Rapid Recovery 6.0 on DL Appliances User’s Guide

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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Introduction to DL Appliance

The DL Appliance with Rapid Recovery software is a backup, replication, and recovery solution that offers near-zero recovery time objectives and recovery point objectives. Rapid Recovery offers data protection, disaster recovery, data migration and data management .You have the flexibility of performing bare-metal restore (to similar or dissimilar hardware), and you can restore backups to physical or virtual machines, regardless of origin. With Rapid Recovery you can replicate to one or more targets for added redundancy and security.

Your appliance sets a new standard for unified data protection by combining backup, replication, and recovery in a single solution that is engineered to be the fastest and most reliable backup for protecting virtual machines (VM), physical machines, and cloud environments.Your appliance is capable of handling up to petabytes of data with built-in global deduplication, compression, encryption, and replication to any private or public cloud infrastructure. Server applications and data can be recovered in minutes for data retention and compliance.

Your appliance supports multi-hypervisor environments on VMware vSphere and Microsoft Hyper-V private and public clouds.

Rapid Recovery offers:

- **Flexibility**. You can perform universal recovery to multiple platforms, including restoring from physical to virtual, virtual to physical, virtual to virtual, and physical to physical.
- **Cloud integration**. You can archive and replicate to the cloud, using cloud storage vendors that support both proprietary and open-source platforms.
- **Intelligent deduplication**. You can reduce storage requirements by storing data once, and referencing it thereafter (once per repository or encryption domain).
- **Instant recovery**. Our Live Recovery feature allows you to access critical data first, while remaining restore operations complete in parallel.
- **File-level recovery**. You can recover data at the file level on-premise, from a remote location, or from the cloud.
- **Virtual support**. Enhanced support for virtualization includes agentless protection and autodiscovery for VMware® ESXi™ 5 and higher, and export to Microsoft® Hyper-V® cluster-shared volumes.

See the following resources for more information about Rapid Recovery.

- The Dell Rapid Recovery product support website at https://support.software.dell.com/rapid-recovery/
- The documentation website at https://support.software.dell.com/rapid-recovery/release-notes-guides/ and http://www.dell.com/support/home/.

Deployment architecture

Your appliance is a scalable backup and recovery product that is flexibly deployed within the enterprise or as a service delivered by a managed service provider. The type of deployment depends on the size and requirements of the customer. Preparing to deploy your appliance involves planning the network storage topology, core hardware and disaster recovery infrastructure, and security.

The deployment architecture consists of local and remote components. The remote components may be optional for those environments that do not require leveraging a disaster recovery site or a managed service provider for off-site recovery. A basic local deployment consists of a backup server called the Core and one or more protected machines. The off-site component is enabled using replication that provides full recovery capabilities in the DR site. The Core uses base images and incremental snapshots to compile recovery points of protected machines.

Additionally, your appliance is application-aware because it can detect the presence of Microsoft Exchange and SQL and their respective databases and log files, and then automatically group these volumes with dependency for comprehensive protection and effective recovery. This ensures that you never have incomplete backups when you are performing recoveries. Backups are performed by using application-aware block-level snapshots. Your appliance can also perform log truncation of the protected Microsoft Exchange and SQL servers.

The following diagram depicts a simple deployment. In this diagram, AppAsure agent software is installed on machines such as a file server, email server, database server, or virtual machines and connect to and are protected by a single Core, which also consists of the central repository. The License Portal manages license subscriptions, groups and users for the protected machines and cores in your environment. The License Portal allows users to log in, activate accounts, download software, and deploy protected machines and cores per your license for your environment.

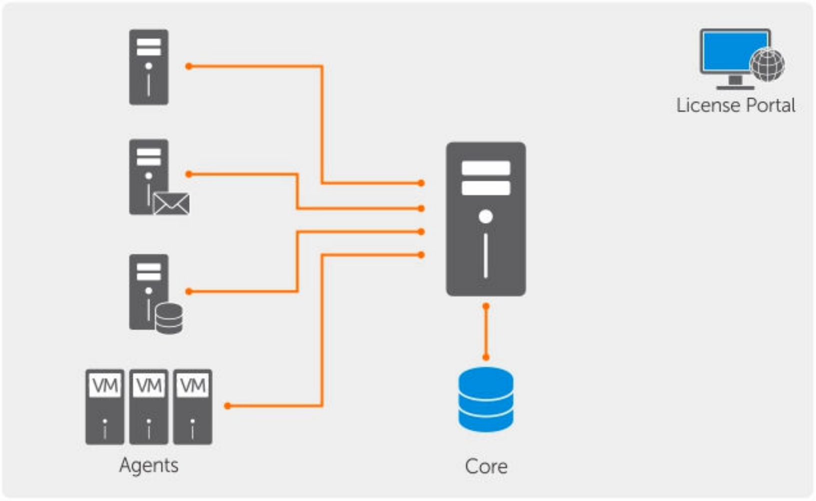


Figure 1. Basic deployment architecture

You can also deploy multiple Cores as shown in the following diagram. A central console manages multiple cores.

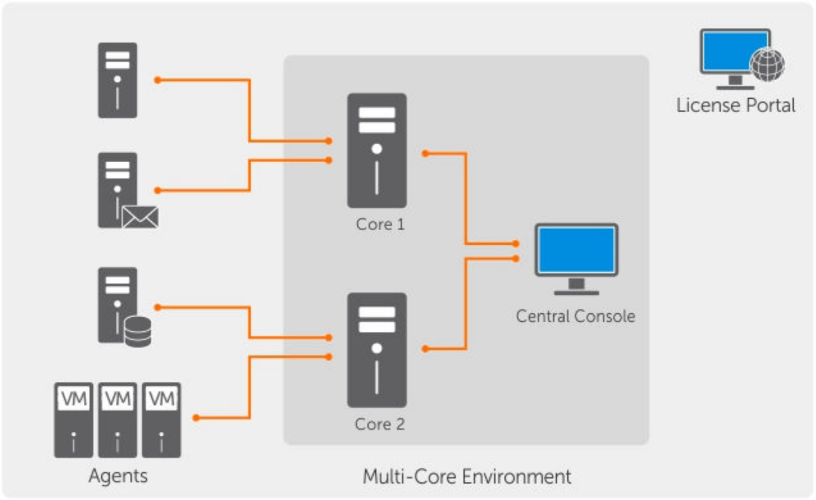


Figure 2. Multi—Core deployment architecture

Smart Agent

Smart Agent tracks the changed blocks on the disk volume and then snaps an image of the changed blocks at a predefined interval of protection. The incremental forever block-level snapshots approach prevents repeated copying of the same data from the protected machine to the Core. The Rapid Recovery Smart Agent is installed on the machines that are protected by the Rapid Recovery Core.

The Smart Agent is application-aware and it detects the type of application that is installed and also the location of the data. It automatically groups data volumes with dependency, such as databases, and then logs them together for effective protection and rapid recovery. After the Rapid Recovery Agent software is configured, it uses smart technology to keep track of changed blocks on the protected disk volumes. When the snapshot is ready, it is rapidly transferred to the Core using intelligent multi-threaded, socket-based connections. To preserve CPU bandwidth and memory on the protected machines, the smart agent does not encrypt or deduplicate the data at the source and protected machines are paired with a Core for protection.

DL Appliance Core

The Core is the central component of the deployment architecture. The Core stores and manages all of the machine backups and provides core services for backup, recovery, and retention; replication, archival, and management. The Core is a self-contained network-addressable computer that runs a 64-bit of Microsoft Windows operating system. Your appliance performs target-based inline compression, encryption, and deduplication of the data received from the protected machine. The Core then stores the snapshot backups in repositories such as, Storage Area Network (SAN) or Direct Attached Storage (DAS).

The repository can also reside on internal storage within the Core. The Core is managed by accessing the following URL from a Web browser: **https://CORENAME:8006/apprecovery/admin**. Internally, all core services are accessible through REST APIs. The Core services can be accessed from within the core or directly over the Internet from any application that can send an HTTP/HTTPS request and receive an HTTP/HTTPS response. All API operations are performed over SSL and mutually authenticated using X. 509 v3 certificates.

Cores are paired with other cores for replication.

Snapshot process

A snapshot is when a base image is transferred from a protected machine to the Core. Snapshots capture and store the state of a disk volume at a given point in time while the applications that generate the data are still in use. In Rapid Recovery, you can force a snapshot, temporarily pause snapshots, and view lists of current recovery points in the repository as well as delete them if needed. Recovery points are used to restore protected machines or to mount to a local file system. The snapshots that are captured by Rapid Recovery are done so at the block level and are application aware. This means that all open transactions and rolling transaction logs are completed and caches are flushed to disk before creating the snapshot.

Rapid Recovery uses a low-level volume filter driver, which attaches to the mounted volumes and then tracks all block-level changes for the next impending snapshot. Microsoft Volume Shadow Services (VSS) is used to facilitate application crash consistent snapshots.

Replication of disaster recovery site or service provider

The replication process requires a paired source-target relationship between two cores. The source core copies the recovery points of the protected machines and then asynchronously and continuously transmits them to a target core at a remote disaster recovery site. The off-site location can be a company-owned data center (self-managed core) or a third-party managed service provider's (MSP's) location, or cloud environment. When replicating to a MSP, you can use built-in workflows that let you request connections and receive automatic feedback notifications. For the initial transfer of data, you can perform data seeding using external media, which is useful for large sets of data or sites with slow links.

In the case of a severe outage, your appliance supports failover and failback in replicated environments. In case of a comprehensive outage, the target core in the secondary site can recover instances from replicated protected machines and immediately commence protection on the failed-over machines. After the primary site is restored, the replicated core can fail-back data from the recovered instances back to protected machines at the primary site.

Recovery

Recovery can be performed in the local site or the replicated remote site. After the deployment is in steady state with local protection and optional replication, the Core allows you to perform recovery using Verified Recovery, Universal Recovery, or Live Recovery.

Product features

You can manage protection and recovery of critical data using the following features and functionality:

- Repository
- Deduplication in Rapid Recovery
- Encryption
- Replication
- Retention and archiving
- Virtualization And Cloud
- Alerts and Event Management
- License portal
- Web console

- Service Management APIs

Understanding repositories

A repository is a central location in which backup snapshot data captured from your protected workstations and server is stored and managed. Data is saved to a repository in the form of recovery points.

A repository can reside on different storage technologies, including Storage Area Network (SAN), Direct Attached Storage (DAS), or Network Attached Storage (NAS).

NOTE: Store repositories for Rapid Recovery Core on primary storage devices. Speed for the storage volume is the most critical factor. Archival storage devices such as Data Domain are not supported due to performance limitations. Similarly, do not store repositories on NAS filers that tier to the cloud, as these devices tend to have performance limitations when used as primary storage.

DAS offers the highest data bandwidth and fastest access rate, and is easy to implement. For optimum results, use DAS with Redundant Array of Independent Disks (RAID) 6 storage. For more information, see Dell Knowledge Base article 118153, “Repository Options: Direct Attached Storage, Storage Area Network or Network Attached Storage.”

The storage location for any repository should always be in a subdirectory that you specify (for example, E:\Repository), never in the root of a volume (for example, E:\).

The Rapid Recovery repository format uses Deduplication Volume Manager (DVM). DVM repositories support multiple volumes, up to 255 repositories on a single Core, and the use of extents. You can create DVM repositories on machines with Windows operating systems only. You can use this repository type when using new Rapid Recovery installations. You can specify the size of a DVM repository upon creation, and can add extents later.

DVM Repository features and attributes include:

- Supports recovery from Rapid Recovery 6.x archives and recovery points
- Supports storage locations on Windows OS only. Repository volume can be local (on storage attached to the Core server), or on a storage location on a Common Internet File System (CIFS) shared location.
- Supported storage types include Storage Area Network (SAN), Direct Attached Storage (DAS), or Network Attached Storage (NAS)
- Requires 8GB RAM, preferably Error Checking and Correction (ECC) memory
- Requires quad core processor on Core machine (this long-standing requirement is now enforced)
- Supports multiple DVM repositories per host
- No additional services required; DVM repository uses native Core services for communication with Core and for tracking events
- Each DVM repository supports up to 4096 repository extents (also called storage locations)
- Fixed size; DVM repository requires you to specify the repository size on a volume. The size that you specify cannot exceed the size of the volume. Each volume you define as a storage location must have a minimum of 1GB of free space available on it.
- Repository storage location can be a simple or dynamic disk, with speed the most important factor
- Can use standard encryption keys created and managed in the Core Console (Core-based encryption)
- Deduplicates data across the entire repository (or across encryption domains within each repository, if encryption keys are used)

- Uses a dedicated, resizeable DVM deduplication cache, with a configurable storage location in Core settings
- Optimized for writing data, storing snapshot data in a repository local to the Core, with all data processed through the Core
- Cannot be renamed after creation
- New repositories of this type can be created using REST APIs, the Rapid Recovery Command Line Management Utility (cmdutil.exe), or Windows PowerShell® cmdlet

When you create a DVM repository, the Rapid Recovery Core pre-allocates the storage space required for the data and metadata in the specified location. The minimum DVM repository size is 1GB, which for practical purposes is generally too small except for testing.

Since DVM deduplication requires a primary and secondary cache, ensure the storage space you reserve is twice the size of your deduplication cache. For example, if you have 1.5GB reserved in the DVM deduplication cache settings on the Core, reserve 3GB on the cache volume. The default installation path for the cache is on the C drive. For more information, see Understanding deduplication cache and storage locations.

You can create multiple independent repositories associated with a single Core, up to 255 DVM repositories. Repositories can span across different storage technologies.

You can further increase the size of a DVM repository by adding new file extents or specifications. An extended repository can contain up to 4096 extents that span across different storage technologies.

For more information on working with DVM repositories, see Managing a DVM repository.

Deduplication in Rapid Recovery

Deduplication is a data compression technique that reduces both storage requirements and network load. The process involves physically storing unique blocks of data only once on disk. In Rapid Recovery, when any unique data block occurs a second time within a repository, instead of storing the data again, a virtual reference to the data is stored.

Deduplication occurs in backup snapshots captured by Rapid Recovery Core. Backup information is deduplicated within a single repository. It cannot be deduplicated across multiple repositories.

Rapid Recovery release 6.0.2 uses target-based deduplication for all DVM repositories. In this model, information is transferred to the DVM repository (the target), and is then deduplicated from the repository.

For the most part, deduplication takes place inline (during the transfer of backup information).

For maximum gains, Rapid Recovery now also offers deduplication that occurs as post-processing. Post-processing is sometimes called pass-through deduplication. Using this model, data in the repository are compared to references in the DVM data cache. If a block of data in the repository has already been saved, then each additional occurrence of that data is replaced with a pointer or reference to the data.

This post-processing can save space on your repository storage volume, particularly if the deduplication cache was filled and then the cache was subsequently increased to take advantage of additional deduplication. This type of deduplication takes place when performing a repository optimization job. This feature is unique to DVM repositories, and is also called duplicate block reclamation.

For more information about the repository optimization job, see About the Repository Optimization Job. For more information on performing this task, see Optimizing a DVM repository.

Thus, Rapid Recovery takes advantage of all types of deduplication described here: target-based deduplication, inline deduplication, and post-processing deduplication.

For more information on where the references to unique blocks are stored for DVM repositories, see Understanding deduplication cache and storage locations.

Understanding encryption keys

The Rapid Recovery Core can encrypt snapshot data for all volumes within any repository using encryption keys that you define and manage from the Core Console.

Instead of encrypting the entire repository, Rapid Recovery lets you specify an encryption key for one or more machines protected on a single Rapid Recovery Core. Each active encryption key creates an encryption domain. There is no limit to the number of encryption keys you can create on the Core.

In a multi-tenant environment (when a single Core hosts multiple encryption domains), data is partitioned and deduplicated within each encryption domain. As a result, Dell recommends using a single encryption key for multiple protected machines if you want to maximize the benefits of deduplication among a set of protected machines.

You can also share encryption keys between Cores using one of three methods. One method is to export an encryption key as a file from one Rapid Recovery Core and import it to another Core. A second method is to archive data secured with an encryption key, and then import that archived data into another Rapid Recovery Core. The third method is to replicate recovery points from a protected machine using an encryption key. After you replicate protected machines, the encryption keys used in the source Core appear as replicated encryption keys in the target Core.

In all cases, once imported, any encryption key appears in the Core with a state of Locked. To access data from a locked encryption key, you must unlock it. For information about importing, exporting, locking or unlocking encryption keys, see the topic Managing encryption keys.

Key security concepts and considerations include:

- Encryption is performed using 256 Bit Advanced Encryption Standard (AES) in Cipher Block Chaining (CBC) mode that is compliant with SHA-3.
- Deduplication operates within an encryption domain to ensure privacy.
- Encryption is performed without impact on performance.
- You can apply a single encryption key to any number of protected machines, but any protected machine can only have one encryption key applied at a time.
- You can add, remove, import, export, modify, and delete encryption keys that are configured on the Rapid Recovery Core.

  ⚠ **CAUTION: Rapid Recovery takes a new snapshot whenever you apply an encryption key to a protected machine. A new snapshot is also triggered after you disassociate an encryption key for a protected machine.**

Encryption keys generated from the Rapid Recovery Core are text files that contain four parameters, as described in the following table:

Table 1. Components of an encryption key

Component	Description
Name	This value is equivalent to the key name given when adding a key in the Rapid Recovery Core Console.
Key	This parameter consists of 107 randomly generated English alphabetic, numeric, and mathematical operator characters.
ID	The key ID consists of 26 randomly generated upper-case and lower-case English characters.
Comment	The comment contains the text of the key description entered when the key was created.

Replication with Rapid Recovery

This section provides conceptual and procedural information to help you understand and configure replication in Rapid Recovery.

Replication is the process of copying recovery points from one Rapid Recovery Core and transmitting them to another Rapid Recovery Core for disaster recovery purposes. The process requires a paired source-target relationship between two or more Cores.

The source Core copies the recovery points of selected protected machines, and then asynchronously and continually transmits that snapshot data to the target Core.

Unless you change the default behavior by setting a replication schedule, the Core starts a replication job immediately after completion of every backup snapshot, checksum check, attachability check, and the nightly jobs. For more information, see Scheduling replication.

For optimum data security, administrators usually use a target Core at a remote disaster recovery site. You can configure outbound replication to a company-owned data center or remote disaster recovery site (that is, a “self-managed” target Core). Or, you can configure outbound replication to a third-party managed service provider (MSP) or cloud provider that hosts off-site backup and disaster recovery services. When replicating to a third-party target Core, you can use built-in work flows that let you request connections and receive automatic feedback notifications.

Replication is managed on a per-protected-machine basis. Any machine (or all machines) protected or replicated on a source Core can be configured to replicate to a target Core.

Possible scenarios for replication include:

- **Replication to a local location**. The target Core is located in a local data center or on-site location, and replication is maintained at all times. In this configuration, the loss of the Core would not prevent a recovery.
- **Replication to an off-site location**. The target Core is located at an off-site disaster recovery facility for recovery in the event of a loss.
- **Mutual replication**. Two data centers in two different locations each contain a Core and are protecting machines and serving as the off-site disaster recovery backup for each other. In this scenario, each Core replicates the protected machines to the Core that is located in the other data center.
- **Hosted and cloud replication**. Rapid Recovery MSP partners maintain multiple target Cores in a data center or a public cloud. On each of these Cores, the MSP partner lets one or more of their customers replicate recovery points from a source Core on the customer’s site to the MSP’s target Core for a fee.

NOTE: In this scenario, customers only have access to their own data.

Possible replication configurations include:

- **Point-to-point replication**. Replicates one or more protected machines from a single source Core to a single target Core.

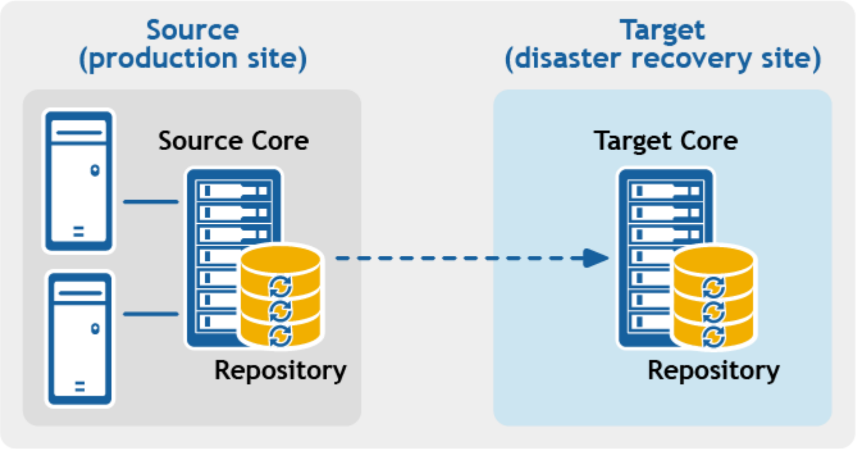


Figure 3. Point-to-point replication configuration

- **Multipoint-to-point replication**. Replicates protected machines from multiple source Cores to a single target Core.

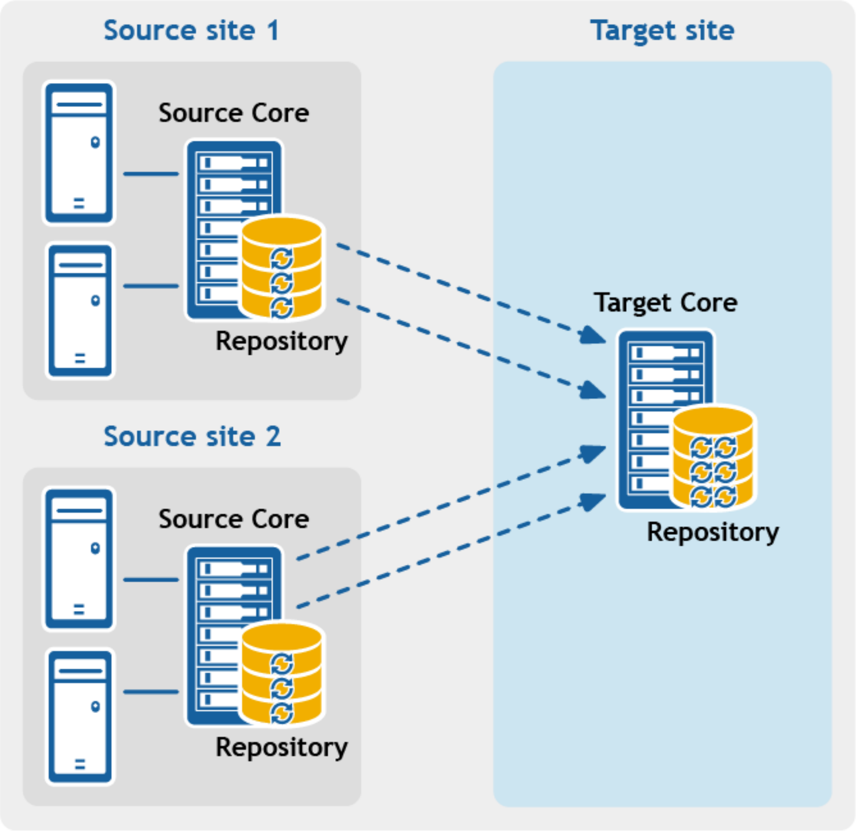


Figure 4. Multipoint-to-point replication configuration

- **Point-to-multipoint replication**. Replicates one or more protected machines from a single source Core to more than one target Core.

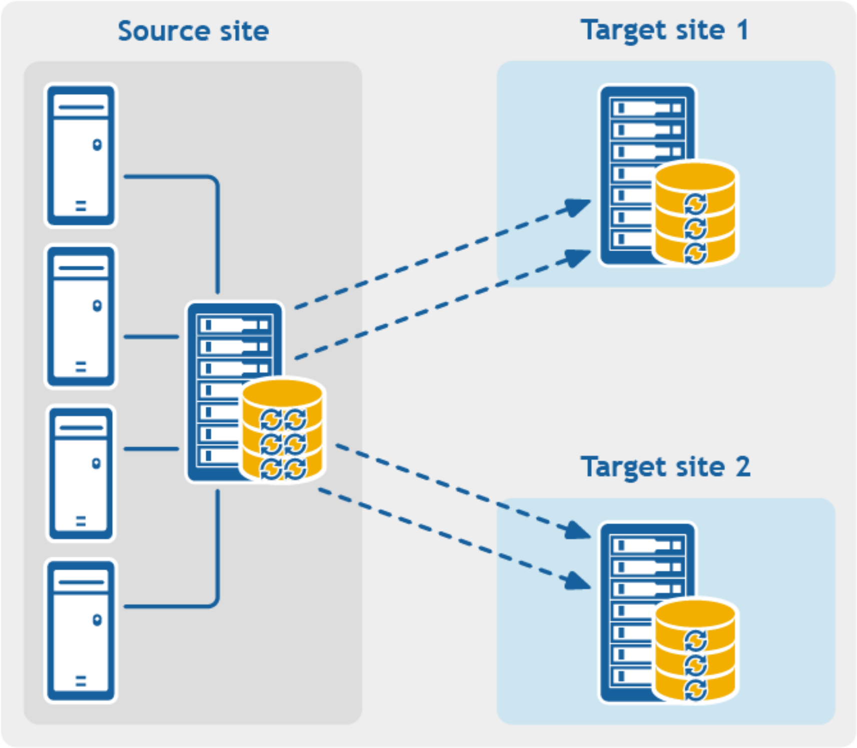


Figure 5. Point-to-multipoint replication configuration

- **Multi-hop replication**. Replicates one or more protected machines from one target Core to another target Core, producing additional failover or recovery options on the replicated Core.

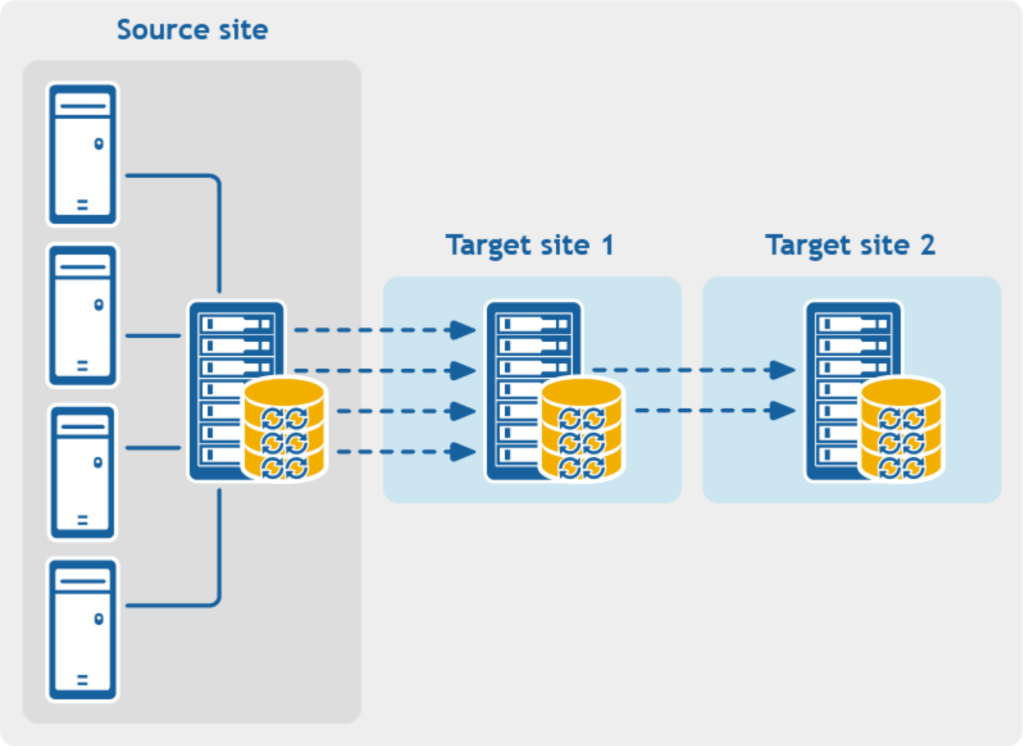


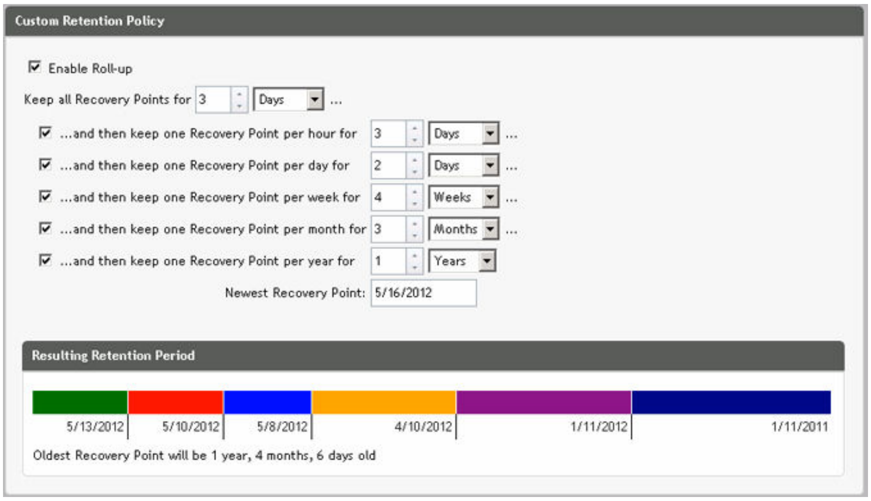
Figure 6. Multi-hop replication configuration

If using Dell Data Protection backup appliances such as the DL1x00 or DL4x00 series, the target Core to which you replicate must have a valid software license configured. These hardware appliances include a replication target license with purchase. Check for your license key in the welcome email message you received when purchased the appliance. For assistance, visit the Licensing Assistance website at https://support.software.dell.com/licensing-assistance or email license@software.dell.com.

Retention and archiving

In your appliance, backup and retention policies are flexible and, therefore, easily configurable. The ability to tailor retention polices to the needs of an organization not only helps to meet compliance requirements, but does so without compromising on RTO.

Retention policies enforce the periods of time in which backups are stored on short-term (fast and expensive) media. Sometimes certain business and technical requirements mandate extended retention of these backups, but use of fast storage is cost prohibitive. Therefore, this requirement creates a need for long-term (slow and cheap) storage. Businesses often use long-term storage for archiving both compliance and non-compliance data. The archive feature supports extended retentions for compliance and non-compliance data, it can also be used for seeding replication data to a target core.



Custom Retention Policy

☑ Enable Roll-up

Keep all Recovery Points for 3 Days ...

☑ ...and then keep one Recovery Point per hour for 3 Days ...

☑ ...and then keep one Recovery Point per day for 2 Days ...

☑ ...and then keep one Recovery Point per week for 4 Weeks ...

☑ ...and then keep one Recovery Point per month for 3 Months ...

☑ ...and then keep one Recovery Point per year for 1 Years

Newest Recovery Point: 5/16/2012

Resulting Retention Period

Oldest Recovery Point will be 1 year, 4 months, 6 days old

Figure 7. Custom retention policy

In your appliance, retention policies can be customized to specify the length of time a backup recovery point is maintained. As the age of the recovery points approaches the end of their retention period, the recovery points age out and are removed from the retention pool. Typically, this process becomes inefficient and eventually fails as the amount of data and the period of retention start grows rapidly. Your appliance solves the big data problem by managing the retention of large amounts of data with complex retention policies and performing rollup operations for aging data using efficient metadata operations.

Backups can be performed with an interval of a few minutes. As these backups age over days, months, and years, retention policies manage the aging and deletion of old backups. A simple waterfall method defines the aging process. The levels within the waterfall are defined in minutes, hours, days, weeks, months, and years. The retention policy is enforced by the nightly rollup process.

For long-term archiving, your appliance provides the ability to create an archive of the source or target core on any removable media. The archive is internally optimized and all data in the archive is compressed, encrypted, and deduplicated. If the total size of the archive is larger than the space available on the removable media, the archive spans across multiple devices based on the available space on the media. The archive also can be locked with a passphrase. Recovery from an archive does not require a new core; any core can ingest the archive and recover data if the administrator has the passphrase and the encryption keys.

Virtualization and cloud

The Core is cloud-ready, which allows you to leverage the compute capacity of the cloud for recovery.

Your appliance can export any protected or replicated machine to a virtual machine, such as licensed versions of VMware or Hyper-V. You can perform a one-time virtual export, or you can establish a virtual standby VM by establishing a continuous virtual export. With continuous exports, the virtual machine is incrementally updated after every snapshot. The incremental updates are very fast and provide standby clones that are ready to be powered up with a click of a button. The supported virtual machine export types are VMware Workstation/Server on a folder; direct export to a vSphere/VMware ESX(i) host; export to Oracle VirtualBox; and export to Microsoft Hyper-V Server on Windows Server 2008 (x64), 2008 R2, 2012 (x64), and 2012 R2 (including support for Hyper-V generation 2 VMs)

Additionally, you can now archive your repository data to the cloud using Microsoft Azure, Amazon S3, Rackspace Cloud Block Storage, or other OpenStack-based cloud services.

Alerts and event management

In addition to HTTP REST API, your appliance also includes an extensive set of features for event logging and notification using e-mail, Syslog, or Windows Event Log. email notifications can be used to alert users or groups of the health or status of different events in response to an alert. The Syslog and Windows Event Log methods are used for centralized logging to a repository in multi-operating system environment. In Windows-only environments, only the Windows Event Log is used.

License portal

The License Portal provides easy-to-use tools for managing license entitlements. You can download, activate, view, and manage license keys and create a company profile to track your license assets. Additionally, the portal enables service providers and re-sellers to track and manage their customer licenses.

Web console

Your appliance features a new web-based central console that manages distributed cores from one central location. MSPs and enterprise customers with multiple distributed cores can deploy the central console to get a unified view for central management. The central console provides the ability to organize the managed cores in hierarchical organizational units. These organizational units can represent business units, locations, or customers for MSPs with role-based access. The central console can also run reports across managed cores.

Service management APIs

Your appliance comes bundled with a service management API and provides programmatic access to all of the functionality available through the Central Management Console. The service management API is a REST API. All the API operations are performed over SSL and are mutually authenticated using X.509 v3 certificates. The management service can be accessed from within the environment or directly over the Internet from any application that can send and receive an HTTPS request and response. This approach facilitates easy integration with any web application such as relationship management methodology (RMM) tools or billing systems. Also included is an SDK client for PowerShell scripting.

2

Working with the DL Appliance Core

Understanding the Rapid Recovery Core Console

This section describes the different elements of the Rapid Recovery Core Console user interface (UI).

Accessing the Rapid Recovery Core Console

Complete the following steps to access the Rapid Recovery Core Console.

- Perform one of the following to access the Rapid Recovery Core Console:
  a. Log in locally to your Rapid Recovery Core server, and then double click the Core Console icon.
  b. Or, type one of the following URLs in your web browser:
     – https://<yourCoreServerName>:8006/apprecovery/admin/ or
     – https://<yourCoreServerIPaddress>:8006/apprecovery/admin/

  NOTE: Because the Rapid Recovery Core Console UI depends JavaScript, the web browser you use to access the Core Console must have JavaScript enabled.

  If you have changed the default port for the Rapid Recovery service, update the port in the preceding URL accordingly.

Understanding the Quick Start Guide

The Quick Start Guide is a feature that provides you with a guided flow of suggested tasks for configuring and using Rapid Recovery Core.

The Quick Start Guide appears automatically the first time you upgrade to or install the Rapid Recovery Core and navigate to the Core Console. Click **Start Guide** on the **Welcome** page of the guide to see the various suggested configuration tasks. Navigate through the guide using the **Skip Step** and **Back** options. When you have seen the last suggested task, click **Finish** to close the guide.

You can launch the Quick Start Guide again at any time from the Help menu in the Core Console. You can also choose to hide the **Welcome** page in the Quick Start Guide.

Unless you hide it, the Quick Start Guide reappears each time you log in to the Rapid Recovery Core Console and access the **Home** page. For more information, see Hiding the Quick Start Guide.

You are not required to perform the steps suggested by the guide. You can simply view the suggested tasks, navigating through them using the **Skip Step** and **Back** options. Optionally, to hide the guide at any point, click **Exit Guide**.

If you choose to perform any configuration tasks suggested by the Quick Start Guide, follow the prompts indicated in any step of the guide, and the appropriate wizard or relevant area in the user interface appears. Procedures to complete each task suggested by the guide is described in this document, as indicated in the table below.

NOTE: Not all configuration tasks suggested by the Quick Start Guide are required for all users. You must understand which tasks you want to accomplish for your specific needs.

The Quick Start Guide addresses the following configuration tasks:

Table 2. Quick Start Guide configuration tasks

Function	Short Description	Result of Selecting Task, Link to Procedure
Protection	Protecting a single machine, protecting a server cluster, or protecting multiple machines using bulk protect	Click Protect or select **Protect Machine** from the drop-down menu to open the Protect Machine Wizard. For information on completing the Protect Machine Wizard, see Protecting a machine. Select **Protect Cluster** from the drop-down menu to open the Connect to Cluster dialog box. For more information on protecting a cluster, see Protecting a cluster. Select **Bulk Protect** from the drop-down menu to open the Protect Multiple Machines Wizard. For information on completing the Protect Multiple Machines Wizard, see About protecting multiple machines.
Replication	Setting up replication from a primary (source) Core to a secondary (target) Core	Click **Replication** to open the Replication page. Prompts you to add a target Core using the Replication Wizard. For information on using the Replication Wizard to set up replication on a self-managed Core, see Replicating to a self-managed target Core. For general information on replication, see Configuring replication.
Virtual Export	Performing a one-time export or establishing continual export from a protected machine to a virtual machine	Click **Export** to perform an export of data from your protected machine to a virtual machine. You can either perform a one-time export, or set up virtual standby for continual export to a VM. For information on virtual exports, see About exporting to virtual machines with Rapid Recovery.
Configuration	Allows you to set up additional configuration for the Rapid Recovery Core	Click **More** to see additional functions you can configure or manage. Functions includes archives; mounts; boot CDs; repositories; encryption keys; cloud accounts; file search; retention policies; notifications; reports; logs; and more.
Configuration: Encryption	Adding or importing encryption keys that you can use for one or more protected machines	Click **Encryption keys** to manage security for protected data by adding or importing encryption keys. You can apply encryption keys to one or more protected machines. Encryption is described in the topic Understanding encryption keys.
Configuration: Notifications	Setting up notifications for events, warnings and alerts	Click **Events** to specify notification groups for events, warnings, and alerts. To send these by email, you must also establish SMTP server settings. For more information on managing events, see the topic Events, including the topics Configuring notification groups and Configuring an email server.
Configuration: Retention	Viewing or changing the— default retention policy for the Core	Click **Retention Policy** to open the Retention Policy page for the Core. From here you can define how long to keep a recovery point before rolling it up. For conceptual information about retention policies, see the topic

Function	Short Description	Result of Selecting Task, Link to Procedure
		Managing aging data. For procedural information, see Managing retention policies.
Restore	Restoring data from a recovery point on the Core	Click **Restore** to open the Restore Machine Wizard. For information on restoring data, see the topic About restoring volumes from a recovery point.

Hiding the Quick Start Guide

The Quick Start Guide appears automatically the first time you upgrade to or install the Rapid Recovery Core.

It also appears when you select Quick Start Guide from the Help drop-down menu, and each time you access the Home page on the Core Console.

Use the procedure below to hide the Quick Start Guide.

- From the Rapid Recovery Core Console, if you are viewing the **Welcome** page of the Quick Start Guide, do the following:
  - If you want to hide the **Welcome** page of the Quick Start Guide, select **Don't show again**.

    NOTE: This option will hide the **Welcome** page the next time the Start Guide is opened, and every time, until you upgrade the Rapid Recovery Core.

    If you choose to hide this page, and want to access advanced options in the future, then select **Back** in the wizard to see this hidden page.
  - If you want to hide the Quick Start Guide for this session, then click **Close**.

    The Quick Start Guide closes. The next time you access the Home page on the Core Console, the Quick Start Guide reappears.

    You can also open the Quick Start Guide from the Help menu.
- From any page in the Quick Start Guide click **Exit Guide.**

  The Quick Start Guide closes. If you select this option, you can still open the Quick Start Guide from the Help menu.

Navigating the Rapid Recovery Core Console

When you log into the Core Console, and any time you click the **Home** 🏠 icon, the **Home** page appears. The **Home** page gives you a view of your Rapid Recovery Core, with two options. In the main viewing area, the default content is the new Core dashboard, which displays a set of real-time reports on your system. Default dashboard reports include recent transfer job status, per machine transfer, a repository overview, and connectivity state for protected, replicated, and recovery points-only machines. Or you can switch to the classic Summary Tables view. In this view, the title of the page shows the display name of your Rapid Recovery Core, and you can see summary tables showing protected machines, repositories, and recent alerts. For more information, see Understanding the Home page (summary tables view) and Understanding the Core dashboard, respectively.

On the **Home** page (and on every page in the Core Console), the left navigation area shows the items that are protected on your Core. You can navigate to other pages in the UI by doing one of the following:

- Clicking the corresponding icon from the icon bar in the left navigation area. The options accessible from the icon bar include Replication, Virtual Standby, Events, Settings, and More.

- Expanding the ⋮ (More) menu on the icon bar, and then selecting a destination
- Clicking a button or menu option from the button bar. Buttons include Protect, Restore, Archive, and Replicate.

When you select an item from the left navigation area, the focus of the Core Console changes to display summary information about that item. For example, if you click the name of a protected machine, the Core console displays information about that machine only, rather than the Core. In this example, the display name of the protected machine appears as the title of the page. A submenu appears to the right, letting you view specific information about the protected machine. The menu options include: Summary, Recovery Points, Events, Settings, Reports, and More.

To return to viewing information about the Core, including dashboard reports, or a summary view of multiple protected or replicated machines, click on the **Home** ⌂ icon on the top left of the UI. On the **Home** page, you can toggle between the dashboard view and the summary page view by clicking the red link at the top right of the page.

You can use the title at the top of the Core Console to provide context for the information you are viewing in the Core. For example:

- Any time you see the display name or IP address of the Core as the page title, you are viewing summary information about the Core.
- If the title is Dashboard, you are viewing the Core dashboard.
- If you see the display name or IP address of a protected machine, or a Summary pane at the top of a page, you are viewing information about a single machine protected by or replicated in the Core.
- If you see the title Protected Machines, you are viewing information about all of the machines protected in the Rapid Recovery Core.
- If you see the title Machines replicated from..., you are viewing information about all of the machines replicated in the Rapid Recovery Core.
- If you see the page title Recovery Points Only, you are viewing information about all of the recover points-only machines on this Core.

For information about the features and functions available from each page, see the appropriate section below.

For more information about viewing protected machines, see Viewing the Protected Machines menu. For more information on managing protected machines, see Managing protected machines.

For more information about viewing replicated machines, see Viewing incoming and outgoing replication.

For more information about viewing recovery-points only machines, see Viewing the Recovery Points Only menu

Understanding the left navigation area

The left navigation area of the Core Console appears on the left side of that user interface. The contents of this navigation area may differ based on the type of objects protected in your Rapid Recovery Core.

The left navigation area always contains the following:

- **Icon bar.** For navigation among the main pages of the Core Console.

- **Text filter.** The text filter is a text field that lets you filter the items displayed in the various menus that appear below it. Clicking the arrow to the right of the text filter expands and collapses each of the menus appearing below it.

Following these elements, the left navigation area typically displays menus to help you navigate, filter, and view the objects protected on your Core. This includes protected machines, replicated machines, and so on.

Each menu is context-sensitive; that is, each menu only appears in the Core Console if it is relevant. For example, if you protect at least one machine, the Protected Machines menu appears, and so on.

For more information, see the left navigation area tables in Viewing the Core Console user interface.

Viewing the Rapid Recovery Core Console Home page

Each time you log into the Rapid Recovery Core Console, or each time you click on the **Home** 🏠 icon in the icon bar, the **Home** page appears.

The **Home** page of the Core Console offers a new **dashboard** view, and the familiar **summary tables** view. The dashboard is the default view.

You can toggle between views on the **Home** page by clicking the red link at the top right of the **Home** page.

From the Home page, and every other page of the Core Console, you can navigate to the functions you want by using the left navigation area.

For more information, see the following topics:

- Understanding the left navigation area
- Understanding the Core dashboard
- Understanding the Home page (summary tables view)

Understanding the Home page (summary tables view)

The **Home** page is only applicable to the Core. In the dashboard view, it shows real-time graphical reports. When you switch to the summary tables view, the **Home** page displays all of the machines the Core protects or replicates, the repositories associated with your Core, and alerts for machines on this Core.

The view of each pane on the **Home** page can be expanded or contracted. For example, if you click the ⌃ (contract view) icon at the top right-hand side of the Protected Machines pane, the view of protected machines contracts, and only the name of the pane is visible. To expand the view to see all protected machines again, click the ⌄ (expand view) icon.

The following table describes the various elements on the **Home** page when in the summary tables view.

Table 3. Home page options

UI Element	Description
Protected Machines	The Protected Machines pane lists the machines that this Core protects. This pane appears regardless of whether any machines have been added to your Core for protection.

UI Element	Description
	This section includes the following information for each protected machine: • **Machine type.** An icon shows whether the machine is a physical machine, virtual machine, or a protected cluster. • **Status.** Colored circles in the Status column show whether the protected machine is accessible, paused, or offline and unreachable. • **Display Name.** The display name or IP address of the protected machine. • **Repository Name.** The name of the repository storing the recovery points for that machine. • **Last Snapshot.** The date and time on which Rapid Recovery took the most recent recovery point snapshot for that machine. • **Recovery Points.** The number of recovery points stored in the repository and space usage for each protected machine. • **Version**. The version of the Rapid Recovery Agent software installed on that machine. If you click on a specific machine name shown in this pane, a Summary page appears, showing summary information for the selected machine. For more information on what you can accomplish on the Summary page, see Viewing summary information for a protected machine.
Replicated Machines	The Replicated Machines pane lists any machines that this Core replicates from another Core. This pane does not appear unless your Core replicates machines from another Core. This section includes the following information for each replicated machine: • **Machine type.** An icon shows whether the machine is a physical machine, virtual machine, or a protected cluster. • **Status.** Colored circles in the Status column show whether the replicated machine is accessible, paused, or offline and unreachable. • **Display Name.** The display name or IP address of the replicated machine. • **Replication Name.** The display name of the originating source Core for any machines you replicate on this target Core. You can define this name when setting up replication. • **Repository Name.** The name of the repository storing the recovery points for that machine. • **Last Replicated Snapshot.** The date and time on which Rapid Recovery took the most recent replica of the original protected machine. • **Recovery Points.** The number of recovery points stored in the repository and space usage for each replicated machine. • **Version**. The version of the Rapid Recovery Agent software installed on that machine. If you click on a specific machine name shown in this pane, the Summary page appears, showing summary information for that replicated machine.
Recovery Points Only Machines	The Recovery Points Only Machines pane lists any machines that were removed from protection or replication, if the recovery points have been retained. These machines can be used for file-level recovery, but cannot be used for bare metal restore, for restoring entire volumes, or for adding snapshot data. This pane does not appear unless you have any machines that meet this definition.

UI Element	Description
	This section includes the following information for each recovery points only machine: • **Machine type.** An icon shows whether the machine is a physical machine, virtual machine, or a protected cluster. • **Status.** Colored circles in the Status column show whether the recovery points only machine is accessible, paused, or offline and unreachable. • **Display Name.** The display name or IP address of the machine for which you kept recovery points. • **Repository Name.** The name of the repository storing the remaining recovery points for that machine. • **Recovery Points.** The number of recovery points stored in the repository and space usage for each recovery points-only machine. If you click on a specific machine name shown in this pane, the Summary page appears for this recovery points only machine.
DVM Repositories	This pane appears for the DL1000, regardless of whether any DVM repositories have been created. This pane does not appear unless your Core has one or more DVM repository. It includes the following information for each DVM repository: • **Type.** An icon depicts a repository. • **Status.** Colored circles in the Status column show whether the repository is mounted and can accept recovery point transfers, or is unreachable, or in an error state. • **Repository Name.** The display name of the repository. • **Space Usage.**The total amount of space used in the repository, and the size of the storage volume or extent. • **Protected Data.** The amount of used space in the repository. • **Machines.** The number of machines for which the repository stores recovery points. • **Recovery Points.** The number of recovery points stored in the repository. • **Compression Ratio.** The rate at which the repository compresses the protected data to save space. For more information, see Understanding repositories.
Alerts	This section lists the important alerts for the Core and every machine it protects. The section includes the following information: • **Icons.** The column of icons indicates the nature of the alert. These include informational messages, errors • **Date.** Displays the date and time of when Rapid Recovery issued the alert. • **Message.** Describes the alert. You can also see these details on the Core Events page. For more information, see Viewing events using tasks, alerts, and journal.

Understanding the Core dashboard

The Core dashboard displays of a set of real-time graphical reports of data relevant to your Core and the machines you protect. The dashboard includes the following reports:

- **Transfer Job**. This report shows all snapshot data transfers (including base images and incremental snapshots) that completed in the last 24 hours. Snapshots include base images and incremental snapshots. This dashboard report appears as a circle graph.
- **Transfer Job per Machine**. This job shows, by protected machine, the number of successful and failed transfer jobs in the last 24 hours. This dashboard report appears as a line graph.
- **Repository**. This report shows the repositories associated with your Core. It shows the number of repositories, how many machines are protected in each, the number of recovery points and the percentage of compression or deduplication. This report is refreshed every minute.
- **Machine Connectivity**. This report shows the connectivity state of machines protected and replicated on your Core. It also shows connectivity for data on recovery points-only machine .

You can collapse or expand the view of any reports on the dashboard by clicking the up or down arrow in the header of the report. Some dashboard reports (machine connectivity and repository) have a plus sign next to the arrow, from which you can add another protected machine or another repository, respectively.

You can also drag and drop to move the location of one of the reports elsewhere on the dashboard, to order the reports in a manner most effective for your use.

Viewing the Protected Machines menu

In the Rapid Recovery user interface, a Protected Machines menu appears in the left navigation area. As with all menu labels in the navigation area, the label for this menu appears in all upper-case letters. By default, this menu is fully expanded, and shows a list of any machines that are protected by this Core. If you have any server clusters protected, then they are included in this list.

You can collapse or expand the view for protected machines and server clusters in your Core by clicking the arrow on the left side of this menu.

The Protected Machines menu includes a drop-down menu on the right side which lists functions that can be performed on all protected machines. Click the arrow to the right of **Protected Machines** to see the menu and to perform any of the following:

- Force an incremental snapshot for all machines
- Force a base image for all machines
- Pause protection for all machines (if protection is active)
- Resume protection for all machines (if protection is paused)
- Refresh metadata for all protected machines
- Remove all machines from protection on the Core

Each machine listed under the Protected Machines menu also has a drop-down menu that controls functions only for that machine. From the drop-down menu for any machine, you can perform the following:

- Force an incremental snapshot for the selected machine
- Pause protection for the selected machine (if protection is active)
- Resume protection (if protection is paused)
- Refresh metadata
- Remove the selected machine from protection on the Core
- Navigate to the Summary page for the selected machine
- Navigate to the Recovery Points page for the selected machine

- Navigate to the Events page for the selected machine
- Navigate to the Settings page for the selected machine
- Generate reports specific to that machine
- Access more functions specific to the selected machine, including system information, mounts, retention policy, notifications, or a machine-specific log
- Create a custom label that displays in the Protected Machines list

If you are managing server clusters from the Rapid Recovery Core, the cluster also appears in the left navigation menu. From the drop-down menu for any cluster, you can also:

- Navigate to the **Protected Nodes** page for the selected cluster

If you click the arrow to the left of the Protected Machines menu, the list of protected machines and server clusters contracts, and no machines are listed. Clicking again on this arrow causes the list of machines to expand again.

Clicking any machine name in the Protected Machines menu opens the Summary page for that machine. For more information on what you can accomplish on the Summary page, see Viewing summary information for a protected machine.

Finally, clicking directly on the **Protected Machines** menu causes the **Protected Machines** page to appear in the main content area, with a single pane showing protected machines on this Core. For more information on what you can accomplish on the **Protected Machines** pane of the Protected Machines page, see Viewing the Protected Machines pane.

NOTE: From the **Protected Machines** page, you can return to a view from the Core perspective by clicking the **Home** icon in the icon bar.

Viewing summary information for a protected machine

When you click the name of a protected machine in the Core Console, the **Summary** page appears. On this page, at minimum, is a Summary pane, and a Volumes pane. If a machine is added to replication, a Replication pane also appears.

If you have one or more protected Exchange servers, you will also see an Exchange Server Information pane that contains information about your protected Exchange server.

If you have one or more protected SQL servers, you will also see a SQL Server Information pane that contains information about your protected SQL servers.

At the top of his page is a menu of actions you can perform on the protected machine. Below it, at minimum, appears a Summary pane, and a Volumes pane. If a machine is added to replication, a Replication pane also appears.

When displaying information for a protected machine—on the Summary page and all other views—there is a menu at the top of the page with functions you can perform. This menu appears immediately below the name of the protected machine.

Related links

- Viewing the Summary pane
- Viewing Volumes on a protected machine
- Viewing replication information
- Viewing the Exchange Server Information pane
- Viewing the SQL Server Information pane

Viewing the Summary pane

The **Summary** pane contains summary information about the protected machine, including the host name, date and time of the last snapshot, date and time of the next scheduled snapshot, encryption key information, and version information for the Rapid Recovery Agent software. There is also a link to a detailed System Information page for the machine.

Viewing Volumes on a protected machine

For any protected machine, from the Summary page, in the Volumes pane, you can perform the following actions for any of the volumes listed:

- Set or modify a protection schedule for a selected volume. Protection schedules are typically established when you first protect a machine. For more information about modifying a protection schedule, see Modifying protection schedules.
- Force a base image or snapshot. Snapshots typically occur based on the protection schedule. However, at any time, you can force a base image or an incremental snapshot for selected volumes. For more information, see Forcing a snapshot.

Viewing replication information

The **Replication** pane contains summary information about the replicated machine, including the replication name, the state of replication, progress, and available space.

Viewing the Exchange Server Information pane

The **Exchange Server Information** pane appears only for protected machines that are Exchange servers.

This pane contains summary information about the protected Exchange server, including the installed version of Microsoft Exchange, the path in which Exchange is installed, and the path defined for Exchange mailbox data.

The Mail Stores grid shows the Exchange Database (EDB) name, the path of the EDB file, the path in which the log files are stored, the log prefix, the system path, the Database Availability Group (DAG), and the mail store type.

Viewing the SQL Server Information pane

The **SQL Server Information** pane appears only for protected machines that are SQL Servers.

This pane contains summary information about the protected SQL Servers. You can expand the database information to see detail for each table in the database. You can also see the database or table name and the database path.

Viewing recovery points for a machine

The Recovery Points page shows a list of the recovery points collected for that protected machine as well as pertinent machine and repository data. On this page, you can mount, export, and restore specific recovery points, as well as delete recovery points.

The page is divided into two panes: Recovery Points Summary and Recovery Points. The Summary pane does not include any actionable links. It displays the following data for the machine.

Table 4. Recovery Points Summary pane data

UI Element	Description
Total Recovery Points	The number of recovery points collected for this particular protected machine.
Total Protected Data	The amount of data from the protected machine that is stored in the repository.
Repository	The name of the repository in which Rapid Recovery stores the recovery points for this protected machine.
Repository Status	The progress bar displays the percentage of the total space used in the repository. The amount of data used and the total size of the repository appear below the progress bar.

For more information, see Viewing the Protected Machines pane.

Viewing events for a protected machine

On the **Events** page, you can view the jobs that occurred or are in progress for the protected machine you selected. Buttons at the top of the page let you navigate to lists of jobs in each of the three categories of activities:

- **Tasks.** A job that the Rapid Recovery must perform to operate successfully.
- **Alerts.** A notification related to a task or event that includes errors and warning.
- **Journal.** A composite of all protected machine tasks and alerts.

The following table includes descriptions of each element on the **Events** page.

Table 5. Events page elements

UI Element	Description
Search keyword	Lets you search for a specific item within each category. Available for tasks only.
From	To narrow your results, you can enter a date at which to begin searching. Available for tasks only.
To	To narrow your results, you can enter a date at which to stop searching. Available for tasks only.
Status icons	Each icon represents a different job status. For alerts and tasks, clicking one of the icons lets you filter the list by that status, essentially generating a report. Clicking the icon a second time removes the filter for that status. You can filter by more than one status. Statuses include: • **Active.** A job that is in progress. • **Queued.** A job that is waiting for another job to complete before it can initiate. • **Waiting.** A job waiting for your approval or completion, such as a seed drive. (For more information about seed drives, see Replication.) • **Complete.** A job that completed successfully. • **Failed.** A job that failed and did not complete.

UI Element	Description
Service icon	This button adds services jobs to the list of jobs. When you click this icon, a smaller service icon appears on each status icon, which lets you filter by service jobs that have those statuses (if any exist). Examples of services jobs include deleting index files or removing a machine from protection.
Export type drop-down list	The drop-down list includes the formats to which you can export the event report. Available for tasks only. It includes the following formats: • PDF • HTML • CSV • XLS • XLSX
(Export icon)	Converts the event report to the format you selected. Available for tasks only.
Page selection	Event reports can include several jobs across multiple pages. The numbers and arrows at the bottom of the **Events** page let you navigate the additional pages of the report.

The **Events** page displays all events in a table. The following table lists the information shown for each item.

Table 6. Detailed information for the Event summary table

UI Element	Description
Status	Shows the status for the task, alert, or journal item. Available for alerts or journal items, click the header to filter the results by status.
Name	Name is available for tasks only. This text field lists the task type that completed for this protected machine. Examples include transfer of volumes, maintaining repository, rolling up, performing mountability checks, performing checksum checks, and so on.
Start Time	Available for tasks, alerts, and journal items. Shows the date and time when the job or task began.
End Time	Available for tasks only. Shows the date and time when the task completed.
Job Details	Available for tasks only. Opens the **Monitor Active Task** dialog box, so you can view details of the specific job or task. These details include an ID for the job, rate at which the core transferred data (if relevant), elapsed time for the job to complete, total work in amount of gigabytes, and any child tasks associated with the job.
Message	Available for alerts and journal items. This text field provides a descriptive message of the alert or journal item.

Viewing reports for a protected machine

The **Reports** drop-down menu lets you generate reports on demand for the selected protected machine.

The Job report provides a report on the status of successful jobs and failed jobs for the selected machine. Failed jobs can be further viewed in a Failure report. For more information on this report type, see Understanding the Job report.

The Failure report provides information on failed and canceled Core jobs for the specified machine. For more information on this report type, see Understanding the Failure report.

For more information about generating these reports, see Generating a Core report on demand.

Viewing replicated machines from the navigation menu

If your Core replicates machines from another Rapid Recovery Core, the display name of the source Core appears as a collapsible menu in the left navigation of the Core Console. As with all menu labels in the navigation area, this replicated machines menu name appears in all upper-case letters, below the Protected Machines menu. By default, the replicated machines menu is fully expanded, and lists all machines originating from that source Core that are replicated on your target Core.

You can collapse or expand the view of replicated machines from that source Core by clicking the arrow on the left side of this menu.

Each replicated machines menu includes a drop-down menu on the right side, which includes functions you can perform simultaneously on all of the replicated machines originating from that Core. Click the arrow to the right of replicated machines menu to see a drop-down list of functions you can perform. These actions include the following:

- Pause replication. If replication is currently active, it stops the action until you resume it.
- Resume replication. If replication has been paused, it begins replicating again.
- Force replication. Replicates on demand, rather than at a scheduled time.
- Remove replication. Removes the replication relationship between the source core and your target core. Optionally, you can delete the recovery points stored in this Core. For more information, see Removing replication.

Clicking directly on name of the source Core in the navigation menu causes the **Machines replicated from [Source Core Name]** page to appear in the main content area. For more information on what you can accomplish on that page, see Viewing incoming and outgoing replication.

Related links

Pausing and resuming replication
Forcing replication
Removing replication

Viewing the Recovery Points Only menu

The Recovery Points Only menu appears in the left navigation area if one of the following is true:

- if your Rapid Recovery Core retains some recovery points from a machine that was previously protected
- if you removed replication but retained the recovery points.

As with all menu labels in the navigation area, the label for this menu appears in all upper-case letters.

You can collapse or expand the view of recovery points-only machines by clicking the arrow on the left side of this menu.

The menu includes a drop-down menu on the right side which lists functions that can be performed on all recovery points-only machines simultaneously. In this case, the only function you can perform is to remove recovery points from the Core.

CAUTION: This action removes all of the recovery points-only machines in your Rapid Recovery Core, permanently deleting them and precluding you from restoring information from those recovery points from this Core.

Viewing the Custom Groups menu

The custom groups menu appears in the left navigation area only if you have defined one or more custom groups. As with all menu labels in the navigation area, the label for this menu appears in all upper-case letters.

You can collapse or expand the view of items in this menu by clicking the arrow on its left side.

The custom groups menu includes a drop-down menu on the right side which lists functions that can be performed simultaneously on all of the like items in that group.

For more information, see Understanding custom groups.

Using the Error dialog box

When an error occurs in the Rapid RecoveryRapid Recovery Core Console user interface, such as trying to enter an invalid parameter, an Error dialog box appears. The dialog box typically indicates the cause of the error, includes some links to provide more information about the error, and includes a Close button. You must close the Error dialog box before you continue, but you may want to view more information about the error.

In the Error dialog box, choose from the following options:

User interface errors that cause the Error dialog box to appear are not tracked in Rapid Recovery events tab, since they are simply validation or data entry errors. However, when you click the Search Knowledge Base option for any error, then the URL link provided for that error is recorded to the CoreAppRecovery.log file. You can search the log for the text string “KB article url generated” to see the URL for each error that was viewed in a browser. For more information on downloading or viewing Core error logs, see the topics Downloading and viewing the Core log file or Accessing Core logs, respectively.

Core settings

This section describes how to manage and change the settings for your Rapid Recovery Core from the ⚙ Settings icon.

Rapid Recovery Core settings

The Rapid Recovery Core settings are configured by default for optimum performance for most users. These settings affect the performance of the Rapid Recovery Core, or in some cases the display of information in the Rapid Recovery Core Console. From the icon bar, click ⚙ (Settings) to access Core settings. A list of all Core settings appears on the left. You can click on the title for any of the settings from this list to jump to the full configuration for that setting on the right. Or you can scroll down through all the Core settings on the right to see all configuration options. For more information, see Rapid Recovery Core settings.

You can also access Core tools such as viewing a summary of system information, or downloading Core log files. For more information, see Core-level tools.

The comprehensive set of Rapid Recovery Core settings that you can configure is described in the following table.

Table 7. Rapid Recovery Core configurable settings

Configuration Setting	Description
Backup and restore Core configuration	Rapid Recovery lets you back up Core configuration settings to an XML file. If you have a backup file, you can use it to restore or migrate Core settings. For more information about backing up and restoring Core settings, see Backing up and restoring Core settings.
General	General settings include configuration options that apply generally to the Rapid Recovery Core, including display options and ports for the web server and for the Rapid Recovery service. For more information about the general settings for Rapid Recovery Core, including how to configure these settings, see Configuring Core general settings.
Updates	Update settings controls aspects of the Automatic Update feature, which checks for updated versions of Rapid Recovery software. For more information about settings for updating the Rapid Recovery Core, including how to configure these settings, see Configuring update settings.
Nightly jobs	Nightly jobs settings are automated tasks which the Core performs on a daily basis. You can configure the time the jobs begin and which jobs are performed. Dell recommends scheduling the jobs outside of normal business hours to reduce load on the system when demand for resources is high. For more information, see Understanding nightly jobs, Configuring nightly jobs for the Core, and Customizing nightly jobs for a protected machine.
Transfer queue	Transfer queue settings control the number of times transfer operations are attempted if jobs fail due to unavailability of resources. You can establish the maximum number of concurrent transfers and the maximum number of retries for transferring data. For more information about transfer queue settings, see Modifying transfer queue settings.
Client timeout	Client timeout settings determine the length of time before that specific connection requests or read and write operations should be attempted before timing out. For more information about client timeout settings, see Adjusting client timeout settings.

Configuration Setting	Description
DVM Deduplication cache	Deduplication ensures that unique blocks of information are stored only once in your repository, creating references to repeated data blocks. The references are stored in a deduplication cache. If encryption keys are used, then deduplication occurs within each encryption domain. DVM deduplication cache settings let you configure the size and specify the locations for the primary and secondary cache, as well as the location for the metadata cache. For more information about deduplication cache, see Understanding deduplication cache and storage locations. For information on adjusting the settings, see Configuring DVM deduplication cache settings.
Replay Engine	Replay engine settings control information regarding the communication channel for the Replay engine, such as IP addresses and timeout settings, to help adjust the performance specific to your network needs. For more information about engine settings for Rapid Recovery, see Configuring Replay engine settings.
Deploy	Deploy settings let you set options for deploying the Rapid Recovery Agent software from your Core to the machines you want to protect. For more information about configuring deployment settings, see Configuring deployment settings.
Database connection	Rapid Recovery stores transactional information in a MongoDB service database that is installed locally by default on the Core machine. You can configure these settings to change how long information is retained in the database, or to change the connection pool size to allow for more or fewer concurrent connections. For more information about establishing or modifying database connection settings for the service database, see Configuring database connection settings.
Local database	Rapid Recovery displays information about Core tasks, events, and alerts on the Events page. Rapid Recovery stores this transactional information in a MongoDB service database that is installed locally on the same machine as the Rapid Recovery Core. You can configure credential information (username and password) for the local Mongo service database using the Local database settings. For more information on adjusting local database settings, see Modifying local database connection settings.
SMTP server	Configure simple mail transfer protocol (SMTP) server settings for the Core, you can also to send Core event information by email. For more information about configuring an SMTP email server, see Configuring an email server. NOTE: To send event information by email, you must also configure notification group settings. For more information on specifying events to receive email alerts, see Configuring notification groups.
Cloud configuration	The Cloud Configuration settings let you specify configuration settings for supported cloud storage accounts. These settings do not create cloud accounts. Instead, they associate existing cloud storage accounts with your Rapid Recovery Core to facilitate actions such as archiving Rapid Recovery information.

Configuration Setting	Description
	For more information about managing cloud storage account information in the Rapid Recovery Core, see Managing cloud accounts.
Reports	Report settings include a single configuration parameter that allows you to select the font used when a report is generated from the Rapid Recovery Core. For more information about changing report settings, see Managing report settings.
Attachability	Attachability settings let you specify whether to perform SQL attachability checks on the protected machine, or whether to use the SQL Server instance on the Core. If specifying SQL on the Core, you must provide credential information. For more information about managing SQL attachability settings for the Core, see Managing Core SQL attachability settings.
Jobs	Core jobs are automatically created whenever you initiate operations such as replication. You can specify settings for each job using the Jobs core settings. You can configure the number of jobs to execute at one time. In case network or other communication errors prevent any job from succeeding the first time, you can set how many times a job should be attempted using the Try count setting. For more information about Core jobs, which jobs are available, and how to configure them, see Core job settings.
Licensing	From the Core console, Rapid Recovery lets you change the license associated with your Core, limit the number of daily snapshots, view license pool information, and contact the license server. For more information about managing licenses from the Core, see Managing licenses. For more information about managing licenses, see the Dell Data Protection | Rapid Recovery License Portal Guide. NOTE: The Dell Data Protection | Rapid Recovery License Portal has a different release cycle than Rapid Recovery software. For the latest product documentation, see the Dell Technical Documentation website.
SNMP configuration	Simple Network Management Protocol (SNMP) is a protocol for managing devices on an IP network. You can configure the Rapid Recovery Core as an SNMP agent. The Core then can report information such as alerts, repository status, and protected machines. For more information on using SNMP with Rapid Recovery, see Understanding SNMP settings.
vSphere	vSphere Core settings apply only for users of the agentless protection of virtual machines. If using a vSphere host, these settings include connection settings that apply to the VMs. For more information on vSphere settings for VMware or ESXi agentless protection, see Configuring vSphere settings.
Log Uploads	When this option is set to Yes, Rapid Recovery Core uploads log files to Dell for analysis in its on-going effort to improve overall product quality. This setting is optional.

Configuring Core general settings

General settings for the Rapid Recovery Core include the Core display name, the web server port, service port, and the locale (the Core console display language).

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **General**.
   - Scroll down on the right side of the Settings page until you can see the General heading.

   The General core settings appear.
3. Click on the general setting you want to change.

   The setting you selected becomes editable, as a text field or a drop-down menu.
4. Enter the configuration information as described in the following table.

   Table 8. General Settings information

Text Box	Description
Display name	Enter a new display name for the Core. This is the name that will display in the Rapid Recovery Core Console. You can enter up to 64 characters.
Web server port	Enter a port number for the Web server. The default port is 8006.
Service port	Enter a port number for the Rapid Recovery Core service. The default port is 8006.
Locale	From the Locale drop-down list, select the language you want to display. You can choose from English, French, German, Japanese, Korean, Portuguese, Simplified Chinese, and Spanish. NOTE: If changing the languages, confirm the message indicating that the Rapid Recovery Core service must restart before the updated language can display in the Core Console. You can restart this service from the Windows Task Manager.

5. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✗ to exit edit mode without saving.

Configuring update settings

Rapid Recovery includes the Automatic Update feature. When installing the Rapid Recovery Core, you can choose whether to automatically update the Rapid Recovery Core software when new updates are available, and how frequently the system should check for updates.

Rapid Recovery release numbers typically include four chunks of information, separated by decimal points: the major release number, minor release number, revision, and build number. For example, the first rebranded release of Rapid Recovery was 6.0.1.609. The next release was 6.0.2.142.

The Auto Update feature compares all digits in a release number. If you enable automatic update, the Core software is only updated without intervention when the major and minor release numbers are identical. For example, automatic update would occur from Core version 6.0.1.609 to 6.0.2.142 (both start with 6.0). On the same machine, the Core would not update automatically from 6.0.2.142 to

6.1.1.XXX, because the digits after the first decimal are not equal. Instead, you are notified (by a banner at the top of the Core Console) that an update to the Core software is available. This notification gives you an opportunity to review release notes, and determine if updating to the latest Core version is appropriate for your needs.

NOTE: For information on installing Rapid Recovery Core software, see the Dell Data Protection | Rapid Recovery Installation and Upgrade Guide.

You can view and change the settings the system uses to check for updates at any time.

CAUTION: When using replication, configuring your system to install updates automatically could result in upgrading the source core before the target core, which may result in replication failure or the inability to set up new replication between cores. For replication users, Dell recommends administrators apply automatic upgrades only to the target Core, and then manually upgrade the source Core, and lastly upgrade the protected machines.

Complete the steps in this procedure to configure update settings.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Updates**.
   - Scroll down on the right side of the Settings page until you can see the Updates heading.

   The Updates core settings appear.
3. Click on the setting you want to change.

   The setting you selected becomes editable.
4. Enter the configuration information as described in the following table.

Table 9. Update settings information

Text Box	Description
Check for new updates	Select how frequently Rapid Recovery checks for and installs updates. You can choose from the following options: • Never • Daily • Weekly • Monthly If you choose automatic updates, after the selected threshold of time passes, if an update is available, it is installed after nightly jobs have completed.
Install updates	Specify the handling of available updates by choosing one of the following options: • Never check for updates • Notify me about updates, but do not install them automatically • Automatically install updates
Status	The status indicates whether any new updates are available.
Last check	The Last check field indicates the date and time the system last checked for an update.

Text Box	Description
	Click **Check Now** to immediately verify whether a software update is available. This check occurs regardless of the frequency you have set.

5. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✖ to exit edit mode without saving.

Understanding nightly jobs

Nightly jobs are daily automated tasks that occur at a predetermined time outside of normal business hours. These jobs are memory-intensive, and include various integrity checks and data consolidation tasks that are best conducted when the Rapid Recovery Core is less active.

All the nightly jobs, and the scope for which they can be applied, are described in the following table. Nightly jobs can be managed at the Core level (which applies to all machines protected on the Core). Those nightly jobs which can also be applied for a specific protected machine list the scope as "Protected machine."

Table 10. Nightly jobs information

Job Name	Scope	Description
✎ Change	N/A	This control opens the Nightly Jobs dialog box, where you can enable, disable, or change settings for each nightly job.
Nightly jobs time	All	This setting represents the time that nightly jobs are scheduled to start running. Dell recommends configuring your Core to run nightly jobs during a time of low activity. The default time is 12:00 AM.
Rollup	Core or protected machine	Applies the retention policy to your backed-up data by combining or "rolling up" recovery points on the schedule dictated in the policy. You can customize the policy on the Core, which applies by default to all protected machines. By default, the rollup job is run for the whole Core; or click ▸ to define which protected machines to roll up using the Core policy. For more information about using a retention policy on a protected machine that differs from the default policy set in the Core, see Customizing retention policy settings for a protected machine.
Check attachability of SQL databases	Protected machine	Checks the integrity of recovery points containing SQL databases. Process: • Mount the latest recovery point for protection groups containing databases. • Connect to the database from SQL Server. • Open the database. • Close the database. • Dismount the recovery point. To enable this nightly check, specify a SQL Server instance to use to perform attachability checks for SQL Server databases on protected machines.

Job Name	Scope	Description
		NOTE: This option does not appear if you are not protecting a SQL Server in your Core.
Download logs from protected machines	Core	Downloads logs for protected machines to the Core, so they can be sent to a logging server.
Consolidate VMware snapshots for protected virtual machines	Core or protected machine	This nightly job is relevant if you use native VMware APIs to protect machines without the Rapid Recovery Agent software. You should periodically consolidate VMware snapshots. Enabling this nightly job lets you perform these consolidations on a daily basis. This nightly job contains one parameter, Maximum simultaneous consolidations, which must be set to a number between 1 and 100.
Check integrity of recovery points	Core or protected machine	Checks the integrity of recovery points for each protected machine. By default, the `Check integrity of recovery points` option is not enabled. Process: • Mount the latest recovery point for every protection group. • Enumerate the files and folders for each volume. • Examines the recovery points to ensure that they are valid. • Dismount the recovery point.
Check checksum of Exchange databases	Protected machine	Checks the integrity of recovery points containing Exchange Database (EDB) files. NOTE: This option does not appear if you are not protecting an Exchange Server in your Core.
Truncate SQL logs (simple recovery model only)	Protected machine	Maintains the size of SQL Server logs by truncating the database transaction log to match the last recovery point. NOTE: This option does not appear if you are not protecting a SQL Server in your Core.
Truncate Exchange logs	Protected machine	Maintains the size of Exchange logs, by truncating the exchange database transaction log to match the last recovery point. NOTE: This option does not appear if you are not protecting an Exchange server in your Core.
Log repository statistics	Core	Sends repository statistics to a logging server.
Delete old events and jobs	Core	Maintains the scale of the events database by removing old events. The number of days is configurable, defaulting to 30 days.

Configuring nightly jobs for the Core

When any nightly job option is enabled on the Rapid Recovery Core, the selected job executes once daily at the time specified for all machines that are protected by the Core. Conversely, if you disable any nightly job at the Core level, the specified job no longer executes for all machines protected by the Core.

> NOTE: If the scope of a nightly job, as described in the topic Understanding nightly jobs, includes protected machines, you can configure that nightly job to apply only for one or more specific protected machines individually. For more information about applying nightly job settings specific to a protected machine, see Customizing nightly jobs for a protected machine.

Because nightly jobs are memory-intensive, Dell recommends configuring your Core to execute them during a time of low activity. The default schedule to run nightly jobs is 12:00 am. If another time is more suitable, change this setting in the Nightly Jobs Time field using this procedure.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the **Settings** page, click **Nightly Jobs**.
   - Scroll down on the right side of the **Settings** page until you can see the Nightly Jobs heading.

   The Nightly jobs Core settings appear.
3. To change any nightly job, or to change the time that nightly jobs begin to execute, click ✎ **Change**.

   The **Nightly Jobs** dialog box displays.
4. If you want to change the time nightly jobs execute, enter a new time in the **Nightly job times** field.
5. In the first column, click to select each nightly jobs option you want to set for the Core. Click any selected option to clear it.
6. Click **OK**.

   The **Nightly Jobs** dialog box closes and your nightly jobs settings for the Core are saved.

Modifying transfer queue settings

Transfer queue settings are Core-level settings that establish the maximum number of concurrent transfers and the maximum number of retries for transferring data.

Complete the steps in this procedure to modify transfer queue settings.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Transfer Queue**.
   - Scroll down on the right side of the Settings page until you can see the Transfer Queue heading.

   The Transfer Queue core settings appear.
3. Click on the setting you want to change.

   The setting you selected becomes editable.
4. Enter the configuration information as described in the following table.

Table 11. Transfer queue settings information

Text Box	Description
Maximum Concurrent Transfers	Enter a value to update the number of concurrent transfers. Set a number from 1 to 60. The smaller the number, the lesser the load on network and other system resources. As the number of agents that are processed increases, so does the load on the system.
Maximum Retries	Enter a value to set the maximum number of attempts before canceling the transfer operation. Set a number from 1 to 60.

5. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✕ to exit edit mode without saving.

Adjusting client timeout settings

Client timeout settings control the length of time that various operations are attempted before the operation times out.

NOTE: Dell recommends leaving default timeout settings unless you experience specific issues in your environment, and you are advised by a Dell Support representative to modify the settings.

Complete the steps in this procedure to adjust client timeout settings.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Client Timeout**.
   - Scroll down on the right side of the Settings page until you can see the Client Timeout heading.

   The Client Timeout core settings appear.
3. Click on the setting you want to change.

   The setting you selected becomes editable.
4. Enter the configuration information as described in the following table.
5. **Table 12. Client timeout settings information**

Setting	Description
Connection Timeout	Controls the timeout for the connection between the Core and protected machines when sending data across the hypertext transfer protocol (http). Enter the amount of time you want to lapse before a connection timeout occurs. Uses HH:MM:SS format. NOTE: The default setting is 0:05:00 or five minutes.
Read/Write Timeout	Controls the timeout for the connection between the Core and protected machines when reading or writing stream data across http. An example is receiving changed data blocks from a protected machine to the Core for an incremental snapshot.

Setting	Description
	Enter the amount of time you want to lapse before a timeout occurs during a read/write event. Uses HH:MM:SS format. NOTE: The default setting is 0:05:00 or five minutes.
Connection UI Timeout	Controls the timeout for the connection between the graphic user interface and the Rapid Recovery Core service across http. Enter the amount of time you want to lapse before a connection UI timeout occurs. Uses HH:MM:SS format. NOTE: The default setting is 0:05:00 or five minutes.
Read/Write UI Timeout	Controls the timeout for the connection for reading and writing data streams between the graphic user interface and the Rapid Recovery Core service across http. Enter the amount of time you want to lapse before a timeout occurs during read or write events. Uses HH:MM:SS format. NOTE: The default setting is 0:05:00 or five minutes.

6. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✖ to exit edit mode without saving.

Understanding deduplication cache and storage locations

Global deduplication reduces the amount of disk storage space required for data your Core backs up. Each repository is deduplicated, storing each unique block once physically on disk, and using virtual references or pointers to those blocks in subsequent backups. To identify duplicate blocks, Rapid Recovery includes a deduplication cache for deduplication volume manager (DVM) repositories. The cache holds references to unique blocks.

By default, for DVM repositories, this deduplication cache is 1.5GB. This size is sufficient for many repositories. Until this cache is exceeded, your data is deduplicated across the repository. Once the amount of redundant information is so great that the deduplication cache is full, your repository can no longer take full advantage of further deduplication for newly added data. The amount of data saved in your repository before the deduplication cache fills varies by the type of data being backed up, and is different for every user.

You can increase the size of the DVM deduplication cache by changing the deduplication cache setting in the Rapid Recovery Core. For more information on how to increase the cache size, see the topic Configuring DVM deduplication cache settings.

When you increase the DVM deduplication cache size, there are two factors to consider: disk space and RAM usage.

Disk space. Two copies of the DVM deduplication cache are stored on disk: a primary cache, and a secondary cache which is a parallel copy. Thus, if using the default cache size of 1.5GB for a DVM repository, 3GB of disk storage is used in your system. As you increase the cache size, the amount of disk space used remains proportionally twice the size of the cache. To ensure proper and fault-resistant performance, the Core dynamically changes the priority of these caches. Both are required, the only difference being that the cache designated as primary is saved first.

RAM usage. When the Rapid Recovery Core starts, it loads the deduplication cache to RAM. The size of the cache therefore affects memory usage for your system. The total amount of RAM the Core uses depends on many factors. These factors include which operations are running, the number of users, the number of protected machines, and the size of the deduplication cache. Each operation the Core performs (transfer, replication, rollup, and so on) consumes more RAM. Once an operation is finished, memory consumption decreases accordingly. However, administrators should consider the highest RAM load requirement for efficient operations.

Default settings for the Rapid Recovery Core place the primary cache, secondary cache, and the metadata cache for DVM repositories in the AppRecovery directory. This folder is installed on the Core machine.

NOTE: Depending on your settings, the AppRecovery directory may not be visible on the Rapid Recovery Core. To see this directory, you may need to change the Folder Options control panel to show hidden files, folders, and drives.

Assuming the Rapid Recovery Core is installed on the C drive, these locations are typically as follows:

Table 13. Default storage locations for DVM deduplication cache settings

Setting	Default Storage Location
Primary Cache Location	C:\ProgramData\AppRecovery\RepositoryMetaData\PrimaryCache
Secondary Cache Location	C:\ProgramData\AppRecovery\RepositoryMetaData\SecondaryCache
Metadata Cache Location	C:\ProgramData\AppRecovery\RepositoryMetaData\CacheMetadata

You can change the storage location of these caches. For example, for increased fault tolerance, you can change location of your secondary cache to a different physical drive than the primary cache, assuming the Rapid Recovery Core has access to the location.

For more information on how to change storage locations for any of these settings, see the topic Configuring DVM deduplication cache settings.

Dell recommends that you plan for deduplication storage separately. Deduplication only occurs in a single repository (not across multiple repositories). If using Core-based encryption, deduplication is further limited to the data protected by a single key, since for security purposes each key serves a single encryption domain.

For more information about deduplication, see Deduplication in Rapid Recovery.

Configuring DVM deduplication cache settings

Complete the steps in this procedure to configure deduplication cache settings for DVM repositories.

1. Navigate to the Rapid Recovery Core Console.

2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **DVM Deduplication Cache**. This setting only appears if your Core has one or more DVM repositories.

- Scroll down on the right side of the Settings page until you can see the DVM Deduplication Cache heading.

  The DVM Deduplication Cache core settings appear.

3. If you want to restore default DVM deduplication cache settings at any time, do the following:
   a. At the top of the deduplication cache settings area, click **Restore Default**.

      The Restore Default dialog box appears

   b. Click **Yes** to confirm the restore.
4. Click the setting you want to change.

   The setting you selected becomes editable.

5. To change individual deduplication cache settings, enter the configuration information as described in the following table.

Table 14. DVM deduplication cache settings information

Setting	Description
↶ Restore Default	This control resets DVM cache locations to system default locations, which are described for each setting.
Primary cache location	If you want to change the primary cache location for DVM repositories, then in the Primary Cache Location text box, type the path for a storage location accessible to the Core. The default location is: C:\ProgramData\AppRecovery\RepositoryMetaData\PrimaryCache Since the primary and secondary caches are the same size, collective storage for these two caches requires twice the amount of space as the amount allocated for the deduplication cache size. For example, if you specify the default amount of 1.5GB for the deduplication cache size, ensure that each of the two storage locations have at least 1.5GB. In particular, if both locations belong to the same drive (for example, the C drive), there must be at least 3.0GB of free disk space.
Secondary cache location	If you want to change the secondary cache location for DVM repositories, then in the Secondary Cache Location text box, type the path for a storage location accessible to the Core. The default location is: C:\ProgramData\AppRecovery\RepositoryMetaData\SecondaryCache
Cache metadata location	If you want to change the cache metadata location for DVM repositories, then in the Cache Metadata Location text box, type the path for a storage location accessible to the Core. The default location is: C:\ProgramData\AppRecovery\RepositoryMetaData\CacheMetadata
Deduplication cache size (GB)	If you want to change the deduplication cache size for DVM repositories, then in the Deduplication Cache Size text box, enter a new amount (in GB). The default location is:

Setting	Description
	C:\ProgramData\AppRecovery\RepositoryMetaData\SecondaryCache The minimum cache size setting is 1.5GB. Additionally, the cache size cannot exceed 50 percent of the installed RAM.

6. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✖ to exit edit mode without saving.

Configuring Replay engine settings

You can configure information regarding the Replay engine, which is the communication channel for Rapid Recovery. These settings determine Core settings to provide effective communication.

In general, Dell recommends using default settings. In some cases, you may be directed by Dell Support to modify these settings to help adjust the performance specific to your network needs.

Complete the steps in this procedure to configure Replay engine settings.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Replay Engine**.
   - Scroll down on the right side of the Settings page until you can see the Replay Engine heading.

   The Replay Engine core settings appear.
3. Click on the setting you want to change.

   The setting you selected becomes editable.
4. Enter the configuration information as described in the following table.

Table 15. Replay engine settings information

Text Box	Description
IP Address	The Core uses this IP address when performing mount and restore for a recovery point, to allow feedback between protected machines and the Core. The IP address for the Replay engine automatically populates with the IP address of the Core machine. If you manually enter the server IP address, then this value is used in cases where the protected machine cannot resolve the automatically provided IP address. You do not need to set this value manually unless you are having issues with protected machines being able to communicate with the Core.
Preferable Port	Enter a port number or accept the default setting. The default port is 8007. The port is used to specify the communication channel for the Replay engine.
Port in use	Represents the port that is in use for the Replay engine configuration.
Allow port auto-assigning	Click for allow for automatic TCP port assignment.

Text Box	Description
Admin Group	Enter a new name for the administration group. The default name is BUILTIN \Administrators.
Minimum Async I/O Length	Enter a value or choose the default setting. It describes the minimum asynchronous input/output length. The default setting is 65536.
Read Timeout	Enter a read timeout value or choose the default setting. The default setting is 00:05:00.
Write Timeout	Enter a write timeout value or choose the default setting. The default setting is 00:05:00.
Receive Buffer Size	Enter an inbound buffer size or accept the default setting. The default setting is 8192.
Send Buffer Size	Enter an outbound buffer size or accept the default setting. The default setting is 8192.
No Delay	It is recommended that you leave this check box unchecked as doing otherwise will impact network efficiency. If you determine that you need to modify this setting, contact Dell Support for guidance in doing so.

5. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✕ to exit edit mode without saving.

Configuring deployment settings

Rapid Recovery lets you download installers from the Rapid Recovery Core to machines you want to protect.

You can configure settings related to the deployment of the Rapid Recovery Agent software from your Core to the machines you want to protect.

Complete the steps in this procedure to configure deployment settings.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Deploy**.
   - Scroll down on the right side of the Settings page until you can see the Deploy heading.

   The Deploy core settings appear.
3. Click on the setting you want to change.

   The setting you selected becomes editable.
4. Enter the configuration information as described in the following table.

Table 16. Deployment settings information

Text Box	Description
Agent installer name	The default filename is Agent-Web.exe. If you wish to change this file name for any reason, you can use this setting to specify a new name of the Core Web Installer executable file. This file streams a download of the latest version of the Rapid Recovery Core installer, which runs directly from the Web and lets you pause and resume the process as needed.
Core address	Enter the address of your Core server. This typically consists of the protocol, the name of your core server and port, and the directory where the Core files reside. For example, if your server is Sample, this setting is https://sample:8006/apprecovery/admin/Core
Failed receive timeout	The amount of time deployment of the Agent software should be attempted before timing out. The default setting is 00:25:00 or twenty-five minutes. If you wish to change this setting, enter the length of time you want the system to attempt to deploy the Agent software before a timeout occurs during read or write events. Uses HH:MM:SS format.
Maximum parallel installs	This setting controls the maximum number of deployments of the Agent software for the Core to attempt at one time. The default setting is 100.

5. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✗ to exit edit mode without saving.

Configuring database connection settings

Rapid Recovery displays information about Core tasks, events, and alerts on the Events page. Rapid Recovery stores this transactional information in a MongoDB service database that is installed locally by default on the Core machine. You can configure these settings to change how long information is retained in the database, or to change the connection pool size to allow for more or fewer concurrent connections.

If using a second Rapid Recovery Core, you can configure the database connection settings on the first Core to point to the second Core machine. In this way, the event data for both Cores will be stored in the MongoDB on the second Core.

Alternatively, you can configure the database connection settings on the Core to point to another machine that has a separately installed MongoDB which is accessible over the network to the Rapid Recovery Core. The event transaction data for your Core is then saved to that service database, not locally. For more information about establishing or modifying database connection settings for the service database, see Configuring database connection settings.

NOTE: For more information about viewing event information from the Rapid Recovery Core, see Viewing events using tasks, alerts, and journal.

Customers can choose to specify installation of the MongoDB service database on another machine accessible on the network to the Rapid Recovery Core. If the service database for your Rapid Recovery

Core is installed on a machine other than the machine hosting the Rapid Recovery Core, you must provide database credentials (a user name and password) in these settings.

Complete the steps in this procedure to modify the database connection settings for the service database used by the Rapid Recovery Core.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Database Connection**.
   - Scroll down on the right side of the Settings page until you can see the Database Connection heading.

     The Database Connection core settings appear.
3. From the top of the Database Connection settings area, you can do the following:
   - Click **Test Connection** to verify your settings.

     Testing the connection is recommended when you change any of the database connection settings.
   - Click **Restore Default** to restore all default database connection settings.

     You are prompted to confirm this action, which results in abandoning any customized database connection settings.
4. Click on the setting you want to change.

   The setting you selected becomes editable.
5. Enter the configuration information as described in the following table.

Table 17. Database connection settings information

Text Box	Description
Host name	Enter a host name for the database connection. NOTE: When localhost is the parameter specified as the host, the MongoDB is installed locally on the machine hosting the Core.
Port	Enter a port number for the database connection. NOTE: The default setting is 27017.
User name	Enter the name of a user with administrative privileges to the MongoDB service database. NOTE: If the host name parameter is localhost, this field is not required.
Password	Enter the password associated with the user name you specified. NOTE: If the host name parameter is localhost, this field is not required.
Retention period (day)	Enter the number of days to retain the event and job history in the service database.
Maximum connection pool size	Sets the maximum number of database connections cached to allow dynamic reuse.

Text Box	Description
	NOTE: The default setting is 100.
Minimum connection pool size	Sets the minimum number of database connections cached to allow dynamic reuse. NOTE: The default setting is 0.

6. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✗ to exit edit mode without saving.

Modifying local database connection settings

You can view system events related to the Rapid Recovery Core on the Events page. The Rapid Recovery Core stores this transactional information in a MongoDB service database. By default, this database is installed locally on the Core machine, and the hostname in the database connection settings defaults to localhost. In this situation, the loopback interface bypasses local network interface hardware, and database credentials are not required.

Optionally, to increase security, you can explicitly specify database credentials (a user name and password) for the MongoDB database used by the Rapid Recovery Core.

NOTE: For more information about viewing event information from the Rapid Recovery Core, see Viewing events using tasks, alerts, and journal. For information about database connection settings, see Configuring database connection settings.

Complete the steps in this procedure to modify the local database connection settings to specify database credentials.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Local Database Settings**.
   - Scroll down on the right side of the Settings page until you can see the Local Database Settings heading.

   The Local Database core settings appear.
3. Click on the setting you want to change.

   The setting you selected becomes editable.
4. Enter the appropriate credentials for connecting to the service database, as described in the following table.

   Table 18. Local database settings information

Text Box	Description
User name	Enter the name of a user with administrative privileges to the MongoDB service database.
Password	Enter the password associated with the user name you specified.

5. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✗ to exit edit mode without saving.

Managing SMTP server settings

If you configure simple mail transfer protocol (SMTP) server settings for the Core, you can send task, event, and alert notifications by email.

Information about configuring an SMTP email server is described in the topic Configuring an email server.

NOTE: To send event information by email, you must also configure notification group settings. For more information on specifying events to receive email alerts, see Configuring notification groups.

Managing Cloud configuration settings

In Rapid Recovery, you can associate storage accounts you have with Cloud storage providers with your Rapid Recovery Core. This lets you archive information from protected machines when the data ages out.

Rapid Recovery integrates with Amazon™ S3, Microsoft Azure, and managed cloud providers using OpenStack open source technology.

For more information about managing cloud storage account information in the Rapid Recovery Core, see Managing cloud accounts.

Managing report settings

You can generate reports for the Rapid Recovery Core or for protected machines. For information on the reports you can generate, see Generating and viewing reports.

Complete the steps in this procedure to manage report settings for Core reports.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Reports**.
   - Scroll down on the right side of the Settings page until you can see the Reports heading.

   The **Reports** core settings appear. Report settings are described in the following table.

Option	Description
Restore Default	This option restores all report settings to the default settings. Defaults are listed below for each setting.
Font	This option controls the default font used for reports. The default is Trebuchet MS typeface. You can change this font to any typeface available to your system.
Paper size	This option controls the default paper size for printing reports. The default is A4. You can choose from the following paper sizes: • Letter • Tabloid • Ledger • Legal • A3 • A4 • Executive

Option	Description
	• B4 • C3Envelope • C4Envelope
Page orientation	This option controls the page orientation for exported reports. The default orientation is Portrait. You can choose from the following layout options: • Portrait • Landscape

3. To change any of the settings for Reports, click in the appropriate setting field.

   The setting field appears as a configurable drop-down menu.
4. Click the drop-down menu, and select one of the values available.

   For example, in the Font field, click **Times New Roman.**
5. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✕ to exit edit mode without saving.

   The option you selected now appears as the new setting for the selected Reports parameter.

Managing Core SQL attachability settings

SQL attachability checks occur as part of the Rapid Recovery nightly jobs. To ease licensing costs, Rapid Recovery gives you two options for performing attachability checks: using a licensed instance of SQL Server installed on the Rapid Recovery Core machine or using the instance of SQL Server already installed on your protected machine. This second option is now the default setting. However, if your protected machine is already exerted during the time when the nightly jobs occur, consider performing the checks with an instance of SQL Server on the Core.

In summary, the process of managing Core SQL attachability settings involves the following tasks:

- Mount the latest recovery point for protection groups containing databases.
- Connect to the database from SQL Server.
- Open the database.
- Close the database.
- Dismount the recovery point.

  To enable this nightly check, specify a SQL Server instance to use to perform attachability checks for SQL Server databases on protected machines.

  NOTE: This option does not appear if you are not protecting a SQL Server in your Core.

To configure the Core to perform SQL attachability checks as part of the nightly jobs, complete the following steps.

NOTE: If you select the default option to use the instance of SQL Server installed on the protected machine, that SQL Server instance will manage SQL attachability for all protected SQL machines. If you do not want this setting to apply to all protected SQL machines, select Use SQL Server on the Core. To perform attachability checks on the Core, you must install or use a licensed version of SQL Server on the Core machine.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Attachability**.
   - Scroll down on the right side of the Settings page until you can see the Attachability heading.
3. To use the SQL Server instance installed on the protected SQL Server machine, select **Use SQL Server on the protected machine**. This is the default option.
4. To use the SQL Server instance installed on the Rapid Recovery Core, select **Use SQL Server on the Core**, and then enter the authentication information as described in the following table.

   Table 19. SQL Server credentials information

Text Box	Description
SQL Server	From the SQL Server drop-down menu, select the appropriate SQL Server instance from the Core server.
Credential Type	Select the appropriate authentication method for your credentials from the following options: • Windows • SQL
User Name	Specify a user name for accessing the SQL Server on the Core based on your selected credential type.
Password	Specify a password for accessing the SQL Server on the Core based on your selected credential type.

5. Click **Test Connection**.

   NOTE: If you entered the credentials incorrectly, a message displays to alert you that the credentials failed. Correct the credential information and test the connection again.
6. After you are satisfied with your changes, click **Apply**.

Understanding Core jobs

Core jobs are processes that the Rapid Recovery Core performs to support its operations, including backing up to recovery points, replicating data, archiving data, exporting data to VMs, maintaining repositories, and so on. Core jobs are initiated automatically for some operations, such as replicating or archiving on an established schedule. You can also invoke some jobs on demand from various elements on the Core Console.

- When viewing or editing Core job settings, each Core job has two parameters: Maximum concurrent jobs and Try count.
  - The Maximum concurrent jobs parameter determines how many jobs of that type can be run at the same time.
  - The Try count parameter determines how many times the job should be tried before abandoning the job, if network or other communication errors prevent the job from succeeding the first time.

- In the Core Jobs table, the Settings column indicates if the job listed is included in Core job settings by default or must be explicitly added.

The following table describes the primary Core jobs available and their functions.

Table 20. Core jobs

Job Name	Description	Maximum Concurrent Jobs	Try Count	Settings
Check attachability of SQL databases in snapshots	Lets the Core check the consistency of SQL databases and ensures that all supporting MDF (data) and LDF (log) files are available in the backup snapshot. Process: • Mount the latest recovery point for protection groups containing SQL databases. • Mount the database. If performing attachability from the protected SQL server, mount using UNC path. • Connect to the database from SQL Server. • Perform the attachability check. • Perform cleanup operations. • Close the database. • Dismount the database. • Dismount the recovery point.	1	0	Default
Check checksum of Exchange databases	Checks the integrity of recovery points containing Exchange databases. Process: • Mount the latest recovery point for protection groups containing SQL databases. • Connect to the database from SQL Server. • Open the database. • Close the database. • Dismount the recovery point.	1	0	Default
Check mountability of Exchange databases	Checks that Exchange databases are mountable.	1	0	Default
Replicate protected machines data from remote source	Transfers a copy of recovery points for a protected machine from a source Core to a target Core. This job runs on the target Core receiving the incoming replicated recovery points.	3	0	Default
Replicate protected machines data to remote target	Transfers a copy of recovery points for a protected machine from a source Core (on which they were originally saved) to	1	3	Default

Job Name	Description	Maximum Concurrent Jobs	Try Count	Settings
	a target Core. This job runs on the source Core and controls outgoing replication.			
Roll up recovery points	Applies the retention policy to your backed-up data by combining or "rolling up" recovery points on the schedule defined in the retention policy.	1	0	Default
Check recovery points	Checks the integrity of recovery points.	1	0	Add
Delete all recovery points	Deletes the full set of recovery points on a protected machine.	1	0	Add
Delete chain of recovery points	Deletes a complete recovery point chain on a protected machine.	1	0	Add
Delete range of recovery points	Deletes a set of recovery points on a protected machine, by recovery point identifier or date range.	1	0	Add
Deploy Agent software to machines	Deploys Rapid Recovery Agent software to the specified machine or machines.	1	0	Add
Download Exchange libraries	Downloads Microsoft Exchange libraries from the protected machine to the Core machine at path C:\ProgramData\AppRecovery\ExchangeLibraries.	1	0	Add
Export to archive	Creates backup in the specified path with an archive of the selected recovery points. Process: • Mount recovery points. • Write data to backups. • Dismount the recovery point.	1	0	Add
Export to virtual machine	Exports data from specified recovery point of protected machine to destination path as a virtual machine. Process: • Mount recovery point. • Create virtual machine from the recovery point data in the destination path. • Dismount the recovery point.	1	0	Add
Import archives	Imports recovery point from the specified backup on a previously created Core archive.	1	0	Add

Job Name	Description	Maximum Concurrent Jobs	Try Count	Settings
Maintain repository	Performs a check of the repository. Process: • Check repository file system. • Mount recovery point. • Recalculate deduplication cache for repository. • Load recovery points from repository.	1	0	Add
Mount recovery point snapshots	Performs mount of recovery point to the specified path.	1	0	Add
Protect ESX® virtual machines	Adds all specified virtual machines to agentless protection. Job is performed immediately after adding agentless protection of one or more VMs to the Core using the Protect Multiple Machines Wizard. Job sets ID number for each specified VM, writes information about the Core to a configuration file, and retrieves metadata from the file.	1	0	Add
Restore from recovery point	Performs a restore from a recovery point to a specified target machine. Process: • Mount recovery point. • Write all data from the recovery point to the specified machine. • Dismount the recovery point.	1	0	Add
Uploading logs	Uploads logs to specified server.	1	0	Add

Some Core jobs are included in Settings. The Jobs settings let you specify how many concurrent jobs of the same type the Core can run, and how many retries should be attempted if the first job attempt fails.

For more information about these Settings, see Core job settings.

For information on adding jobs to Core Settings, see Adding Core jobs to settings.

For information on editing settings for jobs in the Settings list, see Editing Core job settings.

Core job settings

When you select ⚙ (Settings) from the icon bar, you can access settings for some Core jobs. The **Jobs** area on the Core settings page lets you determine two settings for each job type listed:

1. The maximum number of jobs of this type for the Core to attempt at one time. This must be set to a value between 1 to 50.
2. The number of times a job should be attempted if a network or other communication error prevents the job from succeeding the first time. This must be set to a value between 0 to 10.

Several jobs are automatically included in Core settings. These jobs include a value of "Default" in the Settings column (as shown in the topic Understanding Core jobs).

You can add some other jobs to settings if you want to configure those settings to control the maximum number of jobs or retries for those functions. These jobs include a value of "Add" in the Settings column. For information on how to add these jobs to the Settings table, see Adding Core jobs to settings.

Core jobs not available in Settings do not provide the ability to set these two parameters.

For jobs that are listed in settings, you can edit existing settings. This lets you customize the two parameters, delete a job type from the job settings list, or restore default settings. For detailed information, see the topic Editing Core job settings.

Adding Core jobs to settings

Core job settings let you define, for each job type, the maximum number of jobs for the Core to attempt at one time, and how many times that job should be retried if the first attempt failed.

Each Core job type has default values for these two parameters, as described in the topic Core job settings. This list also indicates which of the job types are included in the Core settings by default.

Adding a Core job to settings lets you change these parameters for the job type you added.

Complete the steps in the following procedure to add a job to Core settings.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Jobs**.
   - Scroll down on the right side of the Settings page until you can see the Jobs heading.

   The Jobs core settings appear.
3. On the Core Settings page, under Jobs, click ✚ **Add**.

   The Job Settings dialog box appears.
4. In the **Job Settings** dialog box, from the **Jobs** field, select the name of a job you want to add to the Core settings.

   These jobs are described in the topic Core job settings.
5. To set the maximum number of jobs for the Core to attempt at one time, in the **Maximum concurrent jobs** text box, enter a new value between 1 to 50.
6. To set the number of attempts the Core should make before abandoning the job, in the **Try count** text box, enter a new value between 0 and 10.
7. Click **Save**.

   The Job Settings dialog box closes, and your new job settings are applied.

Editing Core job settings

Core job settings let you define, for each job type, the maximum number of jobs for the Core to attempt at one time, and how many times that job should be retried if the first attempt failed.

Each Core job type has default values for these two parameters, as described in the topic Understanding Core jobs. This list also indicates which of the job types are included in the Core settings by default. When you edit Core job settings, you can accomplish the following:

- You can customize the settings for each Core job type.
- You can delete a job type from the list of Core settings. This feature is not available if the job type is included in settings by default.

  NOTE: Deleting a job from Core settings simply removes the job type from this list. To edit Core settings for that job type again in the future, you can add it to the list as described in the topic Adding Core jobs to settings.
- You can restore the settings for any job type to the default settings.

  NOTE: Although you can only use this feature for the job types included in Core settings by default, you can set other job types to defaults by removing them from the list and adding them again.

Complete the steps in the following procedure to edit the settings of a job.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Jobs**.
   - Scroll down on the right side of the Settings page until you can see the Jobs heading.

   The Jobs core settings appear.
3. From the Job grid, select a job you want to remove from the list. From the drop-down ⚙ menu for that job, select **Delete**.

   The job is removed from the list.
4. From the Job grid, select a job from the list for which you want to reset settings. From the drop-down ⚙ menu for that job, select **Reset to defaults**.

   The job settings for this job are reset to default settings.
5. From the Job grid, select a job you want to change. From the drop-down ⚙ menu for that job, select **Edit**.
6. The Job Settings: [JobName] dialog box opens.
7. To change the maximum number of jobs for the Core to attempt at one time, in the Maximum concurrent jobs text box, enter a new value between 1 to 50.
8. To change the setting for the number of additional attempts the Core should make before abandoning the job, in the Try count text box, enter a new value between 0 and 10.
9. Click **Save**.

   The Job Settings dialog box closes, and your new job settings are applied.

Managing licenses

Many Rapid Recovery Core users start with a trial license, which has limited capabilities. A trial license is valid for 14 days, and can be extended one time by the group administrator to a 28-day license. Once the trial period expires, the Rapid Recovery Core stops taking snapshots until you obtain and register a valid non-trial license.

NOTE: For information about entering license key or file information (for example, to update or change a trial license to a valid long-term license), see Updating or changing a license.

Licenses are validated using license files or license keys.

License files are text files that end with the **.lic** file extension. Examples of license files include the following:

- License files can appear as nine characters in length, consisting of three groups of Arabic numbers, each separated by a hyphen; for example, `123-456-789.lic`.
- Software-based licenses can appear in the format Software-<Group name>.lic, with the group named after the customer name or account; for example, `Software-YourCompany.lic`.
- Dell appliance licenses can appear in the format <Appliance Series>-<Group name>.lic, with the group named after customer name account; for example, `DL4X00 Series-YourCompany.lic`.

License keys are 30 characters in length, consisting of six groups of English alphanumeric characters, each separated by a hyphen. For example, a sample license key format is `ABC12-DEF3G-H45IJ-6K78L-9MN10-OPQ11`.

Rapid Recovery lets you manage licenses or contact the license server directly from the Core Console by selecting ⚙ (Settings) from the icon bar and clicking **Licensing**.

The Licensing settings include the following information:

License Details:

- 🔧 **Change License**. Lets you change an existing license associated with the Core by uploading a license file or entering a license key.
- ✚ **Add License**. This option is available only for Dell backup appliances and lets you upload a license file or entering a license key.
- ✎ **License Portal Group**. This option opens the license portal for group management.
- **License type**. Types of licenses include Trial, Subscription, or Enterprise. For more information, see the topic About Dell Data Protection | Rapid Recovery License Portal Software License Types in the Dell Data Protection | Rapid Recovery License Portal User Guide.
- **License status**. Indicates the status of the license. An active status ensures snapshots can continue as scheduled. If the license is blocked, or expired, or if the Core has not been able to communicate with the Dell Data Protection | Rapid Recovery License Portal past the grace period, snapshots are paused until the license status is corrected.

License Constraints:

- **Maximum snapshots per day**. Indicates the number of backups that are limited by the specific license.

License Pool:

- **Pool size**. The license pool is the number of non-trial licenses available to allocate across groups and subgroups in the Dell Data Protection | Rapid Recovery License Portal. The size of the pool determines how many licenses can be allocated. For more information, see the topic “Understanding License Pools” in the *Dell Data Protection | Rapid Recovery License Portal User Guide*.
- **Protected by this Core**. Indicates the number of machines from the license pool that are protected by this core.
- **Total protected in group**. Indicates the total number of machines protected within the same license group as this Core.

License Server. These settings apply to standard (phone home) licenses. These settings are not applicable for appliances and other non-phone-home licenses:

- **License server address**. Displays an active URL for the license server associated with this Core.
- **Last response from the licensing server**. Indicates whether the last attempted communication with the license server portal was successful.
- **Last contact with licensing server**. Displays the date and time of the last successful contact with the licensing server.
- **Next attempt to contact the licensing server**. Indicates the next scheduled date and time to attempt communication with the licensing server.
- **Contact Now**. This button contacts the license server on demand. Use this option after making changes to your license configuration, to register changes immediately rather than waiting for the next scheduled attempt.

For more information on licenses, see the *Dell Data Protection | Rapid Recovery License Portal User Guide*.

For more information on adding or changing a license key or file, see Updating or changing a license.

For more information on contacting the license portal server, see Contacting the Dell Data Protection | Rapid Recovery License Portal server

You can also view licensing information for a single protected machine. For more information, see Viewing license information on a machine.

Updating or changing a license

After you upgrade or purchase a long-term Rapid Recovery license, you receive by email either a license file or a license key.

Complete the steps in this procedure to upgrade your trial license or change your existing license, and associate it with the Rapid Recovery Core Console.

NOTE: Users of Dell backup appliances can also add licenses to the Core if necessary. For more information, see Adding a license.

For information about obtaining a license key, or for details about using the license portal to download software, register appliances, manage license subscriptions and license groups, and generate license portal reports, see the *Dell Data Protection | Rapid Recovery License Portal User Guide*.

If you just installed a new Core, and are being asked to choose a license file or key, skip to Step 5.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings).
3. Scroll down on the right side of the **Settings** page until you can see the Licensing heading.

   The Core settings for licensing appear.
4. To update or change the existing license associated with your Core, at the top of the License Details core settings area, click 🔧 **Change License**.

   The **Change License** dialog box appears.
5. To enter a license key or upload a license file, do one of the following:
   a. If you want to *manually enter* the license key, in the Change License dialog box, type the key carefully, and then click **Continue**.

    The dialog box closes, and the license file you selected is authenticated, and that license is associated with your Core.

   b. If you want to *upload* a license file, in the Change License dialog box, click **Choose File**.

      In the **File Upload** dialog box, navigate through the file system and locate the new license file you want to use. For example, locate `Software-YourCompany.lic`.

   c. Click the license file, and then click **Open**.

      The File Upload dialog box closes. The selected license file appears in the Change License dialog box.

   d. In the **Change License** dialog box, click **Continue**.

      The dialog box closes, and the license file you selected is authenticated, and that license is associated with your Core.

6. Scroll down on the right side of the Settings page until you can see the License Server heading.

   The Licensing core settings appear.

7. In the License Server area, click **Contact Now**.

   Once the license is applied to the license server, any associated protected machines automatically update with the new license.

Adding a license

Dell backup appliance owners can add one or more licenses to the Rapid Recovery Core Console.

Once you have upgraded or purchased your Rapid Recovery license, you receive by email either a license file or a license key.

You can also update or change an existing license on the Core Console. For more information, see Updating or changing a license.

NOTE: Only Dell backup appliance users see the Add Appliance button.

NOTE: For information about obtaining a license key, see the *Dell Data Protection | Rapid Recovery License Portal User Guide*.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings).
3. Scroll down on the right side of the Settings page until you can see the Licensing heading.

   The Core settings for licensing appear.

4. To add a license and associate it with your Core, at the top of the License Details core settings area, click **Add License. In** the **Add License** dialog box, do one of the following:

   a. If you want to *manually enter* the license key, in the Change License dialog box, type the key carefully, and then click **Continue**.

      The dialog box closes, and the license file you selected is authenticated, and that license is associated with your Core.

   b. If you want to *upload* a license file, in the Change License dialog box, click **Choose File**.

      In the **File Upload** dialog box, navigate through the file system and locate the new license file you want to use. For example, locate `Software-YourCompany.lic`.

   c. Click the license file, and then click **Open**.

      The File Upload dialog box closes. The selected license file appears in the Change License dialog box.

   d. In the **Change License** dialog box, click **Continue**.

The dialog box closes, and the license file you selected is authenticated, and that license is associated with your Core.

5. Scroll down on the right side of the Settings page until you can see the License Server heading.

   The Licensing core settings appear.
6. In the License Server area, click **Contact Now**.

   Once the license is applied to the license server, any associated protected machines automatically update with the new license.

Contacting the Dell Data Protection | Rapid Recovery License Portal server

The Rapid Recovery Core Console frequently contacts the portal server to remain current with any changes made in the Dell Data Protection | Rapid Recovery License Portal.

For non-trial licenses, the Rapid Recovery Core contacts the license portal once every hour. If the Core cannot reach the license portal after a 10-day grace period, the Core stops taking snapshots.

Typically, communication with the license portal server occurs automatically at designated intervals; however, you can initiate communication on-demand.

Complete the steps in this procedure to contact the license portal server.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click **Settings**, and then scroll down on the right side of the **Settings** page until you can see the License Server heading.
3. From the License Server area, click **Contact Now**.

Understanding SNMP settings

Simple Network Management Protocol (SNMP) is a protocol for managing devices on an IP network. SNMP is used primarily to monitor devices on a network for conditions that require attention. This protocol uses software components (agents) to report information to administrative computers (managers). An SNMP agent handles the manager's requests to get or set certain parameters. The SNMP agent can send traps (notifications about specific events) to the manager.

Data objects that the SNMP agents manage are organized into a Management Information Base (MIB) file that contains Object Identifiers (OIDs). Each OID identifies a variable that can be read or set using SNMP.

Rapid Recovery includes support for SNMP version 1.0.

You can configure the Rapid Recovery Core as an SNMP agent. The Core then can report information such as alerts, repository status, and protected machines. An SNMP host can read this information using a standalone application called an SNMP browser. You can install the SNMP browser on any machine accessible over the network to the Rapid Recovery Core.

To ensure the Core SNMP event notifications can be received by the SNMP browser, verify that the notification options for a notification group are properly configured to notify by SNMP trap.

NOTE: You can use the default group, or create a custom notification group. The process is identical.

Open the notification group, select the **Notification Options** tab, and ensure the **Notify by SNMP trap** option is enabled. The notification group specifies trap number 1 by default. If necessary, you can change the trap number to ensure that it matches the setting that the SNMP browser expects.

For more information and specific details about configuring notification options, see Configuring notification groups.

Alternatively, you can download a MIB file from the Rapid Recovery Core. This file is readable using an SNMP browser in a more user-friendly fashion than data it receives directly from the Core.

This section includes the following topics:

- Configuring SNMP settings
- Downloading the SNMP MIB file

Configuring SNMP settings

Use the SNMP settings to control communication between the Core and the SNMP browser. This includes the SNMP port, trap receiver port, and the host name for the trap receiver.

Use this procedure to configure SNMP settings for the Core.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **SNMP Configuration**.
   - Scroll down on the right side of the Settings page until you can see the SNMP Configuration heading.

   The SNMP Configuration settings appear.
3. Modify the SNMP settings as described in the following table.

   Table 21. SNMP connection settings information

Text Box	Description
Incoming port	Enter a port number for the SNMP connection. NOTE: The default setting is 8161.
Trap receiver port	Enter a port number for the trap receiver. The default setting is 162.
Trap receiver host name	Enter a host name for the SNMP connection. NOTE: The default host name is localhost.

4. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✖ to exit edit mode without saving.

Downloading the SNMP MIB file

The Simple Network Management Protocol is used to monitor devices on a network for conditions that require attention. When the Rapid Recovery Core is set as an SNMP agent, the Core report information such as alerts, repository status, and protected machines. This information can be read by an SNMP host using a standalone application called an SNMP browser.

Data objects managed by SNMP agents are organized into a Management Information Base (MIB) file that contains Object Identifiers (OIDs). Each OID identifies a variable that can be read or set using SNMP.

You can download a MIB file from the Rapid Recovery Core. This file, named dell-aa-core.mib, can then be read by an SNMP browser in a more user-friendly fashion than data it receives directly from the Core.

Use this procedure to download the SNMP MIB file from the Rapid Recovery Core.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⋮ (More) and then click **Downloads**.
   The **Downloads** page appears.
3. Scroll down to the Other Files pane.
4. To download the MIB file, click the **SNMP MIB file** download link.
   The SNMP Configuration settings appear.
5. In the **Opening dell-aa-core.mib** dialog box, do one of the following:
   - To open the log file, select Open with, then select an SNMP browser application for viewing the text-based MIB file, and finally click **OK**.
     The dell-aa-core.mib file opens in the selected application.
   - To save the file locally, select **Save File** and click **OK**.
     The dell-aa-core.mib file saves to your Downloads folder. It can be opened using an SNMP browser or a text editor.

Configuring vSphere settings

VMware vSphere is a suite of virtualization software, from which you can manage ESXi or vCenter Server virtual machines. If using vSphere, you no longer need to load the Rapid Recovery Agent software onto individual VMs to protect them. This is called the agentless protection feature, which applies only to virtual machines.

Use this procedure to configure vSphere settings for the Core.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **vSphere**.
   - Scroll down on the right side of the Settings page until you can see the vSphere heading.
     The vSphere settings appear.
3. Modify the vSphere settings as described in the following table.

Table 22. vSphere Core settings information

UI Element	UI Type	Description
Connection lifetime	Spin box	Establishes duration of time before a timeout for the connection with the ESXi server. Uses HH:MM:SS format. NOTE: The default setting is 00:10:00 or ten minutes.
Maximum simultaneous consolidations	Text field	Sets the maximum number of simultaneous consolidations for protected virtual machines. NOTE: The default setting is 0.

UI Element	UI Type	Description
Maximum retries	Text field	Sets the maximum number of attempts for connection to a virtual disk or read and write operations before a timeout. NOTE: The default setting is 10.
Allow parallel restore	Boolean (check box)	When this option is checked, enables parallel restore for an agentless virtual machine. When this option is cleared, this function is disabled. NOTE: The default setting is No (cleared).

4. For each setting, when satisfied with your changes, click the check mark to save the change and exit edit mode, or click **X** to exit edit mode without saving.

Backing up and restoring Core settings

You can back up Core setting information to a file, and later restore these settings if you have problems with the Core machine or if you want to migrate those settings to a different machine. Information that gets backed up includes repository metadata (such as the repository name, data path, and metadata path); machines protected in the Core; replication relationships (targets and sources); which machines are configured for virtual standby; and information about encryption keys.

This process restores the configuration settings only, not the data. Security information (such as authentication credentials) is not stored in the configuration file. There is no security risk to saving a Core configuration file.

NOTE: You must first back up Core setting information before you can use this process to restore Core settings.

Use this procedure to back up and restore Core settings.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings).

   The **Settings** page appears. At the top of the Settings pane, above the categories of settings, you see two buttons, Back Up Settings and Restore Settings.
3. If you want to back up Core settings, proceed to Step 4. If you want to restore Core settings, proceed to Step 6.
4. To back up the current settings in an XML file, from the top of the Settings page, click **Back Up Settings**.

   The Back Up Core Configuration dialog box appears.
5. In the Local path text box, type a directory path accessible locally to the Core machine where you want to store core settings as an XML file, and then click **Back Up**.

   For example, type `C:\Users\Your_User_Name\Documents\AA5CoreSettings` and then click **Back Up**.

   A file named AppRecoveryCoreConfigurationBackup.xml is saved to the local destination you specified.
6. To restore Core settings from a backup XML file saved previously using this method, perform the following steps.

NOTE: When you restore the Core configuration settings, the Rapid Recovery Core service restarts.

a. From the top of the **Settings** page, click **Restore**.

   The **Restore Core Configuration** dialog box appears.
b. In the **local path** text box, enter the local path of the location where you stored the core configuration settings.

   For example, type `C:\Users\Your_User_Name\Documents\AA5CoreSettings`.
c. If you do not want to restore repository information, proceed to Step g.
d. Optionally, if you want to restore repository information as configured in the backup file, select **Restore Repositories** and then click **Restore**.

   The **Restore Repositories** dialog box appears.

   If you choose to restore repository information from the backed-up configuration data, then any repositories configured when the Core settings were saved appear for verification. By default, each existing repository is selected.
e. Verify the repository information you want to restore. If multiple repositories appear in the lists for verification, and you only wish to restore information for some of them, then clear the selection for each repository you do not want.
f. When you are satisfied with the selection of repositories you want to restore, click **Save**.

   The **Restore Repositories** dialog box closes.
g. In the **Restore Repositories** dialog box, click **Restore**.

   The **Restore Repositories** dialog box closes, and the restore process begins. An alert appears indicating that the repository service configuration has changed.
h. If any configuration settings could not be restored you will see an error message. Review the details of the error to see if any action is required on your part. For more information, see Viewing events using tasks, alerts, and journal. To continue, click **Close** to clear the error dialog box.
i. After restoring the configuration, verify the following:

   - Unlock all encryption keys. For more information, see Unlocking an encryption key.
   - If virtual standby is configured to continually update a VM to a network destination, you must specify the network credentials in the virtual standby settings before a successful synchronization. For more information, see VM export.
   - If scheduled archive is configured to archive to a cloud storage account, you must specify credentials so the Core can connect to the cloud account. For more information on linking the Core with a cloud storage account, see Adding a cloud account.
   - If replication is set up and you want to restore to a target Core, verify the target Core settings (particularly the host) on the source Core. For more information, if managing your own Core, see Replicating to a self-managed target Core. If replicating to a Core managed by a third party, see Replicating to a third-party target Core.
   - If the SQL attachability check is configured, and if the SQL Server instance performing the check is on the Core machine, then specify the SQL credentials in Attachability settings. For more information, see Managing Core SQL attachability settings.

     Verify that the Replay Engine configuration was restored, and update the settings if they were not to ensure effective communication. For more information, see Configuring Replay engine settings.

Core-level tools

In addition to configuring Core settings, you can also use the Core-level tools described in the following table.

Table 23. Other Core-level tools

UI Element	Description
System information	Rapid Recovery lets you view information about the Rapid Recovery Core that includes system information, local and mounted volumes, and Replay engine connections. For more information on the information displayed on the System information page, see Understanding system information for the Core. For more information on how to view System information, see Viewing system information for the Core.
Downloading Core log files	Information about various activities for the Rapid Recovery Core are saved to the Core log file. To diagnose possible issues, you can download and view logs for your Rapid Recovery Core. For more information on accessing and viewing the Core logs, see Accessing Core logs. Each protected machine also saves a log of activity. This log can be uploaded to the Core if you select the nightly job called Downloading the logs from the protected machines. For more information about nightly jobs, see Understanding nightly jobs. For more information about how to configure nightly job settings for the Core, see Configuring nightly jobs for the Core. For more information about configuring nightly jobs for specific protected machines, see Customizing nightly jobs for a protected machine.

Understanding system information for the Core

Rapid Recovery lets you view information about the Rapid Recovery Core. You can view general information, information about local volumes, and information about mounted volumes.

In the **General** pane, you can see the information described in the following table.

Table 24. System information

UI Element	Description
Host name	The machine name of your Rapid Recovery Core.
OS version	The version of the operating system installed on the Rapid Recovery Core.
OS architecture	Lists the underlying structure and design of the machine hosting your Rapid Recovery Core. Potentially includes chipset and lists 64-bit system. Rapid Recovery Core supports 64-bit systems only.
Memory (physical)	Lists the amount of Random Access Memory installed on the Core machine.
Display name	Shows the display name of the Core, which is configurable (see Configuring Core general settings).

UI Element	Description
Fully qualified domain name	Shows the fully qualified domain name for the Core machine.
Metadata cache location	Shows the path of the metadata cache location. For more information, see Understanding deduplication cache and storage locations.
Primary cache location	Shows the path of the primary deduplication cache location. For more information, see Understanding deduplication cache and storage locations.
Secondary cache location	Shows the path of the secondary deduplication cache location. For more information, see Understanding deduplication cache and storage locations.

The **Volumes** pane includes the following information about storage volumes for the Core machine: Name, device ID, file system, raw capacity, formatted capacity, used capacity, and mount points.

The **Replay Engine Connections** pane displays detailed information about currently mounted recovery points. You can view the local end point, remote end point, mounted image agent ID, mounted image ID, and the mounted image display name. You can see if the mount is writable, view the authenticated user, bytes read, and bytes written.

You can dismount recovery points that are mounted locally on a Core from the Mounts page. For more information about dismounting recovery points, see Dismounting recovery points.

For more information, see Viewing system information for the Core.

Viewing system information for the Core

System information for the Core includes general information, information about local volumes, and information about mounted volumes for the Core. For a detailed description of the information available on this page, see Understanding system information for the Core.

Complete the steps in this procedure to view system information for the Core.

NOTE: You can also see system information for a specific protected machine. For more information, see Viewing system information for a protected machine.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click (More) and then click **System Information**.

   The System information page appears.

Accessing Core logs

Information about various activities for the Rapid Recovery Core are saved to the Core log file. This file, AppRecovery.log, is stored by default in the path C:\ProgramData\AppRecovery\Logs.

NOTE: Depending on your settings, the AppRecovery directory may not be visible on the Rapid Recovery Core. To see this directory, you may need to change the Folder Options control panel to show hidden files, folders, and drives. If these settings include the option to hide extensions for known file types, the Core log file may appear as AppRecovery with no .log extension.

The core log includes information about completed Core jobs, connection failures, results of attempts on the part of the Core to contact the License Portal, and other information. Each statement stored in the Core log file is preceded by one of four qualifiers: INFO, DEBUG, ERROR, and WARN. These qualifiers help categorize the nature of information stored in the log when diagnosing an issue.

NOTE: Similarly, a log file is also stored on each protected machine containing information relating to its attempts at communicating with the Core. For more information about machine logs, see Accessing protected machine diagnostics.

The ability to access logs can be useful when troubleshooting an issue or working with Dell Rapid Recovery support. To access logs, see the following procedures:

- Downloading and viewing the Core log file
- Downloading and viewing the log file for a protected machine

Downloading and viewing the Core log file

If you encounter any errors or issues with the Core, you can download the Core logs to view them or to share them with your Dell Support representative.

1. From the Rapid Recovery Core Console, on the icon bar, click ⋮ (More) and then click **Core Log**.
2. On the **Download Core Log** page, click **Click here to begin the download**.
3. If prompted to open or save the `CoreAppRecovery.log` file, click **Save**.
4. If you see the **Opening CoreAppRecovery.log** dialog box, do one of the following:
   - To open the log file, select **Open with**, then select an application (such as Notepad) for viewing the text-based log file, and finally click **OK**.

     The CoreAppRecovery.log file opens in the selected application.
   - To save the file locally, select **Save File** and click **OK**.

     The CoreAppRecovery.log file saves to your **Downloads** folder. It can be opened using any text editor.

Related links

Downloading and viewing the Core log file
Downloading and viewing the log file for a protected machine

Roadmap for configuring the Core

Configuration includes tasks such as creating and configuring the repository for storing backup snapshots, defining encryption keys for securing protected data, and setting up alerts and notifications. After you complete the configuration of the Core, you can then protect agents and perform recovery.

Configuring the Core involves understanding certain concepts and performing the following initial operations:

- Create a repository
- Configure encryption keys
- Configure event notification
- Configure retention policy
- Configure SQL attachability

Repositories

This section describes how to work with repositories. It discusses the deduplication volume manager repository and describes its features and attributes. It describes types of deduplication used in Rapid Recovery, and how deduplication is used throughout the application. Then this section describes how to manage DVM repositories, including creating a repository, viewing and editing its details, and deleting a repository. You can learn how to open a repository from one Core on another Core. Finally, this section describes how to migrate recovery points manually from one repository to another.

Managing a DVM repository

Before you can use Rapid Recovery, you need to set up one or more repositories on the Rapid Recovery Core. A repository stores your protected data; more specifically, it stores the snapshots that are captured from the protected machines in your environment.

Managing a DVM repository involves the following operations:

1. **Creating a DVM repository**. Before creating a repository, consider the appropriate technology type. For information about repositories, see Understanding repositories.

   For information about creating a DVM repository, see Creating a DVM repository.
2. **Adding a new storage location**. For more information on adding a new storage location to a DVM repository, see Adding a storage location to an existing DVM repository.
3. **Modifying repository settings**. For more information about modifying repository settings for a repository, see Viewing or modifying repository details
4. **Checking a repository**. For more information about checking a DVM repository, see Checking a repository.
5. **Performing a repository optimization job**. For more information about the repository optimization job, see About the Repository Optimization Job. For steps to optimize an existing DVM repository, see Optimizing a DVM repository.
6. **Deleting a repository**. For more information about deleting a repository, see Deleting a repository.

Creating a DVM repository

This process describes how to create a repository on your Core using the Deduplication Volume Manager (DVM) repository technology.

- You must have administrative access to the machine on which you want to create a DVM repository.
- This repository type requires a minimum of 150GB of storage space available on the volume you define as the storage location.
- The storage location for a DVM repository must be on a local drive attached to the Core server.
- The Core server can be any DL series appliance (including the DL1000) or can be any software-based Windows server meeting system requirements.

NOTE: It is recommended to create the repository through **Appliance** tab. For more information, see Provisioning storage section.

Complete the following steps to create a DVM repository.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⋮ (More), and then select **Repositories**.

The **Repositories** page appears.

On the **Repositories** page, the DVM Repositories pane appears.

3. At the top of the page, click **Add New DVM Repository**.

   The **Add New Repository** dialog box appears.
4. Enter the information as described in the following table.

   Table 25. Add New Repository settings

Text Box	Description
Repository Name	Enter the display name of the repository. By default, this text box consists of the word Repository and a number, which corresponds to the number of repositories for this Core. For example, if this is the first repository, the default name is Repository 1. Change the name as needed. Repository names must contain between 1 and 40 alphanumeric characters, including spaces. Do not use prohibited characters or prohibited phrases .
Concurrent Operations	Define the number of concurrent requests you want the repository to support. By default the value is 64.
Comments	Optionally, enter a descriptive note about this repository. You can enter up to 254 characters. For example, type **DVM Repository 2.**

5. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.

   CAUTION: Define a dedicated folder within the root for the storage location for your repository. Do not specify the root location. For example, use E:\Repository\, not E:\. If the repository that you are creating in this step is later removed, all files at the storage location of your repository are deleted. If you define your storage location at the root, all other files in the volume (e.g., E:\) are deleted, which could result in catastrophic data loss.

   The **Add Storage Location** dialog box appears.
6. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.
7. In the **Storage Location** area, specify how to add the file for the storage location. You can choose to add a locally attached storage volume (such as direct attached storage, a storage area network, or network attached storage). You could also specify a storage volume on a Common Internet File System (CIFS) shared location.
   - Select **Add file on local disk** to specify a local machine, and then enter the information as described in the following table.

     Table 26. Local disk settings

Text Box	Description
Data path	Enter the location for storing the protected data. For example, type `X:\Repository\Data`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.
Metadata path	Enter the location for storing the protected metadata.

Text Box	Description
	For example, type `X:\Repository\Metadata`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.

- Or, select **Add file on CIFS share** to specify a network share location, and then enter the information as described in the following table.

Table 27. CIFS share credentials

Text Box	Description
UNC path	Enter the path for the network share location. If this location is at the root, define a dedicated folder name (for example, `Repository`). The path must begin with \\. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). The letters a to z are case-insensitive. Do not use spaces. No other symbols or punctuation characters are permitted.
User name	Specify a user name for accessing the network share location.
Password	Specify a password for accessing the network share location.

8. In the **Storage Configuration** area, click **More Details** and enter the details for the storage location as described in the following table.

Table 28. Storage configuration details

Text Box	Description
Size	Set the size or capacity for the storage location. The minimum size is 1 GB. The default is 250 GB. You can choose from the following: • GB • TB NOTE: The size that you specify cannot exceed the size of the volume. If the storage location is a New Technology File System (NTFS) volume using Windows XP or Windows 7, the file size limit is 16 TB. If the storage location is a NTFS volume using Windows 8, 8.1, Windows 10, or Windows Server 2012, 2012 R2, the file size limit is 256 TB. NOTE: For Rapid Recovery to validate the operating system, Windows Management Instrumentation (WMI) must be installed on the intended storage location.
Write caching policy	The write caching policy controls how the Windows Cache Manager is used in the repository and helps to tune the repository for optimal performance on different configurations. Set the value to one of the following: • On • Off

Text Box	Description
	• Sync If set to On, which is the default, Windows controls the caching. This is appropriate for Windows 10, and for versions of Windows Server 2012 and later. NOTE: Setting the write caching policy to On could result in faster performance. If you are using Windows Server 2008 SP2 or Windows Server 2008 R2 SP2, the recommended setting is Off. If set to Off, Rapid Recovery controls the caching. If set to Sync, Windows controls the caching as well as the synchronous input/output.
Bytes per sector	Specify the number of bytes you want each sector to include. The default value is 512.
Average bytes per record	Specify the average number of bytes per record. The default value is 8192.

9. Click **Save**.

   The **Add Storage Location** dialog box closes and your settings are saved. The **Add New Repository** dialog box shows your new storage location.

10. Optionally, repeat Step 6 through Step 9 to add additional storage locations for the repository.
11. When all of the storage locations you want to create for the repository at this time have been defined, in the **Add New Repository** dialog box, click **Create**.

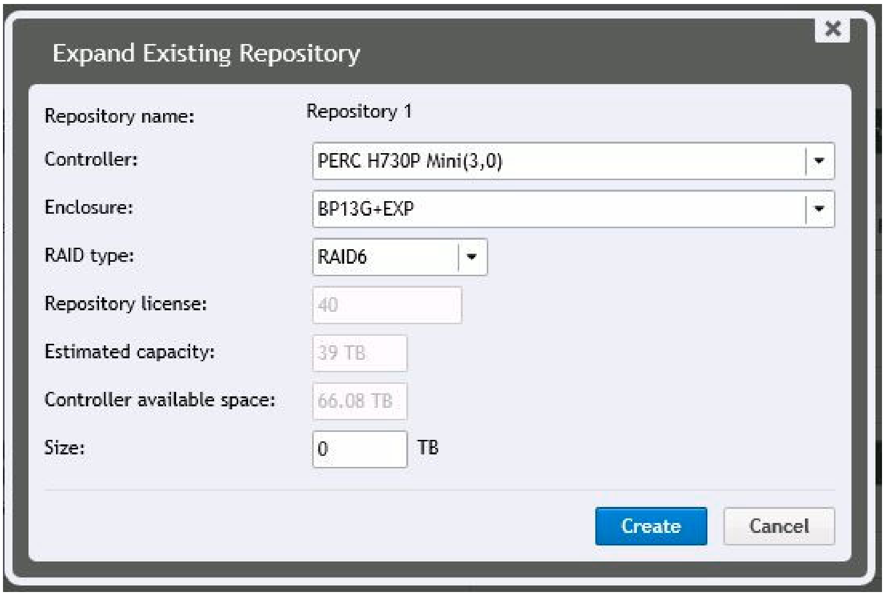
    The **Add New Repository** dialog box closes, and your changes are applied. The **Repositories** page appears, showing your newly added repository in the DVM Repositories summary table.

Expanding repository

The Expand Repository feature is available on all DL models (1300, 4300, 4000), except DL 1000. The type of license applied restricts the repository size. To expand the repository using unused internal storage and storage on external enclosure, update the license. To change the license key, see Updating or changing a license section. To expand the existing repository:

1. Click **Appliance** → **Provisioning**.
2. In the **Repositories** section, click ⚙ → **Expand Existing Repository**, next to the repository that you want to expand.

The **Expand Existing Repository** dialog box is displayed.



Expand Existing Repository

Repository name: Repository 1

Controller: PERC H730P Mini(3,0)

Enclosure: BP13G+EXP

RAID type: RAID6

Repository license: 40

Estimated capacity: 39 TB

Controller available space: 66.08 TB

Size: 0 TB

3. In the **Expand Existing Repository** box, specify the following information:

Table 29. Expanding existing repository

Text Box	Description
Repository name	The name of the repository that has to be expanded is displayed.
Controller	Select the appropriate storage controller depending on whether you are creating repository on internal storage or on direct-attached storage enclosure.
Enclosure	Select the appropriate storage enclosure.
RAID type	Select the appropriate RAID configuration. You have the following options for RAID configurations: 1, 5, or 6.
Repository license	The repository license is displayed.
Estimated capacity	Displays the estimated capacity available for creating a repository.
Controller available space	Displays the available space on the controller.
Size	Enter the size of the repository that has to be created.

4. Click **Create**.
   A new storage location is added to the existing repository.

The repository is expanded to the specified size.

Viewing or modifying repository details

1. Navigate to the Rapid Recovery Core Console.

2. On the icon bar, click (More), and then select **Repositories**.
   The **Repositories** page appears.

The **DVM Repositories** pane appears.

3. From the **Repositories** page menu, you can perform the following general actions:

Option	Description
Add New DVM Repository	Add a new DVM repository.
Open Existing DVM Repository	Open an existing DVM repository from another Core, which changes ownership of the repository to this Core. For more information, see Opening an existing DVM repository.
Refresh	View or refresh the list of repositories.

4. In the **DVM Repositories** pane, from the ⚙ drop-down menu for any DVM repository, you can perform the following additional actions:

Option	Description
Add Storage Location	Extend the existing repository by adding a storage location NOTE: When extending a DVM repository volume, first pause protection. Then extend the volume, and finally, resume protection. This action prevents a rare error that can occur only when extending a volume simultaneous with a specific transfer phase.
Check	Perform a repository check
Settings	View or modify repository settings. These settings include: • Viewing the repository name • Viewing or changing the maximum concurrent operations • Viewing or changing a description for the repository • Enabling or disabling deduplication • Enabling or disabling compression for data stored in the repository
Perform Optimization Job	Perform a repository optimization job
Delete	Delete a repository

NOTE: When extending a DVM repository volume, first pause protection. Then extend the volume, and finally, resume protection. This action prevents a rare error that can occur when extending at a specific transfer phase.

You can perform the following general actions from the Repositories page:

- View or refresh the list of repositories
- Add a new repository
- Open an existing repository from another Core, which changes ownership to this repository

Adding a storage location to an existing DVM repository

NOTE: It's recommended that you expand the repository through **Appliance** tab. For more information, see Expanding repository

Adding a storage location to a DVM repository lets you define where you want the repository or volume to be stored.

Complete the steps in the following procedure to specify the storage location for the repository or volume.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⋮ (More), and then select **Repositories**.

   The Repositories page appears.

   The DVM Repositories pane appears.
3. In the repositories summary table, from the row representing the DVM repository for which you want to add a storage location, click **Settings** and select **Add Storage Location**.

   The **Add Storage Location** dialog box displays.
4. Specify how to add the file for the storage location. You can choose to add the file on the local disk or on a CIFS share.
   - Select **Add file on local disk** to specify a local machine and then enter the information as described in the following table.

     Table 30. Local disk settings

Text Box	Description
Data Path	Enter the location for storing the protected data. For example, type `X:\Repository\Data`. The same limitations to the path apply; use only alphanumeric characters, hyphen, or period, with no spaces or special characters.
Metadata Path	Enter the location for storing the protected metadata. For example, type `X:\Repository\Metadata`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). The letters a to z are case-insensitive. Do not use spaces. No other symbols or punctuation characters are permitted.

   - Or, select **Add file on CIFS share** to specify a network share location and then enter the information as described in the following table.

     Table 31. CIFS share credentials

Text Box	Description
UNC Path	Enter the path for the network share location. If this location is at the root, define a dedicated folder name (for example, `Repository`). The path must begin with \\. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). The letters a to z are case-insensitive. Do not use spaces. No other symbols or punctuation characters are permitted.
User Name	Specify a user name for accessing the network share location.
Password	Specify a password for accessing the network share location.
5. In the Storage Configuration pane, click **More Details** and enter the details for the storage location as described in the following table.

Table 32. Storage location details

Text Box	Description
Size	Set the size or capacity for the storage location.The default size is 250 GB. You can choose from the following: • GB • TB NOTE: The minimum size is 1 GB. The size that you specify cannot exceed the size of the volume. If the storage location is a New Technology File System (NTFS) volume using Windows XP or Windows 7, the file size limit is 16 TB. If the storage location is a NTFS volume using Windows 8, 8.1 or Windows Server 2012, 2012 R2, the file size limit is 256 TB. NOTE: For Rapid Recovery to validate the operating system, Windows Management Instrumentation (WMI) must be installed on the intended storage location.
Write Caching Policy	The write caching policy controls how the Windows Cache Manager is used in the repository and helps to tune the repository for optimal performance on different configurations. Set the value to one of the following: • On • Off • Sync If set to On, which is the default, Windows controls the caching. This is appropriate for Windows 10, and for versions of Windows Server 2012 and later. NOTE: Setting the write caching policy to On could result in faster performance. If you are using Windows Server 2008 SP2 or Windows Server 2008 R2 SP2, the recommended setting is Off. If set to Off, Rapid Recovery controls the caching. If set to Sync, Windows controls the caching as well as the synchronous input/output.
Bytes per Sector	Specify the number of bytes you want each sector to include. The default value is 512.
Average Bytes per Record	Specify the average number of bytes per record. The default value is 8192.

6. Optionally, if you want to perform the repository optimization job for the selected repository, select **Run Repository Optimization Job for [Repository name]**.

   Dell recommends performing the Repository Optimization Job when adding storage locations to an existing repository. This job optimizes the free space by applying deduplication to data stored in the repository.

   Based on factors such as the size of your repository, amount of data in your repository, available network bandwidth, and existing load on the input and output of your system, performing a

Repository Optimization Job could take a substantial amount of time and bandwidth in your environment.

For more information about the repository optimization job, see About the Repository Optimization Job.

7. Click **Save**.

   The dialog box closes and the storage location is saved. In the repositories summary table, the storage location you created is visible if you expand the repository details.

About checking the integrity of DVM repositories

Rapid Recovery Core, users can to set disparate retention policies between source and target Cores. For replication to work properly with different retention policies, the target Core must have the same software version (or newer) than the source Core.

NOTE: The Cores must share the same three digits for the release number (for example, both start with 6.0.1.xxxx, or 5.4.3.xxxx). The build number (represented by xxxx) can be different only if the target Core is newer.

Administrators can now configure rollup on a target Core at a different rate than on the source Core. Similarly, you can now define a custom retention policy for any replicated machine. For example, you can roll up recovery points in the target Core at a faster rate and with less granularity than on the source Core, saving space. Or you can roll up recovery points for any selected replicated machine at a slower rate in the target Core, maintaining more granularity, which may be useful for compliance purposes. For more information on using a retention policy that differs from the default in the Core, see Customizing retention policy settings for a protected machine.

If your Core has been upgraded at any point from AppAssure 5.3.x and you used replication, you must run this job before you can configure dissimilar retention policies between the source Core and a target Core, or configure a custom retention policy on a replicated machine.

You will not see or be able to run this job unless you have one or more eligible repositories (created prior to 5.4.x and not yet performed).

Running this job verifies the integrity of all data stored in the specified repository, ensuring you can recover data from each snapshot or base image. If the integrity check discovers any issue with data in your repository, the job ceases immediately. The event details for that job on the Core prompt you to contact Dell Support, so you can schedule time to work with a Support representative to perform additional procedures to identify and remediate data inconsistencies.

CAUTION: Running this job is expected to take an extended period of time. The amount of time differs based on the amount and type of data in your repository, and on the underlying storage system. While the job is running, no other transactions can be performed in that repository, including transfers (snapshot and base image backups, and replication), nightly jobs, and so on.

You can perform other operations in other repositories while this job is running.

NOTE: This job checks the integrity of all of the contents within a repository. For information about the `Integrity Check` job, which you can use to ensure that a repository is mountable and usable, see Checking a repository.

Checking a repository

Rapid Recovery lets you perform a diagnostic check of a DVM repository volume when errors occur. Core errors could be the result of it being improperly shut down, a hardware failure, or other environmental, lower IP stack factors that can be exposed in Rapid Recovery functionality.

NOTE: This procedure should only be performed for diagnostic purposes. For example, run this check in the event of hardware failure, improper shutdown of the Core, or failure when importing a repository.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⋮ (More), and then select **Repositories**.

   The **Repositories** page appears.

   The DVM Repositories pane appears.
3. To check a DVM repository, in the **DVM Repositories** pane, in any row of the summary table representing a DVM repository, click ⚙ and then select **Check**.

   The **Check Repository** dialog box appears.
4. In the **Check Repository** dialog box, confirm that you understand that all active tasks associated with this repository will be canceled and that you want to proceed.

   Active jobs are canceled and the Check Repository Job starts.
5. Optionally, can you track the status of the job by clicking the **Running tasks** drop-down menu in the button bar, and selecting the Maintaining repository job.

About the Repository Optimization Job

When using a DVM repository, the data you capture in each snapshot is deduplicated. This deduplication occurs incrementally, as snapshots are saved to the repository. One occurrence of each string of information is saved to the repository. When an information string is duplicated, a reference to the original string in the deduplication cache is used, saving storage space in the repository.

If the DVM deduplication cache is filled, only snapshot data that is already referenced in the cache is deduplicated. As deduplication occurs, the cache continues to update with new unique values, overwriting the oldest values in the cache. This results in less than optimal deduplication.

For more information about deduplication, see Understanding deduplication cache and storage locations.

You can choose to increase your DVM duplication cache before it is full, which ensures continued optimal deduplication of your data in that repository. For more information, see Configuring DVM deduplication cache settings.

You can also increase your deduplication cache after it is full. If you want to reclaim space in the repository after increasing your cache, you can optimize the repository. This action forces a comparison of the data in your snapshots to the information in the deduplication cache. If any repeated strings are found in the repository, that data is replaced with references to the data, which saves storage space in the repository. This is sometimes referred to as off-line deduplication, since this deduplication process occurs upon your request, instead of incrementally as snapshot data is transferred.

The optimization process is processor-intensive. The amount of time it takes to run this job depends on several factors. These factors include the size of your repository; the amount of data in your repository; available network bandwidth; and existing load on the input and output of your system. The more data in your repository, the longer this job runs.

The following actions are superseded or canceled when the Repository Optimization Job is occurring.

- Delete Recovery Points Job
- Maintain Repository Job
- Check Repository Integrity Job

The following actions are superseded or canceled when the optimization job is occurring.

- Delete All Recovery Points Job
- Delete Recovery Points Chain Job
- Maintain Repository Job
- Delete Recovery Points Job Base
- Check Repository Integrity Job

For steps on optimizing an existing DVM repository, see Optimizing a DVM repository.

You can interrupt the repository optimization job for a limited time if required. For more information, see Interrupting or Resuming the Repository Optimization Job.

Optimizing a DVM repository

You must have a DVM repostiory in your Core to perform this procedure.

You can perform offline deduplication of data saved to an existing DVM repository. This is accomplished by launching the Repository Optimization Job.

NOTE: Dell recommends performing the Optimize Repository job only after increasing your deduplication cache size. This action lets you reclaim repository space and more effectively use the DVM deduplication cache.

Complete the steps in this procedure to optimize a DVM repository.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⋮ (More), and then select **Repositories**.
   The **Repositories** page appears.
3. In the DVM Repositories pane, from the row representing the repository you want to optimize, click ⚙ and then select **Perform Optimization Job**.
   A warning prompt appears asking you to confirm the optimization.
4. Click to confirm the optimization.
   The optimization job takes precedence over most other jobs. If necessary, you can interrupt an optimization job in progress. For more information on interrupting or resuming this job, see Interrupting or Resuming the Repository Optimization Job.

Interrupting or Resuming the Repository Optimization Job

When you initiate the Optimize Repository Job, the selected DVM repository is deduplicated. This deduplication optimization is a processor-intensive job intended to save space in the repository. For more information, see About the Repository Optimization Job.

Once this job has been initiated, you can interrupt the job using the following procedure. This pauses deduplication. If you have already interrupted a optimization, you can resume the process using this procedure.

NOTE: This procedure applies only to DVM repositories and only when the repository optimization job has been initiated.

Complete the steps in this procedure to interrupt or resume a repository optimization job.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⋮ (More), and then select **Repositories**.

   The **Repositories** page appears.

   The DVM Repositories pane appears.
3. If you want to interrupt an optimization job, do the following:
   a. In the repositories summary table, from the row representing the appropriate repository, click ⚙ and then select **Interrupt Optimization Job**.

      A warning prompt appears asking you to confirm the interruption.

   b. Click to confirm the optimization.
4. If you want to resume an interrupted optimization job, do the following:
   a. In the repositories summary table, from the row representing the appropriate repository, click ⚙ and then select **Continue Optimization Job**.

      A warning prompt appears asking you to confirm the interruption.

   b. In the dialog box, select the option **Continue job from the interrupted point,** and then click **Yes**.

   The dialog box closes, and the repository optimization job resumes from the point where it was last interrupted.

Opening an existing DVM repository

As the primary repository technology for Rapid Recovery, the DVM repository contains snapshot data (in the form of recovery points) from the machines protected on a specific Rapid Recovery Core. You can open an existing repository from one Core (for example, Core A) on a second Core (Core B).

NOTE: Opening a repository from another Core changes ownership of the repository. When you open an existing repository, the information is then accessible only to the second Core.

In the case of a DVM repository, the original Core (Core A) must not be in current use. For example, the machine must be turned off, not accessible to the network, or the Core services must be stopped.

The repository can be on a shared network location, or on a storage device accessible to the second Core.

Complete the following procedure to open an existing repository.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⋮ (More), and then select **Repositories**.
   The **Repositories** page appears.

   The DVM Repositories pane also appears.
3. To open an existing DVM repository, at the top of the page, click **Open Existing DVM Repository**.
   The **Open Existing DVM Repository** dialog box appears.
4. In the **Open Existing DVM Repository** dialog box, enter the following information for the repository you want to open, and then click **Open**.

   Table 33. Open Existing DVM Repository options

Text Box	Description
Path	The path for the repository (for example, D:\work\machine for a local path, or \\10.10.99.155\repositories by IP address, or \\servername\sharename for a network path).
User name	If the repository has a network path, enter the user name for logging in to the network share.
Password	If the repository has a network path, enter the password for logging in to the network share.

   The dialog box closes, and the selected repository is added to your current Core.

Deleting a repository

Complete the steps in this procedure to delete a repository.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⋮ (More), and then select **Repositories**.
   The **Repositories** page appears.

   On the **Repositories** page, the DVM Repositories pane appears.
3. In the repositories summary table, from the row representing the repository you want to delete, click ⚙ to expand the drop-down menu, and then select **Delete**.
   A warning message appears to confirm deletion.
4. Click **Yes** to confirm the deletion of the repository.

   ⚠ **CAUTION: When a repository is deleted, the data contained in the repository is discarded and cannot be recovered.**

Running the Check Repository Job on a DVM repository

Perform this procedure to check the integrity of an entire DVM repository. This is recommended for replicated target cores when upgrading from AppAssure 5.3.x to release 5.4. During the execution of the integrity check, which can be lengthy, no other actions can be performed in the repository.

If you have multiple DVM repositories for a target Core, perform this process once for each repository.

NOTE: If you have another DVM repository on the target Core for which the Integrity Check job has already been completed, or if you create a new additional repository for this target Core, you can perform operations in that secondary repository while the integrity check job is running on the DVM repository you specified.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click (More), and then select **Repositories**..

   The **Repositories** page appears.

   The DVM Repositories pane appears.
3. In the repositories summary table, from the row representing the repository you want to check, click ⚙ and from the drop-down menu, select **Check Repository Job**.

   A confirmation message appears.

   CAUTION: Before you confirm that you want to perform the job, you should carefully consider the duration of time required. While the job is running, no other transactions can be performed in that repository, including transfers (snapshot and base image backups, and replication), nightly jobs, and so on.
4. From the **Check Repository Job** dialog box, to perform the integrity check, click **Yes**.

   The dialog box closes. Any jobs that were queued or that are in progress are canceled, and the integrity check job begins.
5. To monitor the progress of the Check Repository Job for a repository, including a determination of whether additional steps are required after the check, from the icon bar, click (Events).
6. From the **Events** page, click **Job Details** for the job to view more information about the job status.
   - If you see an error in any child tasks for this job, note the error and provide the information to a Dell technical support representative.
   - If the Check Repository Job completes all child tasks successfully, you can then establish a custom retention policy for this repository.

Managing security

The Core can encrypt protected machine snapshot data within the repository. Instead of encrypting the entire repository, you can specify an encryption key during the protection of a machine in a repository which lets the keys be reused for different protected machines. Encryption does not affect performance, as each active encryption key creates an encryption domain, thus letting a single core support multitenancy by hosting multiple encryption domains. In a multi-tenant environment, data is partitioned and deduplicated within the encryption domains. Because you manage the encryption keys, loss of the volume cannot leak the keys. Key security concepts and considerations include:

- Encryption is performed using 256 bit AES in Cipher Block Chaining (CBC) mode that is compliant with SHA-3.
- Deduplication operates within an encryption domain to ensure privacy.
- Encryption is performed without impact on performance.
- You can add, remove, import, export, modify, and delete encryption keys that are configured on the Core.

- There is no limit to the number of encryption keys you can create on the Core.

Applying or removing encryption from a protected machine

You can secure the data protected on your Core at any time by defining an encryption key and applying it to one or more protected machines in your repository. You can apply a single encryption key to any number of protected machines, but any protected machine can only use one encryption key at a time.

The scope of deduplication in Rapid Recovery is limited to protected machines using the same repository and encryption key. Therefore, to maximize the value of deduplication, Dell recommends applying a single encryption key to as many protected machines as is practical. However, there is no limit to the number of encryption keys you can create on the Core. Thus, if legal compliance, security rules, privacy policies, or other circumstances require it, you can add and manage any number of encryption keys. You could then apply each key to only one protected machine, or any set of machines in your repository.

Any time you apply an encryption key to a protected machine, or dissociate an encryption key from a protected machine, Rapid Recovery takes a new base image for that machine upon the next scheduled or forced snapshot. The data stored in that base image (and all subsequent incremental snapshots taken while an encryption key is applied) is protected by a 256-bit advanced encryption standard. There are no known methods for compromising this method of encryption.

If you change the name or passphrase for an existing encryption key currently used to a protected machine, then upon the next scheduled or forced snapshot, Rapid Recovery Core captures and reflects the updated properties of the key. The data stored in that image (and all subsequent incremental snapshots taken while an encryption key is applied) is protected by a 256-bit advanced encryption standard. There are no known methods for compromising this method of encryption.

Once an encryption key is created and applied to a protected machine, there are two concepts involved in removing that encryption. The first is to disassociate the key from the protected machine. Optionally, once the encryption key is disassociated from all protected machines, it can be deleted from the Rapid Recovery Core.

This section includes the following topics:

- Associating an encryption key with a protected machine
- Applying an encryption key from the Protected Machines page
- Disassociating an encryption key from a protected machine

Associating an encryption key with a protected machine

You can apply an encryption key to a protected machine using either of two methods:

- **As part of protecting a machine.** When using this method, you can apply encryption to one or multiple machines simultaneously. This method lets you add a new encryption key, or apply an existing key to the selected machine or machines.

  To use encryption when first defining protection for a machine, you must select the advanced options in the relevant Protect Machines Wizard. This selection adds an Encryption page to the wizard workflow. From this page, select **Enable encryption**, and then select an existing encryption key or specify parameters for a new key. For more information, see Protecting a machine or About protecting multiple machines, respectively.
- **By modifying the configuration settings for a machine.** This method applies an encryption key to one protected machine at a time. There are two approaches for modifying configuration settings for a machine in the Rapid Recovery UI:

- Modify the configuration settings for a specific protected machine. The encryption key you want to use for this approach must already exist on the Rapid Recovery Core, be a universal key type, and must be in an unlocked state. Encryption is part of the General settings. For more information, see Viewing and modifying protected machine settings.
- Click the 🔓 **Not Encrypted** icon on the Protected Machines page. Using this approach you can create and apply a new encryption key, or assign an existing unlocked universal key to the specified protected machine. For more information, see Applying an encryption key from the Protected Machines page.

Applying an encryption key from the Protected Machines page

Once an encryption key has been added to a Rapid Recovery Core, it can be used for any number of protected machines.

If you select an encryption key during the initial protection of one or more machines, that key is automatically applied to any machines you protect using that wizard. In such cases, this procedure is not required.

Perform this procedure:

- If you want to apply an existing, universal, unlocked encryption key to any protected machine in your Core.
- If you just added a new encryption key using the process described in the topic Adding an encryption key and want to apply that key to a protected machine.
- If encryption is already applied to a protected machine in your Core, but you want to change the key to a different universal, unlocked key available in your Core.

CAUTION: After you apply an encryption key to a protected machine, Rapid Recovery takes a new base image for that machine upon the next scheduled or forced snapshot.

1. Navigate to the Rapid Recovery Core and click **Protected Machines**.

   The **Protected Machines** page appears, listing all the machines protected by this Core. An open lock 🔓 appears for any machine that does not have an encryption key applied. A closed lock 🔒 indicates that a protected machine has encryption applied.
2. In the Protected Machines pane, click the lock icon for the protected machine you want to configure.

   The **Encryption Configuration** dialog box appears.
3. Do one of the following:
   - If you want to apply an existing encryption key to this machine, select **Encrypt data using Core-based encryption with an existing key**, and from the drop-down menu, select the appropriate key. Click **OK** to confirm.
   - If you want to change an existing encryption key to a different universal, unlocked key, select **Encrypt data using Core-based encryption with a new key**, and from the drop-down menu, select the appropriate key. Click **OK** to confirm.
   - If you want to create a new encryption key and apply it to this protected machine, select **Encrypt data using Core-based encryption with a new key**. Then enter the details for the key as described in the following table.

     Table 34. New encryption key details

Text Box	Description
Name	Enter a name for the encryption key.

Text Box	Description
	Encryption key names must contain between 1 and 64 alphanumeric characters. Do not use prohibited characters or prohibited phrases.
Description	Enter a descriptive comment for the encryption key. This information appears in the Description field when viewing a list of encryption keys in the Rapid Recovery Core Console. Descriptions may contain up to 254 characters. Best practice is to avoid using prohibited characters and prohibited phrases.
Passphrase	Enter a passphrase used to control access. Best practice is to avoid using prohibited characters. Record the passphrase in a secure location. Dell Support cannot recover a passphrase. Once you create an encryption key and apply it to one or more protected machines, you cannot recover data if you lose the passphrase.
Confirm Passphrase	Re-enter the passphrase. It is used to confirm the passphrase entry.

4. Click **OK**.

   The dialog box closes. The encryption key you specified has been applied to future backups for this protected machine, and the lock now appears as closed.

   Optionally, if you want the encryption key applied immediately, force a snapshot. For more information, see Forcing a snapshot.

   CAUTION: Rapid Recovery uses AES 256-bit encryption in the Cipher Block Chaining (CBC) mode with 256-bit keys. While using encryption is optional, Dell recommends that you establish an encryption key, and that you protect the passphrase you define. Store the passphrase in a secure location as it is critical for data recovery. Without a passphrase, data recovery is not possible.

Disassociating an encryption key from a protected machine

Once an encryption key is applied to a protected machine, all subsequent snapshot data stored in the Rapid Recovery Core is encrypted.

You can disassociate an encryption key from a protected machine. This action does not decrypt the existing backup data, but does result in a new base image for that machine at the time of the next scheduled or forced snapshot.

NOTE: If you want to remove an encryption key from the Core, as described in the topic Removing an encryption key, you must first disassociate that encryption key from all protected machines.

Perform this procedure to disassociate an encryption key from a specific protected machine.

1. Navigate to the Rapid Recovery Core and click **Protected Machines**.

   The Protected Machines page appears, listing all the machines protected by this Core. An open lock 🔓 appears for any machine that does not have an encryption key applied. A closed lock 🔒 indicates that a protected machine has encryption applied.

2. In the Protected Machines pane, click the 🔒 **Encrypted** icon for the protected machine you want to configure.

The **Encryption Configuration** dialog box appears.

3. Select **Encrypt data using Core-based encryption with an existing Key**, and from the drop-down menu, select **(None)** and then click **OK**.
4. If you want to remove this encryption key from the Rapid Recovery Core, first repeat this procedure for all protected machines using this key. Then perform the procedure described in the topic Removing an encryption key.

Managing encryption keys

To manage encryption keys for the Rapid Recovery Core, from the icon bar, click ⋮ (More) and then select **Encryption Keys**. The **Encryption Keys** page appears. For each encryption key added to your Rapid Recovery Core (if any have been defined yet), you see the information described in the following table.

Table 35. Information about each encryption key

UI Element	Description
Select Item	For each encryption key, you can select the checkbox to perform actions from the list of menu options above the table.
Name	The name associated with the encryption key.
Thumbprint	This parameter is a 26-character alphabetic string of randomly generated English upper and lower case letters that helps uniquely identify each encryption key.
Type	Type describes the origin point of an encryption key and its ability to be applied. An encryption key can contain one of two possible types: **Universal**. Universal type is the default condition when you create an encryption key. A key with a type of Universal, combined with a state of Unlocked, indicates that the key can be applied to a protected machine. You cannot manually lock a universal key type; instead, you must first change its type as described in the procedure Changing encryption key types. **Replication**. When a protected machine in a source Core has encryption enabled, and recovery points for that machine are replicated in a target Core, any encryption keys used in the source appear automatically in the target Core with a type of Replication. The default state after receiving a replicated key is locked. You can unlock an encryption key with a type of Replication by providing the passphrase. If a key has a type of Unlocked, you can manually lock it. For more information, see the topic Unlocking an encryption key.
State	The state indicates whether an encryption key can be used. Two possible states include: • **Unlocked**. An Unlocked state indicates that the key can be used immediately. For example, you can encrypt snapshots for a protected machine, or perform data recovery from a replicated recovery point on the target Core. • **Locked**. A Locked state indicates that the key cannot be used until it is unlocked by providing the passphrase. Locked is the default state for a newly imported or replicated encryption key. If the state of an encryption key is locked, it must be unlocked before it can be used. If you previously unlocked a locked encryption key, and the duration to remain unlocked has expired, the state changes from unlocked to locked. After the key locks automatically, you must unlock the key again in order to use it. For more information, see the topic Unlocking an encryption key.

UI Element	Description
Description	The description is an optional field that is recommended to provide useful information about the encryption key such as its intended use or a passphrase hint.

At the top level of the Encryption Keys pane, you can add an encryption key or import a key using a file exported from another Rapid Recovery Core. You can also delete keys selected in the summary table.

Once an encryption key exists for a Core, you can manage the existing keys by editing the name or description properties; changing the passphrase; unlocking a locked encryption key; or removing the key from the Rapid Recovery Core. You can also export a key to a file, which can be imported into another Rapid Recovery Core.

When you add an encryption key from the **Encryption Keys** page, the key appears in the list of encryption keys, but is not applied to a specific protected machine. For information on how to apply an encryption key you create from the **Encryption Keys** pane, or to delete a key entirely from the Rapid Recovery Core, see Applying or removing encryption from a protected machine.

From the **Encryption Keys** pane, you can manage security for the backup data saved to the Core for any protected machine in your repository by doing the following:

- Adding an encryption key
- Importing an encryption key
- Unlocking an encryption key
- Editing an encryption key
- Changing an encryption key passphrase
- Exporting an encryption key
- Removing an encryption key
- Changing encryption key types

Adding an encryption key

Rapid Recovery uses AES 256-bit encryption in the Cipher Block Chaining (CBC) mode with 256-bit keys. While using encryption is optional, Dell recommends that you establish an encryption key, and that you protect the passphrase you define.

⚠ **CAUTION: Store the passphrase in a secure location. Without a passphrase, you cannot recover data from encrypted recovery points.**

After an encryption key is defined, you can use it to safeguard your data. Encryption keys can be used by any number of protected machines.

This step describes how to add an encryption key from the Rapid Recovery Core Console. This process does not apply the key to any machines currently being protected on the Core. You can also add an encryption key during the process of protecting a machine. For more information on adding encryption as part of protecting one machine, see Protecting a machine. For more information on adding encryption to two or more machines while initially protecting them, see About protecting multiple machines.

Complete the steps in this procedure to add an encryption key.

1. Navigate to the Rapid Recovery Core Console.

2. On the icon bar, click ⋮ (More) and then select **Encryption Keys**.

The **Encryption Keys** page appears.

3. Click **Add Encryption Key**.

   The **Create Encryption Key** dialog box appears.

4. In the **Create Encryption Key** dialog box, enter the details for the key as described in the following table.

Table 36. Create encryption key details.

Text Box	Description
Name	Enter a name for the encryption key. Encryption key names must contain between 1 and 64 alphanumeric characters. Do not use prohibited characters or prohibited phrases.
Description	Enter a comment for the encryption key. This information appears in the Description field when viewing encryption keys from the Core Console. You can enter up to 254 characters. Best practice is to avoid using prohibited characters and prohibited phrases.
Passphrase	Enter a passphrase used to control access. Best practice is to avoid using prohibited characters. ⚠ **CAUTION: Record the passphrase in a secure location. Dell Support cannot recover a passphrase. Once you create an encryption key and apply it to one or more protected machines, you cannot recover data if you lose the passphrase.**
Confirm passphrase	Re-enter the passphrase. It is used to confirm the passphrase entry.

5. Click **OK**.

   The dialog box closes and the encryption key you created is visible on the Encryption Keys page.

6. If you want to apply the encryption key to a protected machine, see Applying an encryption key from the Protected Machines page.

Importing an encryption key

You can import an encryption key from another Rapid Recovery Core and use that key to encrypt data for a protected machine in your Core. To import the key, you must be able to access it from the Core machine, either locally or through your network. You must also know the passphrase for the encryption key.

Complete the steps in this procedure to import an encryption key.

NOTE: This procedure does not apply the key to any protected machines. For more information on applying the key, see Applying an encryption key from the Protected Machines page.

1. Navigate to the Rapid Recovery Core.

2. On the icon bar, click ⋮ (More) and then select **Encryption Keys**.

   The **Encryption Keys** page appears.

3. Click **Import**.

The **File Upload** dialog box appears.

4. In the**File Upload** dialog box, navigate to the network or local directory containing the encryption key you want to import.

   For example, navigate to the **Downloads** folder for the logged-in user.

   The key filename starts with "EncryptionKey-," followed by the key ID, and ending in the file extension .key. For example, a sample encryption key name is EncryptionKey-RandomAlphabeticCharacters.key.
5. Select the key you want to import, and then click **Open**.
6. In the **Import Key** dialog box, click **OK**.

   The dialog box closes and the encryption key you imported is visible on the **Encryption Keys** page. If the encryption key was used to protect a volume before it was exported, the state of the key is Locked.

Unlocking an encryption key

Encryption keys may contain a state of unlocked or locked. An unlocked encryption key can be applied to a protected machine to secure the backup data saved for that machine in the repository. From a Rapid Recovery Core using an unlocked encryption key, you can also recover data from a recovery point.

When you import an encryption key into a Rapid Recovery Core, its default state is Locked. This is true regardless of whether you explicitly imported the key, or whether the encryption key was added to the Rapid Recovery Core either by replicating encrypted protected machines or by importing an archive of encrypted recovery points.

For encryption keys added to the Rapid Recovery Core by replication only, when you unlock a key, you can specify a duration of time (in hours, days, or months) for the encryption key to remain unlocked. Each day is based on a 24-hour period, starting from the time the unlock request is saved to the Rapid Recovery Core. For example, if the key is unlocked at 11:24 AM on Tuesday and the duration selected is 2 days, the key automatically re-locks at 11:24 AM that Thursday.

NOTE: You cannot use a locked encryption key to recover data or to apply to a protected machine. You must first provide the passphrase, thus unlocking the key.

You can also lock an unlocked encryption key, ensuring that it cannot be applied to any protected machine until it is unlocked. To lock an encryption key with a state of Universal, you must first change its type to Replicated.

If an unlocked encryption key is currently being used to protect a machine in the Core, you must first disassociate that encryption key from the protected machine before you can lock it.

Complete the steps in this procedure to unlock a locked encryption key.

1. Navigate to the Rapid Recovery Core.
2. On the icon bar, click ⋮ (More) and then select **Encryption Keys**.

   The **Encryption Keys** page appears. The State column indicates which encryption keys are locked.
3. Locate the encryption key you want to unlock, click its drop-down menu ⚙, and select **Unlock**.

   The **Unlock Encryption Key** dialog box appears.
4. In the dialog box, in the Passphrase field, enter the passphrase to unlock this key.

5. To specify the length of time that the key remains unlocked, in the Duration option, do one of the following:
   - To specify that the key remains unlocked until you explicitly lock it, Rapid Recovery select **Until locked manually**.
   - To specify that the key remains locked for a duration which you configure in hours, days, or months, do the following:
     - Select the number field and enter a value between 1 and 999.
     - Specify the duration number as hours, days, or months, respectively.
     - Then click **OK**.

       This option is available for encryption keys added by replication.

       The dialog box closes and the changes for the selected encryption key are visible on the Encryption Keys page.
   - To specify that the key remains locked until a date and time that you specify, do the following:
     - Select the **Until** option.
     - In the text field or using the calendar and clock widgets, explicitly specify the data and time you want the encryption key to lock.
     - Then click **OK**.

       This option is available for encryption keys added by replication.

       The dialog box closes and the changes for the selected encryption key are visible on the Encryption Keys page.

Locking an encryption key

When an encryption key state is locked, it cannot be applied to any protected machine until it is unlocked. To lock an encryption key with a type of Universal, you must first change its type to Replicated.

Complete the steps in this procedure to lock an encryption key.

1. Navigate to the Rapid Recovery Core.
2. On the icon bar, click ⋮ (More) and then select **Encryption Keys**.

   The **Encryption Keys** page appears. The State column indicates which encryption keys are unlocked, and shows the type for each key.
3. Locate the encryption key you want to lock. If its type is Universal, then click its drop-down menu ⚙, and select **Change the type to Replicated**.

   The **Change Encryption Key Type** dialog box appears.
4. In the dialog box, confirm that you want to change the key type to **Replicated**.
5. If you successfully changed the encryption key status to Replicated, then click its drop-down menu ⚙, and select **Lock**..

   The **Lock Encryption Key** dialog box appears.
6. In the dialog box, confirm that you want to lock the key.

   The dialog box closes, and the state of the selected encryption key is now locked.

   ✎ NOTE: This option is available for encryption keys added by replication.

Editing an encryption key

After an encryption key is defined, you can edit the name of the encryption key or the description of the key. These properties are visible when you view the list of encryption keys in the Encryption Keys pane.

Complete the steps in this procedure to edit the name or description of an existing unlocked encryption key.

CAUTION: After you edit the name or description an encryption key that is used to protect one or more machines, Rapid Recovery takes a new base image. That base image snapshot occurs for that machine upon the next scheduled or forced snapshot.

1. Navigate to the Rapid Recovery Core.
2. On the icon bar, click ⋮ (More) and then select **Encryption Keys**.

   The **Encryption Keys** page appears.
3. Locate the encryption key you want to edit, and do the following:
   - If the key is locked, you must first unlock it. See Unlocking an encryption key
   - If the key is unlocked, proceed as described below.
4. Click the drop-down menu ⚙ for the specified encryption key, and select **Edit**.

   The **Edit Encryption Key** dialog box appears.
5. In the dialog box, edit the name or the description for the encryption key, and then click **OK**.

   The dialog box closes, and the changes for the selected encryption key are visible on the **Encryption Keys** page.

Changing an encryption key passphrase

To maintain maximum security, you can change the passphrase for any existing encryption key. Complete the steps in this procedure to change the passphrase for an encryption key.

CAUTION: After you edit the passphrase for an encryption key that is used to protect one or more machines, Rapid Recovery Core captures an incremental snapshot for that machine upon the next scheduled or forced snapshot.

1. Navigate to the Rapid Recovery Core.
2. On the icon bar, click ⋮ (More) and then select **Encryption Keys**.

   The **Encryption Keys** page appears.
3. Locate the encryption key you want to update, click its drop-down menu ⚙, and select **Change passphrase**.

   The **Change Passphrase** dialog box appears.
4. In the dialog box, in the **Passphrase** field, enter the new passphrase for the encryption.
5. In the **Confirm passphrase** field, re-enter the identical passphrase.
6. Click **OK**.

   The dialog box closes and the passphrase is updated.
7. Optionally, if you use a hint in the Description field, edit the encryption key to update the hint. For more information, see Editing an encryption key.

CAUTION: Rapid Recovery uses AES 256-bit encryption in the Cipher Block Chaining (CBC) mode with 256-bit keys. Dell recommends that you record the passphrase in a secure location and keep this information updated. Dell Support cannot recover a passphrase. Without the passphrase, you cannot recover information from encrypted recovery points.

Exporting an encryption key

You can export an encryption key from any Rapid Recovery Core with the express purpose of using it in another Core. When you perform this procedure, the key is saved to the **Downloads** folder for the active Windows user account.

Complete the steps in this procedure to export an encryption key.

1. Navigate to the Rapid Recovery Core.
2. On the icon bar, click ⋮ (More) and then select **Encryption Keys**.

   The **Encryption Keys** page appears.
3. Locate the encryption key you want to export, click its drop-down menu ⚙, and select **Export**.

   The **Opening EncryptionKey-[name.key]** dialog box appears.
4. In the dialog box, select **Save File** to save and store the encryption keys in a secure location, and then click **OK**.

   The encryption key downloads as a text file to the default location, such as the **Downloads** folder of the active Windows user account.
5. Optionally, if you want to import this key into a different Core, copy the file to a location accessible from that Core.

Removing an encryption key

When you remove an encryption key from the Encryption Keys page, the key is deleted from the Rapid Recovery Core.

NOTE: Removing an encryption key does not decrypt the recovery points already saved using the key. You must still retain and provide the passphrase for the key to recover data for existing encrypted recovery points.

You cannot remove an encryption key that is already associated with any protected machine. You must first view the encryption settings for each protected machine using the key, and disassociate the encryption key you want to remove. For more information, see the topic Disassociating an encryption key from a protected machine.

Complete the steps in this procedure to remove an encryption key.

1. Navigate to the Rapid Recovery Core.
2. On the icon bar, click ⋮ (More) and then select **Encryption Keys**.

   The **Encryption Keys** page appears.
3. Locate the encryption key you want to remove. Click its drop-down menu ⚙, and select **Remove**.

   The **Remove Encryption Key** dialog box appears. You see a message confirming the action to remove the encryption key.
4. In the dialog box, confirm that you want to remove the encryption key.

NOTE: Removing an encryption key does not decrypt the recovery points already saved using the key. You must still retain and provide the key to recover data for existing encrypted recovery points.

The dialog box closes, and the encryption key you removed no longer appears on the **Encryption Keys** page.

Changing encryption key types

Encryption keys list one of two possible types on the Encryption Keys pane: Universal or Replication. The type indicates the likely origin of the encryption key, and determines whether you can change its details or passphrase. You can modify these attributes only if the type is Universal. If you need to modify these attributes for a key with Replicated type, you must change its type to Universal using this procedure. When you change the type of an encryption key to Universal, it is unlocked manually and can be used to encrypt other protected machines.

NOTE: You must know the passphrase to change the type from Replicated to Universal.

Encryption keys also have two possible states: Locked or Unlocked. The state controls your ability to apply an encryption key to a protected machine, or to restore data from a recovery point with encryption. You can change the type of an encryption key manually only if the state is Unlocked.

When you first create an encryption key, its type is Universal, and its state is Unlocked. You can use such a key immediately (for example, to encrypt backups for a protected machine). However, a Universal key type cannot be locked manually. If you want to manually lock an encryption key with a type of Universal, you must change the type to Replicated using this procedure.

You cannot change an encryption key type if it is already in use encrypting recovery points for one or more protected machine.

Follow this procedure to change an encryption key type.

1. Navigate to the Rapid Recovery Core.
2. On the icon bar, click ⋮ (More) and then select **Encryption Keys**.

   The **Encryption Keys** page appears. Any encryption keys accessible to the Core appear in a summary table. Each lists a type of Universal or Replicated.
3. Locate the encryption key you want to update.
4. If you want to change a Universal encryption key to Replication, do the following:

   a. Click its drop-down menu ⚙, and select **Change the type to Replicated**.

      The **Change Encryption Key Type** dialog box appears. You see a message confirming that you want to change the type to Replicated.

   - In the dialog box, confirm that you want to change the type to Replication.

   The dialog box closes, and the encryption key type updates to Replication.
5. If you want to change a Replication encryption key to Universal, do the following:

   a. Click its drop-down menu ⚙, and select **Change the type to Universal**

      The **Change Encryption Key Type** dialog box appears. You see a message confirming that you want to change the type to Universal.

   - In the dialog box, in the **Passphrase** field, enter the passphrase and then click **OK** to confirm that you want to change the type to Universal.

The dialog box closes, and the encryption key type updates to Universal.

Managing cloud accounts

This section describes how to define links to existing cloud storage provider accounts, and how to manage those cloud accounts for use with Rapid Recovery. For example, you can archive Rapid Recovery data to the cloud, or import archived data from the cloud.

About cloud accounts

Rapid Recovery lets you archive data to a variety of cloud providers, or import archived data stored in a cloud account. Compatible clouds include Microsoft Azure, Amazon™, Rackspace, and any OpenStack-based provider.

You can add an existing cloud account to the Rapid Recovery Core console. Once added, you can edit the information, configure the account connection options, or remove the account from Rapid Recovery.

Adding a cloud account

Before you can move data in either direction between a cloud account and your Core, you must add cloud provider account information to the Rapid Recovery Core Console. This information identifies the cloud account in the Core Console while caching the connection information securely. This process then lets Rapid Recovery Core connect to the cloud account to perform the operations you specify.

To add a cloud account, complete the steps in the following procedure.

1. On the Rapid Recovery Core Console icon bar, click the ⋮ **More** icon and then select **Cloud Accounts**.

   The **Cloud Accounts** page appears.
2. On the **Cloud Accounts** page, click **Add New Account**.

   The **Add New Account** dialog box opens.
3. Select a compatible cloud provider from the Cloud Type drop-down list.
4. Enter the details described in the following table based on the cloud type selected in Step 3.

   Table 37. Cloud account details

Cloud Type	Text Box	Description
Microsoft Azure	Storage Account Name	Enter the name of your Microsoft Azure storage account. NOTE: The name must match the storage account name in Azure precisely. It must contain lower case letters and numbers only, and be between 3 and 24 characters in length.
	Access Key	Enter the access key for your account. NOTE: You can enter the primary or secondary key. To obtain the access key from your Azure account, check **Keys** under **Settings**.

Cloud Type	Text Box	Description
	Use https protocol	Select this option to use the secure https protocol instead of the standard http protocol.
	Display Name	Enter a display name for this cloud account to display on the Rapid Recovery Core Console; for example, Microsoft Azure 1.
Amazon™ S3	Access Key	Enter the access key for your Amazon™ cloud account.
	Secret Key	Enter the secret key for this account.
	Display Name	Enter a display name for this cloud account to display on the Rapid Recovery Core Console; for example, Amazon 1.
Powered by OpenStack	Region	Enter the region for your cloud account.
	User Name	Enter the user name for you OpenStack-based cloud account.
	Password or API Key	Select whether to use a password or an API key, and then enter your selection for this account.
	Tenant ID	Enter your tenant ID for this account.
	Authentication URL	Enter the authentication URL for this account.
	Display Name	Enter a display name for this cloud account to display in the Rapid Recovery Core Console; for example, OpenStack 1.
Rackspace Cloud Files	Region	Use the drop-down list to select the region for your account.
	User Name	Enter the user name for your Rackspace cloud account.
	Password or API Key	Select whether to use a password or an API key, and then enter your selection for this account.
	Tenant ID	Enter your tenant ID for this account.
	Authentication URL	Enter the authentication URL for this account.
	Display Name	Enter a display name for this cloud account to display on the Rapid Recovery Core Console; for example, Rackspace 1.

5. Click **Save**.
   The dialog box closes, and your account appears on the **Cloud Accounts** page of the Core Console.

Editing a cloud account

If you need to change the information to connect to your cloud account, for example to update the password or edit the display name, you can do so on the Cloud Accounts page of the Rapid Recovery Core Console. Complete the steps in the following procedure to edit a cloud account.

1. On the Rapid Recovery Core Console icon bar, click the ⋮ **More** icon and then select **Cloud Accounts**.

The **Cloud Accounts** page appears.

2. Next to the cloud account you want to edit, click the drop-down menu, and then click **Edit**.

   The **Edit Account** window opens.

3. Edit the details as necessary, and then click **Save**.

   NOTE: You cannot edit the cloud type.

Configuring cloud account settings

Cloud configuration settings let you determine how much time should pass between Rapid Recovery attempts to connect to your cloud account before they time out. Complete the steps in the following procedure to configure the connection settings for your cloud account.

1. On the Rapid Recovery Core Console icon bar, click the ⚙ **Settings**.

   The Settings page appears.

2. In the left menu, click **Cloud Accounts**.
3. In the Cloud Accounts table, click the drop-down menu next to the cloud account you want to configure, and then complete one of the following actions:
   - To change the cloud account connection settings, click **Edit**.
     1. In the Cloud Configuration dialog box, complete any of the following actions:
        - For **Request Timeout**, use the up and down arrows to determine the amount of time in minutes and seconds that Rapid Recovery should spend on a single attempt to connect to the cloud account when there is a delay. Connection attempts will cease after the entered amount of time.
        - For **Write Buffer Size**, enter the buffer size you want to reserve for writing archived data to the cloud.
        - For **Read Buffer Size**, enter the block size you want to reserve for reading archived data from the cloud.
     2. Click **OK**.
   - To return the cloud configuration to the following default settings, click **Reset**.
     - **Request Timeout:** 01:30 (minutes and seconds)
     - **Write Buffer Size:** 8388608 (bytes)
     - **Read Buffer Size:** 8388608 (bytes)

Removing a cloud account

If you discontinue your cloud service, or decide to stop using it for a particular Core, you may want to remove your cloud account from the Core Console. Complete the steps in the following procedure to remove a cloud account.

1. On the Rapid Recovery Core Console icon bar, click the ⋮ **More** icon and then select **Cloud Accounts**.

   The **Cloud Accounts** page appears.

2. Next to the cloud account you want to edit, click the drop-down menu, and then click **Remove**.
3. In the **Delete Account** dialog box, click **Yes** to confirm that you want to remove the account.
4. If the cloud account is currently in use, a second dialog box prompts you to confirm that you still want to remove it. Click **Yes** to confirm.

NOTE: Removing an account that is currently in use causes all archive jobs scheduled for this account to fail.

Archiving

This section describes business cases for creating an archive, how to create an archive using Rapid Recovery, and where you can store it.

Understanding archives

Retention policies enforce the periods for which backups are stored on short-term (fast and expensive) media. Sometimes certain business and technical requirements mandate extended retention of these backups, but use of fast storage is cost prohibitive. Therefore, this requirement creates a need for long-term (slow and cheap) storage. Businesses often use long-term storage for archiving both compliance and non-compliance data. The archive feature in Rapid Recovery is used to support the extended retention for compliance and non-compliance data; and it is also used to seed replication data to a remote replica core.

Once an archive is created, it can be used in the following ways:

- An archive can be mounted as a file system for simple file or folder recovery.
- An archive can be used as the source for a bare metal restore.
- An archive can be imported into a repository.

Creating an archive

You can use this procedure to create a one-time or scheduled archive.

If you plan on creating an archive to a cloud location, first add your cloud account to the Rapid Recovery Core Console. For more information, see Adding a cloud account.

A one-time archive is an archive created on-demand for a specified machine. A scheduled archive is an archive that automatically recurs on the date and time you specify in the wizard. Having the ability to schedule a recurring archive accommodates situations where you would want frequent archives of a machine to be saved, without the inconvenience of needing to manually create the archives each time.

1. On the button bar of the Rapid Recovery Core Console, click **Archive**.
   The Archive Wizard opens.
2. On the **Archive Type** page of the wizard, select one of the following options:
   - One-time archive
   - Continuous archive (by schedule)
3. Click **Next**.
4. On the **Location** page, select an option from the **Location type** drop-down list and then enter the information as described in the following table.

Table 38. Archive location type options

Option	Text Box	Description
Local	Location	Enter the location for the output. It is used to define the location path where you want the archive to reside; for example, d:\work\archive.
Network	Location	Enter the location for the output. It is used to define the location path where you want the archive to reside; for example, \\servername\sharename.
	User name	Enter a user name. It is used to establish logon credentials for the network share.
	Password	Enter a password for the network path. It is used to establish logon credentials for the network share.
Cloud	Account	Select an account from the drop-down list. NOTE: To select a cloud account, you must first have added it in the Core Console. For more information, see Adding a cloud account.
	Container	Select a container associated with your account from the drop-down menu.
	Folder name	Enter a name for the folder in which the archived data is to be saved.

5. Click **Next**.
6. On the **Machines** page of the wizard, select the protected machine or machines you want to archive.
7. Click **Next**.
8. Do one of the following:
   - If you chose to create a one-time archive, skip to Step 15.
   - If you chose to create a scheduled archive, continue to Step 9
9. On the **Schedule** page, select one of the following options from the **Send data** drop-down list:
   - Daily
   - Weekly
   - Monthly
10. Enter the information described in the following table based on your selection from Step 9.

Table 39. Send data options

Option	Text Box	Description
Daily	At time	Select the hour of the day you want to create a daily archive.
Weekly	At day of week	Select a day of the week on which to automatically create the archive.
	At time	Select the hour of the day you want to create an archive.
Monthly	At day of months	Select the day of the month on which to automatically create the archive.
	At time	Select the hour of the day you want to create an archive.

11. Optionally, if you do not want the archive job to begin at the next scheduled time after you complete the wizard, select **Pause initial archiving**.

NOTE: You may want to pause the scheduled archive if you need time to prepare the target location before archiving resumes. If you do not select this option, archiving begins at the scheduled time.

12. Click **Next**.
13. On the **Options** page for a continuous archive, select one of the recycle actions described in the following table.

Table 40. Continuous archive recycle options

Text Box	Description
Incremental	Lets you add recovery points to an existing archive. It compares recovery points to avoid duplicating data that already exists in the archive.
Replace this Core	Overwrites any pre-existing archived data pertaining to this core but leaves the data for other cores intact.
Erase completely	Clears all archived data from the directory before writing the new archive.

14. Optionally, select **Build recovery points chains (fix orphans)**, and then skip to Step 18.
15. On the **Options** page for a one-time archive, enter the information described in the following table.

Table 41. One-time archive options

Text Box	Description
Maximum Size	Large archives of data can be divided into multiple segments. Select the maximum amount of space you want to reserve for creating the archive by doing one of the following: • Select **Entire Target** to reserve all available space in the path provided on the destination provided in Step 4. (for example, if the location is D:\work\archive, all of the available space on the D: drive is reserved). • Select the blank text box, use the up and down arrows to enter an amount, and then select a unit of measurement from the drop-down list to customize the maximum space you want to reserve. NOTE: Amazon™ cloud archives are automatically divided into 50 GB segments. Microsoft Azure cloud archives are automatically divided into 200 GB segments.
Recycle action	Select one of the following recycle action options: • Do not reuse. Does not overwrite or clear any existing archived data from the location. If the location is not empty, Rapid Recovery lets you select a different location. • Replace this Core. Overwrites any pre-existing archived data pertaining to this core but leaves the data for other cores intact. • Erase completely. Clears all archived data from the directory before writing the new archive. • Incremental. Lets you add recovery points to an existing archive. It compares recovery points to avoid duplicating data that already exists in the archive.
Comment	Enter any additional information that is necessary to capture for the archive. The comment will be displayed if you import the archive later.

Text Box	Description
Build recovery points chains (fix orphans)	Select this option to archive the entire recovery point chain. This option is selected by default.

16. Click **Next**.
17. On the **Date Range** page, either manually enter the start date and end date of the recovery points to be archived, or select the date time by clicking the calendar icon followed by the clock icon below the calendar window.
18. Click **Finish**.

    The wizard closes.

Archiving to a cloud

When data reaches the end of a retention period, you may want to extend that retention by creating an archive of the aged data. When you archive data, there is always the matter of where to store it. Rapid Recovery lets you upload your archive to a variety of cloud providers directly from the Core Console. Compatible clouds include Microsoft Azure, Amazon™, Rackspace, and any OpenStack-based provider.

Exporting an archive to a cloud using Rapid Recovery involves the following procedures:

- Add your cloud account to the Rapid Recovery Core Console. For more information, see Adding a cloud account.
- Archive your data and export it to your cloud account. For more information, see Creating an archive.
- Retrieve archived data by importing it from the cloud location. For more information, see Importing an archive.

Editing a scheduled archive

Rapid Recovery lets you change the details of a scheduled archive. To edit a scheduled archive, complete the steps in the following procedure.

1. In the Rapid Recovery Core Console, click the ⋮ **More** drop-down menu on the icon bar, and then select **Archives**.
2. On the Archives page, under Schedule Archives, click the drop-down menu next to the archive you want to change, and then click **Edit**.

   The **Add Archive Wizard** opens.
3. On the **Location** page of the Archive Wizard, select one of the following options from the **Location Type** drop-down list:
   - Local
   - Network
   - Cloud
4. Enter the details for the archive as described in the following table based on the location type you selected in Step 3.

Table 42. Archive details

Option	Text Box	Description
Local	Location	Enter the location for the output. It is used to define the location path where you want the archive to reside; for example, d:\work\archive.
Network	Location	Enter the location for the output. It is used to define the location path where you want the archive to reside; for example, \\servername\sharename.
	User name	Enter a user name. It is used to establish logon credentials for the network share.
	Password	Enter a password for the network path. It is used to establish logon credentials for the network share.
Cloud	Account	Select an account from the drop-down list. NOTE: To select a cloud account, you must first have added it in the Core Console. For more information, see Adding a cloud account.
	Container	Select a container associated with your account from the drop-down menu.
	Folder name	Enter a name for the folder in which you want to save the archived data; for example, Rapid-Recovery-Archive-[DATE CREATED]-[TIME CREATED].

5. Click **Next**.
6. On the **Machines** page of the wizard, select the protected machine or machines that contain the recovery points that you want to archive. Clear the machines that you do not want to archive.
7. Click **Next**.
8. On the **Schedule** page, select one of the following options from the **Send data** drop-down list:
   - Daily
   - Weekly
   - Monthly
9. Enter the information described in the following table based on your selection from Step 8.

Table 43. Send data options

Option	Text Box	Description
Daily	At time	Select the hour of the day you want to create a daily archive.
Weekly	At day of week	Select a day of the week on which to automatically create the archive.
	At time	Select the hour of the day you want to create a daily archive.
Monthly	At day of months	Select the day of the month on which to automatically create the archive.
	At time	Select the hour of the day you want to create a daily archive.

10. Optionally, to postpone archiving to resume at a later time, select **Pause initial archiving**.

    NOTE: You may want to pause the scheduled archive if you need time to prepare the target location before archiving resumes. If you do not select this option, archiving begins at the scheduled time.

11. Click **Next**.

12. On the **Options** page, use the **Recycle action** drop-down list to select one of the options described in the following table:

Table 44. Archive recycle options

Text Box	Description
Incremental	Lets you add recovery points to an existing archive. It compares recovery points to avoid duplicating data that already exists in the archive.
Replace this Core	Overwrites any pre-existing archived data pertaining to this core but leaves the data for other cores intact.
Erase completely	Clears all archived data from the directory before writing the new archive.

13. Optionally select **Build recovery points chains (fix orphans)**.
14. Click **Finish**.

    Rapid Recovery applies your changes to the archive.

Pausing or resuming a scheduled archive

If you have an archiving job scheduled to recur, you can pause or resume this action as necessary.

There may be times when you want to pause a scheduled archive job, such as if you need to change the destination archive location. Also, if you opted to initially pause archiving when you performed the Creating an archiveprocedure, you likely want to resume the scheduled archive later. Complete the steps in the following procedure to pause or resume scheduled archive.

1. From the Rapid Recovery Core Console, and click the ⋮ **More** menu on the icon bar, and then click **Archives**.
2. On the **Archives** page, under Scheduled Archives, do one of the following:
   - Select the preferred archive, and then click one of the following actions as appropriate:
     - Pause
     - Resume
   - Next to the preferred archive, click the drop-down menu, and then click one of the following actions as appropriate:
     - Pause
     - Resume

   The status of the archive displays in the Schedule column.

Forcing an archive job

Using this procedure, you can force Rapid Recovery to perform the archive job on a scheduled archive at any time.

To force an archive job, you must have an archive scheduled on the Core.

1. From the Rapid Recovery Core Console, in the icon bar, click the ⋮ **More** drop-down, and then select **Archives**.
2. On the Archives page, under Schedule Archives, click the drop-down menu next to the archive you want to force, and then click **Force**.

   Rapid Recovery archives the recovery points according to the settings you chose for that archive, regardless of the scheduled archive time you set.

Checking an archive

Checking an archive verifies whether an archive and its contents are healthy enough to be restored.

You can scan an archive for the integrity of its structure, data segments, and index files by performing an archive check. The archive check verifies the presence of all necessary files within the archive and that the files are healthy. To perform an archive check, complete the steps in the following procedure.

1. From the Rapid Recovery Core Console, click the ⋮ **More** drop-down menu in the icon bar, and then select **Archives**.
2. On the **Archives** page, click **Check**.

   The **Check Archive** dialog box appears.
3. For **Location type**, select one of the following options from the drop-down list:
   - Local
   - Network
   - Cloud
4. Based on the location type you selected in Step 3, enter the details for the archive as described in the following table.

   Table 45. Archive details

Option	Text Box	Description
Local	Location	Enter the path for the archive.
Network	Location	Enter the path for the archive.
	User Name	Enter the user name. It is used to establish logon credentials for the network share.
	Password	Enter the password for the network path. It is used to establish logon credentials for the network share.
Cloud	Account	Select an account from the drop-down list. NOTE: To select a cloud account, you must first have added it in the Core Console. For more information, see Adding a cloud account.
	Container	Select a container associated with your account from the drop-down menu.

Option	Text Box	Description
	Folder Name	Select the folder in which the archived data is saved; for example, Rapid Recovery -5-Archive-[DATE CREATED]-[TIME CREATED]

5. Select or clear the checks described in the following table. All are selected by default.

   NOTE: Do not clear all checks. You must select at least one option.

Option	Description
Index files mapping offsets	This option checks that all the data on the internal structure of the archive is in the correct location.
Structure integrity	This option verifies the presence of certain internal files and the folder structure of the archive. If any files or folders are missing, the check fails.
Checksum integrity	This option checks the integrity of the data segments in the archive to ensure that the segments are healthy.

6. Click **Check File**.

   Rapid Recovery checks the archive according to your selections.

Attaching an archive

Attaching an archive lets you see recovery points from the archive.

You must have a pre-existing archive created in Rapid Recovery Core 6.0.1 or later to complete this procedure. For more information, see Creating an archive.

When you attach an archive, the archive name you provide appears as an archive menu in the left navigation menu of the Core Console. Each protected machine with recovery points in the archive is listed separately below the archive menu. You can click any machine name in the archive and browse its recovery points. You can then take the same actions as with any other recovery points currently visible in your Core.

Attaching the archive also caches the credentials for accessing the information. Until you delete the attached archive definition, you can easily re-attach and detach the archive, making its recovery points easily accessible.

Use this procedure to attach an archive.

1. On the Rapid Recovery Core Console, click the **Archive** ▼ drop-down menu, and then select **Attach Archive**.

   The **Attach Archive** dialog box appears.

2. In the **Name** text box, enter a name for this attached archive.

   The value you type in this field appears in the left navigation menu as the archive menu name.

   Following best practice for display names, the archive name should contain between 1 and 64 alphanumeric characters, including spaces. Do not use prohibited characters. or prohibited phrases.

3. In the **Location type** drop-down list, select the location type of your archive from the following options:

   - Local
   - Network

- Cloud

4. Enter the details for the archive as described in the following table based on the location type you selected in Step 3.

Table 46. Location type details

Option	Text Box	Description
Local	Location	Enter the path to the archive; for example, D:\Work\Archive.
Network	Location	Enter the path to the archive; for example, \\servername\sharename.
	User name	Enter user name for logging in to the network share.
	Password	Enter the password for logging in to the network share.
Cloud	Account	Select an account from the drop-down list. NOTE: To select a cloud account, you must first have added it in the Core Console. For more information, see Adding a cloud account.
	Container	Select the container of the archive associated with your account from the drop-down menu.
	Folder name	Enter the name of the folder of the archived data; for example, Rapid-Recovery-Archive-[DATE CREATED]-[TIME CREATED].

5. Click **Attach**.

   The archive attaches to this Core and mounts the contents as a file system.

Importing an archive

You can use this procedure to import an archive one time, or schedule an archive to import on a recurring basis.

When you want to recover archived data, you can import the entire archive to a specified location.

CAUTION: Perform this step only after careful consideration. Importing an archive repopulates the repository with the contents of the archive, replacing any new data in the repository since the archive was captured.

To import an archive, complete the steps in the following procedure.

1. On the menu bar of the Rapid Recovery Core Console, click the **Archive** drop-down menu and then select **Import Archive**.

   The **Import Archive Wizard** opens.
2. On the **Import Type** page of the wizard, select one of the following options:
   - One-time import
   - Continuous import (by schedule)
3. Click **Next**.
4. On the **Location** page, select the location of the archive you want to import from the drop-down list, and then enter the information as described in the following table:

Table 47. Imported archive location type options

Option	Text Box	Description
Local	Location	Enter the location for the output. It is used to define the location path where you want the archive to reside; for example, d:\work\archive.
Network	Location	Enter the location for the output. It is used to define the location path where you want the archive to reside; for example, \\servername\sharename.
	User name	Enter a user name. It is used to establish logon credentials for the network share.
	Password	Enter a password for the network path. It is used to establish logon credentials for the network share.
Cloud	Account	Select an account from the drop-down list. NOTE: To select a cloud account, you must first have added it in the Core Console. For more information, see Adding a cloud account.
	Container	Select a container associated with your account from the drop-down menu.
	Folder Name	Enter a name for the folder in which you want to save the archived data.

5. Click **Next**.
6. On the **Archive Information** page of the wizard, if you want to import every machine included in the archive, select **Import all machines**.
7. Complete one of the following options based on your selection:
   - If you selected **One-time import** in Step 2, you selected **Import all machines** in Step 6, and all the machines are present on the Core—as protected, replicated, or recovery points only machines—go to Step 12.
   - If you selected **Continuous import (by schedule)** in Step 2, you selected **Import all machines** in Step 6, and at least one machine is not present on the Core—as a protected, replicated, or recovery points only machine—click **Next**, and then go to Step 9.
   - If you did not import all machines in Step 6, click **Next**, and then continue to Step 8.
8. On the **Machines** page, select the machines that you want to import from the archive.
   - If you selected **One-time import** in Step 2, and at least one machine is not present on the Core—as a protected, replicated, or recovery points only machine—use the drop-down lists to select a repository for each machine you want to import, and then go to Step 12.
   - If all machines are already present on the Core—as protected, replicated, or recovery points only machines—go to Step 12.
9. Click **Next**.
10. On the **Repository** page, complete one of the following options:
    - If a repository is associated with the Core, select one of the options in the following table.

Table 48. Repository options

Option	Description
Use an existing Repository	Select a repository currently associated with this Core from the drop-down list.
Create a Repository	In the Server text box, enter the name of the server on which you want to save the new repository—for example, servername or localhost—and then see Creating a DVM repository.

- If no repository is associated with the Core, enter the name of the server on which you want to save the new repository—for example, servername or localhost—and then see Creating a DVM repository.

11. If you chose to **Continuous import (by schedule)** in Step 2, on the **Schedule** page, select the options described in the following table.

Table 49. Schedule import options

Option	Description
Daily	Click the clock icon and use the up and down arrows to select at what time you want to the archive job to begin. If you are using a 12-hour time system, click the AM or PM button to specify the time of day.
Weekly	Select the day of the week and then the time you want the archive job to begin. If you are using a 12-hour time system, click the AM or PM button to specify the time of day.
Monthly	Select the day of the month and the time you want the archive job to begin. If you are using a 12-hour time system, click the AM or PM button to specify the time of day.
Pause initial importing	Select this option if you do not want the import job to begin at the next scheduled time after you complete the wizard. NOTE: You may want to pause the scheduled import if you need time to prepare the target location before importing resumes. If you do not select this option, importing begins at the scheduled time.

12. Click **Finish**.

Events

The Rapid Recovery Core includes predefined sets of events. These events can be used to notify administrators of critical issues on the Core or with issues with jobs pertaining to backups, virtual export, replication and so on.

This section describes how to view events displayed on the Rapid Recovery Core Console. You can also learn about event notification methods and configuration, including setting up email notifications. Finally, you can configure notifications to change the amount of time event logs are retained, and reduce repetitive event notification.

Rapid Recovery events

The Rapid Recovery Core includes predefined sets of events, which can be used to notify administrators of critical issues on the Core or with backup jobs on protected machines.

- You define the event types that trigger alerts, as well as the methods the system uses for these notifications (email, toast alerts, and so on), by configuring notification groups. For more information, see Configuring notification groups.
- If you want administrators to receive notifications using email, then in addition to configuring a notification group, you must configure an email server, and configure an email notification template. For more information, see Configuring an email server and Configuring an email notification template, respectively.

- You can reduce the number of events of the same type and scope that appear in the Events page by using the repetition reduction feature. The repetition reduction feature is enabled by default. You can disable this feature, or you can control the span of time for which events are combined into a single occurrence in the event log. For more information, see About configuring repetition reduction.
- You can control how long events and job history information is retained in the Events page of the Core console. For more information, see Configuring event retention.

Viewing events using tasks, alerts, and journal

From the Core console, you can view events for the Core, and you can view events for a specific protected or replicated machine.

The **Events** page on the Core Console displays a log of all system events related to the Rapid Recovery Core. To access and view events for the Core, click (Events).

The **Events** page for a specific protected or replicated machine displays a log of events related to that specific machine. To access and view events for a selected machine, click the machine name in the Protected Machines menu, and from the machine **Summary** page, click the **Events** menu.

The contents of the Events page (on the Core or a specified machine) is divided into three sections: Tasks, Alerts, and Journal. These views allow you to filter details about various events, as appropriate.

You can define how you are notified of various events by configuring notification groups. For more information, see Configuring notification groups.

Complete the steps in the procedures below to view tasks, alerts, or all a journal of all events:

- Viewing tasks
- Viewing alerts
- Viewing all events

Viewing tasks

A task is a job that the Rapid Recovery Core must perform, such as transferring data in a regularly scheduled backup, or performing a restore from a recovery point.

As a task is running, it is listed in the **Running tasks** drop-down menu at the top of the Core Console. Clicking a running task opens the Monitor Active Task dialog box.

You can also view all tasks for the Rapid Recovery Core, or all tasks associated with a specific machine.

1. To view all tasks for the Rapid Recovery Core, from the icon bar, click (Events).

   If you want to view tasks for a specific protected machine, then navigate to the **Summary** page of the specified machine, and then click the **Events** menu.
2. To view only tasks, at the top left-hand side of the page, click **Tasks**. This is the default view.

   The list of events is filtered to display only tasks for the Core or for the machine you selected.
3. Optionally, to filter the list of tasks by keyword, start date, end date, or any combination, do the following:

   a. To filter by keyword, enter the keyword in the **Search keyword** text box.

      For example, you can filter by key words such as "rolling up," "archive," or "transfer."

b. To filter by start date and time, enter the starting date and time using one of the following options:

   - In the **From** text box, type the date and time in format MM/DD/YYYY HH:MM AM/PM. For example, to search from the first day of January in 2016 at 8:00 AM, enter 1/1/2016 8:00 AM.
   - To select the current date and time, click the **Calendar** widget in the **From** text box and then click the current date. The current time will automatically appear.
   - Click the **Calendar** widget, select the date, then click the Clock widget and select the desired time using the controls. Click away from the calendar to accept the selected changes.

c. To further refine the list of tasks that appears, you can also define an end date and time in the same format.

   The list of tasks is immediately filtered based on the criteria you selected.

4. Optionally, you can filter the tasks appearing in the list as follows:

Option	Description
	To see only active tasks, click the **Active tasks** icon.
⌛	To see only tasks that are in the queue to be performed, click the **Queued tasks** icon.
!	To see only tasks that are waiting to be performed, click the **Waiting tasks** icon.
✓	To see only tasks that have been completed, click the **Completed tasks** icon.
	To see only tasks that have failed, click the **Failed tasks** icon.

5. To export the list of tasks, select a format from the list and then click **Export**. In the resulting dialog box, confirm the export and then click **OK**.

You can export using the following formats:

Table 50. Export formats

Format	Description
PDF	Portable Document Format (default export format)
HTML	Web page format
CSV	Comma-separated values
XLS	Microsoft Excel® 1997 - 2003 Workbook
XLSX	Excel Workbook

The file of the type you selected is downloaded to the default location on the Core server.

6. Click the **Job Details** icon for any task to launch a new window with task details, which include:

- Status
- Total work (size or percentage completed)
- Start date and time
- End date and time
- Rate
- Elapsed time

- Phase (for child tasks)

Viewing alerts

An alert is a notification related to a task or event. Alerts types include errors, warnings, or information.

You can view a journal of important alerts for the Rapid Recovery Core, or important alerts associated with a specific machine.

1. To view alerts for the Rapid Recovery Core, from the icon bar, click (Events), and then click **Alerts**.

   If you want to view alerts for a specific protected machine, navigate to the **Summary** page of the specified machine, click the **Events** menu, and then click **Alerts**.

   The list of events is filtered to display only important alerts for the Core or for the machine you selected.
2. Optionally, to filter the list of important alerts by start date, end date, alert message description, or any combination, do the following:
   a. To filter by start date and time, enter the starting date and time using one of the following options:
      - In the **From** text box, type the date and time in format MM/DD/YYYY HH:MM AM/PM. For example, to search from the first day of January in 2016 at 8:00 AM, enter 1/1/2016 8:00 AM.
      - To select the current data and time, click the **Calendar** widget in the **From** text box and then click the current date. The current time will automatically appear.
      - Click the **Calendar** widget, select the date, then click the Clock widget and select the desired time using the controls. Click away from the calendar to accept the selected changes.

   b. To filter by alert message description, enter the description in the **Search message** text box.

      For example, to see alerts only related to agents, enter "agent;' to see alerts related to transfers, enter "transfer;" and so on.

   c. To further refine the list of alerts that appears, you can also define an end date and time in the same format.

      The list of alerts is immediately filtered based on the criteria you selected.
3. Optionally, if you want to remove all alerts, click **Dismiss All**.

Viewing all events

You can view all events for the Rapid Recovery Core, or all events associated with a specific machine.

1. To view a journal of all events for the Rapid Recovery Core, from the icon bar, click (Events), and then click **Journal**.To view all events for the Rapid Recovery Core, navigate to the Rapid Recovery Core Home page and then click (Events).

   If you want to view a journal of all events for a specific protected machine, then navigate to the **Summary** page of the specified machine, click the **Events** menu, and then click **Journal**.
2. Optionally, to filter the list of all events by start date, end date, alert message description, or any combination, do the following:
   a. To filter by start date and time, enter the starting date and time using one of the following options:

- In the **From** text box, type the date and time in format MM/DD/YYYY HH:MM AM/PM. For example, to search from the first day of January in 2016 at 8:00 AM, enter 1/1/2016 8:00 AM.
- To select the current data and time, click the **Calendar** widget in the **From** text box and then click the current date. The current time will automatically appear.
- Click the **Calendar** widget, select the date, then click the Clock widget and select the desired time using the controls. Click away from the calendar to accept the selected changes.

b. To filter by alert message description, enter the description in the **Search message** text box.

For example, to see alerts only related to agents, enter "agent;' to see alerts related to transfers, enter "transfer;" and so on.

c. To further refine the list of events that appears, you can also define an end date and time in the same format.

The list of events is immediately filtered based on the criteria you selected.

Understanding email notifications

You can set up Rapid Recovery Core to notify you of specific events by sending an email message to an email address that you specify. The events which trigger alerts are defined in the notification group, as are the other notification methods.

NOTE: Notification groups must be established regardless of whether you use email as a notification method. For more information, see Configuring notification groups.

If you choose email as one of the notification options, you must also configure an email SMTP server. The Rapid Recovery Core uses the server you define to send alerts based on the parameters in the notification group.

Additionally, you must also define an email notification template. The Core uses this template to define the email subject line for each alert, and the content in the email message body. The template has default settings; you can use the default as-is, or you can test and make modifications to serve your needs.

This section includes the following topics:

- Configuring an email server
- Configuring an email notification template

Configuring an email server

Complete the steps in this procedure to configure an email server.

NOTE: You must also configure notification group settings, including enabling the **Notify by email** option, before email alert messages are sent by the system. For more information on specifying events to receive email alerts, see Configuring notification groups.

1. Navigate to the Rapid Recovery Core Console.

2. On the icon bar, click (Settings), and then do one of the following:

- From the list of Core settings on the left side of the Settings page, click **SMTP Server**.
- Scroll down on the right side of the Settings page until you can see the **SMTP Server** heading.

The SMTP Server core settings appear.

3. Click on the setting you want to change.

The setting you selected becomes editable.

4. Enter the configuration information as described in the following table.

Option	Description
SMTP Server	Enter the name of the email server to be used by the email notification template. The naming convention includes the host name, domain, and suffix; for example, smtp.gmail.com.
From	Enter a return email address. It is used to specify the return email address for the email notification template; for example, noreply@localhost.com.
User name	Enter a user name for the email server.
Password	Enter the password associated with the user name required to access the email server.
Port	Enter a port number. It is used to identify the port for the email server; for example, the port 587 for Gmail. The default is 25.
Timeout (seconds)	Enter an integer value to specify how long to try to connect to the email server. It is used to establish the time in seconds before a timeout occurs. The default is 60 seconds.
TLS	Select this option if the mail server uses a secure connection such as Transport Layer Security (TLS) or Secure Sockets Layer (SSL).

5. For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✖ to exit edit mode without saving.

   CAUTION: If you do not confirm each change, your settings will not change.

6. Click **Send Test Email** and then do the following:
   a. In the **Send Test Email** dialog box, enter a destination email address for the test message and then click **Send**.
   b. If the test message fails, exit the error dialog box and the **Send Test Email** dialog box, and revise your email server configuration settings. Then send the test message again.
   c. Once the test message is successful, click **OK** to confirm the successful operation.
   d. Check the email account to which you sent the test email message.

Configuring an email notification template

When you enable notifications of Rapid Recovery events by email, a default template is created for you by default. The SMTP email server defined for the Core uses this template to send notifications regarding Rapid Recovery events by email.

This topic describes the process of configuring the default email notification template or customizing the content. Using the Restore Default option, you can restore changes to the default notification template at any time.

CAUTION: Modify the template at your own risk. You are responsible for testing any modifications to the template. Only the default template is supported.

Complete the steps in this procedure to configure an email notification template.

NOTE: You must also configure an email server and notification group settings, including enabling the **Notify by email** option, before email alert messages are sent. For more information about configuring an email server for sending alerts, see Configuring an email server. For more information on specifying events to receive email alerts, see Configuring notification groups.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click (More), and then select **Notifications**.

   The **Notifications** page appears.
3. In the Email Settings pane, click **Change**.

   The **Edit Email Notification Configuration** dialog box appears.
4. Select **Enable Email Notifications**.

   The email template is enabled and is visible. The values of the default email template are described in the following step.
5. Review the contents in the Edit Email Notification Configuration dialog box and determine if the default content suits your needs.

Option	Description
Enable email notifications	This setting enables or disables the email notification template. • To enable email notification, select this option. • To disable email notification, clear this option.
Email Subject	The contents of this text field control the subject line for email messages sent as notifications of system events. The default email subject line is as follows: `<hostName> <level>: <name> for <agentName>`

Email	The contents of this text area control the body for email messages sent as notifications of system events. The default email body message is as follows:
	`<shortCompanyName> <coreProductName> on <hostName> has reported the <level> event "<name>"`
	
	`Date/Time: <localTimestamp>`
	
	`<message>`
	
	`<if(details.errorDetails)>`
	`<details.ErrorDetails.Message>`
	
	`<details.ErrorDetails.Details>`
	`<endif>`
	`---`
	
	`About this event: <description>`
	
	`<coreAdminUrl>`

Send Test Email	Clicking this button sends a test email message to the email address you specify in the resulting **Send Test Email** dialog box.
Restore Defaults	Clicking this button removes any customized changes from the email template, and restores the Email Subject and Email fields with the default contents described in this table.

Option	Description
OK	Clicking this button confirms and saves the settings in the Edit Email Notification Configuration dialog box.
Cancel	Clicking this button cancels any changes in the Edit Email Notification Configuration dialog box.

6. If you want to customize the email template, make changes to the text or variables described in the preceding step. The variables used in the default are described in the following table.

Option	Description
hostName	The host name of the Core
details	The details object of the specific event.
agentName	The name of the protected machine associated with this event, if the event has a scope of a single protected machine.
repositoryName	The name of the repository associated with this event, if the event has repository scope.
jobSummary	The summary of the job associated with this event, if the event has job scope.
remoteSlaveCoreName	The name of the remote target core associated with this event, if the event has target core scope.
remoteMasterCoreName	The name of the remote source core associated with this event, if the event has source core scope.
productName	The name of the product, 'Rapid Recovery Core.' This product name can be changed for branding using white labeling.
companyName	The name of the company selling the product.

7. In the **Email Subject** text box, enter a subject for the email template.

   The Email Subject is used to define the subject of the email notification template, for example, <hostname> - <level> <name>.

8. In the **Email** text box, enter the information for the body of the template which describes the event, when it occurred, and the severity.
9. Click **Send Test Email** , and then do the following:
   a. In the Send Test Email dialog box, enter a destination email address for the test message and then click **Send**.
   b. If the test message fails, exit the error dialog box and the Send Test Email dialog box, click **OK** to save the current email template settings. Then modify your email server settings as described in the procedure Configuring an email server. Ensure that you reenter the password for that email account. Save those settings and then return to this procedure.
   c. Once the test message is successful, click **OK** to confirm the successful operation.
   d. Check the email account to which you sent the test email message.

Once you are satisfied with the results of your tests, return to the Edit Email Notification Configuration dialog box, and click **OK** to close the dialog box and save your settings.

Notification groups, SMTP settings and notification templates for system events

Notification groups let you define sets of specific events for which users are alerted, and the manner in which that notification takes place. To configure or edit notification groups, see Configuring notification groups.

You must also configure Simple Mail Transfer Protocol (SMTP) server settings if you want to send alerts as email messages. For more information on setting email server configuration settings, see Configuring an email server.

When sending notification of events, the system uses an email notification. You can customize this template. For more information on configuring or customizing the email notification template, see Configuring an email notification template.

Configuring notification groups

NOTE: You must also configure Simple Mail Transfer Protocol (SMTP) server settings if you want to send alerts as email messages, as described in this procedure. For more information on setting email server configuration settings, see Configuring an email server.

Notification groups let you define sets of specific events for which users are alerted, and the manner in which that notification takes place. You can configure alerts to be sent by the following methods:

- By email
- In the Windows event log
- Using syslogd
- Using toast alerts
- Using alerts
- Using SNMP trap

You can configure more than one notification group with different notification parameters.

Notification groups can be set at the Core level, or for each specific protected machine.

Complete the steps in this procedure to configure notification groups for alerts.

1. Do one of the following:

   - To set notifications at the Core level, from the icon bar, click ⋮ (More), and then select **Notifications**.

     The **Notifications** page appears.

   - To set notifications for a specific protected machine, do the following:

     1. From the Protected Machines menu, click the machine for which you want to specify notifications.

        The **Custom Notification Groups** page appears.

     2. In the Summary page of the protected machine, from the More drop-down menu, select **Notifications**.

     The **Custom Notification Groups** page appears.

2. Click ✚ **Add Group**

   The **Add Notification Group** dialog box appears.

   Notification groups let you define sets of specific events for which users are alerted, and the manner in which that notification takes place. You can configure alerts to be sent by the following methods:

   The **Add Notification Group** dialog box contains a general description area and two tabs:

   - Enable Alerts
   - Notification Options

3. In the general description area, enter the basic information for the notification group, as described in the following table.

Option	Description
Name	Enter a name for the event notification group. This information is required. ⚠ **CAUTION: The value you enter for the notification group name cannot be changed later.**
Description	Enter a description that clarifies the purpose for the event notification group. This information is optional.

4. On the **Enable Alerts** tab, define the set of system events that you want to log, create reports for, and for which you want to be alerted, as follows:

Option	Description
All Alerts	To create alerts for all events, select **All Alerts**.
Errors	To create alerts for errors, from the **Select Types** menu, click **Error**. This is represented by a red X. ☒
Warning	To create alerts for errors, from the **Select Types** menu, click **Warning**. This is represented by a yellow exclamation point icon. ❗
Info	To create alerts for informational messages, from the **Select Types** menu, click **Info**. This is represented by a blue i. ℹ
Restore Default	To restore alert types to the default, from the **Select Types** menu, click **Restore Default**. This is represented by a dark blue left-facing arrow. ↶

5. To create alerts for a specific event type (error, warning, or informational message), do the following:

   a. If the **All Alerts** option does not display alert groups, click the right angle bracket **>** symbol preceding the All Alerts label. The symbol changes to a downward-facing arrow, and the view expands to show groups.

   b. Then click the right angle bracket **>** symbol next to any specific alert group to display related events in the group.

   The event group categories include:

- Archive
- Auto Report
- Attachability
- Auto Update
- Back Up Repository
- Boot CD
- Clouds
- Clusters
- Core Service
- Database Retention
- Dedupe Cache
- DVM Repository
- Exchange
- Export
- Jobs
- Licensing
- Local Mount

- Log Truncation
- Metadata
- Nightly Jobs
- Notification
- Persist Core State
- PowerShell Scripting
- Protection
- Push Install
- Recovery Point Check
- Remote Mount
- Repository Common
- Replication
- Restore
- Rollup
- Scheduled Archives
- Security
- Server Logs
- vSphere

- To define alerts for all events in every group, select the checkbox for **All Alerts**.
- To define alerts for all events within any alert group, select the checkbox next to that group.
- To select only some alert types within an alert group, expand the group and then select only those specific events for which you want to log, report, and set alerts.

6. Click the **Notification Options** tab.
7. On the **Notification Options** tab, specify how to handle the notification process.

Option	Description
Notify by email	Designate the recipients of the email notification. You can choose to specify separate multiple email addresses as well as blind and carbon copies. You can choose: • To: • CC: • BCC:
Notify by Windows Event Log	Select this option if you want alerts to be reported through the Windows Event Log.
Notify by syslogd	Select this option if you want alerts to be reported through syslogd. Specify the details for the syslogd in the following text boxes: • Host: • Port:
Notify by Toast alerts	Select this option if you want the alert to appear as a pop-up in the lower-right corner of your screen.
Notify by Alerts	Select this option if you want alerts to appear as pop-up windows located at the bottom right side of the Core Console.
Notify by SNMP trap	The Rapid Recovery Core serves as an SNMP agent, sending traps (notifications about specific events) to an SNMP manager. The result is the reporting of Core information such as alerts, repository status, and protected machines. Select this

Option	Description
	option if you want to notify Core events by SNMP trap. You must also specify a trap number. For example, the default trap number used by the Rapid Recovery Core is 162.

8. Click **OK**.

   You will see a message indicating that the notification group name you defined cannot be changed after creating the group. Other properties within the notification group can be changed at any time.

   - If you are satisfied with the group name, confirm this message and save your work.
   - If you want to change the group name, click **No** to return to the Create Notification Group window, update the group name and any other notification group settings, and save your work.

   The notification group appears in the summary table. You can create different notification groups using any set of parameters.

About configuring repetition reduction

The ability for administrators to receive alerts upon certain events is critical. Nonetheless, in certain circumstances, receiving repeated notification of events that you are aware of can also be frustrating or inconvenient. Even if an alert is generated due to an environmental failure that you wish to know about immediately, it is possible for the same error condition to generate hundreds or thousands of events in the event log. To reduce repetition in the event log, and reduce the inconvenience of receiving repeated e-mail notifications for the same event in the Core Console, Rapid Recovery includes a repetition reduction setting, which is enabled by default and set at 5 minutes. This setting can be set as low as 1 minute and as high as 60 minutes. It can also be disabled entirely.

When repetition reduction is disabled, then every time an event of the same type and scope occurs, it is logged in the database. Regardless of how much time passed since that event previously occurred, each new occurrence is shown in the Alerts portion of the Events tab.

When repetition reduction is enabled (for example, with the default time of 5 minutes), then the first time that specific event occurs, it is logged in the events database and shown in the alerts log. If subsequently an event of the same type and scope is again logged within the threshold of time established, then the count for the event in the database increases by 1 for each repeat occurrence within that threshold. The log shows in the Alerts portion of the Events page. However, it displays the event only once, with the date and time of the most recent occurrence. The events log is not updated with the same event until the threshold of time from the first occurrence expires. For example, if set for 5 minutes and the event occurs again 6 minutes later, it appears in the log and you receive another email message.

Configuring repetition reduction

Complete the steps in this procedure to configure repetition reduction for events.

1. Navigate to the Rapid Recovery Core Console. From the icon bar, click (More), and then select **Notifications**.

   The **Notifications** page appears.
2. In the Repetition Reduction pane, view the existing settings.
3. To enable, disable, or change the stored events threshold time, click **Change**.

   The **Edit Repetition Reduction** dialog box appears

4. Do one of the following:
   - To disable repetition reduction, clear the **Enable Repetition Reduction** option.
   - To enable repetition reduction, select the **Enable Repetition Reduction** option.
   - To change the time threshold (in minutes) for which repeated identical events are ignored, in the **__ minute(s)** text box, enter a number between 1 and 60.

   NOTE: The **Enable Repetition Reduction** option must be selected in order to change this value.
5. Click **OK** to save your settings and close the dialog box.

Configuring event retention

Events and jobs tracked on the Core are saved for a specified amount of time. The default setting is 30 days. This number can be set between 0 days and 3652 days (approximately 10 years).

Complete the steps in this procedure to configure retention for events.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Database Connection**.
   - Scroll down on the right side of the Settings page until you can see the **Database Connection** heading.

   The Database Connection settings appear.
3. To change the amount of days for which event information is saved to the database, click on the **Retention Period (days)** text field, enter a value between 0 and 3652, and then click ✓ to save the change.
   The events retention period is adjusted as specified.

Rapid Appliance Self Recovery

Rapid Appliance Self Recovery (RASR) is a bare metal restore process that quickly restores your Appliance to an operating state.

RASR offers two recovery options:

- Restore factory settings
- Recover your appliance to a state just before failure (OS, configurations, and settings are recovered)

Creating the RASR USB key

To create a RASR USB key:

1. Navigate to the **Appliance** tab.
2. Using the left pane navigation, select **Appliance** → **Backup**.
   Create RASR USB Drive window is displayed.

   NOTE: Insert a 16 GB or larger USB key before attempting to create the RASR key.
3. After inserting a 16 GB or larger USB key, click on **Create RASR USB Drive now**.
   A **Prerequisite Check** message is displayed.

After the prerequisites are checked, **Create the RASR USB Drive** window displays the minimum size required to create the USB drive and **List of Possible target paths**.

4. Select the target and click **Create**.

   A warning dialog box is displayed.

5. Click **Yes**.

   The RASR USB Drive key is created.

6. NOTE: Make sure to use the Windows Eject Drive function to prepare the USB key for removal. Otherwise, the content in the USB key may be damaged and the USB key doesn't work as expected.

   Remove the RASR USB key created for each DL Appliance, label, and store for future use.

Executing RASR

NOTE: Dell recommends you to create a RASR USB key after you have set up the appliance. To create RASR USB key, see Creating the RASR USB Key section.

NOTE: Ensure that you have the latest RUU available and reachable on your appliance.

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NOTE: To perform system recovery using RASR, see *Recovering a Dell™ DL Backup and Recovery Appliance using Rapid Appliance Self Recovery (RASR)* document at **Dell.com/support/home**.

To perform a factory reset:

1. Insert the RASR USB key created.
2. Restart the appliance and select **Boot Manager (F11)**.
3. In the **Boot Manager Main Menu**, select **One-shot BIOS Boot Menu**.
4. In the **Boot Manager Boot Menu**, select the attached USB drive.
5. Select your keyboard layout.
6. Click **Troubleshoot** → **Rapid Appliance Self Recovery**.
7. Select the target operating system (OS).

   RASR is launched and **welcome** screen is displayed.

8. Click **Next**.

   The **Prerequisites** check screen is displayed.

   NOTE: Ensure all the hardware and other prerequisites are checked before performing the RASR.

9. Click **Next**.

   The **Recovery Mode Selection** screen is displayed with three options:

   - **System Recovery**
   - **Windows Recovery Wizard**
   - **Factory Reset**

10. Select the **Factory Reset** option.

    This option will recover the operating system disk from the factory image.

11. Click **Next**.

    The following warning message is displayed in a dialog box: `This operation will recover the operating system. All OS disk data will be overwritten.`

12. Click **Yes**.

The operating system disk starts restoring back to factory reset.

13. The **RASR Completed** page is displayed on completion of the recovery process. Click **Finish**.
14. Boot the system after restore.
15. NOTE: Continue further only if you see the **AppAssure Appliance Configuration Wizard**, otherwise go to **Step 17**.

    Wait for AppAssure Appliance Configuration Wizard to load, you need to close it. Close the wizard using the Windows Task Manager.
16. Run launchRUU.exe file in the RUU package. Follow the instructions and select the option to continue with RUU installation and complete the RUU installation.
17. The **DL Appliance Configuration Wizard launches** and will guide you through the rest of the restore process.

Your appliance operates normally now.

The Local Mount Utility

This section describes how to download, install, and use the Windows-based Rapid Recovery Local Mount Utility (LMU) to mount recovery points and explore the contents from a file level using a machine that does not host the Rapid Recovery Core.

About the Local Mount Utility

The LMU is a downloadable Windows-based application that lets you mount a Rapid Recovery recovery point in any of the three available modes on any Windows machine. The light-weight utility can be installed on 32-bit as well as 64-bit Windows operating systems and includes the rapidrecovery-vdisk (formerly aavdisk) and aavstor drivers, but it does not run as a service. When you install the utility, by default, it is installed in the directory C:\Program Files\AppRecovery\Local Mount Utility and a shortcut appears on the machine's desktop.

While the utility was designed for remote access to a Rapid Recovery Core machine, you can also install the LMU on the same machine as a Rapid Recovery Core. When it runs on a Core, the application recognizes and displays all mounts from that Core, including mounts performed through the Rapid Recovery Core Console. Likewise, mounts performed on the LMU also appear in the Core Console.

When the LMU is installed on the same machine as Mailbox Restore, the LMU automatically launches Mailbox Restore when you use it to open an Exchange database. Mailbox Restore is the Dell Rapid Recovery application used to restore Microsoft Exchange data stores and items. You can install it upon installation of the LMU or the Rapid Recovery Core. For more information about Mailbox Restore, see the *Dell Data Protection | Rapid Recovery Mailbox Restore for Microsoft Exchange User Guide*.

NOTE: Linux machines use a command-line utility, local_mount, to query the Core for protected machines and their corresponding recovery points. Similarly, that tool lets users remotely mount a recovery point volume; lets users explore the volume contents at the file levels; and lets users restore a individual files or an entire volume from the recovery point, including BMR of the system volume. For more information, see Mounting a recovery point volume on a Linux machine, Restoring volumes for a Linux machine using the command line, and Performing a bare metal restore for Linux machines, respectively..

Working with Rapid Recovery Core machines in the Local Mount Utility

The Local Mount Utility (LMU) lets you work with an unlimited number of Core machines locally or remotely. If you install the LMU on an Rapid Recovery Core machine, that machine automatically appears in the LMU as the localhost. All additional remote Cores appear as their machine names or IP addresses, depending on the information you entered when you added them. With the LMU, you can add, edit, and remove Core machines. For more information, see the following procedures:

Related links

Adding a Core machine to the Local Mount Utility
Changing the Local Mount Utility options
Editing Core connection settings in the Local Mount Utility
Reconnecting to a Core
Removing a Rapid Recovery Core machine from the Local Mount Utility

Adding a Core machine to the Local Mount Utility

To mount a recovery point, you must add a Core machine to the LMU. There is no limit as to how many Cores you can add.

Complete the following procedure to set up the LMU by adding a Core.

1. From the machine on which the LMU is installed, launch the LMU by double-clicking the desktop icon.
2. Do one of the following:
   - From the Local Mount Utility menu in the upper left-hand corner, click **Add Core**.
   - Right-click the blank space in the left panel, and then click **Add Core**.

   The **Add Core** dialog box appears.
3. In the **Add Core** dialog box, enter the requested credentials described in the following table.

Table 51. Rapid Recovery Core credentials

Option	Description
Host name	The name or IP address of the Core from which you want to mount recovery points. NOTE: If installing the LMU on a Rapid Recovery Core machine, the LMU automatically adds the localhost machine.
Port	The port number used to communicate with the Core. The default port number is 8006.
Use my Windows user credentials	Select this option if the credentials you use to access the Core are the same as your Windows credentials.
Use specific credentials	Select this option if the credentials you use to access the Core are different from your Windows credentials.
User name	The user name used to access the Core machine.

Option	Description
	NOTE: This option is only available if you chose to use specific credentials.
Password	The password used to access the Core machine. NOTE: This option is only available if you chose to use specific credentials.

4. Click **Connect**.
5. If adding multiple Cores, repeat all steps as necessary.

Changing the Local Mount Utility options

Complete the following procedure to change the options for all Rapid Recovery Cores connected to the LMU.

1. From the Local Mount Utility user interface, click **Options**.
2. In the **Options** dialog box, you can change the setting described in the following table.

Table 52. Core settings

Option	Description
Default mount point repository	Use the **Browse** button or enter a path to the location you want to use for mounting recovery points.
Use my Windows user account credentials	Select this option to always use your Windows credentials by default when logging in to a Core.
Use specific credentials	Select this option to use the following credentials for each connected Core: • **User name**: Enter the user name to use for all Cores. • **Password**: Enter the password to use for all Cores.
Core connection timeout (sec)	Enter the amount of time the LMU should continue trying to connect to a Core before the connection times out (in minutes : seconds : milliseconds).
Language	Select the language in which you want the LMU to appear. You can choose from the following options: • English • French • German • Portuguese • Spanish • Simplified Chinese • Japanese • Korean

Editing Core connection settings in the Local Mount Utility

To edit the settings you established when you added a Core to the LMU, complete the following procedure.

NOTE: This procedure does not apply to the localhost Core. It only applies to remote Core machines.

1. From the Local Mount Utility user interface, right-click on the Core for which you want to edit settings, and then click **Edit Core**.
2. In the **Edit Core** dialog box, you can change the settings described in the following table.

Table 53. Core settings

Option	Description
Host name	The name of the Core from which you want to mount recovery points. NOTE: If installing the LMU on a Rapid Recovery Core machine, the LMU automatically adds the localhost machine.
Port	The port number used to communicate with the Core. The default port number is 8006.
Use my Windows user credentials	Select this option if the credentials you use to access the Core are the same as your Windows credentials.
Use specific credentials	Select this option if the credentials you use to access the Core are different from your Windows credentials.
User name	The user name used to access the Core machine. NOTE: This option is only available if you chose to use specific credentials.
Password	The password used to access the Core machine. NOTE: This option is only available if you chose to use specific credentials.

3. After you make your changes, click **OK**.

Reconnecting to a Core

If you lose the connection to an Rapid Recovery Core machine, you can refresh the connection with the following step.

From the Local Mount Utility user interface, do one of the following:

- If the Core is offline, double-click the Core whose connection you want to reestablish.
  The LMU attempts to reestablish a connection to the Core.
- If the Core is online, right-click the Core and then click Reconnect to Core.
  The LMU refreshes the connection.

Removing a Rapid Recovery Core machine from the Local Mount Utility

Complete the following procedure to remove a Core from the LMU.

NOTE: This option is not available for a Rapid Recovery Core located on and labeled as the localhost.

1. From the Local Mount Utility user interface, right-click the Core you want to remove, and then click **Remove Core**.
2. To confirm the command, click **Yes** in the dialog box.

   The LMU removes the Core and its protected machines from the navigation tree.

Working with protected machines in the Local Mount Utility

With the Local Mount Utility (LMU), you can mount and browse recovery points from protected machines without having to be logged in to the Rapid Recovery Core Console associated with that machine. For more information, see the following procedures:

- Mounting a recovery point using the Local Mount Utility
- Exploring a mounted recovery point using the Local Mount Utility
- Refreshing recovery points
- Dismounting individual recovery points using the Local Mount Utility
- Dismounting all recovery points from a single Rapid Recovery Core or protected machine
- Dismounting all mounted recovery points using the Local Mount Utility

Mounting a recovery point using the Local Mount Utility

With the LMU, you can mount any recovery point associated with a connected Core machine, including protected machines, replicated machines, and recovery points only machines.

Before mounting a recovery point, the local mount utility (LMU) must connect to the Core on which the recovery point is stored. As described in the procedure Adding a Core machine to the Local Mount Utility, the number of Cores that can be added to the LMU is unlimited; however, the application can connect to only one Core at a time. For example, if you mount a recovery point of a machine protected by one Core and then mount a recovery point of another machine protected by a different Core, the LMU automatically disconnects from the first Core to establish a connection with the second Core.

1. From the Local Mount Utility user interface, expand the Core in the navigation tree to reveal the protected machines.
2. From the navigation tree, select the machine from which you want to mount a recovery point.

   The recovery points appear in the main frame.
3. Optionally, expand the recovery point you want to mount to reveal individual disk volumes or databases.
4. Right-click the recovery point you want to mount, and then select one of the following options:

Option	Description
Mount	This option lets you mount the recovery point as read-only.
Mount writable	This option lets you make changes to the mounted recovery point.
Mount read-only with previous writes	This option mounts the recovery point as read-only and includes any changes that were previously made.
Advanced mount...	This option opens the Advanced Mounts dialog box.

5. If you selected **Advanced Mount**, complete the options described in the following table.

Table 54. Advanced Mount options

Option	Description
Mount point path	Click **Browse** to select a path for the recovery points other than the default mount point path, or manually enter the preferred path.
Mount type	Select one of the following options: • Mount read-only • Mount writable • Mount read-only with previous writes For descriptions of each option, see Step 4.

- Click **Mount**.

  The LMU automatically opens the folder containing the mounted recovery point.

  NOTE: If you select a recovery point that is already mounted, the Mounting dialog asks whether to dismount the recovery point.

Exploring a mounted recovery point using the Local Mount Utility

Exploring a recovery point opens the backed up data in a Windows Explorer window, and lets you search the volumes and folders for the item or items you want to recover.

You can then recover items by copying them to your preferred location using a file manager such as Windows Explorer (or programmatically using Windows APIs). Complete the following procedure to explore a currently mounted recovery point.

NOTE: This procedure is not necessary if you are exploring a recovery point immediately after mounting it, as the folder containing the recovery point automatically opens upon completion of the mounting procedure.

1. From the Local Mount Utility user interface, click **Active mounts**.

   The Active Mounts window opens and displays all mounted recovery points.
2. Expand the navigation tree to reveal the recovery points mounted for each machine and their volumes.
3. Click **Explore** next to the volume you want to explore.

Refreshing recovery points

The LMU does not receive real-time updates from the Core and protected machines. To refresh a protected machine and see its latest recovery points, complete the following procedure.

From the Local Mount Utility user interface, right click the protected machine you want to refresh, and then click Refresh recovery points.

Dismounting individual recovery points using the Local Mount Utility

Complete the following procedure to dismount a recovery point on a remote Core using the LMU.

1. From the Local Mount Utility user interface, click **Active mounts**.

   The **Active Mounts** window opens and displays all mounted recovery points.
2. In the **Active Mounts** window, optionally, you can click the plus or minus icons to expand or contract the view of volumes in each mounted recovery point.

3. In the **Active Mounts** window, Next to each recovery point or volume you want to dismount, click **Dismount**.

   A progress windows shows when the selected recovery points have dismounted.
4. Click the **x** in the top right of the **Active Mounts** window to close the window and return to the LMU.

Dismounting all recovery points from a single Rapid Recovery Core or protected machine

Complete the following procedure to dismount only the recovery points that are mounted from a single Core or a protected machine.

1. From the Local Mount Utility user interface, do one of the following:
   - Right-click the Core for which you want to dismount all recovery points.
   - Right-click the protected machine for which you want to dismount all recovery points.
2. Click **Dismount all for [machine_name]**.
3. To confirm the command, in the dialog box, click **Yes**.

   NOTE: If there are any active tasks that use the existing mounts, dismounting those mounts causes the tasks to fail.

   All mounted recovery points for your selection are dismounted.

Dismounting all mounted recovery points using the Local Mount Utility

There are two main ways in which you can dismount all recovery points at one time in the LMU. You can dismount all recovery points without viewing which recovery points are currently mounted, or you can view all currently mounted recovery points and then dismount them all. See the relevant procedure for each.

Dismounting all recovery points using the Dismount All Mounts button

Complete the following procedure to dismount all mounted recovery points at one time.

1. From the Local Mount Utility menu, click **Dismount All Mounts**.
2. To confirm the command, in the dialog box, click **Yes**.

   NOTE: If there are any active tasks that use the existing mounts, dismounting those mounts causes the tasks to fail.

Dismounting all recovery points using Active Mounts window

Complete the following procedure to dismount all mounted recovery points at one time from the Active Mounts window.

1. From the Local Mount Utility user interface, click **Active Mounts**.
2. In the **Active Mounts** window click **Dismount All**.
3. To confirm the command, in the window, click **Yes**.
4. In the **Active Mounts** window, click **Close**.

Using the Local Mount Utility tray menu

The LMU tray menu is located in your desktop task bar. Right-click the icon to reveal the options described in the following table:

Table 55. Tray menu options

Option	Description
Browse Recovery Points	Opens the LMU main window.
Active Mounts	Opens the Active Mounts dialog box on top of the LMU main window.
Options	Opens the Options dialog box on top of the LMU main window. From the Options dialog box, you can change the default mount point directory and the default Core credentials for the LMU user interface.
About	Reveals the Local Mount Utility licensing information.
Exit	Closes the LMU application.

3

Managing Your Appliance

The Core Console includes an **Appliance** tab, which you can use to provision space, monitor the health of the appliance, and access management tools.

Monitoring status of the Appliance

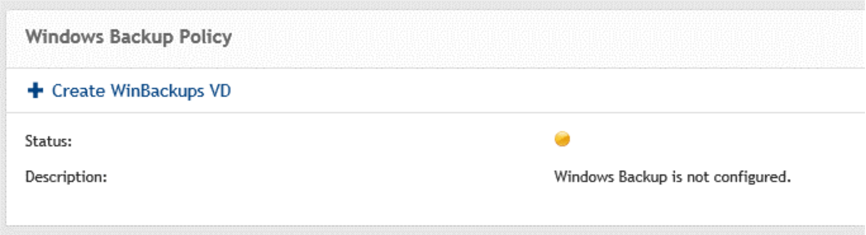
You can monitor the status of the Appliance subsystems by using the **Appliance** → **Health** page. The **Health** page displays a status light next to each subsystem, along with a status description indicating the health of the subsystem.

The **Health** page also provides links to tools that drill down into the details of each subsystem, which can be helpful for troubleshooting warnings or errors. The **Provisioning Status** link, available for the Storage Provisioning subsystem, opens the **Provisioning** screen which displays the provisioning status of that subsystem. The **Rapid Appliance Self Recovery** link available for Rapid Appliance Self Recovery subsystem opens the **Backup** page, where you can create the RASR USB key, monitor the Windows backup status, and configure the Windows backup policy. The VM Management link opens the **Virtual Standby** page from where you can manage the virtual machines. **The Server Administrator** link available for the Storage Hardware subsystem opens the health page of your system where you can analyze the health of the controller, enclosure, physical drives and so on. The **Controllers** link, available for Appliance Hardware opens the **Controllers** page, which gives the detail of the controllers and the physical drives associated with the controller.

Windows backup

The Windows backup feature is available in all DL flavors except DL 1000. The **Appliance** → **Backup** tab allows you to configure the Windows backup policy and displays status of the last backup and also the items that are backed up previously. To use this Windows backup feature, Windows backup virtual disk must exist.

- After you upgrade your appliance with the latest RUU (3.0.x), and if the Windows backup VD (created in AppAssure environment) doesn't exist, the Windows Backup virtual disk is created after you complete the DL Appliance Configuration Wizard. In case, if the Windows backup VD doesn’t exist, click **+ Create WinBackups VD** on the **Backup** page under **Windows Backup Policy** section. In DL 4000 and DL 4300, a VD of size 295 GB is created and in DL1300, a VD of size 210 GB is created.



Windows Backup Policy

Status: ●

Description: Windows Backup is not configured.

- After you upgrade your appliance with the latest RUU, and if the Windows backup VD created in the AppAssure environment exists, perform these steps to create Windows backup VD in the RR environment:

  a. Edit ApplianceProvisioningConfiguration.xml (this file is located in the root of each volume, so you can edit it once and then copy where necessary):

     CAUTION: Do not delete existing Windows backup VD.

     1. Delete all text between <BackupVolumes> tags.
     2. Delete </BackupVolumes> tag.
     3. Edit <BackupVolumes> tag, so it will become <Backupvolume/>
     4. Save and close.

  b. Go to Core Console.

  c. Click **Appliance** → **RASR** tab.

  d. Click **Create Windows Backup volume** button.

  e. Windows backup VD is created if there is enough space.

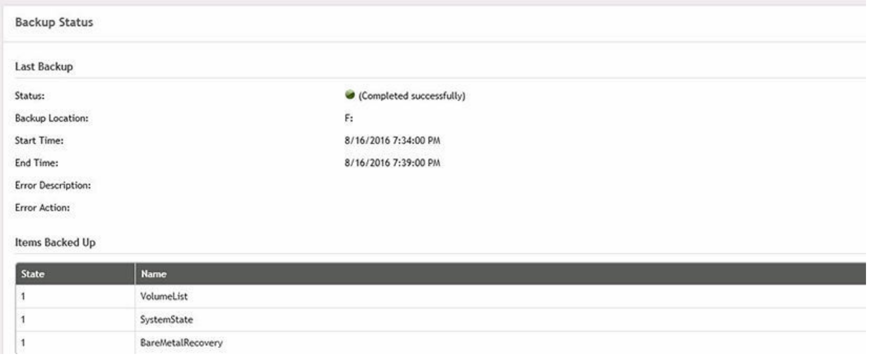
NOTE: You can also configure Windows Backup using the Windows Server Backup feature and store backups in any location, but in this case an error is displayed on the **RASR** page, because backups cannot be controlled and cannot be guaranteed if they will be consistent to perform restore using RASR.

Backup Status

Microsoft Windows backup status is available under the **Last Backup** tab. If a backup is currently running, the information is displayed under the **Current Backup** tab. To view the last backup, perform the following steps:

1. In the Core Console, navigate to the **Appliance** → **Backup** tab.
2. Click the arrow beside the **Status** button to view the status of the backup.
3. The **Last Backup** pane displays the following information:
   - Status
   - State
   - Backup Location
   - Start Time
   - End Time
   - Error Description
   - Items that were backed up

   NOTE: The above information is displayed whether the Windows Backup Policy is run or not.



Backup Status

Last Backup

Status: ● (Completed successfully)
Backup Location: F:
Start Time: 8/16/2016 7:34:00 PM
End Time: 8/16/2016 7:39:00 PM
Error Description:
Error Action:

Items Backed Up

State	Name
1	VolumeList
1	SystemState
1	BareMetalRecovery

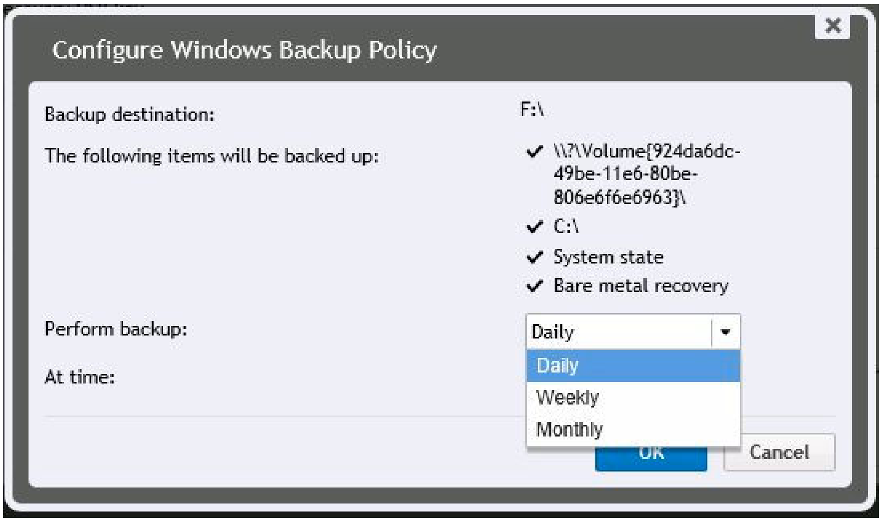
If a backup is running, information regarding **Current Backup Progress** and **Start Time** is displayed.

Windows Backup Policy

To configure a Windows backup policy, perform the following steps:

1. In the Core Console, navigate to **Appliance** → **Backup**.
2. Click the **Configure Policy** button.

   The **Windows Backup Policy** window is displayed.



Configure Windows Backup Policy

Backup destination: F:\

The following items will be backed up:
- ✓ \\?\Volume{924da6dc-49be-11e6-80be-806e6f6e6963}\
- ✓ C:\
- ✓ System state
- ✓ Bare metal recovery

Perform backup: Daily

At time:

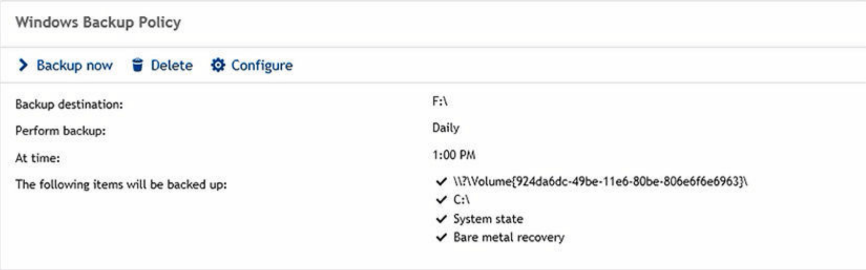
3. Enter the parameters as described below:

Text Box	Description
Following items will be backed up:	• OS Volume • Recovery partition • Bare metal recovery binaries All of the above are selected by default.
Perform backup	Select the frequency at which Winbackup has to be performed. You have the following options: Daily, Weekly, and Monthly.
Select the time to schedule the backup:	Enter the time to schedule a backup.

4. Click **Configure**.

   The Winbackup policy is configured and the details are displayed in the **Windows Backup Policy** section.

Once configured, you have the option to back up the selected items at any instant using the **Backup now** option and delete the backup policy using the **Delete policy** from the **Windows Backup Policy** section.



Backup destination:	F:\
Perform backup:	Daily
At time:	1:00 PM
The following items will be backed up:	✓ \\?\Volume{924da6dc-49be-11e6-80be-806e6f6e6963}\ ✓ C:\ ✓ System state ✓ Bare metal recovery

Provisioning storage

The appliance configures available internal storage and any attached supported external storage enclosures for:

- Repositories\
- Disk volumes for standby VMs or any other purpose

Before you begin provisioning storage on the disk, determine how much storage you want to allocate for standby virtual machines. You can allocate any percentage of the available capacity remaining after creating the Rapid Recovery repository to host standby virtual machines. For example, if you are using Storage Resource Management (SRM), you can allocate up to 100 percent capacity of the storage remaining after creating the Rapid Recovery repository. Space can be allocated for standby VMs only on the appliances that are provisioned to host virtual machines. Using the Rapid Recovery's Live Recovery feature, you can use these virtual machines to quickly replace a failed server that the appliance protects.

Based on a medium-sized environment that does not need standby virtual machines, you can use all of the storage to back up a significant number of agents. However, if you need more resources for standby virtual machines and back up a smaller number of agent machines, you can allocate more resources for larger VMs.

When you select the **Appliance** → **Provisioning** tab, the Rapid Recovery Appliance software locates the available storage space for all supported controllers in the system and validates that the hardware meets the requirements.

To complete disk provisioning for all available storage:

1. Click **Appliance** → **Provisioning**.
   The **Provisioning** screen displays the **Repositories** and **Storage Volumes** sections.

   CAUTION: Before proceeding ensure Step 2 through Step 4 is followed in this procedure.

2. Provision available storage to create:
   - Repository
   - Disk volumes for standby VMs or any other purpose
3. To create a repository:
   a. On the **provisioning** page, in the **Repositories** section, click **Add New Repository**
      The **Add New Repository** dialog box appears.
   b. Enter the information as described in the following table.

Table 56. Provisioning storage

Text Box	Description
Repository Name	Enter the display name of the repository. By default, this text box consists of the word Repository and a number, which corresponds to the number of repositories for this Core. For example, if this is the second repository, the default name is Repository 2. Change the name as needed. Repository names must contain between 1 and 40 alphanumeric characters, including spaces. Do not use prohibited characters or prohibited phrases . For more information, see the topics ‘prohibited characters’ or ‘prohibited phrases’ in the *Dell Data Protection | Rapid Recovery 6.0 User Guide*.
Controller	Select the appropriate storage controller depending on whether you are creating repository on internal storage or on direct-attached storage enclosure.
Enclosure	Select the appropriate storage enclosure.
RAID type	Select the appropriate RAID level. You have the following options for RAID configuration: 1, 5, or 6. NOTE: Your system allows you to create repository only in the RAID levels in which the storage is configured and as available out of factory. To create repository in desired RAID configuration, you must configure your storage in the desired RAID level. To configure storage in the desired RAID level, see Dell Adapters documentation at **www.dell.com/support/home**.
Estimated capacity	Displays the estimated capacity available for creating a repository.
Controller available space	Displays the available space on the controller.
Size	Enter the size of the repository.

c. Click **Create**.

A new repository is created.

4. To create disk volumes for standby VM or any other purpose:

a. In the **Storage Volume** section, click **Create Volume**.

b. In the **Create Volume** dialog box, specify the following information for a new disk volume `Volume name`, `Controller`, `Enclosure`, `RAID type`, and `Size`.

The Controller available space is displayed by default. You can select one of the following RAID configurations: 1, 5, or 6.

c. Click **Create**.

A new storage volume is created.

Deleting space allocation for a virtual disk

In case, if you need to change provisioning configuration please contact technical support. For more information, see **Contacting Dell** section.

Recovery and Update Utility

The Recovery and Update Utility (RUU) is an all-in-one installer to recover and update DL Appliances (DL1000, DL1300, DL4000 and DL4300) software. It includes the Rapid Recovery Core software and appliance-specific components.

RUU consists of updated versions of the Windows Server Roles and Features, .Net 4.5.2, LSI Provider, DL Applications, OpenManage Server Administrator and Rapid Recovery Core Software. In addition, the Recovery and Update Utility also updates the Rapid Appliance Self Recovery (RASR) content.

NOTE: If you are currently using any of the AppAssure Core versions, Rapid Recovery Core version 6.0.2.144 or earlier, RUU forces an update to the most recent version available in the Payload. It is not possible to skip the update and this update is not revertible. If you do not want to upgrade the Core software, do not run the RUU.

Upgrading your Appliance

To upgrade your appliance:

1. Go to the License Portal under the Downloads section or go to **support.dell.com** and download the RUU installer.
2. Copy the utility to the appliance desktop and extract the files.
3. Double-click the **launchRUU** icon.
4. When prompted, click **Yes** to acknowledge that you are not running any of the listed processes.
5. When the **Recovery and Update Utility** screen appears, click **Start**.
6. When prompted to reboot, click **OK**.

   The updated versions of the Windows Server Roles and Features, .Net 4.5.2, LSI Provider, DL Applications, OpenManage Server Administrator and Rapid Recovery Core Software are installed as part of the Recovery and Update Utility. In addition to these, the Recovery and Update Utility also updates the RASR content.

   NOTE: If you are currently using any of the AppAssure Core versions, Rapid Recovery Core version 6.0.2.144 or earlier, RUU forces an update to the most recent version available in the Payload. It is not possible to skip the update and this update is not revertible. If you do not want to upgrade the Core software, do not run the RUU.
7. If prompted, reboot your system.
8. After all services and applications are installed, click **Proceed**.

   The Core Console launches.

Repairing your Appliance

To repair your appliance:

1. Go to the License Portal under the Downloads section or go to **support.dell.com** and download the RUU installer.
2. Copy the utility to the appliance desktop and extract the files.
3. Double-click the **launchRUU** icon.
4. When prompted, click **Yes** to acknowledge that you are not running any of the listed processes.
5. When the Recovery and Update Utility screen displays, click **Start**.
6. When prompted to reboot, click **OK**.

The updated versions of the Windows Server Roles and Features,.Net 4.5.2, LSI Provider, DL Applications, OpenManage Server Administrator and Rapid Recovery Core Software are installed as part of the Recovery and Update Utility.

7. If the bundled version in the utility is the same as the installed version, the Recovery and Update Utility prompts you to confirm that you want to run a repair installation. This step can be skipped if a repair install of the Rapid Recovery Core is not needed.
8. If the bundled version in the utility is higher than the installed version, then the Recovery and Update Utility prompts you to confirm that you want to upgrade the Rapid Recovery Core software.

   NOTE: Rapid Recovery Core software downgrades are not supported.
9. If prompted, reboot your system.
10. After all services and applications are installed, click **Proceed**.

    DL Appliance Configuration Wizard will be launched if the system needs to be configured again after repair, otherwise Core Console will be launched.

4

Protecting workstations and servers

Protecting machines

This section describes how to protect, configure, and manage the protected machines in your Rapid Recovery environment.

About protecting machines with Rapid Recovery

To protect your data using Rapid Recovery, you need to add the workstations and servers for protection in the Rapid Recovery Core Console; for example, your Exchange server, SQL Server, Linux server, and so on.

You must install the Rapid Recovery Agent software on all physical or virtual machines you want to protect in the Core.

NOTE: As an exception to this rule, if protecting virtual machines on a VMware or ESXi host, you can use agentless protection. For more information, including restrictions for agentless protection, see Understanding Rapid Snap for Virtual.

In the Rapid Recovery Core Console, using one of the Protect Machine wizards, you can identify the machines you want to protect. You can do the following:

- You can protect a single machine using the Protect Machine wizard, which connects to the machine using network hostname or IP address. For more information on how to protect a single machine, Protecting a machine.
- You can protect a network cluster using the Protect Cluster function, which connects to the cluster and its nodes using network hostname or IP address.
- You can protect multiple machines simultaneously using the Protect Multiple Machines wizard, which connects to the machines using Microsoft Active Directory®, or to a vCenter or ESXi host; or you can specify the network hostname or IP addresses for a list of machines you enter manually.

NOTE: Dell recommends limiting the number of machines you protect simultaneously to 50 or fewer, to preclude experiencing resource constraints that may cause the protect operation to fail.

When identifying your protection requirements for a single machine in the wizard, you can specify which volumes to protect. When you protect multiple machines, all volumes are protected by default. (You can change this later on an individual machine basis).

The wizard also lets you define a customized schedule for protection (or re-use an existing schedule).

Using advanced options, you can add additional security measures by specifying or applying an encryption key to backups for the machines you want to protect.

Finally, if one does not already exist, you can define a repository using the wizard.

After installing the Agent software, each machine must be restarted after installation.

For more information on how to protect workstations and servers, see Protecting a machine.

CAUTION: Rapid Recovery does not support bare metal restore (BMRs) of Linux machines with ext2 boot partitions. Any BMR performed on a machine with this type of partition results in a machine that does not start. If you want to be able to perform a BMR on a Linux machine with an ext2 boot partition, you must convert the ext2 boot partition to ext3 or ext4 before you begin protecting and backing up the machine.

About protecting Linux machines with Rapid Recovery

The Rapid Recovery Agent software is compatible with multiple Linux-based operating systems (for details, see the system requirements included in *Rapid Recovery Installation and Upgrade Guide* or *Rapid Recovery Release Notes*). The Rapid Recovery Core is compatible only with Windows machines. While you can manage protected Linux machines from the Rapid Recovery Core Console, several procedures for Linux machines have steps that differ from their Windows counterparts. Additionally, you can perform some actions directly on a protected Linux machine by using the local_mount command line utility.

NOTE: The local_mount utility was formerly called aamount.

About managing Exchange and SQL servers in Rapid Recovery Core

Options specific to Exchange Server and SQL Server appear in the Rapid Recovery Core Console only when an instance of the software and related files are detected on protected servers. In those cases, additional options are available when you select the protected machine in the Core Console.

For example, if you select a protected Exchange server in the left navigation menu, then the menu options that appear for that protected machine include an **Exchange** drop-down menu option.

If you select a protected SQL server in the left navigation menu, then the menu options that appear for that protected machine include a **SQL** drop-down menu.

While these options may work differently, there is some commonality. Functions you can accomplish for protected Exchange and SQL servers (and for no other protected machines) include:

- **Forcing server log truncation.** Both SQL servers and Exchange servers include server logs. The process of truncating SQL logs identifies available space on the server. When you truncate logs for an Exchange server, in addition to identifying the available space, the process frees up more space on the server.
- **Setting credentials for the relevant server.** Exchange servers allow you to set credentials for the protected machine on the Summary page for the protected server. SQL servers allow you to set credentials for a single protected SQL Server machine, or to set default credentials for all protected SQL servers.
- **Viewing status for checks on recovery points from Exchange Server or SQL Server**. Recovery points captured from a protected SQL or Exchange server have corresponding color status indicators. These colors indicate the success or failure of various checks relevant for SQL servers or Exchange servers.

This section includes the following topics specific to managing protected machines that use Exchange Server or SQL Server:

- Understanding recovery point status indicators
- Settings and functions for protected Exchange servers
- Settings and functions for protected SQL servers

About protecting server clusters

In Rapid Recovery, server cluster protection is associated with the Rapid Recovery protected machines installed on individual cluster nodes (that is, individual machines in the cluster) and the Rapid Recovery Core, which protects those machines, all as if they were one composite machine.

You can easily configure a Rapid Recovery Core to protect and manage a cluster. In the Core Console, a cluster is organized as a separate entity, which acts as a container that includes the related nodes. For example, in the left navigation area, under the **Protected Machines** menu, protected clusters are listed. Directly below each cluster, the associated individual nodes or agent machines appear. Each of these is a protected machine on which the Rapid Recovery Agent software is installed. If you click on the cluster, the **Summary** page for the cluster appears in the Core Console.

At the Core and cluster levels, you can view information about the cluster, such as the list of related nodes and shared volumes. When showing information for a cluster in the Core Console, you can click **Protected Nodes** in the top navigation menu to view a summary table of individual nodes in the cluster. From that summary table, for each node, you can perform functions such as forcing a snapshot; performing a one-time export or setting up virtual standby; mounting or viewing recovery points; restoring from a recovery point; converting the cluster node to its own protected machine; or removing the node from protection. If the node is an Exchange or SQL Server, you will also see the option to truncate logs.

At the cluster level, you can also view corresponding Exchange and SQL cluster metadata for the nodes in the cluster. You can specify settings for the entire cluster and the shared volumes in that cluster.

If you click on any node in the cluster from the left navigation menu, the information displayed in the Core Console is specific to that node of the cluster. Here you can view information specific to that node, or configure settings just for that node.

Support for cluster shared volumes

In Rapid Recovery release 6.x, support for cluster-shared volumes (CSV) is limited to native backup of CSVs running Windows Server 2008 R2. You can also restore CSV volumes running Windows Server 2008 R2 from a recovery point, or perform virtual export to a Hyper-V CSV running Windows Server 2008 R2. You cannot perform virtual export of a cluster-shared volume. New in Rapid Recovery release 6.0.1 and later is the ability to perform virtual export to a Hyper-V CSV running Windows Server 2012 or Windows Server 2012 R2.

NOTE: The Hyper-V agentless feature is compatible only with Windows Server 2012 R2 and later.

For other operating systems, the Rapid Recovery Agent service can be run on all nodes in a cluster, and the cluster can be protected as a cluster within the Rapid Recovery Core; however, CSVs do not display in the Core Console and are not available for protection. All local disks (such as the operating system volume) are available for protection.

The following table depicts current support in Rapid Recovery Core for cluster-shared volumes.

Table 57. Rapid Recovery support for cluster-shared volumes

Rapid Recovery Cluster Shared Volumes Support	Protect, Replicate, Rollup, Mount, Archive	Restore CSV Volumes	Virtual Export to Hyper-V CSV
Rapid Recovery	6.0	6.0	6.0.x
Windows Server 2008 R2	Yes	Yes	Yes
Windows Server 2012	No	No	Yes
Windows Server 2012 R2	No	No	Yes

[1] Excludes the Hyper-V agentless feature, which is compatible only with Windows Server 2012 R2 and later.

While Rapid Recovery may let you protect some other operating systems on cluster-shared volumes, you do so at your own risk. Only the configurations in the table above are supported by Dell.

Support for dynamic and basic volumes

Rapid Recovery supports taking snapshots of all dynamic and basic volumes. Rapid Recovery also supports exporting simple dynamic volumes that are on a single physical disk. As their name implies, simple dynamic volumes are not striped, mirrored, spanned, or RAID volumes.

The behavior for virtual export of dynamic disks differs, based on whether the volume you want to export is protected by the Rapid Recovery Agent software, or is a VM using agentless protection. This is because non-simple or complex dynamic volumes have arbitrary disk geometries that cannot be fully interpreted by the Rapid Recovery Agent.

When you try to export a complex dynamic disk from a machine with the Rapid Recovery Agent software, a notification appears in the user interface to alert you that exports are limited and restricted to simple dynamic volumes. If you attempt to export anything other than a simple dynamic volume with the Rapid Recovery Agent, the export job fails.

In contrast, dynamic volumes for VMs you protect agentlessly are supported for protection, virtual export, restoring data, and BMR, and for repository storage, with some important restrictions. For example:

- **Protection:** In the case when a dynamic volume spans multiple disks, you must protect those disks together to maintain the integrity of the volume.
- **Virtual export:** You can export complex dynamic volumes such as striped, mirrored, spanned, or RAID volumes from an ESXi host using agentless protection.

  However, the volumes are exported at the disk level, with no volume parsing. For example, if exporting a dynamic volume spanned across two disks, the export will include two distinct disk volumes.

  ⚠ **CAUTION: When exporting a dynamic volume that spans multiple disks, you must export the dynamic disks with the original system volumes to preserve the disk types.**
- **Restoring data:** When restoring a dynamic volume that spans multiple disks, you must restore the dynamic disks with the original system volumes to preserve the disk types. If you restore only one disk, you will break the disk configuration.

Repository storage: Additionally, Rapid Recovery supports the creation of repositories on complex dynamic volumes (striped, mirrored, spanned, or RAID). The file system of the machine hosting the repository must be NTFS or ReFS.

Understanding the Rapid Recovery Agent software installer

Rapid Recovery lets you download installers from the Rapid Recovery Core. From the **Downloads** page, you can choose to download the Agent Installer, the Local Mount Utility (LMU), or an SNMP MIB file. For more information about the LMU, see The Local Mount Utility. For more information about SNMP, see Understanding SNMP settings.

NOTE: For access to the Agent Installer, see Downloading the Rapid Recovery Agent Installer. For more information about deploying the Agent Installer, see the Dell Data Protection | Rapid Recovery Installation and Upgrade Guide.

The Agent installer is used to install the Rapid Recovery Agent application on machines that are intended to be protected by the Rapid Recovery Core. If you determine that you have a machine that requires the Agent Installer, you can download the web installer from the Downloads page of the Rapid Recovery Core Console.

NOTE: Downloading of the Core is performed from the Dell Data Protection | Rapid Recovery License Portal. To download the Rapid Recovery Core installer, visit https://licenseportal.com. For more information, see the *Dell Data Protection | Rapid Recovery License Portal User Guide.*

Downloading the Rapid Recovery Agent Installer

Download the Rapid Recovery Agent Installer and deploy it to any machine that you want to protect on the Rapid Recovery Core. Complete the steps in this procedure to download the web installer.

1. To download the Agent web installer directly from the machine you want to protect, do the following:
   a. In a web browser, open the Dell Data Protection | Rapid Recovery License Portal at https://licenseportal.com.
   b. From the left navigation menu, click **Downloads**.
   c. From the **Windows-Based Applications** pane, scroll down to the **Windows Agent** row, and click **Download** for the appropriate installer (32-bit or 64-bit systems).

      The installer file, for example `Agent-X64-6.0.1.xxxx.exe`, saves to the downloads destination folder.
2. To download the web installer from the Core, on the Core Console icon bar, click the ⋮ **More** icon and then select **Downloads**.
3. On the **Downloads** page, from the **Agent** pane, click **Download web installer**.
4. From the **Opening Agent-Web.exe** dialog box, click **Save File**.

   The installer file, for example `Agent-X64-6.0.1.xxxx.exe`, saves to the downloads destination folder.
5. Move the installer to the appropriate machine and install the Rapid Recovery Agent software.

   For more information about installing the Rapid Recovery Agent software, see the *Rapid Recovery Installation and Upgrade Guide*.

Deploying Agent to multiple machines simultaneously from the Core Console

You can deploy the Rapid Recovery Agent software simultaneously to multiple Windows machines. The machines can be part of an Active Directory domain or vCenter or ESX(i) virtual host; or they can be machines already protected by the local Rapid Recovery Core, as in the case of a Rapid Recovery Agent software upgrade. You also have the option to manually deploy the software to machines that are not necessarily associated with a specific domain or host.

You can also manually deploy the Rapid Recovery Agent software to one or more Linux machines from the Core Console.

⚠ **CAUTION: If AppAssure Agent was previously installed on a Linux machine, then before installing Rapid Recovery Agent, remove the AppAssure Agent from the machine using a shell script. For information on removing the Agent from a Linux machine, see the topic Uninstalling the AppAssure Agent software from a Linux machine. To successfully deploy the Agent software to Linux machines, see the prerequisites in the topic About installing the Agent software on Linux machines. These topics are found in the *Dell Data Protection | Rapid Recovery Installation and Upgrade Guide.***

Deploying the Rapid Recovery Agent software does not protect the machines automatically. After deploying, you must then select the **Protect Multiple Machines** option from the button bar of the Core Console.

NOTE: The feature in which you deploy to multiple machines simultaneously was previously referred to as “bulk deploy”. The feature in which you protect multiple machines simultaneously was previously referred to as “bulk protect”.

To deploy and protect multiple machines simultaneously, perform the following tasks:

- Deploy Rapid Recovery Agent to multiple machines. See Deploying the Rapid Recovery Agent software to one or more machines.
- Monitor the deployment. See Verifying the deployment to multiple machines.
- Protect multiple machines. See About protecting multiple machines.

  NOTE: If you selected the Protect Machine After Install option during deployment, skip this task.
- Monitor the activity of the bulk protection. See Monitoring the protection of multiple machines.

Deploying the Rapid Recovery Agent software to one or more machines

You can simplify the task of deploying the Rapid Recovery Agent software to one or more Windows machines by using the Deploy Agent Software Wizard.

NOTE: In the past, this feature was referred to as "bulk deploy."

When you use the Deploy Agent Software Wizard, Rapid Recovery can automatically detect machines on a host and let you select the machines to which you want to deploy. For machines on domains or hosts other than Active Directory or vCenter or ESX(i), you can manually connect to individual machines by using their IP addresses and the appropriate credentials. You can also push upgrades of the software to machines that the local Rapid Recovery Core already protects.

From within the Core Console, you can complete any of the following tasks:

- Deploying to machines on an Active Directory domain

- Deploying to machines on a VMware vCenter/ESX(i) virtual host
- Deploying an upgrade of the Rapid Recovery Agent software to protected machines
- Deploying to machines manually

NOTE: Dell recommends limiting the number of machines to which you deploy simultaneously to 50 or fewer, to preclude experiencing resource constraints that may cause the deploy operation to fail.

NOTE: The target machines must have internet access to download and install bits, because Rapid Recovery uses the web version of the Rapid Recovery Agent Installer to deploy the installation components. If internet access is unavailable, use the Core Console to download the installer to a medium, such as a USB drive, and then physically install the software on the machines that you want to protect. For more information, see Downloading the Rapid Recovery Agent Installer.

Deploying to machines on an Active Directory domain

Use this procedure to simultaneously deploy the Rapid Recovery Agent software to one or more machines on an Active Directory domain.
Before you begin this procedure, have the domain information and logon credentials for the Active Directory server on hand.

1. On the Rapid Recovery Core Console, click the **Protect** drop-down menu, and then click **Deploy Agent Software**.

   The Deploy Agent Software Wizard opens.
2. On the **Connection** page of the wizard, from the **Source** drop-down list, select **Active Directory**.
3. Enter the domain information and logon credentials as described in the following table.

   Table 58. Domain information and credentials

Text Box	Description
Host	The host name or IP address of the Active Directory domain.
User name	The user name used to connect to the domain; for example, Administrator or, if the machine is in a domain, [domain name]\Administrator).
Password	The secure password used to connect to the domain.
4. Click **Next**.
5. On the **Machines** page, select the machines to which you want to deploy the Rapid Recovery Agent software.
6. Optionally, to automatically restart the protected machines after the Agent is installed, select **After Agent installation, restart the machines automatically (Recommended)**.
7. Click **Finish**.

   The system automatically verifies each machine that you selected.

   If Rapid Recovery detects any concerns during automatic verification, the wizard progresses to a Warnings page, where you can clear machines from selection and manually verify the selected machines. If the machines you added pass the automatic verification, they appear on the Deploy Agent to Machines pane.
8. If the Warning page appeared and you are still satisfied with your selections, click **Finish** again.

The Rapid Recovery Agent software deploys to the specified machines. The machines are not yet protected. Protection begins after you complete Protecting multiple machines on an Active Directory domain.

Deploying to machines on a VMware vCenter/ESX(i) virtual host

Use this procedure to simultaneously deploy the Rapid Recovery Agent software to one or more machines on a VMware vCenter/ESX(i) virtual host.
Before starting this procedure, you must have the following information:

- Logon credentials for the VMware vCenter/ESX(i) virtual host.
- Host location.
- Logon credentials for each machine you want to protect.

NOTE: All virtual machines must have VMware Tools installed; otherwise, Rapid Recovery cannot detect the host name of the virtual machine to which to deploy. In lieu of the host name, Rapid Recovery uses the virtual machine name, which may cause issues if the host name is different from the virtual machine name.

1. On the Rapid Recovery Core Console, click the **Protect** drop-down menu, and then click **Deploy Agent Software**.

   The **Deploy Agent Software Wizard** opens.
2. On the **Connection** page of the wizard, from the **Source** drop-down list, select **vCenter / ESX(i)**.
3. Enter the host information and logon credentials as described in the following table.

   Table 59. vCenter/ESX(i) connection settings

Text Box	Description
Host	The name or IP address of the VMware vCenter Server/ESX(i) virtual host.
Port	The port used to connect to the virtual host. The default setting is 443.
User name	The user name used to connect to the virtual host; for example, Administrator or, if the machine is in a domain, [domain name]\Administrator.
Password	The secure password used to connect to this virtual host.

4. Click **Next**.
5. On the **Machines** page of the wizard, select one of the following options from the drop-down menu:
   - Hosts and Clusters
   - VMs and Templates
6. Expand the list of machines, and then select the VMs to which you want to deploy the software.

   A notification appears if Rapid Recovery detects that a machine is offline or that VMware Tools are not installed.
7. If you want to restart the machines automatically after deployment, select **After Agent installation, restart the machines automatically (Recommended)**.
8. Click **Next**.

   Rapid Recovery automatically verifies each machine you selected.
9. On the **Adjustments** page of the wizard, enter the credentials for each machine in the following format: `hostname::username::password`.

   NOTE: Enter one machine on each line.
10. Click **Finish**.

    The system automatically verifies each machine that you selected.

    If Rapid Recovery detects any concerns during automatic verification, the wizard progresses to a Warnings page, where you can clear machines from selection and manually verify the selected machines. If the machines you added pass the automatic verification, they appear on the Deploy Agent to Machines pane.

11. If the Warning page appeared and you are still satisfied with your selections, click **Finish** again.

The Rapid Recovery Agent software deploys to the specified machines. The machines are not yet protected. Protection begins after you complete Protecting multiple machines on a VMware vCenter/ESX(i) virtual host.

Deploying an upgrade of the Rapid Recovery Agent software to protected machines

You can use the Deploy Agent Software Wizard to push an upgrade of the Rapid Recovery Agent software to machines that are already protected by the local Rapid Recovery Core.

1. On the Rapid Recovery Core Console, click the **Protect** drop-down menu, and then click **Deploy Agent Software**.

   The **Deploy Agent Software Wizard** opens.
2. On the **Connection** page of the wizard, from the **Source** drop-down list, select **Local Core**.
3. Click **Next**.
4. On the **Machines** page of the wizard, select the protected machines to which you want to deploy an upgrade of the Rapid Recovery Agent software.
5. Click **Finish**.

   The system automatically verifies each machine that you selected.

   If Rapid Recovery detects any concerns during automatic verification, the wizard progresses to a **Warnings** page, where you can clear machines from selection and manually verify the selected machines. If the machines you added pass the automatic verification, they appear on the **Deploy Agent to Machines** pane.
6. If the **Warning** page appeared, and you are still satisfied with your selections, click **Finish** again.

Deploying to machines manually

Use the following procedure to deploy the Rapid Recovery Agent to multiple machines on any type of host other than the local Core, Active Directory, or vCenter/ESXi.

1. On the Rapid Recovery Core Console, click the **Protect** drop-down menu, and then select **Deploy Agent Software**.

   The **Deploy Agent Software Wizard** opens.
2. On the **Connection** page of the wizard, from the **Source** drop-down list, select **Manually**.
3. Click **Next**.
4. On the **Machines** page of the wizard, enter the machine details in the dialog box in the format `hostname::username::password::port`. Examples include:

   `10.255.255.255::administrator::&11@yYz90z::8006`

   `abc-host-00-1::administrator::99!zU$o83r::168`
5. If you want to restart the machines automatically after deployment, select **After Agent installation, restart the machines automatically (Recommended)**.
6. Click **Finish**.

   The system automatically verifies each machine that you selected.

   If Rapid Recovery detects any concerns during automatic verification, the wizard progresses to a **Warnings** page, where you can clear machines from selection and manually verify the selected machines. If the machines you added pass the automatic verification, they appear on the **Deploy Agent to Machines** pane.
7. If the **Warning** page appeared, and you are still satisfied with your selections, click **Finish** again.

The Rapid Recovery Agent software deploys to the specified machines. The machines are not yet protected. Protection begins after you complete Protecting multiple machines manually.

Verifying the deployment to multiple machines

Once you have deployed the Rapid Recovery Agent software to two or more machines simultaneously, you can verify the success by viewing each machine listed under the Protected Machines menu.

You can also view information regarding the bulk deploy process from the Events page. Complete the steps in this procedure to verify the deployment.

1. Navigate to the Rapid Recovery Core Console, click (Events), and then click **Alerts**.
   Alert events appear in the list, showing the time the event initiated and a message. For each successful deployment of the Agent software, you will see an alert indicating that the protected machine has been added.
2. Optionally, click on any link for a protected machine.
   The **Summary** page for the selected machine appears, showing pertinent information including:

   - The host name of the protected machine
   - The last snapshot, if applicable
   - The time of the next scheduled snapshot, based on the protection schedule for the selected machine
   - The encryption key, if any, used for this protected machine.
   - The version of the Agent software.

Modifying deploy settings

Complete the steps in this procedure to modify deploy settings.

1. From the Rapid Recovery Core Console, click (Settings).
2. On the **Settings** page, in the left column, click **Deploy** to navigate to the Deploy section.
3. Modify any of the following options by clicking the setting you want to change to make it editable as a text box or drop-down list, and then click ✓ to save the setting.

Table 60. Deploy options

Option	Description
Agent Installer Name	Enter the name of the agent executable file. The default is Agent-web.exe.
Core Address	Enter the address for the Core.
Failed Receive Timeout	Enter the number of minutes to wait without activity before timeout.
Maximum Parallel Installs	Enter a number for the maximum installations you want to install simultaneously. The default and limit is 100.
Automatic reboot after install	Select the check box for Yes, or clear it for No.

Option	Description
Protect After Deploy	Select the check box for Yes, or clear it for No.

Understanding protection schedules

A protection schedule defines when backups are transferred from protected agent machines to the Rapid Recovery Core.

The first backup transfer saved to the Core is called a base image snapshot. All data on all specified volumes (including the operating system, applications, and settings), are saved to the Core, which can take a significant amount of time depending on the amount of data being transferred. Thereafter, incremental snapshots (smaller backups, consisting only of data changed on the protected machine since the last backup) are saved to the Core regularly, based on the interval defined (for example, every 60 minutes). This backup contains less data than a base image, and therefore takes a shorter amount of time to transfer.

Protection schedules are initially defined using the Protect Machine Wizard or the Protect Multiple Machines Wizard. Using a wizard, you can customize protection schedules (choosing either periods or a daily protection time) to accommodate your business needs. You can then modify the existing schedule or create a new schedule at any time in the Protection Schedule dialog box from the summary page of a specific protected machine.

Rapid Recovery provides a default protection schedule, which includes a single period spanning all days of the week, with a single time period defined (from 12:00 AM to 11:59 PM). The default interval (the time period between snapshots) is 60 minutes. When you first enable protection, you also activate the schedule. Thus, using the default settings, regardless of the current time of day, the first backup will occur every hour, on the hour (12:00 AM, 1:00 AM, 2:00 AM, and so on).

Selecting periods lets you view the default protection schedule and make adjustments accordingly. Selecting a daily protection time causes Rapid Recovery Core to back up the designated protected machines once daily at a time you specify.

You can customize the schedule to define peak and off-peak times using the weekday and weekend periods available. For example, if your protected machines are mostly in use on weekdays, you could decrease the interval for the weekday period to 20 minutes, resulting in three snapshots every hour. Or you can increase the interval for the weekend period from 60 minutes to 180 minutes, resulting in snapshots once every three hours when traffic is low.

Alternatively, you can change the default schedule to define peak and off-peak times daily. To do this, change the default start and end time to a smaller range of time (for example, 12:00 AM to 4:59 PM), and set an appropriate interval (for example, 20 minutes). This represents frequent backups during peak periods. You can then add an additional weekday time range for the remaining span of time (5:00 pm to 11:59 pm) and set an appropriate (presumably larger) interval (for example, 180 minutes). These settings define an off-peak period that includes 5:00 PM to midnight every day. This customization results in snapshots every three hours from 5:00 PM through 11:59 PM, and snapshots every 20 minutes from 12:00 AM until 4:59 PM.

When you modify or create a protection schedule using the Protection Schedule dialog box, Rapid Recovery gives you the option to save that schedule as a reusable template that you can then apply to other protected machines.

Other options in the protection wizards include setting a daily protection time. This results in a single backup daily at the period defined (the default setting is 12:00 PM).

When protecting one or multiple machines using a wizard, you can initially pause protection, which defines the protection schedule without protecting the machines. When you are ready to begin protecting your machines based on the established protection schedule, you must explicitly resume protection. For more information on resuming protection, see Pausing and resuming protection. Optionally, if you want to protect a machine immediately, you can force a snapshot. For more information, see Forcing a snapshot.

Protecting a machine

If you have already installed the Rapid Recovery Agent software on the machine you want to protect, but have not restarted it yet, restart the machine now.

This topic describes how to start protecting the data on a single machine that you specify using the Protect Machine Wizard.

NOTE: Unless using agentless protection on a VMware or ESXi host, the machine you want to protect must have the Rapid Recovery Agent software installed in order to be protected. You can choose to install the Agent software prior to this procedure, or you can deploy the software to the target machine as a part of completing the Protect Machine Wizard.

For more information on agentless protection and its restrictions, see Understanding Rapid Snap for Virtual.

For more information on installing the Agent software, see “Installing the Rapid Recovery Agent software” in the *Dell Data Protection | Rapid Recovery License Portal Installation and Upgrade Guide*.
If the Agent software is not installed prior to protecting a machine, you will not be able to select specific volumes for protection as part of this wizard. In this case, by default, all volumes on the agent machine will be included for protection.

Rapid Recovery supports the protection and recovery of machines configured with EISA partitions. Support is also extended to Windows 8 and 8.1, and Windows 2012 and 2012 R2 machines that use Windows Recovery Environment (Windows RE).

To protect multiple machines using one process simultaneously, see About protecting multiple machines.

When you add protection, you need to define connection information such as the IP address and port, and provide credentials for the machine you want to protect. Optionally, you can provide a display name to appear in the Core Console instead of the IP address. If you change this, you will not see the IP address for the protected machine when you view details in the Core Console. You will also define the protection schedule for the machine.

The protection process includes optional steps you can access if you select an advanced configuration. Advanced options include repository functions and encryption. For example, you can specify an existing Rapid Recovery repository to save snapshots, or create a new repository. You can also specify an existing encryption key (or add a new encryption key) to apply to the data saved to the Core for this machine. For more information about encryption keys, see Understanding encryption keys.

The workflow of the protection wizard may differ slightly based on your environment. For example, if the Rapid Recovery Agent software is installed on the machine you want to protect, you will not be prompted to install it from the wizard. Likewise, if a repository already exists on the Core, you will not be prompted to create one.

⚠ **CAUTION: Rapid Recovery does not support bare metal restores (BMRs) of Linux machines with ext2 boot partitions. Any BMR performed on a machine with this type of partition results in a machine that does not start. If you want to be able to perform a BMR on this machine in the future, you must convert any ext2 partitions to ext3 or ext4 before you begin protecting and backing up the machine.**

1. Do one of the following:

- If you are starting from the Protect Machine Wizard, proceed to Step 2.
- If you are starting from the Rapid Recovery Core Console, from the button bar, click **Protect**.

The **Protect Machine Wizard** appears.

2. On the **Welcome** page, select the appropriate installation options:

- If you do not need to define a repository or establish encryption, select **Typical**.
- If you need to create a repository, or define a different repository for backups for the selected machine, or if you want to establish encryption using the wizard, select **Advanced (show optional steps)**.
- Optionally, if you do not wish to see the **Welcome** page for the Protect Machine Wizard in the future, select the option **Skip this Welcome page the next time the wizard opens**.

3. When you are satisfied with your choices on the Welcome page, then click **Next**.

The **Connection** page appears.

4. On the **Connection** page, enter the information about the machine to which you want to connect as described in the following table, and then click **Next**.

Table 61. Machine connection settings

Text Box	Description
Host	The host name or IP address of the machine that you want to protect.
Port	The port number on which the Rapid Recovery Core communicates with the Agent on the machine. The default port number is 8006.
User name	The user name used to connect to this machine; for example, Administrator (or, if the machine is in a domain, [domain name]\Administrator).
Password	The password used to connect to this machine.

If the **Install Agent** page appears next in the Protect Machine Wizard, that means that Rapid Recovery does not detect the Rapid RecoveryAgent on the machine and will install the current version of the software. Go to Step 7.

If the **Upgrade Agent** page appears next in the wizard, that means that an older version of the Agent software exists on the machine you want to protect.

NOTE: The Agent software must be installed on the machine you want to protect, and that machine must be restarted, before it can back up to the Core. To have the installer reboot the protected machine, select the option **After installation, restart the machine automatically (recommended)** before clicking Next.

5. On the **Upgrade Agent** page, do one of the following:

- To deploy the new version of the Agent software (matching the version for the Rapid Recovery Core), select **Upgrade the Agent to the latest version of the software**.

- To continue protecting the machine without updating the Agent software version, clear the option **Upgrade the Agent to the latest version of the software**.

6. Click **Next**.
7. Optionally, on the **Protection** page, if you want a name other than the IP address to display in the Rapid Recovery Core console for this protected machine, then in the **Display Name** field, type a name in the dialog box.

   You can enter up to 64 characters. Do not use the special characters described in the topic prohibited characters . Additionally, do not begin the display name with any of the character combinations described in the topic prohibited phrases .
8. Select the appropriate protection schedule as described below:
   - To use the default protection schedule, in the Schedule Settings option, select **Default protection**.

   With a default protection schedule, the Core will take snapshots of all volumes on the protected machine once every hour. To change the protection settings at any time after you close the wizard, including choosing which volumes to protect, go to the Summary page for the specific protected machine.

   - To define a different protection schedule, in the Schedule Settings option, select **Custom protection**.
9. Proceed with your configuration as follows:
   - If you selected a Typical configuration for the Protect Machine Wizard and specified default protection, then click **Finish** to confirm your choices, close the wizard, and protect the machine you specified.

     The first time protection is added for a machine, a base image (that is, a snapshot of all the data in the protected volumes) will transfer to the repository on the Rapid Recovery Core following the schedule you defined, unless you specified to initially pause protection.
   - If you selected a Typical configuration for the Protect Machine Wizard and specified custom protection, then click **Next** to set up a custom protection schedule. For details on defining a custom protection schedule, see Creating custom protection schedules.
   - If you selected Advanced configuration for the Protect Machine Wizard, and default protection, then click **Next** and proceed to Step 14 to see repository and encryption options.
   - If you selected Advanced configuration for the Protect Machine Wizard and specified custom protection, then click **Next** and proceed to Step 11 to choose which volumes to protect.
10. On the **Protection Volumes** page, select which volumes you want to protect. If any volumes are listed that you do not want to include in protection, click in the Check column to clear the selection. Then click **Next**.

    NOTE: Typically, it is good practice to protect, at minimum, the System Reserved volume and the volume with the operating system (typically the C drive).
11. On the **Protection Schedule** page, define a custom protection schedule and then click **Next**. For details on defining a custom protection schedule, see Creating custom protection schedules.

    If you already have repository information configured, and you selected the Advanced option in Step 1, then the Encryption page appears. Proceed to Step 13.
12. On the **Repository** page, the following:
    - If you already have a repository and want to store the data from this machine for protection in the existing repository, then do the following:

      1. Select **Use an existing repository**.
      2. Select an existing repository from the list.
      3. Click **Next**.

The **Encryption** page appears. Skip to Step 13 to optionally define encryption.

- If you want to create a repository, select **Create a Repository**, and then complete the following steps.

1. On the **Repository**, enter the information described in the following table.

Table 62. Add New Repository settings

Text Box	Description
Repository Name	Enter the display name of the repository. By default, this text box consists of the word Repository and a number, which corresponds to the number of repositories for this Core. For example, if this is the first repository, the default name is Repository 1. Change the name as needed. Repository names must contain between 1 and 40 alphanumeric characters, including spaces. Do not use prohibited characters or prohibited phrases .
Concurrent Operations	Define the number of concurrent requests you want the repository to support. By default the value is 64.
Comments	Optionally, enter a descriptive note about this repository. You can enter up to 254 characters. For example, type **DVM Repository 2.**

2. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.

⚠ **CAUTION: Define a dedicated folder within the root for the storage location for your repository. Do not specify the root location. For example, use E:\Repository\, not E:\. If the repository that you are creating in this step is later removed, all files at the storage location of your repository are deleted. If you define your storage location at the root, all other files in the volume (e.g., E:\) are deleted, which could result in catastrophic data loss.**

The **Add Storage Location** dialog box appears.

3. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.

4. In the **Storage Location** area, specify how to add the file for the storage location. You can choose to add a locally attached storage volume (such as direct attached storage, a storage area network, or network attached storage). You could also specify a storage volume on a Common Internet File System (CIFS) shared location.

– Select **Add file on local disk** to specify a local machine, and then enter the information as described in the following table.

Table 63. Local disk settings

Text Box	Description
Data path	Enter the location for storing the protected data. For example, type `X:\Repository\Data`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.
Metadata path	Enter the location for storing the protected metadata. For example, type `X:\Repository\Metadata`.

Text Box	Description
	When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.

- Or, select **Add file on CIFS share** to specify a network share location, and then enter the information as described in the following table.

Table 64. CIFS share credentials

Text Box	Description
UNC path	Enter the path for the network share location. If this location is at the root, define a dedicated folder name (for example, `Repository`). The path must begin with \\. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). The letters a to z are case-insensitive. Do not use spaces. No other symbols or punctuation characters are permitted.
User name	Specify a user name for accessing the network share location.
Password	Specify a password for accessing the network share location.

5. In the **Storage Configuration** area, click **More Details** and enter the details for the storage location as described in the following table.

Table 65. Storage configuration details

Text Box	Description
Size	Set the size or capacity for the storage location. The minimum size is 1 GB. The default is 250 GB. You can choose from the following: – GB – TB NOTE: The size that you specify cannot exceed the size of the volume. If the storage location is a New Technology File System (NTFS) volume using Windows XP or Windows 7, the file size limit is 16 TB. If the storage location is a NTFS volume using Windows 8, 8.1, Windows 10, or Windows Server 2012, 2012 R2, the file size limit is 256 TB. NOTE: For Rapid Recovery to validate the operating system, Windows Management Instrumentation (WMI) must be installed on the intended storage location.
Write caching policy	The write caching policy controls how the Windows Cache Manager is used in the repository and helps to tune the repository for optimal performance on different configurations. Set the value to one of the following: – On – Off – Sync If set to On, which is the default, Windows controls the caching. This is appropriate for Windows 10, and for versions of Windows Server 2012 and later.

Text Box	Description
	NOTE: Setting the write caching policy to On could result in faster performance. If you are using Windows Server 2008 SP2 or Windows Server 2008 R2 SP2, the recommended setting is Off. If set to Off, Rapid Recovery controls the caching. If set to Sync, Windows controls the caching as well as the synchronous input/output.
Bytes per sector	Specify the number of bytes you want each sector to include. The default value is 512.
Average bytes per record	Specify the average number of bytes per record. The default value is 8192.

6. Click **Next**.

If you chose the **Advanced** option in Step 1, the **Encryption** page appears.

13. Optionally, on the **Encryption** page, to enable encryption, select **Enable Encryption**.

Encryption key fields appear on the **Encryption** page.

NOTE: If you enable encryption, it will be applied to data for all protected volumes for this machine.

You can change encryption settings later from the Rapid Recovery Core Console.
For more information about encryption, see the topic Understanding encryption keys.

CAUTION: Rapid Recovery uses AES 256-bit encryption in the Cipher Block Chaining (CBC) mode with 256-bit keys. While using encryption is optional, Dell highly recommends that you establish an encryption key, and that you protect the passphrase you define. Store the passphrase in a secure location as it is critical for data recovery. Without a passphrase, data recovery is not possible.

14. On the **Encryption** page, select one of the following options:

- If you want to encrypt this protected machine using an encryption key that is already defined on this Rapid Recovery Core, select **Encrypt data using an existing Encryption key**, and then select the appropriate key from the drop-down menu. Proceed to the next step.
- If you want to add a new encryption key to the Core and apply that key to this protected machine, then enter the information as described in the following table.

Table 66. Encryption key settings

Text Box	Description
Name	Enter a name for the encryption key. Encryption key names must contain between 1 and 130 alphanumeric characters. You may not include special characters such as the back slash, forward slash, pipe, colon, asterisk, quotation mark, question mark, open or close brackets, ampersand or hash.
Description	Enter a comment for the encryption key. This information appears in the Description field when viewing encryption keys from the Core Console.
Passphrase	Enter the passphrase used to control access. Best practice is to avoid special characters listed above.

Text Box	Description
	Record the passphrase in a secure location. Dell Support cannot recover a passphrase. Once you create an encryption key and apply it to one or more protected machines, you cannot recover data if you lose the passphrase.
Confirm Passphrase	Re-enter the passphrase you just entered.

15. Click **Finish** to save and apply your settings.

    The first time protection is added for a machine, a base image (that is, a snapshot of all the data in the protected volumes) will transfer to the repository on the Rapid Recovery Core following the schedule you defined, unless you specified to initially pause protection.

Protecting a cluster

This topic describes how to add a cluster for protection in Rapid Recovery . When you add a cluster to protection, you need to specify the host name or IP address of the cluster, the cluster application, or one of the cluster nodes or machines that includes the Rapid Recovery Agent software.

NOTE: A repository is used to store the snapshots of data that are captured from your protected nodes. Before you start protecting data in your cluster, you should have set up at least one repository that is associated with your Rapid Recovery Core.

For information about setting up repositories, see Understanding repositories.

1. From the Rapid Recovery Core Console, click the **Protect** button drop-down menu, and then click **Protect Cluster**.
2. In the Connect to Cluster dialog box, enter the following information.

   Table 67. Connect to Cluster settings

Text Box	Description
Host	The host name or IP address of the cluster, the cluster application, or one of the cluster nodes.
Port	The port number on the machine on which the Rapid Recovery Core communicates with the Agent. The default port is 8006.
User name	The user name of the domain administrator used to connect to this machine: for example, domain_name\administrator. NOTE: The domain name is mandatory. You cannot connect to the cluster using the local administrator user name.
Password	The password used to connect to this machine.

3. Click **Connect**.
4. In the Protect Cluster dialog box, select a repository for this cluster.
5. If you want to secure the recovery points for this cluster using Core-based encryption, select an encryption key.
6. If you do not want protection to begin immediately after completing this procedure, select **Initially pause protection**.
7. To protect the cluster based on default settings, select the nodes for default protection, and then go to Step 10.

NOTE: The default settings schedule a snapshot of all volumes every 60 minutes.

8. To enter custom settings for the cluster (for example, to customize the protection schedule for the shared volumes), do one of the following, and then see Creating custom protection schedules.
   - To customize settings for an individual node, next to the node that you want to customize, click **Settings**, and then click **Function** next to the relevant volume.
   - To customize settings for the cluster, click the Settings button at the bottom of the dialog box, and then click **Function** next to the relevant volume.

   For more information about customizing nodes, see Protecting nodes in a cluster.
9. When you have made all necessary changes, click **Save**.
10. In the Protect Cluster dialog box, click **Protect**.

Modifying cluster node settings

Once you have added protection for cluster nodes, you can easily modify basic configuration settings for those machines or nodes (for example, display name, host name, and so on), protection settings (for example, changing the protection schedule for local volumes on the machine, adding or removing volumes, and pausing protection), and more.

To modify cluster node settings, you must perform the following tasks:

- In the Rapid Recovery Core Console, navigate to the cluster that contains the node you want to modify, and select the machine or node that you want to modify.
- To modify and view configuration settings, see Configuring notification groups.
- To configure notification groups for system events, see Viewing and modifying protected machine settings.
- To customize retention policy settings, see Customizing retention policy settings for a protected machine.
- To modify the protection schedule, see Modifying protection schedules.
- To modify transfer settings, see About modifying transfer settings.

Protecting nodes in a cluster

This task requires that you first protect a cluster. For more information, see Protecting a cluster.

This topic describes how to protect the data on a cluster node or machine that has a Rapid Recovery Agent installed. This procedure lets you add individual nodes to protection that you may have omitted when you protected a cluster.

1. In the Rapid Recovery Core Console, under Protected Machine, click the cluster with the nodes that you want to protect.
2. On the Summary page for the cluster, click the **Protected Nodes**.
3. On the Protected Nodes page, click **Protect Cluster Node**.
4. In the Protect Cluster Node dialog box, select or enter as appropriate the following information.

Table 68. Protect Cluster Node settings

Text Box	Description
Host	A drop-down list of nodes in the cluster available for protection.
Port	The port number on which the Rapid Recovery Core communicates with the Agent on the node.

Text Box	Description
User name	The user name of the domain administrator used to connect to this node; for example, example_domain\administrator or administrator@example_domain.com.
Password	The password used to connect to this machine.

5. To add the node, click **Connect**.
6. To start protecting this node with default protection settings, go to Step 13.

   NOTE: The default settings ensure that all volumes on the machine are protected with a schedule of every 60 minutes.

7. In the Protect [Node Name] dialog box, if you want to use a repository other than the default setting, use the drop-down list to select a repository.
8. If you want to secure the recovery points for this cluster using Core-based encryption, use the drop-down list to select an encryption key.
9. If you do not want protection to begin immediately after completing this procedure, select **Initially pause protection**.
10. To enter custom settings (for example, to customize the protection schedule for the shared volumes), do the following:
    a. To customize settings for an individual volume, next to the volume that you want to customize, click **Function** next to the relevant volume.
    b. See Creating custom protection schedules.
11. Click **Protect**.

Creating custom protection schedules

Complete the steps in this procedure to create custom schedules for protecting data on protected machines when defining protection using a wizard.

1. On the **Protection** page of the protection wizard (Protect Machine, Protect Multiple Machines, Protecting a Cluster), select Custom protection.
2. Click **Next**.
3. On the **Protection Volumes** page, select the volumes you want to protect, and then click **Next**.
4. On the **Protection Schedule** page, to change the interval schedule for any period, do the following:
   a. Select **Periods**.

      The existing periods display and can be modified. Editable fields include a start time, end time, and interval (Every X minutes) for each period.

   b. For each period, click in the interval text box and type an appropriate interval in minutes.

      For example, highlight the default interval of 60 and replace it with the value 20 to perform snapshots every 20 minutes during this period.
5. To create a peak and off-peak period for weekdays, change the time range of the weekday period so that it does not include a 24-hour period, set an optimal interval for the peak range, select **Take snapshots for the remaining time** ,and then set an off-peak interval by doing the following:
   a. Select **Periods**.

      The existing periods display and can be modified.

   b. Click in the **From** box or use the clock icon to change the start time for this period.
   c. Click in the **To** box or use the clock icon to change the end time for this period.
   d. Click in the interval text box and type an appropriate interval in minutes.

      For example, highlight the default interval of 60 and replace it with the value 20 to perform snapshots every 20 minutes during the time range you selected for this period.

   e. Select **Take snapshots for the rest of the time**, and then enter an interval in minutes.

6. To set a single time of day for a single backup to occur daily, select **Daily protection time** and then enter a time in format HH:MM AM. For example, to do a daily backup at 9:00 PM, enter 09:00 PM.
7. To define the schedule without beginning backups, select **Initially pause protection**.

   After you pause protection from the wizard, it remains paused until you explicitly resume it. Once you resume protection, backups will occur based on the schedule you established. For more information on resuming protection, see Pausing and resuming protection.
8. When you are satisfied with changes made to your protection schedule, click **Finish** or **Next**, as appropriate. Return to the procedure for the appropriate wizard to complete any requirements remaining.

Modifying protection schedules

A protection schedule defines when backups are transferred from protected agent machines to the Rapid Recovery Core. Protection schedules are initially defined using the Protect Machine Wizard or the Protect Multiple Machines Wizard.

You can modify an existing protection schedule at any time from the Summary tab for a specific agent machine.

NOTE: For conceptual information about protection schedules, see Understanding protection schedules. For information about protecting a single machine, see Protecting a machine. For information about bulk protect (protecting multiple machines), see About protecting multiple machines. For information on customizing protection periods when protecting an agent using either of these wizards, see Creating custom protection schedules. For information about modifying an existing protection schedule, see Modifying protection schedules.

Complete the steps in this procedure to modify an existing protection schedule for volumes on a protected machine.

1. In the Core Console, from the list of protected machines, click the protected machine that has the protection schedule that you want to change.
2. On the page for the machine you selected, select the applicable volumes, and then click **Set a Schedule**.

   To select all volumes at once, click in the checkbox in the header row. Initially, all volumes share the same protection schedule.

   NOTE: Typically, it is good practice to protect, at minimum, the System Reserved volume and the volume with the operating system (typically the C drive).

   The Protection Schedule dialog box appears.
3. On the Protection Schedule dialog box, do one of the following:
   - If you previously created a protection schedule template and want to apply it to this protected machine, select the template from the drop-down list, and then go to Step 7.
   - If you want to remove an existing time period from the schedule, clear the check box next to each time period option, and then go to Step 7. Options include the following:
     – Mon - Fri: This range of time denotes a typical five-day work week.
     – Sat - Sun: This range of time denotes a typical weekend.
   - If you want to save a new protection schedule as a template, continue to Step 4.
4. When the weekday start and end times are from 12:00 AM to 11:59 PM, then a single period exists. To change the start or end time of a defined period, do the following:
   a. Select the appropriate time period.
   b. To change the start time for this period, use the clock icon under **Start Time**.

   For example, use the arrows to show a time of 08:00 AM.

   c. To change the end time for this period, use the clock icon under **End Time**.

      For example, use the arrows to show a time of 06:00 PM.

   d. Change the interval according to your requirements. For example, if defining a peak period. change the interval from 60 minutes to 20 minutes to take snapshots three times hourly.

5. If you defined a period other than 12:00 AM to 11:59 PM in Step 7, and you want backups to occur in the remaining time ranges, you must add additional periods to define protection by doing the following:

   a. Under the appropriate category, click **Add period.**

   b. Click the clock icon and select the desired start and end times, as appropriate.

      For example, set a start time of 12:00 AM and an end time of 07:59 AM.

   c. Change the interval according to your requirements. For example, if defining an off-peak period. change the interval from 60 minutes to 120 minutes to take snapshots every two hours.

6. If needed, continue to create additional periods, setting start and end times and intervals as appropriate.

   NOTE: If you want to remove a period you added, click the trash icon to the far right of that period, and then click **Yes** to confirm.

7. To create a template from the schedule you set, click **Save as a Template**.
8. In the Save Template dialog box, enter a name for the template, and then click **Save**.
9. When your protection schedule meets your requirements, click **Apply**.

   The protection Schedule dialog box closes.

Pausing and resuming protection

When you pause protection, you temporarily stop all transfers of data from the selected machine to the Rapid Recovery Core. When you resume protection, the Rapid Recovery Core follows the requirements in the protection schedule, backing up your data regularly based on that schedule.

You can pause protection for any Rapid Recovery protected machine:

- When establishing protection using the Protect Machine Wizard or the Protect Multiple Machines Wizard.
- From the Protected Machines drop-down menu in the left navigation area of the Rapid Recovery Core (pausing protection for all protected machines).
- From the Protected Machines page (accessible when you click on the Protected Machines menu).
- From a specific protected machine in the Protected Machines drop-down menu.
- From the top of every page for a specific protected machine.

If you pause protection using the Protect Machine Wizard or the Protect Multiple Machines Wizard, protection is paused until explicitly resumed.

If you pause protection outside of a wizard, you can choose whether to pause protection until resumed, or to pause it for a designated amount of time (specified in any combination of days, hours and minutes). If you pause for a period of time, then when that time expires, the system resumes protection based on the protection schedule automatically.

You can resume protection for any paused Rapid Recovery protected machine:

- From the Protected Machines drop-down menu in the left navigation area of the Rapid Recovery Core (resuming protection for all protected machines).
- From a specific protected machine in the Protected Machines drop-down menu.

- From the Protected Machines page (accessible when you click on the Protected Machines menu).
- From the top of every page for a specific protected machine.

Use the procedure below to pause or to resume protection, as appropriate.

1. In the Rapid Recovery Core Console, to pause protection for all machines, click the Protected Machines drop-down menu in the left navigation area, and then do the following:
   a. Select **Pause Protection**.

      The Pause Protection dialog box appears.

   b. Select the appropriate setting using one of the options described below, and then click **OK**.
      - If you want to pause protection until you explicitly resume it, select **Pause until resumed**.
      - If you want to pause protection for a specified period, select **Pause for** and then, in the Days, Hours, and Minutes controls, type or select the appropriate pause period as appropriate.
2. To resume protection for all machines, do the following:
   a. Select **Resume Protection**.

      The Resume Protection dialog box appears.

   b. In the Resume Protection dialog box, select **Yes**.

      The Resume Protection dialog box closes, and protection is resumed for all machines.
3. To pause protection for a single machine, then in the left navigation area, click the drop-down menu to the right of the machine you want to affect, and then do the following:
   a. Select **Pause Protection**.

      The Pause Protection dialog box appears.

   b. Select the appropriate setting using one of the options described below, and then click **OK**.
      - If you want to pause protection until you explicitly resume it, select **Pause until resumed**.
      - If you want to pause protection for a specified period, select **Pause for** and then, in the Days, Hours, and Minutes controls, type or select the appropriate pause period as appropriate.
4. To resume protection for a single machine, do the following:
   a. Select **Resume Protection**.

      The Resume Protection dialog box appears.

   b. In the Resume Protection dialog box, select **Yes**.

      The Resume Protection dialog box closes, and protection is resumed for the selected machine.
5. To pause protection for a single machine from the machine pages, navigate to the machine that you want to affect.

   The Summary page displays for the selected machine.

   a. At the top of the page, click **Pause**.

      The Pause Protection dialog box appears.

   b. Select the appropriate setting using one of the options described below, and then click **OK**.
      - If you want to pause protection until you explicitly resume it, select **Pause until resumed**.
      - If you want to pause protection for a specified period, select **Pause for** and then, in the Days, Hours, and Minutes controls, type or select the appropriate pause period as appropriate.

   -
6. If you want to resume protection, do the following:
   a. At the top of the page, click **Resume**.

   b. In the Resume Protection dialog box, click **Yes**.

      The Resume Protection dialog box closes, and protection resumes for the selected machine.

Managing protected machines

This section describes how to view, configure and manage the protected machines in your Rapid Recovery environment.

About managing protected machines

The tasks you can accomplish to manage protected machines are broken down into a few categories.

- You can view protected machines in the Rapid Recovery Core using options described in the topic Viewing protected machines.
- You can configure machine settings, access system information, or configure notifications for events regarding a particular machine. For more information, see Configuring machine settings.
- You can for access diagnostics for a protected machine. For more information, see Downloading and viewing the log file for a protected machine.
- You can remove a machine from protection, cancel current operations, or view license information for a protected machine. For more information, see Managing machines.
- You can view and manage data saved in the Core. For more information, see Managing snapshots and recovery points.

Viewing protected machines

From the **Home** page on the Rapid Recovery Core Console, when viewing the Summary Tables view, you can see summary information for any machines protected by the Core in the Protected Machines pane.

NOTE: A software agent acts on behalf of the user to take specific actions. Protected machines are sometimes referred to as agents, since they run the Rapid Recovery Agent software to facilitate data backup and replication on the Rapid Recovery Core.

You can view the status, the display name for each machine, which repository it uses, the date and time of the last snapshot, how many recovery points exist in the repository for the machine, and the total amount of storage space the snapshots use in the repository.

To manage aspects of any protected machine, start by navigating to the machine you want to view, configure, or manage. From the Home page, there are three ways to navigate to a protected machine:

- You can click on the IP address or display name of any protected machine from the Protected Machines pane. This takes you to the Summary page for the selected protected machine.
- In the left navigation area, you can click on the title of the **Protected Machines** menu. The Protected Machines page appears. On the Protected Machines page, you can see summary information about each machine. For a detailed description of this page, see Viewing summary information for a protected machine.
- In the left navigation area, under the Protected Machines menu, you can click any protected machine IP address or display name. This takes you to the Summary page for the selected protected machine. For a detailed description of this page, see Viewing summary information for a protected machine

Viewing cluster summary information

Complete the steps in this procedure to view summary information about a cluster including information about the associated quorum for the cluster.

1. In the Rapid Recovery Core Console, under Protected Machines, click the cluster you want to view.

   The Summary page for the machine appears.

2. On the Summary page, you can view such information as the cluster name, cluster type, quorum type (if applicable), and the quorum path (if applicable). This page also shows at-a-glance

information about the volumes in this cluster, including size and protection schedule. If applicable, you can also view SQL Server or Exchange Server information for a different cluster.

3. To view the most current information, click **Refresh**.

For information about viewing summary and status information for an individual machine or node in the cluster, see Viewing protected machines.

Configuring machine settings

Once you have added machines for protection in Rapid Recovery, you can easily view and modify the settings that govern the behavior of that protected machine. When you modify settings for a specific machine, those settings supersede the behavior set at the Core level.

You can view and configure the following machine settings in the Rapid Recovery Core Console:

- **General**. General machine configuration settings include display name, host name, port, encryption key, and repository. For information about configuring general settings for a machine, see Viewing and modifying protected machine settings.
- **Nightly jobs**. The subset of Core nightly job settings that appear for a specific protected machine allow you to supersede nightly job settings set at the Core level. This includes rollup, which lets you manage the retention policy. Some settings may differ based on the type of machine that is protected.
- **Transfer settings.** Settings specific to managing data transfer processes for the selected protected machine. For information about the types of data transfer affected by these settings, see About modifying transfer settings.
- **Excluded writers**. These settings let you exclude writers. These are machine-specific. A writer is a specific API published my Microsoft to allow other software components to participate in using Microsoft Volume Shadow Services (VSS). Each of the writers in Rapid Recovery that participate in volume snapshots are listed in the Excluded Writers settings. In the event that a writer is interfering with or precluding successful backup transfers, these can be disabled one by one. Dell recommends leaving these settings alone, unless you are otherwise directed by a Dell Support representative.
- **License details**. These are details about the license for the specific protected machine. These settings report information from the Core and the Dell Data Protection | Rapid Recovery License Portal. These settings are read-only. To change these settings, update your license information between the Core and the license portal. See your license administrator for details. For more information, see the *Dell Data Protection | Rapid Recovery License Portal User Guide*.

The procedure for viewing or changing machine-level settings is identical for general, excluded writers, and license details. For more information, see Viewing and modifying protected machine settings.

The procedure for modifying nightly jobs for a machine is different. For information about configuring nightly job settings for a machine, see Customizing nightly jobs for a protected machine.

In some cases, you may want to adjust the data transfer rate for a protected machine. For more information, see About modifying transfer settings.

Viewing and modifying protected machine settings

Machine settings help determine the behavior of a machine protected by the Core. When you modify settings for a specific machine, those settings supersede the behavior set at the Core level.

Complete the steps in this procedure to view and modify general settings, transfer settings, settings for excluded writers, and licensing settings for a protected machine.

NOTE: To view and modify nightly job settings, see Customizing nightly jobs for a protected machine.

This task is also a step in the Modifying cluster node settings.

1. In the Rapid Recovery Core Console, under the Protected Machines menu, click the IP address or machine name for the machine for which you want to view or modify configuration settings.

   The **Summary** page for the selected machine appears.
2. Click the **Settings** menu.

   The **Settings** page appears, showing settings for the selected machine. Optionally, to display setting categories from anywhere on the page, click the appropriate hyperlink on the left side of the page.

   When you click on a setting you want to change, that setting becomes editable as a text field or a drop-down menu.

   For each setting, when satisfied with your changes, click ✓ to save the change and exit edit mode, or click ✖ to exit edit mode without saving.
3. To modify general settings for a protected machine, click the appropriate setting, and then enter the configuration information as described in the following table.

Table 69. General settings for a protected machine

Text Box	Description
Display Name	Enter a display name for the machine. This is the name that displays for a protected machine in the Rapid Recovery Core Console. You can enter up to 64 characters. By default, this is the host name of the machine. You can change this to something more user-friendly if needed. Do not use prohibited characters or prohibited phrases .
Host Name	Enter a host name for the machine.
Port	Enter a port number for the machine. The port is used by the Rapid Recovery Core service to communicate with this machine. The default port is 8006.
Encryption Key	If you want an encryption key that is already defined for this Rapid Recovery Core to be applied to the data for every volume on this protected machine, you can specify the encryption key here. The key must be unlocked. If no encryption keys exist, you can add an encryption key. For more information on managing encryption keys, see Managing encryption keys. If the volumes on this protected machine are encrypted, you can change to a different encryption key. Alternatively, you can disassociate an encryption key by selecting **(none)** from the **Encryption key** drop-down menu. NOTE: After you apply an encryption key, change an encryption key, or disassociate an encryption key for a protected machine, Rapid Recovery takes a new base image upon the next scheduled or forced snapshot.
Repository	Select a repository for the recovery points. Displays the repository configured on the Rapid Recovery Core in which to store the data from this machine. The repository volume can be local (on storage attached to the Core server), or on a volume on a CIFS shared location.

Text Box	Description
	NOTE: The Repository setting on this page can only be changed if there are no recovery points or if the previous repository is missing.

4. To modify nightly job settings for a protected machine, see Customizing nightly jobs for a protected machine.
5. To modify Exchange settings for a protected Exchange server, in the Exchange Server Settings section, click **Enable automatic mountability check**, and do the following:

   - To enable automatic mountability checks, select the check box, and then click ✓.
   - To disable automatic mountability checks, clear the check box, and then click ✕.

   For more information about automatic mountability checks, see About Exchange database mountability checks.
6. To modify transfer settings for a protected machine, click the appropriate setting, and then enter the configuration information as described in the following table.

   NOTE: For conceptual information about transfer settings, see About modifying transfer settings.

Table 70. Transfer Settings for a protected machine

Text Box	Description
↶ Restore Default	This control restores all transfer settings to the system default settings.
Priority	Sets the transfer priority between protected machines. Enables you to assign priority by comparison with other protected machines. Select a number from 1 to 10, with 1 being the highest priority. The default setting establishes a priority of 5. NOTE: Priority is applied to transfers that are in the queue.
Maximum Concurrent Streams	Sets the maximum number of TCP links that are sent to the Core to be processed in parallel per protected machine, for machines protected in a DVM repository. NOTE: Dell recommends setting this value to 8. If you experience dropped packets, try increasing this setting.
Maximum Concurrent Writes	Sets the maximum number of simultaneous disk write actions per protected machine connection. NOTE: Dell recommends setting this to the same value you select for Maximum Concurrent Streams. If you experience packet loss, set slightly lower—for example, if Maximum Current Streams is 8, set this to 7.
Use Core Default Maximum Retries	Select this option to use default retries number for each protected machine, if some of the operations fail to complete.

Text Box	Description
Maximum Segment Size	Specifies the largest amount of data, in bytes, that a computer can receive in a single TCP segment. The default setting is 4194304. Do not change this setting from the default unless directed to do so by a Dell Support representative.
Maximum Transfer Queue Depth	Specifies the amount of commands that can be sent concurrently. The default setting is 64. You can adjust this to a higher number if your system has a high number of concurrent input/output operations.
Outstanding Reads per Stream	Specifies how many queued read operations will be stored on the back end. This setting helps to control the queuing of protected machines. The default setting is 0.
Transfer Data Server Port	Sets the port for transfers. The default setting is 8009.
Transfer Timeout	Specifies in minutes and seconds the amount of time to allow a packet to be static without transfer.
Snapshot Timeout	Specifies in minutes and seconds the maximum time to wait to take a snapshot.
Snapshot Cleaning Timeout	Specifies in minutes and seconds the maximum time for process of deleting VSS snapshot on a protected machine.
Network Read Timeout	Specifies in minutes and seconds the maximum time to wait for a read connection. If the network read cannot be performed in that time, the operation is retried.
Network Write Timeout	Specifies the maximum time in seconds to wait for a write connection. If the network write cannot be performed in that time, the operation is retried.

7. To modify settings for excluded writers, click the appropriate setting, and then enter the configuration information as described in the following table.

Table 71. Excluded Writers settings for a protected machine

Text Box	Description
Excluded Writers	Select a writer if you want to exclude it. Since the writers that appear in the list are specific to the machine you are configuring, you will not see all writers in your list. For example, some writers you may see include: • ASR Writer • COM+ REGDB Writer • Performance Counters Writer • Registry Writer • Shadow Copy Optimization Writer • SQLServerWriter • System Writer • Task Scheduler Writer • VSS Metadata Store Writer

Text Box	Description
	• WMI Writer

8. License details for a protected machine are read-only. License detail information is described in the following table.

Table 72. License details for a protected machine

Text Box	Description
Expiration Date	Indicates the expiration date of the license for the selected protected machine.
License Status	Indicates the current status of the license for the selected protected machine.
License Type	Indicates the type of the license for the selected protected machine.
Agent type	Indicates if the current protected machine is a physical or virtual agent.

Changing the settings for a Hyper-V host or node

This procedure applies to Hyper-V hosts or nodes that use Rapid Recovery Rapid Snap for Virtual (agentless protection) to protect virtual machines (VMs) .

A Hyper-V host that is using Rapid Snap for Virtual (agentless protection) to protect VMs is indicated in the left navigation area by the host icon . The settings for a Hyper-V host with VMs that are protected agentlessly are not the same as a typical protected machine. All changes made to the settings for a host apply to the VMs on that host.

1. On the Core Console, under Protected Machines in the left navigation area, click the Hyper-V host whose settings you want to change.

   The **Summary** page for the host opens.
2. On the menu bar for the host, click **Settings**.

   The **Settings** page opens.
3. Under **General**, click the setting you want to change.

   The setting you selected becomes editable, as a text field or a drop-down menu.
4. Enter the configuration information as described in the following table.

   Table 73. General settings information

Text Box	Description
Display Name	The name that displays for a protected machine in the Rapid Recovery Core Console. You can enter up to 64 characters. By default, it is the host name of the machine. You can change the display name to something more user-friendly if needed. Do not use prohibited characters or prohibited phrases .
Host Name	The name of the protected machine as it appears in the machine's metadata. NOTE: Do not change this setting, as doing so could break the connection between the protected machine and the Core.

5. Under **Transfer Queue**, to change the number of transfer jobs that can occur on the host at one time, click the setting for **Maximum concurrent transfers**.

   NOTE: For best performance, it is recommended that the maximum concurrent transfers for the Hyper-V host or node be set to 1, which is the default setting.
6. Under **Nightly Jobs**, to change the settings for the available nightly jobs, click **Change**.

   The **Nightly Jobs** windows appears.

7. Enter the configuration information as described in the following table.

Table 74. Nightly Jobs settings information

Text Box	Description
Clear orphaned registry keys on protected Hyper-V host	Removes the unnecessary files from the registry that result from attaching and detaching virtual disks during data transfers.
Check integrity of recovery points	Conducts an integrity check of each recovery point created for the virtual machines on the Hyper-V host.

8. Click **OK**.
9. Under **Auto Protection**, to determine whether to automatically protect new virtual machines when they are added to the Hyper-V host, click the setting for **Auto protect new virtual machines**.

Changing the settings for a Hyper-V protected virtual machine

This procedure applies to Hyper-V virtual machines (VMs) that are protected using Rapid Recovery Rapid Snap for Virtual (agentless protection).

A Hyper-V VM that is being protected by Rapid Snap for Virtual (agentless protection) is indicated in the left navigation area by the host icon 🖥. The settings for a Hyper-V agentless VM the same as a typical protected machine with the exception of the Hyper-V section at the bottom of the **Settings** page. The following task provides instructions for only the **Hyper-V** section settings. For all other protected machine settings, see Viewing and modifying protected machine settings.

1. On the Core Console, in the left navigation area under **Protected Machines**, click the Hyper-V VM whose settings you want to change.

   The **Summary** page for the VM opens.
2. On the menu bar for the host, click **Settings**.

   The **Settings** page opens.
3. In the list on the left side, click **Hyper-V**.

   The setting you selected becomes editable, as a text field or a drop-down menu.
4. Under **Hyper-V**, click **Snapshot configuration**.

   The setting you selected becomes editable a drop-down menu.
5. From the drop-down menu, select one of the options described in the following table.

Table 75. Hyper-V settings information

Text Box	Description
Try to create VSS snapshot during transfer first, if it fails, create a checkpoint	If the VSS snapshot succeeds, the recovery point will be in an application-consistent state. If the VSS snapshot fails and a checkpoint is created, the recovery point will be in a crash-consistent state.
Do not create VSS snapshot during transfer	Generates a recovery point in a crash-consistent state.
Use only VSS snapshots during transfers. If VSS snapshot	Generates only application-consistent recovery points. If the VSS snapshot fails, no recovery point is generated.

Text Box	Description
creation fails, the entire transfer will fail	

Changing the vSphere settings for a VMware protected virtual machine

This procedure applies to VMware ESXi or Workstation virtual machines (VMs) that are protected using Rapid Recovery Rapid Snap for Virtual (agentless protection).

The settings for a VMware VM that is protected agentlessly include the same settings that are used for a typical protected machine, with one exception. The **vSphere** section of the **Settings** page includes settings that apply only to agentlessly protected VMware VMs. The following task provides instructions for only the **vSphere** section of the **Settings** page. For all other protected machine settings, see Viewing and modifying protected machine settings.

1. On the Core Console, under Protected Machines in the left navigation area, click the Hyper-V host whose settings you want to change.

   The **Summary** page for the host opens.
2. On the menu bar for the host, click **Settings**.

   The **Settings** page opens.
3. In the list on the left side, click **vSphere**.

   The setting you selected becomes editable, as a text field or a drop-down menu.
4. Under **vSphere**, click the setting that you want to change.

   The setting you selected becomes editable, as a text field or a drop-down menu.
5. Enter the configuration information as described in the following table.

Table 76. vSphere settings information

Text Box	Description
Allow Rapid Recovery to delete user created VMware	The default setting is No.
Allow transfer for volumes with invalid used capacity	The default setting is Yes.
Allow quiesced snapshots	The default setting is Yes.

About modifying transfer settings

In Rapid Recovery, you can modify the settings to manage the data transfer processes for a protected machine. The transfer settings described in this section are set at the protected machine level. To affect transfer at the Core level, see Modifying transfer queue settings.

Rapid Recovery supports Windows 8 and Windows Server 2012 for normal transfers, both base and incremental, as well as with restore, bare metal restore, and virtual machine export.

There are three types of transfers in Rapid Recovery:

- **Snapshot.** Backs up the data on your protected machine. Two types of snapshots are possible: a base image of all protected data, and an incremental snapshot for data updated since the last snapshot. This type of transfer creates recovery points, which are stored on the repository associated with the Core. For more information, see Managing snapshots and recovery points.
- **Virtual Machine Export**. Creates a virtual machine (VM) from a recovery point, containing all of the data from the backup of the protected machine, as well the operating system and drivers and associated data to ensure the VM is bootable. For more information, see VM export.

- **Restore**. Restores backup information to a protected machine. For more information, see About restoring volumes from a recovery point.

  NOTE: The entire volume is always rewritten during restore of Windows systems using EFI system partitions.

Data transfer in Rapid Recovery involves the transmission of a volume of data along a network from protected machines to the Core. In the case of replication, transfer also occurs from the originating or source Core to the target Core.

Data transfer can be optimized for your system through certain performance option settings. These settings control data bandwidth usage during the process of backing up protected machines, performing VM export, or performing a restore. These are some factors that affect data transfer performance:

- Number of concurrent agent data transfers
- Number of concurrent data streams
- Amount of data change on disk
- Available network bandwidth
- Repository disk subsystem performance
- Amount of memory available for data buffering

You can adjust the performance options to best support your business needs and fine-tune the performance based on your environment. For more information, see Throttling transfer speed.

Throttling transfer speed

When transferring backup data or replicated recovery points between protected machines and Cores over the network, you can intentionally reduce the speed of the transfer. This process is known as throttling.

When you throttle the transfer speed, you limit the amount of your network bandwidth dedicated to file transfers from Rapid Recovery. When setting up replication, for example, throttling can reduce the likelihood that the transfer of prior recovery points to the replicated Core consumes all of your network bandwidth.

CAUTION: Throttling transfer speed is not always required or recommended. This information is provided to provided insight into a potential solution for performance issues in your Rapid Recovery environment. For example, sometimes, throttling may solve issues related to repeated transfer failures or network slowdowns caused by transferring a substantial amount of data for your protected or replicated Cores.

There are several factors involved in determining the best approach to throttling. The type of machine being protected is a key factor. For example, a busy Microsoft Exchange server has a much higher change rate than a seldom-used legacy web server.

The input and output capabilities of the storage volumes on your protected machines can also contribute to more or less efficiency.

The speed of your network is another critical factor, with many variables. The network backbone in place (for example, 1GbE versus 10GbE), architecture, configuration, intentional use of NIC teaming, and even the type of cables used can all affect network transfer speed. If your environment has a slower wide area network, and if transfer jobs fail for backup or replication, consider throttling the transfer speed using some of these settings.

Ultimately, the process of network throttling involves trial and error. Dell recommends that you adjust and test your transfer settings, and revisit these settings periodically to ensure that your settings continue to meet your needs.

Adjusting transfer speed should be accomplished on an individual machine basis. In the Core Console, navigate to a specific machine, select Settings, and adjust the Transfer speed. For specific information about viewing and changing these settings, see Viewing and modifying protected machine settings. That topic also includes descriptions of each of the settings used for throttling transfer. Those descriptions may be useful in determining which settings you should experiment with first.

The four main settings involved in throttling transfer speed are described in the following table:

Table 77. Protected machine settings used to throttle transfer speed

Machine-Level Setting	Default Setting	Suggested Throttling Setting
Maximum Concurrent Streams	8	4
Maximum Concurrent Writes	8	4
Maximum Segment Size	4194304	2097152
Outstanding Reads per Stream	0	Start at 24

Dell recommends adjusting and testing the other settings prior to changing the default setting for outstanding reads per stream, unless directed otherwise by a Dell Support representative. When tuning and testing this setting, start with a value of 24.

When you specify limitations to protected machine transfer parameters, these limitations apply per job. If two transfer jobs occur simultaneously or overlap, twice the bandwidth is used. If four transfer jobs across the network overlap, four times the bandwidth is used; and so on.

Customizing nightly jobs for a protected machine

Nightly jobs can be configured at the Core level and the machine level on the appropriate Configuration tab. When nightly job settings are set at the Core level, the changes are applied to all relevant machines protected by that Core. Changes made to the nightly jobs at the machine level supersede the changes made at the Core level, only for the machines specified.

For a list of all nightly jobs, including descriptions and the scope available for each, see the topic Understanding nightly jobs.

Complete the steps in the following procedure to make changes to the nightly jobs for a single protected machine.

1. In the Rapid Recovery Core Console, under the Protected Machines menu, click the IP address or machine name for the machine for which you want to customize nightly jobs.

   The **Summary** page for the selected machine appears.
2. Click the **Settings** menu.

   The **Settings** page appears, showing configuration settings for the selected machine.
3. Optionally, click the **Nightly Jobs** link to scroll down in the Settings page to view nightly jobs settings.
4. Under the Nightly Jobs heading, click ✎ **Change**.

The **Nightly Jobs** dialog box appears.

NOTE: For information about the Rollup setting, including setting a custom retention policy, see Customizing retention policy settings for a protected machine.

5. In the **Nightly Jobs** dialog box, select the jobs you want to include to run nightly, or clear the options you want to omit for this machine.

   NOTE: Options may vary by machine. For example, a protected machine using Exchange Server may include Check checksum of Exchange databases and Truncate Exchange logs.

6. Click **OK**.

   NOTE: The results of this procedure apply only to the selected protected machine. To apply elsewhere, repeat the procedure for each machine you want to customize. To change the nightly job settings for all machines protected by a Core, see Configuring nightly jobs for the Core.

Viewing system information for a protected machine

The Rapid Recovery Core Console provides you with easy access to system information about the machines protected on your Core.

The **General** pane includes general information about the Core machine and environment. The **Volumes** pane lists information about the storage volumes on the Core machine. The **Replay Engine Connections** pane displays , volumes all of the machines that are being protected.

Complete the steps in this procedure to view detailed system information for a protected machine.

1. Navigate to the Rapid Recovery Core Console, and from the protected machines menu in the left navigation area, click a protected machine name.

   The **Summary** page appears for the selected protected machine.

2. On the **Summary** page, at the bottom of the **Summary** pane, click **System Information**.
3. On the **System Information page**, you can view the following details about the selected protected machine.
   - **System Information.** This includes Host Name, OS Version, OS Architecture, Memory (Physical), Display Name, Fully Qualified Domain Name, Cache metadata location, Primary cache location, Secondary cache location, and Virtual Machine Type (if applicable).
   - **Volumes**. This includes the Volume Name, Device ID, File System, Formatted Capacity, Used Capacity, and Mount Points.
   - **Processors**. This includes the Architecture and Number of Cores.
   - **Network Adapters**. This includes the Adapter Type and Speed.
   - **IP Addresses**. This includes the IP Address and Family.

Managing machines

This section describes a variety of tasks you can perform in managing your machines. Topics include:

- Removing a machine
- Removing a cluster from protection
- Viewing license information on a machine
- Downloading and viewing the log file for a protected machine
- Converting a protected cluster node to a protected machine

Removing a machine

When you remove a machine from protection on the Rapid Recovery Core, you are presented with two options: you can keep the recovery points saved thus far to the RR Core, or you can remove the recovery points. If you keep the recovery points, you have what is known as a "recovery points only" machine. Using those recovery points for the machine that has been removed from current protection, you can continue to restore the machine in the future, but only up to the state captured in a saved recovery point.

If you remove the recovery points, this action deletes any snapshot data for that formerly protected machine from the Rapid Recovery Core.

⚠ **CAUTION: If you delete recovery points, you will no longer be able to restore data for that machine.**

Complete the steps in the following procedure to remove a machine from protection in your Rapid Recovery environment.

1. From the Rapid Recovery Core Console, in the left navigation pane under Protected Machines, click the machine you want to remove.
2. On the Summary page for the relevant machine, click **Remove Machine**.
3. In the dialog box, if you want to also delete all recovery points for this machine from the repository, select **Remove with recovery points**.
4. To confirm your choice to remove the machine, click **Yes**.

   Rapid Recovery removes the machine from protection and cancels all active tasks for that machine.

Removing a cluster from protection

Complete the steps in the following procedure to remove a cluster from protection.

1. In the Rapid Recovery Core Console, under Protected Machines, click the cluster you wish to remove.
2. On the Summary page for the cluster, click **Remove Cluster**.
3. Optionally, in the dialog box, to remove all currently stored recovery points for this cluster from the repository, select **Remove with recovery points**.
4. In the dialog box, click **Yes** to confirm.

Removing cluster nodes from protection

Complete the steps in the following procedures to remove cluster nodes from protection.

If you just want to remove a node from the cluster, see Converting a protected cluster node to a protected machine.

1. In the Rapid Recovery Core Console, under Protected Machines, click the cluster node that you want to remove.
2. On the Summary page for the node, click **Remove Machine**.

   The Remove Node dialog box appears.
3. Optionally, in the dialog box, to remove all currently stored recovery points for this cluster from the repository, select **Remove with recovery points**.
4. In the dialog box, click **Yes** to confirm.

Removing all nodes in a cluster from protection

Complete the steps in this procedure to remove all nodes in a cluster from protection.

CAUTION: If you remove all cluster nodes, the cluster is also removed.

1. In the Rapid Recovery Core Console, under Protected Machines, click the cluster whose nodes you want to remove.
2. On the Summary page for the cluster, click **Protected Nodes**.
3. On the Protected Nodes page, select all of the nodes.
4. Click the **Remove Machines** drop-down menu, and then select one of the options described in the following table.

Table 78. Remove Nodes options

Option	Description
Remove and Keep Recovery Points	To keep all currently stored recovery points for this cluster.
Remove Recovery Points	To remove all currently stored recovery points for this cluster from the repository.

5. In the Delete Nodes dialog box, click **Yes** to confirm.

Viewing license information on a machine

You can view current license status information for the Rapid Recovery Agent software installed on a protected machine.

1. From the Rapid Recovery Core Console, under Protected Machines , click the machine that you want to modify.

   The **Summary** page for the selection machine appears.
2. Click the **Settings** menu.

   The **Settings** page appears, showing configuration settings for the selected machine.
3. Click the **Licensing** link to scroll down in the Settings page to view machine-specific licensing settings.

   The Status screen appears and presents details about the product licensing.

Downloading and viewing the log file for a protected machine

If you encounter any errors or issues with a protected machine, you can download the machine logs to view them or to share them with your Dell Support representative.

1. In the left navigation area of the Core Console, under the Protected Machines menu, click the arrow to expand the context-sensitive menu for the relevant protected machine. Scroll down to **More**, expand that menu, and then select **Agent Log**.

   The **Download Agent Log** page appears.
2. On the **Download Agent Log** page, click **Click here to begin the download**.
3. In the **Opening AgentAppRecovery.log** dialog box, do one of the following:
   - To open the log file, select **Open with**, then select an application (such as Notepad) for viewing the text-based log file, and finally click **OK**.

     The AgentAppRecovery.log file opens in the selected application.
   - To save the file locally, select **Save File** and then click **OK**.

     The AgentAppRecovery.log file saves to your Downloads folder. It can be opened using any text editor.

Related links

Downloading and viewing the Core log file

Converting a protected cluster node to a protected machine

In Rapid Recovery, you can convert a protected cluster node to a protected machine so that it is still managed by the Core, but it is no longer part of the cluster. This is helpful, for example, if you need to remove the cluster node from the cluster but still keep it protected.

1. In the Rapid Recovery Core Console, navigate to the cluster that contains the machine you wish to convert, and then click **Protected Nodes**.
2. On the **Protected Nodes** page, from the specific node you want to convert, click the Actions drop-down menu and select **Convert to Agent**.
3. To add the machine back to the cluster, select the machine, and then on the Summary page, from the Actions menu, select **Convert to Cluster Node**, and then click **Yes** to confirm the action.

Understanding custom groups

The Rapid Recovery Core Console shows a Protected Machines menu in the left navigation area. This includes all machines or server clusters added to protection on your Rapid Recovery Core. Beneath this, other menus may appear, based on whether you include those objects in your Core. In the same manner, you can create a custom group, which displays as the last menu type in the left navigation area.

The main benefit of a custom group is the ability to group Core objects together in a logical container. This can help you organize and manage Core objects for a specific purpose (for example, by organization, cost center, department, geographical region, and so on).

The act of creating a group always adds one group member (for example, a protected machine or server cluster, a replicated machine, or a recovery points-only machine) to the new custom group. The object added is determined by your origin point when you create the group. Ideally, you would then add additional members to the group. Thereafter, you can perform group actions that apply to all like members of that custom group, as described in Performing group actions.

Custom groups can include protected machines, server clusters, replicated machines, and recovery point-only machines. Server clusters behave the same as protected machines, with the exception that a server cluster and its nodes behave as a single entity. If you attempt to add a node from a server cluster to a group, the entire cluster is added.

A custom group may contain similar or dissimilar members. For groups of similar members, all group actions apply to all members of the group. For example, if you force a snapshot for a custom group of protected machines, each machine will be backed up. For groups with dissimilar members (for example, protected machines and replicated machines), if you apply a group action such as forcing replication, this will only apply to the replicated machines.

You can create one or more groups. A single protected machine or replicated machine can be included in one or more groups. This way, you can group machines on your core in any way you choose, and can perform actions on that specific group.

Each custom group appears in the left navigation area, with a label you designate. Groups with standard protected machines appear first in the custom group; replicated machines appear below protected machines, as applicable. If there are any recovery point-only machines, these are listed below replicated machines.

In the left navigation area, the objects that are protected on the Core appear each in their own menu. Of these menus, custom groups appear last.

Including a machine in a group does not remove it from its original location. For example, if you have three protected machines called Agent1, Agent2, and Agent3, and you add Agent1 to CustomGroup1, then Agent1 appears in both locations.

For more information, see the following topics:

- Modifying custom group names
- Removing custom groups
- Performing group actions
- Viewing all machines in a custom group on one page

Creating custom groups

When you scroll your cursor over the name of any machine in the Protected Machines or replicated machines menu, you will see an arrow that opens a drop-down menu. From this menu, you can create a custom label.

Use the procedure below to create a custom group.

1. Navigate to the Rapid Recovery Core Console.
2. From the Protected Machines, replicated machines, or recovery points-only menu, do the following:
   a. Place your cursor over a machine in the menu.
   b. Click on the drop-down menu for that machine.
   c. Scroll down and select **Label as**, and then click **New label**.

   The **Create Label** dialog box appears.
3. In the **Name** field, enter an appropriate label for your custom group.

   Use a descriptive name that communicates the purpose of the group. For example, to group protected machines, replicated machines, and recovery point-only machines by department, type `Accounting Department`. You can rename a group later.

   NOTE: Labels must be 50 or fewer characters. You can include a single space between words. You must provide a label for your custom group.
4. When you are satisfied with the label name, click **OK**.

   The dialog box closes, and the custom group appears as the last element in the left navigation area.
5. Optionally, you can add other protected machines, replicated machines, or recovery point-only machines to this group. Navigate to the machine name in the appropriate menu, click its drop-down menu, scroll down and select **Label as**, and then click the name of the custom group.

   You can now perform group actions on this group. For more information, see Performing group actions.

Modifying custom group names

When you modify the name of a custom group, only the label changes. The machine names remain the same.

Use the procedure below to modify a custom group name.

1. Navigate to the Rapid Recovery Core Console.
2. In the Protected Machines menu, scroll your cursor over the custom group you want to modify.

3. Click on the drop-down menu for that group, and then click **Edit**.

   The **Edit Label** dialog box appears, within which the name of the custom group becomes editable.
4. In the **Name** field, update the text, or delete the existing label text and type a new label or your custom group.

   Use a descriptive name that communicates the purpose of the group. For example, to group protected machines, replicated machines, and recovery point-only machines by geographic region, type `Tokyo`. You can rename a group later.

   NOTE: Labels must be 50 or fewer characters. You can include a single space between words. You must provide a label for your custom group.
5. When you are satisfied with the label name, click **OK**.

   The dialog box closes, and the modified custom group appears as the last element in the left navigation area.
6. Optionally, you can add other protected machines, replicated machines, or recovery point-only machines to this group. Navigate to the machine name in the appropriate menu, click its drop-down menu, scroll down and select **Label as**, and then click the name of the custom group.

Removing custom groups

When you remove a custom group, you delete that group from the Protected Machines menu. The machines that were in the group are not removed, and can still be found in the appropriate standard menu.

Use the procedure below to remove a custom group.

1. Navigate to the Rapid Recovery Core Console.
2. In the Protected Machines menu, scroll your cursor over the custom group you want to remove.
3. Click on the drop-down menu for that group, and then click **Remove label**.

   You see a message asking to confirm the removal of the group.
4. Confirm the removal of the custom group.

   The dialog box closes, and the custom group is removed from the navigation area.

Performing group actions

You can perform group actions on any group appearing in the left navigation area of the Rapid Recovery Core Console. If the group contains dissimilar members (for example, replicated machines and recovery points-only machines), then the actions you request will only be performed on the relevant group members.

Use the procedure below to perform group actions on a custom group.

1. Navigate to the Rapid Recovery Core Console.
2. In the Protected Machines menu, scroll your cursor over the custom group for which you want to perform a group action.
3. Click on the drop-down menu for that group, and then select an action as follows:
   - To force an incremental snapshot or base image for all of the protected machines in the group, click **Force Snapshot** or **Force Base Image**, as appropriate. For more information, see Forcing a snapshot.
   - To pause protection for all of the protected machines in the group,, click **Pause Protection** and then specify resumption parameters. For more information, see Pausing and resuming replication.
   - To resume protection for all of the protected machines in the group for which protection has been paused, click **Resume Protection** and then confirm that you want to resume. For more information, see Pausing and resuming replication.

- To refresh the information for all of the objects in the group, click **Refresh Metadata**.
- To pause replication for all replicated machines in this group, under Replication, click **Pause**. For more information, see Pausing and resuming replication.
- To resume replication for all replicated machines in this group for which replication has been paused, under Replication, click **Resume**. For more information, see Pausing and resuming replication
- To force replication for all replicated machines in this group, under Replication, click **Force**. For more information, see Forcing replication.
- To remove replication for all replicated machines in this group, under Replication, click **Remove**. For more information, see Removing incoming replication from the target Core.
- To remove recovery points-only machines from this Core and discard the recovery points, under Recovery Points Only, click **Remove Recovery Points**.
- For custom groups only, to modify the label for the custom group, select **Edit**. For more information, see Modifying custom group names.
- For custom groups only, to remove the custom group from the navigation menu, select **Remove label**. For more information, see Removing custom groups.

Viewing all machines in a custom group on one page

Clicking the name of a custom group takes you to a Machines page that lists all the machines in that custom group. You can then perform some functions on all machines from the Actions menu, or you can perform functions individually by selecting commands from each individual machine.

About protecting multiple machines

You can add two or more Windows machines for protection on the Rapid Recovery Core simultaneously using the Protect Multiple Machines Wizard. To protect your data using Rapid Recovery, you need to add the workstations and servers for protection in the Rapid Recovery Core Console; for example, your Exchange server, SQL Server, Linux server, and so on.

As with protecting individual machines, protecting multiple machines simultaneously requires you to install the Rapid Recovery Agent software on each machine you want to protect.

NOTE: As an exception to this rule, if protecting virtual machines on a VMware or ESXi host, you can use agentless protection. For more information, including restrictions for agentless protection, see Understanding Rapid Snap for Virtual.

Protected machines must be configured with a security policy that makes remote installation possible.

To connect to the machines, they must be powered on and accessible.

There is more than one method to deploy the Agent software to multiple machines simultaneously. For example:

- You can install the Rapid Recovery Agent software to multiple machines using the Deploy Agent Software Wizard. For more information, see Deploying the Rapid Recovery Agent software to one or more machines.
- You can deploy the Rapid Recovery Agent software as part of Protect Multiple Machines Wizard.

The process of protecting multiple machines includes optional steps that you can access if you select an advanced configuration. Advanced options include repository functions and encryption. For example, you can specify an existing Rapid Recovery repository to save snapshots, or you can create a new repository. You can also specify an existing encryption key (or add a new encryption key) to apply to the data saved to the Core for the machines you are protecting.

The workflow of the Protect Multiple Machines Wizard may differ slightly based on your environment. For example, if the Rapid Recovery Agent software is installed on the machines you want to protect, you are not prompted to install it from the wizard. Likewise, if a repository already exists on the Core, you are not prompted to create one.

When protecting multiple machines, follow the appropriate procedure, based on your configuration. See the following options for protecting multiple machines:

- Protecting multiple machines on an Active Directory domain
- Protecting multiple machines on a VMware vCenter/ESX(i) virtual host
- Protecting multiple machines manually

Protecting multiple machines on an Active Directory domain

Use this procedure to simultaneously protect one or more machines on an Active Directory domain.

1. On the Rapid Recovery Core Console, click the **Protect** drop-down menu, and then click **Protect Multiple Machines**.

   The Protect Multiple Machines Wizard opens.
2. On the **Welcome** page of the wizard, select one of the following options:
   - Typical
   - Advanced (show optional steps)
3. Click **Next**.
4. On the **Connection** page of the wizard, from the **Source** drop-down list, select **Active Directory**.
5. Enter the domain information and logon credentials as described in the following table.

   Table 79. Domain information and credentials

Text Box	Description
Host	The host name or IP address of the Active Directory domain.
User name	The user name used to connect to the domain; for example, Administrator or, if the machine is in a domain, [domain name]\Administrator).
Password	The secure password used to connect to the domain.

6. Click **Next**.
7. On the **Select Machines** page of the wizard, select the machines you want to protect.

   The system automatically verifies each machine you selected.
8. Click **Next**.

   If the **Protection** page appears next in the Protect Multiple Machines Wizard, skip to Step 11.

   If the Agent software is not yet deployed to the machines you want to protect, or if any of the machines you specified cannot be protected for another reason, then the selected machines appear on the Warnings page.
9. Optionally, on the **Warnings** page of the wizard, you can verify any machine by selecting the machine and then clicking **Verify** in the toolbar.
10. Optionally, on the **Warnings** page, select **After Agent installation, restart the machines automatically**.

    NOTE: Dell recommends this option. You must restart agent machines before they can be protected.
11. If the status indicates that the machine is reachable, click **Next** to install the Rapid Recovery Agent software.

    The **Protection** page appears.

12. On the **Protection** page of the wizard, select the appropriate protection schedule as described below.
    - If you want to use the default protection schedule, then in the Schedule Settings option, select **Default protection (hourly snapshots of all volumes)**.
    - If you want to define a different protection schedule, then in the Schedule Settings option, select **Custom protection** .
13. Proceed with your configuration as follows:
    - If you selected a Typical configuration for the Protect Machine Wizard and specified default protection, then click **Finish** to confirm your choices, close the wizard, and protect the machine you specified.

      The first time protection is added for a machine, a base image (that is, a snapshot of all the data in the protected volumes) will transfer to the repository on the Rapid Recovery Core following the schedule you defined, unless you specified to initially pause protection.
    - If you selected a Typical configuration for the Protect Machine Wizard and specified custom protection, click **Next** see Creating custom protection schedules.
    - If you selected Advanced configuration for the Protect Machine Wizard, and default protection, then click **Next** and proceed to Step 15 to see repository and encryption options.
    - If you selected Advanced configuration for the Protect Machine Wizard and specified custom protection, click **Next**, to set up a custom protection schedule. For details on defining a custom protection schedule, see Creating custom protection schedules.
14. Click **Next**.
15. On the **Repository** page of the wizard, do one of the following:
    - If you already have a repository and want to store the data from this machine for protection in the existing repository, then do the following:
      1. Select **Use an existing repository**.
      2. Select an existing repository from the list.
      3. Click **Next**.

      The **Encryption** page appears. Skip to Step 19 to optionally define encryption.
    - If you want to create a repository, select **Create a Repository**, and then complete the following steps.
      1. On the **Repository**, enter the information described in the following table.

         Table 80. Add New Repository settings

Text Box	Description
Repository Name	Enter the display name of the repository. By default, this text box consists of the word Repository and a number, which corresponds to the number of repositories for this Core. For example, if this is the first repository, the default name is Repository 1. Change the name as needed. Repository names must contain between 1 and 40 alphanumeric characters, including spaces. Do not use prohibited characters or prohibited phrases .
Concurrent Operations	Define the number of concurrent requests you want the repository to support. By default the value is 64.
Comments	Optionally, enter a descriptive note about this repository. You can enter up to 254 characters. For example, type **DVM Repository 2.**

      2. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.

⚠ **CAUTION: Define a dedicated folder within the root for the storage location for your repository. Do not specify the root location. For example, use E:\Repository\, not E:\. If the repository that you are creating in this step is later removed, all files at the storage location of your repository are deleted. If you define your storage location at the root, all other files in the volume (e.g., E:\) are deleted, which could result in catastrophic data loss.**

The **Add Storage Location** dialog box appears.

3. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.
4. In the **Storage Location** area, specify how to add the file for the storage location. You can choose to add a locally attached storage volume (such as direct attached storage, a storage area network, or network attached storage). You could also specify a storage volume on a Common Internet File System (CIFS) shared location.

   – Select **Add file on local disk** to specify a local machine, and then enter the information as described in the following table.

   Table 81. Local disk settings

Text Box	Description
Data path	Enter the location for storing the protected data. For example, type `X:\Repository\Data`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.
Metadata path	Enter the location for storing the protected metadata. For example, type `X:\Repository\Metadata`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.

   – Or, select **Add file on CIFS share** to specify a network share location, and then enter the information as described in the following table.

   Table 82. CIFS share credentials

Text Box	Description
UNC path	Enter the path for the network share location. If this location is at the root, define a dedicated folder name (for example, `Repository`). The path must begin with \\. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). The letters a to z are case-insensitive. Do not use spaces. No other symbols or punctuation characters are permitted.
User name	Specify a user name for accessing the network share location.
Password	Specify a password for accessing the network share location.

5. In the **Storage Configuration** area, click **More Details** and enter the details for the storage location as described in the following table.

Table 83. Storage configuration details

Text Box	Description
Size	Set the size or capacity for the storage location. The minimum size is 1 GB. The default is 250 GB. You can choose from the following: – GB – TB NOTE: The size that you specify cannot exceed the size of the volume. If the storage location is a New Technology File System (NTFS) volume using Windows XP or Windows 7, the file size limit is 16 TB. If the storage location is a NTFS volume using Windows 8, 8.1, Windows 10, or Windows Server 2012, 2012 R2, the file size limit is 256 TB. NOTE: For Rapid Recovery to validate the operating system, Windows Management Instrumentation (WMI) must be installed on the intended storage location.
Write caching policy	The write caching policy controls how the Windows Cache Manager is used in the repository and helps to tune the repository for optimal performance on different configurations. Set the value to one of the following: – On – Off – Sync If set to On, which is the default, Windows controls the caching. This is appropriate for Windows 10, and for versions of Windows Server 2012 and later. NOTE: Setting the write caching policy to On could result in faster performance. If you are using Windows Server 2008 SP2 or Windows Server 2008 R2 SP2, the recommended setting is Off. If set to Off, Rapid Recovery controls the caching. If set to Sync, Windows controls the caching as well as the synchronous input/output.
Bytes per sector	Specify the number of bytes you want each sector to include. The default value is 512.
Average bytes per record	Specify the average number of bytes per record. The default value is 8192.

6. Click **Next**.

If you chose the **Advanced** option in Step 1, the **Encryption** page appears.

16. Optionally, on the **Encryption** page of the wizard, to enable encryption, select **Enable Encryption**.

Encryption key fields appear on the Encryption page.

NOTE: If you enable encryption, it will be applied to data for all protected volumes for this machine.

You can change the settings later from the Encryption Keys page in the Rapid Recovery Core Console.

For more information about encryption, see the topic Understanding encryption keys.

CAUTION: Rapid Recovery uses AES 256-bit encryption in the Cipher Block Chaining (CBC) mode with 256-bit keys. While using encryption is optional, Dell highly recommends that you establish an encryption key, and that you protect the passphrase you define. Store the passphrase in a secure location as it is critical for data recovery. Without a passphrase, data recovery is not possible.

17. If you want to encrypt these protected machines using an encryption key that is already defined on this Rapid Recovery Core, select **Encrypt data using an existing Encryption key**, and select the appropriate key from the drop-down menu.

    Proceed to Step 19.

18. If you want to add a new encryption key to the Core and apply that key to these protected machines, then enter the information as described in the following table.

Table 84. Encryption key settings

Text Box	Description
Name	Enter a name for the encryption key. Encryption key names must contain between 1 and 130 alphanumeric characters. You may not include special characters such as the back slash, forward slash, pipe, colon, asterisk, quotation mark, question mark, open or close brackets, ampersand or hash.
Description	Enter a comment for the encryption key. This information appears in the Description field when viewing encryption keys from the Core Console.
Passphrase	Enter the passphrase used to control access. Best practice is to avoid special characters listed above. Record the passphrase in a secure location. Dell Support cannot recover a passphrase. Once you create an encryption key and apply it to one or more protected machines, you cannot recover data if you lose the passphrase.
Confirm Passphrase	Re-enter the passphrase you just entered.

19. Click **Finish** to save and apply your settings.

    The wizard closes.

20. If the **Warning** page appeared and you are still satisfied with your selections, click **Finish** again.

The Rapid Recovery Agent software is deployed to the specified machines, if necessary, and the machines are added to protection on the Core.

Protecting multiple machines on a VMware vCenter/ESX(i) virtual host

Use this procedure to simultaneously protect one or more machines on a VMware vCenter/ESX(i) virtual host.

⚠ **CAUTION: If you use agentless protection, Dell recommends that you limit protection to no more than 200 VMs at once. For example, do not select more than 200 VMs when using the Protect Multiple Machines Wizard. Protecting more than 200 VMs results in slow performance. There is no limit to how many VMs a Core can agentlessly protect over time. For example, you could protect 200 VMs today and another 200 VMs tomorrow.**

1. On the Rapid Recovery Core Console, click the **Protect** drop-down menu, and then click **Protect Multiple Machines**.

   The Protect Multiple Machines Wizard opens.
2. On the Welcome page, select one of the following options:
   - Typical
   - Advanced (show optional steps)
3. Click **Next**.
4. On the Connection page of the wizard, from the **Source** drop-down list, select **vCenter / ESX(i)**.
5. Enter the host information and logon credentials as described in the following table.

   Table 85. vCenter/ESX(i) connection settings

Text Box	Description
Host	The name or IP address of the VMware vCenter Server/ESX(i) virtual host.
Port	The port used to connect to the virtual host. The default setting is 443.
User name	The user name used to connect to the virtual host; for example, Administrator or, if the machine is in a domain, [domain name]\Administrator.
Password	The secure password used to connect to this virtual host.

   - To use agentless protection, select **Protect selected VMs Agentlessly**, and then see Protecting vCenter/ESXi virtual machines without the Rapid Recovery Agent.
6. On the Select Machines page, select one of the following options from the drop-down menu:
   - Hosts and Clusters
   - VMs and Templates
7. Expand the list of machines and select the VMs you want to protect.

   A notification appears if Rapid Recovery detects that a machine is offline or does not have VMware Tools installed.
8. Click **Next**.
9. On the Adjustments page, enter the credentials for each machine in the following format: `hostname::username::password`.

   NOTE: Enter one machine on each line.
10. Click **Next**.

    If the Protection page appears next in the Protect Multiple Machines Wizard, skip to Step 14.

If the Agent software is not yet deployed to the machines you want to protect, or if any of the machines you specified cannot be protected for another reason, then the selected machines appear on the Warnings page.

11. Optionally, on the Warnings page, you can verify any machine by selecting the machine and then clicking **Verify** in the toolbar.
12. Optionally, on the Warnings page, select **After Agent installation, restart the machines automatically**.

    NOTE: Dell recommends this option. You must restart agent machines before they can be protected.
13. If the status indicates that the machine is reachable, click **Next** to install the agent software.

    The Protection page appears.
14. On the Protection page, select the appropriate protection schedule as described below.
    - If you want to use the default protection schedule, then in the Schedule Settings option, select **Default protection (hourly snapshots of all volumes)**.
    - If you want to define a different protection schedule, then in the Schedule Settings option, select **Custom protection**.
15. Proceed with your configuration as follows:
    - If you selected a Typical configuration for the Protect Machine Wizard and specified default protection, then click **Finish** to confirm your choices, close the wizard, and protect the machine you specified.

      The first time protection is added for a machine, a base image (that is, a snapshot of all the data in the protected volumes) will transfer to the repository on the Rapid Recovery Core following the schedule you defined, unless you specified to initially pause protection.
    - If you selected a Typical configuration for the Protect Machine Wizard and specified custom protection, click **Next** to set up a custom protection schedule. For details on defining a custom protection schedule, see Creating custom protection schedules.
    - If you selected Advanced configuration for the Protect Machine Wizard, and default protection, then click **Next** and proceed to Step 17 to see repository and encryption options.
    - If you selected Advanced configuration for the Protect Machine Wizard and specified custom protection, then click **Next** to set up a custom protection schedule. For details on defining a custom protection schedule, see Creating custom protection schedules.
16. Click **Next**.
17. On the **Repository** page, do one of the following:
    - If you already have a repository and want to store the data from this machine for protection in the existing repository, then do the following:

      1. Select **Use an existing repository**.
      2. Select an existing repository from the list.
      3. Click **Next**.

      The **Encryption** page appears. Skip to Step 18 to optionally define encryption.
    - If you want to create a repository, select **Create a Repository**, and then complete the following steps.

      1. On the **Repository**, enter the information described in the following table.

Table 86. Add New Repository settings

Text Box	Description
Repository Name	Enter the display name of the repository.

Text Box	Description
	By default, this text box consists of the word Repository and a number, which corresponds to the number of repositories for this Core. For example, if this is the first repository, the default name is Repository 1. Change the name as needed. Repository names must contain between 1 and 40 alphanumeric characters, including spaces. Do not use prohibited characters or prohibited phrases .
Concurrent Operations	Define the number of concurrent requests you want the repository to support. By default the value is 64.
Comments	Optionally, enter a descriptive note about this repository. You can enter up to 254 characters. For example, type **DVM Repository 2.**

2. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.

   ⚠ **CAUTION: Define a dedicated folder within the root for the storage location for your repository. Do not specify the root location. For example, use E:\Repository\, not E:\. If the repository that you are creating in this step is later removed, all files at the storage location of your repository are deleted. If you define your storage location at the root, all other files in the volume (e.g., E:\) are deleted, which could result in catastrophic data loss.**

   The **Add Storage Location** dialog box appears.

3. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.

4. In the **Storage Location** area, specify how to add the file for the storage location. You can choose to add a locally attached storage volume (such as direct attached storage, a storage area network, or network attached storage). You could also specify a storage volume on a Common Internet File System (CIFS) shared location.

   – Select **Add file on local disk** to specify a local machine, and then enter the information as described in the following table.

   Table 87. Local disk settings

Text Box	Description
Data path	Enter the location for storing the protected data. For example, type `X:\Repository\Data`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.
Metadata path	Enter the location for storing the protected metadata. For example, type `X:\Repository\Metadata`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.

   – Or, select **Add file on CIFS share** to specify a network share location, and then enter the information as described in the following table.

Table 88. CIFS share credentials

Text Box	Description
UNC path	Enter the path for the network share location. If this location is at the root, define a dedicated folder name (for example, `Repository`). The path must begin with \\. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). The letters a to z are case-insensitive. Do not use spaces. No other symbols or punctuation characters are permitted.
User name	Specify a user name for accessing the network share location.
Password	Specify a password for accessing the network share location.

5. In the **Storage Configuration** area, click **More Details** and enter the details for the storage location as described in the following table.

Table 89. Storage configuration details

Text Box	Description
Size	Set the size or capacity for the storage location. The minimum size is 1 GB. The default is 250 GB. You can choose from the following: – GB – TB NOTE: The size that you specify cannot exceed the size of the volume. If the storage location is a New Technology File System (NTFS) volume using Windows XP or Windows 7, the file size limit is 16 TB. If the storage location is a NTFS volume using Windows 8, 8.1, Windows 10, or Windows Server 2012, 2012 R2, the file size limit is 256 TB. NOTE: For Rapid Recovery to validate the operating system, Windows Management Instrumentation (WMI) must be installed on the intended storage location.
Write caching policy	The write caching policy controls how the Windows Cache Manager is used in the repository and helps to tune the repository for optimal performance on different configurations. Set the value to one of the following: – On – Off – Sync If set to On, which is the default, Windows controls the caching. This is appropriate for Windows 10, and for versions of Windows Server 2012 and later. NOTE: Setting the write caching policy to On could result in faster performance. If you are using Windows Server 2008 SP2 or Windows Server 2008 R2 SP2, the recommended setting is Off. If set to Off, Rapid Recovery controls the caching. If set to Sync, Windows controls the caching as well as the synchronous input/output.

Text Box	Description
Bytes per sector	Specify the number of bytes you want each sector to include. The default value is 512.
Average bytes per record	Specify the average number of bytes per record. The default value is 8192.

6. Click **Next**.

If you chose the **Advanced** option in Step 1, the **Encryption** page appears.

18. Optionally, on the Encryption page, to enable encryption, select **Enable Encryption**.

    Encryption key fields appear on the Encryption page.

    NOTE: If you enable encryption, it will be applied to data for all protected volumes for this agent machine.

    You can change the settings later from the Configuration tab in the Rapid Recovery Core Console.

    For more information about encryption, see the topic Understanding encryption keys.

    CAUTION: Rapid Recovery uses AES 256-bit encryption in the Cipher Block Chaining (CBC) mode with 256-bit keys. While using encryption is optional, Dell highly recommends that you establish an encryption key, and that you protect the passphrase you define. Store the passphrase in a secure location as it is critical for data recovery. Without a passphrase, data recovery is not possible.

19. If you want to encrypt these protected machines using an encryption key that is already defined on this Rapid Recovery Core, select **Encrypt data using an existing Encryption key**, and select the appropriate key from the drop-down menu.

    Proceed to Step 21.

20. If you want to add a new encryption key to the Core and apply that key to these protected machines, then enter the information as described in the following table.

Table 90. Encryption key settings

Text Box	Description
Name	Enter a name for the encryption key. Encryption key names must contain between 1 and 130 alphanumeric characters. You may not include special characters such as the back slash, forward slash, pipe, colon, asterisk, quotation mark, question mark, open or close brackets, ampersand or hash.
Description	Enter a comment for the encryption key. This information appears in the Description field when viewing encryption keys from the Core Console.
Passphrase	Enter the passphrase used to control access. Best practice is to avoid special characters listed above. Record the passphrase in a secure location. Dell Support cannot recover a passphrase. Once you create an encryption key and apply it to one or more protected machines, you cannot recover data if you lose the passphrase.

Text Box	Description
Confirm Passphrase	Re-enter the passphrase you just entered.

21. Click **Finish** to save and apply your settings.
22. If the Warning page appeared and you are still satisfied with your selections, click **Finish** again.

The Rapid Recovery Agent software is deployed to the specified machines, if necessary, and the machines are added to protection on the Core.

Protecting multiple machines manually

Use this procedure to manually enter each machine that you want to protect. This is used, for example, when protecting Linux machines.

1. On the Rapid Recovery Core Console, click the **Protect** drop-down menu, and then click **Protect Multiple Machines**.

   The Protect Multiple Machines Wizard opens.
2. On the **Welcome** page, select one of the following options:
   - Typical
   - Advanced (show optional steps)
3. Click **Next**.
4. On the **Connection** page of the wizard, from the **Source** drop-down list, select **Manually**.
5. Click **Next**.
6. On the **Select Machines** page, enter the machine details in the dialog box in the format `hostname::username::password::port`. The port setting is optional. Examples include:

   ```
   10.255.255.255::administrator::&11@yYz90z::8006
   ```

   ```
   abc-host-00-1::administrator::99!zU$o83r::168
   ```
7. Click **Next**.

   If the **Protection** page appears next in the Protect Multiple Machines Wizard, skip to Step 11.

   If the Agent software is not yet deployed to the machines you want to protect, or if any of the machines you specified cannot be protected for another reason, then the selected machines appear on the **Warnings** page.
8. Optionally, on the **Machines Warnings** page, you can verify any machine by selecting the machine and then clicking **Verify** in the toolbar.
9. Optionally, on the **Machines Warnings** page, select **After Agent installation, restart the machines automatically**.

   NOTE: Dell recommends this option. You must restart agent machines before they can be protected. Restarting ensures that the Agent service is running, and that proper kernel module is used to protect the machine, if relevant.
10. If the status indicates that the machine is reachable, click **Next** to install the Agent software.

    The **Protection** page appears.
11. On the **Protection** page, select the appropriate protection schedule as described below.
    - If you want to use the default protection schedule, then in the Schedule Settings option, select **Default protection (hourly snapshots of all volumes)**.
    - If you want to define a different protection schedule, then in the Schedule Settings option, select **Custom protection** .
12. Proceed with your configuration as follows:

- If you selected a Typical configuration for the Protect Machine Wizard and specified default protection, then click **Finish** to confirm your choices, close the wizard, and protect the machine you specified.

  The first time protection is added for a machine, a base image (that is, a snapshot of all the data in the protected volumes) will transfer to the repository on the Rapid Recovery Core following the schedule you defined, unless you specified to initially pause protection.
- If you selected a Typical configuration for the Protect Machine Wizard and specified custom protection, click **Next** see Creating custom protection schedules.
- If you selected Advanced configuration for the Protect Machine Wizard, and default protection, then click **Next** and proceed to Step 14 to see repository and encryption options.
- If you selected Advanced configuration for the Protect Machine Wizard and specified custom protection, click **Next**, to set up a custom protection schedule. For details on defining a custom protection schedule, see Creating custom protection schedules.

13. On the **Repository** page, the following:
    - If you already have a repository and want to store the data from this machine for protection in the existing repository, then do the following:

      1. Select **Use an existing repository**.
      2. Select an existing repository from the list.
      3. Click **Next**.

      The **Encryption** page appears. Skip to Step 19 to optionally define encryption.
    - If you want to create a repository, select **Create a Repository**, and then complete the following steps.

      1. On the **Repository**, enter the information described in the following table.

         Table 91. Add New Repository settings

Text Box	Description
Repository Name	Enter the display name of the repository. By default, this text box consists of the word Repository and a number, which corresponds to the number of repositories for this Core. For example, if this is the first repository, the default name is Repository 1. Change the name as needed. Repository names must contain between 1 and 40 alphanumeric characters, including spaces. Do not use prohibited characters or prohibited phrases .
Concurrent Operations	Define the number of concurrent requests you want the repository to support. By default the value is 64.
Comments	Optionally, enter a descriptive note about this repository. You can enter up to 254 characters. For example, type **DVM Repository 2.**

      2. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.

         CAUTION: Define a dedicated folder within the root for the storage location for your repository. Do not specify the root location. For example, use E:\Repository\, not E:\. If the repository that you are creating in this step is later removed, all files at the storage location of your repository are deleted. If you define your storage location at the root, all other files in the volume (e.g., E:\) are deleted, which could result in catastrophic data loss.

         The **Add Storage Location** dialog box appears.
      3. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.

4. In the **Storage Location** area, specify how to add the file for the storage location. You can choose to add a locally attached storage volume (such as direct attached storage, a storage area network, or network attached storage). You could also specify a storage volume on a Common Internet File System (CIFS) shared location.

   - Select **Add file on local disk** to specify a local machine, and then enter the information as described in the following table.

     Table 92. Local disk settings

Text Box	Description
Data path	Enter the location for storing the protected data. For example, type `X:\Repository\Data`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.
Metadata path	Enter the location for storing the protected metadata. For example, type `X:\Repository\Metadata`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.

   - Or, select **Add file on CIFS share** to specify a network share location, and then enter the information as described in the following table.

     Table 93. CIFS share credentials

Text Box	Description
UNC path	Enter the path for the network share location. If this location is at the root, define a dedicated folder name (for example, `Repository`). The path must begin with \\. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). The letters a to z are case-insensitive. Do not use spaces. No other symbols or punctuation characters are permitted.
User name	Specify a user name for accessing the network share location.
Password	Specify a password for accessing the network share location.

5. In the **Storage Configuration** area, click **More Details** and enter the details for the storage location as described in the following table.

   Table 94. Storage configuration details

Text Box	Description
Size	Set the size or capacity for the storage location. The minimum size is 1 GB. The default is 250 GB. You can choose from the following: – GB – TB NOTE: The size that you specify cannot exceed the size of the volume.

Text Box	Description
	If the storage location is a New Technology File System (NTFS) volume using Windows XP or Windows 7, the file size limit is 16 TB. If the storage location is a NTFS volume using Windows 8, 8.1, Windows 10, or Windows Server 2012, 2012 R2, the file size limit is 256 TB. NOTE: For Rapid Recovery to validate the operating system, Windows Management Instrumentation (WMI) must be installed on the intended storage location.
Write caching policy	The write caching policy controls how the Windows Cache Manager is used in the repository and helps to tune the repository for optimal performance on different configurations. Set the value to one of the following: – On – Off – Sync If set to On, which is the default, Windows controls the caching. This is appropriate for Windows 10, and for versions of Windows Server 2012 and later. NOTE: Setting the write caching policy to On could result in faster performance. If you are using Windows Server 2008 SP2 or Windows Server 2008 R2 SP2, the recommended setting is Off. If set to Off, Rapid Recovery controls the caching. If set to Sync, Windows controls the caching as well as the synchronous input/output.
Bytes per sector	Specify the number of bytes you want each sector to include. The default value is 512.
Average bytes per record	Specify the average number of bytes per record. The default value is 8192.

6. Click **Next**.

If you chose the **Advanced** option in Step 1, the **Encryption** page appears.

14. Optionally, on the **Encryption** page, to enable encryption, select **Enable Encryption**.

    Encryption key fields appear on the **Encryption** page.

    NOTE: If you enable encryption, it will be applied to data for all protected volumes for this machine. You can change the settings later from the **Encryption Keys** page in the Rapid Recovery Core Console.
    For more information about encryption, see the topic Understanding encryption keys.

    CAUTION: Rapid Recovery uses AES 256-bit encryption in the Cipher Block Chaining (CBC) mode with 256-bit keys. While using encryption is optional, Dell highly recommends that you establish an encryption key, and that you protect the passphrase you define. Store the passphrase in a secure location, as it is critical for data recovery. Without a passphrase, data recovery is not possible.

15. If you want to encrypt these protected machines using an encryption key that is already defined on this Rapid Recovery Core, select **Encrypt data using an existing Encryption key**, and select the appropriate key from the drop-down menu.

Proceed to Step 17.

16. If you want to add a new encryption key to the Core and apply that key to these protected machines, then enter the information as described in the following table.

Table 95. Encryption key settings

Text Box	Description
Name	Enter a name for the encryption key. Encryption key names must contain between 1 and 130 alphanumeric characters. You may not include special characters such as the back slash, forward slash, pipe, colon, asterisk, quotation mark, question mark, open or close brackets, ampersand or hash.
Description	Enter a comment for the encryption key. This information appears in the Description field when viewing encryption keys from the Core Console.
Passphrase	Enter the passphrase used to control access. Best practice is to avoid special characters listed above. Record the passphrase in a secure location. Dell Support cannot recover a passphrase. Once you create an encryption key and apply it to one or more protected machines, you cannot recover data if you lose the passphrase.
Confirm Passphrase	Re-enter the passphrase you just entered.

17. Click **Finish** to save and apply your settings.

    The wizard closes.

18. If the **Warning** page appeared and you are still satisfied with your selections, click **Finish** again.

The Rapid Recovery Agent software is deployed to the specified machines, if necessary, and the machines are added to protection on the Core.

Monitoring the protection of multiple machines

You can monitor the progress as Rapid Recovery applies the protection polices and schedules to the machines.

In the Rapid Recovery Core Console, navigate to the Rapid Recovery Home page and then click (Events).

The **Events** page displays, broken down by Tasks, Alerts, and Events. As volumes are transferred, the status, start times, and end times display in the Tasks pane.

You can also filter tasks by status (active, waiting, completed, queued, and failed). For more information, see Viewing tasks.

NOTE: To only see tasks that are waiting to be performed, make sure that you select the Waiting Tasks icon.

As each protected machine is added, an alert is logged, which lists whether the operation was successful or if errors were logged. For more information, see Viewing alerts.

For information on viewing all events, see Viewing all events.

Settings and functions for protected Exchange servers

If you are protecting a Microsoft Exchange Server in your Core, there are additional settings you can configure in the Rapid Recovery Core Console, and there are additional functions you can perform.

A single setting, **Enable automatic mountability check**, is available in the Core Console related to Exchange Server. If enabled, Exchange server mountability checks are conducted automatically. This setting is available when the status for the protected machine is green (active) or yellow (paused).

For more information, see About Exchange database mountability checks.

You can also perform a mountability check on demand, from the Recovery Points pane on a protected Exchange server machine. For more information, see Forcing a mountability check of an Exchange database.

Following are functions you can perform for an Exchange server protected by the Core.

- **Specify Exchange server credentials**. Rapid Recovery Core lets you set credentials so the Core can authenticate to the Exchange server to obtain information.

  For more information about setting credentials for Exchange servers, see Setting credentials for an Exchange server machine.
- **Truncate Exchange logs**. When you force log truncation of Exchange server logs, this process identifies the available space and reclaims space on the protected Exchange server.

  For more information about truncating Exchange server logs on demand, see Forcing log truncation for an Exchange machine. This process can also be performed as part of the nightly jobs.
- **Force a mountability check of an Exchange database**. This function checks that Exchange databases are mountable, to detect corruption and alert administrators so that all data on the Exchange server can be recovered successfully.

  For more information about forcing a mountability check on demand, see Forcing a mountability check of an Exchange database.

  You can also force a mountability check to occur automatically after each snapshot. For more information about mountability checks, see About Exchange database mountability checks.
- **Force a checksum check of Exchange Server recovery points**. This function checks the integrity of recovery points containing Exchange database files.

  For more information about forcing a checksum check on demand, see Forcing a checksum check of Exchange database files.

You can truncate Exchange logs and force a checksum check as part of nightly jobs. For more information about the tasks you can schedule as nightly jobs, see Understanding nightly jobs. For information on configuring nightly jobs, see Configuring nightly jobs for the Core.

Setting credentials for an Exchange server machine

In order to set login credentials, an Exchange server must be present on a protected volume. If Rapid Recovery does not detect the presence of an Exchange server, the Set Credentials function does not appear in the Core Console.

Once you protect data on a Microsoft Exchange server, you can set login credentials in the Rapid Recovery Core Console.

Complete the steps in this procedure to set credentials for each Exchange Server.

1. In the left navigation area of the Rapid Recovery Core Console, select the protected Exchange server machine for which you want to set credentials.

   The **Summary** page appears for the protected Exchange server.
2. On the **Summary** page, from the links at the top of the page, click the downward-facing arrow ▼ to the right of the Exchange menu, and then from the resulting drop-down menu, select **Set Credentials**.

   The **Edit Exchange Credentials** dialog box for the protected Exchange server appears.
3. In the **Edit Exchange Credentials** dialog box, enter your credentials as follows:
   a. In the **User name** text field, enter the user name for a user with permissions to the Exchange server; for example, Administrator (or, if the machine is in a domain, [domain name]\Administrator).
   b. In the **Password** text field, enter the password associated with user name you specified to connect to the Exchange server.
   c. Click **OK** to confirm the settings and close the dialog box.

Forcing log truncation for an Exchange machine

In order to force log truncation, an Exchange database must be present on a protected volume. If Rapid Recovery does not detect the presence of a database, the log truncation check does not appear in the Core Console.

When you force log truncation for a protected Exchange Server, the size of the logs are reduced. Complete the steps in this procedure to force log truncation on demand.

1. In the left navigation area of the Rapid Recovery Core Console, select the protected Exchange server for which you want to force log truncation

   The **Summary** page for the protected machine appears.
2. At the top of the page, click the **Exchange** drop-down menu and select **Force Log Truncation**.
3. In the resulting dialog box, click to confirm that you want to force log truncation.

   The dialog box closes. The system starts truncating the Exchange server logs. If Toast alerts are enabled for this type of event, you see a message that the log truncation process starts.

About Exchange database mountability checks

When using Rapid Recovery to back up Microsoft Exchange Servers, mountability checks can be performed on all Exchange databases after every snapshot. This corruption detection feature alerts administrators of potential failures and ensures that all data on the Exchange servers will be recovered successfully in the event of a failure.

To enable or disable this feature, go to the **Settings** menu for a protected machine, and set the **Enable automatic mountability check** option to Yes or No, respectively. For more information about modifying settings for a protected machine, see Viewing and modifying protected machine settings.

Mountability checks are not part of nightly settings. However, if the automatic mountability check is enabled, and if the Truncate Exchange logs nightly job is enabled, then the mountability check is triggered after the completion of log truncation.

You can also perform a mountability check on demand, from the **Recovery Points** pane on a protected Exchange server machine. For more information, see Forcing a mountability check of an Exchange database.

NOTE: The mountability checks only apply to Microsoft Exchange 2007, 2010, and 2013. Additionally, the Rapid Recovery Agent service account must be assigned the Organizational Administrator role in Exchange.

Forcing a mountability check of an Exchange database

In order to force a mountability check, an Exchange database must be present on a protected volume. If Rapid Recovery does not detect the presence of a database, the mountability check function does not appear in the Core Console.

Complete the steps in this procedure to force the system to perform a mountability check for a specific Exchange server recovery point on demand.

1. In the left navigation area of the Rapid Recovery Core Console, select the protected Exchange server machine for which you want to force the mountability check, and then click the **Recovery Points** menu.
2. Scroll down to the **Recovery Points** pane.
3. Navigate through the recovery points to find the desired recovery point. Optionally, click the ▸ arrow to the right of a recovery point in the list to expand the view.

   In the expanded recovery point information, you can see volumes included in the recovery point.
4. In the **Recovery Points** pane, from the row representing the correct recovery point, click ⚙, and from the drop-down menu, select **Force Mountability Check**.
5. In the resulting dialog box, click to confirm that you want to force a mountability check.

   The dialog box closes. The system performs the mountability check. If Toast alerts are enabled for this type of event, you see a message that the mountability check starts.

For instructions on how to view the status of the mountability check, see Viewing events using tasks, alerts, and journal.

Forcing a checksum check of Exchange database files

In order to force a checksum check, an Exchange database must be present on a protected volume. If Rapid Recovery does not detect the presence of a database, the checksum check function does not appear in the Core Console.

Complete the steps in this procedure to force the system to perform a checksum check for a specific Exchange server recovery point.

1. In the left navigation area of the Rapid Recovery Core Console, select the protected Exchange server for which you want to force a checksum check, and then click the **Recovery Points** menu.

   The **Recovery Points** page appears for the protected Exchange server.
2. Scroll down to the **Recovery Points** pane.
3. Navigate through the recovery points to find the desired recovery point. Optionally, click the ▸ arrow to the right of a recovery point in the list to expand the view.

   In the expanded recovery point information, you can see volumes included in the recovery point.
4. In the **Recovery Points** pane, from the row representing the correct recovery point, click ⚙, and from the drop-down menu, select **Force Checksum Check**.
5. In the resulting dialog box, click to confirm that you want to force a checksum check.

   The dialog box closes. The system performs the checksum check. If Toast alerts are enabled for this type of event, you see a message that the checksum check starts.

For instructions on how to view the status of the checksum check, see Viewing events using tasks, alerts, and journal.

Settings and functions for protected SQL servers

If you are protecting a Microsoft SQL Server in your Core, there are additional settings you can configure in the Rapid Recovery Core Console, and there are additional functions you can perform.

A single setting, **Attachability**, is available in the Core Console related to SQL Server.

Rapid Recovery Core lets you perform a SQL attachability check to verify the integrity of recovery points containing SQL databases. This action checks the consistency of SQL databases and ensures that all supporting MDF (data) and LDF (log) files are available in the backup snapshot.

In previous releases, SQL attachability checks have historically required a licensed version of SQL Server on the Core machine. Rapid Recovery Core now provides the ability to perform SQL attachability checks from an instance of SQL Server on the Core, or from a licensed version of SQL Server on a protected SQL Server machine.

The attachability settings let you specify which licensed version of SQL Server is used to perform this check. For more information about configuring attachability settings, see Managing Core SQL attachability settings.

For more information on SQL attachability, see About SQL attachability.

Following are functions you can perform for a SQL server protected by the Core.

- **Specify SQL Server credentials**. Rapid Recovery Core lets you set credentials so the Core can authenticate to the SQL server to obtain information. You can set credentials for a single protected SQL Server machine, or set default credentials for all protected SQL Servers.

  For more information about setting credentials for SQL servers, see Setting credentials for a SQL Server machine.
- **Truncate SQL logs**. When you force log truncation of SQL Server logs, this process identifies the available space on the protected server. This process does not reclaim any space.

  For more information about truncating SQL Server logs on demand, see Forcing log truncation for a SQL machine.
- **Force an attachability check of a SQL Server**. This function checks the consistency of SQL databases and ensures that all supporting MDF (data) and LDF (log) files are available in the backup snapshot.

  For more information about forcing an attachability check for SQL servers on demand, see Forcing a SQL Server attachability check.

Other than specifying credentials, each of the functions described in the preceding list can be accomplished on demand, and can also be configured to occur as part of the nightly jobs performed for the Core. For more information about the tasks you can schedule as nightly jobs, see Understanding nightly jobs. For information on configuring nightly jobs, see Configuring nightly jobs for the Core.

Setting credentials for a SQL Server machine

You must add the SQL Server machine to protection on the Rapid Recovery Core before performing this procedure. For more information about protecting machines, see Protecting a machine.

Once you protect data on a Microsoft SQL Server machine, you can set login credentials for a single instance, or for all SQL Servers, in the Rapid Recovery Core Console.

Complete the steps in this procedure to set credentials for each SQL Server.

1. In the left navigation area of the Rapid Recovery Core Console, select the protected SQL Server machine for which you want set credentials.

   The **Summary** page displays for the protected SQL Server.

2. On the **Summary** page, from the links at the top of the page, click the downward-facing arrow ▼ to the right of the SQL menu, and then from the resulting drop-down menu, do one of the following:

   - If you want to set default credentials for all SQL Server database instances, click **Set Default Credentials for All Instances**, and in the **Edit Default Credentials** dialog box, do the following:

     1. In the **User name** text field, enter the user name for a user with permissions to all associated SQL servers; for example, Administrator (or, if the machine is in a domain, [domain name]\Administrator).
     2. In the **Password** text field, enter the password associated with the user name you specified to connect to the SQL server.
     3. Click **OK** to confirm the settings and close the dialog box.

   - If you want to set credentials for a single SQL Server database instance, click the display name of the protected SQL Server machine, and then in the **Edit Instance Credentials** dialog box, do the following:

     1. Select the credential type (Default, Windows, or SQL)
     2. In the **User name** text field, enter the user name for a user with permissions to the SQL server; for example, Administrator (or, if the machine is in a domain, [domain name]\Administrator).
     3. In the **Password** text field, enter the password associated with the user name you specified to connect to the SQL server.
     4. Click **OK** to confirm the settings and close the dialog box.

Forcing log truncation for a SQL machine

Log truncation is available for machines that use SQL Server. Complete the steps in this procedure to force log truncation.

NOTE: When conducted for a SQL machine, truncation identifies the free space on a disk, but does not reduce the size of the logs.

1. In the left navigation area of the Rapid Recovery Core Console, select the machine for which you want to force log truncation.

   The **Summary** page appears for the protected machine.

2. From the **Summary** page (or from any page for this protected machine), at the top of the page, click the **SQL** drop-down menu and select **Force Log Truncation**.
3. Click **Yes** to confirm that you want to force log truncation.

About SQL attachability

The SQL attachability feature lets the Rapid Recovery Core attach SQL master database files (.MDF files) and log database files (.LDF files) to a snapshot of a protected SQL Server. The snapshot is captured using a local instance of Microsoft SQL Server.

Issues relevant for Rapid Recovery users protecting SQL Server machines include which instance of SQL Server performs attachability, and the method of performing SQL attachability (on demand, or as part of nightly jobs).

The attachability check lets the Core verify the consistency of the SQL databases and ensures that all MDF and LDF files are available in the backup snapshot.

Attachability checks can be run on demand for specific recovery points, or as part of a nightly job.

To perform the SQL attachability check on demand, see Forcing a SQL Server attachability check. To perform SQL attachability once daily, at the time specified for your nightly job operations, enable the option **Check attachability for SQL databases** in nightly jobs. For more information about setting nightly jobs for the Core, see Configuring nightly jobs for the Core. For more information about setting nightly jobs for a specific machine (in this case, a protected SQL Server), see Customizing nightly jobs for a protected machine.

In previous versions, SQL attachability required a local instance of Microsoft SQL Server to be installed and configured on the Core machine. Rapid Recovery Core now lets you choose to perform the attachability check from a SQL Server instance on the Core, or from a SQL Server instance on a protected SQL Server machine. The instance you select must be a fully licensed version of SQL Server, procured from Microsoft or through a licensed reseller. Microsoft does not allow the use of passive SQL licenses.

Whichever SQL Server instance you specify is then used for all attachability checks. Attachability is synchronized between Core settings and nightly jobs. For example, if you specify using the Core instance of SQL Server for nightly jobs, on-demand attachability checks then also use the Core. Conversely, if you specify using a SQL Server instance on a specific protected machine, all on-demand and nightly attachability checks then use the local instance on the protected machine.

Select the SQL Server instance to use as part of global Core settings. For more information, see Managing Core SQL attachability settings.

NOTE: Performing the attachability check from a protected SQL Server machine requires the Rapid Recovery Agent software to be installed on that server. Agentless protection is not supported for SQL attachability.

Attachability in Rapid Recovery Core supports SQL Server 2005, 2008, 2008 R2, 2012, and 2014. The account used to perform the test must be granted the sysadmin role on the SQL Server instance.

The SQL Server on-disk storage format is the same in both 64-bit and 32-bit environments and attachability works across both versions. A database that is detached from a server instance that is running in one environment can be attached on a server instance that runs in another environment.

NOTE: The version of SQL Server on the Core must be equal to or newer than the SQL Server version on all of the protected machines with SQL Server installed.

Forcing a SQL Server attachability check

In order to force an attachability check, a SQL database must be present on a protected volume. If Rapid Recovery does not detect the presence of a database, the attachability check function does not appear in the Core Console.

Complete the steps in this procedure to force the system to perform an attachability check for a specific SQL server recovery point.

1. In the left navigation area of the Rapid Recovery Core Console, select the protected SQL Server machine for which you want to force the attachability check, and then click the **Recovery Points** menu.
2. Scroll down to the **Recovery Points** pane.

3. Navigate through the recovery points to find the desired recovery point. Optionally, click the ▶ arrow to the right of a recovery point in the list to expand the view.

   In the expanded recovery point information, you can see volumes included in the recovery point.

4. In the **Recovery Points** pane, from the row representing the correct recovery point, click ⚙, and from the drop-down menu, select **Force Attachability Check**.
5. In the resulting dialog box, click to confirm that you want to force an attachability check.

   The dialog box closes. The system performs the attachability check.

For instructions on how to view the status of the attachability check, see Viewing events using tasks, alerts, and journal.

Understanding Rapid Snap for Virtual

By installing the Rapid Recovery Agent software, you can protect physical or virtual machines on the Rapid Recovery Core. The supported operating systems are indicated in system requirements in the topic “Rapid Recovery Agent software requirements.”

Rapid Recovery now offers another approach for protecting machines.

The Rapid Snap for Virtual feature — also known as agentless protection — of Rapid Recovery lets you protect virtual machines (VMs) on a VMware ESXi or Hyper-V host without installing the Rapid Recovery Agent on every VM.

CAUTION: Dell recommends that you limit agentless protection to no more than 200 VMs at once. For example, do not select more than 200 VMs when using the Protect Multiple Machines Wizard. Protecting more than 200 VMs results in slow performance. There is no limit to how many VMs a Core can agentlessly protect over time. For example, you could protect 200 VMs today and another 200 VMs tomorrow.

Protecting vCenter/ESXi VMs

Rapid Recovery lets you protect vCenter/ESXi VMs without installing the Rapid Recovery Agent on the VM or ESXi host, achieving agentless protection. To protect an ESXi environment, the Rapid Recovery Core works with the snapshot technology native to VMware.

Rapid Recovery agentless protection uses the ESXi client and the existing application program interface (API) to protect selected VMs on a single host without installing Rapid Recovery Agent software. The Rapid Recovery Core then communicates with the virtual machine disk (VMDK) to determine the necessary details of the protected volumes. Because Rapid Recovery creates recovery points based on volumes, not VMDKs, each volume can be separately mounted, restored, and exported.

NOTE: Rapid Recovery recommends that VMware Tools be installed on virtual machines (VMs) you want to protect on vSphere or ESXi hosts. When VMware Tools are installed on a VM using a Windows operating system (OS), the backups that the Rapid Recovery Core captures use Microsoft Volume Shadow Services (VSS). For information on the behavior of agentless VMs with or without VMware Tools, see Benefits of installing VMware Tools for agentless protection.

Agentless protection also uses VMware Changed Block Tracking (CBT) to reduce the time needed for incremental snapshots. CBT determines which blocks changed in the VMDK file, letting Rapid Recovery back up only the portions of the disk that have changed since the last snapshot. This backup method often results in shorter backup operations and reduced resource consumption on network and storage elements.

There are multiple benefits to using agentless protection. Some of the most useful attributes include the following characteristics:

- No additional software is required on the host machine.
- Agentless protection lets you opt to automatically protect new VMs added to the ESXi host.
- A restart is not required during the protection process.
- Credentials are not required for each individual VM.
- Agentless protection lets you protect a VM even if it is powered off.
- Agentless protection lets you restore to disks.
- Agentless protection does not require free space on a volume during transfers.
- Agentless protection supports all guest operating systems.
- Agentless protection lets you export dynamic disks or volumes.

  NOTE: If dynamic volumes are complex (striped, mirrored, spanned, or RAID), they export as disk images and parse into volumes after the export operation completes on the exported VM.

While there are many reasons to use agentless protection for ESXi VMs, opt for the protection method that best suits your environments and business needs. Along with the previously mentioned benefits, there are also the following considerations to keep in mind when choosing agentless protection:

- Agentless protection does not support protection of dynamic volumes (for example, spanned, striped, mirrored, or RAID volumes) at the volume level. It protects them at the disk level.
- Agentless protection does not support Live Recovery. For more information about this feature, see Understanding Live Recovery.
- After each restore of a single volume to the protected VM, you must restart the VM.
- Agentless protection does not collect Microsoft SQL or Microsoft Exchange metadata.
- You cannot perform a SQL attachability check, log truncation, or a mountability check on recovery points captured on agentless protected machines.
- Agentless protection does not collect or display volume labels, or drive letters.
- Agentless protection does not display the actual amount of space used on a VM if the virtual disk type is thick provision eager zeroed.

If you choose to use agentless protection for your ESXi VMs, the host must meet the following minimum requirements for agentless protection to be successful.

- The host machine must be running ESXi version 5.0.0 build 623860 or later.
- The host machine must meet the minimum system requirements stated in the *Rapid Recovery Installation and Upgrade Guide*.
- For volume-level protection, VMDKs must include either Master Boot Record (MBR) partition tables or GUID partition tables (GPTs). VMDKs without these partition tables are protected as whole disks rather than as individual volumes.
- Each VMware virtual machine must have VMware Tools installed to ensure snapshot consistency.

Protecting Hyper-V servers and clusters

To protect a Hyper-V server agentlessly, you do not need to install the Rapid Recovery Agent on any VMs. You need only install it on the host machine or cluster node. The Agent protects the virtual hard disk on the host and converts any changes to the hard disk files to a volume image or disk image, depending on the file system. A new driver provides file-level support for VMs on hosts and on cluster shared volumes (CSVs).

NOTE: Rapid Recovery supports the VHDx disk file format. It does not support the VHD format.

For protecting VMs on a CSV, the Rapid Recovery Agent and driver must be installed on each cluster node using the auto deployment feature in the Protect Multiple Machines Wizard. From the nodes, the Agent can protect all VMs operating on CSVs by creating two types of changes for every file. The first type of change is saved only before or after a snapshot or clean system restart. The second type of change resides on the disk, which makes an incremental snapshot available even if there is a power failure or dirty shutdown. The Agent installed on the node merges all of the changes into one before transferring the data.

When a host or node is running, Rapid Recovery creates an application-consistent backup. If the host is not running, no backup can be created; however, if one of the nodes is not running, then Rapid Recovery can continue taking snapshots of the VMs on the cluster.

NOTE: For best performance, it is recommended that the maximum concurrent transfers for the Hyper-V host or node be set to 1, which is the default setting.

Agentless Hyper-V protection has many of the same capabilities as traditional protection where the Agent is installed on every VM, including:

- Archiving
- Recovery point integrity checks
- Mounting recovery points
- Auto discovery of new VMs (unique to agentless protection)
- Replication
- Restoring VMs
- Restoring CSVs
- Restoring on CIFS using VHDX format
- Restoring files in a guest VHDX format
- Rollup
- Virtual export to Hyper-V VMs and other hypervisors, including ESXi, VMware Workstation, and VirtualBox

However, there are limitations to consider when choosing agentless Hyper-V protection. Capabilities that are not performed include:

- Exchange mount integrity check
- SQL attachability check
- Live Recovery
- Restoring VMs on CIFS using VHD format
- Restoring files in a guest VHD format

NOTE: For an application-consistent snapshot, you must have the SCSI Controller installed on each VM. Without this controller, the result is always a crash-consistent snapshot.

Benefits of installing VMware Tools for agentless protection

When protecting virtual machines (VMs) without the using Rapid Recovery Agent, Dell recommends installing VMware Tools on protected VMs on vSphere or ESXi hosts to take full advantage of Microsoft Volume Shadow Services (VSS) functionality.

Agentless protection uses the snapshot technology native to VMware to back up protected data. When VMware Tools are installed on a VM with a Windows operating system (OS), the backups that the Rapid Recovery Core captures can also use VSS. When VMware Tools are not installed, Rapid Recovery still collects snapshots, but the absence of VMware Tools can adversely affect the state of data on your protected VM.

There are two possible data states:

- **Crash-consistent.** The VM OS starts and can read and understand the file system.
- **Application consistent.** The VM OS starts and can read and understand the file system. Also, files for transactional applications are in a consistent state. For example, with SQL Server, the logs match the database files, and the database opens quickly and easily.

If you recover a transactional application from a crash-consistent state, the database returns to the last valid state. That most recent valid state may be from the time of the crash, or it may be from earlier than the crash. If it is from earlier, then the database must roll forward some work to make the data files match the information in the logs. This process takes some time when you first open the database, which causes a delay when starting up the machine.

The following conditions apply based on whether VMware Tools are installed and on the powered-on state of the VM:

Table 96. Backup type conditions for VMs

VMware Tools	VM Powered On	Backup Type
Not installed	Yes	Crash-consistent
Not installed	No (dirty shut-down)	Crash-consistent
Not installed	No (clean shut-down)	Application-consistent
Installed	Yes	Application-consistent
Installed	No (dirty shut-down)	Crash-consistent
Installed	No (clean shut-down)	Application-consistent

Protecting vCenter/ESXi virtual machines without the Rapid Recovery Agent

Complete the following procedure to agentlessly protect ESXi virtual machines.

NOTE: Rapid Recovery recommends that VMware Tools be installed on virtual machines (VMs) you want to protect on vSphere or ESXi hosts. When VMware Tools are installed on a VM using a Windows operating system (OS), the backups that the Rapid Recovery Core captures use Microsoft Volume Shadow Services (VSS). For information on the behavior of agentless VMs with or without VMware Tools, see Benefits of installing VMware Tools for agentless protection.

CAUTION: Dell recommends that you limit agentless protection to no more than 200 VMs at once. For example, do not select more than 200 VMs when using the Protect Multiple Machines Wizard. Protecting more than 200 VMs results in slow performance. There is no limit to how many VMs a Core can agentlessly protect over time. For example, you could protect 200 VMs today and another 200 VMs tomorrow.

1. On the Rapid Recovery Core Console, click the **Protect** drop-down menu, and then click **Protect Multiple Machines**.

   The Protect Multiple Machines Wizard opens.
2. On the **Welcome** page, select one of the following options:
   - Typical
   - Advanced (show optional steps)
3. Click **Next**.
4. On the **Connection** page of the wizard, from the **Source** drop-down list, select **vCenter / ESX(i)**.
5. Enter the host information and logon credentials as described in the following table.

   Table 97. vCenter/ESX(i) connection settings

Text Box	Description
Host	The name or IP address of the VMware vCenter Server/ESX(i) virtual host.
Port	The port used to connect to the virtual host. The default setting is 443.
User name	The user name used to connect to the virtual host; for example, Administrator or, if the machine is in a domain, [domain name]\Administrator.
Password	The secure password used to connect to this virtual host.
6. Ensure that **Protect selected VMs Agentlessly** is selected. (This option is selected by default).
7. On the **Select Machines** page, select the VMs you want to protect. You can use the drop-down menu to display a list of Hosts and Clusters or a list of VMs and Templates.

   NOTE: VMware Changed Block Tracking (CBT) must be enabled on each of the VMs you want to protect. If it is not enabled, Rapid Recovery automatically enables CBT to ensure protection.
8. If you want to automatically protect new VMs when they are added to the host, select **Auto protect new machines**, and then complete the following steps.

   a. Click **Next**.

   b. On the **Auto Protection** page, select any containers in which you expect to add new machines.
9. Click **Next**.
10. On the Protection page, select one of the following protection schedules as appropriate:
    - If you want to use the default protection schedule, then in the Schedule Settings option, select **Default protection (hourly snapshots of all volumes)**.
    - If you want to define a different protection schedule, then in the Schedule Settings option, select **Custom protection**.
11. Proceed with your configuration as follows:
    - If you selected a Typical configuration and specified default protection, then click **Finish** to confirm your choices, close the wizard, and protect the machine you specified.

      The first time you add protection for a machine, a base image (a snapshot of all data on the protected volumes) transfers to the repository on the Rapid Recovery Core according to the schedule you defined, unless you specified to initially pause protection.

- If you selected a Typical configuration and specified custom protection, click **Next** to set up a custom protection schedule. For details on defining a custom protection schedule, see Creating custom protection schedules.
- If you selected Advanced configuration for the Protect Machine Wizard, and default protection, then click **Next** and proceed to Step 13 to see repository and encryption options.
- If you selected Advanced configuration for the Protect Machine Wizard and specified custom protection, then click **Next** to set up a custom protection schedule. For details on defining a custom protection schedule, see Creating custom protection schedules.

12. Click **Next**.
13. On the **Repository** page, the following:
    - If you already have a repository and want to store the data from this machine for protection in the existing repository, then do the following:

      1. Select **Use an existing repository**.
      2. Select an existing repository from the list.
      3. Click **Next**.

      The **Encryption** page appears. Skip to Step 19 to optionally define encryption.
    - If you want to create a repository, select **Create a Repository**, and then complete the following steps.

      1. On the **Repository**, enter the information described in the following table.

         Table 98. Add New Repository settings

Text Box	Description
Repository Name	Enter the display name of the repository. By default, this text box consists of the word Repository and a number, which corresponds to the number of repositories for this Core. For example, if this is the first repository, the default name is Repository 1. Change the name as needed. Repository names must contain between 1 and 40 alphanumeric characters, including spaces. Do not use prohibited characters or prohibited phrases .
Concurrent Operations	Define the number of concurrent requests you want the repository to support. By default the value is 64.
Comments	Optionally, enter a descriptive note about this repository. You can enter up to 254 characters. For example, type **DVM Repository 2.**

      2. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.

         CAUTION: Define a dedicated folder within the root for the storage location for your repository. Do not specify the root location. For example, use E:\Repository\, not E:\. If the repository that you are creating in this step is later removed, all files at the storage location of your repository are deleted. If you define your storage location at the root, all other files in the volume (e.g., E:\) are deleted, which could result in catastrophic data loss.

         The **Add Storage Location** dialog box appears.
      3. Click **Add Storage Location** to define the specific storage location or volume for the repository. This volume should be a primary storage location.
      4. In the **Storage Location** area, specify how to add the file for the storage location. You can choose to add a locally attached storage volume (such as direct attached storage, a storage area network, or network attached storage). You could also specify a storage volume on a Common Internet File System (CIFS) shared location.

- Select **Add file on local disk** to specify a local machine, and then enter the information as described in the following table.

Table 99. Local disk settings

Text Box	Description
Data path	Enter the location for storing the protected data. For example, type `X:\Repository\Data`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.
Metadata path	Enter the location for storing the protected metadata. For example, type `X:\Repository\Metadata`. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). You can use the backslash character only to define levels in the path. Do not use spaces. No other symbols or punctuation characters are permitted.

- Or, select **Add file on CIFS share** to specify a network share location, and then enter the information as described in the following table.

Table 100. CIFS share credentials

Text Box	Description
UNC path	Enter the path for the network share location. If this location is at the root, define a dedicated folder name (for example, `Repository`). The path must begin with \\. When specifying the path, use only alphanumeric characters, the hyphen, and the period (only to separate host names and domains). The letters a to z are case-insensitive. Do not use spaces. No other symbols or punctuation characters are permitted.
User name	Specify a user name for accessing the network share location.
Password	Specify a password for accessing the network share location.

5. In the **Storage Configuration** area, click **More Details** and enter the details for the storage location as described in the following table.

Table 101. Storage configuration details

Text Box	Description
Size	Set the size or capacity for the storage location. The minimum size is 1 GB. The default is 250 GB. You can choose from the following: – GB – TB NOTE: The size that you specify cannot exceed the size of the volume. If the storage location is a New Technology File System (NTFS) volume using Windows XP or Windows 7, the file size limit is 16 TB. If the storage location is a NTFS volume using Windows 8, 8.1, Windows 10, or Windows Server 2012, 2012 R2, the file size limit is 256 TB.

Text Box	Description
	NOTE: For Rapid Recovery to validate the operating system, Windows Management Instrumentation (WMI) must be installed on the intended storage location.
Write caching policy	The write caching policy controls how the Windows Cache Manager is used in the repository and helps to tune the repository for optimal performance on different configurations. Set the value to one of the following: – On – Off – Sync If set to On, which is the default, Windows controls the caching. This is appropriate for Windows 10, and for versions of Windows Server 2012 and later. NOTE: Setting the write caching policy to On could result in faster performance. If you are using Windows Server 2008 SP2 or Windows Server 2008 R2 SP2, the recommended setting is Off. If set to Off, Rapid Recovery controls the caching. If set to Sync, Windows controls the caching as well as the synchronous input/output.
Bytes per sector	Specify the number of bytes you want each sector to include. The default value is 512.
Average bytes per record	Specify the average number of bytes per record. The default value is 8192.

6. Click **Next**.

If you chose the **Advanced** option in Step 1, the **Encryption** page appears.

14. Optionally, on the Encryption page, to enable encryption, select **Enable Encryption**.

Encryption key fields appear on the Encryption page.

NOTE: If you enable encryption, it is applied to data for all protected volumes for this agent machine.

You can change the settings later from the Configuration tab in the Rapid Recovery Core Console.

For more information about encryption, see the topic Understanding encryption keys.

CAUTION: Rapid Recovery uses AES 256-bit encryption in the Cipher Block Chaining (CBC) mode with 256-bit keys. While using encryption is optional, Dell highly recommends that you establish an encryption key, and that you protect the passphrase you define. Store the passphrase in a secure location as it is critical for data recovery. Without a passphrase, data recovery is not possible.

15. If you want to encrypt these protected machines using an encryption key that is already defined on this Rapid Recovery Core, select **Encrypt data using an existing Encryption key**, and select the appropriate key from the drop-down menu.

Proceed to Step 17.

16. If you want to add an encryption key to the Core and apply that key to these protected machines, then enter the information as described in the following table.

Table 102. Encryption key settings

Text Box	Description
Name	Enter a name for the encryption key. Encryption key names must contain between 1 and 130 alphanumeric characters. You may not include special characters such as the back slash, forward slash, pipe, colon, asterisk, quotation mark, question mark, open or close brackets, ampersand or hash.
Description	Enter a comment for the encryption key. This information appears in the Description field when viewing encryption keys from the Core Console.
Passphrase	Enter the passphrase used to control access. The best practice is to avoid special characters listed in the Name description of this table. Record the passphrase in a secure location. Dell Support cannot recover a passphrase. Once you create an encryption key and apply it to one or more protected machines, you cannot recover data if you lose the passphrase.
Confirm Passphrase	Re-enter the passphrase you just entered.

17. Click **Finish**.

    Rapid Recovery adds the selected VMs and their host to the list of Protected Machines.

Accessing protected machine diagnostics

In Rapid Recovery, you can download and view diagnostic information for individual protected machines. Additionally, Rapid Recovery lets you download and view log data for the Core.

To access logs, see the following procedures:

- Downloading and viewing the Core log file
- Downloading and viewing the log file for a protected machine

Downloading and viewing the log file for a protected machine

If you encounter any errors or issues with a protected machine, you can download the machine logs to view them or to share them with your Dell Support representative.

1. In the left navigation area of the Core Console, under the Protected Machines menu, click the arrow to expand the context-sensitive menu for the relevant protected machine. Scroll down to **More**, expand that menu, and then select LOG **Agent Log**.

   The **Download Agent Log** page appears.

2. On the **Download Agent Log** page, click ⬇ **Click here to begin the download**.
3. In the **Opening AgentAppRecovery.log** dialog box, do one of the following:
   - To open the log file, select **Open with**, then select an application (such as Notepad) for viewing the text-based log file, and finally click **OK**.

The AgentAppRecovery.log file opens in the selected application.

- To save the file locally, select **Save File** and then click **OK**.

  The AgentAppRecovery.log file saves to your Downloads folder. It can be opened using any text editor.

Downloading and viewing the log file for a protected machine

If you encounter any errors or issues with a protected machine, you can download the machine logs to view them or to share them with your Dell Support representative.

1. In the left navigation area of the Core Console, under the Protected Machines menu, click the arrow to expand the context-sensitive menu for the relevant protected machine. Scroll down to **More**, expand that menu, and then select **Agent Log**.

   The **Download Agent Log** page appears.

2. On the **Download Agent Log** page, click **Click here to begin the download**.
3. In the **Opening AgentAppRecovery.log** dialog box, do one of the following:
   - To open the log file, select **Open with**, then select an application (such as Notepad) for viewing the text-based log file, and finally click **OK**.

     The AgentAppRecovery.log file opens in the selected application.

   - To save the file locally, select **Save File** and then click **OK**.

     The AgentAppRecovery.log file saves to your Downloads folder. It can be opened using any text editor.

Related links

Downloading and viewing the Core log file

Viewing machine status and other details

Complete the step in this procedure to view the status as well as other details for a machine.

In the Rapid Recovery Core Console, navigate to the protected machine you want to view.

The information about the machine displays on the Summary page. The details that display include:

- Host name
- Last Snapshot taken
- Next Snapshot scheduled
- Encryption status
- Version number

  If Exchange Server is installed on the machine, detailed information about the server also displays and includes:

- Last successful Mountability check performed
- Last successful Checksum check performed
- Last Log Truncation performed

  Detailed information about the volumes contained on this machine also displays and includes:

- Volume Name
- Schedule
- Current Schedule

- Next Snapshot
- File System type
- Space Usage out of total size
- If SQL Server is installed on the machine, detailed information about the server also displays and includes:

  Online Status
- Name
- Install Path
- Version

  If Exchange Server is installed on the machine, detailed information about the server and mail stores also displays and includes:
- Version
- Install Path
- Data Path
- Database Name
- Exchange Databases Path
- Log File Path
- Log Prefix
- System Path
- MailStore Type

Managing machines

This section describes a variety of tasks you can perform in managing your machines. Topics include:

- Removing a machine
- Removing a cluster from protection
- Viewing license information on a machine
- Downloading and viewing the log file for a protected machine
- Converting a protected cluster node to a protected machine

Removing a machine

When you remove a machine from protection on the Rapid Recovery Core, you are presented with two options: you can keep the recovery points saved thus far to the RR Core, or you can remove the recovery points. If you keep the recovery points, you have what is known as a “recovery points only” machine. Using those recovery points for the machine that has been removed from current protection, you can continue to restore the machine in the future, but only up to the state captured in a saved recovery point.

If you remove the recovery points, this action deletes any snapshot data for that formerly protected machine from the Rapid Recovery Core.

⚠ **CAUTION: If you delete recovery points, you will no longer be able to restore data for that machine.**

Complete the steps in the following procedure to remove a machine from protection in your Rapid Recovery environment.

1. From the Rapid Recovery Core Console, in the left navigation pane under Protected Machines, click the machine you want to remove.
2. On the Summary page for the relevant machine, click **Remove Machine**.
3. In the dialog box, if you want to also delete all recovery points for this machine from the repository, select **Remove with recovery points**.
4. To confirm your choice to remove the machine, click **Yes**.

   Rapid Recovery removes the machine from protection and cancels all active tasks for that machine.

Canceling operations on a machine

You can cancel currently executing operations for a machine. You can specify to cancel just a current snapshot or to cancel all current operations, which would include exports, replications, and so on.

1. From the Rapid Recovery Core Console, in the left navigation area under Protected Machines, click the machine for which you want to cancel operations.
2. Click the **Events**.
3. Click the Job Details icon on the far right for the in-progress event or operation that you want to cancel.
4. In the Monitor Active Task dialog box, click **Cancel**.

Viewing license information on a machine

You can view current license status information for the Rapid Recovery Agent software installed on a protected machine.

1. From the Rapid Recovery Core Console, under Protected Machines , click the machine that you want to modify.

   The **Summary** page for the selection machine appears.
2. Click the **Settings** menu.

   The **Settings** page appears, showing configuration settings for the selected machine.
3. Click the **Licensing** link to scroll down in the Settings page to view machine-specific licensing settings.

   The Status screen appears and presents details about the product licensing.

VM export

This section describes how to export a recovery point to create a virtual machine.

About exporting to virtual machines with Rapid Recovery

From the Rapid Recovery Core, you can export a recovery point from a repository to a virtual machine. This process—sometimes called virtual export—is a physical-to-virtual (P2V) process that creates a virtual machine from a recovery point. The VM is a bootable clone of a protected machine.

NOTE: The recovery point used must be part of a complete recovery point chain. For more information about recovery point chains, see the topic Recovery point chains and orphans.

You can perform a virtual export from the Virtual Standby page in the Core Console, or by selecting **VM Export** from the **Restore** drop-down menu on the button bar.

When you perform a virtual export from Rapid Recovery Core, you have two choices:

- You can perform a **one-time virtual export**, which represents a single snapshot in time from the information in the recovery point.
- You can create a **virtual standby**. With virtual standby, the VM snapshot that you create from the selected recovery point is continually updated by the Core after every scheduled or forced snapshot captured from the source machine. This creates a high-availability resource for data recovery. If the protected machine fails, you can boot up the virtual machine to quickly replace it temporarily, allowing you time to recover the original protected machine without substantial downtime.

The following diagram shows a typical deployment for exporting data to a virtual machine.

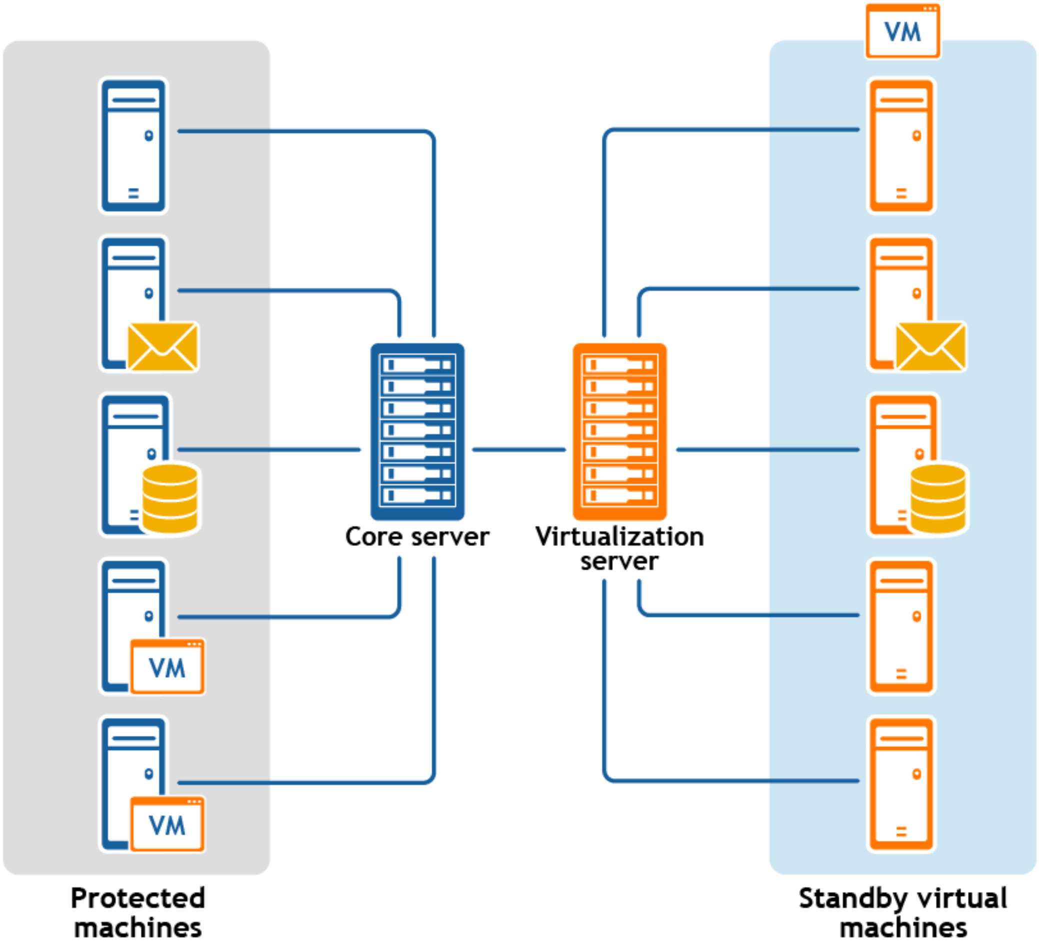


Figure 8. Virtual standby deployment

NOTE: In a configuration involving replication, the Core shown represents the target Core.

When you export to a virtual machine, the following information is exported:

- All of the backup data from a recovery point
- The operating system and settings from the original protected machine

You can perform virtual export of recovery points for your protected Windows or Linux machines to VMware, ESXi, Hyper-V, and VirtualBox.

NOTE: For ESXi, VMware Workstation, or Hyper-V, the virtual machine version must be a licensed version of these virtual machines, not the trial or free versions.

If you have replication set up between two Cores (source and target), you can only export data from the target Core after the initial replication is complete.

Performing a one-time ESXi export

Complete the steps in this procedure to perform a one-time export to ESXi.

1. In the Rapid Recovery Core Console, in the button bar, click the **Restore** drop-down menu, and then click **VM Export**.
2. In the Virtual Machine Export Wizard, select **One-time Export**.
3. Click **Next**.
4. On the Machines page, select the protected machine that you want to export.
5. Click **Next**.
6. On the Recovery Points page, select the recovery point that you want to use for the export.
7. Click **Next**.
8. On the Destination page in the Export Wizard, in the Recover to Virtual machine drop-down menu, select **ESX(i)**.
9. Enter the parameters for accessing the virtual machine as described in the following table, and then click **Next**.

Table 103. Virtual machine parameters

Options	Description
Host name	Enter a name for the host machine.
Port	Enter the port for the host machine. The default is 443.
User name	Enter the user name for logging on to the host machine.
Password	Enter the password for logging on to the host machine.

10. On the Virtual Machine Options page, enter the information described in the following table.

Table 104. Virtual machine options

Option	Description
Resource pool	Select a resource pool from the drop-down list.
VM configuration location	Select a data store from the drop-down list.
Virtual machine name	Enter a name for the virtual machine.

Option	Description
Memory	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.
Number of processors	The number of processors (CPUs) you want for the exported virtual machine. The minimum is 1.
Cores per processor	The number of cores you want to have for each processor. The minimum is 1.
Disk provisioning	Select the type of disk provisioning from the following options: • Thin. Thin provisioning creates a virtual disk the size of the used space on the original volumes, rather than the entire volume size. For example, if the original volume is 1 TB, but contains only 2 GB of used space, Rapid Recovery creates a virtual disk of 2 GB. • Thick. Thick provisioning creates a new disk or volume that is the same size as the original volume from the protected server, even if only a portion of the original volume is being used. For example, if the volume is 1 TB large but contains only 2 GB of used space, Rapid Recovery creates a virtual disk of 1 TB.
Disk mapping	Specify the type of disk mapping from the following options: • Automatic • Manual • With VM
Version	Select the version of of ESXi being used to create the virtual machine from the drop-down list.

11. Click **Next**.
12. On the Volumes page, select the volumes you want to export, and then click **Next**.
13. On the Summary page, click **Finish** to complete the wizard and start the export.

    NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events pages.

Performing a continual (Virtual Standby) ESXi export

Complete the steps in this procedure to perform a continual export to an ESXi virtual machine (VM) using Rapid Recovery.

1. In the Rapid Recovery Core Console, do one of the following:

   - From the Core Console, in the button bar, click the **Restore** drop-down menu, and then select **VM Export**.
     1. In the Virtual Machine Export Wizard, select **Continuous (Virtual Standby)**.
     2. Click **Next.**
   - From the Core Console, in the icon bar, click V (Virtual Standby).

- On the **Virtual Standby** page, click **Add** to launch the Virtual Machine Export Wizard.

2. On the **Machines** page of the Virtual Machine Export Wizard, select the protected machine that you want to export.
3. Click **Next**.
4. On the **Recovery Points** page, select the recovery point that you want to use for the export.
5. Click **Next**.
6. On the **Destination** page of the Export Wizard, in the Recover to a Virtual Machine drop-down menu, select **ESXi**.
7. Enter the information for accessing the virtual machine as described in the following table, and then click **Next**.

Table 105. ESXi credentials

Option	Description
Host name	Enter a name for the host machine.
Port	Enter the port for the host machine. The default is 443.
User name	Enter the logon credentials for the host machine.
Password	Enter the logon credentials for the host machine.

8. On the **Virtual Machine Options** page, enter the information described in the following table.

Table 106. Virtual machine options

Option	Description
Resource Pool	Select a resource pool from the drop-down list.
Data Store	Select a data store from the drop-down list.
Virtual Machine Name	Enter a name for the Virtual Machine.
Memory	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.
Number of processors	The number of processors (CPUs) you want for the exported virtual machine. The minimum is 1.
Cores per processor	The number of cores you want to have for each processor. The minimum is 1.
Disk Provisioning	Select the type of disk provisioning from the following options: • Thin. Thin provisioning creates a virtual disk the size of the used space on the original volumes, rather than the entire volume size. For example, if the original volume is 1 TB, but contains only 2 GB of used space, Rapid Recovery creates a virtual disk of 2 GB. • Thick. Thick provisioning creates a new disk or volume that is the same size as the original volume from the protected server, even if only a portion of the original volume is being used. For example, if the volume is 1 TB large but contains 2 GB of used space, Rapid Recovery creates a virtual disk of 1 TB.

Option	Description
Disk Mapping	Specify the type of disk mapping as appropriate (Automatic, Manual, or with VM).
Version	Select the version of the virtual machine.
Perform initial one-time export	Select to perform the virtual export immediately instead of after the next scheduled snapshot (optional)

9. Click **Next**.
10. On the **Volumes** page, select the volumes you want to export, and then click **Next**.
11. On the **Summary** page, click **Finish** to complete the wizard and start the export.

    NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events pages.

Performing a one-time VMware Workstation export

Complete the steps in this procedure to perform a one-time export to VMware Workstation.

1. In the Rapid Recovery Core Console, in the button bar, click the **Restore** drop-down menu, click **VM Export**.
2. In the Virtual Machine Export Wizard, select **One-time Export**.
3. Click **Next**.
4. On the Machines page, select the protected machine that you want to export.
5. Click **Next**.
6. On the Recovery Points page, select the recovery point that you want to use for the export.
7. Click **Next**.
8. On the Destination page in the Export Wizard, in the Recover to Virtual machine drop-down menu, select **VMware Workstation**, and then click **Next**.
9. On the Virtual Machine Options page, enter the parameters for accessing the virtual machine as described in the following table.

Table 107. Virtual machine parameters

Option	Description
VM Machine Location	Specify the path of the local folder or network share on which to create the virtual machine. NOTE: If you specified a network share path, you will need to enter a valid logon credentials for an account that is registered on the target machine. The account must have read and write permissions to the network share.
User name	Enter the logon credentials for the network location for the export. • If you specified a network share path, you need to enter a valid user name for an account that is registered on the target machine. • If you entered a local path, a user name is not required.
Password	Enter the logon credentials for the network location for the export. • If you specified a network share path, you need to enter a valid password for an account that is registered on the target machine. • If you entered a local path, a password is not required.

Option	Description
VM name	Enter a name for the virtual machine being created; for example, VM-0A1B2C3D4. NOTE: The default name is the name of the source machine.
Version	Specify the version of VMware Workstation for the virtual machine. You can choose from: • VMware Workstation 7.0 • VMware Workstation 8.0 • VMware Workstation 9.0 • VMware Workstation 10.0 • VMware Workstation 11.0 • VMware Workstation 12.0
Amount of RAM (MB)	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.
Number of processors	The number of processors (CPUs) you want for the exported virtual machine. The minimum is 1.
Cores per processor	The number of cores you want to have for each processor. The minimum is 1.

10. Click **Next**.
11. On the Volumes page, select the volumes to export, for example, C:\ and D:\, and then click **Next**.
12. On the Summary page, click **Finish** to complete the wizard and start the export.

    NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events tab.

Performing a continual (Virtual Standby) VMware Workstation export

Complete the steps in this procedure to perform a continual export to a VMware Workstation virtual machine (VM) using Rapid Recovery.

1. In the Rapid Recovery Core Console, do one of the following:

   - From the Core Console, in the button bar, click the **Restore** drop-down menu, and then select **VM Export**.
     1. In the Virtual Machine Export Wizard, select **Continuous (Virtual Standby)**.
     2. Click **Next.**
   - From the Core Console, in the icon bar, click (Virtual Standby).
     – On the **Virtual Standby** page, click **Add** to launch the Virtual Machine Export Wizard.
2. On the **Machines** page of the Virtual Machine Export Wizard, select the protected machine that you want to export.
3. Click **Next**.

4. On the **Recovery Points** page, select the recovery point that you want to use for the export.
5. Click **Next**.
6. On the **Destination** page of the Virtual Machine Export Wizard, in the Recover to a Virtual Machine drop-down menu, select **VMware Workstation**, and then click **Next**.
7. On the **Virtual Machine Options** page, enter the parameters for accessing the virtual machine as described in the following table.

Table 108. Virtual machine parameters

Option	Description
Target Path	Specify the path of the local folder or network share on which to create the virtual machine. NOTE: If you specified a network share path, you will need to enter a valid logon credentials for an account that is registered on the target machine. The account must have read and write permissions to the network share.
User name	Enter the logon credentials for the network location for the export. • If you specified a network share path, you need to enter a valid user name for an account that is registered on the target machine. • If you entered a local path, a user name is not required.
Password	Enter the logon credentials for the network location for the export. • If you specified a network share path, you need to enter a valid password for an account that is registered on the target machine. • If you entered a local path, a password is not required.
Virtual Machine	Enter a name for the virtual machine being created; for example, VM-0A1B2C3D4. NOTE: The default name is the name of the source machine.
Version	Specify the version of VMware Workstation for the virtual machine. You can choose from: • VMware Workstation 7.0 • VMware Workstation 8.0 • VMware Workstation 9.0 • VMware Workstation 10.0 • VMware Workstation 11.0 • VMware Workstation 12.0
Memory	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.
Number of processors	The number of processors (CPUs) you want for the exported virtual machine. The minimum is 1.

Option	Description
Cores per processor	The number of cores you want to have for each processor. The minimum is 1.

8. Select **Perform initial one-time export** to perform the virtual export immediately instead of after the next scheduled snapshot.
9. Click **Next**.
10. On the **Volumes** page, select the volumes to export, for example, C:\ and D:\, and then click **Next**.
11. On the **Summary** page, click **Finish** to complete the wizard and to start the export.

    NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events pages.

Performing a one-time Hyper-V export

Complete the steps in this procedure to perform a one-time export to Hyper-V.

1. In the Rapid Recovery Core Console, in the button bar, click the **Restore** drop-down menu, click **VM Export**.
2. In the Virtual Machine Export Wizard, select **One-time Export**.
3. Click **Next**.
4. On the **Machines** page, select the protected machine that you want to export.
5. Click **Next**.
6. On the **Recovery Points** page, select the recovery point that you want to use for the export.
7. Click **Next**.
8. On the **Destination** page, in the Export to Virtual machine drop-down menu, select **Hyper-V**.
9. To export to a local machine with the Hyper-V role assigned, click **Use local machine**.
10. To indicate that the Hyper-V server is located on a remote machine, click **Remote host**, and then enter the information for the remote host as described in the following table.

Table 109. Remote host information

Text Box	Description
Host Name	Enter an IP address or host name for the Hyper-V server. It represents the IP address or host name of the remote Hyper-V server.
Port	Enter a port number for the machine. It represents the port through which the Core communicates with this machine.
User name	Enter the user name for the user with administrative privileges for the workstation with the Hyper-V server. It is used to specify the logon credentials for the virtual machine.
Password	Enter the password for the user account with administrative privileges on the workstation with Hyper-V server. It is used to specify the logon credentials for the virtual machine.

11. Click **Next**.
12. On the **Virtual Machines Options** page, in the **VM Machine Location** text box, enter the path for the virtual machine; for example, D:\export. This is used to identify the location of the virtual machine.

NOTE: You need to specify the virtual machine location for both local and remote Hyper-V servers. The path should be a valid local path for the Hyper-V server. Non-existent directories are automatically created. You should not attempt to create them manually. Export to shared folders (for example, to \\data\share) is not permitted.

13. In the **Virtual Machine Name** text box, enter the name for the virtual machine .

    The name you enter appears in the list of virtual machines in the Hyper-V Manager console.

14. To specify memory usage, click one of the following:

    - **Use the same amount of RAM as the source machine**. Select this option to identify that the RAM use is identical between the virtual and source machines.
    - **Use a specific amount of RAM.** Select this option if you want to specify the amount of RAM in MB.

      The minimum amount is 1024 MB, and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.

15. To specify the disk format, next to Disk Format, click one of the following:

    - VHDX
    - VHD

      NOTE: Hyper-V Export supports VHDX disk formats if the target machine is running Windows 8 (Windows Server 2012) or higher. If the VHDX is not supported for your environment, the option is disabled.

      If exporting to Hyper-V generation 2, only VHDX disk format is supported.

16. To specify generation of Hyper-V to use for export, click one of the following:

    - Generation 1
    - Generation 2

      NOTE: Only generation 2 supports the secure boot option.

17. Specify the appropriate network adapter for the exported VM.

18. On the **Volumes** page, select the volume(s) to export; for example, C:\.

    NOTE: If the selected volumes are larger than the appropriate maximum allocations supported by the application as indicated below, or exceed the amount of space available, you will receive an error.

    - For VHDX disk format, your selected volumes should be no larger than 64 TB.
    - For VHD disk format, your selected volumes should be no larger than 2040 GB.

19. On the **Volumes** page, click **Finish** to complete the wizard and to start the export.

    NOTE: You can monitor the status and progress of the export by viewing the **Virtual Standby** or **Events** pages.

Performing a continual (Virtual Standby) Hyper-V export

Complete the steps in this procedure to perform a continual export to a Hyper-V virtual machine (VM) using Rapid Recovery.

1. In the Rapid Recovery Core Console, do one of the following:

    - From the Core Console, in the button bar, click the **Restore** drop-down menu, and then select **VM Export**.

1. In the Virtual Machine Export Wizard, select **Continuous (Virtual Standby)**.
2. Click **Next.**

- From the Core Console, in the icon bar, click V (Virtual Standby).
  - On the **Virtual Standby** page, click **Add** to launch the Virtual Machine Export Wizard.

2. On the **Machines** page of the Virtual Machine Export Wizard, select the protected machine that you want to export.
3. Click **Next**.
4. On the **Recovery Points** page, select the recovery point that you want to use for the export.
5. Click **Next**.
6. On the **Destination** page, in the Export to a Virtual Machine drop-down menu, select **Hyper-V**, and then do one of the following:
   - To export to a local machine with the Hyper-V role assigned, click **Use local machine**.
   - To indicate that the Hyper-V server is located on a remote machine, click **Remote host**, and then enter the parameters for the remote host as described in the following table.

Table 110. Remote host information

Text Box	Description
Host Name	Enter an IP address or host name for the Hyper-V server. It represents the IP address or host name of the remote Hyper-V server.
Port	Enter a port number for the machine. It represents the port through which the Core communicates with this machine.
User name	Enter the user name for the user with administrative privileges for the workstation with the Hyper-V server. It is used to specify the logon credentials for the virtual machine.
Password	Enter the password for the user account with administrative privileges on the workstation with Hyper-V server. It is used to specify the logon credentials for the virtual machine.

7. Click **Next**.
8. On the **Virtual Machines Options** page, in the **VM Machine Location** text box, enter the path for the virtual machine; for example, D:\export. This is used to identify the location of the virtual machine.

   NOTE: You need to specify the virtual machine location for both local and remote Hyper-V servers. The path should be a valid local path for the Hyper-V server. Non-existent directories are automatically created. You should not attempt to create them manually. Export to shared folders (for example, to \\data\share) is not permitted.

9. In the **Virtual Machine Name** text box, enter the name for the virtual machine.

   The name you enter appears in the list of virtual machines in the Hyper-V Manager console.

10. To specify memory usage, click one of the following:
    - **Use the same amount of RAM as the source machine**. Select this option to identify that the RAM use is identical between the virtual and source machines.
    - **Use a specific amount of RAM.** Select this option if you want to specify the amount of RAM in MB.

      The minimum amount is 1024 MB, and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.

11. To specify the disk format, next to Disk Format, click one of the following:
    - VHDX
    - VHD

NOTE: Hyper-V Export supports VHDX disk formats if the target machine is running Windows 8 (Windows Server 2012) or higher. If the VHDX is not supported for your environment, the option is disabled.

If exporting to Hyper-V generation 2, only VHDX disk format is supported.

12. To specify generation of Hyper-V to use for export, click one of the following:
    - Generation 1
    - Generation 2

    NOTE: Only generation 2 supports the secure boot option.
13. Specify the appropriate network adapter for the exported VM.
14. On the **Volumes** page, select the volume(s) to export; for example, C:\.

    NOTE: If the selected volumes are larger than the appropriate maximum allocations supported by the application as indicated below, or exceed the amount of space available, you will receive an error.

    - For VHDX disk format, your selected volumes should be no larger than 64 TB.
    - For VHD disk format, your selected volumes should be no larger than 2040 GB.
15. Select **Perform initial one-time export** to perform the virtual export immediately instead of after the next scheduled snapshot.
16. On the **Volumes** page, click **Finish** to complete the wizard and to start the export.

    NOTE: You can monitor the status and progress of the export by viewing the **Virtual Standby** or **Events** pages.

Performing a one-time VirtualBox export

Complete the steps in this procedure to perform a one-time export to VirtualBox.

1. In the Rapid Recovery Core Console, in the button bar, click the **Restore** drop-down menu, click **VM Export**.
2. In the Virtual Machine Export Wizard, select **One-time Export**.
3. Click **Next**.
4. On the Machines page, select the protected machine that you want to export.
5. Click **Next**.
6. On the Recovery Points page, select the recovery point that you want to use for the export.
7. Click **Next**.
8. On the Destination page in the Export Wizard, in the Recover to Virtual machine drop-down menu, select **VirtualBox**, and then click **Next**.
9. On the Virtual Machine Options page, select **Use Windows machine**.
10. Enter the parameters for accessing the virtual machine as described in the following table.

Table 111. Virtual machine parameters

Option	Description
Virtual Machine Name	Enter a name for the virtual machine being created. NOTE: The default name is the name of the source machine.
Target Path	Specify a local or remote target path to create the virtual machine.

Option	Description
	NOTE: The target path should not be a root directory. If you specify a network share path, you will need to enter valid logon credentials (user name and password) for an account that is registered on the target machine. The account must have read and write permissions to the network share.
Memory	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.

11. To specify a user account for the virtual machine, select **Specify the user account for the exported virtual machine**, and then enter the following information. This refers to a specific user account for which the virtual machine will be registered in the event there are multiple user accounts on the virtual machine. When this user account is logged on, only this user will see this Virtual Machine in VirtualBox manager. If an account is not specified, then the Virtual Machine will be registered for all existing users on the Windows machine with VirtualBox.
    - User name - Enter the user name for which the virtual machine is registered.
    - Password - Enter the password for this user account.
12. Click **Next**.
13. On the Volumes page, select the volumes to export, for example, C:\ and D:\, and then click **Next**.
14. On the Summary page, click **Finish** to complete the wizard and to start the export.

    NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events tab.

Performing a continual (Virtual Standby) VirtualBox export

To perform this step, VirtualBox must be installed on the Core machine.

Complete the steps in this procedure to perform a continuous export to a VirtualBox virtual machine (VM) using Rapid Recovery.

1. In the Rapid Recovery Core Console, do one of the following:
    - From the Core Console, in the button bar, click the **Restore** drop-down menu, and then select **VM Export**.
        1. In the Virtual Machine Export Wizard, select **Continuous (Virtual Standby)**.
        2. Click **Next.**
    - From the Core Console, in the icon bar, click V (Virtual Standby).
        - On the **Virtual Standby** page, click **Add** to launch the Virtual Machine Export Wizard.
2. On the **Machines** page of the Virtual Machine Export Wizard, select the protected machine that you want to export.
3. Click **Next**.
4. On the **Recovery Points** page, select the recovery point that you want to use for the export.

5. Click **Next**.
6. On the **Destination** page of the Export Wizard, in the **Recover to a Virtual Machine** drop-down menu, select **VirtualBox**.
7. On the **Virtual Machine Options** page, select **Remote Linux Machine**.
8. Enter information about the virtual machine as described in the following table.

Table 112. Remote Linux machine settings

Option	Description
VirtualBox Host Name	Enter an IP address or host name for the VirtualBox server. This field represents the IP address or host name of the remote VirtualBox server.
Port	Enter a port number for the machine. This number represents the port through which the Core communicates with this machine.
Virtual Machine Name	Enter a name for the virtual machine being created. NOTE: The default name is the name of the source machine.
Target Path	Specify a target path to create the virtual machine. NOTE: It is recommended that you create a root folder from root so that the virtual machine runs from root. If you do not use root, you will need to create the destination folder manually on the target machine prior to setting up the export. You will also need to manually attach or load the virtual machine after the export.
User Name	User name of the account on the target machine, for example, root.
Password	Password for the user account on the target machine.
Memory	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.

9. Select **Perform initial one-time export** to perform the virtual export immediately instead of after the next scheduled snapshot.
10. Click **Next**.
11. On the **Volumes** page, select the volumes of data to export, and then click **Next**.
12. On the **Summary** page, click **Finish** to complete the wizard and to start the export.

    NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events pages.

Managing exports

If your Core has virtual export established, the configuration parameters for each virtual export appear as a row on the **Virtual Standby** page. From here you can view the status of exports that you currently have set up, and manage your virtual standby machines. You can add a virtual standby, force export, pause or resume virtual standby, or remove the requirements for continual export.

When a one-time export takes place, the job is listed in the export queue on the **Virtual Standby** page. During this time, you can pause, resume, or cancel the export operation.

NOTE: Rapid Recovery supports Hyper-V export to Window 8, Window 8.1, Windows Server 2012 and 2012 R2.

Virtual export to a virtual standby VM does not occur if the VM is powered on.

Complete the steps in this procedure to manage virtual exports.

1. On the Core Console, in the icon bar, click V (Virtual Standby).

   The **Virtual Standby** page appears. Here you can view two tables of saved export settings. They include the information described in the following table.

Table 113. Virtual standby information

Column	Description
Select item	For each row in the summary table, you can select the check box to perform actions from the list of menu options preceding the table.
Status indicator	Colored spheres in the Status column show the status of virtual standby. If you hover the cursor over the colored circle, the status condition is displayed. • Green. Virtual standby is successfully configured, is active, and is not paused. The next export is performed immediately following completion of the next snapshot. • Yellow. Virtual standby pauses, but the parameters are still defined and saved in the Core. However, after a new transfer, the export job will not start automatically and there will be no new exports for this protected machine until the status changes.
Machine Name	The name of the source machine.
Destination	The virtual machine and path to which data is being exported.
Export Type	The type of virtual machine platform for the export, such as ESXi, VMware, Hyper-V, or VirtualBox.
Last Export	The date and time of the last export. If an export has just been added but has not completed, a message displays stating the export has not yet been performed. If an export has failed or was canceled, a corresponding message also displays.
Settings	The ⚙ drop-down menu lets you perform the following functions: • **Edit**. Lets you edit the virtual standby settings. • **Force**. Forces a virtual export. • **Pause**. Pauses virtual export. Only available when status is active. • **Resume**. Resumes virtual export. Only available when status is paused. • **Remove**. Removes the requirement for continual export. Does not remove the exported VM most recently updated.

Table 114. Export queue information

Column	Description
Select item	For each row in the summary table, you can select the check box to perform actions from the list of menu options preceding the table.
Destination	The virtual machine and path to which data is being exported.
Export Type	The type of virtual machine platform for the export, such as ESXi, VMware, Hyper-V, or VirtualBox.
Schedule Type	The type of export as either One-time or Continuous.
Status	The progress of the export, displayed as a percentage in a progress bar.

2. To manage saved export settings, select an export, and then click one of the following:
   - **Edit**. Opens the **Virtual Machine Export Wizard** to the **VM Options** page. Here you can change the location of the exported VM, change the version of the VM type, or specify RAM or processors for the export. To immediately start the VM export, select **Perform initial one-time export**.
   -
   - **Force**. Forces a new export. This option could be helpful when virtual standby is paused and then resumed, which means the export job will restart only after a new transfer. If you do not want to wait for the new transfer, you could force an export.
   - **Pause**. Pauses an active export.
   - **Resume**. Resumes the requirement for continue export at the next scheduled or forced snapshot.
3. To remove an export from the system, select the export, and then click **Remove**.

   The export configuration is permanently removed from the system. Removing the virtual standby configuration does not remove any virtual machine exported as a result of the configuration.
4. To manage the number of exports that run at the same time, do the following:
   - Under Export Queue, click **Settings**.
   - In the **Maximum Concurrent Exports** dialog box, enter the number of exports you want to run simultaneously. The default number is 5.
   - Click **Save**.
5. To cancel a one-time or continual export currently listed in the Export Queue, select the export, and then click **Cancel**.
6. To add a new virtual standby export, you can click **Add** to launch the Export Wizard. For further information about setting up virtual standby for a specific virtual machine, see one of the following topics:
   - Exporting data to an ESXi virtual machine
   - Exporting data to a VMware Workstation virtual machine
   - Exporting data to a Hyper-V virtual machine
   - Exporting data to a VirtualBox virtual machine

Exporting data to an ESXi virtual machine

In Rapid Recovery, you can export data to ESXi by performing a one-time export, or by establishing a continual export (for virtual standby). Complete the steps in the following procedures for the appropriate type of export.

Performing a one-time ESXi export

Complete the steps in this procedure to perform a one-time export to ESXi.

1. In the Rapid Recovery Core Console, in the button bar, click the **Restore** drop-down menu, and then click **VM Export**.
2. In the Virtual Machine Export Wizard, select **One-time Export**.
3. Click **Next**.
4. On the Machines page, select the protected machine that you want to export.
5. Click **Next**.
6. On the Recovery Points page, select the recovery point that you want to use for the export.
7. Click **Next**.
8. On the Destination page in the Export Wizard, in the Recover to Virtual machine drop-down menu, select **ESX(i)**.
9. Enter the parameters for accessing the virtual machine as described in the following table, and then click **Next**.

Table 115. Virtual machine parameters

Options	Description
Host name	Enter a name for the host machine.
Port	Enter the port for the host machine. The default is 443.
User name	Enter the user name for logging on to the host machine.
Password	Enter the password for logging on to the host machine.

10. On the Virtual Machine Options page, enter the information described in the following table.

Table 116. Virtual machine options

Option	Description
Resource pool	Select a resource pool from the drop-down list.
VM configuration location	Select a data store from the drop-down list.
Virtual machine name	Enter a name for the virtual machine.
Memory	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.
Number of processors	The number of processors (CPUs) you want for the exported virtual machine. The minimum is 1.
Cores per processor	The number of cores you want to have for each processor. The minimum is 1.

Option	Description
Disk provisioning	Select the type of disk provisioning from the following options: • Thin. Thin provisioning creates a virtual disk the size of the used space on the original volumes, rather than the entire volume size. For example, if the original volume is 1 TB, but contains only 2 GB of used space, Rapid Recovery creates a virtual disk of 2 GB. • Thick. Thick provisioning creates a new disk or volume that is the same size as the original volume from the protected server, even if only a portion of the original volume is being used. For example, if the volume is 1 TB large but contains only 2 GB of used space, Rapid Recovery creates a virtual disk of 1 TB.
Disk mapping	Specify the type of disk mapping from the following options: • Automatic • Manual • With VM
Version	Select the version of of ESXi being used to create the virtual machine from the drop-down list.

11. Click **Next**.
12. On the Volumes page, select the volumes you want to export, and then click **Next**.
13. On the Summary page, click **Finish** to complete the wizard and start the export.

    NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events pages.

Performing a continual (Virtual Standby) ESXi export

Complete the steps in this procedure to perform a continual export to an ESXi virtual machine (VM) using Rapid Recovery.

1. In the Rapid Recovery Core Console, do one of the following:
    - From the Core Console, in the button bar, click the **Restore** drop-down menu, and then select **VM Export**.
        1. In the Virtual Machine Export Wizard, select **Continuous (Virtual Standby)**.
        2. Click **Next.**
    - From the Core Console, in the icon bar, click V (Virtual Standby).
        – On the **Virtual Standby** page, click **Add** to launch the Virtual Machine Export Wizard.
2. On the **Machines** page of the Virtual Machine Export Wizard, select the protected machine that you want to export.
3. Click **Next**.
4. On the **Recovery Points** page, select the recovery point that you want to use for the export.
5. Click **Next**.
6. On the **Destination** page of the Export Wizard, in the Recover to a Virtual Machine drop-down menu, select **ESXi**.
7. Enter the information for accessing the virtual machine as described in the following table, and then click **Next**.

Table 117. ESXi credentials

Option	Description
Host name	Enter a name for the host machine.
Port	Enter the port for the host machine. The default is 443.
User name	Enter the logon credentials for the host machine.
Password	Enter the logon credentials for the host machine.

8. On the **Virtual Machine Options** page, enter the information described in the following table.

Table 118. Virtual machine options

Option	Description
Resource Pool	Select a resource pool from the drop-down list.
Data Store	Select a data store from the drop-down list.
Virtual Machine Name	Enter a name for the Virtual Machine.
Memory	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.
Number of processors	The number of processors (CPUs) you want for the exported virtual machine. The minimum is 1.
Cores per processor	The number of cores you want to have for each processor. The minimum is 1.
Disk Provisioning	Select the type of disk provisioning from the following options: • Thin. Thin provisioning creates a virtual disk the size of the used space on the original volumes, rather than the entire volume size. For example, if the original volume is 1 TB, but contains only 2 GB of used space, Rapid Recovery creates a virtual disk of 2 GB. • Thick. Thick provisioning creates a new disk or volume that is the same size as the original volume from the protected server, even if only a portion of the original volume is being used. For example, if the volume is 1 TB large but contains 2 GB of used space, Rapid Recovery creates a virtual disk of 1 TB.
Disk Mapping	Specify the type of disk mapping as appropriate (Automatic, Manual, or with VM).
Version	Select the version of the virtual machine.
Perform initial one-time export	Select to perform the virtual export immediately instead of after the next scheduled snapshot (optional)

9. Click **Next**.
10. On the **Volumes** page, select the volumes you want to export, and then click **Next**.
11. On the **Summary** page, click **Finish** to complete the wizard and start the export.

NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events pages.

Exporting data to a VirtualBox virtual machine

In Rapid Recovery, you can export data to VirtualBox Export by performing a one-time export, or by establishing a continual export (for virtual standby).

NOTE: VirtualBox export of a Windows 10 protected machine is not currently supported.

Complete the steps in the following procedures for the appropriate type of export.

NOTE: To perform this type of export, you should have VirtualBox installed on the Core machine. Virtual Box Version 4.2.18 or higher is supported for Windows hosts.

Performing a one-time VirtualBox export

Complete the steps in this procedure to perform a one-time export to VirtualBox.

1. In the Rapid Recovery Core Console, in the button bar, click the **Restore** drop-down menu, click **VM Export**.
2. In the Virtual Machine Export Wizard, select **One-time Export**.
3. Click **Next**.
4. On the Machines page, select the protected machine that you want to export.
5. Click **Next**.
6. On the Recovery Points page, select the recovery point that you want to use for the export.
7. Click **Next**.
8. On the Destination page in the Export Wizard, in the Recover to Virtual machine drop-down menu, select **VirtualBox**, and then click **Next**.
9. On the Virtual Machine Options page, select **Use Windows machine**.
10. Enter the parameters for accessing the virtual machine as described in the following table.

Table 119. Virtual machine parameters

Option	Description
Virtual Machine Name	Enter a name for the virtual machine being created. NOTE: The default name is the name of the source machine.
Target Path	Specify a local or remote target path to create the virtual machine. NOTE: The target path should not be a root directory. If you specify a network share path, you will need to enter valid logon credentials (user name and password) for an account that is registered on the target machine. The account must have read and write permissions to the network share.
Memory	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB

Option	Description
	The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.

11. To specify a user account for the virtual machine, select **Specify the user account for the exported virtual machine**, and then enter the following information. This refers to a specific user account for which the virtual machine will be registered in the event there are multiple user accounts on the virtual machine. When this user account is logged on, only this user will see this Virtual Machine in VirtualBox manager. If an account is not specified, then the Virtual Machine will be registered for all existing users on the Windows machine with VirtualBox.
    - User name - Enter the user name for which the virtual machine is registered.
    - Password - Enter the password for this user account.
12. Click **Next**.
13. On the Volumes page, select the volumes to export, for example, C:\ and D:\, and then click **Next**.
14. On the Summary page, click **Finish** to complete the wizard and to start the export.

    NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events tab.

Performing a continual (Virtual Standby) VirtualBox export

To perform this step, VirtualBox must be installed on the Core machine.

Complete the steps in this procedure to perform a continuous export to a VirtualBox virtual machine (VM) using Rapid Recovery.

1. In the Rapid Recovery Core Console, do one of the following:
    - From the Core Console, in the button bar, click the **Restore** drop-down menu, and then select **VM Export**.
        1. In the Virtual Machine Export Wizard, select **Continuous (Virtual Standby)**.
        2. Click **Next.**
    - From the Core Console, in the icon bar, click V (Virtual Standby).
        – On the **Virtual Standby** page, click **Add** to launch the Virtual Machine Export Wizard.
2. On the **Machines** page of the Virtual Machine Export Wizard, select the protected machine that you want to export.
3. Click **Next**.
4. On the **Recovery Points** page, select the recovery point that you want to use for the export.
5. Click **Next**.
6. On the **Destination** page of the Export Wizard, in the **Recover to a Virtual Machine** drop-down menu, select **VirtualBox**.
7. On the **Virtual Machine Options** page, select **Remote Linux Machine**.
8. Enter information about the virtual machine as described in the following table.

Table 120. Remote Linux machine settings

Option	Description
VirtualBox Host Name	Enter an IP address or host name for the VirtualBox server. This field represents the IP address or host name of the remote VirtualBox server.
Port	Enter a port number for the machine. This number represents the port through which the Core communicates with this machine.
Virtual Machine Name	Enter a name for the virtual machine being created. NOTE: The default name is the name of the source machine.
Target Path	Specify a target path to create the virtual machine. NOTE: It is recommended that you create a root folder from root so that the virtual machine runs from root. If you do not use root, you will need to create the destination folder manually on the target machine prior to setting up the export. You will also need to manually attach or load the virtual machine after the export.
User Name	User name of the account on the target machine, for example, root.
Password	Password for the user account on the target machine.
Memory	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.

9. Select **Perform initial one-time export** to perform the virtual export immediately instead of after the next scheduled snapshot.
10. Click **Next**.
11. On the **Volumes** page, select the volumes of data to export, and then click **Next**.
12. On the **Summary** page, click **Finish** to complete the wizard and to start the export.

    NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events pages.

Exporting data to a VMware Workstation virtual machine

In Rapid Recovery, you can export data to VMware Workstation by performing a one-time export or by establishing a continual export (for virtual standby). Complete the steps in the following procedures for the appropriate type of export.

Performing a one-time VMware Workstation export

Complete the steps in this procedure to perform a one-time export to VMware Workstation.

1. In the Rapid Recovery Core Console, in the button bar, click the **Restore** drop-down menu, click **VM Export**.
2. In the Virtual Machine Export Wizard, select **One-time Export**.
3. Click **Next**.
4. On the Machines page, select the protected machine that you want to export.

5. Click **Next**.
6. On the Recovery Points page, select the recovery point that you want to use for the export.
7. Click **Next**.
8. On the Destination page in the Export Wizard, in the Recover to Virtual machine drop-down menu, select **VMware Workstation**, and then click **Next**.
9. On the Virtual Machine Options page, enter the parameters for accessing the virtual machine as described in the following table.

Table 121. Virtual machine parameters

Option	Description
VM Machine Location	Specify the path of the local folder or network share on which to create the virtual machine. NOTE: If you specified a network share path, you will need to enter a valid logon credentials for an account that is registered on the target machine. The account must have read and write permissions to the network share.
User name	Enter the logon credentials for the network location for the export. • If you specified a network share path, you need to enter a valid user name for an account that is registered on the target machine. • If you entered a local path, a user name is not required.
Password	Enter the logon credentials for the network location for the export. • If you specified a network share path, you need to enter a valid password for an account that is registered on the target machine. • If you entered a local path, a password is not required.
VM name	Enter a name for the virtual machine being created; for example, VM-0A1B2C3D4. NOTE: The default name is the name of the source machine.
Version	Specify the version of VMware Workstation for the virtual machine. You can choose from: • VMware Workstation 7.0 • VMware Workstation 8.0 • VMware Workstation 9.0 • VMware Workstation 10.0 • VMware Workstation 11.0 • VMware Workstation 12.0
Amount of RAM (MB)	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.
Number of processors	The number of processors (CPUs) you want for the exported virtual machine. The minimum is 1.

Option	Description
Cores per processor	The number of cores you want to have for each processor. The minimum is 1.

10. Click **Next**.
11. On the Volumes page, select the volumes to export, for example, C:\ and D:\, and then click **Next**.
12. On the Summary page, click **Finish** to complete the wizard and start the export.

    NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events tab.

Performing a continual (Virtual Standby) VMware Workstation export

Complete the steps in this procedure to perform a continual export to a VMware Workstation virtual machine (VM) using Rapid Recovery.

1. In the Rapid Recovery Core Console, do one of the following:
    - From the Core Console, in the button bar, click the **Restore** drop-down menu, and then select **VM Export**.
        1. In the Virtual Machine Export Wizard, select **Continuous (Virtual Standby)**.
        2. Click **Next.**
    - From the Core Console, in the icon bar, click V (Virtual Standby).
        - On the **Virtual Standby** page, click **Add** to launch the Virtual Machine Export Wizard.
2. On the **Machines** page of the Virtual Machine Export Wizard, select the protected machine that you want to export.
3. Click **Next**.
4. On the **Recovery Points** page, select the recovery point that you want to use for the export.
5. Click **Next**.
6. On the **Destination** page of the Virtual Machine Export Wizard, in the Recover to a Virtual Machine drop-down menu, select **VMware Workstation**, and then click **Next**.
7. On the **Virtual Machine Options** page, enter the parameters for accessing the virtual machine as described in the following table.

Table 122. Virtual machine parameters

Option	Description
Target Path	Specify the path of the local folder or network share on which to create the virtual machine. NOTE: If you specified a network share path, you will need to enter a valid logon credentials for an account that is registered on the target machine. The account must have read and write permissions to the network share.
User name	Enter the logon credentials for the network location for the export. • If you specified a network share path, you need to enter a valid user name for an account that is registered on the target machine. • If you entered a local path, a user name is not required.

Option	Description
Password	Enter the logon credentials for the network location for the export. • If you specified a network share path, you need to enter a valid password for an account that is registered on the target machine. • If you entered a local path, a password is not required.
Virtual Machine	Enter a name for the virtual machine being created; for example, VM-0A1B2C3D4. NOTE: The default name is the name of the source machine.
Version	Specify the version of VMware Workstation for the virtual machine. You can choose from: • VMware Workstation 7.0 • VMware Workstation 8.0 • VMware Workstation 9.0 • VMware Workstation 10.0 • VMware Workstation 11.0 • VMware Workstation 12.0
Memory	Specify the memory usage for the virtual machine by clicking one of the following: • Use the same amount of RAM as source machine • Use a specific amount of RAM, and then specify the amount in MB The minimum amount is 1024 MB and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.
Number of processors	The number of processors (CPUs) you want for the exported virtual machine. The minimum is 1.
Cores per processor	The number of cores you want to have for each processor. The minimum is 1.

8. Select **Perform initial one-time export** to perform the virtual export immediately instead of after the next scheduled snapshot.
9. Click **Next**.
10. On the **Volumes** page, select the volumes to export, for example, C:\ and D:\, and then click **Next**.
11. On the **Summary** page, click **Finish** to complete the wizard and to start the export.

    NOTE: You can monitor the status and progress of the export by viewing the Virtual Standby or Events pages.

Exporting data to a Hyper-V virtual machine

In Rapid Recovery, you can export data to Hyper-V Export by performing a one-time export, or by establishing a continual export (for Virtual Standby).

Rapid Recovery supports first-generation Hyper-V export to the following hosts:

- Windows 8
- Windows 8.1
- Windows Server 2008
- Windows Server 2008 R2

- Windows Server 2012
- Windows Server 2012 R2

Rapid Recovery supports second-generation Hyper-V export to the following hosts:

- Windows 8.1
- Windows Server 2012 R2

NOTE: Not all protected machines can be exported to Hyper-V second generation hosts.

Only protected machines with the following Unified Extensible Firmware Interface (UEFI) operating systems support virtual export to Hyper-V second generation hosts:

- Windows 8 (UEFI)
- Windows 8.1 (UEFI)
- Windows Server 2012 (UEFI)
- Windows Server 2012 R2 (UEFI)

NOTE: Hyper-V export to second-generation VM can fail if the Hyper-V host does not have enough RAM allocated to perform the export.

Complete the steps in the following procedures for the appropriate type of export.

Performing a one-time Hyper-V export

Complete the steps in this procedure to perform a one-time export to Hyper-V.

1. In the Rapid Recovery Core Console, in the button bar, click the **Restore** drop-down menu, click **VM Export**.
2. In the Virtual Machine Export Wizard, select **One-time Export**.
3. Click **Next**.
4. On the **Machines** page, select the protected machine that you want to export.
5. Click **Next**.
6. On the **Recovery Points** page, select the recovery point that you want to use for the export.
7. Click **Next**.
8. On the **Destination** page, in the Export to Virtual machine drop-down menu, select **Hyper-V**.
9. To export to a local machine with the Hyper-V role assigned, click **Use local machine**.
10. To indicate that the Hyper-V server is located on a remote machine, click **Remote host**, and then enter the information for the remote host as described in the following table.

Table 123. Remote host information

Text Box	Description
Host Name	Enter an IP address or host name for the Hyper-V server. It represents the IP address or host name of the remote Hyper-V server.
Port	Enter a port number for the machine. It represents the port through which the Core communicates with this machine.
User name	Enter the user name for the user with administrative privileges for the workstation with the Hyper-V server. It is used to specify the logon credentials for the virtual machine.

Text Box	Description
Password	Enter the password for the user account with administrative privileges on the workstation with Hyper-V server. It is used to specify the logon credentials for the virtual machine.

11. Click **Next**.
12. On the **Virtual Machines Options** page, in the **VM Machine Location** text box, enter the path for the virtual machine; for example, D:\export. This is used to identify the location of the virtual machine.

    NOTE: You need to specify the virtual machine location for both local and remote Hyper-V servers. The path should be a valid local path for the Hyper-V server. Non-existent directories are automatically created. You should not attempt to create them manually. Export to shared folders (for example, to \\data\share) is not permitted.

13. In the **Virtual Machine Name** text box, enter the name for the virtual machine .

    The name you enter appears in the list of virtual machines in the Hyper-V Manager console.

14. To specify memory usage, click one of the following:
    - **Use the same amount of RAM as the source machine**. Select this option to identify that the RAM use is identical between the virtual and source machines.
    - **Use a specific amount of RAM.** Select this option if you want to specify the amount of RAM in MB.

      The minimum amount is 1024 MB, and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.
15. To specify the disk format, next to Disk Format, click one of the following:
    - VHDX
    - VHD

      NOTE: Hyper-V Export supports VHDX disk formats if the target machine is running Windows 8 (Windows Server 2012) or higher. If the VHDX is not supported for your environment, the option is disabled.

      If exporting to Hyper-V generation 2, only VHDX disk format is supported.
16. To specify generation of Hyper-V to use for export, click one of the following:
    - Generation 1
    - Generation 2

      NOTE: Only generation 2 supports the secure boot option.
17. Specify the appropriate network adapter for the exported VM.
18. On the **Volumes** page, select the volume(s) to export; for example, C:\.

    NOTE: If the selected volumes are larger than the appropriate maximum allocations supported by the application as indicated below, or exceed the amount of space available, you will receive an error.

    - For VHDX disk format, your selected volumes should be no larger than 64 TB.
    - For VHD disk format, your selected volumes should be no larger than 2040 GB.
19. On the **Volumes** page, click **Finish** to complete the wizard and to start the export.

    NOTE: You can monitor the status and progress of the export by viewing the **Virtual Standby** or **Events** pages.

Performing a continual (Virtual Standby) Hyper-V export

Complete the steps in this procedure to perform a continual export to a Hyper-V virtual machine (VM) using Rapid Recovery.

1. In the Rapid Recovery Core Console, do one of the following:
   - From the Core Console, in the button bar, click the **Restore** drop-down menu, and then select **VM Export**.
     1. In the Virtual Machine Export Wizard, select **Continuous (Virtual Standby)**.
     2. Click **Next.**
   - From the Core Console, in the icon bar, click (Virtual Standby).
     - On the **Virtual Standby** page, click **Add** to launch the Virtual Machine Export Wizard.
2. On the **Machines** page of the Virtual Machine Export Wizard, select the protected machine that you want to export.
3. Click **Next**.
4. On the **Recovery Points** page, select the recovery point that you want to use for the export.
5. Click **Next**.
6. On the **Destination** page, in the Export to a Virtual Machine drop-down menu, select **Hyper-V**, and then do one of the following:
   - To export to a local machine with the Hyper-V role assigned, click **Use local machine**.
   - To indicate that the Hyper-V server is located on a remote machine, click **Remote host**, and then enter the parameters for the remote host as described in the following table.

Table 124. Remote host information

Text Box	Description
Host Name	Enter an IP address or host name for the Hyper-V server. It represents the IP address or host name of the remote Hyper-V server.
Port	Enter a port number for the machine. It represents the port through which the Core communicates with this machine.
User name	Enter the user name for the user with administrative privileges for the workstation with the Hyper-V server. It is used to specify the logon credentials for the virtual machine.
Password	Enter the password for the user account with administrative privileges on the workstation with Hyper-V server. It is used to specify the logon credentials for the virtual machine.

7. Click **Next**.
8. On the **Virtual Machines Options** page, in the **VM Machine Location** text box, enter the path for the virtual machine; for example, D:\export. This is used to identify the location of the virtual machine.

   NOTE: You need to specify the virtual machine location for both local and remote Hyper-V servers. The path should be a valid local path for the Hyper-V server. Non-existent directories are automatically created. You should not attempt to create them manually. Export to shared folders (for example, to \\data\share) is not permitted.
9. In the **Virtual Machine Name** text box, enter the name for the virtual machine.

   The name you enter appears in the list of virtual machines in the Hyper-V Manager console.
10. To specify memory usage, click one of the following:

- **Use the same amount of RAM as the source machine**. Select this option to identify that the RAM use is identical between the virtual and source machines.
- **Use a specific amount of RAM.** Select this option if you want to specify the amount of RAM in MB.

  The minimum amount is 1024 MB, and the maximum allowed by the application is 65536 MB. The maximum amount of memory usage is limited by the amount of RAM available to the host machine.

11. To specify the disk format, next to Disk Format, click one of the following:
    - VHDX
    - VHD

      NOTE: Hyper-V Export supports VHDX disk formats if the target machine is running Windows 8 (Windows Server 2012) or higher. If the VHDX is not supported for your environment, the option is disabled.

      If exporting to Hyper-V generation 2, only VHDX disk format is supported.
12. To specify generation of Hyper-V to use for export, click one of the following:
    - Generation 1
    - Generation 2

      NOTE: Only generation 2 supports the secure boot option.
13. Specify the appropriate network adapter for the exported VM.
14. On the **Volumes** page, select the volume(s) to export; for example, C:\.

    NOTE: If the selected volumes are larger than the appropriate maximum allocations supported by the application as indicated below, or exceed the amount of space available, you will receive an error.

    - For VHDX disk format, your selected volumes should be no larger than 64 TB.
    - For VHD disk format, your selected volumes should be no larger than 2040 GB.
15. Select **Perform initial one-time export** to perform the virtual export immediately instead of after the next scheduled snapshot.
16. On the **Volumes** page, click **Finish** to complete the wizard and to start the export.

    NOTE: You can monitor the status and progress of the export by viewing the **Virtual Standby** or **Events** pages.

Managing aging data

This section describes how to manage aging snapshot data saved to your repository. It includes information about retaining recovery points in your repository, retention policies, and the resulting process of rolling up recovery points to conserve space. It describes the new ability to relocate recovery points from your repository to a Dell DR backup and deduplication appliance.

This section also describes how to archive data for long-term storage that is not subject to rollup, and how to access recovery points that have been archived.

About Rapid Recovery data retention and archiving

Each time your Core captures a snapshot, the data is saved as a recovery point to your repository. Recovery points naturally accumulate over time. The Core uses a retention policy to determine how long snapshot data is retained in the repository. During the rollup portion of the nightly job, the Core enforces the retention policy to reduce the amount of storage space consumed. During rollup, the date of each recovery point is compared to the date of the most recent recovery point. The Core then combines or "rolls up" older recovery points. Over time, older recovery points are eventually replaced with newer ones as the oldest recovery points "age out" beyond the oldest retention period.

To keep recovery points that would otherwise be combined and eventually deleted, you can create an archive from the Core Console. An archive is a file containing the full set of recovery points for machines protected on your Core at the point in time in which it was created.

You can store an archive in a file system, or on a storage account in the cloud.

If you need to access the data in a recovery point, you can later attach (for Rapid Recovery 6.x and later) or import the archive, restoring those recovery points to your repository. You can then take the same actions on that data as with any other recovery points currently in your Core.

NOTE: Since the Core recognizes the original dates of recovery points in an archive, imported recovery points may again be rolled up or deleted during the next nightly job period. If you want to retain older recovery points, you can disable rollup for the relevant machines, or you can extend the retention period.

Managing retention policies

A retention policy is a set of rules that dictates the length of time for the Core to retain recovery points before starting to roll them up. Retention policies can be set to roll up based on hours, days, weeks, months and years. You can set up to six rules (the default policy sets five rules).

Since you can back up as frequently as every 5 minutes, the first rule in the retention policy typically sets how long to retain all recovery points. For example, if you back up a machine every quarter hour, 96 recovery points are saved to the repository for that machine per day, until rollup begins. Without managing your retention policy, that amount of data can quickly fill a repository.

NOTE: Administrators should note that frequent backups can have an impact on network traffic. Other factors affecting network traffic include other transfers (such as replication), the change rate of your data, and your network hardware, cables and switches.

The Core comes preset with a default retention policy. The default policy works retains:

- All recovery points for three days
- One recovery point per hour for two days
- One recovery point per day for four days
- One recovery point per week for three weeks
- One recovery point per month for two months
- One recovery point per year for X years (disabled in default policy).

Following this default policy, the oldest recovery point is typically 92 days old. Data past that origination date for a default policy is deleted.

Setting the retention policy at the Core level applies automatically to all machines that the Core protects. You can change the default policy to suit your needs.

For any machine, you can also create a custom retention policy. Setting the policy at the machine level lets you specify a different retention policy than the default Core policy. For more information about configuring retention policies, see Configuring Core default retention policy settings and Customizing retention policy settings for a protected machine.

Configuring Core default retention policy settings

The retention policy for the Core specifies how long the recovery points for a protected machine are stored in the repository.

The Core retention policy is enforced by a rollup process which is performed as one component of running nightly jobs. Then, recovery points beyond the age specified in the retention policy are “rolled up” (combined) into fewer recovery points that cover a less granular period of time. Applying the retention policy on a nightly basis results in the ongoing rollup of aging backups. This eventually results in the deletion of the oldest recovery points, based on the requirements specified in that retention policy.

Different retention settings can be configured for source and target Cores.

NOTE: This topic is specific to customizing retention policy settings on the Rapid Recovery Core. When you save customized retention policy settings on the Core, you establish the default retention policy settings which can be applied to all machines protected by this Core. For more information on customizing retention policy settings for individual protected machines, see Customizing retention policy settings for a protected machine.

1. Navigate to the Rapid Recovery Core Console.
2. On the icon bar, click ⚙ (Settings), and then do one of the following:
   - From the list of Core settings on the left side of the Settings page, click **Nightly Jobs**.
   - Scroll down on the right side of the Settings page until you can see the **Nightly Jobs** heading.

   The Nightly Jobs core settings appear.
3. Under **Nightly Jobs**, click ✎ **Change**.

   The **Nightly Jobs** dialog box appears.
4. To specify the time intervals for retaining the backup data as needed, in the Nightly Jobs pane, select **Rollup**, and then click **Settings**.

   The **Configuration** dialog box for the Core default retention policy appears.
5. To restore Core retention policy settings to the default values at any time, at the bottom of the Configuration dialog box, click **Restore Defaults** and then click **Yes** to confirm.

   All settings are restored to the default values described in the table in Step 6.
6. To define a retention policy, first specify the primary setting that determines how long initial backup snapshots are retained. Then proceed to define a cascading set of rollup requirements that determines the intervals between when recovery points should be rolled up.

   The retention policy options are described in the following table.

Table 125. Schedule options for default retention policy

Text Box	Description
Keep all recovery points for n [retention time period]	Specifies the retention period for the recovery points. Enter a number to represent the retention period and then select the time period. The default is 3 days.

Text Box	Description
	You can choose from: Days, Weeks, Months, or Years
...and then keep one recovery point per hour for n [retention time period]	Provides a more granular level of retention. It is used as a building block with the primary setting to further define how long recovery points are maintained. Enter a number to represent the retention period and then select the time period. The default is 2 days. You can choose from: Days, Weeks, Months, or Years
...and then keep one recovery point per day for n [retention time period]	Provides a more granular level of retention. It is used as a building block to further define how long recovery points are maintained. Enter a number to represent the retention period and then select the time period. The default is 4 days. You can choose from: Days, Weeks, Months, or Years
...and then keep one recovery point per week for n [retention time period]	Provides a more granular level of retention. It is used as a building block to further define how long recovery points are maintained. Enter a number to represent the retention period and then select the time period. The default is 3 weeks. You can choose from: Weeks, Months, or Years
...and then keep one recovery point per month for n [retention time period]	Provides a more granular level of retention. It is used as a building block to further define how long recovery points are maintained. Enter a number to represent the retention period and then select the time period. The default is 2 months. You can choose from: Months or Years
...and then keep one recovery point per year for n [retention time period]	Enter a number to represent the retention period and then select the time period. You can choose from: Years

The oldest recovery point is determined by the retention policy settings.

The following is an example of how the retention period is calculated.

Keep all recovery points for three days.

...and then keep one recovery point per hour for three days

...and then keep one recovery point per day for four days

...and then keep one recovery point per week for three weeks

...and then keep one recovery point per month for two months

...and then keep one recovery point per month for one year

In this example, the oldest recovery point would be one year, 4 months, and 6 days old.

7. When satisfied with your retention policy settings, click **Save**.

   The **Configuration** dialog box closes.
8. In the **Nightly Jobs** dialog box, click **OK**.

   The **Nightly Jobs** dialog box closes. The retention policy you defined is applied during the nightly rollup.

   You can also to apply these settings when specifying the retention policy for any individual protected machine. For more information about setting retention policies for a protected machine, see Customizing retention policy settings for a protected machine.

Customizing retention policy settings for a protected machine

The retention policy for a protected machine specifies how long recovery points are stored in the repository. Typically, each protected machine uses the default retention policy established for the Core unless you specify a custom retention policy, as described in this procedure.

Use this procedure to define a custom retention policy for a protected machine, including a replicated machine.

1. From the Protected Machines menu of the Rapid Recovery Core Console, click the name of the machine that you want to modify.

   The **Summary** page for the selection machine appears.
2. Click the **Settings** menu.

   The **Settings** page appears, showing configuration settings for the selected machine.
3. Optionally, click the **Nightly Jobs** link to scroll down in the Settings page to view nightly jobs settings.
4. Under the Nightly Jobs heading, click ✎ **Change**.

   The **Nightly Jobs** dialog box appears.
5. To specify the time intervals for retaining the backup data as needed, select **Rollup** and then click **Settings**.

   The **Configuration** dialog box for the retention policy appears.
6. If customizing retention policies settings for a replicated machine, and if you see a caution notifying you to perform an Integrity Check on your repository, proceed with this step. Otherwise, skip to the next step.

   a. If you are prepared to perform the job, click **Check Integrity**

   b. Click **Yes** to confirm the Integrity Check job.

   > NOTE: Running this job could take a substantial amount of time, based on the size of your repository. During this time, you can perform no other actions (snapshots, replication, virtual export, and so on) in the repository. For information about this job, see About checking the integrity of DVM repositories.

   - Once the Check Integrity job completes all child job successfully, return to this procedure and continue with the next step.
7. In the **Configuration** dialog box, do one of the following:

   - To use the default retention policy for this protected machine, select **Use Core default retention policy**, and then click **Save**. The default policy is applied to this agent.
   - To define a custom retention policy for this agent, select **Use custom retention policy**, and then continue with the next step.

The **Configuration** dialog box expands to show custom retention policy information.

8. Enter the custom schedule for retaining the recovery points as described in the following table.

Table 126. Schedule options for custom retention policy

Text Box	Description
Keep all recovery points for n [retention time period]	Specifies the retention period for the recovery points. Enter a number to represent the retention period and then select the time period. The default is 3 days. You can choose from: Days, Weeks, Months, and Years
...and then keep one recovery point per hour for n [retention time period]	Provides a more granular level of retention. It is used as a building block with the primary setting to further define how long recovery points are maintained. Enter a number to represent the retention period and then select the time period. The default is 2 days. You can choose from: Days, Weeks, Months, and Years
...and then keep one recovery point per day for n [retention time period]	Provides a more granular level of retention. It is used as a building block to further define how long recovery points are maintained. Enter a number to represent the retention period and then select the time period. The default is 4 days. You can choose from: Days, Weeks, Months, and Years
...and then keep one recovery point per week for n [retention time period]	Provides a more granular level of retention. It is used as a building block to further define how long recovery points are maintained. Enter a number to represent the retention period and then select the time period. The default is 3 weeks. You can choose from: Weeks, Months, and Years
...and then keep one recovery point per month for n [retention time period]	Provides a more granular level of retention. It is used as a building block to further define how long recovery points are maintained. Enter a number to represent the retention period and then select the time period. The default is 2 months. You can choose from: Months and Years
...and then keep one recovery point per year for n [retention time period]	Enter a number to represent the retention period and then select the time period. You can choose from: Years

The following is an example of how the retention period is calculated.

Keep all recovery points for three days.

...and then keep one recovery point per hour for three days

...and then keep one recovery point per day for four days

...and then keep one recovery point per week for three weeks

...and then keep one recovery point per month for two months

...and then keep one recovery point per month for one year

In this example, the oldest recovery point would be one year, 3 months old.

9. If you want to retain all recovery points in your primary repository, clear the **Relocate outdated recovery points to an R3 repository** option and skip the next step.
10. If you want to relocate recovery points from your primary repository to an R3 repository stored on a Dell DR series backup appliance, do the following:.
    a. Select the **Relocate outdated recovery points to an R3 repository** option.
    b. Specify the age at which you want to relocate recovery points from your primary repository to the R3 repository.

       You can specify the age by weeks, months or years. The shortest period you can set is 1 week.
    c. From the **Select a repository** drop-down menu, select the R3 repository to which you want to tier the specified recovery points.

    NOTE: Regardless of where recovery points are located (local DVM repository or in a remote R3 repository on a DR backup appliance), they are still subject to the retention policy, and will still be rolled up. If you need to retain older recovery points, one method is to archive. The other approach is to disable rollup or extend the retention period for the relevant protected machines.
11. Click **Save**.

Forcing rollup for a protected machine

You can bypass your scheduled retention policy by forcing recovery points to roll up at the protected machine level.

1. From the Protected Machines menu of the Rapid Recovery Core Console, click the name of a specific protected machine.

   The **Summary** page for the selection machine appears.
2. Click the **More** drop-down menu at the top of the protected machine view, and then select **Retention Policy**.

   The **Retention Policy** page for the specified machine appears.
3. Click **Force Rollup**.
4. In the dialog box, click **Yes** to confirm.

   Rapid Recovery initiates rollup for this machine, regardless of the retention policy schedule.

Replication

This section describes how to configure and manage the replication of protected data from a Rapid Recovery source Core to a Rapid Recovery target Core for disaster recovery.

Replication with Rapid Recovery

This section provides conceptual and procedural information to help you understand and configure replication in Rapid Recovery.

Replication is the process of copying recovery points from one Rapid Recovery Core and transmitting them to another Rapid Recovery Core for disaster recovery purposes. The process requires a paired source-target relationship between two or more Cores.

The source Core copies the recovery points of selected protected machines, and then asynchronously and continually transmits that snapshot data to the target Core.

Unless you change the default behavior by setting a replication schedule, the Core starts a replication job immediately after completion of every backup snapshot, checksum check, attachability check, and the nightly jobs. For more information, see Scheduling replication.

For optimum data security, administrators usually use a target Core at a remote disaster recovery site. You can configure outbound replication to a company-owned data center or remote disaster recovery site (that is, a “self-managed” target Core). Or, you can configure outbound replication to a third-party managed service provider (MSP) or cloud provider that hosts off-site backup and disaster recovery services. When replicating to a third-party target Core, you can use built-in work flows that let you request connections and receive automatic feedback notifications.

Replication is managed on a per-protected-machine basis. Any machine (or all machines) protected or replicated on a source Core can be configured to replicate to a target Core.

Possible scenarios for replication include:

- **Replication to a local location**. The target Core is located in a local data center or on-site location, and replication is maintained at all times. In this configuration, the loss of the Core would not prevent a recovery.
- **Replication to an off-site location**. The target Core is located at an off-site disaster recovery facility for recovery in the event of a loss.
- **Mutual replication**. Two data centers in two different locations each contain a Core and are protecting machines and serving as the off-site disaster recovery backup for each other. In this scenario, each Core replicates the protected machines to the Core that is located in the other data center.
- **Hosted and cloud replication**. Rapid Recovery MSP partners maintain multiple target Cores in a data center or a public cloud. On each of these Cores, the MSP partner lets one or more of their customers replicate recovery points from a source Core on the customer’s site to the MSP’s target Core for a fee.

  NOTE: In this scenario, customers only have access to their own data.

Possible replication configurations include:

- **Point-to-point replication**. Replicates one or more protected machines from a single source Core to a single target Core.

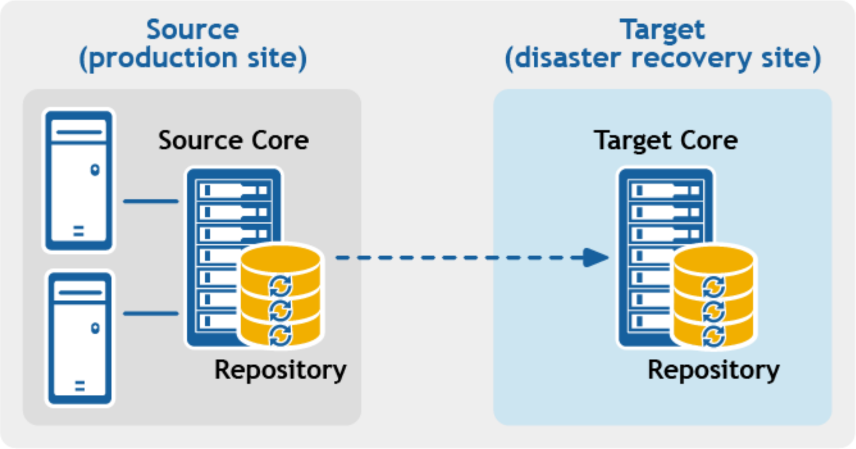


Figure 9. Point-to-point replication configuration

- **Multipoint-to-point replication**. Replicates protected machines from multiple source Cores to a single target Core.

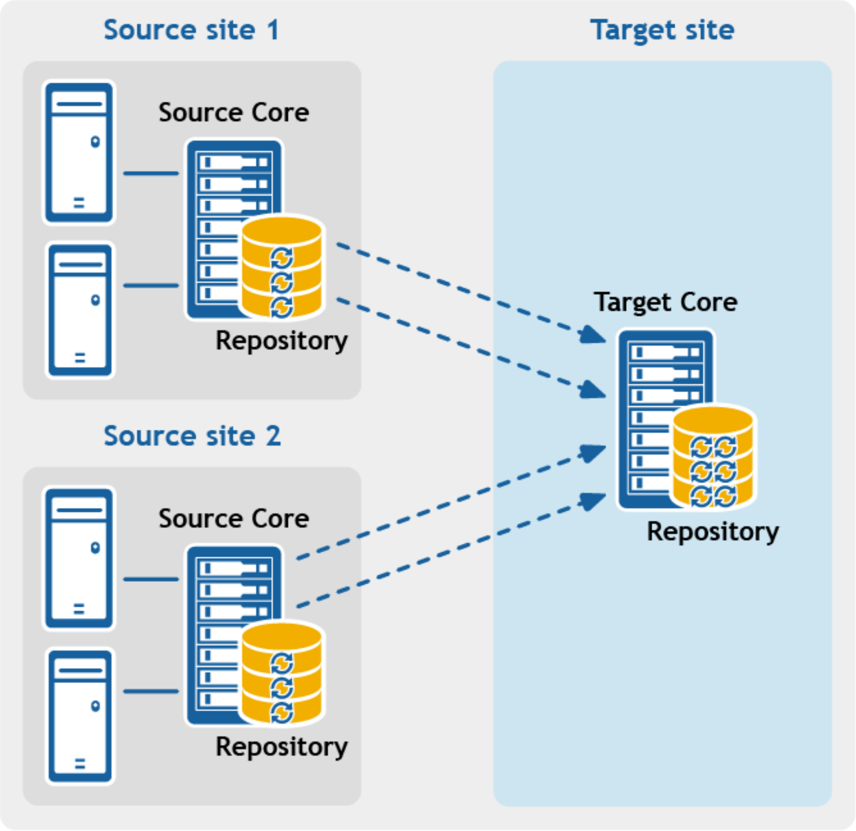


Figure 10. Multipoint-to-point replication configuration

- **Point-to-multipoint replication**. Replicates one or more protected machines from a single source Core to more than one target Core.

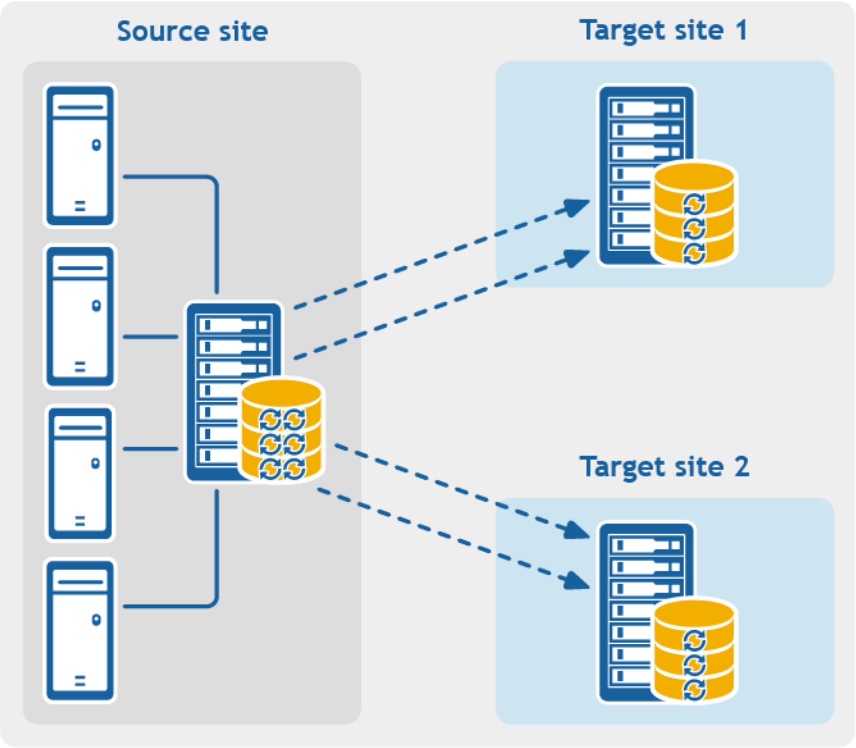


Figure 11. Point-to-multipoint replication configuration

- **Multi-hop replication**. Replicates one or more protected machines from one target Core to another target Core, producing additional failover or recovery options on the replicated Core.

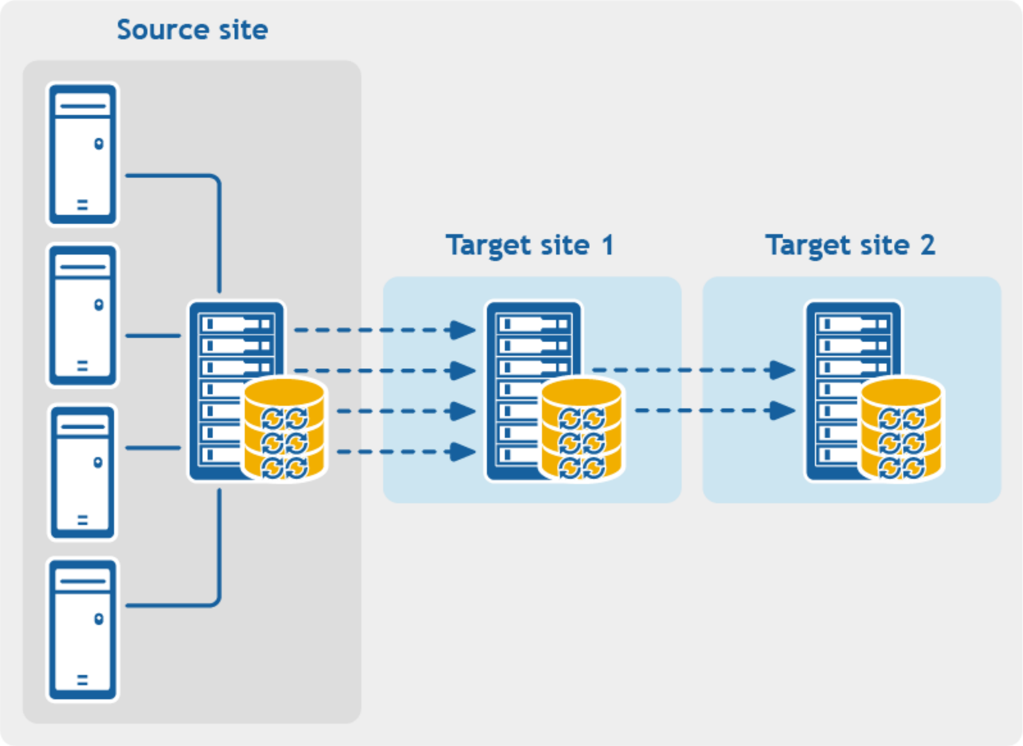


Figure 12. Multi-hop replication configuration

If using Dell Data Protection backup appliances such as the DL1x00 or DL4x00 series, the target Core to which you replicate must have a valid software license configured. These hardware appliances include a replication target license with purchase. Check for your license key in the welcome email message you received when purchased the appliance. For assistance, visit the Licensing Assistance website at https://support.software.dell.com/licensing-assistance or email license@software.dell.com.

Recovery point chains and orphans

Rapid Recovery captures snapshots of a protected machine, and saves the data to a repository as a *recovery point*. The first recovery point saved to the Core is called a *base image*. The base image includes the operating system, applications, and settings for each volume you choose to protect, as well as all data on those volumes. Successive backups are *incremental snapshots*, which consist only of data changed on the protected volumes since the last backup. The base image plus all incremental snapshots together form a complete *recovery point chain*.

From a complete recovery point chain, you can restore data with ease and confidence, using the full range of recovery options available to Rapid Recovery. These options include file-level restore, volume-level restore, and bare metal restore.

Since logically you cannot restore from data that does not exist, in the case of an incomplete recovery point chain, you cannot restore data at the volume level or perform a bare metal restore. In such cases, you can still restore any data that does exist in a recovery point at the file level.

If the information you want to restore from a recovery point is in a previous backup that is not available to the Core (an earlier incremental snapshot or the base image), the recovery point is said to be *orphaned*. Orphaned recovery points are typical in some replication scenarios.

For example, when you first establish replication, your options for restoring data from the replicated recovery points are limited. Until all backup data from the source Core is transmitted to the target Core, creating full recovery point chains from the orphans, you can only perform file-level restore.

When replication begins

By default, replication transfer jobs are automatically queued by the Core immediately after each regularly scheduled backup transfer completes. Thus, unless the replication schedule for a protected machine is customized, its replication schedule is based on its standard backup snapshot schedule.

When you first set up replication, if one or more recovery points exist on the source Core, the replication process begins immediately, unless:

- You select the option to initially pause replication, or
- You select the option to use a seed drive to perform the initial transfer.

If you pause replication initially, replication begins when you explicitly resume replication.

If you set up replication and specify the use of a seed drive, replication to the target Core begins with the next regularly scheduled backup snapshot.

NOTE: You can also force a backup of the protected machine after establishing replication. This causes replication to begin immediately after the protected machine snapshot completes.

If you specify a seed drive when you set up replication, only future backup transfers are replicated. If you want existing recovery points from the original protected machine to exist on the target Core, you must seed data from the protected machine. To seed data, create a seed drive from the source Core, and then consume the seed drive on the target Core.

You can also customize the replication schedule for a protected machine. For example, if you use the default protection schedule of one backup per hour, you can specify that the source Core replicate to the target Core at a different schedule (for example, once daily at 2AM).

Determining your seeding needs and strategy

The following topics discuss restoring from replicated data and whether you need to seed recovery point data from the source Core.

When seeding data is required

When you first establish replication, unless you specify the use a seed drive, the source Core begins transmitting all of the recovery points for the selected machines to the target Core. Transmitting your data over the network can take a good deal of time. Factors involved include the speed of your network, the robustness of your network architecture, and the amount of data to be transmitted to the target Core. For example, if the backup data on the source Core measures 10GB and the WAN link transfers 24Mbps, the transfer could take approximately one hour to complete.

Based on the amount of information you want to copy to the target Core, the seed drive can add up to hundreds or thousands of gigabytes of data. Many organizations choose not to consume the network bandwidth required, and instead opt to define and consume a seed drive. For more information, see Performance considerations for replicated data transfer.

If you specify the use of a seed drive when defining replication, then only recovery points saved to the source Core *after* you establish replication are replicated to the target Core. Backups saved on the source Core *before* replication was established will not be present on the target Core until you explicitly *seed* the data, using the following process.

To avoid slowing down your network with an intensive transfer of historical data, seed your prior backup data to the target Core using a **seed drive**. A seed drive is an archive file that **copies** a set of deduplicated base images and incremental snapshots from the source Core. The seed drive file contains the full set of previous recovery points for the protected machines you want to replicate from the source Core to the target Core.

Move the seed drive file to a storage volume which you then make available to the target Core. Then you **consume** the information from the seed drive. This involves attaching the volume with the seed drive image to the target Core and importing the data to the repository from the Core Console. This process repairs orphans, uniting incremental snapshots replicated to the target Core with their base images, to form one or more complete recovery point chains. This process is sometimes called copy-consume.

Seeding data from your source Core is not always required. For example:

- If you are setting up replication for a new Rapid Recovery Core, seeding is not required.
- If the data from previous snapshots are not critical for your replicated data, and you only need to recover data saved after replication is set up, seeding is not required.

  NOTE: In this case, Dell recommends capturing a new base image immediately before or immediately after setting up replication. This step ensures a full recovery point chain exists on the target Core from which to restore data in the future.
- If you captured a base image immediately before setting up replication, and only have a need to restore from data captured after that date, seeding is not required.
- If you set up replication without specifying a seed drive, then the snapshot data transmits over the network from the source Core to the target Core.

If one of these situations applies to you, you do not need to seed data. In such cases, replication can be completed entirely from the source Core.

If you set up replication for a Core with existing recovery points and may need to restore at the volume level, want to perform a BMR, or want to restore data from an earlier base image or incremental snapshot, seeding is required. In these situations, consider your seeding needs and strategy. Review the information in this topic and decide whether you will seed to your target Core, and which approach you will use.

Approaches to seeding data

If you want your replicated machines on a target Core to have access to data saved previously on the original source Core, seed your target Core using one of the following approaches:

1. **Seed to the target Core over a network connection.** Specify the use of a seed drive when you define replication. you can then share the folder containing the seed drive with the target Core, and consume the seed drive file over the network. For large data or slow connections, seeding by this method can take a substantial amount of time and consume substantial network bandwidth.

   NOTE: Dell does not recommend seeding large amounts of data over a network connection. Initial seeding potentially involves very large amounts of data, which could overwhelm a typical WAN connection.

2. **Transfer backup data from the source Core using physical storage media.** Transfer the seed drive file to a portable external removable storage device. This approach is typically useful for large sets of data or sites with slow network connections. Seeding using this method requires you to perform the following steps:

   a. Create a seed archive from the source Core, saving it to removable media.
   b. Transport the seed drive to the physical location of the target Core.
   c. Attach the drive to the target Core.
   d. Consume the data from the seed drive to the repository of the target Core.

   If replicating to a third-party Core, once your media is received by the MSP, a data center representative typically attaches the media and notifies you when it is ready for you to consume (or import) the seed data into the Core.

   NOTE: Because large amounts of data need to be copied to the storage device, an eSATA, USB 3.0, or other high-speed connection is recommended. If the total size of the seed data archive is larger than the space available on the removable media, the archive can span across multiple devices.

3. **For source and target Cores stored on virtual hosts, transfer backup data using a virtual hard disk**. If your source Core and target Core are both on a virtual host, you can define and consume a seed drive on virtual storage media. Seeding using this method requires you to perform the following steps:

   a. Create a seed drive file from the source Core, saving it to a virtual storage volume.
   b. Detach the volume from the source Core and attach it to the target Core.
   c. Consume the data from the seed drive to the repository of the target Core.

NOTE: While replication of incremental snapshots can occur between the source and target Cores before seeding is complete, the replicated snapshots transmitted from the source to the target remain orphaned until the initial data is consumed, and they are combined with the replicated base images.

Related links

- For details on the process of consuming the seed drive, see the topic Consuming the seed drive on a target Core.
- For more information about orphaned recovery points, see Deleting an orphaned recovery point chain.
- For information on preparing a seed drive, see Understanding seed drives, and Consuming the seed drive on a target core.

Related links

Consuming the seed drive on a target Core
Deleting an orphaned recovery point chain

Performance considerations for replicated data transfer

If the bandwidth between the source and target Cores cannot accommodate the transfer of stored recovery points, set up replication and specify the use of a seed drive. This process seeds the target Core with base images and recovery points from the selected servers protected on the source Core. The seeding process can be performed at any time. Seeding can be performed as part of the initial transfer of data, which serves as the foundation for regularly scheduled replication. You can also seed data for a previously replicated machine if replication has been paused or deleted. In this case, the "Build recovery point chains" option lets you copy not-yet replicated recovery points to a seed drive.

When preparing for replication, consider the following factors:

- **Change rate.** The change rate is the rate at which the amount of protected data is accumulated. The rate depends on the amount of data that changes on protected volumes and the protection interval of the volumes. Some machine types typically have a higher change rate, such as an Exchange email server. One way to reduce the change rate is to reduce the protection interval.
- **Bandwidth.** The bandwidth is the available transfer speed between the source Core and the target Core. It is crucial that the bandwidth be greater than the change rate for replication to keep up with the recovery points snapshots create. For very large data transfers from Core to Core, multiple parallel streams may be required to perform at wire speeds up to the speed of a 1GB Ethernet connection.

  NOTE: Bandwidth that ISPs specify is typically the total available bandwidth. All devices on the network share the outgoing bandwidth. Make sure that there is enough free bandwidth for replication to accommodate the change rate.
- **Number of protected machines.** It is important to consider the number of machines protected per source Core and how many you plan to replicate to the target. You are not required to replicate every machine protected on the source Core; Rapid Recovery lets you replicate on a per-protected machine basis, so you can choose to replicate only certain machines, if you want. If all protected machines on a source Core must be replicated, the change rate is typically higher. This factor is relevant if the bandwidth between the source and target Cores is insufficient for the amount and size of the recovery points being replicated.

The maximum change rate for WAN connection types is shown in the following table, with examples of the necessary bandwidth per gigabyte for a reasonable change rate.

Table 127. Examples of bandwidth per gigabyte

Broadband	Bandwidth	Max Change Rate
DSL	768 Kbps and up	330MB per hour
Cable	1 Mbps and up	429MB per hour
T1	1.5 Mbps and up	644MB per hour
Fiber	20 Mbps and up	8.38GB per hour

NOTE: For optimum results, adhere to the recommendations listed in the table preceding.

If a link fails during data transfer, replication resumes from the previous failure point of the transfer (once link functionality is restored).

Depending on your network configuration, replication can be a time-consuming process. Ensure that you account for enough bandwidth to accommodate replication, other Rapid Recovery transfers such as backups, and any other critical applications you must run.

If you experience issues successfully transferring data over the network, especially for certain protected or replicated machines, considering adjusting the rate of data transfer for those machines. For more information, seeAbout modifying transfer settings and Throttling transfer speed.

About replication and encrypted recovery points

While the seed drive does not contain backups of the source Core registry and certificates, the seed drive does contain encryption keys from the source Core if the recovery points being replicated from source to target are encrypted. The replicated recovery points remain encrypted after they are transmitted to the target Core. The owners or administrators of the target Core need the passphrase to recover the encrypted data.

About retention policies for replication

Retention policies on the source and target Cores are not synchronized. Rollup and on-demand deletion perform independently on each Core on initial action, as well as when running nightly jobs.

For more information on retention policies, see Managing retention policies.

Replicating to a self-managed target Core

This configuration applies to replication to an off-site location and to mutual replication. The following steps are prerequisite:

- The Rapid Recovery Core must be installed on all source and target machines.
- If you are configuring Rapid Recovery for multi-point to point replication, you must perform this task on all source Cores and the one target Core. For descriptions of these replication configurations, see Replication .
- If you need to create a seed drive and transfer it to a physical removable storage volume to perform the initial transfer of existing recovery points, you must have a suitable portable storage device prepared. You must also have physical access to the source Core machine, to attach the drive to copy the seed drive archive.
- If using a seed drive in a self-managed target Core, you or a trusted administrator must have physical access to the target Core.

A self-managed target Core is a Core to which you have access. For example, a self-managed Core is often managed by your company at an off-site location, or is hosted at a different geographic location than the source Core. Replication can be set up entirely on the source Core, unless you choose to seed your data using a seed drive. In such cases, you must create a seed drive using this procedure, and later attach the seed drive to the target Core to consume the archived recovery point data. For more information, see Determining your seeding needs and strategy.

Complete the steps in the following procedure to configure your source Core to replicate to a self-managed target Core.

1. Navigate to the Rapid Recovery Core console of the source Core.
2. On the button bar, click **Replicate**.
   The **Replication Wizard** appears.
3. On the **Target Core** page of the Replication Wizard, if you are establishing replication with a target Core that has been paired with this source Core previously, select **Use an existing target Core**, and then select the appropriate target Core from the drop-down list. Skip to step 5.
4. On the **Target Core** page of the Replication Wizard, if you are establishing replication with a target Core from this source Core for the first time, select **I have my own Target Core**, and then enter the information as described in the following table.

Table 128. Target Core information

Text Box	Description
Host Name	Enter the host name or IP address of the Core machine to which you are replicating.
Port	Enter the port number on which the Rapid Recovery Core will communicate with the machine.

Text Box	Description
	The default port number is 8006.
User Name	Enter the user name for accessing the machine.
Password	Enter the password for accessing the machine.

5. Click **Next**.

   NOTE: If no repository exists on the target core, a warning appears notifying you that you can pair the source core with the target Core, but that you are unable to replicate agents (protected machines) to this location until a repository is established. For information about how to set up a repository to a Core, see Creating a DVM repository.

6. On the **Request** page, enter a name for this replication configuration; for example, SourceCore1. This is the display name used for the Incoming Replication pane on the target Core's Replication page.
7. Click **Next**.
8. On the **Protected Machines** page, select the protected machines you want to replicate, and then use the drop-down lists in the Repository column to select a repository for each protected machine.
9. If you want to perform the seeding process for the transfer of the base data, complete the following steps:

   NOTE: Because large amounts of data need to be copied to the portable storage device, Dell recommends using an eSATA, USB 3.0, or other high-speed connection to the portable storage device.

   a. On the **Protected Machines** page of the Replication Wizard, select **Use a seed drive to perform the initial transfer**.
      - If you currently have one or more protected machines replicating to a target Core, you can include these protected machines on the seed drive by selecting **Include already replicated recovery points in the seed drive**.

   b. Click **Next**.

   c. On the **Seed Drive Location** page of the Replication Wizard, use the **Location type** drop-down list to select from the following destination types:
      - Local
      - Network
      - Cloud

   d. Enter the details for the seed drive file as described in the following table, based on the location type you selected in Step c.

Table 129. Archive details

Option	Text Box	Description
Local	Output location	Enter the location for the output. It is used to define the location path where you want the seed drive archive to reside; for example, D:\work\archive.
Network	Output location	Enter the location for the output. It is used to define the location path where you want the seed drive archive to reside; for example, \\servername\sharename.
	User Name	Enter a user name. It is used to establish logon credentials for the network share.

Option	Text Box	Description
	Password	Enter a password for the network path. It is used to establish logon credentials for the network share.
Cloud	Account	Select an account from the drop-down list. NOTE: To select a cloud account, you must first have added it in the Core Console. For more information, see Adding a cloud account.
	Container	Select a container associated with your account from the drop-down menu.
	Folder Name	Enter a name for the folder in which the archived data is to be saved. The default name is Rapid-Recovery-Archive-[DATE CREATED]-[TIME CREATED]

e. Click **Next**.

f. On the **Seed Drive Options** page of the Replication Wizard, enter the information as described in the following table.

Table 130. Seed drive options

Item	Description
Maximum Size	Large archives of data can be divided into multiple segments. Select the maximum size of the segment you want to reserve for creating the seed drive by doing one of the following: • Select **Entire Target** to reserve all available space in the path provided on the Seed Drive Location page for future use. For example, if the location is D:\work\archive, all of the available space on the D: drive is reserved if required for copying the seed drive, but is not reserved immediately after starting the copying process. • Select the text box, enter an amount, and then select a unit of measurement from the drop-down list to customize the maximum space you want to reserve. The default is 250MB.
Recycle action	In the event the path already contains a seed drive, select one of the following options: • **Do not reuse**. Does not overwrite or clear any existing seed data from the location. If the location is not empty, the seed drive write will fail. • **Replace this Core**. Overwrites any pre-existing seed data pertaining to this core but leaves the data for other cores intact. • **Erase completely**. Clears all seed data from the directory before writing the seed drive.
Comment	Enter a comment that describes the seed drive.
Add all Agents to Seed Drive	Select this option to replicate all protected machines on the source core using the seed drive. This option is selected by default.
Build recovery point chains (fix orphans)	Select this option to replicate the entire recovery point chain to the seed drive. This option is selected by default.

Item	Description
	NOTE: Typical seeding in AppAssure 5.4 replicated only the latest recovery point to the seed drive, which reduced the amount of time and space required for creating the seed drive. Opting to build recovery point (RP) chains to the seed drive requires enough space on the seed drive to store the latest recovery points from the specified protected machine or machines, and may take additional time to complete the task.

g. Do one of the following:
   - If you cleared the **Add all Agents to Seed Drive** check box, click **Next**.
   - If you selected **Add all Agents to Seed Drive**, go to Step 10.

h. On the **Protected Machines** page of the Replication Wizard, select the protected machines you want to replicate to the target Core using the seed drive.

10. Click **Finish**.

11. If you created a seed drive, send it to your target Core.

The pairing of the source Core to the target Core is complete.

Unless you selected the option to initially pause replication, the replication process begins immediately.

1. If you selected the option to use a seed drive, replication produces orphaned recovery points on the target Core until the seed drive is consumed and provides the necessary base images.
2. If you specified the use of the a drive, transfer the seed drive archive file to a volume (shared folder, virtual disk, or removable storage media). Then, consume the seed drive.

Viewing incoming and outgoing replication

If you click the **Replication** icon from the icon bar, the **Replication** page appears. This page gives you an understanding of replication from the scope of this Core. It includes two panes:

- The **Outgoing Replication** pane lists any machines protected in this Core that are replicated on another Core.
- The **Incoming Replication** pane lists the machines replicated on this Core, and the source Core from which these machines are replicated.

This section describes the information shown in these panes.

Information about outgoing replication from this Rapid Recovery Core is described in the following table.

Table 131. Information about outgoing replication

UI Element	Description
Select item	For each row in the summary table, you can select the checkbox to perform actions from the list of menu options above the table.
Type	Shows the machine type. You can expand a target Core to show individual replicated machines.
Status indicator	Status of replication. Colored circles in the Status column show whether a replicated machine is online or unreachable. If you hover the cursor over the colored circle, the status condition is displayed. Status conditions include green (replication established

UI Element	Description
	and online), yellow (replication paused), red (authentication error), and gray (offline or unreachable).
Replication Name	The display name of the Core machine to which machines from this source Core are replicated.
Machines	Lists the number of machines replicated to the selected target Core.
Sync	The date and time of the last replication transfer to the target Core.
⚙	When you click the actions drop-down menu in this column, you see a list of actions to perform to affect the specific replication relationship.

You can perform actions on two or more of the target Cores listed in the Outgoing Replication grid. To perform actions on multiple target Cores, select the checkbox for each Core in the grid, and then, from the menu above the grid, select the action you want to perform. You can perform the actions described in the following table.

Table 132. Global actions available in the Outgoing Replication pane

UI Element	Description
Add Target Core	Lets you define another target Core to replicate machines protected on this source Core.
Refresh	Refreshes the information shown in the table.
Force	Forces replication.
Pause	Pauses established replication.
Resume	Resumes paused replication.
Copy	Opens the replication wizard, letting you copy existing recovery points for selected protected machines to a seed drive.
Delete	Deletes outgoing replication.
Seed Drives	This menu option appears if data was copied to a seed drive when replication was set up. Displays information about the seed drive file, including the data and time the seed drive was saved. Collapsible menus indicate the target Core and the protected machines from which the seed drive files were generated.
⚙	When you click the actions drop-down menu in this column, you see a list of actions to perform to affect the specific replication relationship.

Information about incoming replication from another Core is described in the following table.

Table 133. Information about incoming replication

UI Element	Description
Select item	For each row in the summary table, you can select the checkbox to perform actions from the list of menu options above the table.
Type	Shows the machine type. You can expand a source Core to show individual replicated machines.
Status indicator	Status of replication. Colored circles in the Status column show whether a replicated machine is online or unreachable. If you hover the cursor over the colored circle, the status condition is displayed. Status conditions include green (replication established and online), yellow (replication paused), red (authentication error), and gray (offline or unreachable).
Replication Name	The display name of the source Core machine containing protected machines that are replicated on this target Core. This name can be optionally specified when establishing replication on the source Core using the Replication Wizard.
Machines	Lists the number of machines protected on the source Core that are replicated to this target Core.
Sync	The date and time of the last replication transfer from the source Core.
⚙	When you click the actions drop-down menu in this column, you see a list of actions to perform to affect the specific replication relationship.

You can perform actions on two or more of the source Cores listed in the Incoming Replication grid. To perform actions on multiple source Cores, select the checkbox for each Core in the grid, and then, from the menu above the grid, select the action you want to perform. You can perform the actions described in the following table.

Table 134. Global actions available in the Incoming Replication pane

UI Element	Description
Refresh	Refreshes the information shown in the table.
Force	Forces replication.
Pause	Pauses established replication.
Resume	Resumes paused replication.
Delete	Deletes incoming replication.

Configuring replication

To replicate data using Rapid Recovery, you must configure the source and target cores for replication. After you configure replication, you can then replicate protected machine data, monitor and manage replication, and perform recovery.

Performing replication in Rapid Recovery involves performing the following operations:

- Set up a repository on the target core. For more information on adding a repository to the target core, see Creating a DVM repository.

- Configure self-managed replication. For more information on replicating to a self-managed target core, see Replicating to a self-managed target Core.
- Configure third-party replication. For more information on replicating to a third-party target core, see Replicating to a third-party target Core.
- Replicate an existing protected machine. For more information on replicating a machine that is already protected by the source core, see Adding a machine to existing replication.
- Consume the seed drive. For more information on consuming seed drive data on the target core, see Consuming the seed drive on a target Core.
- Set the replication priority for a protected machine. For more information on prioritizing the replication of protected machines, see Setting replication priority for a protected machine.
- Set a replication schedule for a protected machine. For more information on setting a replication schedule, see Scheduling replication.
- Monitor replication as needed. For more information on monitoring replication, see Viewing incoming and outgoing replication.
- Manage replication settings as needed. For more information on managing replication settings, see Managing replication settings.
- Recover replicated data in the event of disaster or data loss. For more information on recovering replicated data, see Recovering replicated data.

Replicating to a third-party target Core

A third-party Core is a target Core that it managed and maintained by an MSP. Replicating to a Core managed by a third party does not require the customer to have access to the target Core.

The process of replicating to a third-party Core involves tasks that must be completed by the customer as well as the third party. After a customer submits a request for replication on the source Core or Cores, the MSP must complete the configuration on the target Core by reviewing the request.

NOTE: This configuration applies to Hosted and Cloud Replication. The Rapid Recovery Core must be installed on all source Core machines. If you are configuring Rapid Recovery for Multi-Point to Point replication, you must perform this task on all source Cores.

To replicate to a target Core managed by a third party, complete the following tasks:

- Submitting a replication request to a third-party service provider
- Reviewing a replication request from a customer
- Ignoring a replication request from a customer

Submitting a replication request to a third-party service provider

If you are an end user who subscribes to a core managed by a third party, such as an MSP, complete the steps in this procedure to submit a replication request to your third-party service provider.

1. Navigate to the Rapid Recovery Core.
2. From the icon button bar, click **Replicate**.

   The **Replication Wizard** appears.
3. On the **Target Core** page of the Replication Wizard, select **I have a subscription to a third-party providing off-site backup and disaster recovery services**, and then enter the information as described in the following table.

Table 135. Third-party target core information

Text Box	Description
Host Name	Enter the host name, IP address, or FQDN for the third-party core machine.
Port	Enter the port number that was given to you by your third-party service provider. The default port number is 8006.

- If the Core you want to add has been paired with this source core previously, you can do the following:
  1. Select **Use an existing target core**.
  2. Select the target core from the drop-down list.
  3. Click **Next**.
  4. Skip to Step 7.

4. Click **Next**.
5. On the **Request** page of the Replication Wizard, enter the information as described in the following table.

Table 136. Third-party target core details

Text Box	Description
Email Address	Enter the email address associated with your third-party service subscription.
Customer ID (optional)	Optionally, enter the customer ID that was assigned to you by the service provider.

6. Click **Next**.
7. On the **Protected Machines** page of the Replication Wizard, select the protected machines you want to replicate to the third-party core.
8. If you want to perform the seeding process for the transfer of base data, complete the following steps.

> NOTE: Because large amounts of data need to be copied to the portable storage device, an eSATA, USB 3.0, or other high-speed connection to the portable storage device is recommended.

a. On the **Protected Machines** page of the Replication Wizard, select **Use a seed drive to perform initial transfer**.
   - If you currently have one or more protected machines replicating to a target core, you can include these machines on the seed drive by selecting the option **Include already replicated recovery points in the seed drive**.

b. Click **Next**.

c. On the **Seed Drive Location** page of the Replication Wizard, use the **Location** type drop-down list to select from the following destination types:
   - Local
   - Network
   - Cloud

d. Enter the details for the archive as described in the following table, based on the location type you selected in Step c.

Table 137. Archive details

Option	Text Box	Description
Local	Output location	Enter the location for the output. It is used to define the location path where you want the seed drive archive to reside; for example, D:\work\archive.
Network	Output location	Enter the location for the output. It is used to define the location path where you want the archive to reside; for example, \\servername\sharename.
	User Name	Enter a user name. It is used to establish logon credentials for the network share.
	Password	Enter a password for the network path. It is used to establish logon credentials for the network share.
Cloud	Account	Select an account from the drop-down list. NOTE: To select a cloud account, you must first have added it in the Core Console. For more information, see Adding a cloud account.
	Container	Select a container associated with your account from the drop-down menu.
	Folder Name	Enter a name for the folder in which the archived data is to be saved. The default name is Rapid-Recovery-Archive-[DATE CREATED]-[TIME CREATED]

e. Click **Next**.

f. On the **Seed Drive Options** page of the Replication Wizard, enter the information as described in the following table.

Table 138. Seed drive options

Item	Description
Maximum Size	Large archives of data can be divided into multiple segments. Select the maximum amount of space you want to reserve for creating the seed drive by doing one of the following: • Select **Entire Target** to reserve all available space in the path provided on the Seed Drive Location page (for example, if the location is D:\work \archive, all of the available space on the D: drive is reserved). • Select the blank text box, enter an amount, and then select a unit of measurement from the drop-down list to customize the maximum space you want to reserve.
Recycle action	In the event the path already contains a seed drive, select one of the following options: • **Do not reuse**. Does not overwrite or clear any existing seed data from the location. If the location is not empty, the seed drive write will fail. • **Replace this Core**. Overwrites any pre-existing seed data pertaining to this core but leaves the data for other cores intact. • **Erase completely**. Clears all seed data from the directory before writing the seed drive.

Item	Description
Comment	Enter a comment that describes the seed drive.
Add all Agents to Seed Drive	Select this option to replicate all protected machines on the source core using the seed drive. This option is selected by default.
Build recovery points chains (fix orphans)	Select this option to replicate the entire recovery point chain to the seed drive. This option is selected by default. NOTE: Typical seeding in AppAssure 5.4 replicated only the latest recovery point to the seed drive, which reduced the amount of time and space required for creating the seed drive. Opting to build recovery point (RP) chains to the seed drive requires enough space on the seed drive to store the latest recovery points from the specified protected machine or machines, and may take additional time to complete the task.

g. Do one of the following:
   - If you cleared the **Add all Agents to Seed Drive** check box, click **Next**.
   - If you selected **Add all Agents to Seed Drive**, go to Step 9.

h. On the **Machines** page of the Replication Wizard, select the protected machines you want to replicate to the target core using the seed drive.

9. Click **Finish**.

10. If you created a seed drive, send it as directed by your third-party service provider.

Reviewing a replication request from a customer

After an end user completes the procedure Submitting a replication request to a third-party service provider, a replication request is sent from the source core to the third-party target core. As the third party, you can review the request, and then approve it to begin replication for your customer, or you can deny it to prevent replication from occurring.

Choose from the following options:

- Approving a replication request
- Denying a replication request

Approving a replication request

Complete the following procedure to approve a replication request on a third-party target core.

1. On the target Core, navigate to the Rapid Recovery Core Console.

2. From the icon bar, click (Replication).

The **Replication** page appears.

3. On the **Replication** page, click **Request (#)**.

The **Pending Replication Requests** section appears.

4. Under Pending Replication Requests, click the drop-down menu next to the request you want to review, and then click **Review**.

The **Review Replication Request** window appears.

NOTE: The information that appears in the Source Core Identity section of this window is determined by the request completed by the customer.

5. Under Source Core Identity, do one of the following:
   - Select **Replace an existing replicated Core**, and then select a core from the drop-down list.
   - Select **Create a new source Core**, and then confirm that the Core Name, customer Email Address, and Customer ID, provided are correct. Edit the information as necessary.
6. Under Agents, select the machines to which the approval applies, and then use the drop-down lists in the Repository column to select the appropriate repository for each machine.
7. Optionally, in the **Comment** text box, enter a description or message to include in the response to the customer.
8. Click **Send Response**.

   Replication is accepted.

Denying a replication request

Complete the steps in the following procedure to deny a replication request sent to a third-party core from a customer.

To deny a request without reviewing it, see Ignoring a replication request from a customer.

1. On the target Core, navigate to the Rapid Recovery Core Console.
2. From the icon bar, click (Replication).

   The **Replication** page appears.
3. On the **Replication** page, click **Request (#)**.

   The **Pending Replication Requests** section appears.
4. Under Pending Replication Requests, click the drop-down menu next to the request you want to review, and then click **Review**.

   The **Review Replication Request** window appears.
5. Click **Deny**.

   Replication is denied. Notification of denial appears under Alerts on the Events page of the source Core.

Ignoring a replication request from a customer

As a third-party service provider of a target core, you have the option to ignore a request for replication sent from a customer. This option could be used if a request was sent by mistake or if you want to deny a request without reviewing it.

For more information about replication requests, see Reviewing a replication request from a customer.

Complete the following procedure to ignore a replication request from a customer.

1. On the target Core, navigate to the Rapid Recovery Core Console.
2. From the icon bar, click (Replication).

   The **Replication** page appears.
3. On the **Replication** page, click **Request (#)**.

   The **Pending Replication Requests** section appears.
4. Under Pending Replication Requests, click the drop-down menu next to the request you want to ignore, and then click **Ignore**.
5. On the **Ignoring request** dialog box, click **Yes** to confirm the command.

Notification that the request has been ignored is sent to the source Core, and the request is removed from the Replication page on the target Core.

Adding a machine to existing replication

After replication is established between a source and target Core, it is possible to add new protected machines to replicate to the target. Complete the steps in the following procedure on the source Core to add a new protected machine to a paired target Core for replication.

For more information about replication, see Replication and Replicating to a self-managed target Core.

1. Navigate to the Rapid Recovery Core console of the source Core.
2. On the button bar, click **Replicate**.

   The Replication Wizard opens to the **Protected Machines** page.
3. On the **Protected Machines** page, select the protected machines you want to replicate, and then use the drop-down lists in the Repository column to select a repository for each protected machine.
4. If you want to perform the seeding process for the transfer of the base data, complete the following steps:

   NOTE: Because large amounts of data need to be copied to the portable storage device, an eSATA, USB 3.0, or other high-speed connection to the portable storage device is recommended.

   a. On the **Protected Machines** page of the Replication Wizard, select **Use a seed drive to perform initial transfer**.

      - If you currently have one or more protected machines replicating to a target Core, you can include these machines on the seed drive by selecting the option **Include already replicated recovery points in the seed drive**.

   b. Click **Next**.

   c. On the **Seed Drive Location** page of the wizard, use the **Location** type drop-down list to select from the following destination types:

      - Local
      - Network
      - Cloud

   d. Enter the details for the archive as described in the following table based on the location type you selected in Step c.

Table 139. Archive details

Option	Text Box	Description
Local	Output location	Enter the location for the output. It is used to define the location path where you want the archive to reside; for example, d:\work\archive.
Network	Output location	Enter the location for the output. It is used to define the location path where you want the archive to reside; for example, \\servername\sharename.
	User Name	Enter a user name. It is used to establish logon credentials for the network share.

Option	Text Box	Description
	Password	Enter a password for the network path. It is used to establish logon credentials for the network share.
Cloud	Account	Select an account from the drop-down list. NOTE: To select a cloud account, you must first have added it in the Core Console. For more information, see Adding a cloud account.
	Container	Select a container associated with your account from the drop-down menu.
	Folder Name	Enter a name for the folder in which the archived data is to be saved. The default name is Rapid-Recovery-Archive-[DATE CREATED]-[TIME CREATED]

e. Click **Next**.

f. On the **Seed Drive Options** page of the wizard, enter the information as described in the following table.

Table 140. Seed drive options

Item	Description
Maximum Size	Large archives of data can be divided into multiple segments. Select the maximum amount of space you want to reserve for creating the seed drive by doing one of the following: • Select **Entire Target** to reserve all available space in the path provided on the Seed Drive Location page (for example, if the location is D:\work \archive, all of the available space on the D: drive is reserved). • Select the blank text box, enter an amount, and then select a unit of measurement from the drop-down list to customize the maximum space you want to reserve.
Recycle action	In the event the path already contains a seed drive, select one of the following options: • Do not reuse. Does not overwrite or clear any existing seed data from the location. If the location is not empty, the seed drive write will fail. • Replace this Core. Overwrites any pre-existing seed data pertaining to this core but leaves the data for other cores intact. • Erase completely. Clears all seed data from the directory before writing the seed drive.
Comment	Enter a comment that describes the seed drive.
Add all Agents to Seed Drive	Select this option to replicate all protected machines on the source core using the seed drive. This option is selected by default.
Build recovery point chains (fix orphans)	Select this option to replicate the entire recovery point chain to the seed drive. This option is selected by default.

Item	Description
	NOTE: Typical seeding in Rapid Recovery 5.4 replicates only the latest recovery point to the seed drive, which reduces the amount of time and space required for creating the seed drive. Opting to build recovery point (RP) chains to the seed drive requires enough space on the seed drive to store the latest recovery points from the specified protected machine or machines, and may take additional time to complete the task.

g. Do one of the following:
   - If you cleared the **Add all Agents to Seed Drive** check box, click **Next**.
   - If you selected **Add all Agents to Seed Drive**, go to Step 5.

h. On the **Protected Machines** page of the wizard, select the protected machines you want to replicate to the target Core using the seed drive.

5. Click **Finish**.

Consuming the seed drive on a target Core

Complete the follow procedure to consume the data from the seed drive file on the target Core.

NOTE: This procedure is only necessary if a seed drive file was created as part of Replicating to a self-managed target Core or Replicating to a third-party target Core.

1. If the seed drive file was saved to a portable storage device, such as a USB drive, connect the drive to the target Core.

2. On the target Core, open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

   The **Replication** page appears.

3. On the **Replication** page, under Incoming Replication, click the drop-down menu for the correct source Core, and then select **Consume**.

   The **Consume** dialog box appears.

4. In the **Location type** field, select one of the following options from the drop-down list:
   - Local
   - Network
   - Cloud

5. Enter the details for the seed drive archive file, as described in the following table based on the location type you selected in Step 4.

Table 141. Archive details

Option	Text Box	Description
Local	Location	Enter the path for the archive.
Network	Location	Enter the path for the archive.
	User Name	Enter the user name. It is used to establish logon credentials for the network share.
	Password	Enter the password for the network path. It is used to establish logon credentials for the network share.

Option	Text Box	Description
Cloud	Account	Select an account from the drop-down list. NOTE: To select a cloud account, you must first have added it in the Core Console. For more information, see Adding a cloud account.
	Container	Select a container associated with your account from the drop-down menu.
	Folder Name	Enter the name of the folder in which the archived data is saved; for example, Rapid-Recovery-Archive-[DATE CREATED]-[TIME CREATED]

6. Click **Check File**.

   The Core searches for the file.

   After finding the file, the following text boxes appear in the Consume window, pre-populated with the data gathered from Step 4, Step 5, and the file. The Date Range displays the dates of the oldest and newest recovery points contained in the seed drive. Any comments entered when the seed drive was created are automatically imported.
7. On the **Consume** dialog box, under Agents, select the machines for which you want to consume data.
8. Click **Consume**.
9. To monitor the progress of consuming data, view the Events page.

Abandoning a seed drive

If you create a seed drive with the intent of consuming it on the target Core, but later choose not to consume it, you can abandon the seed drive.

Until you abandon the seed drive or consume it, a link for the outstanding seed drive remains on the Outgoing Replication pane on the source Core.

Until you transmit information from the seed drive, orphaned recovery points (which exist on the original protected machine, but not the target Core) cannot be used to restore data.

CAUTION: If you abandon the seed drive, then the original recovery points (defined in the seed drive file) are then transmitted over the network to the target Core during the next replication job. Transmitting old recovery points over the network could slow down the network considerably, especially if there are many recovery points.

Complete the steps in the following procedure to abandon an outstanding seed drive.

NOTE: Abandoning the seed drive in the Core Console does not affect the seed drive file from its storage location.

1. On the source Core, open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

   The **Replication** page appears.
2. On the **Replication** page, in the Outgoing Replication pane, click **Seed Drives (#)**.

   In the Outgoing Replication pane, a section appears containing information about the outstanding seed drives.

3. Optionally, click the downward-facing arrow ▼ to expand the collapsible menu.

   Information appears about outstanding seed drives, including the target Core and the date range of the recovery points included in the seed drive.

4. Click ⚙ to open the drop-down menu for the seed drive file you want to abandon, and then select **Abandon**.
5. In the confirmation window, confirm that you want to abandon the seed drive.

   The seed drive is removed.

   If no more seed drives exist on the source Core, the Seed Drives (#) link and outstanding seed drives section are removed from the Outgoing Replication pane.

Managing replication settings

Rapid Recovery lets you monitor, schedule, and adjust replication at the overall, core, and protected machine levels.

You can edit the following replication settings:

- To schedule replication jobs, see Scheduling replication.
- To create a seed drive of a protected machine that is already paired for replication, see Using the Copy function to create a seed drive
- To monitor the progress of a replication job, see Viewing incoming and outgoing replication.
- To pause or resume a paused replication job, see Pausing and resuming replication.
- To force replication of an incoming or outgoing protected machine, see Forcing replication.
- To manage settings for all target cores and replication procedures, see Managing settings for outgoing replication.
- To manage settings for an individual target core, see Changing target Core settings.
- To manage priority settings for an individual protected machine being replicated to a target core, see Setting replication priority for a protected machine.

Scheduling replication

Unless you change the default behavior by setting a replication schedule, the Core starts a replication job immediately after completion of every backup snapshot, checksum check, attachability check, and the nightly jobs. For more information, see Scheduling replication.

You can change the replication schedule to reduce the load on the network.

Complete the steps in the following procedure to set a replication schedule for any replicated machine.

1. On the target Core, open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

   The **Replication** page appears.

2. In the Outgoing Replication pane, click ⚙ to open the drop-down menu next to the Core for which you want schedule replication, and then select **Schedule**.

   The **Replication Schedule for [CoreName]** dialog box opens.
3. Select from one of the following three options:
   - **At All Times**. Replicates after every new snapshot, checksum check, and attachability check, and after the nightly jobs complete.

- **Daily (Start replication only during the specified time period)**. Begins replicating only within the time range provided.

  1. In the **From** text box, enter the earliest time at which replication should begin.
  2. In the **To** text box, enter the latest time at which replication should begin.

     NOTE: If replication is in progress when the scheduled time ends, the replication job completes after the allotted time period.

- **Custom**. Begins replicating only within the time range provided, letting you set one time range for weekdays and another time range for weekends.

  1. Next to Weekdays, in the **From** text box, enter the earliest time at which replication should occur on a weekday; and then in the **To** text box, enter the latest time at which replication should occur on a weekday.
  2. Next to Weekends, in the **From** text box, enter the earliest time at which replication should occur on weekends; and then in the **To** text box, enter the latest time at which replication should occur on weekends.

4. Click **Save**.

   The schedule is applied to all replication to the selected target Core.

Using the Copy function to create a seed drive

If you chose not to create a seed drive when you configured replication, you can create a seed drive using the Copy function in the protected machine drop-down menu.

1. On the source Core, open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

   The **Replication** page appears.

2. On the **Replication** page, in the Outgoing Replication pane, click ▼ to expand the Core that protects the machine for which you want to create a seed drive.

   The selection expands to show each protected machine in the specified Core.

3. Click in the first row of the table to select each machine for which you want to create a seed drive.
4. In the menu under the Outgoing Replication pane, click **Copy**.

   The **Replication Wizard** appears.

5. On the **Seed Drive Location** page of the wizard, use the **Location** drop-down list to select from the following destination types:

   - Local
   - Network
   - Cloud

6. Enter the details for the seed drive archive, as described in the following table, based on the location type you selected in the preceding step.

   Table 142. Archive details

Option	Text Box	Description
Local	Output location	Enter the location for the output. It is used to define the location path where you want the archive to reside; for example, d:\work\archive.
Network	Output location	Enter the location for the output. It is used to define the location path where you want the archive to reside; for example, \\servername \sharename.

Option	Text Box	Description
	User Name	Enter a user name. It is used to establish logon credentials for the network share.
	Password	Enter a password for the network path. It is used to establish logon credentials for the network share.
Cloud	Account	Select an account from the drop-down list. NOTE: To select a cloud account, you must first have added it in the Core Console. For more information, see Adding a cloud account.
	Container	Select a container associated with your account from the drop-down menu.
	Folder Name	Enter a name for the folder in which the archived data is to be saved. The default name is Rapid-Recovery-Archive-[DATE CREATED]-[TIME CREATED]

7. Click **Next**.
8. On the Seed Drive Options page, enter the information as described in the following table.

Table 143. Seed drive options

Item	Description
Maximum Size	Large archives of data can be divided into multiple segments. Select the maximum amount of space you want to reserve for creating the seed drive by doing one of the following: • Select **Entire Target** to reserve all available space in the path provided on the Seed Drive Location page (for example, if the location is D:\work\archive, all of the available space on the D: drive is reserved). • Select the blank text box, enter an amount, and then select a unit of measurement from the drop-down list to customize the maximum space you want to reserve.
Recycle action	In the event the path already contains a seed drive, select one of the following options: • **Do not reuse.** Does not overwrite or clear any existing seed data from the location. If the location is not empty, the seed drive write will fail. • **Replace this Core**. Overwrites any pre-existing seed data pertaining to this core but leaves the data for other cores intact. • **Erase completely**. Clears all seed data from the directory before writing the seed drive.
Comment	Enter a comment that describes the seed drive.
Add all Agents to Seed Drive	Select this option to replicate all protected machines on the source core using the seed drive. This option is selected by default.
Build recovery point chains (fix orphans)	Select this option to replicate the entire recovery point chain to the seed drive. This option is selected by default.

Item	Description
	NOTE: Typical seeding in Rapid Recovery 5.4.x replicated only the latest recovery point to the seed drive, which reduced the amount of time and space required for creating the seed drive. Opting to build recovery point chains to the seed drive requires enough space on the seed drive to store the latest recovery points from the specified protected machines, and may take additional time to complete the task.

9. Do one of the following:
   - If you cleared the **Add all Agents to Seed Drive** check box, click **Next**.
   - If you selected **Add all Agents to Seed Drive**, go to Step 10.
10. On the **Protected Machines** page of the wizard, select the protected machines for which you want to create a seed drive.
11. Click **Finish**.

Monitoring replication

When replication is set up, you can monitor the status of replication tasks for the source and target Cores. You can refresh status information, view replication details, and more.

1. On the source Core, open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

   The **Replication** page appears.
2. On this page, you can view information about and monitor the status of replication tasks as described in the following table.

   Table 144. Replication tasks

Section	Description	Available Actions
Seed Drives (#)	After you specify the use of a seed drive when defining replication, until you abandon or consume it, a **Seed Drives (#)** link appears on the Outgoing Replication pane on the source Core. The number displayed indicates how many seed drives are pending. NOTE: This link does not appear unless a seed drive is pending. Click this link to list seed drives that have been written but not yet consumed by the target Core. Further expand the collapsible menu to show information about outstanding seed drives, including the target Core and	In the drop-do, click **Abandon** to abandon or cancel the seed process. wn menu

Section	Description	Available Actions
	the date range of the recovery points included in the seed drive.	
Outgoing Replication	Lists all target Cores to which the source Core is replicating. It includes a state indicator, the target Core name, the number of machines being replicated, and the progress of a replication transmission.	On a source Core, in the ⚙ drop-down menu, you can select the following options: • **Details.** Lists the ID, URL, display name, state, customer ID, email address, and comments for the replicated Core. • **Change Settings.** Lists the display name and lets you edit the host and port for the target Core. • **Schedule.** Lets you set a customized schedule for replication to this target Core. • **Add Machines.** Lets you select a host from a drop-down list, select protected machines for replication, and create a seed drive for the new protected machine's initial transfer. You can optionally choose to include recovery points for machines already added to replication. • **Delete.** Lets you delete the replication relationship between source and target Cores. Doing so ceases all replication to this Core.
Incoming Replication	Lists all source machines from which the target receives replicated data. It includes the remote Core name, state, machines, and progress. Lists all source Cores from which the target receives replicated data. The display name for the source Cores listed are populated from the value in the Replication Wizard when defining replication. It includes a state indicator, the remote Core name, and the progress of a replication transmission.	On a target Core, in the ⚙ drop-down menu, you can select the following options: • **Details.** Lists the ID, host name, customer ID, email address, and comments for the replicated Core. • **Consume.** Consumes the initial data from the seed drive and saves it to the local repository. • **Delete.** Lets you delete the replication relationship between target and source Cores. Doing so ceases all replication from this Core.
Pending Replication Requests	This information applies to managed service providers only. When a customer clicks he **Requests** link in the Incoming Replication pane, a summary table section appears listing the customer ID, email address, and host name for the request.	In the drop-down menu, click **Ignore** to ignore or reject the request, or **Review** to review the pending request.

Pausing and resuming replication

You can pause replication temporarily for the source (outgoing) or target (incoming) Cores.

The option to pause replication is only available when replication is active. The option to resume replication is only available if replication is paused.

Complete the steps in the following procedure to pause or resume replication.

1. Open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

   The **Replication** page appears.
2. To pause replication for all replicated machines, do the following:
   a. Click the checkbox at the top of the summary table to select the source or target Core.
   b. Click **Pause** from the menu preceding the summary table.

      Replication for all protected machines in the selected Core is paused.
3. To pause replication for only certain machines, do the following:
   a. Click the ▼ arrow to the right of any Core.

      The view expands to show each of the protected machines from the selected Core that are being replicated.
   b. Click in the first column to select each machine for which you want to pause replication. Click any selection again to clear the checkbox for machines you do not want to pause.
   c. Click **Pause** from the menu preceding the summary table.

      Replication for the selected protected machines is paused.
4. To resume replication for all replicated machines, do the following:
   a. Click the checkbox at the top of the summary table to select the source or target Core.
   b. Click **Resume** from the menu at the top of the summary table.

      Replication for all protected machines in the selected Core is resumed.
5. To resume replication for only certain machines, do the following:
   a. Click the ▼ arrow to the right of any Core.

      The view expands to show each of the protected machines from the selected Core that are being replicated.
   b. Click in the first column to select each machine for which you want to resume replication. Click any selection again to clear the checkbox for machines you do not want to resume.
   c. Click **Resume** from the menu at the top of the summary table.

      Replication for the selected protected machines is resumed.

Forcing replication

From the source Core, you can force replication at any time, instead of waiting for a replication job to queue after a specific event such as a backup or attachability check.

Complete the steps in the following procedure to force replication on either the source or the target Core.

1. On the source Core, open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

The **Replication** page appears.

2. Do one of the following:
   - To force replication on a source Core, from the **Outgoing Replication** pane, select a Core, and from the menu at the top of the summary table, click › **Force**.
   - To force replication on a target Core, from the **Incoming Replication** pane, select a Core, and from the menu at the top of the summary table, click › **Force**.

   The Force Replication dialog box appears.
3. Optionally, if you want to repair any orphaned chains of recovery points, select **restore orphaned recovery point chains**.
4. To confirm, in the Force Replication dialog box, click **Yes**.

   The dialog box closes, and replication is forced.

Managing settings for outgoing replication

The changes made to these settings affect the data transfer to all target Cores associated with this source Core.

1. On the source Core, open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

   The **Replication** page appears.
2. In the **Outgoing Replication** pane, at the top of the summary table, click ⚙ (Settings).

   The **Replication Settings** dialog box appears.
3. In the **Replication Settings** dialog box, edit the replication settings as described in the following table.

Table 145. Replication settings

Option	Description
Cache lifetime (seconds)	Specify the amount of time between each target Core status request performed by the source Core.
Volume image session timeout (minutes)	Specify the amount of time the source Core spends attempting to transfer a volume image to the target Core.
Maximum parallel streams	Specify the number of network connections permitted to be used by a single protected machine to replicate that machine’s data at one time.
Maximum transfer speed (MB/s)	Specify the speed limit for transferring the replicated data.
Maximum transfer data size (GB)	Specify the maximum size in GB for transferring blocks of replicated data.
Restore Defaults	Select this option to change all replication settings to the system defaults. NOTE: Take note of any customized settings before selecting this option. You will not be prompted to confirm this action

4. When satisfied, click **Save** to save the replication settings and close the dialog box.

Changing target Core settings

You can change the host and port settings for individual target Cores from the source Core.

1. On the source Core, open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

   The **Replication** page appears.

   In the **Outgoing Replication** pane, the summary table includes a row for each target Core that has been configured to replicate recovery points from this source Core.

2. Click the ⚙ (Settings) drop-down menu for the target Core you want to modify, and then select **Change Settings**.

   The **Settings** dialog box appears.

3. Edit any of the options described in the following table.

   Table 146. Target Core settings

Option	Description
Host	Enter the host for the target Core.
Port	Enter a port for the target Core to use for communication with the source Core. NOTE: The default port is 8006.

4. Click **Save**.

Setting replication priority for a protected machine

Replication priority determines which replication jobs are sent to the Core first. Prioritization is set ordinally, on a scale of 1 to 10, where a priority of 1 is the first priority, and a priority of 10 is the last priority. When you first establish replication for any machine, its priority is set to 5. You can view and change priority at the protected machine level from the source Core.

In some cases, it is possible that some replication jobs are abandoned. For example, replication jobs can be abandoned if your environment is experiencing unusually high change rates or if your network does not have enough bandwidth. This situation is particularly likely if you set schedules which limit the hours when replication occurs in your environment. For more information about setting schedules replication, see Scheduling replication.

To ensure replication occurs for important machines first, set critical servers to a priority with a lower number (between 1 and 5). Set priority for less important machines to a higher number (between 6 and 10).

Setting replication priority to 4 for any protected machine assures its replication job is started before a machine with the default replication priority of 5. Replication jobs for machines with a priority of 3 are queued before 4, and so on. The lower the priority number, the sooner its replication jobs are sent. It is easy to remember that priority 1 is most important. Machines with a replication priority of 1 are the first machines queued for replication.

Complete the steps below to edit the settings that prioritize when a protected machine replicates.

1. On the source Core, open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

   The **Replication** page appears.
2. In the **Outgoing Replication** pane, click the ▼ arrow to the right of any source Core.

   The view expands to show each of the protected machines from this source Core that are being replicated to the designated target Core.
3. Click the ⚙ (Settings) drop-down menu for the protected machine you want to prioritize, and then click **Settings**.

   A dialog box appears.
4. Click the **Priority** drop-down list and select a priority, from **1 (Highest)** to **10 (Lowest)**, based on your requirements.
5. Click **Save**.

   The dialog box closes, and the replication priority for the selected machine updates.

Removing replication

Replication is the intentional duplication of recovery points for a protected machine from one Rapid Recovery Core (the source Core) to a second Core (the target).

The goal of replication is to maintain a high-availability duplicate of data for the original protected machine. For optimum data security, Dell recommends locating the target Core at a separate geographic location.

Unless you change the default behavior by setting a replication schedule, the Core starts a replication job immediately after completion of every backup snapshot, checksum check, attachability check, and the nightly jobs. For more information, see Scheduling replication.

When you remove replication, you discontinue further copying of recovery points from the source to the target Core. Removing replication never affects the data saved on the original (source) Core.

Also, when you remove replication, you have the option of leaving the replicated recovery points from the original machine on your target Core, or deleting them. If you retain the recovery points for a replicated machine that you remove, the recovery points for that machine are then represented in the Core as a recovery points-only machine. You can browse data from those retained recovery points, or restore files at the file level, while they persist on the target Core.

You can remove replication using any of the following approaches:

- Removing outgoing replication from the source Core
- Removing incoming replication from the target Core

Removing outgoing replication from the source Core

Complete the steps in this procedure to remove one or more protected machines from replication on the source Core.

1. On the source Core, open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

The **Replication** page appears.

In the **Outgoing Replication** pane, the summary table includes a row for each target Core that has been configured to replicate recovery points from this source Core.

2. Optionally, click the ▼ arrow to the right of any target Core.

   The view expands to show each of the protected machines from this source Core that are being replicated to the designated target Core.

3. Select the protected machines you want to remove from outgoing replication as follows:

   - To completely remove the existing replication relationship between this source Core and any target Core, click the ⚙ (Settings) drop-down menu for any target Core, and then select **Delete**.
   - To remove outgoing replication for a subset of machines in the specified target Core, expand the view to show all machines being replicated, and select the check box for each replicated machine that you want to remove. Clear the checkbox for any machine you want to continue replicating.

     Then, from the menu above the summary table, click 🗑 **Delete**.

   A confirmation message appears asking if you want to remove the replication relationships.

4. In the resulting dialog box, click **Yes** to confirm removal.

Removing incoming replication from the target Core

Complete the steps in this procedure to remove one or more protected machines from replication on the target Core.

NOTE: You can also remove replication of protected machines from the Outgoing Replication pane on the Replication page of the source Core. For more information, see Removing outgoing replication from the source Core

1. On the target Core, open the Rapid Recovery Core Console, and from the icon bar, click (Replication).

   The **Replication** page appears. In the Incoming Replication pane, the summary table includes a row for each source Core with protected machines that this target Core replicates.

2. Select the replicated machines to remove as follows:

   - To delete **all** machines replicated from the source Core to your target Core, in the Incoming Replication pane, select the check box for that Core.
   - To delete a smaller subset of machines from the same source Core, do the following:

   a. Click the ▼ arrow to the right of the source Core.

      The view expands to show each of the machines from the selected source Core that are replicated on your target Core.

   b. Select the check box for each replicated machine that you want to remove.

   c. From the parent row of the selected source Core, click the ⚙ (Settings) drop-down menu, and then select **Delete**.

      The **Remove Replication** dialog box appears.

3. In the **Remove Replication** dialog box, do one of the following:

   - If you want to leave the replicated recovery points on the target Core, clear the option **Delete existing recovery points** .
   - If you want to delete all replicated recovery points received from that machine as well as remove the source core from replication, select **Delete existing recovery points**.

4. Click **Yes** to confirm deletion.

   ⚠ **WARNING: If you select this option, all of the recovery points replicated to this Core will be deleted.**

   The selected machines protected on the source Core are removed from replication on this target Core. Optionally, if you selected the option to delete recovery points, they are removed from the repository of this Core.

Recovering replicated data

"Day-to-day" replication functionality is maintained on the source Core, while only the target Core is capable of completing the functions necessary for disaster recovery.

For disaster recovery, the target core Can use the replicated recovery points to recover the protected machines. You can perform the following recovery options from the target Core:

- **Mount recovery points**. For more information, see Mounting a recovery point.
- **Roll back to recovery points**. For more information, see About restoring volumes from a recovery point or Restoring volumes for a Linux machine using the command line.
- **Perform a virtual machine (VM) export**. For more information, see About exporting to virtual machines with Rapid Recovery.
- **Perform a bare metal restore (BMR)**. For more information, see Performing a bare metal restore for Windows machines.

5

Recovering data

Managing recovery

The Rapid Recovery Core can instantly restore data or recover machines to physical or virtual machines from the recovery points. The recovery points contain agent volume snapshots captured at the block level. These snapshots are application-aware, meaning all open transactions and rolling transaction logs are completed and caches are flushed to disk before creating the snapshot. Using application-aware snapshots in tandem with Verified Recovery, enables the Core to perform several types of recoveries, including:

- Recovery of files and folders
- Recovery of data volumes, using Live Recovery
- Recovery of data volumes for Microsoft Exchange Server and Microsoft SQL Server, using Live Recovery
- Bare metal restore, using Universal Recovery
- Bare metal restore to dissimilar hardware, using Universal Recovery
- Ad-hoc and continuous export to virtual machines

Snapshots and recovery points

This section describes how to use and manage the snapshots and recovery points generated by Rapid Recovery. It includes information about mounting, viewing, and forcing, as well as migrating and deleting recovery points.

Managing snapshots and recovery points

A recovery point is a collection of snapshots taken of individual disk volumes and stored in the repository. Snapshots capture and store the state of a disk volume at a given point in time while the applications that generate the data are still in use. In Rapid Recovery, you can force a snapshot, temporarily pause snapshots, and view lists of current recovery points in the repository as well as delete them if needed. Recovery points are used to restore protected machines or to mount to a local file system.

The snapshots that are captured by Rapid Recovery are done so at the block level and are application aware. This means that all open transactions and rolling transaction logs are completed and caches are flushed to disk before creating the snapshot.

Rapid Recovery uses a low-level volume filter driver, which attaches to the mounted volumes and then tracks all block-level changes for the next impending snapshot. Microsoft Volume Shadow Services (VSS) is used to facilitate application crash consistent snapshots.

Viewing the recovery points page of a protected machine

Complete the steps in the following procedure to view the full list of recovery points for a protected machine.

NOTE: If you are protecting data from a DAG or CCR server cluster, the associated recovery points do not appear at the cluster level. They are only visible at the node or machine level.

1. In the Rapid Recovery Core Console, navigate to the protected machine for which you want to view recovery points.
2. From the menu at the top of the page, click **Recovery Points**.

   The Recovery Points page appears, showing a Recovery Points Summary pane and a Recovery Points pane.

   You can view summary information about the recovery points for the machine as described in the following table.

   Table 147. Recovery point summary information

Info	Description
Total recovery points	Lists the total number of recovery points saved to the repository for this machine.
Total protected data	Indicates the amount of storage space used in the repository for these recovery points.
DVM repository	Lists the name of the repository in which these recovery points are stored.
DVM repository status	Graphically displays the amount of space consumed by the recovery points. Shows percentage of the repository used, the amount of space, and the total space of the repository. Click on the graph to see the amount of space remaining.

   You can view information about the recovery points for the machine as described in the following table.

   Table 148. Recovery point information

Info	Description
Icon	Graphic depiction of either a recovery point or, if expanded, a volume within the recovery point . Recovery points show a right arrow ▶ indicating that detail can be expanded.
Encrypted	Indicates if the recovery point is encrypted.
Status	Indicates current status of the recovery point.
Contents	Lists the volumes included in the recovery point. Click (Information) to see the space usage and file system.

Info	Description
Type	Defines a recovery point as either a base image or an incremental (differential) snapshot.
Creation Date	Displays the date when the recovery point was created.
Size	Displays the amount of space that the recovery point consumes in the repository.
⚙	The Settings drop-down menu lets you perform certain functions for the selected recovery point.

3. Optionally, expand a recovery point to view the protected volumes.

Related links

Viewing recovery points for a machine

Understanding recovery point status indicators

Once a recovery point is captured for a protected SQL or Exchange server, the application displays a corresponding color status indicator in the Recovery Points grid. This grid appears in the **Recovery Points** pane when viewing recovery points for a specific machine. The color that displays is based on the check settings for the protected machine and the success or failure of those checks, as described in the following tables.

NOTE: For more information on viewing recovery points, see Viewing the recovery points page of a protected machine.

Recovery status point colors for Exchange databases

The following table lists the status indicators that display for Exchange databases.

Table 149. Exchange database status indicators

Status Color	Description
White	Indicates that an Exchange database is not detected within the recovery point, volume, or volume group.
Yellow	Indicates that the Exchange database mountability checks have not yet been run.
Red	Indicates that either the mountability or checksum checks failed on at least one database.
Green	Indicates that the recovery point contains one or more database, and that mountability checks are enabled, and that mountability check passed or that the checksum check passed.

Recovery status point colors for SQL databases

The following table lists the status indicators that display for SQL databases.

Table 150. SQL database status indicators

Status Color	Description
White	Indicates that a SQL database is not detected within the recovery point, volume, or volume group.
Yellow	SQL database was offline, indicating that attachability checks were not possible and have not been performed.
Red	Indicates that the attachability check failed, or SQL database is offline.
Green	Indicates that the attachability check passed.

NOTE: Recovery points that do not have an Exchange or SQL database associated with it appear with a white status indicator. In situations where both an Exchange and SQL database exists for the recovery point, the most severe status indicator displays for the recovery point.

Mounting a recovery point

In Rapid Recovery, you can mount a recovery point for a Windows machine to access stored data through a local file system.

NOTE: To mount a Linux recovery point with the `local_mount` utility, see Mounting a recovery point volume on a Linux machine.

NOTE: When mounting recovery points from data restored from a machine that has data deduplication enabled, you must also enable deduplication on the Core server.

1. In the Rapid Recovery Core Console, navigate to the machine that you want to mount to a local file system.

   The **Summary** page appears for the selected protected machine.
2. Click the **Recovery Points** menu.

   The **Recovery Points** page appears for the selected machine.
3. Optionally, in the **Recovery Points** pane, from the list of recovery points, click the right arrow ▸ symbol to expand the recovery point detail, showing volumes included in the recovery point.
4. In the row for the recovery point that you want to mount, click ⚙ and from the drop-down menu, select **Mount**.

   The **Mount Wizard** appears, displaying the **Volumes** page.
5. On the **Volumes** page, select each volume of the recovery point that you want to mount, and then click **Next**.

   The **Mount Options** page of the Mount Wizard appears.
6. In the**Mount Options** page, edit the settings for mounting a recovery point as described in the following table.

   Table 151. Mount Options settings

Option	Description
Local folder	Specify the path used to access the mounted recovery point.

Option	Description
	For example, select `C:\ProgramData\AppRecovery\MountPoints\MountPoint1`.
Mount type	Specify the way to access data for the mounted recovery point: • Read-only • Read-only with previous writes • Writable
Create a Windows share for this Mount	Optionally, select this check box to specify if the mounted recovery point can be shared, and then set access rights to it, including the Share name and Allowed groups.

7. Click **Finish** to mount the recovery point.

   NOTE: If you want to copy directories or files from a mounted recovery point to another Windows machine, you can use Windows Explorer to copy them with default permissions or original file access permissions. For details, see Restoring a directory or file using Windows Explorer to Restoring a directory or file and preserving permissions using Windows Explorer.

8. Optionally, while the task is in process, you can view its progress from the **Running Tasks** drop-down menu on the Core Console, or you can view detailed information on the **Events** page. For more information about monitoring Rapid Recovery events, see Viewing events using tasks, alerts, and journal.

Dismounting recovery points

Complete the steps in this procedure to dismount recovery points that are mounted on the Core.

NOTE: When dismounting a recovery point mounted remotely, the action is referred to as *disconnecting*.

1. In the Rapid Recovery Core Console, from the icon bar, click (More) and then select **Mounts**.

   The **Mounts** page appears. There is a pane for Local Mounts (recovery points mounted from the Core) and another for Remote Mounts (recovery points mounted using the Local Mount Utility). In each pane, the respective mounted recovery points appears in a list.

2. To dismount local mounts, in the **Local Mounts** pane, do the following:

   a. Select the local mount point or points you want to dismount.

      - To dismount all recovery points, click the checkbox in the title bar of the Local Mounts table to select all mount points.
      - To dismount one or more recovery points, click the checkbox in the first column of each row representing the mount point you want to disconnect.

   b. Click **Dismount**.

      A confirmation dialog box appears.

   c. Click to confirm that you want to dismount the selected recover points.

      The local recovery points dismount.

      NOTE: If toast alerts are enabled, you may see an alert that the appropriate mount points are being dismounted.

3. To disconnect recovery points mounted remotely, in the **Remote Mounts** pane, do the following:

a. Select the remote mount point or points you want to disconnect.
   - To disconnect all recovery points, click the checkbox in the title bar of the Remote Mounts table to select all mount points.
   - To disconnect one or more recovery points, click the checkbox in the first column of each row representing the mount point you want to disconnect.

b. Click **Disconnect**.

   A confirmation dialog box appears.

c. Click to confirm that you want to disconnect the selected recover points.

   The local recovery points disconnected.

   NOTE: If toast alerts are enabled, you may see an alert that the appropriate mount points are being disconnected.

4. Confirm that the previously mounted recovery points no longer appear in the Local Mounts or Remote Mounts list, as appropriate.

Working with Linux recovery points

The recommended and supported method to mount and unmount recovery points from a protected Linux machine is to use the *local_mount* utility.

The procedures listed below specifically address using local_mount to mount and unmount Linux recovery points.

NOTE: For managing Linux recovery points in any other way, see Managing snapshots and recovery points, as all other management can be conducted from the Core Console.

Mounting a recovery point volume on a Linux machine

Using the local_mount utility in Rapid Recovery, you can remotely mount a volume from a recovery point as a local volume on a Linux machine.

NOTE: When performing this procedure, do not attempt to mount recovery points to the /tmp folder, which contains the aavdisk files.

1. Create a new directory for mounting the recovery point (for example, you can use the `mkdir` command).
2. Verify the directory exists (for example, by using the `ls` command).
3. Run the Rapid Recovery local_mount utility as root, or as the super user, for example:

   ```
   sudo local_mount
   ```
4. At the Rapid Recovery mount prompt, enter the following command to list the protected machines.

   ```
   lm
   ```
5. When prompted, enter the IP address or hostname of your Rapid Recovery Core server.
6. Enter the logon credentials for the Core server, that is, the user name and password.

   A list of the machines that are protected by the Rapid Recovery server displays. Each machine is identified by the following: line item number, host/IP address, and an ID number for the machine.

   For example: 7d658e5f-fa08-4600-95f0-5f486bc1b6a4#de0896fd-571a-4cc5-aeed-264d2c3c72f4#f377e145-dd4d-3ac3-5b15-37ce8f4913ba
7. Enter the following command to list the recovery points that are available for a specified machine:

   ```
   lr <line_number_of_machine>
   ```

NOTE: Note that you can also enter the machine ID number in this command instead of the line item number.

A list of the base and incremental recovery points for the machine appears. The list includes the line item number, date and timestamp, location of volume, size of recovery point, and an ID number for the volume, which includes a sequence number at the end to identify the recovery point.

For example, 7d658e5f-fa08-4600-95f0-5f486bc1b6a4#de0896fd-571a-4cc5-aeed-264d2c3c72f4#f377e145-dd4d-3ac3-5b15-37ce8f4913ba:2

8. Enter the following command to select and mount the specified recovery point at the specified mount point/path.

   ```
   m <volume_recovery_point_ID_number> <volume-letter> [flag] <path>
   ```

   The flag in the command determines how to mount the recovery point. You can use one of the following options:

   - [r] - mount read-only (default). This flag lets you mount a recovery point but does not let you make changes to it.
   - [w] - mount writable. This flag lets you mount the recovery point and lets you make changes.
   - [v] - mount with previous writes. Mounting with the “v” flag lets you mount the recovery point and include any changes that were made during the previous writable mount but are not present in the recovery point.
   - [n] - do not mount nbd to <path>. A nbd (network block device) makes a socket connection between the Core and the protected machine when you perform a local mount. This flag lets you mount the recovery point without mounting the nbd, which is useful if you want to manually check the file system of the recovery point.

     NOTE: You can also specify a line number in the command instead of the recovery point ID number to identify the recovery point. In that case, you would use the machine line number (from the lm output), followed by the recovery point line number and volume letter, followed by the path, such as, m <machine_line_number> <recovery_point_line_number> <volume_letter> <path>. For example, if the `lm` output lists three protected machines, and you enter the `lr` command for number 2 and you mount the twenty-third recovery point volume b to /tmp/mount_dir, then the command would be:

     ```
     m 2 23 b /tmp/mount_dir
     ```

     NOTE: If you are mounting a BTRFS volume from a compatible operating system (see the "Rapid Recovery release 6.1 operating system installation and compatibility matrix" topic in the *Dell Data Protection | Rapid Recovery Installation and Upgrade Guide*), then you must include the following parameter:

     ```
     mount -o nodatasum,device=/dev/xxx /dev/xxx /mnt/yyy
     ```

9. To verify that the mount was successful, enter the following command, which should list the attached remote volume:

   ```
   l
   ```

Unmounting a recovery point on a Linux machine

Complete the steps in this procedure to unmount a recovery point on a Linux machine.

1. Run the Rapid Recovery local_mount utility as root, or as the super user, for example:

   ```
   sudo local_mount
   ```

2. At the Rapid Recovery mount prompt, enter the following command to list the protected machines.

   ```
   lm
   ```

3. When prompted, enter the IP address or hostname of your Rapid Recovery Core server.
4. Enter the logon credentials (user name and password) for the Core server.

A list of the machines that are protected by the Rapid Recovery server displays.

5. Enter the following command to list the recovery points that are available for a specified machine:

   ```
   lr <line_number_of_machine>
   ```

   NOTE: Note that you can also enter the machine ID number in this command instead of the line item number.

   A list of the base and incremental recovery points for the machine will display and includes. The list includes the line item number, date and timestamp, location of volume, size of recovery point, and an ID number for the volume that includes a sequence number at the end, which identifies the recovery point.

   For example: 7d658e5f-fa08-4600-95f0-5f486bc1b6a4#de0896fd-571a-4cc5-aeed-264d2c3c72f4#f377e145-dd4d-3ac3-5b15-37ce8f4913ba:2
6. Run the `l or list` command to obtain a list of mounted Network Block Device (NBD)-devices. If you mount any recovery point, you will get a path to NBD-device after executing the `l or list` command.
7. Enter the following command to unmount a recovery point.

   ```
   unmount <path_of_nbd-device>
   ```
8. Run the `l or list` command to verify that the unmount of the recovery point was successful.

Forcing a snapshot

Forcing a snapshot lets you force a data transfer for the current protected machine. When you force a snapshot, the transfer starts immediately or is added to the queue if other jobs are running.

You can choose from two types of snapshots.

If you select an incremental snapshot and there is no previous recovery point, a base image is captured. Forcing a snapshot does not change the timing for any schedules snapshots.

NOTE: Rapid Recovery supports Window 8, Windows 8.1, Windows Server 2012, and Windows Server 2012 R2 for both base and incremental transfers.

- A base image is a snapshot of all data on the selected volumes of the machine.
- An incremental snapshot captures all data that has been changed since the last snapshot.

1. In the Rapid Recovery Core Console, navigate to the machine or cluster with the recovery point for which you want to force a snapshot.
2. On the Summary page, in the Summary pane, click **Force Snapshot**.

   The Force Snapshot dialog appears.
3. In the Force Snapshot dialog box, in the check box, click one or more volumes or protection groups.
4. Click **Force Snapshot** or Force Base Image, respectively.
5. If you selected a base image, click to confirm that you want to take a base image.

   A base image could take a substantial amount of time, based on the amount of data in the volumes you want to back up.

   The snapshot you selected is queued and begins as soon as other jobs have completed.

Removing recovery points

You can easily remove recovery points for a particular machine from the repository. When you delete recovery points in Rapid Recovery, you can specify one of the following options.

- **Delete All Recovery Points**. Removes all recovery points for the selected protected machine from the Repository.
- **Delete a Range of Recovery Points**. Removes all recovery points in a specified range before the current, up to and including the base image, which is all data on the machine as well as all recovery points after the current until the next base image.

NOTE: You cannot recover the recovery points you have deleted. If you need the data stored in the recovery points, considering archiving the data first.

1. In the Rapid Recovery Core Console, under the **Protected Machines** menu, click the name or IP address of the machine for which you want to view and remove recovery points.

   The Summary view for the selected protected machine appears.
2. Next to the machine name or IP address, click the **Recovery Points** menu.

   The **Recovery Points** page for the selected machine appears.
3. Scroll down to the **Recovery Points** pane.

   Options appear under the pane title, including Refresh, Delete Range, and Delete All.
4. To delete all currently stored recovery points, under the Recovery Points pane title, click **Delete All**, and in the confirmation dialog box, click to confirm deletion.
5. To delete a set of recovery points in a specific data range, do the following:
   a. Under the Recovery Points pane title, click **Delete Range**.

      The **Delete Recovery Points Within Range** dialog box appears.

   b. In the **Delete Recovery Points Within Range** dialog box, in the **From** field, select the date and time from which you want to start deleting recovery points.

   c. In the **To** field, select the date and time defining the last recovery point you want to delete.

   d. Click **Delete**.

   e. In the confirmation dialog box, click to confirm deletion.

Deleting an orphaned recovery point chain

An orphaned recovery point is an incremental snapshot that is not associated with a base image. Subsequent snapshots continue to build onto this recovery point; however, without the base image, the resulting recovery points are incomplete and are unlikely to contain the data necessary to complete a recovery. These recovery points are considered to be part of the orphaned recovery point chain. If this situation occurs, the best solution is to delete the chain and create a new base image.

For more information about forcing a base image, see Forcing a snapshot.

1. In the Rapid Recovery Core Console, navigate to the protected machine for which you want to delete the orphaned recovery point chain.
2. From the menu at the top of the page, click **Recovery Points**.
3. In the Recovery Points pane, expand the orphaned recovery point.

   This recovery point is labeled in the Type column as “Incremental, Orphaned.”
4. Next to Actions, click **Delete**.

   The Delete Recovery Points windows appears.

5. In the Delete Recovery Points window, click **Yes**.

   △ **CAUTION: Deleting this recovery point deletes the entire chain of recovery points, including any incremental recovery points that occur before or after it, until the next base image. This operation cannot be undone.**

   The orphaned recovery point chain is deleted.

Migrating recovery points manually to a different repository

If you want to remove the recovery points of a protected machine from a repository without deleting them, you can migrate them to a different repository manually by using this procedure. This process involves archiving recovery points from the source repository, and then importing the archive into the target repository.

For example, you can perform this procedure if your existing repository is full, or if your needs change and you want to protect a machine using a different Core and repository.

△ **CAUTION: If your repository was upgraded previously from AppAssure 5.3 or 5.4 and used replication, Dell recommends performing the Check Repository Job on each repository in that target Core before migration. Performing this job will preclude copying any data irregularities to the new destination repository. The Check Repository Job is only available in the UI if it is applicable to your Core, and could take a substantial amount of time to run. For information about this job, see About checking the integrity of DVM repositories. For information on performing this job, see Running the Check Repository Job on a DVM repository.**

1. In the Rapid Recovery Core Console, pause protection for the protected machine or machines whose recovery points you want to migrate. For more information, see Pausing and resuming protection.
2. Cancel all current operations for the protected machine or machines whose recovery points you want to migrate, or wait for them all to complete.
3. Archive the recovery points for the machine or machines you paused. For more information, see Creating an archive.
4. After archiving and verifying the archive, remove the existing recovery points for the protected machine you want to migrate. For more information, see Removing recovery points.

   NOTE: Without removing existing recovery points, you cannot change repositories for a protected machine.
5. Create a new repository for the migrated recovery points, or ensure a new destination repository exists. For more information, see Creating a DVM repository.
   - If you want to use an existing repository, continue to Step 6.
6. Change the repository for each machine that you paused by completing the following steps:
   a. On the Core Console, click the protected machine in the navigation tree.
   b. On the **Summary** page of the protected machine, click **Settings**.
   c. On the **Settings** page, in the **General** pane, click the **Repository** drop-down list, and then select in the name of the repository you created in Step 4.
      - If you want to use an existing repository, select the name of an existing repository.

        NOTE: When migrating recovery points to an existing repository, ensure that the existing repository has enough free space to contain the migrated recovery points.
   d. Click **OK**.
7. Resume protection for the machine or machines that you paused. For more information, see Pausing and resuming protection.
8. Take a new base image for each of the protected machines you moved. For more information, see Forcing a snapshot and use the Force Base Image option.

9. Import the archived data for the machines you want to migrate. For more information, see Importing an archive.

Restoring data

This section describes how to restore backed up data.

About restoring data with Rapid Recovery

The Rapid Recovery Core can instantly restore data or recover machines to physical or virtual machines from recovery points. The recovery points contain agent volume snapshots captured at the block level. These snapshots are application aware, meaning that all open transactions and rolling transaction logs are completed and caches are flushed to disk before creating the snapshot. Using application-aware snapshots in tandem with Verified Recovery enables the Core to perform several types of recoveries, including:

- Recovery of files and folders
- Recovery of data volumes, using Live Recovery
- Recovery of data volumes for Microsoft Exchange Server and Microsoft SQL Server, using Live Recovery
- Bare metal restore, using Universal Recovery
- Bare metal restore to dissimilar hardware, using Universal Recovery
- Ad-hoc and continual export to virtual machines

NOTE: When you restore data or perform virtual export, the recovery point used must be part of a complete recovery point chain. For more information about recovery point chains, see the topic Recovery point chains and orphans.

Understanding Live Recovery

Live Recovery is a feature of restoring data in Rapid Recovery Core. If your protected machine experiences data failure of a non-system Windows volume, you can restore data from a recovery point on the Rapid Recovery Core. Selecting Live Recovery in the Restore Wizard allows users to immediately continue business operations with near-zero downtime. Live Recovery during restore gives you immediate access to data, even while Rapid Recovery continues to restore data in the background. This feature allows near-zero recovery-time, even if the restore involves terabytes of data.

Rapid Recovery Core uses unique block-based backup and recovery technology that allows full user access to target servers during the recovery process. Requested blocks are restored on-demand for seamless recovery.

Live Recovery applies to physical and virtual machines protected by Rapid Recovery Core, with the following exclusions:

- Live Recovery is accessible to non-system Windows volumes. The C:\ drive and the system-reserved partition cannot be restored using Live Recovery.
- Live Recovery is accessible to Windows-based volumes using the Rapid Recovery Agent. Agentless volumes or Linux volumes cannot take advantage of Live Recovery.

Live Recovery lets you instantly restore physical or virtual servers directly from the backup file. When a non-system volume is being restored, Rapid Recovery presents the volume metadata to the Operating

System instantly, making that data available on demand. For example, if the database volume of Microsoft Exchange is corrupt, Live Recovery can restore the volume, database, and Exchange services in minutes.

This feature provides the fastest method of recovering large quantities of data with minimal downtime. Users can immediately continue business operations.

Once Live Recovery begins, the restored volume and its contents become instantly available. Rapid RecoveryCore continues to restore the data in the background, even though the volume, its data, applications and services are already back in production. If specific data is requested, the background process prioritizes the restoration of this data immediately. This powerful functionality allows even the most stringent service-level agreement to be met.

Once you start Live Recovery, metadata (directory structure, security descriptors, NTFS file attributes, free space map, and so on) of the target volume is quickly restored on the protected machine. Thereafter, the volume and its contents become available to the system. The Rapid Recovery Agent begins restoring data blocks from the Rapid Recovery Core server, writing the blocks to the target volume.

Requests for data that has not yet been restored are immediately answered, with the requesting program or system unaware that the blocks were just restored.

Restoring data from recovery points

Rapid Recovery protects your data on Windows and Linux machines. Backups of protected agent machines are saved to the Rapid Recovery Core as recovery points. From these recovery points, you can restore your data using one of three methods.

From the Rapid Recovery Core Console, you can restore entire volumes from a recovery point of a non-system volume, replacing the volumes on the destination machine. You can do this for only Windows machines. For more information, see About restoring volumes from a recovery point.

You cannot restore a volume that contains the operating system directly from a recovery point, because the machine to which you are restoring is using the operating system and drivers that are included in the restore process. If you want to restore from a recovery point to a system volume (for example, the C drive of the agent machine), you must perform a Bare Metal Restore (BMR). This involves creating a bootable image from the recovery point, which includes operating system and configuration files as well as data, and starting the target machine from that bootable image to complete the restore. The boot image differs if the machine you want to restore uses a Windows operating system or a Linux operating system. If you want to restore from a recovery point to a system volume on a Windows machine, see Performing a bare metal restore for Windows machines. If you want to restore from a recovery point of a system volume on a Linux machine, see Performing a bare metal restore for Windows machines.

Finally, in contrast to restoring entire volumes, you can mount a recovery point from a Windows machine, and browse through individual folders and files to recover only a specific set of files. For more information, see Restoring a directory or file using Windows Explorer. If you need to perform this while preserving original file permissions (for example, when restoring a user's folder on a file server), see Restoring a directory or file and preserving permissions using Windows Explorer.

The topics in this section describe information about restoring data on physical machines. For more information on exporting protected data from Windows Machines to virtual machines, see VM export.

NOTE: When recovering data on Windows machines, if the volume that you are restoring has Windows data deduplication enabled, you will need to make sure that deduplication is also enabled on the Core server.

Rapid Recovery supports Windows 8, Windows 8.1, Windows 10, Windows Server 2012, and Windows Server 2012 R2 for normal transfers (both base and incremental) as well as with restoring data, bare metal restore, and virtual exports.

For more information on the types of volumes supported and not supported for backup and recovery, see Support for dynamic and basic volumes.

About restoring volumes from a recovery point

You can restore the volumes on a protected machine from the recovery points stored in the Rapid Recovery Core.

NOTE: In previous releases, this process was referred to as performing a rollback.

NOTE: Rapid Recovery supports the protection and recovery of machines configured with EISA partitions. Support is also extended to Window 8, Windows 8.1, Windows Server 2012, and Windows Server 2012 R2 machines that use Windows Recovery Environment (Windows RE).

You can begin a restore from any location on the Rapid Recovery Core Console by clicking the Restore icon in the Rapid Recovery button bar. When you start a restore in this manner, you must specify which of the machines protected on the Core you want to restore, and then drill down to the volume you want to restore.

Or you can go to Recovery Points page for a specific machine, click the drop-down menu for a specific recovery point, and then select **Restore**. If you begin a restore in this manner, then follow this procedure starting with Step 5.

If you want to restore from a recovery point to a system volume, or restore from a recovery point using a boot CD, you must perform a Bare Metal Restore (BMR). For information about BMR, see Understanding bare metal restore for Windows machines, and for prerequisite information for Windows or Linux operating systems, see Prerequisites for performing a bare metal restore for a Windows machine and Prerequisites for performing a bare metal restore for a Linux machine, respectively. You can access BMR functions from the Core Console as described in the roadmap for each operating system. You can also perform a BMR from the Restore Machines Wizard. This procedure will direct you at the appropriate point in the wizard to the procedure Performing a bare metal restore using the Restore Machine Wizard.

Restoring volumes from a recovery point

The protected machine must have the Agent software installed and must have recovery points from which you perform the restore operation.

Complete the following procedure to restore volumes from a recovery point.

1. To restore a volume on a protected machine from the Restore icon, navigate to the Core Console and click **Restore** from the Rapid Recovery button bar.

   The Restore Machine Wizard appears.

2. From the Protected Machines page, select the protected machine for which you want to restore data, and then click **Next**.

   The Recovery Points page appears.

3. From the list of recovery points, search for the snapshot you want to restore to the agent machine.
   - If necessary, use the buttons at the bottom of the page to display additional pages of recovery points.
   - Optionally, to limit the number of recovery points showing in the Recovery Points page of the wizard, you can filter by volumes (if defined) or by creation date of the recovery point.
4. Click any recovery point to select it, and then click **Next**.

   The Destination page appears.
5. On the Destination page, choose the machine to which you want to restore data as follows:
   - To restore data from the selected recovery point to the same machine, and if the volumes you want to restore do not include the system volume, then select **Recover to a protected machine (only non-system volumes)**, verify that the destination machine is selected, and then click **Next**.

     The Volume Mapping page appears. Proceed to Step 9.
   - To restore data from the selected recovery point to a different protected machine (for example, replace the contents of Machine2 with data from Machine1), then select **Recover to a protected machine (only non-system volumes)**, select the destination machine from the list, and then click **Next**.

     The Volume Mapping page appears. Proceed to Step 9.
   - If you want to restore from the selected recovery point to the same machine or a different machine using a boot CD, this process is considered a bare metal restore (BMR). For information about BMR, see Understanding bare metal restore for Windows machines.

     NOTE: Performing a BMR has specific requirements, based on the operating system of the agent machine you want to restore. To understand these prerequisites, see Prerequisites for performing a bare metal restore for a Windows machine and Prerequisites for performing a bare metal restore for a Linux machine, respectively.

     If the volumes you want to restore include the system volume, then select **Recover to any target machine using a boot CD**. This option prompts you to create a boot CD.

     - To continue and create the boot CD with information from the selected recovery point using the Restore Machine Wizard, click **Next** and proceed to Performing a bare metal restore for Windows machines.
     - If you have already created the boot CD and the target machine has been started using the boot CD, then proceed to Step 8 of the topic Performing a bare metal restore for Windows machines.
   - If you want to restore from a recovery point to a system volume (for example, the C drive of the agent machine named Machine1), this process is also considered a BMR. Select **Recover to any target machine using a boot CD**. This option prompts you to create a boot CD.
     - To continue and create the boot CD with information from the selected recovery point using the Restore Machine Wizard, click Next and proceed to Performing a bare metal restore for Windows machines.
     - If you have already created the boot CD, then proceed to Step 6.
6. Start the machine you want to restore to using the boot CD. For more information, for BMR on a Windows machine, see Loading the boot CD and starting the target machine and for BMR on a Linux machine, see Loading the Live DVD and starting the target machine.
7. On the Core server, in the Destination page of the Restore Machine Wizard, select **I already have a boot CD running on the target machine**, and then enter the information about the machine to which you want to connect described in the following table.

Table 152. Machine information

Text Box	Description
IP Address	The IP address of the machine to which you want to restore. This is identical to the IP address displayed in the URC.
Authentication Key	The specific password to connect to the selected server. This is identical to the Authentication Key displayed in the URC.

8. Click **Next**.

   If the connection information you entered matches the URC, and if the Core and the target server can identify each other properly on the network, then the volumes for the selected recovery point are loaded. The Disk Mapping page appears.

   To complete your BMR from the Restore Machine Wizard, proceed to Step 9 of the topic Performing a bare metal restore for Windows machines.

   NOTE: Rapid Recovery supports FAT32 and ReFS partitions. Only full restore and BMR are supported as a driver limitation exists with ReFS. Restore is implemented in user mode, VM export, and so on. If a Core is protecting at least one agent volume that contains the ReFS file system, it should be installed on Windows 8/2012, which provides native support of ReFS. Otherwise, functionality is limited and operations that involve such things as mounting a volume image do not work. The Rapid Recovery Core Console presents applicable error messages in these occurrences.

   Bare metal restore of Storage Spaces disks configuration (a feature of Windows 8.1) is also not supported in this release. For details, see the Rapid Recovery Installation and Upgrade Guide.

9. On the Volume Mapping page, for each volume in the recovery point that you want to restore, select the appropriate destination volume. If you do not want to restore a volume, in the Destination Volumes column, select **Do not restore**.
10. Select **Show advanced options** and then do the following:
    - For restoring to Windows machines, if you want to use Live Recovery, select **Live Recovery**.

      Using the Live Recovery instant recovery technology in Rapid Recovery, you can instantly recover or restore data to your physical machines or to virtual machines from stored recovery points of Windows machines, which includes Microsoft Windows Storage Spaces. Live Recovery is not available for Linux machines or VMs using agentless protection.
    - If you want to force the selected volumes to dismount before the restore begins, select **Force Dismount**.

      CAUTION: If you do not force a dismount before restoring data, the restore may fail with an error stating that the volume is in use.
11. Click **Next.**
12. On the Dismount Databases page, if the volumes you want to restore contain SQL or Microsoft Exchange databases, you are prompted to dismount them.

    If you want to remount these databases after the restore is complete, select **Automatically remount all databases after the recovery point is restored**.
13. Click **Next.**

    The Warning page may appear and prompt you to close all programs on the volumes that you want to restore. If it does, click **Next** again.
14. On the Summary page, select the option **IMPORTANT! I understand that this operation will overwrite selected volumes with the data from the selected recovery point** to acknowledge that you understand the consequences of a volume restore.

WARNING: This option emphasizes the consequence that any data that was saved on the selected volume after the date and time of the selected recovery point is lost upon restore.

15. Click **Finish**.

Restoring a directory or file using Windows Explorer

You can use Windows Explorer to copy and paste directories and files from a mounted recovery point to any Windows machine. This can be helpful when you want to distribute only a portion of a recovery point to your users.

When you copy directories and files, the access permissions of the user who is performing the copy operation are used and applied to the pasted directories and files. If you want to restore directories and files to your users while preserving original file permissions (for example, when restoring a user’s folder on a file server), see Restoring a directory or file and preserving permissions using Windows Explorer.

1. Mount the recovery point that contains the data you want to restore. For details, see Mounting a recovery point.
2. In Windows Explorer, navigate to the mounted recovery point and select the directories and files that you want to restore. Right-click and select **Copy**.
3. In Windows Explorer, navigate to the machine location to where you want to restore the data. Right-click and select **Paste**.

Restoring a directory or file and preserving permissions using Windows Explorer

You can use Windows Explorer to copy and paste directories and files from a mounted recovery point to any Windows machine while preserving file access permissions.

For example, if you need to restore a folder accessed only by specific users on a file server, you can use the Copy and Paste with Permissions commands to ensure that the restored files retain the permissions that restrict access. In this way, you can avoid having to manually apply permissions to the restored directories and files.

NOTE: The Paste with Permissions command is installed with Rapid Recovery Core and Agent software. It is not available in the Local Mount Utility.

1. Mount the recovery point that contains the data you want to restore. For details, see Mounting a recovery point.
2. In Windows Explorer, navigate to the mounted recovery point and select the directories and files that you want to restore. Right-click and select **Copy**.
3. In Windows Explorer, navigate to the machine location to where you want to restore the data. Right-click and select **Paste with Permissions**.

   NOTE: In this step, if the Paste with Permissions command is disabled on the right-click menu, then Windows Explorer is not aware of the files that you want to copy. Repeat Step 2 to enable the Paste with Permissions command on the right-click menu.

Performing a restore for clusters and cluster nodes

A restore is the process of restoring the volumes on a machine from recovery points. For a server cluster, you perform a restore at the node, or machine, level. This section provides guidelines for performing a restore for cluster volumes.

Performing a restore for CCR and DAG (Exchange) clusters

Complete the steps in this procedure to perform a restore for CCR and DAG (Exchange) clusters.

1. Turn off all nodes except one.
2. Perform a restore using the standard Rapid Recovery procedure for the machine as described in About restoring volumes from a recovery point and Restoring volumes for a Linux machine using the command line.
3. When the restore is finished, mount all databases for the cluster volumes.
4. Turn on all other nodes.
5. For Exchange, navigate to the Exchange Management Console, and, for each database, perform the Update Database Copy operation.

Performing a restore for SCC (Exchange, SQL) clusters

Complete the steps in this procedure to perform a restore for SCC (Exchange, SQL) clusters.

1. Turn off all nodes except one.
2. Perform a restore using the standard Rapid Recovery procedure for the machine as described in About restoring volumes from a recovery point and Restoring volumes for a Linux machine using the command line.
3. After the restore is finished, mount all databases from the cluster volumes.
4. Turn on all other nodes one-by-one.

   NOTE: You do not need to roll back the quorum disk. It can be regenerated automatically or by using cluster service functionality.

Restoring from an attached archive

There are two ways you can restore data from an archive: You can use an archive as a source for a bare metal restore (BMR); or you can attach an archive, mount a recovery point from the archive, and then restore the archived data.

When you attach an archive, it appears under Attached Archives on the Archives page of the Core Console, while the contents of the archive become accessible from the left navigation area. The contents appear under the name of the archive. Machines that were archived appear as recovery-points-only machines so that you can access the recovery points in the same way that you would for a currently protected machine: by mounting a recovery point, locating the item that you want to recover, and using Windows Explorer to copy and paste the item to your destination.

There are advantages to restoring from an attached archive rather than importing an archive to a repository.

- Restoring from an attached archive saves the time you may spend importing an entire archive to a repository.
- Also, when you import an archive, the archived recovery points are added to the repository.

  Because these archived recovery points are likely the oldest items in the repository, they may be rolled up according to your retention policy during the next nightly job. (Although, this action does not delete them from the archive; you could re-import them the next day.)
- Lastly, the Core remembers the attachment association with archives, even after you detach an archive, making it easier and faster to attach the archive again later.

  You can remove the association by deleting the attachment.

To restore data from an attached archive, complete the following steps using the related links:

NOTE: The procedure for restoring from an attached archive assumes that you already have an archive of rolled-up recovery points.

1. Attach the archive.
2. Mount the recovery point that contains the data that you want to recover.
3. Restore data using any of the following methods:
   - Restore data, such as file or folder, from the recovery point .
   - Restore the entire recovery point.
   - Export the recovery point to a virtual machine.

Related links

Attaching an archive
Mounting a recovery point
Restoring a directory or file using Windows Explorer
About exporting to virtual machines with Rapid Recovery
Windows backup
Understanding archives
Importing an archive
Performing a BMR from an archive

Understanding bare metal restore for Windows machines

This section describes how to restore a protected Windows machine from bare-metal similar or dissimilar hardware.

Bare metal restore for Windows machines

Servers, when operating as expected, perform the tasks they are configured to do. It is only when they fail that things change. When a catastrophic event occurs, rendering a server inoperable, immediate steps are needed to restore the full functionality of that machine.

Rapid Recovery provides the ability to perform a bare metal restore (BMR) for your Windows or Linux machines. BMR is a process that restores the full software configuration for a specific system. It uses the term “bare metal” because the restore operation recovers not only the data from the server, but also reformats the hard drive and reinstalls the operating system and all software applications. To perform a BMR, you specify a recovery point from a protected machine, and roll back (perform a restore) to the designated physical or virtual machine. If you are performing a restore to a system volume, this is considered a BMR. If you are performing a restore and require a boot CD, this is also considered a BMR. Other circumstances in which you may choose to perform a bare metal restore include hardware upgrade or server replacement In both of these cases, you perform a restore from a recovery point to the upgraded or replaced hardware.

Rapid Recovery supports Windows 8, 8.1 and Windows Server 2012, 2012 R2 operating systems that are booted from FAT32 EFI partitions are available for protection or recovery, as well as Resilient File System (ReFS) volumes.

NOTE: Bare metal restore of Storage Spaces disks configuration (a feature of Windows 8.1) is also not supported in this release. At present, only full restore and BMR are supported as a driver limitation exists with ReFS, so restore is implemented in user mode, VM export, and so on. If a Core is protecting at least one agent volume that contains the ReFS file system, it should be installed on a Window 8, Windows 8.1, Windows Server 2012, or Windows Server 2012 R2 machine, since these operating systems provides native support of ReFS. Otherwise, functionality will be limited and operations that involve such things as mounting a volume image will not work. The Rapid Recovery Core Console will present applicable error messages in these occurrences.

Only supported Linux operating systems are available for protection or recovery. This includes Ubuntu®, Red Hat® Enterprise Linux®, CentOS™, and SUSE® Linux Enterprise Server (SLES®). For details, see the *Dell Data Protection | Rapid Recovery Installation and Upgrade Guide*.

Performing a BMR is possible for physical or virtual machines. As an added benefit, Rapid Recovery allows you to perform a BMR whether the hardware is similar or dissimilar. Performing a BMR on Rapid Recovery separates the operating system from a specific platform, providing portability.

Examples of performing a BMR for similar hardware include replacing the hard drive of the existing system, or swapping out the failed server with an identical machine.

Examples of performing a BMR for dissimilar hardware include restoring a failed system with a server produced by a different manufacturer or with a different configuration. This process encompasses creating a boot CD image, burning the image to disk, starting up the target server from the boot image, connecting to the recovery console instance, mapping volumes, initiating the recovery, and then monitoring the process. Once the bare metal restore is complete, you can continue with the task of loading the operating system and the software applications on the restored server, followed by establishing unique settings required for your configuration.

Bare metal restore is used not only in disaster recovery scenarios, but also to migrate data when upgrading or replacing servers.

Performing a bare metal restore for Windows machines

To perform a bare metal restore for Windows machines, perform the following tasks.

- Creating a Windows boot image. This boot CD ISO image will be used to start up the destination drive, from which you can access the Universal Recovery Console to communicate with backups on the Core. See Understanding boot CD creation for Windows machines.
  - If you require physical media to start up the destination machine, you need to transfer the boot CD ISO image to media. See Transferring the boot CD ISO image to media.
  - In all cases, you must load the boot image into the destination server and start the server from the boot image. See Loading the boot CD and starting the target machine.

    NOTE: This process describes how to manage a boot CD image from the Create Boot CD dialog box. You can also perform these steps from the Restore Machine Wizard, starting from the Boot CD page of the wizard. You access this when you specify Recover to any target machine using a boot CD from the Destination page of the wizard. For step-by-step instructions for managing a Windows boot image from the Restore Machine Wizard as part of a bare metal restore, see About performing a bare metal restore using the Restore Machine Wizard.
- Launch a Bare Metal Restore for Windows. After the destination machine is started from the boot CD, you can launch the BMR. See Using the Universal Recovery Console for a BMR. It involves the following tasks:
  - Initiate a restore from a recovery point on the Core. See Selecting a recovery point and initiating a BMR.

  - Map the volumes. See About disk mapping for a bare metal restore.
  - If restoring to dissimilar hardware, and the necessary storage and network drivers are not present on the boot CD, you may need to load the drivers from a portable media device. For more information, see Loading drivers using the Universal Recovery Console.
- Performing a BMR from the Restore Machine Wizard. Optionally, the processes for managing a Windows boot image and for launching the BMR, including all sub-tasks, can be performed from the Restore Machine Wizard. For information on launching the wizard, see steps 1 through 5 of About restoring volumes from a recovery point, and then refer to About performing a bare metal restore using the Restore Machine Wizard.
- Verifying a Bare Metal Restore. After starting the bare metal restore, you can verify and monitor your progress. See Verifying a bare metal restore.
  - You can monitor the progress of your restore. See Viewing the recovery progress.
  - Once completed, you can start the restored server. See Starting a restored target server
  - Troubleshoot the BMR process. See Troubleshooting connections to the Universal Recovery Console and Repairing boot problems.

Prerequisites for performing a bare metal restore for a Windows machine

Before you can begin the process of performing a bare metal restore for a Windows machine, you must ensure that the following conditions and criteria exist:

- A 64-bit central processing unit (CPU). The Rapid Recovery boot CD includes the Win PE 5.1 operating system. Rapid Recovery BMRs are not compatible with x86-based CPUs. You can only perform a BMR on a 64-bit CPU.

  NOTE: This requirement is new as of 6.0.
- Backups of the machine you want to restore. You must have a functioning Rapid Recovery Core containing recovery points of the protected server you want to restore
- Hardware to restore (new or old, similar or dissimilar). The target machine must meet the installation requirements for an agent; for details, see the *Dell Data Protection | Rapid Recovery Installation and Upgrade Guide*.
- Image media and software. You must have a blank CD or DVD and disk burning software, or software to create an ISO image. If managing machines remotely using virtual network computing software such as UltraVNC, then you must have VNC Viewer.
- Compatible storage drivers and network adapter drivers. If restoring to dissimilar hardware, then you must have compatible storage drivers and network adapter drivers for the target machine, including RAID, AHCI, and chipset drivers, as appropriate.
- Storage space and partitions, as appropriate. Ensure that there is enough space on the hard drive to create destination partitions on the target machine to contain the source volumes. Any destination partition should be at least as large as the original source partition.
- Compatible partitions. Windows 8, Windows 8.1, Windows 10, Windows Server 2012, and Windows Server 2012 R2 operating systems that are booted from FAT32 EFI partitions are available for protection or recovery, as well as are Resilient File System (ReFS) volumes. UEFI partitions are treated as simple FAT32 volumes. Incremental transfers are fully supported and protected. Rapid Recovery provides support of UEFI systems for BMR including automatic partitioning GPT disks.

About performing a bare metal restore using the Restore Machine Wizard

Managing a Windows boot image through the wizard includes the following actions:

- Initiating creation of the boot CD.
- Defining the path for the image on the Core machine.
- Selecting the recovery environment appropriate to the hardware you want to restore on.
- Optionally defining connection parameters for the restored agent for using the network or UltraVNC.

- Optionally injecting drivers for hardware you want to restore on.
- Optionally transferring the boot image to physical media.
- Booting the machine to which you want to restore data from the CD.
- Connecting to the Universal Recovery Console.
- Mapping volumes.
- Initiating the bare metal restore from the selected recovery point on the core.

NOTE: This process describes how to manage a boot CD image from the Restore Machine Wizard, as part of the process for performing a BMR using that wizard. You can also manage a boot image from the Create Boot CD dialog box. For information on managing a boot CD image outside of the Restore Machine Wizard, see Understanding boot CD creation for Windows machines.

Performing a bare metal restore using the Restore Machine Wizard

You can use the Restore Wizard to create a boot CD as well as perform a bare metal restore (BMR).

Before performing a BMR, see Prerequisites for performing a bare metal restore for a Windows machine or Prerequisites for performing a bare metal restore for a Linux machine, as appropriate. If starting your BMR for a Windows machine from the Core Console, see Performing a bare metal restore for Windows machines.

The protected machine must have the Agent software installed and must have recovery points from which you can perform the restore operation.

1. To restore a volume on a protected machine, navigate to the Core Console and click **Restore** from the Rapid Recovery button bar.

   The Restore Machine Wizard appears.
2. On the Machines page, select the protected machine you want to restore, and then click **Next**.

   The Recovery Points page appears.
3. Select the recovery point you want to use to restore the machine.
   - Optionally, if you want to limit the number of recovery points displayed, you can filter by volumes (if defined) or by creation date of the recovery point. You can also conduct a search for a specific recovery point.
4. Click **Next**.
5. On the Destination page, select **Recover to any target machine using a boot CD**.
   - If you have not yet loaded a boot CD on the machine you want to restore, click **Next**, and then continue to Step 6.
   - If you already loaded a boot CD onto the BMR target machine, select **I already have a boot CD running on the target machine**, click **Next**, and then go to Step 16.
6. On the Boot CD page, in the Output path text box, enter the path where the boot CD ISO image should be stored.

   NOTE: If the shared drive on which you want to store the image is has insufficient disk space, you can create a disk as needed in the path; for example, F:\filename.iso.

   NOTE: The file extension must be .iso. When specifying the path, use only alphanumeric characters, the hyphen, the backslash (only as a path delimiter), and the period (only to separate host names and domains). The letters a to z are case-insensitive. Do not use spaces. No other symbols or punctuation characters are permitted.
7. Optionally, to set up network parameters for the target machine, or to add UltraVNC capabilities, select **Show advanced options**, and then complete the following steps:
   - To establish a network connection with the BMR target, select **Use the following IP address**, and then enter the information described in the following table.

Table 153. Network connection options

Option	Description
IP address	The IP address for the restored machine.
Subnet mask	The subnet mask for the restored machine.
Default gateway	Specify the default gateway for the restored machine.
DNS server	Specify the domain name server for the restored machine.

- If you have an UltraVNC account and would like to use it to complete the BMR, select **Add UltraVNC**, and then enter the information described in the following table.

Table 154. UltraVNC connection credentials

Option	Description
Password	The password for your UltraVNC account.
Port	The port you want to use to connect to the BMR target. The default port is 5900.

8. Click **Next**.
9.
   - To establish a network connection for the restored machine, select **Use the following IP address** as described in the following table.
   - To define UltraVNC information, select **Add UltraVNC** as described in the following table.

     Use this option if you require remote access to the recovery console. You cannot log on using Microsoft Terminal Services while using the boot CD.

Table 155. UltraVNC connection

Option	Description
Password	Specify a password for this UltraVNC connection.
Port	Specify a port for this UltraVNC connection. The default port is 5900.

10. When you are satisfied with your selections on the Boot CD page, click **Next**.
11. Optionally, on the Driver Injection page, if you plan to restore to dissimilar hardware, inject the appropriate storage controller and other drivers for your target system by completing the following steps:
    a. Download the drivers from the server manufacturer’s Web site and unpack them.
    b. Compress each driver into a .zip file using an appropriate compression utility (for example, WinZip).
    c. On the Driver Injection page of the Restore Machine Wizard, click **Add an Archive of Drivers**.
    d. Navigate through the filing system to locate the compressed driver file, select the file, and then click **Open**.
    e. Repeat Step c and Step d, as appropriate, until you inject all necessary drivers.

    For more information about injecting drivers, see Understanding driver injection in a boot CD.

    NOTE: Not all versions of Windows are compatible with automatic driver injection. If your operating system is not compatible, manually save drivers to C:\Program Files\AppRecovery\Core\BootCdKit\Drivers\.

    Rapid Recovery creates the boot CD ISO image.
12. Click **Next**.

13. Start the BMR target machine, and then complete one of the following options:
    - If you can start the target machine from the boot CD ISO image, do so now.
    - If you cannot start the target machine, copy the ISO image to physical media (a CD or DVD), load the disc in the target machine, configure the machine to load from the boot CD, and restart from the boot CD.

      NOTE: You may need to change the BIOS settings of the target machine to ensure that the volume that loads first is the boot CD.

    The target machine, when started from the boot CD, displays the Universal Recovery Console (URC) interface. This environment is used to restore the system drive or selected volumes directly from the Rapid Recovery Core. Note the IP address and authentication key credentials in the URC, which refresh each time you start from the boot CD.
14. On the Connection page of the Restore Machine Wizard on the Core Console, enter authentication information from the URC instance of the machine you want to restore as follows:

    Table 156. Authentication options

Option	Description
IP Address	The IP address provided in the URC on the target machine.
Authentication Key	The authentication key provided in the URC on the target machine.

15. Click **Next**.
16. On the Disk Mapping page, if you want to map volumes manually, proceed to Step 10. If you want to map volumes automatically, complete the following steps:
    a. From the Volume mapping drop-down menu, select **Automatic**.
    b. From the list of volumes, ensure that the volumes you want to restore are selected. All volumes are selected by default.

       If you do not want to restore a listed volume, clear the option.

       NOTE: At least one volume must be selected to perform the restore.
    c. On the right side, select the destination disk for the restore.
    d. Click **Next**.
    e. In the Disk Mapping Preview page, review the parameters of the restore actions you selected.
    f. Go to Step 18.
17. To map volumes manually, on the Disk Mapping page, complete the following steps:
    a. From the Volume mapping drop-down menu, select **Manual**.
    b. In the Destination column, select a destination volume you want to restore. Optionally, if you do not wish to restore a listed volume, clear the option.

       NOTE: At least one volume must be selected to perform the restore.
18. Click **Finish**.

    CAUTION: All existing partitions and data on the target drive will be permanently removed and replaced with the contents of the selected recovery point, including the operating system and all data.
19. If the volumes you want to restore contain SQL or Microsoft Exchange databases, and if you are performing a Live Restore, then on the Dismount Databases page, you are prompted to dismount them. Optionally, if you want to remount these databases after the restore is complete, select **Automatically remount all databases after the recovery point is restored**.
20. Click **Restore**.

21. In the status message, click **OK** to confirm that the restore process has started.

    The restore begins. You can monitor the progress on the Events page. For more information, see Viewing events using tasks, alerts, and journal.

Understanding boot CD creation for Windows machines

A bare metal restore for Windows requires a boot image referred to as the boot CD, which you create by defining parameters in the Rapid Recovery Core Console. This image is tailored to your specific needs. You will use the image to start the destination Windows machine. Based on the specifics of your environment you may need to transfer this image to physical media such as a CD or DVD. You must then virtually or physically load the boot image, and start the Windows server from the boot image.

The first step when performing a bare metal restore (BMR) for a Windows machine is to create the boot CD file in the Rapid Recovery Core Console. This is a bootable ISO image which contains the Rapid Recovery Universal Recovery Console (URC) interface, an environment that is used to restore the system drive or the entire server directly from the Rapid Recovery Core.

The boot CD ISO image that you create is tailored to the machine being restored; therefore, it must contain the correct network and mass storage drivers. If you anticipate that you will be restoring to different hardware from the machine on which the recovery point originated, then you must include storage controller and other drivers in the boot CD. For information about injecting those drivers in the boot CD, see Understanding driver injection in a boot CD.

Understanding driver injection in a boot CD

The boot CD image requires storage drivers to recognize the drives of the server, and network adapter drivers in order to communicate with the Rapid Recovery Core over the network.

A generic set of Windows 8.1 x64 storage controller and network adapter drivers are included automatically when you generate a boot CD for Windows. This satisfies the requirements of newer Dell systems. Systems from other manufacturers or older Dell systems may require you to inject storage controller or network adapter drivers when creating the boot CD. If you discover the boot CD you created does not contain the drivers necessary to complete the restore, you can also load drivers on to the target machine using the URC. Fore more information, see Loading drivers using the Universal Recovery Console.

When creating the boot CD, driver injection is used to facilitate the operability between the recovery console, network adapter, and storage on the target server.

Data restored from the recovery point includes drivers for the hardware previously in place. If performing a bare metal restore to dissimilar hardware, then you must also inject storage controller drivers into the operating system being restored using the URC after the data has been restored to the drive, This allows the restored operating system to boot using the new set of hardware. After the OS is booted after the restore, you can then download and install any additional drivers needed by the OS to interact with its new hardware.

Creating a boot CD ISO image

A boot CD is the term Rapid Recovery uses to refer to the portable storage location of the ISO image reserved for performing a bare metal restore (BMR). The image includes the Rapid Recovery Universal Recovery Console (URC).

To perform a BMR on a machine, you must start the machine from the boot CD, which launches the URC. The URC is what makes it possible to connect the BMR target to the location of the recovery point you want to use to complete the restore.

1. From the Rapid Recovery Core Console where the server you need to restore is protected, in the icon bar, click the More menu, and then click **Boot CDs**.
2. On the Boot CDs page, click **Create Boot CD**.

   The Create Boot CD dialog box displays.
3. In the Create Boot CD dialog box, in the **Output path** text box, enter the location where you want to store the boot CD ISO image.

   NOTE: The file extension must be .iso. When specifying the path, use only alphanumeric characters, the hyphen, the backslash (only as a path delimiter), and the period (only to separate host names and domains). The letters a to z are not case sensitive. Do not use spaces. No other symbols or punctuation characters are permitted.
4. Under Connection Options, do one of the following:
   - To obtain the IP address dynamically using Dynamic Host Configuration Protocol (DHCP), select **Obtain IP address automatically**.
   - To specify a static IP address for the URC, select **Use the following IP address**, and then enter the following information:
     - IP address
     - Subnet mask
     - Default gateway
     - DNS server

   NOTE: You must specify all four of these fields.
5. If you require remote access to the recovery console, and you have UltraVNC installed, under UltraVNC Options, complete the following steps:

   NOTE: UltraVNC lets you manage the URC remotely while it is in use. You cannot log on using Microsoft Terminal Services while using the boot CD.

   a. Select **Add UltraVNC**.
   b. Enter your **UltraVNC password**.
   c. Enter the **UltraVNC port**. The default port is 5900.

   NOTE: The UltraVNC Options are only available if you already have UltraVNC installed. To make these options available, go to http://www.uvnc.com/downloads/ultravnc/ to download UltraVNC version 1.0.9.1 or later for x64 architecture. Install it and save the winvnc.exe file to C:\Program Files\AppRecovery\Core\BootCdKit\UltraVnc_x64\.
6. If you plan to restore to dissimilar hardware, inject the appropriate storage controller and other drivers for your target system by completing the following steps:

   NOTE: Not all versions of Windows are compatible with automatic driver injection. If your operating system is not compatible, manually save drivers to C:\Program Files\AppRecovery\Core\BootCdKit\Drivers\.

   a. Download the drivers from the server manufacturer’s Web site and unpack them.
   b. Compress each driver into a .zip file using an appropriate compression utility (for example, WinZip).
   c. In the Create Boot CD dialog box, in the Drivers pane, click **Add an Archive of Drivers**.
   d. Navigate through the filing system to locate the compressed driver file, select the file, and then click **Open**.

The driver file appears in the Drivers pane of the Create Boot CD dialog box.

e. Repeat Step c and Step d, as appropriate, until you add all necessary drivers.

f. In the Drivers pane, select the drivers that you want to inject.

For more information about injecting drivers, see Understanding driver injection in a boot CD.

7. Click **Create Boot CD**.

   Rapid Recovery creates the boot CD and saves it with the file name you provided.

8. To monitor the progress of this task, go to the icon bar and click the Events icon.

   For more information about monitoring Rapid Recovery events, see Viewing events using tasks, alerts, and journal.

   When the ISO image creation is complete, a record of the image appears on the Boot CDs page, which you can access from the More menu in the icon bar.

To access the ISO image, you can navigate to the output path you specified or click the link on the Boot CDs page to save the image to a location from which you can then load it onto the new system, such as a network drive.

Transferring the boot CD ISO image to media

When you create the boot CD file, it is stored as an ISO image in the path you specified. You must be able to mount this image as a drive on the server on which you are performing a bare metal restore.

You can burn the boot CD ISO image onto compact disc (CD) or digital video disk (DVD) media accessible at system startup.

When you start the machine from the boot CD, the Universal Recovery Console launches automatically.

If performing a BMR on a virtual machine, this step is not required. Simply load the ISO image in a drive and edit settings for that VM to start from that drive.

Loading the boot CD and starting the target machine

After you create the boot CD image, you need to boot the target server with the newly created boot CD.

To connect to the Rapid Recovery Core Console or to use Chromium for downloading additional drivers, you must first load an Ethernet controller and network adapter. For more information, see Loading drivers using the Universal Recovery Console.

NOTE: If you created the boot CD using DHCP, you must capture the IP address and password.

1. On the new server, load the boot CD image from the appropriate location, and then start the server from the boot CD image to load the Rapid Recovery Agent software and Win PE 5.1.

   The target machine displays a blue Dell screen with three icon buttons at the top of the screen.

2. To open the Rapid Recovery Universal Recovery Console (URC) user interface, click the Dell icon at the top of the screen.

   The IP address and password for the machine appear under Authentication.

   NOTE: A new temporary password is generated each time the machine is started with the boot CD. Write down the IP address displayed in the Network Adapters Settings pane and the authentication password displayed in the Authentication pane. You will need this information later during the data recovery process to log back on to the console.

   NOTE: If there is no IP address provided, load the Ethernet controller and network adapter.

3. If you want to change the IP address, select it and click **Change**.

   NOTE: If you specified an IP address in the Create Boot CD dialog box, the Universal Recovery Console uses it and displays it in the Network Adapter settings screen.

The machine is ready for you to connect to the Core, select a recovery point, and continue the bare metal restore process.

Using the Universal Recovery Console for a BMR

Before launching a bare metal restore (BMR) for a Windows machine, the following conditions are required:

- To restore a recovery point saved on the Core, you must have the appropriate hardware in place. For more information, see Prerequisites for performing a bare metal restore for a Windows machine.
- The BMR destination Windows machine must be started using the boot CD image. For more information, see Understanding boot CD creation for Windows machines.

A BMR initiates a machine using a recovery point you select. The recovery point includes drivers from the previous hardware. If restoring to dissimilar hardware, then you must inject storage controller drivers into the operating system being restored using the URC after the data has been restored to the drive, This lets the restored operating system start using the new set of hardware. After the OS starts, you can then download and install any additional drivers the OS needs to interact with the new hardware.

To launch a BMR from the Rapid Recovery Core Console, perform the following tasks.

- Selecting a recovery point and initiating a BMR
- About disk mapping for a bare metal restore
- Loading drivers using the Universal Recovery Console

This process is a step in Performing a bare metal restore for Windows machines.

About the Universal Recovery Console tools

The Universal Recovery Console (URC) includes access to tools that may assist you with completing a bare metal restore (BMR).

You can find the following tools by clicking the center icon at the top of the Dell splash screen on a BMR target that is booted into the URC:

- **Far Manager.** This tool is similar to Windows Explorer. It provides a way to browse for files on the server until you complete the BMR and install an operating system with its own browsing function, such as Windows Explorer.
- **Chromium.** This browser is the open-source basis for Google Chrome™ and lets you browse the Internet on a server that has a network controller loaded through the URC.
- **PuTTY.** This tool is an open-source terminal emulator. In the context of a Rapid Recovery BMR, it lets you connect to a NAS storage device that does not include a user interface. This capability may be necessary if you want to restore from an archive and the archive is on a NAS.
- **Notepad.** As in a Windows operating system, this tool lets you type unformatted notes and view log files.
- **Task Manager.** As in a Windows operating system, this tool lets you manage processes and monitor the performance of the server while the restore is in progress.
- **Registry Editor.** As in a Windows operating system, this tool lets you change the system registry of the BMR target.

- **Command Prompt.** This tool lets you perform commands on the BMR target outside of the URC until you install a user interface.

Loading drivers using the Universal Recovery Console

This feature lets you add any drivers that were not included in the ISO image but are required for a successful bare metal restore.

This task is a step in Performing a bare metal restore for Windows machines. It is part of the process for Using the Universal Recovery Console for a BMR.

When creating a boot CD, you can add necessary drivers to the ISO image. After you boot into the target machine, you also can load storage or network drivers from within the Universal Recovery Console (URC).

If you are restoring to dissimilar hardware, you must inject storage controller, RAID, AHCI, chipset, and other drivers if they are not already on the boot CD. These drivers make it possible for the operating system to operate all devices on your target server successfully after you restart the system following the restore process.

Complete the steps in one of the following procedures to load drivers using the URC:

- Loading drivers in the Universal Recovery Console using portable media
- Loading a driver in the URC using Chromium

Loading drivers in the Universal Recovery Console using portable media

The following tasks are prerequisites for this procedure.

- Creating a boot CD ISO image
- Transferring the boot CD ISO image to media
- Loading the boot CD and starting the target machine

Complete the following procedure to use a portable media device to load drivers in the Universal Recovery Console (URC).

1. On an internet-connected machine, download the drivers from the manufacturer's website for the server and unpack them.
2. Compress each driver into a .zip file using an appropriate compression utility (for example, WinZip).
3. Copy and save the .zip file of drivers onto a portable media device, such as a USB drive.
4. Remove the media from the connected machine and insert it into the boot target server.
5. On the target server, load the boot CD and start the machine.

   The Dell splash screen appears.
6. To start the URC, click the **Dell icon**.

   The URC opens to the Boot CD driver manager tab.
7. Expand the **Other devices** list.

   This list shows the drivers that are necessary for the hardware but are not included in the boot CD.
8. Right-click a device from the list, and then click **Load Driver**.
9. In the Select driver load mode window, select one of the following options:
   - Load single driver package (driver will be loaded without verification for device support)
   - Scan folder for driver packets (drivers for selected device will be searched in selected folder)
10. Expand the drive for the portable media device, select the driver (with file extension .inf), and then click **OK**.

The driver loads to the current operating system.

11. In the Info window, click **OK** to acknowledge that the driver successfully loaded.
12. Repeat this procedure as necessary for each driver you want to load.

Loading a driver in the URC using Chromium

The following tasks are prerequisites for this procedure.

- Creating a boot CD ISO image
- Transferring the boot CD ISO image to media
- Loading the boot CD and starting the target machine

Complete the following procedure to use the Chromium browser that comes installed on the boot CD to load drivers while in the URC.

1. On the target server, load the boot CD and start the machine.

   The Dell splash screen appears.
2. To start the URC, click the **Dell icon**.

   The URC opens to the Boot CD driver manager tab.
3. On the BMR target, click the tools (center icon) at the top of the screen, and then click **Chromium**.
4. In the Chromium browser, navigate to a website where you can download the necessary driver.
5. Download the driver or drivers to your location choice, such as a local folder or a network file share.
6. Expand the **Other devices** list.

   This list shows the drivers that are necessary for the hardware but are not included in the boot CD.
7. Right-click a device from the list, and then click **Load Driver**.
8. In the Select driver load mode window, select one of the following options:
   - Load single driver package (driver is loaded without verification for device support)
   - Scan folder for driver packets (drivers for selected device are searched in selected folder)
9. Navigate to the location where you saved the driver, select the driver, and then click **OK**.

   The driver loads to the current operating system.
10. In the Info window, click **OK** to acknowledge that the driver successfully loaded.
11. Repeat this procedure as necessary for each driver you want to load.

Selecting a recovery point and initiating a BMR

After the Universal Recovery Console (URC) is accessible on the bare metal restore (BMR) target machine, you must select the recovery point that you want to restore.

Navigate to the Core Console to select which recovery point you want to load, and then designate the recovery console as the destination for the restored data.

NOTE: This step is required to perform BMR on all Windows machines and optional to perform BMR on Linux machines.

This task is a step in Performing a bare metal restore for Windows machines. It is part of the process for Using the Universal Recovery Console for a BMR.

If performing a BMR for a Linux machine from the Core Console, then this task is also a step in Performing a bare metal restore for Linux machines It is part of the process for Launching a bare metal restore for a Linux machine using the command line.

1. In the Rapid Recovery Core Console, from the list of protected machines, click the name of the protected machine you want to restore.

   The Summary page for the selected machine appears.
2. Click **Recovery Points**.
3. Next to the recovery point you want to use for the BMR, click the drop-down menu, and then click **Restore**.

   The Restore Machine Wizard appears.
4. Select **Recover to any target machine using a boot CD**.
5. Select **I already have a boot CD running on the target machine**.

   The authentication text boxes appear.
6. Enter the information about the machine you want to restore as described in the following table.

   Table 157. Target machine information

Text Box	Description
IP Address	The IP address of the machine to which you want to restore. This is identical to the IP address displayed in the URC.
Authentication Key	The specific password to connect to the selected server. This is identical to the Authentication Key displayed in the URC.
7. Click **Next**.

   If the connection information you entered matches the URC, and if the Core and the target server can identify each other properly on the network, then the volumes for the selected recovery point are loaded, and the Disk Mapping page appears. In this case, your next step is to map volumes.
8. Proceed to About disk mapping for a bare metal restore to learn about your disk-mapping options.

About disk mapping for a bare metal restore

After you connect to the Universal Recovery Console, you need to map volumes between those listed in the recovery point and the volumes existing on the target hardware.

Rapid Recovery attempts to automatically map volumes. If you accept the default mapping, then the disk on the destination machine is cleaned and re-partitioned and any previously existing data is deleted. The alignment is performed in the order the volumes are listed in the recovery point, and the volumes are allocated to the disks appropriately according to size, and so on. Assuming there is enough space on the target drive, no partitioning is required when using automatic disk alignment. A disk can be used by multiple volumes. If you manually map the drives, note that you cannot use the same disk twice.

For manual mapping, you must have the new machine correctly formatted already before restoring it. The destination machine must have a separate partition for each volume in the recovery point, including the system reserved volume. For more information, see Using the Universal Recovery Console for a BMR.

Complete the procedure for one of the following disk-mapping options:

- Automatically mapping disks for a BMR
- Manually mapping disks for a BMR

CAUTION: While Rapid Recovery supports FAT32 and ReFS partitions, at present, only full restore and BMR are supported as a driver limitation exists with ReFS, so restore is implemented in user mode, VM export, and so on. If a Core is protecting at least one agent volume that contains the ReFS file system, it should be installed on Windows 8, Windows 8.1, Windows 10, Windows Server 2012, or Windows Server 2012 R2 machines, which provide native support of ReFS. Otherwise, functionality is limited and operations that involve such things as mounting a volume image do not work. The Rapid Recovery Core Console presents applicable error messages in these occurrences.

CAUTION: Bare metal restore of Storage Spaces disks configuration (a feature of Windows 8.1) is not supported. For details, see the *Dell Data Protection | Rapid Recovery Installation and Upgrade Guide.*

This task is a step in Performing a bare metal restore for Windows machines. It is part of the process for Using the Universal Recovery Console for a BMR.

If performing a BMR for a Linux machine from the Core Console, then this task is also a step in Performing a bare metal restore for Linux machines. It is part of the process for Launching a bare metal restore for Linux.

Automatically mapping disks for a BMR

This procedure lets you automatically map disks during a bare metal restore (BMR) using the Restore Machine Wizard.

Complete the steps in the following procedure to automatically select the volumes you want to recover and where to restore them.

1. On the Disk Mapping page of the Restore Machine Wizard, next to Volume mapping, select **Automatic** from the drop-down menu.
2. In the left table, verify that the appropriate volumes are listed and are selected.

   NOTE: Typically for a BMR, you should restore, at minimum, the system reserved volume and the system volume (usually, but not always, the C:\ volume). You must select at least one volume to perform a BMR.
3. In the right table, select the disk or disks to which you want to map volumes on the target machine.
4. Click **Next**.
5. On the Disk Mapping Preview page, review the mapping of the recovery point volumes and the destination volume for the restore.
6. To begin the restore, click **Finish**.

   CAUTION: If you select Begin Restore, all existing partitions and data on the target drive are permanently removed and replaced with the contents of the selected recovery point, including the operating system and all data.

Manually mapping disks for a BMR

This procedure describes how to designate which disks should be stored in which locations on the restored machine.

To manually map disks, you must first use DiskPart on the Command Line on the BMR target machine to create and format target volumes. For more information, see DiskPart Command-Line Options (Standard 7 SP1) on the Microsoft Developer Network.

Complete the steps in the following procedure to manually select the volumes you want to recover and where to restore them.

1. On the Disk Mapping page of the Restore Machine Wizard, next to Volume mapping, select **Manual** from the drop-down menu.

   NOTE: If no volumes exist on the drive of the machine on which you are performing a bare metal restore (BMR), you cannot see this option or manually map volumes.
2. In the Volume Mapping area, under Source Volume, verify that the source volume is selected, and that the appropriate volumes are listed beneath it and are selected.
3. Under Destination, from the drop-down menu, select the appropriate destination that is the target volume to perform the BMR of the selected recovery point, and then click **Restore**.
4. In the confirmation dialog box, review the mapping of the source of the recovery point and the destination volume for the restore.
5. To begin the restore, click **Begin Restore**.

   CAUTION: If you select Begin Restore, all existing partitions and data on the target drive will be removed permanently, and replaced with the contents of the selected recovery point, including the operating system and all data.

Performing a BMR from an archive

Rapid Recovery lets you restore a machine from bare metal using an archived recovery point.

The following tasks are prerequisites for this procedure.

- Creating a boot CD ISO image
- Loading the boot CD and starting the target machine

From the Universal Recovery Console (URC), you can access the Rapid Recovery Core and retrieve a recovery point for a restore. You can also opt to restore your bare metal machine from a recovery point stored in an archive. The URC lets you reach this archive whether it is on a local drive, a network share, or a cloud account.

1. In the URC, click the **Restore from Archive** tab.
2. In the **Location Type** drop-down list, select the location of your archive. You can choose from the following options.
   - Local
   - Network
   - Cloud
3. Enter the credentials described in the following table according to your location type selection.

Table 158. Location type credentials options

Location Type	Option	Description
Local	Local path	The current location of the archive.
Network	Network path	The current location of the archive.
	User	The user name for network share access.
	Password	The password for network share access.

Location Type	Option	Description
Cloud	Cloud Type	The provider of your cloud storage location. Select from the following options: • Microsoft Azure • Amazon™ S3 • Powered by OpenStack • Rackspace® Cloud Files

4. If you selected a cloud type, complete the credentials that pertain to your cloud provider.
   - For Microsoft Azure, complete the following steps:
     1. Enter the following credentials:
        - Storage Account Name
        - Access Key
     2. For the Container name, from the drop-down list, select a container.
     3. For the Cloud path, from the drop-down list, select the path to the archive.
   - For Amazon™ S3, complete the following steps
     1. Enter the following credentials:
        - Access key
        - Secret key
     2. For the Container name, from the drop-down list, select a container.
     3. For the Cloud path, from the drop-down list, select the path to the archive.
   - For Powered by OpenStack or Rackspace Cloud Files accounts, complete the following steps:
     1. Enter the following information:
        - Region
        - User
     2. Select one of the following options:
        - Password
        - API Key
     3. In the text box, enter the information based on your selection in Step c.
     4. Enter the following information:
        - Tenant ID
        - Authentication URL
        - Container name
        - Cloud path
5. Click **Next**.
6. On the **Machines** page, select the machine you want to restore, and then click **Next**.
7. On the **Recovery Points** page, select the recovery point you want to use to restore the machine, and then click **Next**.
8. On the **Mapping** page, select one of the following options, and then complete the corresponding steps:

- From the **Volume Mapping** drop-down list, select **Automatic**.

  1. In the left table, verify that the appropriate volumes are listed and are selected.

     NOTE: Typically for a BMR, you should restore, at minimum, the system reserved volume and the system volume (usually, but not always, the C:\ volume). You must select at least one volume to perform a BMR.

  2. In the right table, select the disk or disks to which you want to map volumes on the target machine.

- From the **Volume Mapping** drop-down, select **Manual**.

  NOTE: To manually map disks, you must first use DiskPart on the Command Line to create and format target volumes. For more information, see DiskPart Command-Line Options (Standard 7 SP1) on the Microsoft Developer Network.

  NOTE: If no volumes exist on the drive of the machine on which you are performing a bare metal restore (BMR), you cannot see this option or manually map volumes.

  – Under **Destination Volumes**, from the drop-down menu, select the appropriate target volume for each volume in the recovery point.

9. In the **mount maps path** text box, enter a destination for the temporary storage of mapping files.

   The default location is X:\ProgramData\AppRecovery\IndexEntriesMaps.

   NOTE: To ensure that your destination has sufficient free space, divide the total mount volume capacity by 1,024. For example, using the formula `(Mount volume total capacity) / 1024 = Free space`, then `1 TB / 1024 = 1 GB`.

10. Click **Restore**.

    The URC maps the volumes to the new disk or disks.

11. Click **Restore**.

    The URC restores the data to the target machine. You can view the progress on the **Restore progress** tab.

12. After the restore is complete, remove the boot CD.
13. To boot the BMR target machine into Windows, restart the machine.

Loading drivers to the operating system

This procedure describes how to load drivers to the operating system on a bare metal restore (BMR) target.

To inject drivers to the operating system, you have already completed the following tasks:

- Created a boot CD using the Boot CD Builder in the Rapid Recovery Core Console. For more information, see Creating a boot CD ISO image.
- Loaded the boot CD in the BMR target. For more information, see Loading the boot CD and starting the target machine.
- Loaded any necessary drivers or controllers for storage and networking. For more information, see Loading drivers using the Universal Recovery Console.
- Performed a restore using either the Restore Machine Wizard in the Rapid Recovery Core Console or an archive from the Universal Recovery Console (URC). For more information, see Performing a bare metal restore using the Restore Machine Wizard and Performing a BMR from an archive.

After you perform a Restore, the process is not complete until you inject the drivers to the operating system on the bare metal restore (BMR) target. This task is in addition to loading drivers in the URC.

1. After you click Restore in the BMR procedure of your choice (see prerequisites), click the **Existing Windows driver management** tab.
2. From the drop-down list, select an operating system.

   The URC searches for available drivers.
3. To load additional drivers, click **Force Load**.
4. Navigate through the filing system to locate the compressed driver file, and then select the file.
5. Click **OK**.

   The URC loads the driver into the operating system you selected.
6. Repeat Step 3 through Step 5 for each additional driver you need to load.
7. Restart the BMR target machine.

   The BMR is complete. If you experience an issue when you restart, see Repairing boot problems.

Performing a bare metal restore for Linux machines

In Rapid Recovery you can perform a Bare Metal Restore (BMR) for a Linux machine, including a restore of the system volume. When you restore a Linux machine, you will roll back to the boot volume recovery point. BMR functionality is supported using the command line `local_mount` utility and from within the Core Console UI.

⚠ **CAUTION: Before you begin the BMR process, be sure that any Linux machine you want to restore does not include an ext2 boot partition. When BMR is performed on a machine with ext2 partition type, the process typically results in a machine that does not start. To perform a BMR in this case, you would have needed to convert any ext2 partitions to ext3, ext4, or XFS before you began protecting and backing up the machine.**

⚠ **CAUTION: When you boot a restored Linux machine for the first time after a BMR, Rapid Recovery takes a base image of the restored machine. Depending on the amount of data on the machine, this process takes more time than taking an incremental snapshot. For more information about base images and incremental snapshots, see Understanding protection schedules.**

To perform a bare metal restore for Linux machines, perform the following tasks.

- Manage a Linux boot image. This Linux Live DVD boot ISO image is used to start up the destination drive, from which you can access the Universal Recovery Console to communicate with backups on the Core. See Managing a Linux boot image.
  - To obtain the boot image for BMR, you must first determine which image you need and then download it from the License Portal. See About the boot ISO image for Linux followed by Downloading a boot ISO image for Linux.
  - If you require physical media to start up the destination Linux machine, you will need to transfer the ISO image to media. See Saving the Live DVD ISO image to media.
  - In all cases, you will need to load the boot image into the destination server and start the server from the boot image. See Loading the Live DVD and starting the target machine.
  - After you load the media, you must connect the Linux machine to the Rapid Recovery Core. See Connecting to the BMR target from the Rapid Recovery Core.
- Manage Partitions. You may need to create or mount partitions before performing a BMR on a Linux machine. See Managing Linux partitions.
  - The Linux system on which you are performing a BMR must have the same partitions as the source volumes in the recovery point. You may need to create additional partitions on the target system, if required. See Creating partitions on the destination drive.

    - If you are performing a manual BMR, you must first mount partitions. See Mounting partitions from the command line. Steps to mount partitions are included in the process to perform a BMR from the command line. See Launching a bare metal restore for a Linux machine using the command line.

      If you are using auto-partitioning for BMR within the Core Console, you do not need to mount partitions. Rapid Recovery will restore the same partitions as those included in the recovery point(s) being restored.
- Launch a Bare Metal Restore for Linux. Once the destination machine is started from the Live DVD boot image, you can launch the BMR. The tasks required depend on whether you will perform this from the Rapid Recovery user interface or from the command line using the local_mount utility. See Launching a bare metal restore for Linux.
    - If using the Core Console, you will need to initiate a restore from a recovery point on the Core. See Selecting a recovery point and initiating a BMR.
    - If using the Core Console, you will need to map the volumes from the UI. See About disk mapping for a bare metal restore.
    - Optionally, if restoring from the command line, you can use the screen utility to enhance your ability to scroll and see commands in the terminal console. This utility opens by default. If you close it, you can start it again. For more information, see Starting the Screen utility.
    - If using local_mount, all tasks will be performed at the command line. For more information, see Launching a bare metal restore for a Linux machine using the command line.
- Verifying a Bare Metal Restore. After starting the bare metal restore, you can verify and monitor your progress. See Verifying the bare metal restore from the command line.
    - You can monitor the progress of your restore. See Viewing the recovery progress.
    - Once completed, you can start the restored server. See Starting a restored target server.
    - Troubleshoot the BMR process. See Troubleshooting connections to the Universal Recovery Console and Repairing boot problems.

Prerequisites for performing a bare metal restore for a Linux machine

Before you can begin the process of performing a bare metal restore for a Linux machine, you must ensure that the following conditions and criteria exist:

- Backups of the machine you want to restore. You must have a functioning Rapid Recovery Core containing recovery points of the protected server you want to restore.
- Hardware to restore (new or old, similar or dissimilar). The target machine must meet the installation requirements for an agent; for details, see the Rapid Recovery Installation and Upgrade Guide.
- Live DVD boot image. Obtain the Linux Live DVD ISO image, which includes a bootable version of Linux. Download it from the Dell Data Protection | Rapid Recovery License Portal at https://licenseportal.com. If you have any issues downloading the Live DVD, contact Dell Rapid Recovery support.
- Image media and software. If using physical media, you must have a blank CD or DVD and disk burning software, or software to create an ISO image.
- Compatible storage drivers and network adapter drivers. If restoring to dissimilar hardware, then you must have compatible storage drivers and network adapter drivers for the target machine, including RAID, AHCI, and chipset drivers for the target operating system, as appropriate.
- Storage space and partitions, as appropriate. Ensure that there is enough space on the hard drive to create destination partitions on the target machine to contain the source volumes. Any destination partition should be at least as large as the original source partition.
- Restore path. Identify the path for the restore, which is the path for the device file descriptor. To identify the path for the device file descriptor, use the `fdisk` command from a terminal window.

Managing a Linux boot image

A bare metal restore for Linux requires a Live DVD boot image, which you download from the Dell Data Protection | Rapid Recovery License Portal. You will use this image to start the destination Linux machine.

Based on the specifics of your environment you may need to transfer this image to physical media such as a CD or DVD. You must then virtually or physically load the boot image, and start the Linux server from the boot image.

NOTE: The Live DVD was previously known as the Live CD.

Managing a Linux boot image is a step in Performing a bare metal restore for Linux machines.

You can perform the following tasks:

About the boot ISO image for Linux

The first step when performing a bare metal restore (BMR) for a Linux machine is to download the Linux Live DVD ISO image from the Dell Data Protection | Rapid Recovery License Portal. The Live DVD functions with all Linux file systems supported by Rapid Recovery, and includes a bootable version of Linux, a screen utility, and the Rapid Recovery Universal Recovery Console (URC) interface. The Rapid Recovery Universal Recovery Console is an environment that is used to restore the system drive or the entire server directly from the Rapid Recovery Core.

NOTE: The International Organization for Standardization (ISO) is an international body of representatives from various national organizations that sets file system standards. The ISO 9660 is a file system standard that is used for optical disk media for the exchange of data and supports various operating systems. An ISO image is the archive file or disk image, which contains data for every sector of the disk as well as the disk file system.

Downloading a boot ISO image for Linux

You must download the Live DVD ISO image that matches your version of Rapid Recovery. The current version of Live DVD is available from the Dell Data Protection | Rapid Recovery License Portal at https://licenseportal.com. If you need a different version, contact Dell Rapid Recovery support

NOTE: For more information about the Dell Data Protection | Rapid Recovery License Portal, see the Dell Data Protection | Rapid Recovery License Portal License Portal User Guide.

This task is a step in Performing a bare metal restore for Linux machines. It is part of the process for Managing a Linux boot image.

Complete the steps in this procedure to download the Live DVD ISO image.

1. Log into the Dell Data Protection | Rapid Recovery License Portal athttps://licenseportal.com.
2. Access the Downloads area.
3. Scroll down to Linux Based Applications and, from the Linux Live DVD section, click **Download**.
4. Save the Live DVD ISO image. If you are restoring a virtual machine, you can save it to a network location, and set the VM to start up from a CD or DVD drive associated with the ISO image.
5. If restoring from a physical machine, burn the Boot CD ISO image onto a compact disc (CD) or digital video disk (DVD) from which the target machine can be started. For more information, see Saving the Live DVD ISO image to media.

Saving the Live DVD ISO image to media

When you download the Linux Live DVD file, it is stored as an ISO image in the path you specified. You must be able to boot the target Linux machine from the Live DVD image.

This task is a step in Performing a bare metal restore for Linux machines. It is part of the process for Managing a Linux boot image.

Burn the boot CD ISO image onto a compact disc (CD) or digital video disk (DVD) media.

If performing a BMR on a virtual machine, this step is not required. Simply load the ISO image in a drive and edit the machine settings for that VM to start from that drive. You can also use virtual export to restore a Linux VM. For more information, see VM export.

Loading the Live DVD and starting the target machine

After you obtain the Live DVD ISO image, you need to start the Linux machine from the newly created Live DVD.

This task is a step in Performing a bare metal restore for Linux machines. It is part of the process for Managing a Linux boot image.

1. Navigate to the new server and load the Live DVD image from the appropriate location. Specify that the server will start from the Live DVD image.
2. Start the machine.

   A Rapid Recovery splash screen displays and a terminal window opens, displaying the IP address and authentication password for the machine.

   NOTE: A new temporary password is generated each time the machine is started with the Live DVD image.
3. Write down the IP address and the authentication password displayed on the introduction screen. You will need this information later during the data recovery process to log back on to the console.

Connecting to the BMR target from the Rapid Recovery Core

After you start the target Linux machine with the Live DVD, this machine is ready for you to connect to it from the Core and begin the bare metal restore process. You can perform this process using any one of two methods:

- Launching a restore from the Rapid Recovery Core Console. For more information, see Launching a bare metal restore for Linux.
- Launching a Restore from the command Line using the aamount utility. For more information, see Launching a bare metal restore for a Linux machine using the command line.

Managing Linux partitions

When performing a BMR, the destination drive onto which you will be restoring data must have the same partitions as in the recovery point you are restoring. You may need to create partitions to meet this requirement.

You can launch the restore from the command line using the aamount utility, or you can launch the restore from the Rapid Recovery Core Console. If restoring using the user interface, you must first mount the partitions.

Managing Linux partitions is a step in Performing a bare metal restore for Linux machines.

You can perform the following tasks:

Related links

Creating partitions on the destination drive
Formatting partitions on the destination drive
Mounting partitions from the command line

Creating partitions on the destination drive

Often, when performing a BMR, the destination drive is a new volume that may consist of a single partition. The drive on the destination machine must have the same partition table as in the recovery point, including the size of the volumes. If the destination drive does not contain the same partitions, you must create them before performing the bare metal restore. Use the fdisk utility to create partitions on the destination drive equal to the partitions on the source drive.

⚠ **CAUTION: The procedure below is just an example. Customer environments differ. You should change the commands you use to match the specifics for your environment.**

This task is a step in Performing a bare metal restore for Linux machines. It is part of the process for Managing Linux partitions.

1. Optionally, you can use the Screen utility. This utility starts by default, and remains active until you reboot the machine.

   NOTE: If you explicitly close it and want to open it again, see Starting the Screen utility.

2. From the command line, enter the following command and then press **Enter** to change privileges to run as administrator and then list existing disk partitions:

   ```
   sudo fdisk -l
   ```

   A list of all volumes appears.

   This example assumes the volume you want to partition is /dev/sda. If your volume is different (for example, for older drives, you may see /dev/hda), change commands accordingly.

3. To create a new boot partition, enter the following command and then press **Enter**:

   ```
   sudo fdisk /dev/sda
   ```

4. To create a new boot partition, enter the following command and then press **Enter**:

   ```
   n
   ```

5. To create a new primary partition, enter the following command and then press **Enter**:

   ```
   p
   ```

6. To specify partition number, enter the partition number and then press **Enter**. For example, to specify partition 1, type 1 and then press **Enter**.
7. To use the first sector, 2048, press **Enter**.
8. Allocate an appropriate amount to the boot partition by entering the plus sign and the allocation amount and then press **Enter**.

   For example, to allocate 500 M for the boot partition, type the following and then press **Enter**:

   ```
   +512000K
   ```

9. To toggle a bootable flag for the boot partition (to make the partition bootable), type the following command and then press **Enter**:

   ```
   a
   ```

10. To assign a bootable flag for the appropriate partition, type the number of the partition and then press **Enter**. For example, to assign a bootable flag for partition 1, type 1 and then press **Enter**.
11. Continue partitioning your disk as needed.
12. To save all changes in the fdisk utility, type the following command and then press **Enter**:

    ```
    w
    ```

Formatting partitions on the destination drive

After creating partitions on a new volume on the destination drive to perform bare metal restore, if you are not using auto partition, you must format the partitions before they can be mounted. If this situation applies to you, follow this procedure to format partitions in ext3, ext4, or XFS formats.

For all other scenarios, you do not need to format partitions as described in this topic.

This task is a step in Performing a bare metal restore for Linux machines. It is part of the process for Managing Linux partitions.

1. Optionally, you can use the Screen utility. This utility starts by default, and remains active until you reboot the machine.

   NOTE: If you explicitly close it and want to open it again, see Starting the Screen utility.
2. From the command line, enter the following command and then press **Enter** to change privileges to run as administrator and then list existing disk partitions:

   ```
   sudo fdisk -l
   ```

   A list of all volumes appears.

   This example assumes the partition you want to format is /dev/sda1. If your volume is different (for example, for older drives, you may see /dev/hda), change commands accordingly.
3. Select one of the following command based on the format you want to use for the destination partition:
   - To format a partition in ext3 format, enter the following command and then press **Enter**:

     ```
     sudo mkfs.ext3 /dev/sda1
     ```
   - To format a partition in ext4 format, enter the following command and then press **Enter**:

     ```
     sudo mkfs.ext4 /dev/sda1
     ```
   - To format a partition in XFS format, enter the following command and then press **Enter**:

     ```
     sudo mkfs.xfs /dev/sda1
     ```

   The selected partition is formatted accordingly.
4. Optionally, if you need to format other partitions, repeat this procedure.

Mounting partitions from the command line

If performing a BMR using the Rapid Recovery Core Console, you must first mount the appropriate partitions on the destination machine. Perform this from the command line in the Universal Recovery Console.

This task is a step in Performing a bare metal restore for Linux machines. It is part of the process for Managing Linux partitions.

Complete the steps in this procedure to mount partitions on the Linux machine before performing a restore.

1. From the command line, enter the following command and then press **Enter** to change privileges to run as administrator and then list existing disk partitions:

   ```
   sudo fdisk -l
   ```

A list of all volumes appears.

2. Format all partitions you will need to perform the BMR to the mount directory. These must match the volumes that are in the recovery point. For example, if the volume you want to mount is called sda1, and the mount directory is mnt, then type the following command and then press **Enter**:
3. Mount all partitions you will need to perform the BMR to the mount directory. These must match the volumes that are in the recovery point. For example, if the volume you want to mount is called sda1, and the mount directory is mnt, then type the following command and then press **Enter**:

   ```
   mount /dev/sda1 /mnt
   ```
4. Repeat Step 3 as necessary until you have mounted all required volumes.

   After you mount the volumes, you can perform a restore to the destination Linux machine from the Rapid Recovery Core Console. See Launching a bare metal restore for Linux.

Launching a bare metal restore for Linux

Before launching a bare metal restore (BMR) for a Linux machine, the following conditions are required:

- To restore a recovery point saved on the Core, you must have the appropriate hardware in place. For more information, see Prerequisites for performing a bare metal restore for a Linux machine.
- The BMR destination Linux machine must be started using the Live DVD boot image. For more information, see Managing a Linux boot image.
- The number of volumes on the Linux machine to be restored must match the number of volumes in the recovery point. You must also decide whether to restore from the Rapid Recovery Core Console, or from the command line using local_mount. For more information, see Managing Linux partitions.
- If restoring from the Core Console UI, the first step in launching a BMR is to select the appropriate recovery point, then initiate the restore to the hardware by specifying the IP address and temporary password you obtained from the Universal Recovery Console. You must then map the drives and start the restore.

This process is a step in Performing a bare metal restore for Linux machines.

To launch a BMR from the Rapid Recovery Core Console, perform the following tasks.

- Selecting a recovery point and initiating a BMR
- About disk mapping for a bare metal restore

If restoring from the command line using the local_mount utility, then you must first set appropriate privileges, mount volumes, execute local_mount, obtain information about the Core from the list of machines, connect to the core, obtain a list of recovery points, select the recovery point you want to roll back onto bare metal, and launch the restore.

Optionally, you may want to start the Screen utility.

To launch a BMR from the command line, perform the following tasks.

- Starting the Screen utility
- Launching a bare metal restore for a Linux machine using the command line

Starting the Screen utility

Included on the Live DVD is Screen, a utility which is available when you boot from the Live DVD into the Universal Recovery Console. Screen allows users to manage multiple shells simultaneously over a single Secure Shell (SSH) session or console window. This allows you to perform one task in a terminal window (such as verify mounted volumes) and, while that is running, open or switch to another shell instance to perform another task (such as to run the local_mount utility).

The Screen utility also has its own scroll-back buffer, which enables you to scroll the screen to view larger amounts of data, such as a list of recovery points.

NOTE: This utility is provided for convenience; use of the Screen utility is optional.

The screen utility starts on the machine booted with the Live DVD by default. However, if you have closed this application, you must start the Screen utility from the Live DVD using the procedure below.

If the machine was booted from the Live DVD, then in the terminal window, type screen and press **Enter**.

The Screen utility starts.

Launching a bare metal restore for a Linux machine using the command line

Once the Live DVD ISO image is accessible on the machine on which you want to perform a BMR, and the number and size of volumes matches between the target machine and the recovery point you want to restore to bare metal, then you can launch a restore from the command line using the local_mount utility.

NOTE: This component was formerly called `aamount`.

If you want to perform a BMR using the Rapid Recovery Core Console UI, see Selecting a recovery point and initiating a BMR.

NOTE: When performing this procedure, do not attempt to mount recovery points to the /tmp folder, which contains the rapidrecovery-vdisk (formerly aavdisk) files.

This task is a step in Performing a bare metal restore for Linux machines. It is part of the process for Launching a bare metal restore for a Linux machine using the command line.

Complete the steps in this procedure to select a recovery point on the Core to roll back to the physical or virtual BMR target machine.

1. To run the Rapid Recovery local_mount utility as root, type the following command and then press **Enter**:

   ```
   sudo local_mount
   ```

2. To list the protected machines, type the following command and then press **Enter**:

   ```
   lm
   ```

3. When prompted, enter the connection information for the Rapid Recovery Core as described in the following table, pressing Enter after each required command:

   Table 159. Rapid Recovery Core connection information

Text Box	Description	Required
Rapid Recovery Core IP address or hostname	The IP address or hostname of the Rapid Recovery Core.	Yes
Domain	The domain of the Rapid Recovery Core. This is optional.	No
User	The user name for an administrative user on the Core	Yes
Password	The password used to connect the administrative user to the Core.	Yes

A list displays showing the machines protected by the Rapid Recovery Core. It lists the machines found by line item number, the host display name or IP address, and an ID number for the machine.

4. To list the recovery points for the machine that you want to restore, type the list recovery points command using the following syntax and then press **Enter**:

   ```
   lr <machine_line_item_number>
   ```

   NOTE: You can also enter the machine ID number in this command instead of the line item number.

   A list displays the base and incremental recovery points for that machine. This list includes:

   - A line item number
   - Date and time stamp
   - A lettered list of volumes within the recovery point
   - Location of the volume
   - Size of the recovery point
   - An ID number for the volume that includes a sequence number at the end, which identifies the recovery point

5. To select the recovery point for a restore, enter the following command and then press **Enter**:

   ```
   r <recovery_point_ID_number> <path>
   ```

   CAUTION: You must ensure that the system volume is not mounted.

   NOTE: If you started the machine from the Live DVD, then the system volume is not mounted.

   This command rolls back the volume image specified by the ID from the Core to the specified path. The path for the restore is the path for the device file descriptor and is not the directory to which it is mounted.

   NOTE: You can also specify a line number in the command instead of the recovery point ID number to identify the recovery point. In that case, use the agent/machine line number (from the `lm` output), followed by the recovery point line number and volume letter (from the lettered list of volumes within the recovery point), followed by the path. For example:

   ```
   r <machine_line_item_number> <base_image_recovery_point_line_number>
   <volume_letter> <path>
   ```

   For example, type:

   ```
   r 1 24 a /dev/sda1
   ```

   In this command, `<path>` is the file descriptor for the actual volume.

6. When prompted to proceed, enter y for Yes and then press **Enter**.

   After the restore begins, a series of messages will display that notify you of the restore completion status.

   NOTE: If you receive an exception message, the details regarding that exception can be found in the local_mount.log file. The local_mount.log file is located in **/var/log/apprecovery**.

7. Upon a successful restore, exit local_mount by typing `exit` and then press **Enter**.
8. Your next step is to verify the restore. For more information, see Verifying the bare metal restore from the command line.

Restoring volumes for a Linux machine using the command line

In Rapid Recovery, you can restore volumes on your protected Linux machines using the command line `local_mount` utility.

NOTE: This process was previously referred to as *Rollback*. When performing this procedure, do not attempt to mount recovery points to the /tmp folder, which contains the rapidrecovery-vdisk (formerly aavdisk) files. Restoring volumes is also supported for your protected machines within the Rapid Recovery Core Console. See About restoring volumes from a recovery point for more information.

CAUTION: To restore the system or root (/) partition or entire operating system, see Performing a bare metal restore for Linux machines.

1. Run the Rapid Recovery `local_mount` utility as root, for example:

   ```
   sudo local_mount
   ```

2. At the Rapid Recovery mount prompt, enter the following command to list the protected machines.

   ```
   lm
   ```

3. When prompted, enter the IP address or hostname of your Rapid Recovery Core server.
4. Enter the logon credentials, that is, the user name and password, for this server.

   A list displays showing the machines protected by this Rapid Recovery server. It lists the protected machines found by line item number, host/IP address, and an ID number for the machine (for example: 7d658e5f-fa08-4600-95f0-5f486bc1b6a4#de0896fd-571a-4cc5-aeed-264d2c3c72f4#f377e145-dd4d-3ac3-5b15-37ce8f4913ba:2).

5. Enter the following command to list the currently mounted recovery points for the specified machine:

   ```
   lr <machine_line_item_number>
   ```

   NOTE: Note that you can also enter the machine ID number in this command instead of the line item number.

   A list displays that shows the base and incremental recovery points for that machine. This list includes a line item number, date/timestamp, location of volume, size of recovery point, and an ID number for the volume that includes a sequence number at the end (for example, ”293cc667-44b4-48ab-91d8-44bc74252a4f:2”), which identifies the recovery point.

6. Enter the following command to select a recovery point to restore:

   ```
   r <volume_recovery_point_ID_number> <device path>
   ```

   This command restores the volume image specified by the ID from the Core to the specified path. The path for the restore is the path for the device file descriptor, not the directory to which it is mounted.

   - You can also specify a line number in the command instead of the recovery point ID number to identify the recovery point. In that case, you would use the protected machine line number (from the lm output), followed by the recovery point line number and volume letter, followed by the path, such as, r <machine_line_item_number> <recovery_point_line_number> <volume_letter> <path>. In this command, <path> is the file descriptor for the actual volume.

     For example, if the `lm` output lists three protected machines, and you enter the `lr` command for protected machine number `2`, and you want to restore the `23` recovery point volume `b` to the volume that was mounted to the directory `/dev/sda5`, the command would be:

     ```
     r2 23 b /dev/sda5
     ```

NOTE: It is possible to restore to / if needed. If performing a Bare Metal Restore using a Live DVD, it is assumed you want to restore to a different machine. For more information, see Launching a bare metal restore for Linux.

7. When prompted to proceed, enter `y` for Yes.

   Once the restore proceeds, a series of messages will display to notify you of the status.
8. Upon a successful restore, the `local_mount` utility will automatically mount and re-attach the kernel module to the restored volume if the target was previously protected and mounted. If not, you will need to mount the restored volume to the local disk and then should verify that the files are restored (for example, you can use the `sudo mount` command and then the `ls` command.)

Verifying a bare metal restore

After you perform a bare metal restore (BMR), you can verify the progress of the restore. When the action is completed successfully, you can start the restored server. Some troubleshooting steps are included if you encounter difficulties connecting to the Universal Recovery Console to complete the restore, and if you need to repair startup problems with the restored machine.

You can perform the following tasks:

Related links

Viewing the recovery progress
Starting a restored target server
Troubleshooting connections to the Universal Recovery Console
Repairing boot problems

Viewing the recovery progress

Complete the steps in this procedure to view the progress of restoring data from a recovery point (including bare metal restore) initiated from the Rapid Recovery Core Console.

1. After you initiate the process restoring data from a recovery point, while the task is in process, you can view its progress from the Running Tasks drop-down menu on the Core Console.
2. Optionally, you can view detailed information in the Events page. Fore more information about monitoring Rapid Recovery events, see Viewing tasks, alerts, and events.

Starting a restored target server

Complete the steps in this procedure to start the restored target server.

NOTE: Before starting the restored target server, you should verify that the recovery was successful. For more information, see Viewing the recovery progress.

This task is a step in Performing a bare metal restore for Windows machines. It is part of the process for Verifying a bare metal restore.

1. On the target server, verify that the Rapid Recovery Universal Recovery Console is active.
2. Eject the boot CD (or disconnect physical media with the boot CD image) from the restored server.
3. In the Universal Recovery Console, click the Power menu icon at the top of the screen, and then click **Reboot**.
4. Specify to start the operating system normally.
5. Log on to the machine. The system should be restored to the state captured in the recovery point.

Troubleshooting connections to the Universal Recovery Console

The following are troubleshooting steps for connecting to the boot CD image as part of the process for Selecting a recovery point and initiating a BMR.

If an error displays indicating that the Core could not connect to the remote server, then any of several possible causes are likely.

- Verify that the IP address and Current Password displayed in the URC are identical to the information you entered in the Recovery Console Instance dialog box.
- To reach the server on which to restore data, the Core must be able to identify the server on the network. To determine if server identification is possible, you can open a command prompt on the Core and ping the IP address of the target BMR server. You can also open a command prompt on the target server and ping the IP address of the Rapid Recovery Core.
- Verify that the network adapter settings are compatible between Core and target BMR server.

Repairing boot problems

The following tasks are prerequisites for this procedure.

- Creating a boot CD ISO image
- Loading the boot CD and starting the target machine
- Loading drivers using the Universal Recovery Console

Complete the steps in this procedure to repair startup problems. Keep in mind that if you restored to dissimilar hardware, you must have injected storage controller, RAID, AHCI, chipset and other drivers if they are not already on the boot CD. These drivers make it possible for the operating system to operate all devices on your target server successfully. For more information, see Loading drivers using the Universal Recovery Console. Complete the following procedure to repair startup problems on your target server.

1. From the Universal Recovery Console, click the **Existing Windows driver manager** tab.
2. Click **Repair Boot Problems**.

   The startup parameters in the target server boot record are automatically repaired.

Verifying the bare metal restore from the command line

Dell recommends performing the following steps to verify a bare metal restore completed from the command line.

This task is a step in Performing a bare metal restore for Linux machines.

Related links

Performing a file system check on the restored volume
Using the command line to make a restored Linux machine bootable

Performing a file system check on the restored volume

Once you execute a bare metal restore from the command line, you should perform a file system check on the restored volume to ensure the data restored from the recovery point was not corrupted.

This task is a step in Performing a bare metal restore for Linux machines. It is part of the process for Verifying the bare metal restore from the command line.

Perform the task below to perform a file system check on the restored volume.

1. From the command line in the Universal Recovery Console of the Linux machine you have restored, to verify whether the appropriate partitions are mounted, type the following command and then press **Enter**:

   ```
   df
   ```

2. If the restored volume is not mounted, then skip to Step 3. If the restored volume is mounted, unmount it by typing the following command and then pressing Enter:

   ```
   umount <mount point>
   ```

3. Run a file system check on the restored volumes by typing the following command and then press Enter:

   ```
   fsck -f <volume>
   ```

   If the fsck returns clean, the file system is verified.

4. Mount the appropriate volumes once again by typing the following command in format `mount <volume> <folder>`, and then press **Enter**.

   For example, if the volume path is prod/sda1 and the folder you want to mount to is mnt, then type the following and then press **Enter**:

   ```
   mount /dev/sda1 /mnt
   ```

Using the command line to make a restored Linux machine bootable

Once you complete a clean file system check on the restored volume, you must create bootable partitions.

GNU Grand Unified Bootloader (GRUB) is a boot loader that allows administrators to configure which operating system or specific kernel configuration is used to start the system. After a BMR, the configuration file for GRUB must be modified so that the machine uses the appropriate universally unique identifier (UUID) for the root volume. Before this step you must mount the root and boot volumes, and check the UUIDs for each. This ensures that you can boot from the partition.

NOTE: This procedure applies to Linux machines that use GRUB1 or GRUB2. When using this procedure, ensure that the boot partition is healthy and protected.

GRUB or GRUB2 is typically installed with Linux operating systems. You can perform this procedure using the version that comes with your Linux distribution. If a version of GRUB is not installed, you will have to re-install the default version appropriate for your Linux distribution.

CAUTION: When you boot a restored Linux machine for the first time after a BMR, Rapid Recovery takes a base image of the restored machine. Depending on the amount of data on the machine, this process takes more time than taking an incremental snapshot. For more information about base images and incremental snapshots, see Understanding protection schedules.

This task is a step in Performing a bare metal restore for Linux machines. It is part of the process for Verifying the bare metal restore from the command line.

Perform the task below to create bootable partitions using the command line.

1. You must mount the root volume first and then the boot volume. Mount each restored volume by using the following commands:

   a. To mount the root volume, type the following command and then press **Enter**:

      ```
      mount /<restored volume[root]> /mnt
      ```

For example, if /dev/sda2 is the root volume, then type mount /dev/sda2 /mnt and then press **Enter**.

b. To mount the boot volume, type the following command and then press **Enter**:

```
mount /<restored volume[boot]> /mnt/boot
```

For example, if /dev/sda1 is the boot volume, then type mount /dev/sda1 /mnt/boot and then press **Enter**.

NOTE: Some system configurations may include the boot directory as part of the root volume.

2. If the volume size is increasing — that is, if the destination volume on the new Linux machine is larger than the volume was in the recovery point — then you must delete any existing bitmap data files.
3. Obtain the Universally Unique Identifier (UUID) of the new volumes by using the `blkid` command. Type the following and then press **Enter**:

```
blkid [volume]
```

NOTE: You can also use the `ls -l /dev/disk/by-uuid` command.

4. If performing a BMR on a brand new disk on the destination machine, comment out the swap partition in fstab in your root volume.
5. Modifying fstab and mtab paths should occur on the restored volume, not the Live DVD. There is no need to modify paths on the Live DVD. Prepare for the installation of Grand Unified Bootloader (GRUB) by typing the following commands. Following each command, press **Enter**:

```
mount --bind /dev /mnt/dev

mount --bind /proc /mnt/proc

mount --bind /sys /mnt/sys
```

6. Change root directory by typing the following command and then press **Enter**:

```
chroot /mnt /bin/bash
```

7. Obtain the old UUID of the partition or partitions from the mounted recovery points `/etc/fstab` file and compare it to the UUIDs for the root (for Ubuntu and CentOS), boot (for CentOS and RHEL), or data partitions by typing the following command and then press **Enter**:

```
less /mnt/etc/fstab
```

8. Obtain the old UUID of the partition or partitions from the mounted recovery points `/etc/mtab` file and compare it to the UUIDs for the root (for Ubuntu and CentOS), boot (for CentOS and RHEL), and data partitions by typing the following command and then press **Enter**:

```
less /mnt/etc/mtab
```

9. If using SLES 11, install GRUB by typing the following commands, pressing Enter after each:

```
grub-install --recheck /dev/sda

grub-install /dev/sda
```

10. If using Ubuntu, CentOS 6.x, RHEL 6.x, or Oracle Linux 6.x, install GRUB by typing the following command, and then press Enter:

```
grub-install /dev/sda
```

11. If using SLES 12, CentOS 7, RHEL 7, or Oracle 7, install GRUB2 by typing the following command, and then press Enter:

```
grub2-install /dev/sda
```

12. After you complete installation, run one of the following updates:

- For SLES:

```
grub-install.unsupported --recheck /dev/sda
grub-install.unsupported /dev/sda
update-grub
```

NOTE: If the `update-grub` command does not exist on your Linux distribution, omit this option.

- For other distributions:

  ```
  grub-install /dev/sda
  update-grub
  ```

  NOTE: If the `update-grub` command does not exist on your Linux distribution, omit this option.

13. Remove the Live DVD disk from the CD-ROM or DVD drive and restart the Linux machine.

6

Generating and viewing reports

This section provides an overview of reporting available in Rapid Recovery Core, and in the Rapid Recovery Central Management Console.

About Rapid Recovery reports

You can generate reports from the Rapid Recovery Core Console. Some of these reports are also available from the Central Management Console.

The reports available are described in the following table.

Table 160. Rapid Recovery reports

Report type	Description
Job report	Provides a report on the status of successful jobs, failed jobs, and jobs with errors. Failed jobs can be further viewed in a Failure report. This job type can be run from the Core Console and from the Central Management Console. • When run from the Core, this report can specify details for one or more Cores. By default, this set of information includes jobs for all machines—every protected machine, replicated machine and recovery point-only machine in the specified Cores. In the report parameters, you can customize the report. Use the filters to select or exclude some machines. You can also select or exclude jobs that are machine independent, in which case the report shows status for Core jobs only. • When run from the perspective of a protected machine from the Core Console, the resulting report displays the status for jobs only for that protected machine. • When run from the Central Management Console, this report can specify details for any combination of Cores or Core groups configured in the Console. The only configurable parameters are the report type and the date range. For more information on this report type, see Understanding the Job report.
Failure report	Provides information on failed Core jobs for the specified criteria. This job type can be run from the Core Console and from the Central Management Console. • When run from the Core, this report can include protected machine details or exclude them. Like the Job report, this report can also be run only from a protected machine selected in the Core. The resulting report displays detail about failed jobs only for the selected protected machine. • When run from the Central Management Console, this report can specify failure events for any combination of Cores or Core groups configured in the Console. The only configurable parameters are the report type and the date range.

Report type	Description
	For more information on this report type, see Understanding the Failure report.
Summary report	Provides summary information. By default, this set of information includes jobs for all machines—every protected machine, replicated machine and recovery point-only machine in the specified Cores. In the report parameters, you can customize the report. Use the filters to select or exclude some machines. You can also select or exclude jobs that are machine independent, in which case the report shows status for Core jobs only. This report is not available from the perspective of any single protected machine. This job type can be run from the Core Console and from the Central Management Console. • When run from the Core Console, the categories of information in this report include Core, license, and repository. The information is displayed in list, chart, and table form. • When run from the Central Management Console, this report can specify summary information for any combination of Cores or Core groups configured in the Console. The only configurable parameters are the report type and the date range. The categories of information in this report include Core, license, and repository. The summary report also includes a report on protected machines and the ratio of successful jobs to all jobs. The information is displayed in list, chart, and table form. For more information on this report type, see Understanding the Summary report.
Repository report	This report type provides you with a report of all repositories on the selected Core or Cores. You can also select any single repository available to the Core. This report is available from the Core Console only, and only from the perspective of the Core. For more information on this report type, see Understanding the Repository report.
Scheduled report	You can also schedule any of these reports from the Core Console. Scheduling a report causes the report you specify to generate repeatedly on the schedule you define. Optionally, you can establish email notifications each time a report is generated. For more information about scheduling, modifying, pausing, or deleting reports, see Managing scheduled reports from the Core Console.

Based on the report type and the parameters that you select, you can generate a report on one or more Rapid Recovery Cores or for one or more protected machines.

From the Central Management Console, you can generate a report for any combination of Cores or Core groups configured in that Console.

Generating a report from the Core Console

You can generate reports on demand from the Core Console. The following rules apply:

- All reports can be generated from the perspective of the Core.
- Additionally, two job types (the Job report and the Failure report) can be generated from the perspective of a protected machine. For such reports, data is generated only pertaining to the selected machine.
- Failure reports contain data only if jobs on the selected Cores (or protected machines) have failed.

The method for generating on-demand reports is similar, whether the report is generated from the focus of the Core, or whether it is generated from the perspective of a protected machine. However, navigation differs slightly.

You can also schedule reports to generate on a repeated basis. For more information about scheduling, modifying, pausing, or deleting reports, see Managing scheduled reports from the Core Console.

Generating a Core report on demand

As described in the topic About Rapid Recovery reports, you can generate the full range of available reports from the Core Console.

Complete the steps in the following procedure to generate a report from the perspective of the Rapid Recovery Core.

1. Navigate to the Rapid Recovery Core Console.
2. From the icon bar, click ⋮ (More), and then select **Reports**.

   The **Job Report** page appears. To the right of the report name in the page title, a downward-facing arrow appears, from which you could select another report type.

   If you want to generate a Job report, proceed to Step 6 to begin specifying your report criteria.
3. To choose another report type, click the arrow to the right of the report name to see a menu of available reports.
4. For defining scheduled reports, see Scheduling a report.
5. To generate a Repository report only, skip to Step 11.
6. For a Job, Job Summary, Failure, or Summary report, from the **Date Range** drop-down menu, select a date range.

   If you do not choose a date range, the default option (Last 31 days) is used. You can choose from the options in the following table.

Option	Description
Last 24 hours	Reports activity for the last day, relative to the time you generate the report.
Last 7 days	Reports activity for the last week, relative to the time you generate the report.
Last 31 days	Reports activity for the last 31 days, relative to the time you generate the report.
Last 90 days	Reports activity for the last 90 days, relative to the time you generate the report.
Last 365 days	Reports activity for the last year, relative to the time you generate the report.
All Time	This time period spans the lifetime of the Core.
Custom	This time period requires you to further specify start and end dates.
Month to date	Reports activity from the first day of the current calendar month to the date you generate the report.
Year to date	Reports activity from the first day of the current calendar year to the date you generate the report.

   NOTE: In call cases, no report data is available before the Core software was deployed, or from before machines were protected on the Core.
7. For a Job or Failure report, from the **Target Cores** drop-down menu, select the appropriate Core or Cores for which you want to generate a report.

   The default selection includes all available Cores.
8. From the **Protected Machines** drop-down menu, select the machine or machines for which you want to generate the report.

By default, this set of information includes jobs for all machines—every protected machine, replicated machine and recovery point-only machine in the specified Cores. In the report parameters, you can customize the report. Use the filters to select or exclude some machines. You can also select or exclude jobs that are machine independent, in which case the report shows status for Core jobs only.

You can choose from:

Option	Description
Select all	This option selects all protected machines protected on this Core. NOTE: You can select all machines, and then clear some of the selections to specify a subset of all machines.
Machine independent	Select this option to generate a report which includes jobs from a Core perspective. Job types such as creating or deleting a repository, or creating a boot CD, are not associated with a specific machine. If deploying the Agent software to a machine that is not yet protected, this job type is also considered machine independent. These jobs do not list a protected machine in the Protected Machine column of the resulting report. In contrast, if you deploy the Agent software to a machine that is already protected in the Core, the protected machine name is included in the report. It is not considered machine independent.
Protected machines	This option lists the machines protected on this Core. You can select them all, or a subset of the protected machines.
Recovery points only	This option lists machines that were once protected, but still have recovery points saved in the repository.
[Source cores]	If your Core is a target Core, and replicates recovery points for any machines protected on a source Core, then the name of that source Core appears (in all uppercase letters). This option lists all machines protected on that source Core. You can select all machines replicated in this target Core, or you can select a subset of them.
[Custom groups]	If you have any custom groups created on this Core, the name of each custom group appears as an option. Each object in that custom group appears. You can select all objects in the group, or a subset of them.

9. If generating a Summary report, skip to Step 12.
10. For a Job, Job Summary, or Failure report, from the **Job Types** drop-down menu, select the appropriate job types.

    By default, this set of information includes all jobs for the selected protected machines. In the report parameters, you can customize the report. Use the filters to select or exclude every job in the Main Jobs category, and every job in the Other Jobs category. Or you can expand each of these categories when defining job parameters, and select only the job types from either category that you want to appear in the report. Click the checkbox for any job type to select or clear that type. You can select some or all jobs from either category.

    You can choose from the following **other** job types:
11. For a Repository report, from the Repositories menu, select the repository or repositories that you want included in the report.

    The default selection includes all available repositories.
12. Click **Preview** to generate the report with the specified criteria.

If the report criteria you selected is not found, the report still generates, but the report contains an empty row. For example, if there are no errors, the contents of the Error column are null in the report.

13. Do one of the following:
    - View the generated report online.
    - Update the report dynamically by changing any of the criteria; then click **Preview** again.
    - Use the **Reports menu** to select an export format (including the default format, PDF) and click ⤓ to export the report. For more information about the Reports menu, see Using the Reports menu.
    - Use the **Reports toolbar** to view, manipulate, or print the report. For more information about the Reports toolbar, see Using the Reports toolbar.

Generating a protected machine report on demand

You can generate a Job report or a Failure report for any protected machine.

Complete the steps in the following procedure to generate a report for a protected machine.

1. Navigate to the Rapid Recovery Core Console.
2. From the Protected Machines menu, click the protected machine for which you want to see a report.

   The summary page for the selected protected machine appears.
3. At the top of the page, from the menu options next to the protected machine name, click the downward-facing arrow next to Reports, and then select a report type.
    - If you want to generate a report on all jobs pertaining to this protected machine, including failed jobs, click **Job Report**, and begin specifying your report criteria.
    - If you want to generate a list of failed jobs only pertaining to this protected machine, click **Failure Report**, and begin specifying your report criteria.
4. For a Job or Failure report, from the **Date Range** drop-down menu, select a date range.

   If you do not choose a date range, the default option (Last 31 days) is used. You can choose from the options in the following table.

Option	Description
Last 24 hours	Reports activity for the last day, relative to the time you generate the report.
Last 7 days	Reports activity for the last week, relative to the time you generate the report.
Last 31 days	Reports activity for the last 31 days, relative to the time you generate the report.
Last 90 days	Reports activity for the last 90 days, relative to the time you generate the report.
Last 365 days	Reports activity for the last year, relative to the time you generate the report.
All Time	This time period spans the lifetime of the Core.
Custom	This time period requires you to further specify start and end dates.
Month to date	Reports activity from the first day of the current calendar month to the date you generate the report.
Year to date	Reports activity from the first day of the current calendar year to the date you generate the report.

   NOTE: In call cases, no report data is available before the Core software was deployed, or from before machines were protected on the Core.

5. From the **Job Types** drop-down menu, select the appropriate job types.

   By default, this set of information includes all jobs for the selected protected machines. In the report parameters, you can customize the report. Use the filters to select or exclude every job in the Main

Jobs category, and every job in the Other Jobs category. Or you can expand each of these categories when defining job parameters, and select only the job types from either category that you want to appear in the report. Click the checkbox for any job type to select or clear that type. You can select some or all jobs from either category.

6. Click **Preview** to generate the report with the specified criteria.

   If the report criteria you selected is not found, the report still generates, but the report contains an empty row. For example, if there are no errors, the contents of the Error column are null in the report.

7. Do one of the following:

   - View the generated report online.
   - Update the report dynamically by changing any of the criteria; then click **Preview** again.
   - Use the **Reports menu** to select an export format and export the report. For more information about the Reports menu, see Using the Reports menu.
   - Use the **Reports toolbar** to view, manipulate, or print the report. For more information about the Reports toolbar, see Using the Reports toolbar.

Managing scheduled reports from the Core Console

You can schedule any of the reports available from the Core Console. Scheduling a report causes it to be generated repeatedly in the future. The schedule defines whether to generate the report on a daily, weekly, or monthly basis.

Optionally, Rapid Recovery lets you send an email notification to one or more recipients when each report is generated. The email specifies the report type, report format, and date range, and includes the report as an attachment.

NOTE: Before you can send reports by email, you must configure an SMTP server for the Core. For more information, see Configuring an email server.

Whether or not you choose to send email notifications, you can save the generated reports locally, or on a network location accessible to the Core server.

You must specify email notification and delivery, or you must specify a location to save reports. You can also choose both options.

This section includes the following topics:

Related links

Scheduling a report
Modifying a report schedule
Pausing, resuming, or deleting a scheduled report

Scheduling a report

You can schedule a report available from the Core Console. The report then generates on the schedule you defined until you pause or delete the report.

You must specify email notification and delivery, or you must specify a location to save reports. You can also choose both options.

Complete the steps in this procedure to schedule a report.

1. Navigate to the Rapid Recovery Core Console.
2. From the icon bar, click ⋮ (More), and then select **Reports**.

   The **Job Report** page appears. A downward-facing arrow appears to the right of the current report name.
3. Click the arrow to the right of the report name, and from the drop-down menu, select **Scheduled Reports**.

   The **Scheduled Reports** page appears.
4. To schedule a report to generate on a repeated basis, click **Add**.

   The **Set Reporting Schedule Wizard** appears.
5. On the **Configuration** page of the wizard, enter the details for the report you want to schedule, and then click **Next**. The configuration options are described in the following table.

   Table 161. Scheduled report configuration options

Machine	Available Reports
Name	Type the display name you want to assign to this particular schedule. The default name is Schedule report 1. Limit your name to 64 or fewer characters. Do not use prohibited characters or prohibited phrases .
Report format	Select a report output format. If you do not select a value, the default format (pdf) is used.
Report type	Select the type of report you want to generate on a repeated basis.
Labels	Select the labels you want to appear on your scheduled report. At least one label is required. The Custom Groups feature allows you to group Core objects in one logical container, for which you define a label. Using the Labels parameter in the Set Reporting Schedule Wizard, you can select a custom group for which scheduled reports are run. If no custom labels exist, the available options in the Labels drop-down menu include Select All and Protected Machines. If custom groups appear, each group appears as an option. You can select or clear any of the options to include or exclude those objects in the scheduled report.
Protected machine	Select one or more protected machines to be included in the report. This option is not available for the Repository report.
Job Types	Select the job types you want to appear in the report. By default, this set of information includes jobs for all machines—every protected machine, replicated machine and recovery point-only machine in the specified Cores. In the report parameters, you can customize the report. Use the filters to select or exclude some machines. You can also select or exclude jobs that are machine independent, in which case the report shows status for Core jobs only.

Machine	Available Reports
	The Job Types parameter is not available for the Core Summary and Repository scheduled report types.

6. On the **Destination** page of the wizard, select a destination for the reports you want to schedule. You must choose one of the following, and may select both. When satisfied, click **Next**.
   - In the **Send to email addresses** field, enter one or more valid email addresses to notify users by email message when a scheduled report is generated.

     NOTE: If you do not specify email notifications and delivery, then you must specify a storage location.

   - Select **Save as file** to save the generated report files to a location you specify, and in the **Location type** drop-down menu, select a local, network, or cloud storage option. Then, in the **Location** field, specify additional location information as described in the following table.

Table 162. Location options for scheduled reports

Location type	Location type description	Location
Local	Select location type Local to save generated reports in a local path accessible to the Core.	Specify the path in the Location field. Type a location accessible to the Core locally. For example, to store reports in the Reports folder on the D drive, enter D:\Reports\.
Network	Select location type Network to save generated reports in a path accessible to the Core on the network. Specify the path in the Location field.	Specify the path in the Location field. Type a location accessible to the Core from the network. Use format \\servername \sharename. For example, to store reports on the Data server in the shared folder called Reports, enter \\Data\Reports\. Specify network credentials in the User name and Password fields.
Cloud	Select location type Cloud to save generated reports in a Cloud storage account configured in the Core. The storage account must already be defined before performing this step. For information on setting up a Cloud storage account to work with the Core, see Managing cloud accounts.	From the Account field, select the appropriate Cloud storage account to use to store generated reports. From the Container field, specify an appropriate container in the storage account. From the Folder Name field, specify a folder into which to store future generated reports.

7. When satisfied with your Destination options, click **Next**.
8. On the **Schedule** page of the wizard, from the **Send data** menu, select an option to determine how frequently to generate the report that you specified. You can generate reports daily, weekly, or monthly. Each option has its own parameters, as described in the following table.

Table 163. Frequency options for generating scheduled reports

How frequent	Frequency details	Frequency parameters
Daily	Generates and saves or sends the specified report once daily at the specified time. Default time for this action is 12:00 AM (based on the time on the Core server).	To change the default time that the report generates, in the time text field, type a new value or use the controls to change the hour, minutes, and AM or PM.
Weekly	Generates and saves or sends the specified report once weekly at the specified time of the specified day. Default time for this action is 12:00 AM on Sunday (based on the time on the Core server).	To change the default day that the report generates, from the day of week menu, select a day of the week. To change the default time that the report generates, in the time text field, type a new value or use the controls to change the hour, minutes, and AM or PM.
Monthly	Generates and saves or sends the specified report once monthly on the specified date and time of day. Default date for this action is the first of each month at 12:00 AM (based on the time on the Core server).	To change the default date that the report generates, from the day of month menu, select a date. To change the default time that the report generates, in the time text field, type a new value or use the controls to change the hour, minutes, and AM or PM.

9. Optionally, on the **Schedule** page of the wizard, if you want to prevent the scheduled report from generating until you resume paused reports, select **Initially pause reporting**.

   If you want this report to generate as scheduled, clear this option.
10. When satisfied with the schedule, click **Finish** to exit the wizard and save your work.

    The new report schedule appears in the Summary Reports summary table.

Modifying a report schedule

Once a report is scheduled, you can modify any of its parameters or details. You can edit report configuration information (report name, output format, report type, included repositories. You can also change email notification options, and the destination to save the generated report. Finally, you can also change the schedule of the report.

Complete the steps in this procedure to modify parameters for a scheduled report.

1. Navigate to the Rapid Recovery Core Console.
2. From the icon bar, click ⋮ (More), and then select **Reports**.

   The **Job Report** page appears. A downward-facing arrow appears to the right of the current report name.
3. Click the arrow to the right of the report name, and from the drop-down menu, select **Scheduled Reports**.

   The **Scheduled Reports** page appears.
4. In the Scheduled Reports summary table, from the row of the report you want to modify, click the ⚙ Settings icon and then select **Edit**.

The **Set Reporting Schedule Wizard** appears.

5. Navigate through the pages of this wizard, changing any parameters necessary. For information on any of the parameters in this wizard, see the topic Scheduling a report.
6. On the **Schedule** page of the wizard, click **Finish** to close the wizard and save your changes.

   The wizard closes, and the report schedule is modified.

Pausing, resuming, or deleting a scheduled report

Once a report is scheduled, it generates on the schedule defined. If you want to temporarily stop the generation of a scheduled report, then you can pause the schedule.

If a scheduled report is paused, and you wish to resume the generation of the report, then you can resume the report as described in this procedure.

If you are currently generating a scheduled report, and no longer need to generate that report, you can delete it.

To determine if any scheduled report is paused, check the status column in the scheduled reports summary table. A green sphere indicates an active scheduled report; a yellow sphere indicates a paused schedule; and a red sphere indicates an error.

Complete the steps in this procedure to pause, resume, or delete a schedule for a report.

1. Navigate to the Rapid Recovery Core Console.
2. From the icon bar, click ⋮ (More), and then select **Reports**.

   The **Job Report** page appears. A downward facing arrow appears to the right of the current report name.
3. Click the arrow to the right of the report name, and from the drop-down menu, select **Scheduled Reports**.

   The **Scheduled Reports** page appears.
4. In the Scheduled Reports summary table, view the status of all scheduled reports, using the colored indicators.
5. For each report you want to pause or resume, select the check box in the first column.
6. From the Scheduled Reports options above the summary table, do one of the following:

   - To pause the generation of the selected reports, click **Pause**.
   - To resume generation of scheduled reports that have been paused, click **Resume**.
   - To delete the selected schedules for existing scheduled reports, click **Delete**.

     Deleting a scheduled report only prevents the generation of future reports. If previous scheduled reports have been saved, they are not removed.

Using the Reports menu

The Reports menu appears at the top of the page when viewing Reports. This menu includes a report title, which is also a drop-down menu that lets you see which report types are available. Below this menu are one or more filters that help you to define your report criteria.

The specific filters available depend on the report type. For information on the parameters that apply to each report type, see the topic for understanding that report type.

On the right side of the reports menu, some controls appear. These controls, described in the following table, help you generate and export the report.

Table 164. Reports menu controls

UI Element	Description
Preview button	Click the preview button to generate a report based on the selected report type and the report parameters specified in the filters.
Export format drop-down menu	The Export drop-down menu lets you select a report output format. If you do not select a value, the default format (pdf) is used.
Download button/icon	The Download button exports the generated report in the format type selected in the Export menu.

Reports include units of measure which make it easier to determine if a column is represented in GB, TB, or in seconds.

If you are not satisfied with the appearance of a generated or exported report, you can change the font used in the reports. For more information, see Managing report settings.

Once a report is generated, you can use the reports toolbar.

Related links

- Understanding the Job report
- Understanding the Failure report
- Understanding the Summary report
- Understanding Central Management Console core reports

Using the Reports toolbar

After you generate it from the Reports menu, the report appears below a Reports toolbar. The toolbar can help you manipulate report output, including saving and printing the reports.

On the left of the toolbar, there is a Toggle sidebar option. This tool expands or contracts the sidebar, giving access to a few more display options. To the right of the toolbar, the Tools option expands a drop-down menu providing report navigation controls. The elements of the Reports toolbar are described in the following table.

Table 165. Reports toolbar icons

Icon	Description
◫	**Toggle sidebar**. All report pages are displayed as thumbnails. Other options in the sidebar are not supported.
⊞	**Sidebar: Show thumbnails**. This is the default view for all pages of a generated report.
☰	**Sidebar: Show document outline**. This feature is not supported.

Icon	Description
📎	**Sidebar: Show attachments**. There are no attachments for reports. This feature is not supported.
🔍	**Find**. Allows you to search text within the generated report. Includes options to highlight all text that matches the criteria you enter, and also to match or ignore case.
⬆	**Previous page**. Move the report view to the previous page.
⬇	**Next page**. Progress to the next page in the report view.
Page: 1 of 2	**Enter page number**. Click in the page number text field, enter a valid page number, and press Enter to progress to that page in the report view.
+	**Zoom out**. Lets you zoom out the view of the generated report. Each successive click zooms out further, to a minimum of 25%.
−	**Zoom in**. Lets you zoom in the view of the generated report. Each successive click zooms in further, to a maximum of 1000%.
Automatic Zoom	**Automatic Zoom**. Lets you control the zoom view of the generated report, including viewing by actual size, fit page, full width, or by percentage, including 50%, 75%, 100%, 125%, 150%, 200%, 300%, or 400%.
📂	**Open file**. Lets you navigate your file system to locate and open a saved report.
🖶	**Print**. Lets you print the generated report.
»	**Tools**. The Tools drop-down menu expands or contracts when you click this icon. The Tools options are described below.
⤒	**Tools: Go to first page**. Navigates you to the first page of the generated report.
⤓	**Tools: Go to last page**. Navigates you to the last page of the generated report.
↻	**Tools: Rotate clockwise**. This option rotates the canvas of the generated report in a clockwise direction.
↺	**Tools: Rotate counterclockwise**. This option rotates the canvas of the generated report in a counterclockwise direction.
✋	**Tools: Hand tool**. When you select this tool, it Lets you move the report by clicking and dragging across the screen.

Icon	Description
ⓘ	**Tools: Document properties**. Provides information about the document properties of the generated report. Click **Close** to close this window.

For information about generating a report, see Generating a report from the Core Console. For information about the generating a report for multiple cores in the Central Management Console, see Generating a report from the Central Management Console.

Understanding the Job report

The Job report is available for the Rapid Recovery Core and for machines protected on the Core. This report provides you with a method to view the status of jobs performed by a selected Core or a protected machine. Rows or columns of data that appear in the report with no data indicate that the tested parameter was null. For example, if a column (such as Errors) appears with no information, then no errors are occurred for the selected record. If the report generates a blank row, the job for the selected record reflects machine-independent activity.

For information on how to generate a Job report from the Core, see Generating a Core report on demand. For information on how to generate a Job report for a protected machine, see Generating a protected machine report on demand.

When you generate a Job report, report details include the following:

- Selection criteria for the report
- A summary table showing a row for each job in the date range you specified. In addition to listing the appropriate core, protected machine, and job type, each row includes:
  - A summary of the job
  - The job status
  - Any errors related to the job
  - The start and end dates for the job
  - The job duration in seconds
  - The total work in MB

If information is not relevant for a specific category, that cell appears with no information in the report. For example, if the Core for a specified protected machine has no errors, the Error column is blank for that row in the report.

Understanding the Job Summary report

The Job Summary report is available when reporting from the Core perspective only; this report is not available from reports for a protected machine. This report has a single summary, showing summary information about all jobs performed on the Core, including a count of failed, passed, and canceled jobs. It shows more detail than the Job report, because it specifies each job as a separate line in the report.

For information on how to generate a Job Summary report, see Generating a report from the Core Console.

Report parameters for this report type include:

- Date range

- Protected machines
- Job types

When you generate a Job Summary report, report details include selection criteria for the report, as well as information about protected machines, volumes, and job types.

Core information

The Core portion of the Summary Report includes data regarding the Rapid Recovery Core being reported. This information includes:

- The number of machines protected in the Rapid Recovery Core
- The number of machines with failed jobs

Protected machines summary

The Protected machines portion of the Summary report includes data for all machines protected by the selected Rapid Recovery Core, and the volumes on those machines.

The chart shows a line for each job type for each machine, and includes the ratio of successful jobs (of any type), number of jobs passed, number of jobs failed, and canceled jobs. (Canceled jobs are not considered for these statistics.)

Understanding the Failure report

The Failure report is a subset of the Job report and is available for the Rapid Recovery Core and for machines protected on the Core. A Failure report includes only the canceled and failed jobs listed in the Job report, and compiles them into a single report that can be printed and exported. If the report generates with a blank row, there are no errors within the date range specified in your report criteria.

NOTE: Results for target Cores and protected machines parameters appear for the Core-level report only.

For information on how to generate a Job report from the Core, see Generating a Core report on demand. For information on how to generate a Job report for a protected machine, see Generating a protected machine report on demand.

When you generate a Failure report, a summary table appears, showing a row for each job in the date range you specified. In addition to listing the appropriate core, protected machine, and job type, each row includes:

- A summary of the job
- The job status
- Any errors related to the job
- The start and end dates for the job
- The job duration in seconds
- The total work in MB

Understanding the Summary report

The Summary report is available for one or more Cores. This report is not available from reports for a protected machine. The Summary report includes information about the repositories on the selected

Rapid Recovery Core and about the machines protected by that core. The information appears as two summaries within one report.

For information on how to generate a Summary report, see Generating a report from the Core Console.

Report parameters for this report type include:

- Date range
- Protected machines

When you generate a Summary report, report details include selection criteria for the report, as well as information about repositories and protected machines.

Core information

The Core portion of the Summary Report includes data regarding the Rapid Recovery Core being reported. This information includes:

- The license key (identifier)
- The current version of the Rapid Recovery Core software

Repositories summary

The Repositories portion of the Summary Report includes data for the repositories located on the selected Rapid Recovery Core. This information includes:

- The number of repositories in the Rapid Recovery Core
- A summary of repositories on the Core.

Protected machines summary

The Protected machines portion of the Summary report includes data for all machines protected by the selected Rapid Recovery Core or Cores. This includes a chart and a summary table.

The chart shows protected machines by the ratio of successful jobs (of any type), compared to failed jobs. (Canceled jobs are not considered for these statistics.)

The X or horizontal axis shows the number of protected machines. The Y or vertical axis shows tiers of success. Specifically, the Y axis shows, by protected machine, how many had:

- No jobs performed
- Less than 50% success rate
- 50% or more success rate
- 100% success rate

Below the chart, information appears about protected machines. This information includes:

- The amount of protected machines
- The number of protected machines with failed jobs
- A summary table, by protected machine, which shows:
  - Protected machine name
  - Volumes protected by the machine
  - Protected space, in GB (total and current)

  - Daily change rate (average and median)
  - Job statistics (success, completed, failed, canceled)
  - If encryption was applied
- The Core version

Understanding the Repository report

The Repository report includes information about the repositories on the selected Rapid Recovery Core and about the machines protected by that core. The information appears as two summaries within one report.

For information on how to generate a Repository report from the Core, see Generating a Core report on demand.

Report parameters for this report type include only repositories.

When you generate a Repository report, report details for each repository includes a summary list of repositories on the Core.

The Central Management Console

The Rapid Recovery Central Management Console is an optional component intended for environments with two or more Rapid Recovery Cores. This component is a web portal providing a central interface where you can group, manage, and generate reports for multiple Cores.

Operating system requirements for the Central Management Console are identical to the requirements for the Rapid Recovery Core. These components can be installed on the same machine or on different machines, as your needs dictate.

After installation, you must configure the Central Management Console by adding Cores you want to manage, either individually, or as part of Core groups.

NOTE: You must run the installer with local administrator privileges.

The Windows 8, 8.1, and 10, and Windows Server 2012 and 2012 R2 operating systems must have the ASP.NET 4.5 feature installed on the server for proper loading of the GUI. This configuration is included for you as part of the Rapid Recovery installer.

For more information about installing this component, see the topic "Installing the Rapid Recovery Central Management Console" in the *Dell Data Protection | Rapid Recovery Installation and Upgrade Guide.*

For more information about configuring this component, see the topic Configuring the Rapid Recovery Central Management Console in the *Dell Data Protection | Rapid Recovery User Guide*.

For more information about understanding the UI of this component, see the topic Understanding the Rapid Recovery Central Management Console in the *Dell Data Protection | Rapid Recovery User Guide*.

Understanding the Rapid Recovery Central Management Console

When you open the Central Management Console, information is displayed in Console view. The **Welcome** page appears, and you can see the following elements:

Table 166. UI elements in the Rapid Recovery Central Management Console

UI Element	Description
Branding area	For typical environments, the top left side of the Central Management Console is branded with the full parent product name, Dell Data Protection | Rapid Recovery. Clicking anywhere on the branding area results in directing the web browser user to product documentation on the Dell Support website.
Left navigation area	The left navigation area appears under the branding area, on the left side of the user interface. Functions of the navigation area differ based on the mode selected from the top right of the Central Management Console **Console mode.** In the navigation area, when in the Console mode, clicking any Core or Core Group opens the selected Core or Core group in the Rapid Recovery Core Console. **Reports mode.** In the navigation area, when in the Reports mode, selecting Cores or Core groups determines the set of information to appear when you generate reports. **Manage mode.** In the navigation area, when in the Manage mode, you can navigate through settings for Cores and Core Groups. You can also add and remove Cores and Core Groups in Manage mode. Clicking the arrows expands and collapses the menu. Included are the following levels of hierarchy: Organization, Core Groups, and Cores. If you click the left arrow, the navigation area collapses. To expand the navigation area, click the right arrow.
Links menu	**Contact Dell Support.** Links to the Dell Support website in a new browser window, providing access to Live Chat, video tutorials, Rapid Recovery knowledge base articles, frequently asked questions, and more.
Links menu	**Documentation.** Links to the Dell Support website in a new browser window, providing access to Live Chat, video tutorials, Rapid Recovery knowledge base articles, frequently asked questions, and more.
Links menu	**Version.** Lists the current version of the Central Management Console. Clicking this link opens the About dialog box.
Links menu	**Mode selector.** On the top right of the links menu, the name of the current logged-in Windows user appears in a drop-down menu. From this menu, you can change the view of the Central Management Console. You can choose from the following views: **Console.** This mode is the default, allowing you to view the Cores and Core groups in your environment from one location. **Reports.** From this mode, you can generate, view and export reports from the Cores configured in this console. **Manage.** From the Manage mode, you can remove or add additional cores to the Central Management Console, alone or in groups.

UI Element	Description
	Language. In versions that support localization, the Language option is listed. Selecting this option opens the Switch Language dialog box, from which you can select a display language for the Central Management Console. . **Clear account cache.** Select this option to clear existing information for the logged-in user account.

You can change the view of the Central Management Console by selecting an option from the mode selector (the drop-down menu on the top right of the page). For example:

- To manage Cores or Core groups that are already configured, use Console view.
- To configure the Central Management Console, switch to Manage view.
- To generate reports, switch to Reports view.

The Cores that you can view and manage appear in the left navigation menu. You can configure individual Cores, or organize them by group. You can restrict access to Cores in specific groups using Windows user names or groups.

Configuring the Rapid Recovery Central Management Console

Configuring the Rapid Recovery Central Management Console involves adding Cores and Core groups, establishing their settings, and specifying access settings for groups if required.

Once you complete the configuration, you can manage settings and all Cores from one central location.

To configure the Central Management Console, you can perform all tasks listed in Related links below.

Related links

Adding a Core to the Central Management Console
Configuring Core settings in the Central Management Console
Adding a Core group to the Central Management Console
Configuring Core group settings
Configuring Core group access

Adding a Core to the Central Management Console

If you want to add a core to a Core group, the group must be created first. For more information, see Adding a Core group to the Central Management Console. You can also edit the Core details later to specify a group.

Add one or more Cores to the Central Management Console to manage them or generate reports from a single interface.

Complete the steps in the following procedure to add a Core to the Central Management Console.

1. From the Rapid Recovery Central Management Console, click the mode selector drop-down and select **Manage**.

   The page refreshes, showing Add Core, Add Group, and Delete icons.
2. From the top of the left navigation menu, click **Add Core**.

   The **Add Core** page appears.

3. Enter the required information for connecting to the Core, as described in the following table.

Table 167. Add Core details

Text Box	Description
Parent group	Optionally, if you want the Core to join an existing Core group, select the parent group from the appropriate organization.
Display name	Enter a display name for the Core. The display name must be limited to 150 characters or less. Best practice is to keep this name under 33 characters. Do not use prohibited characters or prohibited phrases. For more information on prohibited characters or prohibited phrases, see the *Dell Data Protection | Rapid Recovery User Guide*.
Host name	Enter the IP address for accessing the Core. If the Core you are adding is the current server, you can use localhost.
Port	Enter a port number for the connection. The default value is 8006.
User name	Enter a user name to access the Core service for the newly added Core.
Password	Enter a password to access the Core service for the newly added Core.

4. Click **Test Connection** to test the configuration.

   If the test is successful, a success message displays. Click **OK** to close the confirmation message.

5. Click **Save**.

   Your changes are saved, and the Core is now added to the parent group.

Related links

Adding a Core group to the Central Management Console

Configuring Core settings in the Central Management Console

Complete the steps in the following procedure to configure Core settings in the Central Management Console.

1. From the Rapid Recovery Central Management Console, click the mode selector drop-down and select **Manage**.

   The page refreshes, showing Add Core, Add Group, and Delete icons.

2. From the left navigation menu, click the name of the appropriate Core.

   The **Settings** page appears for the selected Core.

3. In the Settings tab, modify the Core information as described in the following table.

Table 168. Core settings

Text Box	Description
Parent group	Select the parent group of the Cores for the new Core settings you want to add.
Display name	Enter a display name for the Core.
User name	Enter the user name for the Core.

Text Box	Description
Password	Enter the password for the Core.
How should the management portal connect to [Core name]?	Select the option that specifies the connection. You can choose to: • Use [Core name]'s last known IP address (xxx.xxx.xxx.xxx), or • Use hostname or IP address [host name or IP address]. If you choose to specify the connection through the use of a host name or IP address, you must enter the appropriate information in the hostname or IP address field.
On what port is [Core name] listening?	Select either of the port options. You can choose: • Default port (8006), or • Custom port [port] If you choose to specify the port, enter the port number in the Custom port field.

4. Click **Test Connection**.

   If the test is successful, a message will display to indicate that the connection was successful.
5. Click **Save**.

Adding a Core group to the Central Management Console

Complete the steps in the following procedure to add a Core group to the Rapid Recovery Central Management Console.

1. From the Rapid Recovery Central Management Console, click the mode selector drop-down and select **Manage**.

   The page refreshes, showing Add Core, Add Core Group, and Delete icons.
2. From the top of the left navigation menu, click **Add Group**.

   The **Add Group** page appears.
3. Select the parent group and the display name as described in the following table.

   Table 169. Adding a Core group

Text Box	Description
Parent group	Select the parent group of the Cores for the new Core group you want to add.
Display name	Enter a display name for the Core group. The display name must be limited to 150 characters or less. Best practice is to keep this name under 33 characters. Do not use prohibited characters or prohibited phrases. For more information on prohibited characters or prohibited phrases, see the *Dell Data Protection | Rapid Recovery User Guide.*

4. Click **Save**.

Related links

Adding a Core group to the Central Management Console

Configuring Core group settings

Before you can configure Core group settings or access, the group must be created first. For more information, see Adding a Core group to the Central Management Console.

Complete the steps in the following procedure to configure core group settings.

1. From the Rapid Recovery Central Management Console, click the mode selector drop-down and select **Manage**.

   The page refreshes, showing Add Core, Add Core Group, and Delete icons.
2. From the left navigation menu, click the name of the Core group you want to configure.

   The Settings page appears for the selected Core group.
3. Modify the information for the Core group as described in the following table.

   Table 170. Core group settings

Text Box	Description
Parent group	Select the parent group of the Cores for the new Core group settings you want to add.
Display name	Enter a display name for the Core group. The display name must be limited to 150 characters or less. Best practice is to keep this name under 33 characters. Do not use prohibited characters or prohibited phrases. For more information on prohibited characters or prohibited phrases, see the Dell Data Protection | Rapid Recovery User Guide.

4. Click **Save**.

Configuring Core group access

Before you can configure Core group settings or access, the group must be created first. For more information, see Adding a Core group to the Central Management Console.

To add or view cores in the Central Management Console, the current user account must be a member of the Active Directory domain administrators group. Alternatively, you can provide access to individual users or groups using this procedure.

Complete the steps in the following procedure to configure Core group access.

1. From the Rapid Recovery Central Management Console, click the mode selector drop-down and select **Manage**.

   The page refreshes, showing Add Core, Add Group, and Delete icons.
2. From the left navigation menu, click the name of the Core group you want to configure.

   The **Settings** page appears for the selected Core group.
3. Click the **Access** tab.

   The Access settings for the Core group appear.
4. Click **Add**.

   The **Allow Access** dialog box appears. You can provide access to an individual, or to a group.
5. Do one of the following:
   - If you want to provide access to an individual, then in the **Name** text field, enter the name of the individual, and then click **User**. This is the default option.

For example, type Administrator (or, if the machine is in a domain, [domain name] \Administrator).

- If you want to provide access to a group, then in the **Name** text field, enter the name of the group, and then click **Group**.

  For example, type AdminGroup (or, if the machine is in a domain, [domain name] \AdminGroup).

6. Click **Check Name** to validate that the user name or group name you specified is accessible.

   If the name entered is valid, an Account verified message appears.

7. Once you have entered and validated a name, click **Save**.

   The **Allow Access** dialog box closes, and your changes are saved. The access name appears in the Access tab for the Core group.

Understanding Central Management Console core reports

Rapid Recovery lets you generate and view job reports, failure reports, and summary information for multiple Rapid Recovery Cores. Details about the Cores are presented in summary tables with the same categories described in the sections Understanding the Job report, Understanding the Failure report, and Understanding the Summary report.

For information on how to generate a report for multiple cores, see Generating a report from the Central Management Console.

Generating a report from the Central Management Console

Complete the following procedure to generate a report for multiple Rapid Recovery Cores from the Central Management Console.

1. From the Rapid Recovery Central Management Console, click the mode selector drop-down menu in the upper-right corner, and select **Reports**.

   The report selection page appears. The CoreJobReport is selected by default. To the right of the report name, a downward-facing arrow appears, from which you could select another report type.

2. From the left navigation menu, select any combination of the individual Rapid Recovery Cores or Core Groups, that you want to include in the report.
3. From the report type drop-down menu, select the type of report you want to generate. You can choose from one of the following options:

   - Job Report
   - Failure Report
   - Summary Report
   - Job Summary Report

   For more information about these report types, see About Rapid Recovery reports.

4. From the date range drop-down menu, select a date range.

   You can choose from the options in the following table.

Option	Description
Day	Reports activity for the last day, relative to the time you generate the report.
Week	Reports activity for the last week, relative to the time you generate the report.
Month	Reports activity for the last 31 days, relative to the time you generate the report.
Year	Reports activity for the last year, relative to the time you generate the report.
All Time	This time period spans the lifetime of the Core.
Custom	This time period requires you to further specify start and end dates.

NOTE: In all cases, no report data is available before the Core software was deployed, or from before machines were protected on the Core.

5. Do one of the following:
   - Click **Preview** to generate and view the generated report online.
   - Update the report dynamically by changing report criteria; then click **Preview** again.
   - Choose an export format (including the default format, XLSX) and click **Download**.
   - Use the **Reports toolbar** to view, manipulate, or print the report. For more information about the Reports toolbar, see Using the Reports toolbar.

7

Understanding the Rapid Recovery Command Line Management utility

Dell Data Protection | Rapid Recovery consists of several software components. Key components relevant to this topic include the following:

- The Rapid Recovery Core manages authentication for protected machines, schedules for transferring data for backup and replication, export to virtual machines, reporting, and bare metal restore (BMR) to similar or dissimilar hardware.
- The Rapid Recovery Agent is responsible for volume snapshots and fast transfer of the data to the repository managed by the Core.
- The Rapid Recovery Command Line Management utility, cmdutil.exe, provides third-party access to manage system functionality. This tool permits scripting of the Rapid Recovery Core management functions.

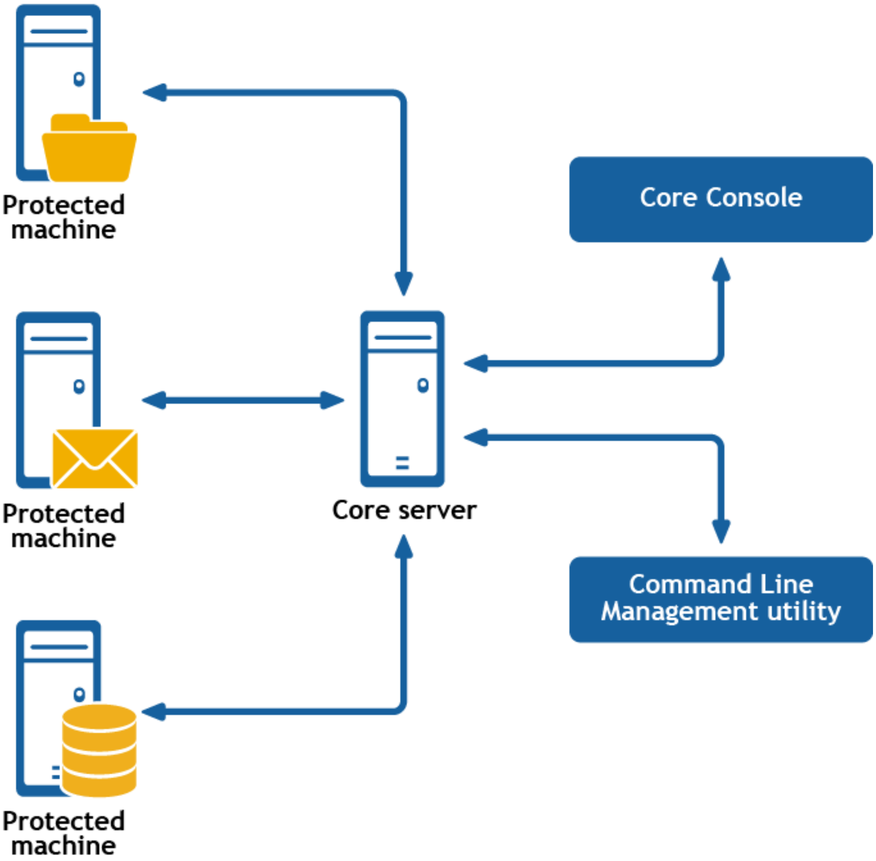


Figure 13. Rapid Recovery Command Line Management provides command-line functions

Rapid Recovery Command Line Management is a Windows command line utility that lets users interact with the Rapid Recovery Core server. It offers some of the same functions that the Rapid Recovery Core

Console graphic user interface provides. For example, Rapid Recovery Command Line Management utility can mount recovery points or force a snapshot.

The Rapid Recovery Command Line Management utility is embedded in every installation of the Rapid Recovery Core. To open the Command Line Management utility for a default installation, navigate to the path **C:\Program Files\AppRecovery\Core\CoreService\**, and double-click the `cmdutil.exe` file.

In Command Line mode, action flags can be passed to the Rapid Recovery Command Line Management utility through a selection of command options and qualifiers to perform limited management functions.

Commands

This section describes the commands and options available for the Rapid Recovery Command Line Management utility. The following commands are available for use:

- Archive
- CancelActiveJobs
- CheckRepository
- CreateArchiveRepository
- CreateBootCD
- CreateRepository
- DeleteRepository
- Dismount
- DismountArchiveRepository
- EditEsxServer
- Force
- ForceAttach
- ForceChecksum
- ForceLogTruncation
- ForceMount
- ForceReplication
- ForceRollup
- ForceVirtualStandby
- Help
- List
- Mount
- MountArchiveRepository
- NewCloudAccount
- OpenDvmRepository
- Pause
- Protect
- ProtectCluster
- ProtectEsxServer
- RemoveAgent

- RemoveArchiveRepository
- RemovePoints
- RemoveScheduledArchive
- RemoveVirtualStandby
- Replicate
- Replication
- RestoreAgent
- RestoreArchive
- RestoreUrc
- Resume
- SeedDrive
- StartExport
- UpdateRepository
- Version
- VirtualStandby

Archive

Businesses often use long-term storage to archive both compliant and non-compliant data. The archive feature in Rapid Recovery supports extended retention for compliant and non-compliant data. The administrator can save an archive on the local storage or network location by specifying the `-path` parameter and credentials.

Usage

The usage for the command is as follows:

```
/archive -core [host name] -user [user name] -password [password] -all | -
protectedserver [name | IP address] -path [location] -startdate [time string] -
enddate [time string] -archiveusername [name] -archivepassword [password] -
comment [text]
```

Command Options

The following table describes the options available for the `archive` command:

Table 171. Archive command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.

Option	Description
`-all`	Archive all recovery points for all protected machines on the Core.
`-protectedserver`	Protected machine with recovery points to be archived. You can specify several machine names enclosed in double quotes and separated by spaces.
`-path`	Path where archived data should be placed; for example: d:\work\archive or network path \\servername\sharename.
`-startdate`	Start date for selecting recovery points by creation date. The value must be enclosed in double quotes; for example, `"04/30/2012 02:55 PM"`.
`-enddate`	Optional. End date for selecting recovery points by creation date. Value must be enclosed in double quotes; for example, `"05/31/2012 11:00 AM"`. The current time system is used by default.
`-archiveusername`	Optional. User name for the remote machine. Required for network path only.
`-archivepassword`	Optional. Password to the remote machine. Required for network path only.
`-comment`	Optional. Comment text must be enclosed in double quotes; for example: `-comment "comment goes here..."`.

Examples:

Archive all recovery points with creation dates starting from 04/30/2012 02:55 PM for all machines on the Core:

```
>cmdutil /archive -core 10.10.10.10 -user administrator -password 23WE@#$sdd -
path d:\work\archive -startdate "04/30/2012 02:55 PM" -all
```

Archive recovery points that fall within a date range for two protected machines:

```
>cmdutil /archive -core 10.10.10.10 -user administrator -password 23WE@#$sdd -
protectedserver "10.20.30.40" "20.20.10.1" -path d:\work\archive -startdate
"04/30/2012 02:55 PM" -enddate "05/31/2012 11:00 AM"
```

CancelActiveJobs

Use the `cancelactivejobs` command to cancel the execution of all in-progress jobs of a specific type, such as transfer or replication.

Usage

The usage for the command is as follows:

```
/cancelactivejobs -core [host name] -user [user name] -password [password] -
jobtype [job type filter]
```

Command Options

The following table describes the options available for the `cancelactivejobs` command:

Table 172. CancelActiveJobs command options

Option	Description
-?	Display help on the command.
-core	Optional. Remote core host machine IP address (with an optional port number). By default, the connection is made to the core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote core host machine. If you specify a password, you must also provide a user name. If none is provided, the logged-in user's credentials are used.
-protectedserver	Determines the protected machine on which the jobs should be canceled.
-all	Select and cancel events of specified type for all protected servers.
-jobtype	Optional. Specifies job type filter. Available values are: • 'transfer' (data transfer) • 'repository' (repository maintenance) • 'replication' (local and remote replications) • 'backup' (backup and restore) • 'bootcdbuilder' (create boot CDs) • 'diagnostics' (upload logs) • 'exchange' (Exchange Server files check) • 'export' (recovery point export) • 'pushinstall' (deploy agents) • 'restore' (recovery point restore) • 'rollup' (recovery point rollups) • 'sqlattach' (agent attachability checks) • 'mount' (mount repository) By default, all jobs of the specified type are canceled.

Example:

Cancel all transfer jobs on Core 10.10.10.10:

```
>cmdutil /cancelactivejobs -core 10.10.10.10:8006 -user administrator -password
23WE@#$sdd -jobtype transfer
```

CheckRepository

You can use the CheckRepository command to verify the integrity of an existing DVM repository created in AppAssure Core or Rapid Recovery Core.

Usage

The usage for the command is as follows:

```
/checkrepository -repository [repository name] | -all [check all repositories] -
core [host name] -user [user name] -password [password] name] -force
```

Command Options

The following table describes the options available for the `CheckRepository` command:

Table 173. CheckRepository command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-all`	Optional. This option checks all DVM repositories associated with the Core.
`-repository`	The name of the DVM repository.
`-force`	Optional. This option performs the check without your confirmation.

Example:

Start checking the DVM repository:

```
>cmdutil /checkrepository -repository "Repository1" -core 10.10.10.10 -user
administrator -password 23WE@#$sdd
```

CreateArchiveRepository

When you create an archive repository, you create a destination for the contents of a scheduled archive. This feature lets you mount an archived recovery point and restore a machine without importing the archive.

Usage

The usage for the command is as follows:

```
/createarchiverepository -core [host name] -user [user name] -password
[password] name] -name [archive repository name] -path [path to the archive] -
archiveusernamme [network user name] -archivepassword [network password] -
cloudaccountname [name of the cloud account] -cloudcontainer [name of the cloud
container]
```

Command Options

The following table describes the options available for the `CreateArchiveRepository` command:

Table 174. CreateArchiveRepository command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-name`	Required. The name of the archive repository.
`-path`	The path to the existing archive. It can be a local, network, or cloud location. For example: d:\work\archive or \\servername\sharename.
`-archiveusername`	Optional. This option is the login to the remote machine. It is required for a network path only.
`-archivepassword`	Optional. This option is the password for the remote machine. It is only required for a network path only.
`-cloudaccountname`	Optional. This option is the display name for an existing cloud account. It is required for a cloud path only.
`-cloudcontainer`	Optional. The cloud container is where the archive is located. It is required for a cloud path only.

Examples:

Create an archive repository with the name "NewArchive:"

```
>cmdutil /createarchiverepository -name NewArchive -core 10.10.10.10 -user
administrator -password 23WE@#$sdd -path d:\work\archive
```

Additionally, if an archive contains more than one location, then the command should include paths for all of the segments ordered from 1 to N, where N equals the number of segments.

Create an archive repository with the name "NewSegmentArchive:"

```
>cmdutil /createarchiverepository -name NewSegmentArchive -path1 \
\RemmoteServer1\Share\Archive\Segment1 - archiveusername1 Administrator -
archivepassword1 23WE@#$sdd -path2 Archives\NewSegment -cloudcontainer2
ArchiveContainer -cloudaccountname AmazonS3Local - path3 d:\work\archive\Third
```

CreateBootCD

This command lets you create a bare metal restore (BMR) boot CD without using the Rapid Recovery Core Console.

Usage

The usage for the command is as follows:

```
/createbootcd -ip [IP address] -mask -defaultgateway -dnsserver -vncpassword -
vncport -isofilepath [destination for the boot image]
```

Command Options

The following table describes the options available for the `CreateBootCD` command:

Table 175. CreateBootCD command options

Option	Description
`-?`	Display this help message.
`-ip`	Optional. This option specifies the IP address of the target BMR machine. By default, it generates automatically.
`-mask`	Optional. This option specifies the subnet mask of the target BMR machine. By default, it generates automatically.
`-defaultgateway`	Optional. This option specifies the default gateway of the target BMR machine. By default, it generates automatically.
`-dnsserver`	Optional. This option specifies the DNS server for the target BMR machine. By default, it generates automatically.
`-vncpassword`	Optional. This option specifies the user password for an existing UltraVNC account. By default, this option is empty.
`-vncport`	Optional. This option specifies the port to use for UltraVNC. You can change it only if you used the `-vncpassword` option. By default, the port is 5900.
`-isofilepath`	Optional. This option specifies the patch to the boot CD file. The default path is C:\ProgramData\AppRecovery\Boot CDs.

Example:

Create a boot CD:

```
>cmdutil /createbootcd -ip 192.168.20.188 -mask 255.255.255.0 -defaultgateway
192.168.20.2 -dnsserver 192.168.20.2 -isofilepath D:\bcd\newbcd3.iso
```

CreateRepository

Use the `createrepository` command to create a new DVM repository on a local machine or on a CIFS share location.

Usage

The usage for the command when creating a repository on a local location is as follows:

```
/createrepository -name [repository name] -size [size allocated for repository]
-datapath [data path of repository] -metadatapath [metadata path of repository]
-core [host name] -user [user name] -password [password]
```

The usage for the command when creating a DVM repository on a share location is as follows:

```
/createrepository -name [repository name] -size [size allocated for repository]
-uncpath [path for data and metadata] -shareusername [user name for share
location] -sharepassword [password for share user name] -concurrentoperations
[number of operations to occur at one time] -core [host name] -user [user name]
-password [password]
```

Command Options

The following table describes the options available for the `createrepository` command:

Table 176. CreateRepository command options

Option	Description
`-?`	Display help on the command.
`-core`	Optional. Remote core host machine IP address (with an optional port number). By default, the connection is made to the core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-name`	Repository name.
`-size`	Size of repository storage location. Available units are b, Kb, Mb, Gb, Tb, and Pb.
`-datapath`	For local location only. Determines data path of repository storage location.
`-metadatapath`	For local location only. Determines metadata path of repository storage location.
`-uncpath`	For share location only. Determines data and metadata paths of repository storage location.
`-shareusername`	For share location only. Determines the user name to the share location.
`-sharepassword`	For share location only. Determines password to share location.
`-comment`	Optional. Description of repository.

Option	Description
`-concurrentoperations`	Optional. Maximum number of operations that can be pending at one time. Value by default: 64.

Examples:

Create a DVM repository at a local location:

```
>cmdutil /createrepository -name “Repository 1” -size 200 Gb -datapath d:
\repository -metadatapath d:\repository -core 10.10.10.10:8006 -user
administrator -password 23WE@#$sdd
```

Create a DVM repository at a share location:

```
>cmdutil /createrepository -name “Repository 1” -size 200 Gb -uncpath \\share
\repository -shareusername login -sharepassword pass123 -comment “First
repository.” -concurrentoperations 8 -core 10.10.10.10:8006 -user administrator
-password 23WE@#$sdd
```

DeleteRepository

You can use the DeleteRepository command to remove an entire DVM repository created in AppAssure Core or Rapid Recovery Core.

Usage

The usage for the command is as follows:

```
/deleterepository -core [host name] -user [user name] -password [password]
name] -name [repository name] | -a [all repositories]
```

Command Options

The following table describes the options available for the `DeleteRepository` command:

Table 177. DeleteRepository command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-a`	Optional. This option deletes all DVM repositories associated with the Core.
`-name`	The name of the DVM repository you want to delete.

Example:

Delete all DVM repositories:

```
>cmdutil /deleterepository -a
```

Delete the repository with the name "RepositoryName:"

```
>cmdutil /deleterepository -name RepositoryName
```

Dismount

Use the `dismount` command to dismount a mounted recovery point specified by the `-path` option, dismount points for the selected agent by the `-protectedserver` parameter, or dismount all mounted recovery points—`-all`.

Usage

The usage for the command is as follows:

```
/dis[mount] -core [host name] -user [user name] -password [password] [-all | -
protectedserver [name | IP address] | -path [location]
```

Command Options

The following table describes the options available for the `dismount` command:

Table 178. Dismount command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-all`	Dismount all mounted recovery points.
`-protectedserver`	Dismount all mounted recovery points for current agent.
`-path`	Dismount selected mount point.

Example:

Dismount a recovery point that was mounted to folder c:\mountedrecoverypoint:

```
>cmdutil /dismount -core 10.10.10.10 -user administrator -password 23WE@#$sdd -
path c:\mountedRecoveryPoint
```

DismountArchiveRepository

After retrieving the information you want from a mounted archive, you should dismount the archive to avoid potential issues.

Usage

The usage for the command is as follows:

```
/dismountarchiverepository -core [host name] -user [user name] -password
[password] name] -name [archive repository name]
```

Command Options

The following table describes the options available for the `DismountArchiveRepository` command:

Table 179. DismountArchiveRepository command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-name`	Required. The name of the archive repository.

Examples:

Dismount the repository named "NewArchive:"

```
>cmdutil /dismountarchiverepository -name NewArchive -core 10.10.10.10 -user
administrator -password 23WE@#$sdd -path d:\work\archive
```

EditEsxServer

You can use the `editesxserver` command whenever you want to make changes to the number of VMware ESX(i) virtual machines that you want to protect agentlessly.

Usage

The usage for the command is as follows:

```
/editEsxServer -core [host name] -user [user name] -password [password] -
protectedserver [name | IP address] -add | -remove -virtualMachines [virtual
machines collection | all] -autoProtect [object ID or name collection]
```

Command Options

The following table describes the options available for the `editesxserver` command:

Table 180. EditEsxServer command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-repository`	Required. The name of the repository that is associated with the Core that you want to use to protect the virtual machine. NOTE: You must enclose the name in double quotes.
`-protectedserver`	Use this option to edit vCenter and ESX(i) objects for a specific protected machine.
`-add`	Use this option to add a specified vCenter or ESXi object.
`-remove`	Use this option to remove a specified vCenter or ESXi object.
`-virtualmachines`	Optional. This option lets you list the virtual machines that you want to protect.
`-autoprotect`	Optional. This option lets you list the new virtual machines that you want to automatically protect.

Examples:

Automatically protect specific vCenter or ESXi objects of a vCenter or ESXi server with the Core:

```
>cmdutil /editEsxServer -protectedserver 10.10.8.150 -add -autoprotect
"Folder1" "Folder2"
```

Force

The `force` command forces a snapshot of a specified protected server. Forcing a snapshot lets you force a data transfer for the current protected machine. When you force a snapshot, the transfer will start immediately or will be added to the queue. Only the data that has changed from a previous recovery point will be transferred. If there is no previous recovery point, all data on the protected volumes will be transferred.

Usage

The usage for the command is as follows:

```
/force [snapshot] default | [base] [-all | -protectedserver [name | IP
address]] -core [host name] -user [user name] -password [password]
```

Command Options

The following table describes the options available for the `force` command:

Table 181. Force command options

Option	Description
`-?`	Display this help message.
`-force`	Optional. Type of snapshot to create. Available values: 'snapshot' (incremental snapshot) and 'base' (base image snapshot). By default, an incremental snapshot is performed.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-all`	Force snapshots for all machines on the core.
`-protectedserver`	Force a snapshot for a specific protected machine.

Example:

Force a snapshot for all machines on the Core:

```
>cmdutil /force snapshot -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -all
```

ForceAttach

The `forceattach` command lets you force a SQL database files attachability check. When you force an attachability check, the check begins immediately.

Usage

The usage for the command is as follows:

```
/forceattach -core [host name] -user [user name] -password [password] -
protectedserver [name | IP address] -rpn [number | numbers] | -time [time
string]
```

Command Options

The following table describes the options available for the `forceattach` command:

Table 182. ForceAttach command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-protectedserver`	Protected machine against which to perform the attachability check.
`-rpn`	The sequential number of a recovery point against which to perform checks (run command /list rps to obtain the numbers). To perform checks against multiple recovery points with a single command, you can specify several numbers separated by spaces.
`-time`	Select a recovery point by its creation time. You must specify the exact time in the format “mm/dd/yyyy hh:mm tt” (for example, “2/24/2012 09:00 AM”). Keep in mind to specify the date and time values of the time zone set on your PC.

Example:

Perform attachability checks for recovery points with numbers 5 and 7:

```
>cmdutil /forceattach -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -protectedserver 10.10.5.22 -rpn 5 7
```

ForceChecksum

The `forcechecksum` command lets you force an integrity check of any Exchange Message Databases (MDBs) present on the specified recovery point or points. When you force a checksum check, the command begins immediately.

Usage

The usage for the command is as follows:

```
/forcechecksum -core [host name] -user [user name] -password [password] -
protectedserver [name | IP address] -rpn [number | numbers] -time [time string]
```

Command Options

The following table describes the options available for the `forcechecksum` command:

Table 183. ForceChecksum command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
-protectedserver	Protected machine against which to perform the checksum check.
-rpn	The sequential number of a recovery point against which to perform checks (run command /list rps to obtain the numbers). To perform checks against multiple recovery points with a single command, you can specify several numbers separated by spaces.
-time	Select a recovery point by its creation time. You must specify the exact time in the format “mm/dd/yyyy hh:mm tt” (for example, “2/24/2012 09:00 AM”). Keep in mind to specify the date and time values of the time zone set on your PC.

Example:

Perform a checksum check for recovery points with numbers 5 and 7:

```
>cmdutil /forcechecksum -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -protectedserver 10.10.5.22 -rpn 5 7
```

ForceLogTruncation

Forcing log truncation lets you perform this job one time, on-demand. It immediately truncates the logs for the specified SQL Server agent machine.

Usage

The usage for the command is as follows:

```
/[forcelogtruncation | flt] -core [host name] -user [user name] -password
[password] -protectedserver [name | IP address]
```

Command Options

The following table describes the options available for the `forcelogtruncation` command:

Table 184. ForceLogTruncation command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
-protectedserver	Protected machine against which to perform log file truncation.

Example:

Force log truncation for a protected server:

```
>cmdutil /forcelogtruncation -core 10.10.10.10 -user administrator -password
23WE@#$sdd -protectedserver 10.10.20.20
```

ForceMount

Use the `forcemount` command to conduct an one-time recovery point mountability check. This determines whether or not the specified recovery point or recovery points can be mounted and used to restore backed up data. You must list either one or more specific recovery points on which to conduct the check, or a time range during which the recovery points were created.

Usage

The usage for the command is as follows:

```
/forcemount -core [host name] -user [user name] -password [password] -
protectedserver [name | IP address] -rpn [number | numbers] | -time [time
string]
```

Command Options

The following table describes the options available for the `forcemount` command:

Table 185. ForceMount command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.

Option	Description
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
-protectedserver	Protected machine against which to perform a mountability check.
-rpn	The sequential number of a recovery point against which to perform checks (run command /list rps to obtain the numbers). To perform checks against multiple recovery points with a single command, you can specify several numbers separated by spaces.
-time	Select a recovery point by its creation time. You must specify the exact time in the format "mm/dd/yyyy hh:mm tt" (for example, "2/24/2012 09:00 AM"). Keep in mind to specify the date and time values of the time zone set on your PC.

Example:

Perform mountability checks for recovery points with numbers 5 and 7:

```
>cmdutil /forcemount -core 10.10.10.10 -user administrator -password 23WE@#$sdd
-protectedserver 10.10.20.20 -rpn 5 7
```

ForceReplication

Use the `forcereplication` command to force a one-time transfer of replicated data from the source core to the target core. You can replicate one specific protected server or replicate all protected servers. The protected servers must be already configured for replication.

Usage

The usage for the command is as follows:

```
/[forcereplication |frep] -core [host name] -user [user name] -password
[password] -targetcore [host name] -all | -protectedserver [name | IP address]
```

Command Options

The following table describes the options available for the `forcereplication` command:

Table 186. ForceReplication command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.

Option	Description
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used
-targetcore	Host name of the target core against which replication should be forced.
-protectedserver	The protected machine you want to replicate.
-all	Force replication for all machines being replicated to the target core.

Example:

Force replication for a protected server on a specific target core:

```
>cmdutil /forcereplication -target core 10.10.10.10 -protectedserver 10.20.30.40
```

ForceRollup

Use the `forcerollup` command to force the rollup of recovery points on a protected machine.

Usage

The usage for the command is as follows:

```
/[forcerollup | fro] -core [host name] -user [user name] -password [password] -
protectedserver [name | IP address]
```

Command Options

The following table describes the options available for the `forcerollup` command:

Table 187. ForceRollup command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used

Option	Description
-protectedserver	Optional. Protected machine against which to perform rollup.

Example:

Force rollup for agent 10.10.10.1 on the Core:

```
>cmdutil /forcerollup -core 10.10.10.10 - user administrator -password 23WE@#
$sdd -protectedserver 10.10.10.1
```

ForceVirtualStandby

Exporting data from a protected machine to a virtual machine creates a virtual standby machine. If you have continuous virtual export set up, you can use this command to force Rapid Recovery to export data on demand, regardless of the predetermined schedule.

Usage

The usage for the command is as follows:

```
/forcevirtualstandby -core [host name] -user [user name] -password [password
login] -protectedserver [name] | -all
```

Command Options

The following table describes the options available for the `ForceVirtualStandby` command:

Table 188. ForceVirtualStandby command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
-protectedserver	The name or space-separated names of virtualized machines.
-all	This command specifies whether to force all scheduled virtual exports.

Examples:

Force all virtual standby exports:

```
>cmdutil /forcevirtualstandby -all
```

Force virtual standby for two machines:

```
>cmdutil /forcevirtualstandby -protectedserver 10.10.35.48 10.10.35.69
```

Help

The `help` command displays a list of the available commands and their definitions. It also provides copyright and version details.

Usage

The usage for the command is as follows:

```
/help
```

Example:

Request Command Line help:

```
>cmdutil /help
```

List

The `list` command returns information about all recovery points, active jobs, completed jobs, failed jobs, invalid (failed) recovery points, valid (passed) recovery points, mounts, protected servers, volumes, virtualized servers, unprotected volumes, clusters, protection groups, SQL databases, Exchange databases, replicated servers, and repositories for the specified agent or list of servers currently protected by the Core. The most recent records return by default. You can list all records or specify how many records display by using a number parameter. This parameter should contain the letter "l" for the latest recovery points and "f" for the first recovery point. Each recovery point has its own number, which the administrator can use for mounting.

Usage

The usage for the command is as follows:

```
/list [rps | passed | failed | mounts | volumes | protectedservers | activejobs
| completed jobs | failedjobs | virtualizedservers | unprotectedvolumes |
clusters | protectiongroups | sqldatabases | exchangemailstores |
replicatedservers | repositories] -protectedserver [name | IP address] -core
[host name] -user [user name] -password [password] -number [all | l<number> |
f<number> | <number>] -jobtype
```

Command Options

The following table describes the options available for the `list` command:

Table 189. List command options

Option	Description
`-?`	Display this help message.
`-list`	Select one of the following options: • all recovery points ('rps') • valid recovery points ('passed') • invalid recovery points ('failed')

Option	Description
	• mounts ('mounts') • protected volumes ('volumes') • unprotected volumes ('unprotectedvolumes') • protected machines ('protectedservers') • active jobs ('activejobs') • failed jobs ('failedjobs') • completed jobs ('completedjobs') • virtualized servers ('virtualizedservers') • clusters ('clusters') • protection groups ('protectiongroups') • SQL Server databases ('sqldatabases') • MS Exchange databases ('exchangemailstores') • replicated servers ('replicatedservers') • repositories (‘repositories’)
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-all`	For show jobs only. Display al events of a specific type (active/failed/completed) on the core server.
`-protectedserver`	Protected machine with recovery points to display.
`-number`	Optional. Number of data items to display. Use only with the following specifiers: 'rps', 'activejobs', 'completedjobs', 'failedjobs'. Available values are: • all (fetch all data items) • l[number] or [number] (fetches top ## data items) • f[number] (fetches first ## data items) Only takes effect when displaying recovery points and jobs.
`-jobtype`	Optional. Filter output by job type. Available values include: • 'transfer' (data transfer) • 'repository' (repository maintenance) • 'replication' (local and remote replications) • 'backup' (backup and restore) • 'bootcdbuilder' (create boot CDs) • 'diagnostics' (upload logs) • 'exchange' (Exchange Server files check) • 'export' (recovery point export) • 'pushinstall' (deploy agents)

Option	Description
	• 'restore' (recovery point restores) • 'rollup' (protected machine rollups) • 'sqlattach' (agent attachability checks) • 'mount' (mount repository)

Examples:

List the 30 most recent recovery points:

```
>cmdutil /list rps -core 10.10.10.10 -user administrator -password 23WE@#$sdd -
protectedserver 10.10.5.22 -number l30
```

View all failed data transfer jobs performed by a protected machine:

```
>cmdutil /list failed jobs -core 10.10.10.10 -user administrator -password
23WE@#$sdd -protectedserver 10.10.5.22 -number all -jobtype transfer
```

Mount

The `mount` command mounts a snapshot of one or more drives. You can specify whether the mount should be read, write, or read-only with previous writes. The default selection is read-only.

Usage

The usage for the command is as follows:

```
/mount -core [host name] -user [user name] -password [password] -
protectedserver [name | IP address] -mounttype [read | write |
readOnlyWithPreviousWrites] -drives [drive names] -volumes [volume names] -path
[location] -rpn [number | numbers] | -time [time string]
```

Command Options

The following table describes the options available for the `mount` command:

Table 190. Mount command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-protectedserver`	Protected machine with a recovery point or points to be mounted.

Option	Description
-mounttype	Optional. Specifies a mount mode. Available values are 'read' (read-only), 'readOnlyWithPreviousWrites' (read-only with previous writes), 'write' (writable). The default mode is read-only.
-volumes	Optional. List of volume names to mount. If not specified, all volumes are mounted. Values must be enclosed in double quotes and separated by spaces; for example: "c:" "d:". Do not use trailing slashes in volume names.
-path	Path to a folder on the core server to which the recovery point should be mounted. If one does not exist, a folder is automatically created.
-rpn	Optional. The sequential number of a recovery point to mount (use /list rps command to get the numbers). Specify several space-separated numbers to mount multiple recovery points with a single command. In this case data from each recovery point will be stored in a separate child folder. Note: if neither option -time nor -rpn is specified then the most recent recovery point that successfully passed integrity check will be mounted.
-time	Optional. Determines recovery point or points to be selected for mount. Available values include: 'latest', 'passed', exact time in the format "mm/dd/yyyy hh:mm tt" (for instance, "2/24/2012 09:00 AM"). Keep in mind to specify date time values of the time zone set on your PC. If neither the -time option nor the -rpn option is specified, then the most recent recovery point that successfully passed an integrity check is mounted.
-localdrive	Optional. Perform mount to user disk on local PC.

Examples:

Mount the most recent recovery points containing volumes “c:\” and “d:\” in the read-only mode:

```
>cmdutil /mount -core 10.10.10.10 -user administrator -password 23WE@#$sdd -
protectedserver 10.10.5.22 -path c:\mountedrecoverypoint -mounttype read -
volumes "c:" "d:"
```

Mount recovery points with numbers 2 and 7:

```
>cmdutil /mount -core 10.10.10.10 -user administrator -password 23WE@#$sdd -
protectedserver 10.10.5.22 -path c:\mountedrecoverypoint -rpn 2 7
```

MountArchiveRepository

To restore data from an archive in Rapid Recovery, you must first mount it.

Usage

The usage for the command is as follows:

```
/mountarchiverepository -core [host name] -user [user name] -password
[password] -name [archive repository name]
```

Command Options

The following table describes the options available for the mountarchiverepository command:

Table 191. MountArchiveRepository command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-name`	Required. The name of the archive repository.

Examples:

Mount the repository named "NewArchive:"

```
>cmdutil /mountarchiverepository -name NewArchive
```

NewCloudAccount

Use the NewCloudAccount command to add an account for a cloud provider to the Rapid Recovery Core. You can then use the account to store archives for retention or replication.

Usage

The usage for the command is as follows:

```
/newcloudaccount -core [host name] -user [user name] -password [password] -
displayname [name for the account] -type [cloud account provider] -useername
[user name for the account] -key [secret key] -region [region for account]
tenanatid [tenant ID] -authurl [authorization URL]
```

Command Options

The following table describes the options available for the `NewCloudAccount` command:

Table 192. NewCloudAccount command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.

Option	Description
`-password`	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-displayname`	The name you want to use for the cloud account.
`-type`	The type of cloud account. Supported values include: • amazon • openstack • rackspace • windowsazure • "windows azure" • azure
`-username`	The user name for the cloud account you want to add. This is the credential you use in the authentication process. The property has the following variations based on the cloud type: • Amazon - Access Key • OpenStack - User Name • Rackspace - User Name • Windows Azure - Storage Account Name
`-key`	The authentication key for the cloud account you want to add. This is the credential you use in the authentication process. The property has the following variations based on the cloud type: • Amazon - Secret Key • OpenStack - API Key • Rackspace - API Key • Windows Azure - Access Key
`-region`	The region of the cloud account you want to add. This option is required only for OpenStack and Rackspace acocunts.
`-tenantid`	The ID you use to authenticate an OpenStack cloud account. This option is required only for OpenStack accounts.
`-authurl`	The URL you use to authenticate an OpenStack cloud account. This option is required only for OpenStack accounts.

Examples:

Add a new cloud account with the name "Amazon S3 Account" with the access key "akey" and the secret key "skey:"

```
>cmdutil /newcloudaccount -displayname "Amazon S3 Account" -type amazon -
useername akey -key skey
```

OpenDvmRepository

Use this command to open an existing DVM repository created in AppAssure Core or Rapid Recovery Core.

Usage

The usage for the command is as follows:

```
/opendvmrepository -localpath [local path] -sharepath [network share path] -
shareusername [user name for network share] -sharepassword [network share
password]
```

Command Options

The following table describes the options available for the `OpenDvmRepository` command:

Table 193. OpenDvmRepository command options

Option	Description
`-?`	Display this help message.
`-localpath`	The path to the folder with a DVM repository on the local Core.
`-sharepath`	The path to the folder with the DVM repository on a CIFS share.
`-shareusername`	The user name you use to log in to the shared folder.
`-sharepassword`	The password you use to log in to the shared folder.

Example:

Open an existing DVM repository on the local machine:

```
>cmdutil /opendvmrepository -localpath E:\Repository
```

Pause

An administrator can pause snapshots, export to virtual machines, or replicate a Core. The `pause` command accepts three parameters: `snapshot`, `vmexport`, and `replication`. Only one parameter can be specified. A snapshot can be paused until a certain time, if a time parameter is specified.

A user can pause replication in three ways:

- On a source Core for all protected machines.(– `[outgoing]`).

  The administrator must specify the remote machine name with the outgoing replication pairing to pause outgoing replication on the source Core:

  ```
  >cmdutil /pause replication /o 10.10.12.10
  ```
- On the source Core for a single protected machine.(–`protectedserver`):

  ```
  >cmdutil /pause replication /protectedserver 10.10.12.97
  ```
- On target Core (–`incoming`).

  If the local Core is a target Core, the administrator can pause replication by specifying the source Core using the incoming parameter:

  ```
  >cmdutil /pause replication /i 10.10.12.25
  ```

Usage

The usage for the command is as follows:

```
/pause [snapshot | vmexport | replication] -core [host name] -user [user name] -
password [password] -all | -protectedserver [name | IP address] -incoming [host
name] | outgoing [host name] -time [time string]
```

Command Options

The following table describes the options available for the `pause` command:

Table 194. Pause command options

Option	Description
`-?`	Display this help message.
`-pause`	[`snapshots`], [`replication`] or [`vmexport`].
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-all`	Optional. Pause all agents on the selected Core.
`-protectedserver`	Optional. Pause current protected server.
`-incoming`	Optional. Host name of the remote core that replicates to the core machine.
`-outgoing`	Optional. Host name of the remote target core to which data is replicated.
`-time`	Optional. The time in the format ‘Day-Hours-Minutes’ when the snapshots will be resumed (only for snapshots pause).

Examples:

Pause creating snapshots for a specific protected server:

```
>cmdutil /pause snapshot -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -protectedserver 10.10.10.4
```

Pause creating snapshots for a protected machine and resume it after three days, 20 hours, and 50 minutes:

```
>cmdutil /pause snapshot -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -protectedserver 10.10.10.4 -time 3-20-50
```

Pause export to virtual machine for all protected machines on the core:

```
>cmdutil /pause vmexport -core 10.10.10.10 /user administrator -password 23WE@#
$sdd -all
```

Pause outgoing replication on the core for a specific protected machine:

```
>cmdutil /pause replication -core 10.10.10.10 -user administrator -password
23WE@#$sdd -protectedserver 10.10.1.76
```

Pause outgoing replication for all protected machines on the target core:

```
>cmdutil /pause replication -core 10.10.10.10 -user administrator -password
-23WE@#$sdd -outgoing 10.10.1.63
```

Pause incoming replication for all machines on the target core:

```
>cmdutil /pause replication -core 10.10.10.10 -user administrator -password
23WE@#$sdd -incoming 10.10.1.82
```

Protect

The `protect` command adds a server under protection by a core.

Usage

The usage for the command is as follows:

```
/protect -core [host name] -user [user name] -password [password] -repository
[name] -agentname [name | IP address] -agentusername [user name] -agentpassword
[password] -agentport [port] -volumes [volume names]
```

Command Options

The following table describes the options available for the `protect` command:

Table 195. Protect command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-repository`	Name of a repository on the Core to which the protected machine data should be stored. The name must be enclosed in double quotes.
`-agentname`	Name or IP address of the server you want to protect.

Option	Description
-agentusername	User name for the server to be protected.
-agentpassword	Password for the server to be protected.
-agentport	Protected server port number.
-volumes	List of volumes to protect. Values must be enclosed in double quotes and separated by a space. Do not use trailing slashes in volume names; for example: "c:" "d:".

Example:

Protect specific volumes of a server with the Core:

```
>cmdutil /protect -core 10.10.10.10 -username administrator -password 23WE@#
$sdd -repository "Repository 1" -agentname 10.10.9.120 -agentport 5002 -
agentusername administrator agentpassword 12345 -volumes "c:" "d:"
```

ProtectCluster

The `protectcluster` command adds a cluster under protection by a core.

Usage

The usage for the command is as follows:

```
/protectcluster -core [host name] -user [user name] -password [password] -
repository [name] -clustername [name | IP address] -clusterusername [user name]
-clusterpassword [password] -clusterport [port] -clustervolumes [volume names] -
clusternodes [cluster nodes collection]
```

Command Options

The following table describes the options available for the `protectcluster` command:

Table 196. ProtectCluster command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
-repository	Name of a repository on the Core to which the protected machine data should be stored. The name must be enclosed in double quotes.

Option	Description
`-clustername`	Name or IP address of the cluster you want to protect.
`-clusterusername`	User name for the cluster to be protected.
`-clusterpassword`	Password for the cluster to be protected.
`-clusterport`	Protected cluster server port number.
`-clustervolumes`	List of volumes to protect. Values must be enclosed in double quotes and separated by a space. Do not use trailing slashes in volume names; for example: “c:” “d:”.
`-clusternodes`	List of the cluster nodes and the volumes you want to protect on each node.

Example:

Protect specific volumes of a cluster server with the Core:

```
>cmdutil /protectcluster -core 10.10.10.10 -username administrator -password
23WE@#$sdd -repository “Repository 1” -clustername 10.10.8.150 -clusterport
8006 -clusterusername clusterAdmin clusterpassword password -volumes “C:
\ClusterStorage\Volume1” -clusternodes nodeName 10.10.8.150 volumes “c:”
nodeName 10.10.8.151 volumes “c:”
```

ProtectEsxServer

You can use the `protectesxserver` command whenever you want to add a VMware ESX(i) virtual machine to protection.

Usage

The usage for the command is as follows:

```
/protectesxserver -core [host name] -user [user name] -password [password] -
repository [repository name] -server [name | IP address] -serverusername [user
name] -serverpassword [password for server login] -serverport [port] -
virtualMachines [virtual machines collection | all] -autoProtect [object ID or
name collection]
```

Command Options

The following table describes the options available for the `protectesxserver` command:

Table 197. ProtectEsxServer command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.

Option	Description
-user	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
-repository	Required. The name of the repository that is associated with the Core that you want to use to protect the virtual machine. NOTE: You must enclose the name in double quotes.
-server	The name or IP address for the vCenter or ESXi server you want to protect.
-serverusername	The user name for logging in to the vCenter or ESXi server that you want to protect.
-serverpassword	The password for logging in to the vCenter or ESXi server that you want to protect.
-serverport	Optional. The port number for the vCenter or ESXi server that you want to protect.
-virtualmachines	Optional. This option lets you list the virtual machines that you want to protect.
-autoprotect	Optional. This option lets you list new virtual machines that you want to automatically protect.

Examples:

Protect specific virtual machines from a vCenter or ESXi server with the Core:

```
>cmdutil /protectesxserver -core 10.10.10.10 -user admin -password password -
repository "Repository 1" -server 10.10.8.150 -serverport 443 -serverusername
root -serverpassword password -virtualmachines "VM1" "VM2" -autoprotect
"Folder1"
```

RemoveAgent

The `RemoveAgent` command lets you remove a protected machine from the protection of a Core and optionally delete the recovery points of the removed machine. If you do not delete the recovery points, Rapid Recovery retains and labels them as a recovery points only machine.

Usage

The usage for the command is as follows:

```
/removeagent -core [host name] -user [user name] -password [password] -
protectedserver [name | IP address] -deleterecoverypoints
```

Command Options

The following table describes the options available for the `RemoveAgent` command:

Table 198. RemoveAgent command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-protectedserver`	The name or IP address of the server you want to remove from protection.
`-deleterecoverypoints`	Optional. Deletes all recovery points for the machine you want to remove.

Example:

Remove a machine from protection and delete the associated recovery points:

```
>cmdutil /removeagent -protectedserver 10.10.1.1 -deleterecoverypoints
```

RemoveArchiveRepository

You can use the `removearchiverepository` command to delete a repository from the Rapid Recovery Core.

Usage

The usage for the command is as follows:

```
/removearchiverepository -core [host name] -user [user name] -password
[password] name] -name [archive repository name]
```

Command Options

The following table describes the options available for the `removearchiverepository` command:

Table 199. RemoveArchiveRepository command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-name`	Required. The name of the archive repository.

Examples:

Remove the repository named "NewArchive" from the local Core:

```
>cmdutil /removearchiverepository -name NewArchive
```

RemovePoints

The `removepoints` command lets you delete specific recovery points of a protected machine.

Usage

The usage for the command is as follows:

```
/removepoints -core [host name] -user [user name] -password [password] -
protectedserver [name | IP address] -rpn [number | numbers] | -time [time
string]
```

Command Options

The following table describes the options available for the `removepoints` command:

Table 200. RemovePoints command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.

Option	Description
-protectedserver	The name or IP address of the server for which you want to delete recovery points
-rpn	Optional. The sequential number of a recovery point to be deleted (use `/list rps` command to get the numbers). Specify several space-separated numbers to delete multiple recovery points with a single command.
-time	Optional. Determines which recovery point or points to delete by creation time. Specify the exact time in the format "mm/dd/yyyy hh:mm tt" (for example, "2/24/2012 09:00 AM"). Keep in mind to specify the date time values of the time zone set on your PC.

Example:

Delete the recovery points with number 5 and 7:

```
>cmdutil /removepoints -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -protectedserver 10.10.5.22 -rpn 5 7
```

RemoveScheduledArchive

Use this command to discontinue an existing Rapid Recoveryscheduled continuous archive.

Usage

The usage for the command is as follows:

```
/removescheduledarchive -core [host name] -user [user name] -password
[password] name] -all -ids [id | id1 id2]
```

Command Options

The following table describes the options available for the `removescheduledarchive` command:

Table 201. RemoveScheduledArchive command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
-user	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
-all	This option specifies whether to remove all scheduled archives associated with this Core.

Option	Description
-ids	Use this option to list the ID or IDs for each scheduled archive you want to remove. Separate multiples IDs with spaces.

Examples:

Remove all scheduled archives:

```
>cmdutil /removescheduledarchive -all
```

Remove one scheduled archive:

```
>cmdutil /removescheduledarchive -ids 6c123c39-5058-4586-bd0c-7c375e72017b
```

RemoveVirtualStandby

Use this command to discontinue the continuous export of data to a virtual machine in the Rapid Recovery command utility.

Usage

The usage for the command is as follows:

```
/removevirtualstandby -core [host name] -user [user name] -password [password
login] -protectedserver [name] | -all
```

Command Options

The following table describes the options available for the `removevirtualstandby` command:

Table 202. RemoveVirtualStandby command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
-protectedserver	The name or space-separated names of virtualized machines.
-all	This command specifies whether to remove all scheduled virtual exports.

Examples:

Remove all virtual standby exports:

```
>cmdutil /removevirtualstandby -all
```

Remove virtual standby export for two machines:

```
>cmdutil /removevirtualstandby -protectedserver 10.10.35.48 10.10.35.69
```

Replicate

Use the `Replicate` command to set up replication between two Rapid Recovery Cores.

Usage

The usage for the command is as follows:

```
/replicate -request [email | email customer ID] -targetserver [host name |
hostname port | hostname user name password | hostname port user name password]
-replicationname [name] -seeddrive [localpath | network path username password]
[comment] -protectedserver [name | name repository]
```

Command Options

The following table describes the options available for the `Replicate` command:

Table 203. Replicate command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used
-request	Optional. Specify this option if you want to use a subscription to a third-party provider of off-site backup and disaster recovery services.
-targetserver	The name of the server where you want to establish replication. It includes the following parameters: • port • user name • password The port parameter is optional, with a default of 8006. If you used the `request` option, you should also use the user name and password for the target server.
-replicationname	Optional. Use the name of the replication job if you do not use the `request` option.
-seeddrive	Optional. Use this option to specify a seed drive for the initial data transfer. The comment parameter is optional.

Option	Description
-protectedserver	The list of protected machines you want to replicate. If you use the `request` option, list only the names or IP addresses of protected machines. Otherwise, list both protected machines and the corresponding remote repository name.

Example:

Replicate two protected machines to the remote Core using a seed drive from a network share:

```
>cmdutil /replicate -targetserver 10.10.1.100 Administrator 123Q -
replicationname ReplicationName -seeddrive Network \\10.10.1.100\seeddrive
Administrator 123Q -protectedserver 10.10.1.1 Repository1 10.10.1.2 Repository2
```

Replication

Use the `replication` command to control existing replication between two Rapid Recovery Cores and manage pending replication requests.

NOTE: This command succeeds the `Replicate` command, which establishes the connection—called pairing—between the Cores and uses a seed drive for the initial data transfer. For more information about this command, see Replicate.

Usage

The usage for the command is as follows:

```
/replication [-list [incoming | outgoing | pending] -accept | -deny | -ignore |
-delete | -edit] -id [replication ID] -protectedserver [name | name repository]
-responsecomment [comment] -deleterecoverypoints -scheduletype [type] -
dailystarttime [time] -dailyendtime [time] -weekdaystarttime [time] -
weekdayendtime [time] -weekendstarttime [time] -weekendendtime [time]
```

Command Options

The following table describes the options available for the `replication` command:

Table 204. Replication command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used
-list	The list of incoming or outgoing replication jobs or pending replication requests.
-accept	Accepts the replication request.

Option	Description
`-deny`	Denies the replication request.
`-ignore`	Ignores the replication request.
`-delete`	Use this option to delete an existing replication job or a machine from the replication job. Specify only the `-id` parameter to delete an entire replication relationship, or specify both the `-id` and `-protectedserver` parameters to delete only specific machines from replication.
`-edit`	Edits the schedule of existing replication jobs.
`-id`	The identifier for the replication job or pending replication request. It can be a remote Core ID, host name, customer ID, email address, or pending replication request ID.
`-protectedserver`	When responding to a replication request, use this option to apply your response to list of protected servers with a repository name or ID. Use the parameter "all" to apply response to all requested machines.
`-responsecomment`	The comment you provide with the response to a pending replication request.
`-deleterecoverypoints`	Use this option if specific recovery points from a deleted replicated machine should also be removed.
`-scheduletype`	If you use the `-edit` option, this option specifies the type of replication schedule. Include one of the following four values: • atalltimes - Automatically replicate at any time. • daily - Replicate daily. Specify the `-dailystarttime` and `-dailyendtime` parameters. • custom - When using daily replication, use this value to schedule replication on weekdays or weekends. Specify the `-weekdaystarttime`, `-weekdayendtime`, `-weekendstarttime`, and `-weekendendtime` parameters.
`-dailystarttime`	Use only for the daily value of the `-scheduletype` option. It is used to establish a window of time for when replication should occur. Use this option to specify the earliest time of day when you want replication to start.
`-dailyendtime`	Use only for the daily value of the `-scheduletype` option. It is used to establish a window of time for when replication should occur. Use this option to specify the latest time of day when you want replication to start.
`-weekdaystarttime`	Use only for the custom value of the `-scheduletype` option. It is used to establish a window of time for when replication should occur. Use this option to specify the earliest time of a weekday when you want replication to start.
`-weekdayendtime`	Use only for the custom value of the `-scheduletype` option. It is used to establish a window of time for when replication should occur. Use this option to specify the latest time of a weekday when you want replication to start.
`-weekendstarttime`	Use only for the custom value of the `-scheduletype` option. It is used to establish a window of time for when replication should occur. Use this option to specify the earliest time of the weekend when you want replication to start.

Option	Description
`-weekendendtime`	Use only for the custom value of the `-scheduletype` option. It is used to establish a window of time for when replication should occur. Use this option to specify the latest time of the weekend when you want replication to start.

Example:

List all incoming replication:

```
>cmdutil /replication -list incoming
```

Accept pending replication requests for two protect machines:

```
>cmdutil /replication -accept -id customer@email.address -protectedserver
10.10.1.1 Repository1 10.10.1.2 Repository2 -responsecomment A response comment
```

Deny a pending replication request:

```
>cmdutil /replication -deny -id customer@email.address
```

Delete existing replication with replicated recovery points:

```
>cmdutil /replication -delete -id RemoteServerHostname -deleterecoverypoints
```

Remove two machines from existing replication:

```
>cmdutil /replication -delete -id "156d7a46-8e44-43f4-9ed8-60d998e582bf" -
protectedserver 10.10.1.1 10.10.1.2
```

Edit schedule of replication with specified weekday and weekend times:

```
>cmdutil /replication -edit -id RemoteServerHostName -scheduletype custom -
weekdaystarttime "9:00 AM" -weekdayendtime "6:00 PM" -weekendstarttime "9:00
AM" -weekendendtime "6:00 PM"
```

RestoreAgent

The `restoreagent` command lets you restore a protected machine or volume from a specific Rapid Recovery recovery point.

Usage

The usage for the command is as follows:

```
/restoreagent -protectedserver [name | IP address] -rpn [recovery point number]
-volumes [IDs | names | all] -targetmachine [name] -targetvolume [volume name] -
forcedismount -autorestart
```

Command Options

The following table describes the options available for the `restoreagent` command:

Table 205. RestoreAgent command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-protectedserver`	The name or IP address of the server you want to restore.
`-rpn`	The identification number of the recovery point you want to use to restore the machine. To find the correct number, use the command `/list rps`.
`-volumes`	The IDs or names of the volumes you want to restore. To restore all protected volumes, use `-volumes all`.
`-targetmacchine`	The name of the machine to which you want to restore the protected machine.
`-targetvolume`	The name or ID of the volume to which you want to restore the machine.
`-forcedismount`	Optional. Use this option to force the dismount of the database on demand.
`-autorestart`	Optional. Use this command if restarting an Exchange Server machine is necessary.

Example:

Restore a machine to a protected machine with the IP address 192.168.20.130, including the force database dismount option:

```
>cmdutil /restoreagent -protectedserver 192.168.20.130 -rpn 259 -volumes "F:"
"E:" "C:" -targetmachine 192.168.20.174 -targetvolume "E:" "G:" "F:" -
forcedismount
```

RestoreArchive

This command restores an archive from a local archive or share and places the restored data in a specified repository.

Usage

The usage for the command is as follows:

```
/restorearchive -core [host name] -user [user name] -password [password] -all |
-protectedserver [name | IP address] -repository [name] -archiveusername [name]
-archivepassword [password] -path [location]
```

Command Options

The following table describes the options available for the `restorearchive` command:

Table 206. RestoreArchive command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-all`	Restore data for all protected machines from the archive files.
`-protectedserver`	Protected machine with recovery points to restore. You can specify several machine names enclosed in double quotes and separated by spaces.
`-repository`	Name of a repository on the Core to which the restored recovery points should be placed. The name must be enclosed in double quotes.
`-archiveusername`	Optional. User name for the remote machine. Required for network path only.
`-archivepassword`	Optional. Password to the remote machine. Required for network path only.
`-path`	Location of the archived data to be restored; for example: d:\work\archive or network path \\servename\sharename.

Examples:

Restore archived data for all protected servers:

```
>cmdutil /restorearchive -core 10.10.10.10 -username administrator -password
23WE@#$sdd -all -repository repository1 -path d:\work\archive
```

Restore archived data for specific protected servers:

```
>cmdutil /restorearchive -core 10.10.10.10 -username administrator -password
23WE@#$sdd -protectedserver "10.10.20.30" "20.10.10.5" -repository repository1 -
path d:\work\archive
```

RestoreUrc

The `restoreurc` command lets you restore a protected machine or volume from a specific Rapid Recovery recovery point to a bare-metal machine using the Universal Recovery Console (URC).

Usage

The usage for the command is as follows:

```
/restoreurc -protectedserver [name | IP address] -rpn [recovery point number] -
volumes [IDs | names | all] -targetmachine [IP address] -urcpassword [password
from the URC] -targetdisk [disk number | all]
```

Command Options

The following table describes the options available for the `restoreurc` command:

Table 207. RestoreUrc command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-protectedserver`	The name or IP address of the server you want to which you want to restore the URC.
`-rpn`	The identification number of the recovery point you want to use to restore the machine. To find the correct number, use the command `/list rps`.
`-volumes`	The IDs or names of the volumes you want to restore. To restore all protected volumes, use `-volumes all`.
`-targetmacchine`	The name of the machine to which you want to restore the protected machine.
`-urcpassword`	The authentication key from the URC.
`-targetdisk`	The numbers of the disks on which you want to restore the machine. To select all disks from the machine using the URC, use `-targetdisk all`.

Example:

Restore a machine to disks 0 and 1 of the machine using the URC, when the IP address for the URC machine is 192.168.20.175:

```
>cmdutil /restoreurc -protectedserver 192.168.20.130 -rpn 259 -volumes "C:"
"E:" -targetmachine 192.168.20.175 -urcpassword ******** -targetdisk 0 1
```

Resume

The administrator can use this command to resume snapshots, export to a virtual machine, and replicate. You must specify your need to resume by a parameter. The following parameters are valid: `snapshot`, `vmexport`, and `replication`. See Pause for more details.

Usage

The usage for the command is as follows:

```
/resume [snapshot | vmexport | replication] -core [host name] -user [user name]
-password [password] -all | -protectedserver [name | IP address] -incoming
[host name] | outgoing [host name] -time [time string]
```

Command Options

The following table describes the options available for the `resume` command:

Table 208. Resume command options

Option	Description
`-?`	Display this help message.
`-restore`	[`snapshots`], [`replication`] or [`vmexport`].
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-all`	Resume all agents on the selected Core.
`-protectedserver`	Resume current protected server.
`-incoming`	Host name of the remote core that replicates to the core machine.
`-outgoing`	Host name of the remote target core to which data is replicated.

Examples:

Resume snapshots for specific protected server:

```
>cmdutil /resume snapshot -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -protectedserver 10.10.10.4
```

Resume export to a virtual machine for all protected machines on the core:

```
>cmdutil /resume vmexport -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -all
```

Resume outgoing replication on the core for a specific protected machine:

```
>cmdutil /resume replication -core 10.10.10.10 -user administrator -password
23WE@#$sdd -protectedserver 10.10.1.76
```

Resume outgoing replication for all protected machines on the target core:

```
>cmdutil /resume replication -core 10.10.10.10 -user administrator -password
23WE@#$sdd -outgoing 10.10.1.63
```

Resume incoming replication for all machines on the target core:

```
>cmdutil /resume replication -core 10.10.10.10 -user administrator -password
23WE@#$sdd -incoming 10.10.1.82
```

SeedDrive

You can use a seed drive for the initial data transfer when you establish Rapid Recovery replication.

Usage

The usage for the command is as follows:

```
/seeddrive [-list | -startcopy | -startconsume | -abandon] -path [local |
network path] -seeddriveusername [user name] -seeddrivepassword [password] -
remotecore [name] [-targetcore [name or IP] | -protectedserver [name] | -all] -
usecompatibleformat
```

Command Options

The following table describes the options available for the `seeddrive` command:

Table 209. SeedDrive command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.

Option	Description
-password	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
-list	The list of outstanding seed drives with extended information.
-startcopy	Start copying data to the seed drive.
-startconsume	Start consuming the seed drive.
-abandon	Abandon the outstanding seed drive request.
-path	The local or network path of the seed drive.
-seeddriveusername	Optional. The user name for the network location of the seed drive.
-seeddrivepassword	Optional. The password for the network location of the seed drive.
-targetcore	Optional. Use only with the -copy option. It is the name or IP address of the remote Core. All protected machines replicating to this Core receive seed drive recovery points.
-remotecore	Use only with the -consume option. It is the name of the remote Core from which the seed drive recovery points are created or consumed.
-protectedserver	The name or IP address of the protected machine you are using to create or consume the seed drive of recovery points. For example: -protectedserver "10.10.60.48" "10.10.12.101."
-all	This option specifies whether to consume or copy all of the available protected machines.
-usecompatibleformat	The new archiving format offers improved performance, however it is not compatible with older Cores. Use this option when working with a legacy AppAssure Core.

Examples:

List outstanding seed drives:

```
>cmdutil /seeddrive -list
```

Copy two protected machines to the seed drive on the network share:

```
>cmdutil /seeddrive -startcopy -remotecore TargetCoreName -path \
\10.10.1.1\Share\Seed\ -seeddriveusername Administrator -seeddrivepassword
12345 -usecompatibleformat
```

Starting consuming the seed drive:

```
>cmdutil /seeddrive -startconsume -path \\10.10.1.1\Share\Seed\ -
seeddriveusername Adminsitrator -seeddrivepassword 12345 -remotecore
RemoteCoreName
```

Abandon an outstanding seed drive request:

```
>cmdutil /seeddrive -abandon RemoteCoreHostName
```

StartExport

The `startexport` command forces a one-time export of data from a protected machine to a virtual server. You can export to an ESXi, VMware Workstation, Hyper-V, or VirtualBox virtual machine. If exporting to ESXi, you must specify thick or thin disk provisioning.

Usage

The usage for the command is as follows:

```
/startexport -exporttype [esxi | vm | hyperv | vb] -core [host name] -user
[user name] -password [password] -protectedserver [name | IP address] -volumes
[volume names] -rpn [recovery point number | numbers] | -time [time string] -
vmname [virtual machine name] -hostname [virtual host name] -hostport [virtual
hostport number] -hostusername [virtual host user name] -hostpassword [virtual
host password] [-ram [total megabytes] | -usesourceram] -diskprovisioning [thin
| thick] -diskmapping [automatic | manual | withvm] -targetpath [location] -
pathusername [user name] -pathpassword [password] [-uselocalmachine]
```

Command Options

The following table describes the options available for the `startexport` command:

Table 210. StartExport command options

Option	Description
`-?`	Display this help message.
`-exporttype`	Perform export of data from protected server to an ESXi server ('esxi'), VMware Workstation server ('vm'), Hyper-V server ('hyperv'), or VirtualBox server ('vb').
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-protectedserver`	Protected machine with recovery points to be exported.
`-volumes`	Optional. List of volume names to be exported. If not specified, all volumes will be exported. Values must be enclosed in double quotes and separated with spaces; for example: “c:” “d:”. Do not use trailing slashes in volume names.
`-rpn`	Optional. The sequential number of a recovery point to be exported (use Get-RecoveryPoints command to get the numbers). If neither the ‘time’ nor the ‘rpn’ option is specified, then the most recent recovery point is exported.

Option	Description
`-time`	Optional. Determines the recovery point or points to be selected for export. You need to specify the exact time in the format "mm/dd/yyyy hh:mm tt" (for example, "2/24/2012 09:00 AM"). Be sure to specify the date time values of the time zone set on your PC. Note: if neither the 'time' nor the 'rpn' option is specified, then the most recent recovery point is exported.
`-vmname`	The Windows name of the virtual machine.
`-hostname`	For ESXi and Hyper-V virtual exports only. The virtual server host name.
`-linuxhostname`	For VirtualBox exports only. The virtual server host name.
`-hostport`	For ESXi and Hyper-V virtual exports only. The virtual server port number.
`-hostusername`	For ESXi and Hyper-V virtual exports only. The user name for the virtual server host.
`-hostpassword`	For ESXi and Hyper-V virtual exports only. The password for the virtual server host.
`-ram`	Use this option to allocate a specific amount of RAM on the virtual server.
`-usesourceram`	Optional. Use this option to allocate the same amount of RAM on the virtual server that the source machine contains.
`-diskprovisioning`	Use this option for ESXi exports only. Optional. The amount of disk space that you want to allocate on the virtual machine. Use one of the two following specifications: • Thick - This specification makes the virtual disk as large as the original drive on the protected machine. • Thin - This specification allocates the amount of actual disk space occupied on the original drive with a few additional megabytes. The default specification is "thin."
`-diskmapping`	Use this option for ESXi exports only. Optional. This option determines how to map the disks from the protected machine to the virtual machine. Use one of the following values: • auto - This value automatically maps the disks. • manual - This value lets you map the disks manually. • withvm - This value stores the virtual disks in a datastore that you select. The default value is "auto."
`-targetpath`	For VMware Workstation and VirtualBox exports only. This option specifies the local or network path—or Linux path, for VirtualBox only—to the folder where you want to store the virtual machine files
`-pathusername`	For VMware Workstation exports only. It is the user name for the network machine. It is only required when you specify a network path in the `-targetpath` option.
`-pathpassword`	For VMware Workstation exports only. It is the password for the network machine. It is only required when you specify a network path in the `-targetpath` option.

Option	Description
`-uselocalmachine`	For Hyper-V exports only. Optional. Use this command to connect to the local Hyper-V server. This option ignores the `-hostname`, `-hostport`, `-hostusername`, and `-hostpassword` options.

Examples:

Export data to an ESXi virtual machine with a specific name and the same amount of RAM and disk size as the source protected server:

```
>cmdutil     /startexport -exporttype esxi -core 10.10.10.10 -user
administrator -password 23WE@#$sdd -protectedserver 10.10.5.22 -vmname Win2008-
Smith -hostname 10.10.10.23 -hostport 443 -hostusername root -hostpassword
12QWsdxc@# -usesourceram -diskprovisioning thick
```

Create a VMware Workstation machine file on the local drive with protected data from recovery point #4:

```
>cmdutil /startexport -exporttype vmstation -core 10.10.10.10 -user
administrator -password 23WE@#$sdd -protectedserver 10.10.5.22 -rpn 4 -vmname
Win2008-Smith -targetpath c:\virtualmachines -ram 4096
```

Create a Hyper-V machine files to be stored on a remote machine:

```
>cmdutil /startexport -exporttype hyperv -core 10.10.10.10 -user administrator -
password 23WE@#$sdd -protectedserver 10.10.5.22 -vmlocation \\WIN7-Bobby
\virtualmachines -hostname 10.10.10.23 -hostport 443 -hostusername root -
hostpassword 12QWsdxc@# -ram 4096
```

UpdateRepository

The `updaterepository` command adds a new storage location to an existing DVM repository.

Usage

The usage for the command is as follows:

```
/updaterepository -name [repository name] -size [size of the repository] [-
datapath [data path] -metadatapath [metadata path] | [-uncpath [UNC path] -
shareusername [share user name] -sharepassword [share password] -core [host
name] -user [user name] -password [password]
```

Command Options

The following table describes the options available for the `updaterepository` command:

Table 211. UpdateRepository command options

Option	Description
`-?`	Display this help message.
`-name`	Repository name.
`-size`	Size of repository storage location. Available units are b, Kb, Mb, Gb, Tb, and Pb.
`-datapath`	For local location only. Determines data path of repository storage location.

Option	Description
-metadatapath	For local location only. Determines metadata path of repository storage location.
-uncpath	For share location only. Determines data and metadata paths of repository storage location.
-shareusername	For share location only. Determines user name to share location.
-sharepassword	For share location only. Determines password to share location.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.

Examples:

Create a new storage location in a local DVM repository:

```
>cmdutil /updaterepository -name “Repository 1” -size 200Gb -datapath d:
\repository -metadatapath d:\repository -core 10.10.10.10:8006 -username
administrator -password 23WE@#$sdd
```

Create a storage location for a DVM repository at a shared location:

```
>cmdutil /updaterepository -name “Repository 1” -size 200Gb -uncpath \\share
\repository -shareusername login -sharepassword 23WE@#$sdd -core
10.10.10.10:8006 -username administrator -password 23WE@#$sdd
```

Version

The `version` command displays information about the version of the Rapid Recovery software installed on the specified server. If you do not specify a core or protected server, the information returned applies to the Core on which you are currently working.

Usage

The usage for the command is as follows:

```
/[version | ver] -protectedserver [name | IP address]
```

Command Options

The following table describes the options available for the `version` command:

Table 212. Version command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
-protectedserver	Optional. The protected machine for which you want to view version information. If you do not specify a protect machine, the return is information about the Core machine on which you are working.

Example:

Display information about the version of Rapid Recovery installed on the current Rapid Recovery Core:

```
>cmdutil /version
```

VirtualStandby

You can use the `virtualstandby` command to export data from a Rapid Recovery protected machine to a compatible virtual machine.

Usage

The usage for the command is as follows:

```
/virtualstandby -edit -exporttype [esxi | vm | hyperv | vb] -core [host name] -
user [user name] -password [password] -protectedserver [name | IP address] -
volumes [volume names] -vmname [virtual machine name] -gen2 -hostname [virtual
host name] -hostport [virtual host port number] -hostusername [virtual host
user name] -hostpassword [virtual host password] [-ram [total megabytes] | -
usesourceram] -diskprovisioning [thin | thick] -diskmapping [automatic | manual
| withvm] -targetpath [location] -pathusername [user name] -pathpassword
[password] [-uselocal machine] -initialexport
```

Command Options

The following table describes the options available for the `virtualstandby` command:

Table 213. VirtualStandby command options

Option	Description
-?	Display this help message.
-exporttype	This option exports data from a protected machine to one of the following specified virtual servers: • esxi (ESXi) • vm (VMware Workstation)

Option	Description
	- hyperv (Hyper-V) - vb (VirtualBox)
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default, the connection is made to the Core installed on the local machine.
`-user`	Optional. The user name for the remote Core host machine. If you specify a user name, you must also provide a password. If none is provided, then the credentials for the logged-on user are used.
`-password`	Optional. The password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none is provided, then the credentials for the logged-on user are used.
`-protectedserver`	Use this option to specify the protected machine whose recovery points you want to export.
`-volumes`	Optional. Use this option to list the names of the volumes that you want to export. If you do not specify volumes, then all volumes in the recovery point will export. Enclose values in double quotes and separate them with a space; for example: "c:" "d:". Do not use trailing slashes in volumes names.
`-ram`	Use this option to allocate a specific amount of RAM on the virtual server.
`-usesourceram`	Optional. Use this option to allocate the same amount of RAM on the virtual server that the source machine contains.
`-vmname`	The Windows name of the virtual machine.

`-gen2`	Optional. This option specifies Generation 2 of the VM server. If you do not specify the generation, the command uses Generation 1. The following operating systems support Generation 2:
	- Windows
	  – Windows Server 2012 R2
	  – Windows 8.1
	- Ubuntu Linux
	  – CentOs
	  – RHEL
	  – Oracle Linux 7

`-hostname`	For ESXi and Hyper-V virtual exports only. The virtual server host name.
`-linuxhostname`	For VirtualBox exports only. The virtual server host name.
`-hostport`	For ESXi and Hyper-V virtual exports only. The virtual server port number.
`-hostusername`	For ESXi and Hyper-V virtual exports only. The user name for the virtual server host.

Option	Description
`-hostpassword`	For ESXi and Hyper-V virtual exports only. The password for the virtual server host.
`-diskprovisioning`	For ESXi exports only. Optional. The amount of disk space that you want to allocate on the virtual machine. Use one of the two following specifications: • Thick - This specification makes the virtual disk as large as the original drive on the protected machine. • Thin - This specification allocates the amount of actual disk space occupied on the original drive with a few additional megabytes. The default specification is "thin."
`-diskmapping`	For ESXi exports only. Optional. This option determines how to map the disks from the protected machine to the virtual machine. Use one of the following values: • auto - This value automatically maps the disks. • manual - This value lets you map the disks manually. • withvm - This value stores the virtual disks in a datastore that you select. The default value is "auto."
`-targetpath`	For VMware Workstation and VirtualBox exports only. This option specifies the local or network path—or Linux path, for VirtualBox only—to the folder where you want to store the virtual machine files.
`-pathusername`	For VMware Workstation exports only. It is the user name for the network machine. It is only required when you specify a network path in the `-targetpath` option.
`-pathpassword`	For VMware Workstation exports only. It is the password for the network machine. It is only required when you specify a network path in the `-targetpath` option.
`-uselocalmachine`	For Hyper-V exports only. Optional. Use this command to connect to the local Hyper-V server. This option ignores the `-hostname`, `-hostport`, `-hostusername`, and `–hostpassword` options.
`-edit`	Optional. This option lets you edit existing virtual machines. It ignores the `–exporttype` and `-initialexport` options.
`-initialexport`	Optional. This option specifies whether to start an initial on-demand virtual machine export after you configure a continuous virtual standby.

Examples:

Set up a virtual standby export to an ESXi virtual machine with the name, amount of RAM, and disk size of the source protected server:

```
>cmdutil /virtualstandby -exporttype esxi -core 10.10.10.10 -user administrator
-password 23WE@#$sdd -protectedserver 10.10.5.22 -vmname Win2008-Smith -
hostname 10.10.10.23 -hostport 443 -hostusername root -hostpassword 12QWsdxc@# -
usesourceram -diskprovisioning thick
```

Set up a virtual standby export to a VMware Workstation machine file on the local drive:

```
>cmdutil /virtualstandby -exporttype vm -core 10.10.10.10 -user administrator -
password 23WE@#$sdd -protectedserver 10.10.5.22 -vmname Win2008-Smith -
targetpath c:\virtualmachines -ram 4096
```

Set up a virtual standby export to a Hyper-V machine files and store them on a remote machine:

```
>cmdutil /virtualstandby -exporttype hyperv -core 10.10.10.10 -user
adminstrator -password 23WE@#$sdd -protectedserver 10.10.5.22 -vmname Win20008-
Smith -vmlocation \\WIN7-Bobby\virtualmachines -hostname 10.10.10.23 -hostport
443 -hostusername root -hostpassword 12QWsdxc@# -ram 4096
```

Localization

When running on the same machine on which Rapid Recovery Core is installed, the Rapid Recovery Command Line Management utility bases its display language on the language set for the Rapid Recovery Core. In this release, supported languages include English, Chinese (Simplified), French, Korean, German, Japanese, Portuguese (Brazil), and Spanish.

If the Rapid Recovery Command Line Management utility is installed on a separate machine, English is the only language supported.

A

Core Console references

This appendix includes reference tables that describe many of the functions and icons available in the Rapid Recovery Core Console. It serves as a supplement to Understanding the Rapid Recovery Core Console chapter of the *Dell Data Protection | Rapid Recovery User Guide.*

Viewing the Core Console user interface

The Core Console is the main UI through which users interact with Rapid Recovery. When you log into the Rapid Recovery Core Console, you see the following elements.

Table 214. UI elements included in the Core Console

UI Element	Description
Branding area	For typical environments, the top left side of the Core Console is branded with the full product name, including the Dell logo. Clicking anywhere on the branding area results in the opening of a new tab in the web browser, displaying product documentation on the Support website.
Button bar	The button bar, which appears to the right of the branding area, contains buttons accessible from anywhere in the Core Console. These buttons launch wizards to accomplish common tasks such as protecting a machine; performing a restore from a recovery point; creating, attaching, or importing an archive; or replicating from this source Core to a target Core. Each button in the button bar is further described in the Table 215. Button bar buttons and menus table.
Running tasks count	Shows how many jobs are currently running. This value is dynamic based on the system state. When you click the drop-down menu, you see a status summary for all jobs currently running. By clicking the **X** for any job, you can choose to cancel that job.
Help drop-down menu	The **Help** menu includes the following options: • **Help**. Links to in-product help, which opens in a separate browser window. • **Documentation**. Links to Rapid Recovery technical documentation on the Dell Support website. • **Support**. Links to the Dell Support website, providing access to Live Chat, video tutorials, Rapid Recovery knowledge base articles, frequently asked questions, and more. • **Quick Start Guide**. The Quick Start Guide is a guided flow of suggested tasks to configure and use Rapid Recovery. The guide opens automatically each time you log in to the Core Console, unless you disable this feature. You can also open the Quick Start Guide from the Help menu. For more information about the Quick Start Guide, see Understanding the Quick Start Guide. • **About**. Opens the About Dell Data Protection | Rapid Recovery Core dialog box, including version information and a description of the software.

UI Element	Description
Server date and time	The current time of the machine running the Rapid Recovery Core service appears at the top right of the Core Console. When you hover your mouse over the time, the server date also appears. This is the date and time recorded by the system for events such as logging, scheduling, and reporting. For example, when applying protection schedules, the time displayed on the Core Console is used. This is true even if the time zone is different on the database server or on the client machine where the browser is running.
Icon bar	The icon bar includes a graphic representation for major functions accessible in the Core Console. It appears on the left side of the user interface (UI), directly below the branding area. Clicking the appropriate item in the icon bar takes you to the corresponding section of the UI where you can manage that function. Each of the icons in the icon bar is further described in the Table 216. Icon bar table.
Left navigation area	The left navigation area appears on the left side of the user interface, below the icon bar. • The left navigation area contains the text filter and the Protected Machines menu. • If you have added replication to this Core, then this area contains a Replicated Machines menu. • If you have any machines that were removed from protection but for which recovery points were saved, then this area contains a Recovery Points Only menu. • If you added any custom groups, then this area contains a Custom Group menu. • If you attached an archive, then this area contains an attached archives menu. You can toggle the appearance of the left navigation area on and off. This is helpful when you need to see more content in the main navigation area of the UI. To hide this section, click the gray border between the left navigation and main navigation areas. To show this UI element once more, click the gray border again. Each of the elements in the left navigation area are further described in the Table 218. Left navigation area and menus table.
Context-sensitive help	? ? From the Rapid Recovery Core Console, each time you click the Help icon (a blue question mark), a resizable browser window opens with two frames. The left frame contains a navigation tree showing topics from the Dell Rapid Recovery User Guide. The right frame displays content for the selected help topic. At any given time, the help navigation tree expands to show the location in its hierarchy for the selected topic. You can browse through all User Guide topics using this context-sensitive help feature. Close the browser when you are done browsing topics. You can also open help from the **Help** option of the **Help** menu.

Button bar

Details about the button bar appear in the following table.

Table 215. Button bar buttons and menus

UI Element	Description
Button bar: Protect	The **Protect** button launches the Protect Machine Wizard, from which you can protect a single machine in the Rapid Recovery Core. Additionally, for

UI Element	Description
button and menu	other protection options, you can access the drop-down menu next to this button, which includes the following options. • The **Protect Machine** option is another method to launch the Protect Machine Wizard to protect a single machine. • The **Protect Cluster** option allows you to connect to a server cluster. • The **Protect Multiple Machines** option opens the Protect Multiple Machines Wizard to allow you to protect two or more machines simultaneously. • The **Deploy Agent Software** option lets you install the Rapid Recovery Agent software to one or more machines simultaneously. This function uses the Deploy Agent Software Wizard.
Button bar: Restore button and menu	The **Restore** button opens the Restore Machine Wizard to allow you to restore data from recovery points saved from a protected machine. Additionally for other restore or export options, you can access the drop-down menu next to this button, which includes the following options. • The **Restore Machine** option is another method to launch the Restore Machine Wizard to restore data. • The **Mount Recovery Point** option launches the Mount Wizard, which lets you mount recovery points from a protected machine. • The **VM Export** option opens the Export Wizard. From this wizard you can create a virtual machine from recovery points saved in the Rapid Recovery Core. You have the option of creating a one-time export, or you can define parameters for a VM that is continually updated after every snapshot for a protected machine.
Button bar: Archive button and menu	The **Archive** button opens the Archive Wizard. From this wizard you can create a one-time archive from selected recovery points, or you can create an archive and continually save to that archive based on a schedule you define. Additionally for other archive options, you can access the drop-down menu next to this button, which includes the following options. • The **Create Archive** option is another method to launch the Create Archive Wizard to create a one-time archive or to archive continually. • The **Import Archive** option launches the Import Archive Wizard, which lets you import an archive. • The **Attach Archive** option mounts an archive so you can read the contents as a file system.
Button bar: Replication button	The **Replication** button opens the Replication Wizard. From this wizard you can specify a target Core, select machines protected on your source Core, and replicate recovery points from selected machines to the target Core in the repository you specify. You can pause replication when defining it, or you can have replication begin immediately. Additionally, you can specify whether a seed drive will be used to copy data for existing recovery points to the target Core.

Icon bar

Details about the icon bar appear in the following table.

Table 216. Icon bar

UI Element	Description		
Icon bar	The icon bar includes a graphic representation for major functions accessible in the Core Console. Clicking the appropriate item takes you to the corresponding section of the user interface where you can manage that function. Icons in the icon bar include:		
Icon bar: Home icon	⌂	**Home**. Click the Home icon to navigate to the Core Home page.	
Icon bar: Replication icon		**Replication**. Click the Replication icon to view or manage incoming or outgoing replication.	
Icon bar: Virtual Standby icon	V	**Virtual Standby**. Click the Virtual Standby icon to export information from a recovery point to a bootable virtual machine.	
Icon bar: Events icon		**Events**. Click the Events icon to view a log of all system events related to the Rapid Recovery Core.	
Icon bar: Settings icon	⚙	**Settings**. Click the Settings icon to view or manage settings for the Rapid Recovery Core. You can back up or restore Core configuration settings. You can set general settings to control ports or display aspects. Additionally, you can configure settings in the following categories: automatic updates; nightly jobs; transfer queue settings; client timeout settings; DVM deduplication cache settings; Replay engine settings; and deploy settings. You can view or change database connections; SMTP server settings; cloud storage accounts; and change font settings for reports. You can set SQL attachability settings; core job settings; license settings; SNMP settings; and vSphere settings.	
Icon bar: More icon	⋮	**More**. Click the More icon to access other important features. Each has its own icon, listed below.	
Icon bar: More icon	System Info		**System Info**. Click System Info to display data about the Rapid Recovery Core server. You can see the host name, OS, architecture and memory for the Core. You can see the name displayed on the Core Console. You can also view the fully qualified domain name of the Core on your network, and the path for your cache metadata and deduplication caches. For more information about changing the display name, see Understanding system information for the Core. For more information about deduplication cache, see Understanding deduplication cache and storage locations.

UI Element	Description	
		For information on adjusting the settings, see Configuring DVM deduplication cache settings.
Icon bar: More icon	Archives	**Archives**. Rapid Recovery lets you manage archives of information from the Core. You can view information about scheduled or attached archives, and you can add, check, or import archives.
Icon bar: More icon	Mounts	**Mounts**. Lets you view and dismount local mounts, and view and disconnect remote mounts.
Icon bar: More icon	Boot CDs	**Boot CDs**. Lets you manage boot CDs, typically used for a bare metal restore (BMR). You can create a boot CD ISO image, delete an existing image, or click the path for the image to open or save it.
Icon bar: More icon	Repositories	**Repositories**. Lets you view and manage repositories associated with your Core.
Icon bar: More icon	Encryption Keys	**Encryption Keys**. Lets you view, manage, import, or add encryption keys that you can apply to protected machines. If not being used, you can delete encryption keys.
Icon bar: More icon	Cloud Accounts	**Cloud Accounts**. Lets you view and manage connections between your Core and Cloud storage accounts.
Icon bar: More icon	Retention Policy	**Retention Policy**. Lets you view and modify the Core retention policy, including how long to keep recovery points before rolling them up and eventually deleting them.
Icon bar: More icon	Notifications	**Notifications**. Lets you configure notifications about Core events, define SMTP server settings to email notifications, and set repetition reduction to suppress repeated notifications about the same event.
Icon bar: More icon	Downloads	Downloads. You can download the Agent software web installer, the Local Mount Utility, or MIB files containing event information to use in an SNMP browser.
Icon bar: More icon	Reports	Reports. Lets you access Core reports or schedule reports to generate on an ongoing basis.
Icon bar: More icon	Core Log	Core Log. Lets you download Core log file for diagnostic purposes.

Left navigation menu

The full set of menus that may appear in the left navigation area are described in the following table:

Table 217. Left navigation menu options

UI Element	Description
Protected Machines menu	The Protected Machines menu appears as the first menu in the left navigation area, if one or more machines is protected in your Core. If you click a specific machine name shown in this pane, a Summary page appears, showing summary information for the selected machine. For more information on what you can accomplish on the Summary page, see Viewing summary information for a protected machine.
Replicated machines menu	If you see the name of another Rapid Recovery Core as a top-level navigation menu, then the Core on which you are viewing the Core Console is a target Core. The menu is named after the source Core, and each machine listed under it represents a machine from that source Core that is replicated on this target. If this target Core replicates recovery points from more than one source Core, each source Core appears as its own navigable menu in the left navigation area. If you click a specific machine name shown in a replicated machines menu, a Summary page appears, showing summary information for the selected replicated machine. For more information about replication, see Replication.
Recovery Points Only menu	If you see a RECOVERY POINTS ONLY menu, your Core retains recovery points for a machine it once protected or replicated. While that machine is no longer continuing to capture new snapshots, the recovery points previously captured on your Core remain. These recovery points can be used for file-level recovery, but cannot be used for bare metal restore, for restoring entire volumes, or for adding snapshot data.
Custom groups menu	If you created any custom groups, a custom group menu appears in the navigation menu. Custom groups are logical containers used to group machines together (for example, by function, or organization, or by geographic location). Custom groups can contain heterogeneous objects (protected machines, replicated machines, and so on). You can define the label for a custom group; like other menus, the name appears in the menu in all upper-case letters. You can perform actions for like items in a custom group by clicking the arrow to the right of the custom group title. For example, you can force a snapshot for every protected machine in a custom group. For more information about creating and managing custom groups, see Understanding custom groups.
Attached archives menu	If you attach any archives to your Core, each archive is listed in the left navigation menu. Its label is the name of the archive. Contained in this list is each machine included in the archive.

Details about the elements in the left navigation area appear in the following table.

Table 218. Left navigation area and menus

UI Element	Description	
Machines menus text filter	🔍	The text filter is a text field that lets you filter the items displayed in the Protected Machines, Replicated Machines, and Recovery-Point Only machines menus. If you type your criteria in this filter, then only the machines that meet your criteria display in the appropriate menus.
Expand and contract details	⧉	Click the arrow to the right of the text filter to expand and contract detail for the Protected Machines, Replicated Machines, and Recovery-Point Only machines menus.
Protected Machines menu	🖥 ⧉ ⧉	The Protected Machines menu appears in the left navigation area of the UI. In this menu, you can view any protected machines, protected clusters, or replicated machines configured in your Core. If you have any protected groups or recovery point-only machines, these also appear as part of this menu. You can collapse or expand the view for any of the protected machines in your Core by clicking the arrow on the left side of this menu label. The icon displayed portrays the machine type: • A simple machine icon portrays a physical machine or a protected VM with Rapid Recovery Agent software installed. • A multi-machine icon portrays a protected cluster. • A hollow double-machine icon portrays a VMware VM using agentless protection. • A hollow triple-machine icon portrays a VMware vCenter host. If you click the Protected Machines menu, a Protected Machines page appears, showing all protected machines on this Core in the Protected Machines pane. For more information, see Viewing the Protected Machines menu.
Replicated Machines menu		If replicating machines from another Rapid Recovery Core, the name of that Core appears as a separate menu under the Protected Machines menu. Each machine replicated on this target core from the listed source core appears under this menu. For each replicated machine, the icon indicates the type of machine being replicated. For example, if replicating a single machine, the icon shows one machine. If replicating a server cluster, the icon represents a cluster. You can collapse or expand the view for any of these replicated machines by clicking the arrow on the left side of this menu label. From the Replicated Machines menu, you can perform actions on all replicated machines. If you click the Replicated Machines menu, the Machines page appears. This page shows all machines protected on another (source) Core that are replicated to this target Core. For more information, see Viewing replicated machines from the navigation menu.

UI Element	Description
Recovery Points Only menu	If any machines previously protected on the Core were removed from protection, but the recovery points were not deleted, then the Recovery Points Only menu appears. Each of the formerly protected machines with retained recovery points displays in this list. You can collapse or expand the view for any of the recovery points-only machines by clicking the arrow on the left side of this menu label. From the Recovery Points Only menu, you can remove the recovery points for all the recovery-points only machines on this Core. If you click the Recovery Points Only menu, the Machines page appears, showing the machines from which the recovery points were saved. For more information, see Viewing the Recovery Points Only menu.
Custom Groups menu	If your Core includes any custom groups, then the left navigation area includes a Custom Group menu. Each of the objects in that custom group displays in this list. You can collapse or expand the view for any of the custom groups in your Core by clicking the arrow on the left side of this menu label. From the Custom Groups menu, you can perform actions for like items in the group. If you click the Custom Groups menu, the Machines page appears, showing a pane for each of the Rapid Recovery objects that appear in your group: protected machines, replicated machines, and recovery points-only machines. For more information, see Viewing the Custom Groups menu.
Attached archives menu	If you attached any archives to your Core, then the left navigation area includes a menu for each attached archive. Each of the protected machines included in the archive displays in this list. The menu label uses the name specified when the archive was saved. You can collapse or expand the view for any of the archives attached to your Core by clicking the arrow on the left side of this menu label. From the attached archives menu, you can perform actions for like items in the group. If you click the attached archives menu, the Machines page appears, showing a pane for each of the Rapid Recovery objects that appear in your group: protected machines, replicated machines, and recovery points-only machines. For more information, see Viewing the Custom Groups menu.

Viewing the Protected Machines pane

The Protected Machines pane contains information about all machines protected on this Rapid Recovery Core. For each protected machine (if any are protected yet), you see listed in the grid the information described in the following table.

Table 219. Information about each protected machine

UI Element	Description
Select item	For each row in the summary table, you can select the checkbox to perform actions from the list of menu options above the table.
Type	Shows the machine type.
Status indicator	Colored circles in the Status column show whether a machine is online or unreachable. If you hover the cursor over the colored circle, the status condition is displayed. Status conditions include green (online and protected), yellow (paused protection), red (authentication error), and gray (offline or unreachable).
Encryption status	The lock icon indicates encryption status for the selected protected machine. An open lock indicates no encryption; a closed lock indicates that encryption keys are established. For more information on encryption, see Understanding encryption keys.
Display name	The display name of the protected machine.
Last snapshot	Lists the date and time of the last backup transfer of this machine.
Repository Name	Lists the repository into which data for this machine are stored.
Recovery Points	Lists the number of recovery points and how much space they take in the repository.
Version	The version of the Rapid Recovery Agent software loaded on the machine.
Actions	When you click the Settings drop-down menu in this column, you see a list of actions to perform specifically on the selected protected machine.

If any of the machines protected in this Core are configured for virtual standby, then you will see additional information as described in the following table.

Table 220. Information about protected machines configured for virtual standby

UI Element	Description
Last export	The date and time of the last virtual export.
Destination	The destination for saving the protected machine as a virtual machine. For example, ESXi, VMware Workstation, Hyper-V, or VirtualBox.
Status	Status of machine configured for virtual standby. Status conditions include “In Sync,” “Paused,” and “Not enabled.”

From the Actions drop-down menu of the Protected Machines pane, you can perform the actions described in the following table. Some options appear only for an Exchange server or SQL server, as indicated

Table 221. Actions available in the Protected Machines pane

UI Element	Description
Force Snapshot	Lets you force an incremental snapshot or a base image for all protected volumes on the selected protected machines. For more information, see Forcing a snapshot.
One-time Export	Launches the Virtual Machine Export Wizard. This Wizard let you perform a one-time export of recovery point data from a protected machine to a virtual machine in any supported VM format. For more information, see VM export.
Virtual Standby	Launches the Virtual Machine Export Wizard. This Wizard let you perform a virtual standby for continual export of recovery point data from a protected machine to a virtual machine in any supported VM format. For more information, see VM export.
Mount	Launches the Mount Wizard. This Wizard let you mount recovery points from the selected protected machine.
Recovery Points	Opens the Recovery Points Summary page.
Restore	Launches the Restore Machine Wizard. This process lets you restore data from recovery point on the Core to a protected machine. For more information, see About restoring volumes from a recovery point.
Remove Machine	Removes the selected machine from protection on the Rapid Recovery Core, letting you choose to either delete or retain the recovery points already on the Rapid Recovery Core. For more information, see Removing a machine.

You can perform actions on two or more of the machines listed in the protected machines grid. To perform actions on multiple machines, select the checkbox for each protected machine. Then, from the menu above the summary table, you can perform any of the actions described in the following table.

Table 222. Additional actions available in the Protected Machines pane when machines are selected

UI Element	Description
Force Snapshot	Lets you force an incremental snapshot for all protected volumes on the selected protected machines. For more information, see Forcing a snapshot.
Force Base Image	Lets you force a base image for all protected volumes on the selected protected machines. For more information, see Forcing a snapshot.
Protection > Pause or Resume	Lets you pause protection for the selected machines (if protection is active), or lets you resume protection for the selected machines (if protection is paused). For more information, see Pausing and resuming protection.
Replication	Lets you enable, force, copy, pause, or resume replication. You can also copy existing recovery points to a seed drive. For more information, see Managing replication settings.
Cancel	Lets you cancel all currently active operations for the selected machines, or lets you cancel snapshots only that are currently taking place for the selected machines. This does not affect operations scheduled for the future.
Remove Machines	Removes the selected machine from protection on the Rapid Recovery Core, letting you choose to either delete or retain the recovery points already on the Rapid Recovery Core. For more information, see Removing a machine.

From the Configuration drop-down menu for each protected machine, you can perform the actions listed in the following table. Some options appear only for an Exchange server or SQL server, as indicated.

Table 223. Actions available in the Protected Machines pane

UI Element	Description
Force Snapshot	Lets you force an incremental snapshot or a base image for one or more volumes on the selected machine. For more information, see Forcing a snapshot.
Force Log Truncation for Exchange	For a protected Exchange Server machine, forces truncation of the Exchange logs, which frees up space on the Exchange server. For more information, see Forcing log truncation for a SQL machine.
Force Log Truncation for SQL	For a protected SQL Server machine, forces truncation of the SQL Server logs, which identifies free space on the SQL server. For more information, see Forcing log truncation for a SQL machine.
Export	Launches the Export Wizard. This Wizard let you export recovery point data from a protected machine to a virtual machine in any supported VM format. You can perform a one-time export or set up virtual standby for continual exports. For more information, see VM export.
Mount	Opens the Mount Recovery Point dialog box, which allows you to browse through snapshot data saved the Rapid Recovery Core to mount a specific recovery point. For more information, see Mounting a recovery point or Mounting a recovery point volume on a Linux machine respectively.
Recovery Points	Opens the Recovery Points tab for the selected agent machine. For more information, see Managing snapshots and recovery points.
Restore	Launches the Restore Machine Wizard. This process lets you restore data from recovery point on the Core to a protected machine. For more information, see About restoring volumes from a recovery point.
Remove Machine	Removes the selected machine from protection on the Rapid Recovery Core, letting you choose to either delete or retain the recovery points already on the Rapid Recovery Core. For more information, see Removing a machine.

Viewing events for a protected machine

On the **Events** page, you can view the jobs that occurred or are in progress for the protected machine you selected. Buttons at the top of the page let you navigate to lists of jobs in each of the three categories of activities:

- **Tasks.** A job that the Rapid Recovery must perform to operate successfully.
- **Alerts.** A notification related to a task or event that includes errors and warning.
- **Journal.** A composite of all protected machine tasks and alerts.

The following table includes descriptions of each element on the **Events** page.

Table 224. Events page elements

UI Element	Description
Search keyword	Lets you search for a specific item within each category. Available for tasks only.
From	To narrow your results, you can enter a date at which to begin searching. Available for tasks only.
To	To narrow your results, you can enter a date at which to stop searching. Available for tasks only.
Status icons	Each icon represents a different job status. For alerts and tasks, clicking one of the icons lets you filter the list by that status, essentially generating a report. Clicking the icon a second time removes the filter for that status. You can filter by more than one status. Statuses include: • **Active.** A job that is in progress. • **Queued.** A job that is waiting for another job to complete before it can initiate. • **Waiting.** A job waiting for your approval or completion, such as a seed drive. (For more information about seed drives, see Replication.) • **Complete.** A job that completed successfully. • **Failed.** A job that failed and did not complete.
Service icon	This button adds services jobs to the list of jobs. When you click this icon, a smaller service icon appears on each status icon, which lets you filter by service jobs that have those statuses (if any exist). Examples of services jobs include deleting index files or removing a machine from protection.
Export type drop-down list	The drop-down list includes the formats to which you can export the event report. Available for tasks only. It includes the following formats: • PDF • HTML • CSV • XLS • XLSX
⤓ (Export icon)	Converts the event report to the format you selected. Available for tasks only.
Page selection	Event reports can include several jobs across multiple pages. The numbers and arrows at the bottom of the **Events** page let you navigate the additional pages of the report.

The **Events** page displays all events in a table. The following table lists the information shown for each item.

Table 225. Detailed information for the Event summary table

UI Element	Description
Status	Shows the status for the task, alert, or journal item. Available for alerts or journal items, click the header to filter the results by status.
Name	Name is available for tasks only. This text field lists the task type that completed for this protected machine. Examples include transfer of volumes, maintaining repository, rolling up, performing mountability checks, performing checksum checks, and so on.
Start Time	Available for tasks, alerts, and journal items. Shows the date and time when the job or task began.
End Time	Available for tasks only. Shows the date and time when the task completed.
Job Details	Available for tasks only. Opens the **Monitor Active Task** dialog box, so you can view details of the specific job or task. These details include an ID for the job, rate at which the core transferred data (if relevant), elapsed time for the job to complete, total work in amount of gigabytes, and any child tasks associated with the job.
Message	Available for alerts and journal items. This text field provides a descriptive message of the alert or journal item.

Viewing the More menu for a protected machine

The **More** menu offers additional options to help manage the selected a protected machine. To access these tools, click the More drop-down menu and select from one of the options described in the following table.

Table 226. Tools accessible from the More option for a protected machine

UI Element	Description
System Information	Shows information about the protected machine, system information, volumes, processors, network adapters, and IP addresses for this machine. For more information, see Viewing system information for a protected machine.
Mounts	From the Local Mounts pane, you can view or dismount volumes mounted locally. From the Remote Mounts pane, you can view or dismount volumes mounted using the Local Mount Utility. For information on dismounting volumes, see Dismounting recovery points. For information on mounting a recovery point locally, see Mounting a recovery point or Mounting a recovery point volume on a Linux machine, respectively.
Retention Policy	Lets you specify a retention policy for the selected machine. You can choose to use the Core's default policy, or you can differentiate the retention policy for this machine only. For more information, see Customizing retention policy settings for a protected machine.

UI Element	Description
🔔 Notifications	Lets you specify a custom notification group for events pertaining to the selected machine. This does not change the notifications already set on the Core. For more information, see Configuring notification groups.
LOG Agent Log	Lets you download and view the log file for a machine protected using the Rapid Recovery Agent software. For more information, see Downloading and viewing the log file for a protected machine.

B

Understanding the Rapid Recovery PowerShell module

Dell Data Protection | Rapid Recovery consists of several software components. Key components relevant to this topic include the following:

- The Rapid Recovery Core manages authentication for protected machines, schedules for transferring data for backup and replication, export to virtual machines, reporting, and bare metal restore (BMR) to similar or dissimilar hardware.
- The Rapid Recovery Agent is responsible for taking volume snapshots and for fast transfer of the data to the repository managed by the Core.
- The Rapid Recovery PowerShell Module is a Windows utility that lets users interact with the Core server by using Windows PowerShell® scripts. This module offers some of the same functionality that the Rapid Recovery Core Console graphic user interface (GUI) provides. For example, the Rapid Recovery PowerShell Module can mount Rapid Recovery recovery points or force a snapshot of a protected machine.

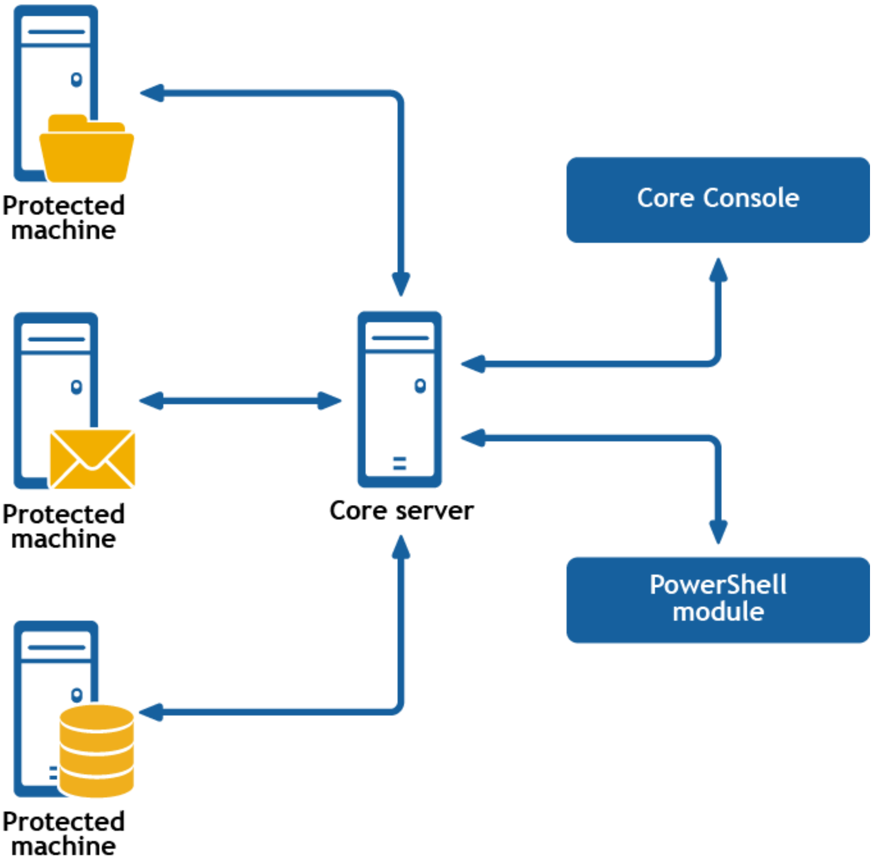


Figure 14. The PowerShell module interacts with the Rapid RecoveryCore

PowerShell is a Microsoft .NET Framework-connected environment designed for administrative automation. This section describes the Rapid Recovery PowerShell module and the cmdlets administrators can use to script certain functions without interaction with the Rapid Recovery Core GUI.

NOTE: You can also run PowerShell scripts as pre and post scripts. For more information and sample scripts, see Extending Rapid Recovery jobs using scripting.

Prerequisites for using PowerShell

Before using the Rapid Recovery PowerShell module, you must have Windows PowerShell 2.0 or later installed. Due to new features introduced in PowerShell 3.0, including easier access to object properties, PowerShell Web access, and support for REST calls, Dell recommends using PowerShell 3.0 or later.

NOTE: Make sure to place the powershell.exe.config file in the PowerShell home directory. For example, C:\WindowsPowerShell\powershell.exe.config

powershell.exe.config

```
<?xml version="1.0"?>
<configuration>
    <startup useLegacyV2RuntimeActivationPolicy="true">
        <supportedRuntime version="v4.0.30319"/>
        <supportedRuntime version="v2.0.50727"/>
    </startup>
</configuration>
```

Launching PowerShell and importing the module

Unlike other system modules, the Rapid Recovery PowerShell Module is not loaded by default. For each session, you can open Windows PowerShell with administrative privileges, and then import the module. Complete the steps in this procedure to launch PowerShell and import the Rapid Recovery PowerShell Module.

1. Open an elevated command prompt for Windows PowerShell. For example, type Windows PowerShell in the Start menu, and for the resulting Windows PowerShell application, right-click and select **Run as administrator**.

   Windows PowerShell opens in a new command window.
2. Enter the following command and then press Enter:

   ```
   Import-Module “RapidRecoveryPowerShellModule”
   ```

   The Rapid Recovery PowerShell module is imported for your current session. You can begin to run cmdlets in the existing command window.

Working with commands and cmdlets

Cmdlets are specialized commands in a Windows PowerShell script that perform a single function. A cmdlet is typically expressed as a verb-noun pair. The result returned by a cmdlet is an object.

You can pipeline PowerShell commands, which enables the output of one cmdlet to be piped as input to another cmdlet. As a simple example, you can request the list of commands in the Rapid Recovery PowerShell module, and sort that list by name. The example script for this is:

```
Get-Command -module rapidrecoverypowershellmodule | sort-object name
```

Getting cmdlet help and examples

After you open PowerShell and import the Rapid Recovery PowerShell module, you can request additional information at any time by using the Get-Help <command_name> cmdlet. For example, to get information about the virtual machine export cmdlet, enter the following cmdlet and then press Enter:

```
Get-Help Start-VMExport
```

The object returned includes the command name, synopsis, syntax, and any options you can use with the command.

Another method to get help for a specific cmdlet is to type the command name followed by `-?`. For example:

```
Start-VMExport -?
```

You can also request examples for a cmdlet by executing the following command:

```
>Get-Help Start-VMExport -examples
```

Rapid Recovery PowerShell module cmdlets

This section describes the cmdlets and options available in the Rapid Recovery PowerShell Module. All cmdlets in the Rapid Recovery PowerShell Module support the following common parameters:

- Verbose
- Debug
- ErrorAction
- ErrorVariable
- WarningAction
- WarningVariable
- OutBuffer
- OutVariable

For more information, use `Get-Help about_commonparameters`.

The available cmdlets are listed in the following table.

Table 227. Cmdlets in the Rapid Recovery PowerShell Module

Cmdlet name	Description
Edit-EsxiVirtualStandby	Edit an existing ESXi virtual standby configuration.
Edit-HyperVVirtualStandby	Edit an existing Hyper-V virtual standby configuration.
Edit-VBVirtualStandby	Edit an existing VirtualBox virtual standby configuration.
Edit-VMVirtualStandby	Edit an existing VMware Workstation virtual standby configuration.
Edit-ScheduledArchive	Edit an existing scheduled archive configuration.
Get-ActiveJobs	Retrieve a collection of active jobs.
Get-CloudAccounts	Get information about the cloud accounts saved to the Core.
Get-Clusters	Retrieve a collection of protected clusters.
Get-CompletedJobs	Retrieve a collection of completed jobs.
Get-ExchangeMailStores	Retrieve a collection of Exchange mail stores.
Get-Failed	Get information about failed recovery points.
Get-FailedJobs	Retrieve a collection of failed jobs.
Get-Mounts	Show all mounted recovery points.
Get-Passed	Get information about passed recovery points.
Get-ProtectedServers	Get information about protected servers.
Get-ProtectionGroups	Retrieve a collection of protection groups.
Get-QueuedJobs	Retrieve a collection of jobs waiting in the queue.
Get-RecoveryPoints	Get information about recovery points.
Get-ReplicatedServers	Get information about replicated servers.
Get-Repositories	Get information about repositories.
Get-ScheduledArchive	Get information about recurring archive jobs.
Get-SqlDatabases	Retrieve a collection of SQL databases.

Cmdlet name	Description
Get-UnprotectedVolumes	Retrieve a collection of unprotected volumes.
Get-VirtualizedServers	Get information about virtualized servers.
Get-Volumes	Get information about volumes.
New-Base	Force base image snapshot.
New-CloudAccount	Add a new cloud account to the Core.
New-EncryptionKey	Create a new encryption key.
New-EsxiVirtualStandby	Create a new ESXi virtual standby virtual machine.
New-HyperVVirtualStandby	Create a new Hyper-V virtual standby virtual machine.
New-Mount	Mount recovery points.
New-Replication	Set up and force replication.
New-Repository	Create new DVM repository.
New-ScheduledArchive	Schedule a new recurring archive.
New-Snapshot	Force snapshot.
New-VBVirtualStandby	Create a new VirtualBox virtual standby virtual machine.
New-VMVirtualStandby	Create a new VMware Workstation virtual standby virtual machine.
Push-Replication	Force replication.
Push-Rollup	Force rollup.
Remove-Agent	Remove a machine from protection.
Remove-Mount	Dismount recovery point.
Remove-Mounts	Dismount all mounted recovery points.
Remove-RecoveryPoints	Delete recovery points for a protected machine.
Remove-Repository	Delete an existing DVM repository.
Remove-ScheduledArchive	Discontinue a scheduled archive.

Cmdlet name	Description
Remove-VirtualStandby	Remove a virtual standby virtual machine from the Core.
Resume-Replication	Resume replication.
Resume-RepositoryActivity	Resume repository activity.
Resume-ScheduledArchive	Resume a scheduled archive.
Resume-Snapshot	Resume snapshot.
Resume-VirtualStandby	Resume exporting data to a virtual standby virtual machine.
Start-Archive	Archive recovery points.
Start-AttachabilityCheck	Force attachability check for protected MS SQL databases.
Start-ChecksumCheck	Force a checksum check for protected Exchange mail stores.
Start-EsxiExport	Force export to an ESXi server.
Start-HypervExport	Force export to a Hyper-V server.
Start-LogTruncation	Force log truncation.
Start-MountabilityCheck	Force mountability check for protected Exchange mail stores.
Start-Protect	Put a server under protection.
Start-ProtectCluster	Put a cluster under protection.
Start-RepositoryCheck	Force a DVM repository check.
Start-RestoreArchive	Restore archive with recovery points.
Start-ScheduledArchive	Force a data transfer for a scheduled archive.
Start-VBExport	Force export to a VirtualBox server.
Start-VirtualStandby	Force a data transfer to an existing virtual standby virtual machine.
Start-VMExport	Force export to a VMWare Workstation server.
Stop-ActiveJobs	Cancel active jobs.
Suspend-Replication	Pause replication.

Cmdlet name	Description
Suspend-RepositoryActivity	Pause activity for a repository.
Suspend-ScheduledArchive	Pause data transfers for a scheduled archive.
Suspend-Snapshot	Pause snapshot.
Suspend-VirtualStandby	Pause data transfers to a virtual standby virtual machine.
Update-Repository	Add extent to DVM repository.

Edit-EsxiVirtualStandby

The `Edit-EsxiVirtualStandby` command lets you use PowerShell to make changes to an existing virtual export to an ESXi virtual machine (VM).

Usage

The usage for the command is as follows:

```
Edit-EsxiVirtualStandby [-HostName <String>] [-HostPort <String>] [-
HostUserName <String>] [-HostPassword <String>] [-DiskProvisioning <String>] [-
DiskMapping <String>] [-ProtectedServer <String>] [-Volumes <String[]>] [-
VMName <String>] [-UseSourceRam] [-Ram <String>] [-User <String>] [-Core
<String>] [-Password <String>] [-Verbose] [-Debug] [-
ErroAction<ActionPreference>] [-WarningAction<ActionPreference>] [-
ErrorVariable String>] [-WarningVariable <String> [-OutVariable <String>] [-
OutBuffer <Int32>]
```

Command Options

The following table describes the options available for the `Edit-EsxiVirtualStandby` command:

Table 228. Edit-EsxiVirtualStandby command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.

Option	Description
-all	Show all jobs, including those performed by the Core and all protected servers.
-number	Optional. Determine how many records to display. available values are: all (display all jobs); l[number] or [number] (fetches ## most recent jobs sorted by execution and time); f[number] (displays first ## recovery jobs sorted by execution and time). By default, the 20 most recent jobs are shown.
-jobtype	Optional. Specifies the job type filter. Available values are: `'transfer'` (data transfer), `'repository'` (repository maintenance), `'replication'` (local and remote replications), `'backup'` (backup and restore), `'bootcdbuilder'` (create boot CDs), `'diagnostics'` (upload logs), `'exchange'` (Exchange Server files check), `'export'` (recovery point export), `'pushinstall'` (deploy agents), `'rollback'` (restoring from a recovery point), `'rollup'` (recovery point rollups), `'sqlattach'` (agent attachability checks), and `'mount'` (mount repository). By default, all jobs of the specified type are returned.
-time	Optional. Filter output by date and time for the job started. Available types of input include: #d or DD (where # is a number for the period of time of days before now until now) #h or #H (where # is number for the period of hours before now until now) “time date 1”, “time date 2” (to show a custom range of time from a specific date appearing before the comma to a specific date following the comma).

Example:

Lists all active jobs on the local Core:

```
>Get-activejobs –all
```

Edit-HyperVVirtualStandby

The `Edit-HyperVVirtualStandby` command lets you use PowerShell to make changes to an existing virtual export to a Hyper-V virtual machine (VM).

Usage

The usage for the command is as follows:

```
Edit-HyperVVirtualStandby [-HostName <String>] [-HostPort <String>] [-
HostUserName <String>] [-HostPassword <String>] [-VMLocation <String>] [-
UseLocalMachine] [-gen2] [-UseVhdx] [-ProtectedServer <String>] [-Volumes
<String[]>] [-VMName <String>] [-UseSourceRam] [-Ram <String>] [-User <String>]
[-Core <String>] [-Password <String>] [-Verbose] [-Debug] [-ErrorAction
<ActionPreference>] [-WarningAction <ActionPreference>] [-ErrorVariable
<String>] [-WarningVariable <String>] [-OutVariable <String>] [-OutBuffer
<Int32>]
```

Command Options

The following table describes the options available for the `Edit-HyperVVirtualStandby` command:

Table 229. Edit-HyperVVirtualStandby command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.
`-all`	Show all jobs, including those performed by the Core and all protected servers.
`-number`	Optional. Determine how many records to display. available values are: all (display all jobs); l[number] or [number] (fetches ## most recent jobs sorted by execution and time); f[number] (displays first ## recovery jobs sorted by execution and time). By default, the 20 most recent jobs are shown.
`-jobtype`	Optional. Specifies the job type filter. Available values are: `'transfer'` (data transfer), `'repository'` (repository maintenance), `'replication'` (local and remote replications), `'backup'` (backup and restore), `'bootcdbuilder'` (create boot CDs), `'diagnostics'` (upload logs), `'exchange'` (Exchange Server files check), `'export'` (recovery point export), `'pushinstall'` (deploy agents), `'rollback'` (restoring from a recovery point), `'rollup'` (recovery point rollups), `'sqlattach'` (agent attachability checks), and `'mount'` (mount repository). By default, all jobs of the specified type are returned.
`-time`	Optional. Filter output by date and time for the job started. Available types of input include: #d or DD (where # is a number for the period of time of days before now until now) #h or #H (where # is number for the period of hours before now until now) “time date 1”, “time date 2” (to show a custom range of time from a specific date appearing before the comma to a specific date following the comma).

Example:

Lists all active jobs on the local Core:

```
>Get-activejobs –all
```

Edit-ScheduledArchive

The `Edit-ScheduledArchive` command lets you use PowerShell to make changes to an existing scheduled archive.

Usage

The usage for the command is as follows:

```
Edit-ScheduledArchive -core [host name] -user [login] -password [password] -all
| -protectedserver [name | IP address | "[name1 | IP address1]" "[name2 | IP
address2]"] -path [location] -cloudaccountname [name] -cloudcontainer [name] -
recycleaction [type] -scheduletype [type] -dayofweek [name] -dayofmonth
[number] -time [time] -initialpause -id [id]
```

Command Options

The following table describes the options available for the `Edit-ScheduledArchive` command:

Table 230. Edit-ScheduledArchive command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	The protected machine with recovery points that you want to archive. You can specify multiple machine names enclosed in double quotes and separated by commas.
`-all`	Archive recovery points for all protected machines.
`-path`	The path to where to save the archived data. For example: • Local machine: "d:\work\archive" • Network path: "\\servername\sharename" • Folder in a cloud account: "Folder Name" NOTE: The number of symbols should not be greater than 100 for local and network locations, and should not be greater than 150 for a cloud location.
`-cloudaccountname`	Optional. Use only for cloud archiving. The name of the cloud account where you want to save the archive.

Option	Description
-cloudcontainer	Optional. Use only for cloud archiving. The name of the cloud container in the chosen cloud account, where the archive will be saved. When you use this option, you should also specify the "-cloudaccountname" parameter.
-recycleaction	The type of recycle action. Specified by using one of the following four values: • "replacethiscore" - Overwrites any pre-existing archived data pertaining to this Core, but leaves the data for other Cores intact. • "erasecompletely" - Clears all archived data from the directory before writing the new archive. • "incremental" - Lets you add recovery points to an existing archive. It compares recovery points to avoid duplicating data that already exists in the archive.
-scheduletype	Type of schedule interval. Specified the option with one of the following four values: • "daily" - For a daily automatically created archive. • "weekly" - For a weekly automatically created archive. You must specify the "-dayofweek" parameter. • "monthly" - For a monthly automatically created archive. You must specify the "-dayofmonth" parameter. If a month does not have the day specified—for example, "31"—then the archive will not occur for that month. • "lastdayofmonth" - For automatically creating an archive on the last day of each month.
-dayofweek	Use only for the "weekly" option of the "-scheduletype" parameter. The day of the week on which to automatically create the archive (for example, "Monday").
-dayofmonth	Use only for the "month" option of the "-scheduletype" parameter. The day (number) of the month on which to automatically create the archive (for example, "15").
-time	The hour of the day when you want to create an archive.
-initialpause	Optional. Specify this option if you want to initially pause archiving after you configure the archiving schedule.
-id	The identifier of the scheduled archive that you want to edit.

Example:

Edit a scheduled archive on the local Core:

```
>Edit-ScheduledArchive -protectedserver protectedserver1 -path d:\work\archive -
cloudaccountname cloud1 -cloudcontainer cloudarchives -recycleaction
incremental -scheduletype daily -time 12:00 AM -initialpause -i
    d archiveid
```

Edit-VBVirtualStandby

The `Edit-VBVirtualStandby` command lets you use PowerShell to make changes to an existing virtual export to a VirtualBox virtual machine (VM).

Usage

The usage for the command is as follows:

```
Edit-VBVirtualStandby [-TargetPath <String>] [-PathUserName <String>] [-
PathPassword <String>] [-LinuxHostName <String>] [-HostPort <UInt32>] [-
AccountUserName <String>] [-AccountPassword <String>] [-ProtectedServer
<String>] [-Volumes <String[]>] [-VMName <String>] [-UseSourceRam] [-Ram
<String>] [-User <String>] [-Core <String>] [-Password <String>] [-Verbose] [-
Debug] [-ErrorAction <ActionPreference>] [-WarningAction <ActionPreference>] [-
ErrorVariable <String>] [-WarningVariable <String>] [-OutVariable <String>] [-
OutBuffer <Int32>]
```

Command Options

The following table describes the options available for the `Edit-VBVirtualStandby` command:

Table 231. Edit-VBVirtualStandby command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.
`-all`	Show all jobs, including those performed by the Core and all protected servers.
`-number`	Optional. Determine how many records to display. available values are: all (display all jobs); l[number] or [number] (fetches ## most recent jobs sorted by execution and time); f[number] (displays first ## recovery jobs sorted by execution and time). By default, the 20 most recent jobs are shown.
`-jobtype`	Optional. Specifies the job type filter. Available values are: `'transfer'` (data transfer), `'repository'` (repository maintenance), `'replication'` (local and remote replications), `'backup'` (backup and restore), `'bootcdbuilder'` (create boot CDs), `'diagnostics'` (upload logs), `'exchange'` (Exchange Server files check), `'export'` (recovery point export), `'pushinstall'` (deploy agents), `'rollback'` (restoring from a recovery point), `'rollup'` (recovery point rollups), `'sqlattach'` (agent attachability checks), and `'mount'` (mount repository). By default, all jobs of the specified type are returned.

Option	Description
`-time`	Optional. Filter output by date and time for the job started. Available types of input include: #d or DD (where # is a number for the period of time of days before now until now) #h or #H (where # is number for the period of hours before now until now) “time date 1”, “time date 2” (to show a custom range of time from a specific date appearing before the comma to a specific date following the comma).

Example:

Lists all active jobs on the local Core:

```
>Get-activejobs –all
```

Edit-VMVirtualStandby

The `Edit-VMVirtualStandby` command lets you use PowerShell to make changes to an existing virtual export to a VMware Workstation virtual machine (VM).

Usage

The usage for the command is as follows:

```
 Edit-VMVirtualStandby [-TargetPath <String>] [-PathUserName <String>] [-
PathPassword <String>] [-ProtectedServer <S
    tring>] [-Volumes <String[]>] [-VMName <String>] [-UseSourceRam] [-Ram
<String>] [-User <String>] [-Core <String>]
    [-Password <String>] [-Verbose] [-Debug] [-ErrorAction <ActionPreference>]
[-WarningAction <ActionPreference>] [-Er
    rorVariable <String>] [-WarningVariable <String>] [-OutVariable <String>] [-
OutBuffer <Int32>]
```

Command Options

The following table describes the options available for the `Edit-VMVirtualStandby` command:

Table 232. Edit-VMVirtualStandby command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.

Option	Description
-protectedserver	Show jobs for a specific protected machine, indicated by IP address.
-all	Show all jobs, including those performed by the Core and all protected servers.
-number	Optional. Determine how many records to display. available values are: all (display all jobs); l[number] or [number] (fetches ## most recent jobs sorted by execution and time); f[number] (displays first ## recovery jobs sorted by execution and time). By default, the 20 most recent jobs are shown.
-jobtype	Optional. Specifies the job type filter. Available values are: `'transfer'` (data transfer), `'repository'` (repository maintenance), `'replication'` (local and remote replications), `'backup'` (backup and restore), `'bootcdbuilder'` (create boot CDs), `'diagnostics'` (upload logs), `'exchange'` (Exchange Server files check), `'export'` (recovery point export), `'pushinstall'` (deploy agents), `'rollback'` (restoring from a recovery point), `'rollup'` (recovery point rollups), `'sqlattach'` (agent attachability checks), and `'mount'` (mount repository). By default, all jobs of the specified type are returned.
-time	Optional. Filter output by date and time for the job started. Available types of input include: #d or DD (where # is a number for the period of time of days before now until now) #h or #H (where # is number for the period of hours before now until now) “time date 1”, “time date 2” (to show a custom range of time from a specific date appearing before the comma to a specific date following the comma).

Example:

Lists all active jobs on the local Core:

```
>Get-activejobs –all
```

Get-ActiveJobs

The `Get-ActiveJobs` command returns all active jobs from the Core. The `–jobtype` parameter could be used to observe specific jobs.

Usage

The usage for the command is as follows:

```
Get-ActiveJobs -core [host name] -user [user name] -password [password] -all |
-protectedserver [server name or IP address] -number [all | f[number] |
l[number] | number] -jobtype [type] -time [time]
```

Command Options

The following table describes the options available for the `Get-ActiveJobs` command:

Table 233. Get-ActiveJobs command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.
`-all`	Show all jobs, including those performed by the Core and all protected servers.
`-number`	Optional. Determine how many records to display. available values are: all (display all jobs); l[number] or [number] (fetches ## most recent jobs sorted by execution and time); f[number] (displays first ## recovery jobs sorted by execution and time). By default, the 20 most recent jobs are shown.
`-jobtype`	Optional. Specifies the job type filter. Available values are: `'transfer'` (data transfer), `'repository'` (repository maintenance), `'replication'` (local and remote replications), `'backup'` (backup and restore), `'bootcdbuilder'` (create boot CDs), `'diagnostics'` (upload logs), `'exchange'` (Exchange Server files check), `'export'` (recovery point export), `'pushinstall'` (deploy agents), `'rollback'` (restoring from a recovery point), `'rollup'` (recovery point rollups), `'sqlattach'` (agent attachability checks), and `'mount'` (mount repository). By default, all jobs of the specified type are returned.
`-time`	Optional. Filter output by date and time for the job started. Available types of input include: #d or DD (where # is a number for the period of time of days before now until now) #h or #H (where # is number for the period of hours before now until now) “time date 1”, “time date 2” (to show a custom range of time from a specific date appearing before the comma to a specific date following the comma).

Example:

Lists all active jobs on the local Core:

```
>Get-activejobs –all
```

Get-Clusters

The Get-Clusters command returns information about server clusters protected in the Core.

Usage

The usage for the command is as follows:

```
Get-Clusters -core [host name] -user [user name] -password [password]
```

Command Options

The following table describes the options available for the Get-Clusters command:

Table 234. Get-Clusters command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.

Example:

List server clusters protected on the local Core:

```
>Get-Clusters
```

Get-CompletedJobs

The Get-CompletedJobs command returns a list of jobs completed on the Core. The -jobtype parameter could be used to observe specific jobs.

Usage

The usage for the command is as follows:

```
Get-CompletedJobs -core [host name] -user [user name] -password [password] -all
|
-protectedserver [server name or IP address] -number [all | f[number] |
l[number] | number] -jobtype [type] -time [time]
```

Command Options

The following table describes the options available for the Get-CompletedJobs command:

Table 235. Get-CompletedJobs command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.
`-all`	Show all jobs, including those performed by the Core and all protected servers.
`-number`	Optional. Determine how many records to display. available values are: all (display all jobs); l[number] or [number] (fetches ## most recent jobs sorted by execution and time); f[number] (displays first ## recovery jobs sorted by execution and time). By default, the 20 most recent jobs are shown.
`-jobtype`	Optional. Specifies the job type filter. Available values are: `'transfer'` (data transfer), `'repository'` (repository maintenance), `'replication'` (local and remote replications), `'backup'` (backup and restore), `'bootcdbuilder'` (create boot CDs), `'diagnostics'` (upload logs), `'exchange'` (Exchange Server files check), `'export'` (recovery point export), `'pushinstall'` (deploy agents), `'rollback'` (restoring from a recovery point), `'rollup'` (recovery point rollups), `'sqlattach'` (agent attachability checks), and `'mount'` (mount repository). By default, all jobs of the specified type are returned.
`-time`	Optional. Filter output by date and time for the job started. Available types of input include: #d or DD (where # is a number for the period of time of days before now until now) #h or #H (where # is number for the period of hours before now until now) “time date 1”, “time date 2” (to show a custom range of time from a specific date appearing before the comma to a specific date following the comma).

Example:

Lists all active jobs on the local Core:

```
>Get-CompletedJobs –all
```

Lists all completed create repository jobs on the local Core:

```
>Get-CompletedJobs –jobtype repository
```

Get-ExchangeMailStores

The `Get-ExchangeMailStores` command returns information about male stores on Exchange servers Protected by the Core.

Usage

The usage for the command is as follows:

```
Get-ExchangeMailStores -core [host name] -user [user name] -password [password]
-protectedserver [server name or IP address]
```

Command Options

The following table describes the options available for the `Get-ExchangeMailStores` command:

Table 236. Get-ExchangeMailStores command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.

Example:

Lists Exchange mail stores for Exchange server for the local Core:

```
>Get-ExchangeMailStores -protectedserver 10.10.10.10
```

Get-Failed

The `Get-Failed` command returns information about failed recovery points on the local Core.

Usage

The usage for the command is as follows:

```
Get-Failed -core [host name] -user [user name] -password [password] -all |
-protectedserver [server name or IP address] -number [all | f[number] |
l[number] | number]
```

Command Options

The following table describes the options available for the `Get-Failed` command:

Table 237. Get-Failed command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.
`-number`	Optional. Determine how many records to display. available values are: all (display all jobs); l[number] or [number] (fetches ## most recent jobs sorted by execution and time); f[number] (displays first ## recovery jobs sorted by execution and time). By default, the 20 most recent jobs are shown.

Example:

Lists all failed recovery points:

```
>Get-failed -protectedserver 10.10.10.10
```

Get-FailedJobs

The `Get-FailedJobs` command returns all failed jobs from the local Core.

Usage

The usage for the command is as follows:

```
Get-FailedJobs -core [host name] -user [user name] -password [password] -all |
-protectedserver [server name or IP address] -number [all | f[number] |
l[number] | number] -jobtype [type] -time [time]
```

Command Options

The following table describes the options available for the `Get-FailedJobs` command:

Table 238. Get-FailedJobs command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.
`-all`	Show all jobs, including those performed by the Core and all protected servers.
`-number`	Optional. Determine how many records to display. available values are: all (display all jobs); l[number] or [number] (fetches ## most recent jobs sorted by execution and time); f[number] (displays first ## recovery jobs sorted by execution and time). By default, the 20 most recent jobs are shown.
`-jobtype`	Optional. Specifies the job type filter. Available values are: `'transfer'` (data transfer), `'repository'` (repository maintenance), `'replication'` (local and remote replications), `'backup'` (backup and restore), `'bootcdbuilder'` (create boot CDs), `'diagnostics'` (upload logs), `'exchange'` (Exchange Server files check), `'export'` (recovery point export), `'pushinstall'` (deploy agents), `'rollback'` (restoring from a recovery point), `'rollup'` (recovery point rollups), `'sqlattach'` (agent attachability checks), and `'mount'` (mount repository). By default, all jobs of the specified type are returned.
`-time`	Optional. Filter output by date and time for the job started. Available types of input include: #d or DD (where # is a number for the period of time of days before now until now) #h or #H (where # is number for the period of hours before now until now) “time date 1”, “time date 2” (to show a custom range of time from a specific date appearing before the comma to a specific date following the comma).

Example:

Lists all failed jobs on the local Core:

```
>Get-FailedJobs –all
```

Lists all failed create backup jobs on the local Core:

```
>Get-FailedJobs -type backup
```

Get-Mounts

The `Get-Mounts` command returns all recovery points mounted on the local Core.

Usage

The usage for the command is as follows:

```
Get-Mounts -core [host name] -user [user name] -password [password] -
protectedserver [server name or IP address]
```

Command Options

The following table describes the options available for the `Get-Mounts` command:

Table 239. Get-Mounts command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.

Example:

Show all mounted recovery points:

```
>Get-Mounts -core 10.10.10.10:8006 -user administrator -password 23WE@#$sdd -
protectedserver 10.10.5.22
```

Get-Passed

The `Get-Passed` command returns information about recovery points that have passed verification checks on the Core.

Usage

The usage for the command is as follows:

```
Get-Passed -core [host name] -user [user name] -password [password] -
protectedserver [server name or IP address] -number [all | f[number] |l[number]
| number]
```

Command Options

The following table describes the options available for the `Get-Passed` command:

Table 240. Get-Passed command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.

Example:

Lists all recovery points on the local Core the passed verification checks:

```
>Get-Passed -protectedserver 10.10.10.10
```

Get-ProtectedServers

The `Get-ProtectedServers` command information about machines protected on the local Core.

Usage

The usage for the command is as follows:

```
Get-ProtectedServers -core [host name] -user [user name] -password [password]
```

Command Options

The following table describes the options available for the `Get-ProtectedServers` command:

Table 241. Get-ProtectedServers command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.

Option	Description
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.

Example:

Lists all machines currently protected on the local Core:

```
>Get-ProtectedServers
```

Get-ProtectionGroups

The `Get-ProtectionGroups` command returns information about protection groups on the local Core.

Usage

The usage for the command is as follows:

```
Get-ProtectionGroups -core [host name] -user [user name] -password [password] -
all |
-protectedserver [server name or IP address]
```

Command Options

The following table describes the options available for the `Get-ProtectionGroups` command:

Table 242. Get-ProtectionGroups command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.

Example:

Lists protection groups on the local Core:

```
>Get-ProtectionGroups -protectedserver 10.10.10.10
```

Get-QueuedJobs

The `Get-QueuedJobs` command returns all jobs waiting to begin from the Core.

Usage

The usage for the command is as follows:

```
Get-QueuedJobs -core [host name] -user [login] -password [password] -all | -
protectedserver [name | IP address] -nu
    mber [all | f[number] | l[number] | number] -jobtype [type] -time [time]
```

Command Options

The following table describes the options available for the `Get-ActiveJobs` command:

Table 243. Get-ActiveJobs command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.
`-all`	Show all jobs, including those performed by the Core and all protected servers.
`-number`	Optional. Determine how many records to display. available values are: all (display all jobs); l[number] or [number] (fetches ## most recent jobs sorted by execution and time); f[number] (displays first ## recovery jobs sorted by execution and time). By default, the 20 most recent jobs are shown.
`-jobtype`	Optional. Specifies the job type filter. Available values are: `'transfer'` (data transfer), `'repository'` (repository maintenance), `'replication'` (local and remote replications), `'backup'` (backup and restore), `'bootcdbuilder'` (create boot CDs), `'diagnostics'` (upload logs), `'exchange'` (Exchange Server files check), `'export'` (recovery point export), `'pushinstall'` (deploy agents), `'rollback'` (restoring from a recovery point), `'rollup'` (recovery point rollups), `'sqlattach'` (agent attachability checks), and `'mount'` (mount repository). By default, all jobs of the specified type are returned.
`-time`	Optional. Filter output by date and time for the job started. Available types of input include:

Option	Description
	#d or DD (where # is a number for the period of time of days before now until now) #h or #H (where # is number for the period of hours before now until now) “time date 1”, “time date 2” (to show a custom range of time from a specific date appearing before the comma to a specific date following the comma).

Example:

Lists all queued jobs on the local Core:

```
>Get-QueuedJobs –all
```

Get-RecoveryPoints

The `Get-RecoveryPoints` command returns information about recovery points for machines protected on the local Core.

Usage

The usage for the command is as follows:

```
Get-RecoveryPoints -core [host name] -user [user name] -password [password]
-protectedserver [server name or IP address] -number [all | f[number] |
l[number] | number]
```

Command Options

The following table describes the options available for the `Get-RecoveryPoints` command:

Table 244. Get-RecoveryPoints command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.
`-number`	Optional. Determine how many records to display. available values are:

Option	Description
	all (display all jobs); l[number] or [number] (fetches ## most recent jobs sorted by execution and time); f[number] (displays first ## recovery jobs sorted by execution and time). By default, the 20 most recent jobs are shown.

Example:

Lists recovery points for machines protected on the local Core:

```
>Get-RecoveryPoints -protectedserver 10.10.10.10
```

Get-ReplicatedServers

The `Get-ReplicatedServers` command returns information about machines replicated on the Core.

Usage

The usage for the command is as follows:

```
Get-ReplicatedServers -core [host name] -user [user name] -password [password]
```

Dell recommends you consider security when using commands to return values. For example, this command returns the administrator password for each replicated server. If used in an MSP environment from the target Core, this can potentially expose the login password of the administrator user. For environments with encrypted repository data, this does not pose substantial security issues.

Command Options

The following table describes the options available for the `Get-ReplicatedServers` command:

Table 245. Get-ReplicatedServers command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.

Example:

Lists all replicated servers on the local Core:

```
>Get-ReplicatedServers
```

Get-Repositories

The `Get-Repositories` command returns information about repositories on the Core.

Usage

The usage for the command is as follows:

```
Get-Repositories -core [host name] -user [user name] -password [password]
```

Command Options

The following table describes the options available for the `Get-Repositories` command:

Table 246. Get-Repositories command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.

Example:

Lists repositories on the local Core:

```
>Get-Repositories
```

Get-ScheduledArchives

The `Get-ScheduledArchives` command lets you use PowerShell to view information about the existing Rapid Recovery scheduled archives associated with this Core.

Usage

The usage for the command is as follows:

```
Get-ScheduledArchives -core [host name] -user [login] -password [password]
```

Command Options

The following table describes the options available for the `Get-ScheduledArchives` command:

Table 247. Get-ScheduledArchives command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.

Example:

Get information about the scheduled archives on this Core:

```
>Get-ScheduledArchives -core 10.10.10.10 -user administrator -password password
```

Get-SqlDatabases

The `Get-SqlDatabases` command returns a list of SQL databases from the specified protected machine.

Usage

The usage for the command is as follows:

```
Get-SqlDatabases -core [host name] -user [user name] -password [password]
-protectedserver [server name or IP address]
```

Command Options

The following table describes the options available for the `Get-SqlDatabases` command:

Table 248. Get-SqlDatabases command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.

Option	Description
-protectedserver	Show jobs for a specific protected machine, indicated by IP address.

Example:

Lists all SQL databases jobs on the local Core:

```
>Get-SqlDatabases -protectedserver 10.10.10.10
```

Get-UnprotectedVolumes

The `Get-UnprotectedVolumes` command returns information about volumes that are available for protection but not currently protected on the Core.

Usage

The usage for the command is as follows:

```
Get-UnprotectedVolumes
-core [host name] -user [user name] -password [password] -protectedserver
[server name or IP address]
```

Command Options

The following table describes the options available for the `Get-UnprotectedVolumes` command:

Table 249. Get-UnprotectedVolumes command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
-protectedserver	Show jobs for a specific protected machine, indicated by IP address.

Example:

Lists all volumes available for protection (but not get protected) on the specified agent machine:

```
>Get-UnprotectedVolumes -protectedserver 10.10.10.10
```

Get-VirtualizedServers

The `Get-VirtualizedServers` command returns information about virtualized servers.

Usage

The usage for the command is as follows:

```
Get-VirtualizedServers -core [host name] -user [user name] -password [password]
```

Command Options

The following table describes the options available for the `Get-VirtualizedServers` command:

Table 250. Get-VirtualizedServers command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.

Example:

Lists all virtualized servers on the local Core:

```
>Get-VirtualizedServers
```

Get-Volumes

The `Get-Volumes` command returns information about volumes on a specified machine that is protected by the Core.

Usage

The usage for the command is as follows:

```
Get-Volumes -core [host name] -user [user name] -password [password]
-protectedserver [server name or IP address]
```

Command Options

The following table describes the options available for the `Get-Volumes` command:

Table 251. Get-Volumes command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.

Example:

Lists all volumes on the specified machine:

```
>Get-Volumes -protectedserver 10.10.10.10
```

New-Base

The `New-Base` command forces a new base image resulting in a data transfer for the current protected machine. When you force a base image, the transfer will start immediately or will be added to the queue. Only the data that has changed from a previous recovery point will be transferred. If there is no previous recovery point, all data on the protected volumes will be transferred.

Usage

The usage for the command is as follows:

```
New-Base [[-all] | -protectedserver [machine name]] -core [host name] -user
[user name] -password [password]
```

Command Options

The following table describes the options available for the `New-Base` command:

Table 252. New-Base command options

Option	Description
`-?`	Display this help message.
`-all`	Base image for all agents.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.

Option	Description
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
-protectedserver	Force for the current protected machine’s name.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.

Example:

Force base image for all protected machines:

```
>New-Base -all
```

New-CloudAccount

The `New-CloudAccount` command lets you add a new cloud account to the Rapid Recovery Core.

Usage

The usage for the command is as follows:

```
New-CloudAccount -core [host name] -user [login] -password [password] -
displayname [display name] -type [cloud acco
    unt type] -username [user name] - key [secret key] -region [region] -
tenantid [tenant Id] -authurl [authorization
    url]
```

Command Options

The following table describes the options available for the `New-CloudAccount` command:

Table 253. New-CloudAccount command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
-displayname	The name of the cloud account to display.

Option	Description
`-type`	The type of cloud account you want to add. Supported values include: • amazon • openstack • rackspace • windowsazure • "windows azure" • azure
`-username`	The user name for the cloud account that you want to add. It is used in the authentication process. This property resolves as "Access Key" for Amazon™ cloud, "User Name" for Rackspace and OpenStack, and "Storage Account Name" for Windows Azure cloud accounts.
`-key`	The key for the cloud account you want to add. It is used in the authentication process. This property resolves as "Secret Key" for Amazon™ cloud, "Api Key" for Rackspace and OpenStack, and "Access Key" for a Windows Azure cloud accounts.
`-region`	The region of the cloud account that you want to add. This property is required only for RackSpace and OpenStack cloud accounts.
`-tenantid`	The identifier that is used in the authentication process of an OpenStack cloud account. This option is required only for OpenStack cloud accounts.
`-authurl`	The URL that is used in the authentication process of an OpenStack cloud account. This option is required only for OpenStack cloud accounts.

Example:

Create a new Amazon™ S3 cloud account named "Amazon S3 Account" with the access key "akey" and the secret key "skey."

```
>New-CloudAccount -displayname "Amazon S3 Account" -type Amazon -username akey -
key skey
```

New-EncryptionKey

The `New-EncryptionKey` command lets you create a new encryption key for securing your Rapid Recovery backed up data.

Usage

The usage for the command is as follows:

```
New-EncryptionKey -core [host name] -user [login] -password [password] -name
[encryption key name] -passphrase [pas
    sphrase] -comment [comment]
```

Command Options

The following table describes the options available for the `New-EncryptionKey` command:

Table 254. New-EncryptionKey command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-name`	The name of the encryption key that you want to create.
`-passphrase`	The passphrase to the encryption key that you want to create.
`-comment`	Optional. The description of the encryption key.

Example:

Create an encryption key on the local Core:

```
>New-EncryptionKey –name EncryptionKey1 -passphrase 123456
```

New-EsxiVirtualStandby

The `New-EsxiVirtualStandby` PowerShell command lets you create a new ESXi virtual standby machine using Rapid Recovery.

Usage

The usage for the command is as follows:

```
New-EsxiVirtualStandby -core [host name] -user [login] -password [password] -
protectedserver [name | IP address] -volumes [volumes names] -vmname [virtual
machine name] -hostname [virtual host name] -hostport [virtual host port
number] -hostusername [virtual host login] -hostpassword [virtual host
password] [-ram [total megabytes] | -usesourceram] -diskprovisioning [thin |
thick] -diskmapping [automatic | manual | withvm] -initialexport
```

Command Options

The following table describes the options available for the `New-EsxiVirtualStandby` command:

Table 255. New-EsxiVirtualStandby command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.

Option	Description
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
-protectedserver	Show jobs for a specific protected machine, indicated by IP address.
-volumes	Optional. List the volume names you want to export. If not specified, all volumes in the recovery point(s) are exported. Values must be enclosed in double quotes and separated by space; for example, "c:", "d:". **NOTE:** Do not use trailing slashes in volume names.
-vmname	The Microsoft Windows name of the virtual machine.
-hostname	The name of the virtual server host.
-hostport	The port number to use for communicating with the virtual server.
-hostusername	The user name for logging in to the virtual server host.
-hostpassword	The password for logging in to the virtual server host.
-ram	Allocate a specific amount of RAM on the virtual server.
-usesourceram	Optional. Allocate the same amount of RAM on the virtual server that the source protected machine has.
-diskprovisioning	Optional. The amount of disk space to allocate on the virtual machine. Available values include: • Thick - Specify 'thick' to make the virtual disk as large as the original drive on the protected server. • Thin - Specify 'thin' to allocate the amount of actual disk space occupied on the original drive plus some additional megabytes. The default disk provisioning is 'thin'.
-diskmappinjg	Optional. It determines how to map the disks from the recovery point to the virtual machine. Available values include: • 'auto' • 'manual' • 'withvm' The default setting is 'auto'.

Option	Description
`-initialexport`	Optional. Specify this option if you need to start an initial on-demand virtual machine export after configuring the virtual standby.

Example:

Create a new ESXi virtual standby:

```
>New-EsxiVirtualStandby -protectedserver 10.10.10.4 -vmname ExportedMachine -
hostname 10.10.10.127 -hostport 443 -hostusername root -hostpassword pass123 -
usesourceram -diskprovisioning thin -diskmapping auto
```

New-HyperVVirtualStandby

The `New-HyperVVirtualStandby` PowerShell command lets you create a new Hyper-V virtual machine (VM) using Rapid Recovery.

Usage

The usage for the command is as follows:

```
New-HyperVVirtualStandby -core [host name] -user [login] -password [password] -
protectedserver [name | IP address]
    -volumes [volumes names] -vmname [virtual machine name] [-gen2] -useVhdx [-
uselocalmachine] | -hostname [virtual ho
    st name] -hostport [virtual host port number] -hostusername [virtual host
login] -hostpassword [virtual host passwo
    rd]] -vmlocation [location] [-ram [total megabytes] | -usesourceram] -
initialexport
```

Command Options

The following table describes the options available for the `New-HyperVVirtualStandby` command:

Table 256. New-HyperVVirtualStandby command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.

Option	Description
-volumes	Optional. List the volume names you want to export. If not specified, all volumes in the recovery point(s) are exported. Values must be enclosed in double quotes and separated by space; for example, "c:", "d:". NOTE: Do not use trailing slashes in volume names.
-vmname	The Microsoft Windows name of the virtual machine.
-gen2	Optional. Specify to use the second VM generation. If not specified, generation 1 is used. Rapid Recovery supports generation 2 from Windows Server 2012 R2 through Windows 8.1.
-usevhdx	Optional. If you specify this option, Rapid Recovery uses the VHDX disk format to create the VM. If you do not, it uses the VHD disk format. Generation 2 uses only the VHDX format.
-uselocalmachine	Optional. Connect to the local Hyper-V server. When you specify this value, Rapid Recovery ignores the following options: • hostname • hostport • hostusername • hostpassword
-hostname	The name of the virtual server host.
-hostport	The port number to use for communicating with the virtual server.
-hostusername	The user name for logging in to the virtual server host.
-hostpassword	The password for logging in to the virtual server host.
-vmlocation	Local or network path to the folder where you want to store the virtual machine files.
-ram	Allocate a specific amount of RAM on the virtual server.
-usesourceram	Optional. Allocate the same amount of RAM on the virtual server that the source protected machine has.
-initialexport	Optional. Specify this option if you need to start an initial on-demand virtual machine export after configuring the virtual standby.

Example:

Create a new Hyper-V virtual standby machine:

```
>New-HyperVVirtualStandby -core [host name] -user [login] -password [password] -
protectedserver [name | IP address]
    -volumes [volumes names] -vmname [virtual machine name] [-gen2] -useVhdx [-
uselocalmachine] | -hostname [virtual ho
    st name] -hostport [virtual host port number] -hostusername [virtual host
login] -hostpassword [virtual host passwo
```

```
    rd]] -vmlocation [location] [-ram [total megabytes] | -usesourceram] -
initialexport
```

New-Mount

The `New-Mount` command mounts a snapshot of one or more drives.

Usage

The usage for the command is as follows:

```
New-Mount -core [host name] -user [user name] -password [password] -
protectedserver [machine name] -mounttype [read | write |
readonlywithpreviouswrites] -drives [drive names] -path [location] –time [MM/DD/
YYYY hh:mm:ss tt | passed | latest] –rpn [number]
```

Command Options

The following table describes the options available for the `New-Mount` command:

Table 257. New-Mount command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-protectedserver`	The protected server IP address or machine name (depends on how the particular machine was protected.
`-time`	Optional. The timestamp of the Recovery Point to mount. This should be in the format that is specified by the OS on the current PC. The administrator is able to get the latest recovery point by specifying latest or last checked recovery point by passed parameter value. By default the latest time option is chosen.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-path`	Path on the Core machine to which recovery points will be mounted.
`-mounttype`	Optional. Specifies a mount mode. Available options are `'read'`, `'readOnlyWithPreviousWrites'` (read-only with previous writes), `'write'` (writable). Default mode is `read-only`.
`-volumes`	Optional. Space-separated list of volume names to mount. If the volume's name contains spaces or special characters, it has to be specified using double quotes. If not specified, all volumes will be mounted.
`-drivers`	Optional. Comma-separated list of volume names to mount. If not specified, all volumes will be mounted.

Option	Description
	NOTE: This option is obsolete, use `'-volumes'` instead.
`-rpn`	Optional. Recovery point number for the mount. You can obtain this using the `get-mounts` command. Specify several numbers for the `rpn` parameter to mount different points with a single command. NOTE: If you set an array of points to mount, each point will be located in a separate child directory. The name describes the time when the recovery point was created. When you call dismount, all child directories will be removed. You should remove the parent directory manually.

Example:

```
>New-Mount -core 10.10.10.10:8006 -user administrator -password 23WE@#$sdd -
protectedserver 10.10.5.22 -path C:\MountedRecoveryPoint -mounttype read -
volumes c "d, ko"
```

Mount an array of recovery points:

```
>New-Mount -rpn 10 52 41 -protectedserver localhost –path "D:/Folder for mount"
```

Mount a recovery point with certain time created:

```
>New-Mount -protectedserver 10.10.5.56 –path "D:/Folder for mount" –time
"8/24/2012 11:46 AM"
```

Resume-Replication

The `New-Replication` command lets you set up and force replication for a protected server or servers.

Usage

The usage for the command is as follows:

```
New-Replication -core [host name] -user [login] -password [password] -
targetserver [host name] -protectedserver [name | IP address]
```

Command Options

The following table describes the options available for the `New-Replication` command:

Table 258. New-Replication command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.

Option	Description
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
-replicationname	Name of the replication configuration on the target Core.
-targetserver	The host name, user name, and password for the target Core.
-protectedserver	The name of the protected machine and repository on the target Core for setting up replication.

Example:

Create new replication for the protected machine with IP 10.10.10.4:

```
>New-Replication -targetserver 10.10.10.128 -protectedserver 10.10.10.4
```

New-Repository

The `New-Repository` command creates a new DVM repository in the Rapid Recovery Core. The size specified must be between 250MB and 16TB.

Usage

The usage for the command is as follows:

```
New-Repository | -name [name] -size [size] -datapath [location] -metadatapath
[location]
```

Command Options

The following table describes the options available for the `New-Repository` command:

Table 259. New-Repository command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
-name	Repository name.
-size	Size of repository extent. Available units are: b, Kb, MB, GB, TB, PB.
-datapath	For local location only. Determines data path of repository extent.

Option	Description
-metadatapath	For local location only. Determines metadata path of repository extent.
-uncpath	For share location only. Determines data and metadata paths of repository extent.
-shareusername	For share location only. Determines login to share location.
-sharepassword	For share location only. Determines password to share location.
-comment	Optional. Description of repository.
-concurrent Operations	Optional. Maximum number of operations that can be pending at one time. Value by default: 64.

Example:

Create new DVM repository of minimum size in local drive E:

```
>New-Repository –name Repository2 -size 250Mb -datapath e:\Repository\Data -
metadatapath e:\Repository\Metadata
```

New-ScheduledArchive

The `New-ScheduledArchive` command lets you use PowerShell to make changes to an existing scheduled archive.

Usage

The usage for the command is as follows:

```
New-ScheduledArchive -core [host name] -user [login] -password [password] -all
| -protectedserver [name | IP address] -path [location] -archiveusername [name]
-archivepassword [password] -cloudaccountname [name] -cloudcontainer [name] -
recycleaction [type] -schdeuletype [type] -dayofweek [name] -dayofmonth
[number] -time [time]
```

Command Options

The following table describes the options available for the `New-ScheduledArchive` command:

Table 260. New-ScheduledArchive command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.

Option	Description
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	The protected machine with recovery points that you want to archive. You can specify multiple machine names enclosed in double quotes and separated by commas.
`-all`	Archive recovery points for all protected machines.
`-path`	The path to where to save the archived data. For example: • Local machine: "d:\work\archive" • Network path: "\\servername\sharename" • Folder in a cloud account: "Folder Name" **NOTE:** The number of symbols should not be greater than 100 for local and network locations, and should not be greater than 150 for a cloud location.
`-archiveusername`	Optional. The user name for logging in to the remote machine. It is required for a network path only.
`-archivepassword`	Optional. The password for logging in to the remote machine. It is required for a network path only.
`-cloudaccountname`	Optional. Use only for cloud archiving. The name of the cloud account where you want to save the archive.
`-cloudcontainer`	Optional. Use only for cloud archiving. The name of the cloud container in the chosen cloud account, where the archive will be saved. When you use this option, you should also specify the "-cloudaccountname" parameter.
`-recycleaction`	The type of recycle action. Specified by using one of the following four values: • "replacethiscore" - Overwrites any pre-existing archived data pertaining to this Core, but leaves the data for other Cores intact. • "erasecompletely" - Clears all archived data from the directory before writing the new archive. • "incremental" - Lets you add recovery points to an existing archive. It compares recovery points to avoid duplicating data that already exists in the archive.
`-scheduletype`	Type of schedule interval. Specified the option with one of the following four values: • "daily" - For a daily automatically created archive. • "weekly" - For a weekly automatically created archive. You must specify the "-dayofweek" parameter. • "monthly" - For a monthly automatically created archive. You must specify the "-dayofmonth" parameter. If a month does not have the day specified—for example, "31"—then the archive will not occur for that month. • "lastdayofmonth" - For automatically creating an archive on the last day of each month.

Option	Description
-dayofweek	Use only for the "weekly" option of the "-scheduletype" parameter. The day of the week on which to automatically create the archive (for example, "Monday").
-dayofmonth	Use only for the "month" option of the "-scheduletype" parameter. The day (number) of the month on which to automatically create the archive (for example, "15").
-time	The hour of the day when you want to create an archive.
-initialpause	Optional. Specify this option if you want to initially pause archiving after you configure the archiving schedule.

Examples:

Archive all recovery points with creation dates starting from 04/30/2012 02:55 PM for all machines on the Core, and replace pre-existing archived data pertaining to this Core:

```
>New-ScheduledArchive -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -path "d:\work\archive" -s
    tartdate "04/30/2012 02:55 PM" -all -recycleaction replacethiscore
```

Archive recovery points that fall within a date range for two protected machines, and clear all archived data from the directory before writing the new archive:

```
>New-ScheduledArchive -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -protectedserver "10.20.30.40" "20.20.10.1" -path "d:\work\archive" -
startdate "04/30/2012 02:55 PM" -enddate "05/31/2012 11:00 AM" -recycleaction
erasecompletely
```

Create an incremental archive for all recovery points with creation dates starting from 04/30/2012 02:55 PM for all machines on the Core to the cloud account with the name "Amazon S3" and a container named "Container":

```
>New-ScheduledArchive -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -path "ArchiveOnCloud" -cloudaccountname "Amazon S3" -cloudcontainer
"Container" -startdate "04/30/2012 02:55 PM" -all -recycleaction incremental
```

New-Snapshot

The `New-Snapshot` command forces a snapshot resulting in a data transfer for the current protected machine. When you force a snapshot, the transfer will start immediately or will be added to the queue. Only the data that has changed from a previous recovery point will be transferred. If there is no previous recovery point, all data on the protected volumes will be transferred.

Usage

The usage for the command is as follows:

```
New-Snapshot [-all] | -protectedserver [machine name]] -core [host name] -user
[user name] -password [password]
```

Command Options

The following table describes the options available for the `New-Snapshot` command:

Table 261. New-Snapshot command options

Option	Description
`-?`	Display this help message.
`-all`	Force all protected machines.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Force for the current protected machine’s name.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.

Example:

Force a snapshot for all protected machines:

```
>New-Snapshot -all
```

New-VBVirtualStandby

The `New-VBVirtualStandby` command lets you use PowerShell to create a new virtual export to a VirtualBox virtual machine (VM).

Usage

The usage for the command is as follows:

```
New-VBVirtualStandby -core [host name] -user [login] -password [password] -
protectedserver [name | IP address] -volumes [volumes names] -vmname [virtual
machine name] [-ram [total megabytes] | -usesourceram]  -linuxhostname [linux
hostname] -hostport [linux port] -targetpath [location] -pathusername [login] -
pathpassword [password] -initialexport
```

Command Options

The following table describes the options available for the `New-VBVirtualStandby` command:

Table 262. New-VBVirtualStandby command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password.

Option	Description
	If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.
`-volumes`	Optional. List the volume names you want to export. If not specified, all volumes in the recovery point(s) are exported. Values must be enclosed in double quotes and separated by space; for example, "c:", "d:". NOTE: Do not use trailing slashes in volume names.
`-vmname`	The Microsoft Windows name of the virtual machine.
`-ram`	Allocate a specific amount of RAM on the virtual server.
`-usesourceram`	Optional. Allocate the same amount of RAM on the virtual server that the source protected machine has.
`-linuxhostname`	The Linux VirtualBox server host name.
`-hostport`	The Linux VirtualBox server port.
`-targetpath`	The local, network, or Linux path to the folder where you want to store the virtual machine files.
`-pathusername`	The user name for logging in to the network machine. It is only required when you specify a network location for the target path.
`-pathpassword`	The password for logging in to the network machine. It is only required when you specify a network location for the target path.
`-accountusername`	Optional. You can specify a user account with which to register the exported virtual machine. It is the user name for logging in to the user account. Use this option for a local or network machine only.
`-accountpassword`	Optional. You can specify a user account with which to register the exported virtual machine. It is the password for logging in to the user account. Use this option for a local or network machine only.
`-initialexport`	Optional. Specify this option if you need to start an initial on-demand virtual machine export after configuring the virtual standby.

Example:

Create a VirtualBox virtual standby machine named ExportedMachine1 in a specified location:

```
>New-VBVirtualStandby -protectedserver 10.10.10.4 -volumes C:\ -vmname
ExportedMachine1 -usesourceram -targetpath I:\VMExport
```

New-VMVirtualStandby

The `New-VMVirtualStandby` PowerShell command lets you create a new VMware Workstation virtual standby machine using Rapid Recovery.

Usage

The usage for the command is as follows:

```
New-VMVirtualStandby -core [host name] -user [login] -password [password] -
protectedserver [name | IP address] -volumes [volumes names] -vmname [virtual
machine name] [-ram [total megabytes] | -usesourceram] -targetpath [location] -
pathusername [login] -pathpassword [password] -initialexport
```

Command Options

The following table describes the options available for the `New-VMVirtualStandby` command:

Table 263. New-VMVirtualStandby command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Show jobs for a specific protected machine, indicated by IP address.
`-volumes`	Optional. List the volume names you want to export. If not specified, all volumes in the recovery point(s) are exported. Values must be enclosed in double quotes and separated by space; for example, "c:", "d:". NOTE: Do not use trailing slashes in volume names.
`-vmname`	The Microsoft Windows name of the virtual machine.
`-ram`	Allocate a specific amount of RAM on the virtual server.
`-usesourceram`	Optional. Allocate the same amount of RAM on the virtual server that the source protected machine has.
`-pathusername`	The user name for logging in to the network machine. It is only required when you specify a network location for the target path.

Option	Description
-pathpassword	The password for logging in to the network machine. It is only required when you specify a network location for the target path.
-initialexport	Optional. Specify this option if you need to start an initial on-demand virtual machine export after configuring the virtual standby.

Example:

Create a new VMware Workstation virtual standby:

```
>New-VMVirtualStandby -protectedserver 10.10.10.4 -volumes C:\ -vmname
ExportedMachine1 -usesourceram -targetpath I:\VMExport
```

Script pauses, requiring user to specify an index number for the appropriate workstation. Enter the index number for the script to complete (in this case, 2). Example continues:

```
2
Verify location ...
Virtual Standby successfully configured
PS C:\Users\Administrator>
```

Push-Replication

The `Push-Replication` command forces replication for one or more protected machines.

Usage

The usage for the command is as follows:

```
Push-Replication -core [host name] -user [user name] -password [password] -
targetcore [host name] -all | -protectedserver [machine name | IP address]
```

Command Options

The following table describes the options available for the `Push-Replication` command:

Table 264. Push-Replication command options

Option	Description
-?	Display this help message.
-all	Force replication for all machines being replicated to the target Core.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
-protectedserver	Protected machine name on the target Core against which to force replication.

Option	Description
-user	Optional. Login for the remote Core host machine. If you specify a login, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.

Example:

Push replication for a single protected machine:

```
>Push-Replication -core 10.10.10.10:8006 -user administrator -password 23WE@#
$sdd
-targetcore 10.10.10.20:8006 –protectedserver 10.10.5.22
```

Push replication for all protected machines:

```
>Push-Replication -all
```

Push-Rollup

The `Push-Rollup` command forces rollup for a protected machine.

Usage

The usage for the command is as follows:

```
Push-Rollup -core [host name] -user [user name] -password [password] -
protectedserver [machine name | IP address]
```

Command Options

The following table describes the options available for the `Push-Rollup` command:

Table 265. Push-Rollup command options

Option	Description
-?	Display this help message.
-all	Force all protected machines.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
-protectedserver	Force for the current protected machine’s name.
-user	Optional. Login for the remote Core host machine. If you specify a login, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.

Example:

Push rollup for a single protected machine:

```
>Push-Rollup -core 10.10.10.10:8006 -user administrator -password 23WE@#$sdd -
protectedserver 10.10.5.22
```

Push rollup for all protected machines:

```
>Push-Rollup -all
```

Remove-Agent

The `Remove-Agent` PowerShell command lets you remove a machine from Rapid Recovery Core protection.

Usage

The usage for the command is as follows:

```
Remove-Agent -core [host name] -user [login] -password [password] -
protectedserver [name | IP address] -deleterecoverypoints -all
```

Command Options

The following table describes the options available for the `Remove-MountAgent` command:

Table 266. Remove-Agent command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Dismount all mounted recovery points for the current protected machine.
`-deleterecoverypoints`	Optional. Delete all recovery points for this protected machine.
`-all`	Optional. Delete all protected machines from the Core.

Example:

Dismount all protected machines and their recovery points:

```
>Remove-Agent -core 10.10.10.10:8006 -user administrator -password 23WE@#$sdd -
deleterecoverypoints -all
```

Remove-Mount

The `Remove-Mount` command dismounts a mounted recovery point specified by the `/Path`. Dismount points for the selected machine using the `-protectedserver` parameter or dismount points for all the mounted recovery points by using the `-all` parameter.

Usage

The usage for the command is as follows:

```
Remove-Mount -core [host name] -user [user name] -password [password] [-
protectedserver [machine name] | -path [mount path]]
```

Command Options

The following table describes the options available for the `Remove-Mount` command:

Table 267. Remove-Mount command options

Option	Description
`-?`	Display this help message.
`-all`	Dismount all mounted recovery points.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-path`	Dismount selected mount point.
`-protectedserver`	Dismount all mounted recovery points for the current protected machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.

Example:

Dismount the recovery point specified by the path:

```
>Remove-Mount -core 10.10.10.10:8006 -user administrator -password 23WE@#$sdd -
path C:\mountedRecoveryPoint
```

Remove-Mounts

The `Remove-Mounts` command dismounts all mounted recovery points.

Usage

The usage for the command is as follows:

```
Remove-Mounts -core [host name] -user [user name] -password [password]
```

Command Options

The following table describes the options available for the `Remove-Mounts` command:

Table 268. Remove-Mounts command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.

Example:

Dismount all recovery points on the specified Core:

```
>Remove-Mounts -core 10.10.10.10:8006 -user administrator -password 23WE@#$sdd
```

Remove-RecoveryPoints

The `Remove-RecoveryPoints` PowerShell command lets you delete recovery points for a specific machine.

Usage

The usage for the command is as follows:

```
Remove-RecoveryPoints -core [host name] -user [login] -password [password] -
[range | chain | all] -protectedserver
    [name | IP address] -rpn [number | numbers] | -time [time string | time
interval specified by two time strings]
```

Command Options

The following table describes the options available for the `Remove-RecoveryPoints` command:

Table 269. Remove-RecoveryPoints command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
-protectedserver	Dismount all mounted recovery points for the current protected machine.
-rpn	Optional. Only for chain deletion (base image with chain of incrementals or orphaned points). The sequential number of a recovery point to be deleted (use the Get-RecoveryPoints command to obtain the numbers). You can specify several space-separated numbers to delete multiple recovery points with a single command.
-time	Use this option to delete a chain of recovery points. Optional. To delete a single recovery point, select the recovery point by its creation time. Specify the exact time in the format "mm/dd/yyyy hh:mm tt" (for example, "2/24/2012 09:00 AM"). Keep in mind to specify date and time values of the time zone set on your computer. Required. For a date range, specify a time interval using two time strings separated by coma and space to select the range of recovery points to delete.
-range	Optional. The range of recovery points to delete by time interval.
-chain	Optional. A base image with sequential incrementals or a sequential set of orphaned points to delete selected by recovery point number or time of recovery point creation.
-all	Optional. Delete all protected machines from the Core.

Example:

Delete the recovery point specified by the date:

```
>Remove-RecoveryPoints -core 10.10.10.10:8006 -user administrator -password
23WE@#$sdd -time "2/24/2012 09:00 AM"
```

Remove-Repository

The `Remove-Repository` PowerShell command deletes a Rapid Recovery repository and its contents from the Core.

Usage

The usage for the command is as follows:

```
Remove-Repository -core [host name] -user [login] -password [password] -name
[repository name] -all
```

Command Options

The following table describes the options available for the `Remove-Repository` command:

Table 270. Remove-Repository command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-name`	The name of the repository that you want to delete.
`-all`	Delete all repositories associated with this Core.

Example:

Remove all repositories on the local Core:

```
>Remove-repository -all
```

Remove-ScheduledArchive

If you scheduled Rapid Recovery to regularly archive recovery points for a specific machine, you can use the `Remove-ScheduledArchive` PowerShell command to remove that scheduled archive from the Core.

Usage

The usage for the command is as follows:

```
Remove-ScheduledArchive -core [host name] -user [login] -password [password] -
all -ids [id | id1 id2]
```

Command Options

The following table describes the options available for the `Remove-ScheduledArchive` command:

Table 271. Remove-ScheduledArchive command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
-all	Remove all archives associated with this Core.
-id	The identifier of the archive that you want to remove. To list more than one archive, separate each ID with a space.

Example:

Remove several scheduled archives from the local Core:

```
>Remove-ScheduledArchive -ids 799138c8-3dfc-4398-9711-1823733c2a31, 26c29bb7-
b320-47f5-b5a8-dffc49f50e25
```

Remove-VirtualStandby

If you scheduled Rapid Recovery to continuously export data to a virtual machine, then you can use the `Remove-VirtualStandby` PowerShell command to cancel and delete this scheduled job.

Usage

The usage for the command is as follows:

```
Remove-VirtualStandby -core [host name] -user [login] -password [password] -all
| -protectedserver [name(s) | IP ad
    dress]
```

Command Options

The following table describes the options available for the `Remove-VirtualStandby` command:

Table 272. Remove-VirtualStandby command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password.

Option	Description
	If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
-all	Remove all virtual standby jobs associated with this Core.
-protectedserver	The name or IP address for the protected machine for which you want to remove virtual standby.

Example:

Remove all virtual standby jobs associated with this Core:

```
>Remove-VirtualStandby -all
```

Resume-Replication

The `Resume-Replication` command lets you resume replication. See Suspend-Replication for more details.

Usage

The usage for the command is as follows:

```
Resume-Replication -core [host name] -user [user name] -password [password] -
all | -protectedserver [machine name | IP address] -incoming [host name] | -
outgoing [host name]
```

Command Options

The following table describes the options available for the `Resume-Replication` command:

Table 273. Resume-Replication command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-all	All protected servers.

Option	Description
`-protectedserver`	Resume replication for the specified machine.
`-incoming`	Host name of the remote Core that replicates to the Core machine. Replication is resumed for all protected machines on the remote Core.
`-outgoing`	Host name of the remote target core to which data is replicating. Replication is resumed for all protected machines on the remote core.

Example:

Resume replication for the protected machine with IP 10.10.10.128 for the local Core, specifying the repository being used:

```
>Resume-Replication replicationname Replication1 -targetserver
10.10.10.128,Administrator,123asdQ -protectedserver 10.10.10.4

# Repository
- ----------

1 Repository A
2 Repository B
Please, input number of Repository from the list above or type 'exit' to exit:
```

Script pauses, requiring user to specify an index number for the appropriate repository. Enter the index number for the script to complete (in this case, 2). Example continues:

```
2
Replication job was started.
True
PS C:\Users\Administrator>
```

Resume-Snapshot

An administrator is able to resume snapshots, export to virtual machines, and perform replication. See Start-VMExport for more details.

Usage

The usage for the command is as follows:

```
Resume-Snapshot -core [host name] -user [user name] -password [password] -all |
-protectedserver [name | IP address]
```

Command Options

The following table describes the options available for the `Resume-Snapshot` command:

Table 274. Resume-Snapshot command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.

Option	Description
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-all`	All protected servers.
`-protectedserver`	Resume snapshot for the specified machine.

Example:

Resume snapshots for the protected machine with IP 10.10.10.4 for the local Core:

```
>Resume-Snapshot -protectedserver 10.10.10.4
```

Resume-VirtualStandby

The `Resume-VirtualStandby` PowerShell command lets you resume the suspended export of data to a Rapid Recovery virtual standby machine.

Usage

The usage for the command is as follows:

```
Resume-VirtualStandby -core [host name] -user [login] -password [password] -all
| -protectedserver [name(s) | IP address]
```

Command Options

The following table describes the options available for the `Resume-VirtualStandby` command:

Table 275. Resume-VirtualStandby command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-all`	Resume exports for all virtual standby machines.

Option	Description
`-protectedserver`	The name or names—separated by a comma and space—of the protected machines with virtual standby machines that you want to resume.

Example:

Resume virtual standby exports for a protected machine:

```
>Resume-VirtualStandby -core 10.10.10.10:8006 -user administrator -password
23WE@#$sdd -protectedserver 10.10.5.22
```

Resume-VMExport

The `Resume-VMExport` command lets an administrator export to virtual machines. See Suspend-VMExport for more details.

Usage

The usage for the command is as follows:

```
Resume-VMExport -core [host name] -user [user name] -password [password] -all |
-protectedserver [name | IP address]
```

Command Options

The following table describes the options available for the `Resume-VMExport` command:

Table 276. Resume-VMExport command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-all`	All protected servers.
`-protectedserver`	Resume snapshot for the specified machine.

Example:

Resume export to a virtual machine for each protected machine on the local Core:

```
>Resume-VMExport -all
```

Start-Archive

Businesses often use long-term storage to archive both compliant and non-compliant data. The archive feature in Rapid Recovery is used to support the extended retention for compliant and non-compliant data. The administrator can save an archive on the local storage or network location by specifying the `/Path` command and credentials.

Usage

The usage for the command is as follows:

```
Start-Archive -path -startdate -enddate [-all] | -protectedserver [machine
name] or [IP]] -core [host name] -user [user name] -password [password]
```

Command Options

The following table describes the options available for the `Start-Archive` command:

Table 277. Start-Archive command options

Option	Description
`-?`	Display this help message.
`-path`	Location path. Example path: 'D:\work\archive' or network path: '\\servername \sharename'.
`-all`	Archive recovery points for all machines on the Core.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-startdate`	Start date of the date range for the created recovery points. Should be in the format specified by the OS on the current PC.
`-enddate`	End date of the date range. Defaults to the current time.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Archive recovery points for the specified machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-archiveusername`	Optional. Required for network path only.
`-archivepassword`	Optional. Required for network path only.
`-comment`	Optional. Example: `-comment 'Before install new application'`.

Example:

Archive all recovery points for all machines on the Core:

```
>Start-Archive -path D:\work\archive -startdate 'Example 04/30/2012' -all
```

Start-AttachabilityCheck

The `Start-AttachabilityCheck` command forces an attachability check for all SQL Server databases protected by the Core.

Usage

The usage for the command is as follows:

```
Start-AttachabilityCheck -core [host name] -user [username] - password
[password]
- protectedserver [machine name | IP address] -rpn [number | numbers] | -time
[time string]
```

Command Options

The following table describes the options available for the `Start-AttachabilityCheck` command:

Table 278. Start-AttachabilityCheck command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	The protected machine on which to perform the SQL attachability check.
`-rpn`	Optional. The sequential number of a recovery point on which to perform the SQL attachability check. You can use the `-GetRecoveryPoints` command to obtain recovery point numbers. You can specify several space-separated numbers to perform the checks against multiple recovery points with a single command. NOTE: If neither ‘time’ nor ‘rpn’ option is specified in this command, than the most recent recovery point is used for the attachability check.
`-time`	Optional. Determines recovery point to be selected for SQL attachability check. You need to specify exact time in the format “MM/DD/YYYY hh:mm tt” (for example:

Option	Description
	"04/24/2015 09:00 AM")." Specify date time values of the time zone set on your local machine. NOTE: If neither 'time' nor 'rpn' option is specified in this command, than the most recent recovery point will be exported.

Example:

Perform a SQL attachability check on the most recent recovery point for the specified protected SQL server:

```
>Start-AttachabilityCheck - protectedserver 10.10.9.120
```

Start-ChecksumCheck

The `Start-ChecksumCheck` PowerShell command lets you force a checksum check of Exchange Server recovery points.

Usage

The usage for the command is as follows:

```
Start-ChecksumCheck -core [host name] -user [login] -password [password] -
protectedserver [name | IP address] -rpn [number | numbers] | -time [time
string]
```

Command Options

The following table describes the options available for the `Start-ChecksumCheck` command:

Table 279. Start-ChecksumCheck command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	The name of the protected machine.
`-rpn`	Optional. Only for chain deletion (base image with chain of incrementals or orphaned points). The sequential number of a recovery point to check (use the Get-RecoveryPoints command to obtain the numbers). You can specify several space-separated numbers to delete multiple recovery points with a single command.

Option	Description
-time	Optional. Select the recovery point to check by its creation time, instead of its sequential number. Specify the exact time in the format "mm/dd/yyyy hh:mm tt" (for example, "2/24/2012 09:00 AM"). Keep in mind to specify date and time values of the time zone set on your computer.

Example:

Start a checksum check on two recovery points.:

```
> Start-ChecksumCheck -core 10.10.10.10 -user administrator -password 23WE@#
$sdd -protectedserver 10.10.5.22 -rpn 5 7
```

Start-EsxiExport

The `Start-EsxiExport` PowerShell command initiates the launch of a virtual export from the selected Rapid Recovery recovery point to an ESX(i) server virtual machine.

Required parameters include the name of the protected machine containing recovery points to export; the name of the virtual machine you are exporting to; the amount of RAM to be allocated on the virtual machine; the host name and port of the Linux server host, and the path to the local, network, or Linux folder where the resulting virtual machine files will be stored.

Usage

The usage for the command is as follows:

```
Start-EsxiExport -core [host name] -user [user name] -password [password] -
protectedserver [machine name | IP address] -volumes [volume names] -rpn
[number | numbers] | -time [time string] -vmname [virtual machine name] -
hostname [virtual host name] -hostport [virtual host port number] -hostusername
[virtual host user name] hostpassword [virtual host password] [-ram [total
megabytes] | -usesourceram] -diskprovisioning [thin | thick] -diskmapping
[automatic | manual | withvm]
```

Command Options

The following table describes the options available for the `Start-EsxiExport` command:

Table 280. Start-EsxiExport command options

Option	Description
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
-protectedserver	Protected machine with recovery points to be exported.

Option	Description
`-volumes`	Optional. List of volume names to be exported. If not specified, all volumes in the specified recovery points will be exported. Values must be enclosed in double quotes, each separated by a space. do not use trailing slashes in volume names. For example, specify “C:” not “C:/”
`-rpn`	Optional. The sequential number of a recovery point to be exported. (You can use the `Get-RecoveryPoints` command to obtain recovery point numbers. NOTE: If neither ‘time’ nor ‘rpn’ option is specified in this command, than the most recent recovery point will be exported.
`-time`	Optional. Determines recovery point to be selected for export. You need to specify exact time in the format “MM/DD/YYYY hh:mm tt” (for example: “04/24/2015 09:00 AM”).” Specify date time values of the time zone set on your local machine. NOTE: If neither ‘time’ nor ‘rpn’ option is specified in this command, than the most recent recovery point will be exported.
`-vmname`	Windows name of the virtual machine.
`-hostname`	The virtual server host name.
`-hostport`	The virtual server port number.
`-hostusername`	The user name to the virtual server host.
`-hostpassword`	The password to the virtual server host.
`-ram`	Allocate specific amount of RAM on the virtual server.
`-usesourceram`	Optional. Allocate the same amount of RAM on the virtual server as the source protected machine.
`-diskprovisioning`	Optional. The amount of disk space that will be allocated on the virtual machine. Specify ‘thick’ to make the virtual disk as large as the original drive on the protected server, or ‘thin’ to allocate the amount of actual disk space occupied on the original drive, plus some extra space in megabytes. By default, ‘thin’ provisioning is selected.
`-diskmapping`	Optional. Select either ‘auto,’ ‘manual,’ or ‘withvm’. By default, auto-mapping is enabled.
`-resetup`	Optional. Recreates virtual machine if it is already presented at the specified location.
`-datacenter`	Optional. Specifies which datacenter to use.
`-resourcepool`	Optional. Specifies which resource pool to use.
`-datastore`	Optional. Specifies which datastore to use.

Option	Description
`-computeresource`	Optional. Specifies which compute resource to use.
`-version`	Optional. Specifies which version of ESXi to use.

Start-HypervExport

The `Start-HypervExport` PowerShell command initiates the launch of a virtual export from the selected Rapid Recovery recovery point to a Hyper-V server virtual machine.

Usage

The usage for the command is as follows:

```
Start-HypervExport -core [host name] -user [user name] -password [password] -
protectedserver [[machine name] or [IP address]] -volumes [volume names] -rpn
[number | numbers] | -time [time string] [-vmname [uselocalmachine] | -hostname
[virtual host name] -hostport [virtual host port number] -hostusername [virtual
host user name] -hostpassword [virtual host password] -vmlocation [location]] [-
ram [total megabytes] | -usesourceram] -diskformat [VHD | VHDX]
```

Command Options

The following table describes the options available for the `Start-HypervExport` command:

Table 281. Start-HypervExport command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Protected machine with recovery points to be exported.
`-volumes`	Optional. List of volume names to be exported. If not specified, all volumes in the specified recovery points will be exported. Values must be enclosed in double quotes, each separated by a space. do not use trailing slashes in volume names. For example, specify “C:” not “C:/”
`-rpn`	Optional. The sequential number of a recovery point to be exported. (You can use the `Get-RecoveryPoints` command to obtain recovery point numbers.

Option	Description
	NOTE: If neither 'time' nor 'rpn' option is specified in this command, than the most recent recovery point will be exported.
-time	Optional. Determines recovery point to be selected for export. You need to specify exact time in the format "MM/DD/YYYY hh:mm tt" (for example: "04/24/2015 09:00 AM")." Specify date time values of the time zone set on your local machine. NOTE: If neither 'time' nor 'rpn' option is specified in this command, than the most recent recovery point will be exported.
-vmname	Windows name of the virtual machine.
-gen2	Optional. Specify to use the second VM generation. If not specified, generation 1 is used. Rapid Recovery supports generation 2 from Windows Server 2012 R2 through Windows 8.1.
-usevhdx	Optional. If you specify this option, Rapid Recovery uses the VHDX disk format to create the VM. If you do not, it uses the VHD disk format. Generation 2 uses only the VHDX format.
-uselocalmachine	Optional. Connect the local Hyper-V server. If this parameter is used, the following options are ignored: hostname, host port, host username, host password.
-hostname	The virtual server host name.
-hostport	The virtual server port number.
-hostusername	The user name to the virtual server host.
-hostpassword	The password to the virtual server host.
-vmlocation	Local or network path to the folder where you want to store the virtual machine files.
-ram	Allocate specific amount of RAM on the virtual server.
-usesourceram	Optional. Allocate the same amount of RAM on the virtual server as the source protected machine.

Start-LogTruncation

The `Start-LogTruncation` command forces log truncation for the specified protected SQL Server or Microsoft Exchange server.

Usage

The usage for the command is as follows:

```
Start-LogTruncation -core [host name] -user [user name] -password [password] -
protectedserver [[machine name] or [IP address]] -target [sql | exchange]
```

Command Options

The following table describes the options available for the `Start-LogTruncation` command:

Table 282. Start-LogTruncation command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Archive of recovery points for the specified machine.
`-target`	Specify the type of log truncation (either 'sql' or 'exchange'). If not specified, logs are truncated on all databases.

Example:

Truncate SQL logs:

```
>Start-LogTruncation -protectedserver SQL1 -target sql
```

Truncate Exchange server logs: all recovery points for all machines on the Core:

```
> start-LogTruncation -protectedserver ExServer2 -target exchange
```

Start-MountabilityCheck

The `Start-MountabilityCheck` command forces a mountability check for protected Microsoft Exchange mail stores.

Usage

The usage for the command is as follows:

```
Start-MountabilityCheck -core [host name] -user [user name] -password
[password] -protectedserver [[machine name] or [IP address]] -rpn [number |
numbers] |
-time [time string]
```

Command Options

The following table describes the options available for the `Start-MountabilityCheck` command:

Table 283. Start-MountabilityCheck command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Archive of recovery points for the specified machine.
`-rpn`	Optional. The sequential number of a recovery point to be exported. (You can use the `-GetRecoveryPoints` command to obtain recovery point numbers. NOTE: If neither 'time' nor 'rpn' option is specified in this command, than the most recent recovery point will be exported.
`-time`	Optional. Determines recovery point to be selected for export. You need to specify exact time in the format "MM/DD/YYYY hh:mm tt" (for example: "04/24/2015 09:00 AM")." Specify date time values of the time zone set on your local machine. NOTE: If neither 'time' nor 'rpn' option is specified in this command, than the most recent recovery point will be exported.

Example:

Start a mountability check for oall recovery points for all machines on the Core:

```
> Start-MountabilityCheck -protected EX01
```

Start-Protect

The `Start-Protect` command lets an administrator add a server under protection by a Core.

Usage

```
Start-Protect -core [host name] -user [user name] -password [password] -
repository [repository name] -agent [name | IP address] -agentusername [user
name]
-agentpassword [password] -agentport [port] -volumes [volume names]
```

Command Options

The following table describes the options available for the `Start-Protect` command:

Table 284. Start-Protect command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
-repository	Name of a repository on the Core where the protected machine's data is stored.
-agentname	Protected machine name or IP address.
-agentusername	Log on to the server to be protected.
-agentpassword	Password to the server to be protected.
-agentport	Protected server port number.
-volumes	List of volumes to protect. Values must be enclosed in double quotes and separated by a space. Do not use trailing slashes in volume names. For example, "c:" or "d:".

Example:

Put volumes of a server under protection:

```
>Start-Protect -repository "Repository 1" -agentname 10.10.9.120 -agentusername
administrator -agentpassword 12345 -agentport 5002 -volumes "c:" "d:"
```

Start-ProtectCluster

The `Start-ProtectCluster` command lets an administrator add a server cluster under protection by a Core.

Usage

Usage for the command is as follows:

```
Start-ProtectCluster -core [host name] -user [user name] -password [password] -
repository [repository name] -clustername [name | IP address] -clusterusername
[user name for cluster] -clusterpassword [password for cluster] -clusterport
[port] -clustervolumes [volume names] -clusternodes [cluster nodes names and
volumes]
```

Command Options

The following table describes the options available for the `Start-ProtectCluster` command:

Table 285. Start-ProtectCluster command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-repository`	Name of a repository on the Core where the protected machine's data is stored. The name must be enclosed in double quotes.
`-clustername`	The name of the cluster to protect.
`-clusterusername`	User name for the cluster to be protected.
`-clusterpassword`	Password to the cluster to be protected.
`-clusterport`	Port number for the cluster to be protected.
`-clustervolumes`	List of volumes to protect. Values must be in double quotes and separated by a space. Do not use trailing slashes in volume names. For example, "c:", "d".
`-clusternodes`	List of cluster nodes with volumes to protect. First specify label "nodename" and then type the name of the node. Then, specify label "volumes" and then type a list of volumes for the node. For example: `"nodename", "10.10.10.10", "volumes", "c:", "e:", "nodename", "10.10.10.11," "volumes", "c:"`

Example:

Put volumes of a server under protection:

```
>Start-ProtectCluster -repository "Repository 1" -clustername 10.10.9.120 -
clusterusername administrator -clusterpassword 12345 -clusterport 5002 -
clustervolumes "c:" "d:" -clusternodes nodename 10.10.10.10 volumes "c:" "e:"
```

Start-RepositoryCheck

The `Start-RepositoryCheck` PowerShell command lets you check the integrity of a repository.

Usage

The usage for the command is as follows:

```
Start-RepositoryCheck -name [repository name] | -all [check all repositories] -
password [password] -force
```

Command Options

The following table describes the options available for the `Start-RepositoryCheck` command:

Table 286. Start-RepositoryCheck command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-repository`	Required. The name of the repository that you want to check.
`-all`	Optional. Check all repositories associated with this Core.
`-force`	Optional. Perform the repository check without confirmation.

Example:

Start checking a repository:

```
>Start-RepositoryCheck -repository newRepository1 -core 10.10.10.10:8006 -user
administrator -password 23WE@#$sdd
```

Start-RestoreArchive

Businesses often use long-term storage to archive both compliant and non-compliant data. The archive feature in Rapid Recovery is used to support the extended retention for compliant and non-compliant data. The administrator can save an archive on the local storage or network location by specifying the –`Path` command and credentials.

Usage

The usage for the command is as follows:

```
Start-RestoreArchive -core [host name] -user [login] -password [password] -all
| -protectedserver [name | IP address | "[name1 | IP address1]" "[name2 | IP
address2]"] -repository [name] -archiveusername [name] -archivepassword
[password] -path [location]  -cloudaccountname [name] -cloudcontainer [name]
```

Command Options

The following table describes the options available for the `Start-RestoreArchive` command:

Table 287. Start-RestoreArchive command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-all`	Archive recovery points for all protected machines.
`-protectedserver`	The protected machine with recovery points that you want to archive. You can specify multiple machine names enclosed in double quotes and separated by commas.
`-repository`	The name of the repository where you want to place restored recovery points. You must enclose the name in double quotes; for example, "Repository1."
`-archiveusername`	Optional. The user name for logging in to the remote machine. It is required for a network path only.
`-archivepassword`	Optional. The password for logging in to the remote machine. It is required for a network path only.
`-path`	The path to where to save the archived data. For example: • Local machine: "d:\work\archive" • Network path: "\\servername\sharename" • Folder in a cloud account: "Folder Name" NOTE: The number of symbols should not be greater than 100 for local and network locations, and should not be greater than 150 for a cloud location.
`-cloudaccountname`	Optional. Use only for cloud archiving. The name of the cloud account where you want to save the archive.
`-cloudcontainer`	Optional. Use only for cloud archiving. The name of the cloud container in the chosen cloud account, where the archive will be saved. When you use this option, you should also specify the "-cloudaccountname" parameter.
`-manifestcore`	Optional. Specify the Core that you want to use from the manifest of the restored archive.

Example:

Archive all recovery points for all machines on the Core and store them on the local machine:

```
>Start-RestoreArchive -path D:\work\archive -startdate 'Example 04/30/2012' -all
```

Start-ScheduledArchive

The `Start-ScheduledArchive` PowerShell command lets you force a Rapid Recovery scheduled archive to begin on demand, regardless of the pre-established schedule.

Usage

The usage for the command is as follows:

```
Start-ScheduledArchive -core [host name] -user [login] -password [password] -
all -ids [id | id1 id2]
```

Command Options

The following table describes the options available for the `Start-ScheduledArchive` command:

Table 288. Start-ScheduledArchive command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
-all	Force all scheduled archives.
-id	The identification number or space-separated identifiers of the scheduled archives that you want to force.

Example:

Start multiple scheduled archive jobs:

```
>Start-ScheduledArchive -ids 799138c8-3dfc-4398-9711-1823733c2a31, 26c29bb7-
b320-47f5-b5a8-dffc49f50e25
```

Start-VBExport

The `start-VBExport` command initiates the launch of a virtual export from the selected recovery point to an Oracle VirtualBox server virtual machine.

Required parameters include the name of the protected machine containing recovery points to export; the name of the virtual machine you are exporting to; the amount of RAM to be allocated on the virtual machine; the host name and port of the Linux server host, and the path to the local, network, or Linux folder where the resulting virtual machine files will be stored.

Usage

The usage for the command is as follows:

```
Start-VBExport -core -user [user name] -password [password] -protectedserver
[machine name] or [IP address]] -volumes [volume names] -rpn [number | numbers]
|
-time [time string] -vmname [virtual machine name] [-ram [total megabytes] |
-usesourceram] -linuxhostname [linux hostname] -hostport [linux port] -
targetpath [location] pathusername [user name] - pathpassword [password]
```

Command Options

The following table describes the options available for the `Start-VBExport` command:

Table 289. Start-VBExport command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Protected machine with recovery points to be exported.
`-volumes`	Optional. List of volume names to be exported. If not specified, all volumes in the specified recovery points will be exported. Values must be enclosed in double quotes, each separated by a space. do not use trailing slashes in volume names. For example, specify “C:” not “C:/”
`-rpn`	Optional. The sequential number of a recovery point to be exported. (You can use the `Get-RecoveryPoints` command to obtain recovery point numbers.) NOTE: If neither ‘time’ nor ‘rpn’ option is specified in this command, than the most recent recovery point will be exported.
`-time`	Optional. Determines recovery point to be selected for export. You need to specify exact time in the format “MM/DD/YYYY hh:mm tt“ (for example: “04/24/2015 09:00 AM”).” Specify date time values of the time zone set on your local machine. NOTE: If neither ‘time’ nor ‘rpn’ option is specified in this command, than the most recent recovery point will be exported.

Option	Description
-vmname	Windows name of the virtual machine.
-ram	Allocate specific amount of RAM on the virtual server.
-usesourceram	Optional. Allocate the same amount of RAM on the virtual server as the source protected machine.
-linuxhostname	Linux VirtualBox server hostname.
-hostport	Linux VirtualBox server port.
-targetpath	Local or network or Linux path to the folder where the virtual machine files are to be stored.
-pathusername	User name for network machine. Only required when you specify network path in parameter -targetpath.
-pathpassword	Password for network machine. Only required when you specify network path in parameter -targetpath.
-accountusername	Optional. Use if you can specify a user account to register the exported virtual machine. For local or network machine only.
-accountpassword	Optional. Use only when you specify a user account to register the exported virtual machine using parameter -accountusername. For local or network machine only.

Example:

Export all volumes from the latest recovery point on machine 10.10.12.97 to a VM called NewVirtualBoxVM:

```
>Start-VBExport -protectedserver 10.10.12.97 -vmname NewVirtualBoxVM -ram
usesourceram -targetpath D:/exports
```

Start-VirtualStandby

The Start-VirtualStandby PowerShell command lets you force a Rapid Recovery a data export to a virtual standby machine. This on-demand export can occur outside of the regularly scheduled virtual standby exports.

Usage

The usage for the command is as follows:

```
Start-VirtualStandby -core [host name] -user [login] -password [password] -all
| -protectedserver [name(s) | IP address]
```

Command Options

The following table describes the options available for the Start-VirtualStandby command:

Table 290. Start-VirtualStandby command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-all`	Force an export for all virtual standby machines.
`-protectedserver`	The name or names—separated by a comma and space—of the protected machines that you want to force to export.

Example:

Force a virtual standby export for a protected machine:

```
>Start-VirtualStandby -core 10.10.10.10:8006 -user administrator -password
23WE@#$sdd -protectedserver 10.10.5.22
```

Start-VMExport

The `Start-VMExport` command initiates the launch of a virtual export from the selected recovery point to a VMware Workstaation server virtual machine.

Required parameters include the name of the protected machine containing recovery points to export; the name of the virtual machine you are exporting to; the amount of RAM to be allocated on the virtual machine; and the path to the local or network, folder where the resulting virtual machine files will be stored.

Usage

The usage for the command is as follows:

```
Start-VMExport -core -user [user name] -password [password] -protectedserver
[machine name] or [IP address]] -volumes [volume names] -rpn [number | numbers]
|
-time [time string] -vmname [virtual machine name] [-ram [total megabytes] |
-usesourceram] -linuxhostnme [linux hostname] -hostport [linux port] -
targetpath [location] pathusername [user name] - pathpassword [password]
```

Command Options

The following table describes the options available for the `Start-VMExport` command:

Table 291. Start-VMExport command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Protected machine with recovery points to be exported.
`-volumes`	Optional. List of volume names to be exported. If not specified, all volumes in the specified recovery points will be exported. Values must be enclosed in double quotes, each separated by a space. do not use trailing slashes in volume names. For example, specify “C:” not “C:/”
`-rpn`	Optional. The sequential number of a recovery point to be exported. (You can use the `Get-RecoveryPoints` command to obtain recovery point numbers. **NOTE:** If neither ‘time’ nor ‘rpn’ option is specified in this command, than the most recent recovery point will be exported.
`-time`	Optional. Determines recovery point to be selected for export. You need to specify exact time in the format “MM/DD/YYYY hh:mm tt” (for example: “04/24/2015 09:00 AM”).” Specify date time values of the time zone set on your local machine. **NOTE:** If neither ‘time’ nor ‘rpn’ option is specified in this command, than the most recent recovery point will be exported.
`-vmname`	Windows name of the virtual machine.
`-ram`	Allocate specific amount of RAM on the virtual server.
`-usesourceram`	Optional. Allocate the same amount of RAM on the virtual server as the source protected machine.
`-targetpath`	Local or network or Linux path to the folder where the virtual machine files are to be stored.
`-pathusername`	User name for network machine. Only required when you specify network path in parameter `-targetpath`.
`-pathpassword`	Password for network machine. Only required when you specify network path in parameter `-targetpath`.
`-version`	Version of VMware Tools to use. Valid versions are: 7, 8, 9, and 10.

Example:

Export all volumes from the latest recovery point on machine 10.10.12.97 to a VM called NewVMwareVM:

```
>Start-VBExport -protectedserver 10.10.12.97 -vmname NewVMWareVM -ram
usesourceram -targetpath D:/exports
```

Stop-ActiveJobs

The `Stop-ActiveJobs` cancels active jobs for a specified protected machine.

Usage

The usage for the command is as follows:

```
Stop-ActiveJobs [-protectedserver [machine name | IP address] | -core [host
name]] -user [user name] -password [password] -jobtype [jobtype]
```

Command Options

The following table describes the options available for the `Stop-ActiveJobs` command:

Table 292. Stop-ActiveJobs command options

Option	Description
`-?`	Display this help message.
`-all`	Select and cancel events of the specified type for all protected machines.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-protectedserver`	Determines protected machine on which jobs should be canceled.
`-jobtype`	Optional. Specifies job type filter. Available values are: ‘transfer’ (data transfer), ‘repository’ (repository maintenance), ‘replication’ (local and remote replications), ‘backup’ 9backup and restore), ‘bootcdbuilder’ (create boot CDs), ‘diagnostics’(upload logs), ‘exchange’ (Exchange Server files check), ‘export (recovery point export),

Option	Description
	‘pushinstall’ (deploy Agent software to protected machines), ‘rollback’ (restore data from recovery point), ‘rollup’ (recovery point rollup’s), ‘sqlattach’ (agent attachability checks), ‘mount’ (not repository). By default, all jobs of the specified type are canceled.

Example:

Stop transfer job in protected machine:

```
>Stop-ActiveJobs –protectedserver 10.10.1.76 -jobtype transfer
```

Stop all jobs for a specific protected machine:

```
>Stop-ActiveJobs –protectedserver 10.10.1.76 -all
```

Suspend-Replication

The `Suspend-Replication` command lets an administrator pause replication.

A user can pause replication in three ways:

- Pause replication on the master Core for all protected machines (`–outgoing parameter`)

  The administrator must specify the remote machine name with outgoing replication pairing to pause outgoing replication on the master Core.

  ```
  >Suspend-replication -outgoing 10.10.12.10
  ```
- Pause replication on the master Core for a single protected machine (`-protectedserver` parameter)

  ```
  >Suspend-replication -protectedserver 10.10.12.97
  ```
- Pause replication on the target Core (`–incoming parameter`)

  If the local Core is a target Core, the administrator can pause replication by specifying the master Core using the –incoming parameter.

Command Options

The following table describes the options available for the `Suspend-Replication` command:

Table 293. Suspend-Replication command options

Option	Description
`-?`	Display this help message.
`-all`	Pauses all protected machines on the selected Core.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-pause`	`[snapshots]`, `[replication]` or `[vmexport]`.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.

Option	Description
`-protectedserver`	Pause the current protected server.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-incoming`	Host name of the remote Core that replicates to the Core machine. Replication is suspended for all protected machines on the remote Core.
`-outgoing`	Host name of the remote target core to which data is replicating. Replication is suspended for all protected machines on the remote core.

Example:

Pause outgoing replication on the remote Core with the IP address: 10.10.1.15, for the single protected machine with the IP address: 10.10.1.76:

```
>Suspend-replication –core 10.10.1.15 –protectedserver 10.10.1.76
```

Pause outgoing replication from the local Core to remote target with the IP address: 10.10.1.63 for all protected machines:

```
>Suspend-replication –outgoing 10.10.1.63
```

Pause incoming replication from 10.10.1.82 on the remote Core with the IP address: 10.10.1.15 (Administrator is able to pause incoming replication only for whole machine):

```
>Suspend-replication –core 10.10.1.15 –incoming 10.10.1.82
```

Suspend-RepositoryActivity

The `Suspend-RepositoryActivity` PowerShell command lets you pause activities for a Rapid Recovery repository. Suspending activities places a lock on the repository, preventing any data from entering or leaving.

Usage

The usage for the command is as follows:

```
Suspend-RepositoryActivity -core [host name] -user [login] -password [password]
-all | -repository ["name" | "name1 " "name2"]
```

Command Options

The following table describes the options available for the `Suspend-RepositoryActivity` command:

Table 294. Suspend-RepositoryActivity command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.

Option	Description
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-all	Suspend activities for all repositories associated with this Core.
-repository	The name of the repository that you want to lock. The name must be enclosed in double quotes. You can specify several space-separated repositories.

Examples:

Suspend activities for multiple repositories:

```
>Suspend-RepositoryActivity -repository "repository1" "repository2"
```

Suspend activities on all repositories:

```
>Suspend-RepositoryActivity -all
```

Suspend-ScheduledArchive

The `Suspend-ScheduledArchive` PowerShell command lets you pause a Rapid Recovery scheduled archive. This command prevents the archive from occurring as scheduled until you reactivate it. .

Usage

The usage for the command is as follows:

```
Suspend-ScheduledArchive -core [host name] -user [login] -password [password] -
all -ids [id | id1 id2]
```

Command Options

The following table describes the options available for the `Suspend-ScheduledArchive` command:

Table 295. Suspend-ScheduledArchive command options

Option	Description
-?	Display this help message.
-core	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.

Option	Description
`-all`	Pauses all scheduled archives.
`-id`	The identification number or space-separated numbers of scheduled archives to suspend.

Example:

Suspend multiple scheduled archives:

```
>Suspend-ScheduledArchive -ids 799138c8-3dfc-4398-9711-1823733c2a31, 26c29bb7-
b320-47f5-b5a8-dffc49f50e25
```

Suspend-Snapshot

The `Suspend-Snapshot` command lets an administrator pause snapshots.

Usage

The usage for the command is as follows:

```
Suspend-Snapshot -core [host name] -user [user name] -password [password] -all
|
-protectedserver [name | IP address] -time [time string]
```

Command Options

The following table describes the options available for the `Suspend-Snapshot` command:

Table 296. Suspend-Snapshot command options

Option	Description
`-?`	Display this help message.
`-all`	Pauses all protected machines on the selected Core.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-time`	The time in the format `'Day-Hours-Minutes'` when the snapshots will be resumed (only for snapshots pause).

Example:

Pause snapshots for the protected machine with IP 10.10.10.4 for the local Core with a certain time to resume:

```
>Suspend-Snapshot -protectedserver 10.10.10.4 -time 3-20-50
```

Suspend-VirtualStandby

The `Suspend-VirtualStandby` PowerShell command lets you pause the export of data to a Rapid Recovery virtual standby machine.

Usage

The usage for the command is as follows:

```
Suspend-VirtualStandby -core [host name] -user [login] -password [password] -
all | -protectedserver [name(s) | IP address]
```

Command Options

The following table describes the options available for the `Suspend-VirtualStandby` command:

Table 297. Suspend-VirtualStandby command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a log on. If none are provided, then the logged-on user's credentials will be used.
`-all`	Pause exports for all virtual standby machines.
`-protectedserver`	The name or names—separated by a comma and space—of the protected machines with virtual standby machines that you want to suspend.

Example:

Suspend virtual standby exports for a protected machine:

```
>Suspend-VirtualStandby -core 10.10.10.10:8006 -user administrator -password
23WE@#$sdd -protectedserver 10.10.5.22
```

Suspend-VMExport

The `Suspend-VMExport` command lets an administrator pause exports to virtual machines.

Usage

```
Suspend-VMExport -core [host name] -user [user name] -password [password] -all
| -protectedserver [name | IP address]
```

Command Options

The following table describes the options available for the `Suspend-VMExport` command:

Table 298. Suspend-VMExport command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.
`-user`	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
`-password`	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
`-all`	Pauses all protected machines on the selected Core.
`-protectedserver`	Pause the current protected server.

Example:

Suspend VM export for the protected machine with IP 10.10.10.4 for the local Core:

```
>Suspend-VMExport -protectedserver 10.10.12.25
```

Update-Repository

The `Update-Repository` command adds an extent to an existing DVM repository. The size specified must be between 250MB and 16TB.

Usage

```
Update-Repository -name [repository name] -size [size] [[[-datapath [datapath]
-metadatapath [metadata path]] | [-uncpath [UNC path] -shareusername [share
user name] -sharepassword [share password]]] -core [host name] -user [user
name]
-password [password]
```

Command Options

The following table describes the options available for the `Update-Repository` command:

Table 299. Update-Repository command options

Option	Description
`-?`	Display this help message.
`-core`	Optional. Remote Core host machine IP address (with an optional port number). By default the connection is made to the Core installed on the local machine.

Option	Description
-user	Optional. User name for the remote Core host machine. If you specify a user name, you also have to provide a password. If none are provided, then the logged-on user's credentials will be used.
-password	Optional. Password to the remote Core host machine. If you specify a password, you also have to provide a user name. If none are provided, then the logged-on user's credentials will be used.
-name	DVM repository name.
-size	Size of DVM repository extent. Available units are: b, Kb, MB, GB, TB, PB.
-datapath	For local location only. Determines data path of DVM repository extent.
-metadatapath	For local location only. Determines metadata path of DVM repository extent.
-uncpath	For share location only. Determines data and metadata paths of DVM repository extent.
-shareusername	For share location only. Determines login to share location.
-sharepassword	For share location only. Determines password to share location.

Example:

Add an extent to the DVM repository of the minimum size:

```
>Update-Repository -name Repository1 -size 250Mb -datapath C:\Repository\Data -
metadatapath C:\repository\Metadata
```

Localization

When running on the same machine on which Rapid Recovery Core is installed, the Rapid Recovery PowerShell module bases its display language on the language set for the Core. Localized Rapid Recovery versions such as this one support English, Chinese (Simplified), French, Korean, German, Japanese, Portuguese (Brazil), and Spanish.

If the Rapid Recovery PowerShell module is installed on a separate machine, English is the only language supported.

Qualifiers

The following table describes the qualifiers available for Rapid Recovery PowerShell Module.

Table 300. Rapid Recovery PowerShell module qualifiers

Qualifier	Usage
`-core <Rapid Recovery Core Name>`	Host name of the Core. Default: `Localhost`
`-ProtectedServer <Protected Server Name>`	Host name/IP address of the Rapid Recovery Agent. Default: `Localhost` if multiple servers protected, otherwise the single server protected.
`-Mode <READ, READWRITE, WRITE>`	Recovery Point Mount mode. Default: `Read`.
`-Volumes <Snapshot Volume Letter>`	Snapshot volume letter from Rapid Recovery Agent. Default: `All`.
`-User <User Name>`	User name used to connect to the Rapid Recovery Core. This is typically the service user.
`-Domain <Domain Name>`	Domain to which the user defined in /User belongs.
`-Password <Password>`	Password of the user defined in `/User`.
`-Path <Target path to mount, dismount recovery points or archive location>`	For example: `C:\RapidRecoveryMount`.

C

Extending Rapid Recovery jobs using scripting

Rapid Recovery enables administrators to automate the administration and management of resources at certain occurrences through the execution of commands and scripts. The Rapid Recovery software supports the use of PowerShell scripting for Windows and Bourne Shell scripting for Linux.

Core jobs are automatically created whenever you initiate operations on the Rapid Recovery Core such as replication, virtual export, or a backup snapshot. You can extend these jobs by running a script before it or after it. These are known as pre and post scripts.

This section describes the scripts that can be used by administrators at designated occurrences in Rapid Recovery for Windows and Linux.

⚠ **CAUTION: The sample PowerShell and Bourne scripts provided in this document will function when run as designed by qualified administrators. Take precautions when modifying functioning scripts to retain working versions. Any modifications to the script samples included here, or any scripts you create, are considered customization, which is not typically covered by Dell Support.**

Using PowerShell scripts in Rapid Recovery

Windows PowerShell is a Microsoft .NET Framework-connected environment designed for administrative automation. Rapid Recovery includes comprehensive client software development kits (SDKs) for PowerShell scripting that lets administrative users run user-provided PowerShell scripts at designated occurrences; for example, before or after a snapshot, attachability and mountability checks, and so on. Administrators can run scripts from both the Rapid Recovery Core and the protected machine. Scripts can accept parameters, and the output of a script is written to Core and protected machine log files.

NOTE: For nightly jobs, preserve one script file and the JobType input parameter to distinguish between nightly jobs.

Script files are located in the %ALLUSERSPROFILE%\AppRecovery\Scripts folder.

- In Windows 7, the path to locate the %ALLUSERSPROFILE% folder is: C:\ProgramData.
- In Windows 2003, the path to locate the folder is: Documents and Settings\All Users\Application Data \.

  NOTE: Windows PowerShell is required and must be installed and configured before running Rapid Recovery scripts.

For more information on how using PowerShell scripts see Sample PowerShell scripts, Input Parameters for PowerShell Scripting, Input parameters for Bourne Shell scripting, and Sample Bourne Shell scripts.

Prerequisites for PowerShell scripting

Before running PowerShell scripts for Rapid Recovery, you must have Windows PowerShell 2.0 or later installed. Due to new features introduced in PowerShell 3.0, including easier access to object properties, PowerShell Web access, and support for REST calls, Dell recommends using PowerShell 3.0 or later.

NOTE: Place the powershell.exe.config file in the PowerShell home directory. For example, C:\WindowsPowerShell\powershell.exe.config.

powershell.exe.config

```
<?xml version="1.0"?>
<configuration>
    <startup useLegacyV2RuntimeActivationPolicy="true">
        <supportedRuntime version="v4.0.30319"/>
        <supportedRuntime version="v2.0.50727"/>
    </startup>
</configuration>
```

Testing PowerShell Scripts

If you want to test the scripts you plan to run, you can do so by using the PowerShell graphical editor, powershell_is. You also need to add the configuration file, powershell_ise.exe.config to the same folder the configuration file, powershell.exe.config.

NOTE: The configuration file, powershell_ise.exe.config must have the same content as the powershell.exe.config file.

CAUTION: If the pre-PowerShell or post-PowerShell script fails, the job also fails.

Localization

When running on the same machine on which Rapid Recovery Core is installed, the Rapid Recovery PowerShell module bases its display language on the language set for the Core. Localized Rapid Recovery versions such as this one support English, Chinese (Simplified), French, Korean, German, Japanese, Portuguese (Brazil), and Spanish.

If the Rapid Recovery PowerShell module is installed on a separate machine, English is the only language supported.

Qualifiers

The following table describes the qualifiers available for Rapid Recovery PowerShell Module.

Table 301. Rapid Recovery PowerShell module qualifiers

Qualifier	Usage
`-core <Rapid Recovery Core Name>`	Host name of the Core. Default: `Localhost`
`-ProtectedServer <Protected Server Name>`	Host name/IP address of the Rapid Recovery Agent.

Qualifier	Usage
	Default: `Localhost` if multiple servers protected, otherwise the single server protected.
`-Mode <READ, READWRITE, WRITE>`	Recovery Point Mount mode. Default: `Read`.
`-Volumes <Snapshot Volume Letter>`	Snapshot volume letter from Rapid Recovery Agent. Default: `All`.
`-User <User Name>`	User name used to connect to the Rapid Recovery Core. This is typically the service user.
`-Domain <Domain Name>`	Domain to which the user defined in /User belongs.
`-Password <Password>`	Password of the user defined in `/User`.
`-Path <Target path to mount, dismount recovery points or archive location>`	For example: `C:\RapidRecoveryMount`.

Input Parameters for PowerShell Scripting

All available input parameters are used in sample scripts. The parameters are described in the following tables.

NOTE: Script files must possess the same name as the sample script files.

AgentProtectionStorageConfiguration (namespace Replay.Common.Contracts.Agents)

The following table presents the available objects for the AgentProtectionStorageConfiguration parameter.

Table 302. Objects for the AgentProtectionStorageConfiguration parameter

Method	Description
public Guid RepositoryId { get; set; }	Gets or sets the ID of the repository where the agent recovery points are stored.
public string EncryptionKeyId { get; set; }	Gets or sets the ID of the encryption key for this agent's recovery points. An empty string means no encryption.

AgentTransferConfiguration (namespace Replay.Common.Contracts.Transfer)

The following table presents the available objects for the AgentTransferConfiguration parameter.

Table 303. Objects for the AgentTransferConfiguration parameter

Method	Description
public uint MaxConcurrentStreams { get; set; }	Gets or sets the maximum number of concurrent TCP connections the Core establishes to the agent for transferring data.
public uint MaxTransferQueueDepth { get; set; }	Gets or sets the maximum number of block extents which can be queued for writing. When a range of blocks are read from a transfer stream, that range is placed on a producer or consumer queue, where a consumer thread reads it and writes it to the epoch object. If the repository writes slower than the network reads, this queue fills up. The point at which the queue is full and reads stop is the maximum transfer queue depth.
public uint MaxConcurrentWrites { get; set; }	Gets or sets the maximum number of block write operations to have outstanding on an epoch at any given time. If additional blocks are received beyond the maximum number of write operations specified in this parameter, those additional blocks are ignored until one of the outstanding writes finishes.
public ulong MaxSegmentSize { get; set; }	Gets or sets the maximum number of contiguous blocks to transfer in a single request. Depending on testing, higher or lower values may be optimal.
public Priority Priority { get; set; }	Gets or sets the priority for transfer request.
public uint GetChangedBlocksRetries { get; set; }	Gets or sets the count of retries if initial retrieval of changed blocks from the agent failed.
public int MaxRetries { get; set; }	Gets or sets the maximum number of times a failed transfer should be retried before it is presumed failed.
public bool UseDefaultMaxRetries { get; set; }	If included, the default maximum number of retries (specified in transfer configuration) will be used.
public Guid ProviderId{ get; set; }	Gets or sets the GUID of the VSS provider to use for snapshots on this host. Administrators typically accept the default.
public Collection<ExcludedWriter> ExcludedWriterIds { get; set; }	Gets or sets the collection of VSS writer IDs that should be excluded from this snapshot. The writer ID is determined by the name of the writer. This name is for documentation purposes only, and does not necessarily provide an exact match of the writer name.
public ushort TransferDataServerPort { get; set; }	Gets or sets a value containing the TCP port upon which to accept connections from the Core for the actual transfer of data from the protected machine to the Core. The Agent attempts to listen on this port, but if the port is in use, the protected machine can use a different port instead. The Core should use the port number specified in the BlockHashesUri and BlockDataUri properties of the VolumeSnapshotInfo object for each snapped volume.
public TimeSpan CleanSnapshotTimeout { get; set; }	Gets or sets the amount of time to wait for cleaning up the snapshot after transfer is finished.

Method	Description
public TimeSpan SnapshotTimeout { get; set; }	Gets or sets the amount of time to wait for a VSS snapshot operation to complete before giving up and timing out.
public TimeSpan TransferTimeout { get; set; }	Gets or sets the amount of time to wait for further contact from the Core before abandoning the snapshot.
public TimeSpan NetworkReadTimeout { get; set; }	Gets or sets the timeout for network read operations related to this transfer.
public TimeSpan NetworkWriteTimeout { get; set; }	Gets or sets the timeout for network write operations related to this transfer.
public uint InitialQueueSize { get; set; }	Gets or sets a size of initial queue or requests.
public uint MinVolumeFreeSpacePercents { get; set; }	Gets or sets a minimal amount of free space on a volume, measured by percentage. If free space is lower than the amount specified in this parameter, then all change logs are deleted and a base image is forced.
public uint MaxChangeLogsSizePercents { get; set; }	Gets or sets a maximum size of driver change logs as part of volume capacity, measured by percentage. If part of change logs is bigger than this value, then all change logs are deleted and a base image is forced.
public bool EnableVerification { get; set; }	Gets or sets a value indicating whether diagnostic verification of each block sent to Core should be performed.

BackgroundJobRequest (namespace Replay.Core.Contracts.BackgroundJobs)

The following table presents the available objects for the BackgroundJobRequest parameter.

Table 304. Objects for the BackgroundJobRequest parameter

Method	Description
public AgentIdsCollection AgentIds { get; set; }	Gets or sets the IDs of the protected machines.
public bool IsNightlyJob { get; set; }	Gets or sets the value indicating whether the background job is a nightly job.
public Guid NightlyJobTransactionId { get; set; }	Gets or sets the ID of nightly job transaction.
public Guid JobId { get; set; }	Gets or sets the ID of background job.
public bool Force { get; set; }	Gets or sets the value indicating if a job was forced.
public uint JobStartsCount { get; set; }	Gets or sets the number of attempts to start a job.
public virtual bool InvolvesAgentId(Guid agentId)	Determines the value indicating whether the concrete agent is involved in job.

ChecksumCheckJobRequest (namespace Replay.Core.Contracts.Exchange.ChecksumChecks)

Inherits its values from the parameter, DatabaseCheckJobRequestBase.

DatabaseCheckJobRequestBase (namespace Replay.Core.Contracts.Exchange)

Inherits its values from the parameter, BackgroundJobRequest.

Table 305. Objects for the DatabaseCheckJobRequestBase parameter

Method	Description
public string RecoveryPointId { get; set; }	Gets or sets the ID of the recovery point for which databases will be checked.

ExportJobRequest (namespace Replay.Core.Contracts.Export)

Inherits its values from the parameter, BackgroundJobRequest.

The following table presents the available objects for the ExportJobRequest parameter.

Table 306. Objects for the ExportJobRequest parameter

Method	Description
public uint RamInMegabytes { get; set; }	Gets or sets the memory size for the exported VM. Set to zero (0) to use the memory size of the source machine.
public ushort CpuCount { get; set; }	Gets or sets the CPU count for the exported VM. Set to 0 to use the CPU count of the source machine.
public ushort CoresPerCpu { get; set; }	Gets or sets the Cores per CPU count for the exported VM. Set to 0 to use the Cores per CPU count of the source machine.
public VirtualMachineLocation Location { get; set; }	Gets or sets the target location for this export. This is an abstract base class.
public VolumeImageIdsCollection VolumeImageIds { get; private set; }	Gets or sets the volume images to include in the VM export.
public ExportJobPriority Priority { get; set; }	Gets or sets the priority for export request.

NightlyAttachabilityJobRequest (namespace Replay.Core.Contracts.Sql)

Inherits its values from the parameter, BackgroundJobRequest.

Table 307. Objects for the NightlyAttachabilityJobRequest parameter

Method	Description
public int SimultaneousJobsCount { get; set; }	Gets or sets count of jobs that can be run simultaneously.

RollupJobRequest (namespace Replay.Core.Contracts.Rollup)

Inherits its values from the parameter, BackgroundJobRequest.

TakeSnapshotResponse (namespace Replay.Agent.Contracts.Transfer)

The following table presents the available objects for the TakeSnapshotResponse parameter.

Table 308. Objects for the TakeSnapshotResponse parameter

Method	Description
public Guid SnapshotSetId { get; set; }	Gets or sets the GUID assigned by VSS to this snapshot.
public VolumeSnapshotInfoDictionary VolumeSnapshots { get; set; }	Gets or sets the collection of snapshot info for each volume included in the snap.

TransferJobRequest (namespace Replay.Core.Contracts.Transfer)

Inherits its values from the parameter, BackgroundJobRequest.

The following table presents the available objects for the TransferJobRequest parameter.

Table 309. Objects for the TransferJobRequest parameter

Method	Description
public VolumeNameCollection VolumeNames { get; set; }	Gets or sets the collection of names for transfer. VolumeNames is a data structure that contains the following data: • GuidName. The Guid associated with the volume, used as the name if a DisplayName is not set. • DisplayName. The displayed name of the volume.
public VolumeNameCollection TransferredVolumes { get; set; }	Gets or sets the collection of transferred volumes.
public VolumeNameCollection DependentVolumeNames { get; set; }	Gets or sets the collection of dependent volumes.
public QuotaSettingsCollection EnabledDiskQuotas { get; set; }	Gets or sets quotas that are enabled on a volume.
public ShadowCopyType ShadowCopyType { get }	Gets the type of copying for transfer. The available values are: • Copy

Method	Description
	• Full
public AgentTransferConfiguration TransferConfiguration { get; set; }	Gets or sets the transfer configuration. AgentTransferConfiguration is an object which will have the following data: • MaxConcurrentStreams. The maximum number of concurrent TCP connections the core will establish to the agent for transferring data • MaxTransferQueueDepth. The maximum number of block extents which can be queued up for writing • MaxConcurrentWrites. The maximum number of block write operations to have outstanding on an epoch at any given time. If additional blocks are received when this many block writes are outstanding, those additional blocks will be ignored until one of the outstanding blocks gets written. • MaxSegmentSize. The maximum number of contiguous blocks to transfer in a single request • Priority. An object which will have the following data: – Undefined – One – Two – Three – Four – Five – Six – Seven – Eight – Nine – Ten – Highest (which is equal to One) – Lowest (which is equal to Ten) – Default (which is equal to Five) • MaxRetries. The maximum number of times a failed transfer should be retried before it is presumed failed • UseDefaultMaxRetries. A value indicating that the maximum number of retries is the default value • ProviderId. The GUID of the VSS provider to use for snapshots on this host. Users typically use the default setting.
public AgentProtectionStorageConfiguration StorageConfiguration { get; set; }	Gets or sets the storage configuration.
public string Key { get; set; }	Generates a pseudorandom (but not cryptographically secure) key, which can be used as a one-time password to authenticate transfer requests.
public bool IsBaseImage { get; set; }	Gets or sets value indicating whether base image will be taken.

Method	Description
public bool IsForced { get; set; }	Gets or sets value indicating whether transfer has been forced.
public Guid ProtectionGroupId { get; set; }	Gets or sets the ID of the protection group.
public TargetComponentTypes LogTruncationTargets { get; set; }	Gets or sets value that indicates for which databases log truncation will be performed (SQL or Exchange).
public bool ForceBaseImage { get }	Gets the value indicating whether the base image was forced or not.
public bool IsLogTruncation { get }	Gets the value indicating whether the log truncation job is performing or not.

TransferPrescriptParameter (namespace Replay.Common.Contracts.PowerShellExecution)

Inherits its values from the TransferScriptParameterBase parameter.

TransferPostscriptParameter (namespace Replay.Common.Contracts.PowerShellExecution)

The following table presents the available objects for the TransferPostscript parameter. Inherits its value from the TransferScriptParameterBase parameter.

Table 310. Objects for the TransferPostscript parameter

Method	Description
public VolumeNameCollection VolumeNames (get; set;)	Gets or sets the collection of volume names for transfer. VolumeNames is a data structure that contains the following data: • GuidName. The Guid associated with the volume, used as the name if a DisplayName is not set. • DisplayName. The displayed name of the volume.
public ShadowCopyType ShadowCopyType { get; set; }	Gets or sets the type of copying for transfer.ShadowCopyType is an enumeration with values. The available values are: • Unknown • Copy • Full
public AgentProtectionStorageConfigurationCommon StorageConfiguration { get; set; }	Gets or sets the storage configuration.
public AgentTransferConfiguration TransferConfiguration { get; set; }	Gets or sets the transfer configuration. AgentTransferConfiguration is an object which will have the following data: • MaxConcurrentStreams. The maximum number of concurrent TCP connections the core will establish to the agent for transferring data

Method	Description
	• MaxTransferQueueDepth. The maximum number of block extents which can be queued up for writing • MaxConcurrentWrites. The maximum number of block write operations to have outstanding on an epoch at any given time. If additional blocks are received when this many block writes are outstanding, those additional blocks will be ignored until one of the outstanding blocks gets written. • MaxSegmentSize. The maximum number of contiguous blocks to transfer in a single request • Priority. An object which has the following data: – "Undefined – "One – "Two – "Three – "Four – "Five – "Six – "Seven – "Eight – "Nine – "Ten – "Highest (which is equal to One) – "Lowest (which is equal to Ten) – "Default (which is equal to Five) • MaxRetries. The maximum number of times a failed transfer should be retried before it is presumed failed • UseDefaultMaxRetries. A value indicating that the maximum number of retries is the default value • ProviderId. The GUID of the VSS provider to use for snapshots on this host. Administrators typically accept the default.
public AgentTransferConfiguration TransferConfiguration { get; set; } (cont.)	• ExcludedWriterIds. Collection of VSS writer IDs which should be excluded from this snapshot. The writer ID is keyed by the name of the writer. This name is for documentation purposes only and does not have to exactly match the actual name of the writer. • TransferDataServerPort. A value containing the TCP port upon which to accept connections from the core for the actual transfer of data from the agent to the core. • SnapshotTimeout. The amount of time to wait for a VSS snapshot operation to complete before giving up and timing out. • TransferTimeout. The amount of time to wait for further contact from the core before abandoning the snapshot. • NetworkReadTimeout. The timeout for network read operations related to this transfer. • NetworkWriteTimeout. The timeout for network write operations related to this transfer. • InitialQueueSize. A size of initial queue of requests. • MinVolumeFreeSpacePercents. A minimal amount of free space on a volume in percent. • MaxChangeLogsSizePercents. A maximum size of driver change logs as part of volume capacity measured in percent.

Method	Description
	• EnableVerification. A value indicating whether diagnostic verification of each block sent to Core should be performed.
public AgentProtectionStorageConfiguration StorageConfiguration { get; set; }	Gets or sets the storage configuration The AgentProtectionStorageConfiguration object contains the following data: • RepositoryId. The name of the repository where this agent's recovery points will be stored • EncryptionKeyId. The ID of the encryption key for this agent's recovery points. An empty string means no encryption
public string Key { get; set; }	The Key method generates a pseudorandom (but not cryptographically secure) key, which can be used as a one-time password to authenticate transfer requests.
public bool ForceBaseImage { get; set; }	Gets or sets the value indicating whether the transfer was a forced base image capture.
public bool IsLogTruncation { get; set; }	Gets or sets the value indicating whether logging is being truncated.
public uint LatestEpochSeenByCore { get; set; }	Gets or sets latest epoch value. The LatestEpochSeenByCore method is the ordinal number of the most recent snapshot taken by the Core. This is the 'epoch number' assigned by the filter driver to this particular snapshot at the moment it was taken with VSS.
public Guid SnapshotSetId { get; set; }	Gets or sets the GUID assigned by VSS to this snapshot.
public VolumeSnapshotInfoDictionary VolumeSnapshots { get; set; }	Gets or sets the collection of snapshot info for each volume included in the snapshot.

TransferScriptParameterBase (namespace Replay.Common.Contracts.PowerShellExecution)

The following table presents the available objects for the TransferScriptParameterBase parameter.

Table 311. Objects for the TransferScriptParameterBase parameter

Method	Description
public AgentTransferConfiguration TransferConfiguration { get; set; }	Gets or sets the transfer configuration.
public AgentProtectionStorageConfigurationCommon StorageConfiguration { get; set; }	Gets or sets the storage configuration.

VirtualMachineLocation (namespace Replay.Common.Contracts.Virtualization)

The following table presents the available objects for the VirtualMachineLocation parameter.

Table 312. Objects for the VirtualMachineLocation parameter

Method	Description
public string Description { get; set;}	Gets or sets a human-readable description of this location.
public string Name { get; set;}	Gets or sets the name of the VM.

VolumeImageIdsCollection (namespace Replay.Core.Contracts.RecoveryPoints)

Inherits its values from the parameter, System.Collections.ObjectModel.Collection<string>.

VolumeName (namespace Replay.Common.Contracts.Metadata.Storage)

The following table presents the available objects for the VolumeName parameter.

Table 313. Objects for the VolumeName parameter

Method	Description
public string GuidName { get; set;}	Gets or sets the ID of the volume.
public string DisplayName { get; set;}	Gets or sets the name of the volume.
public string UrlEncode()	Gets a URL-encoded version of the name which can be passed cleanly on a URL. NOTE: A known issue exists in .NET 4.0 WCF (https://connect.microsoft.com/VisualStudio/feedback/ViewFeedback.aspx?FeedbackID=413312), which prevents path escape characters from working correctly in a URI template. Because a volume name contains both '\' and '?', you must replace the special characters '\' and '?' with other special characters.
public string GetMountName()	Returns a name for this volume that is valid for mounting volume image to some folder.

VolumeNameCollection (namespace Replay.Common.Contracts.Metadata.Storage)

Inherits its values from the parameter, System.Collections.ObjectModel.Collection<VolumeName>.

The following table presents the available objects for the VolumeNameCollection parameter.

Table 314. Objects for the VolumeNameCollection parameter

Method	Description
public override bool Equals(object obj)	Determines whether this instance and a specified object, which must also be a VolumeNameCollection object, have the same value. (Overrides Object.Equals(Object).)
public override int GetHashCode()	Returns the hash code for this VolumeNameCollection. (Overrides Object.GetHashCode().)

VolumeSnapshotInfo (namesapce Replay.Common.Contracts.Transfer)

The following table presents the available objects for the VolumeSnapshotInfo parameter.

Table 315. Objects for the VolumeSnapshotInfo parameter

Method	Description
public Uri BlockHashesUri { get; set;}	Gets or sets the URI at which the MD5 hashes of volume blocks can be read.
public Uri BlockDataUri { get; set;}	Gets or sets the URI at which the volume data blocks can be read.

VolumeSnapshotInfoDictionary (namespace Replay.Common.Contracts.Transfer)

Inherits its values from the parameter, System.Collections.Generic.Dictionary<VolumeName, VolumeSnapshotInfo>.

Sample PowerShell scripts

The following sample scripts are provided to assist administrative users in executing PowerShell scripts.

Related links

- PreTransferScript.sh
- PostTransferScript.ps1
- PreExportScript.ps1
- PostExportScript.ps1
- PreNightlyJobScript.ps1
- PostNightlyJobScript.ps1

PreTransferScript.ps1

The PreTransferScript is run on the protected machine before transferring a snapshot.

Sample PreTransferScript

```
# receiving parameter from transfer job
param([object]$TransferPrescriptParameter)
# building path to Agent's Common.Contracts.dll and loading this assembly
$regLM = [Microsoft.Win32.Registry]::LocalMachine
$regLM = $regLM.OpenSubKey('SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall
\AppRecovery Agent 5')
$regVal = $regLM.GetValue('InstallLocation')
```

```
$regVal = $regVal + 'Common.Contracts.dll'
[System.Reflection.Assembly]::LoadFrom($regVal)  |  out-null
# Converting input parameter into specific object
$TransferPrescriptParameterObject = $TransferPrescriptParameter -as
[Replay.Common.Contracts.PowerShellExecution.TransferPrescriptParameter];
# Working with input object. All echo's are logged
if($TransferPrescriptParameterObject -eq $null) {
        echo 'TransferPrescriptParameterObject parameter is null'
}
else {
        echo
'TransferConfiguration:'$TransferPrescriptParameterObject.TransferConfiguration
        echo 'StorageConfiguration:'
$TransferPrescriptParameterObject.StorageConfiguration
}
```

PostTransferScript.ps1

The PostTransferScript is run on the protected machine after transferring a snapshot.

Sample PostTransferScript

```
# receiving parameter from transfer job
param([object] $TransferPostscriptParameter)
# building path to Agent's Common.Contracts.dll and loading this assembly
$regLM = [Microsoft.Win32.Registry]::LocalMachine
$regLM = $regLM.OpenSubKey('SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall
\AppRecovery Agent 5')
$regVal = $regLM.GetValue('InstallLocation')
$regVal = $regVal + 'Common.Contracts.dll'
[System.Reflection.Assembly]::LoadFrom($regVal)  |  out-null
# Converting input parameter into specific object
$TransferPostscriptParameterObject = $TransferPostscriptParameter -as
[Replay.Common.Contracts.PowerShellExecution.TransferPostscriptParameter];
# Working with input object. All echo's are logged
if($TransferPostscriptParameterObject -eq $null) {
            echo 'TransferPostscriptParameterObject parameter is null'
}
else {
echo 'VolumeNames:' $TransferPostscriptParameterObject.VolumeNames
            echo 'ShadowCopyType:'
$TransferPostscriptParameterObject.ShadowCopyType
        echo 'ForceBaseImage:' $TransferPostscriptParameterObject.ForceBaseImage
        echo 'IsLogTruncation:'
$TransferPostscriptParameterObject.IsLogTruncation
}
```

PreExportScript.ps1

The PreExportScript is run on the Core before any export job.

Sample PreExportScript

```
# receiving parameter from export job
param([object]$ExportJobRequest)
# building path to Core's Common.Contracts.dll and loading this assembly
$regLM = [Microsoft.Win32.Registry]::LocalMachine
$regLM = $regLM.OpenSubKey('SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall
\AppRecovery Core 5')
$regVal = $regLM.GetValue('InstallLocation')
$regVal = $regVal + 'CoreService\Common.Contracts.dll'
[System.Reflection.Assembly]::LoadFrom($regVal)  |  out-null
```

```
# Converting input parameter into specific object
$ExportJobRequestObject = $ExportJobRequest -as
[Replay.Core.Contracts.Export.ExportJobRequest]
# Working with input object. All echo's are logged
if($ExportJobRequestObject -eq $null) {
        echo 'ExportJobRequestObject parameter is null'
}
else {
        echo 'Location:' $ExportJobRequestObject.Location
        echo 'Priority:' $ExportJobRequestObject.Priority
}
```

PostExportScript.ps1

The PostExportScript is run on the Core after any export job.

NOTE: There are no input parameters for the PostExportScript when used to run once on the exported protected machine after initial startup. The regular protected machine should contain this script in the PowerShell script folder as PostExportScript.ps1.

Sample PostExportScript

```
# receiving parameter from export job
param([object]$ExportJobRequest)
# building path to Core's Common.Contracts.dll and loading this assembly
$regLM = [Microsoft.Win32.Registry]::LocalMachine
$regLM = $regLM.OpenSubKey('SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall
\AppRecovery Core 5')
$regVal = $regLM.GetValue('InstallLocation')
$regVal = $regVal + 'CoreService\Common.Contracts.dll'
[System.Reflection.Assembly]::LoadFrom($regVal)  |  out-null
$regVal2 = $regLM.GetValue('InstallLocation')
$regVal2 = $regVal2 + 'CoreService\Common.Contracts.dll'
# Converting input parameter into specific object
$ExportJobRequestObject = $ExportJobRequest -as
[Replay.Core.Contracts.Export.ExportJobRequest]
# Working with input object. All echo's are logged
if($ExportJobRequestObject -eq $null) {
        echo 'ExportJobRequestObject parameter is null'
}
else {
        echo 'VolumeImageIds:' $ExportJobRequestObject.VolumeImageIds
        echo 'RamInMegabytes:' $ExportJobRequestObject.RamInMegabytes
}
```

PreNightlyJobScript.ps1

The PreNightlyJobScript is run before every nighty job on Core side. It contains the parameter $JobClassName, which helps to handle those child jobs separately.

Sample PreNightlyJobScript

```
# receiving parameters from Nightlyjob
param([System.String]$JobClassMethod , [object]$NightlyAttachabilityJobRequest,
[object]$RollupJobRequest, [object]$Agents, [object]$ChecksumCheckJobRequest,
[object]$TransferJobRequest, [int]$LatestEpochSeenByCore)
# building path to Core's Common.Contracts.dll and loading this assembly
$regLM = [Microsoft.Win32.Registry]::LocalMachine
$regLM = $regLM.OpenSubKey('SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall
\AppRecovery Core 5')
$regVal = $regLM.GetValue('InstallLocation')
```

```
$regVal = $regVal + 'CoreService\Common.Contracts.dll'
[System.Reflection.Assembly]::LoadFrom($regVal)  |  out-null
# Nightlyjob has four child jobs: NightlyAttachability Job, Rollup Job,
Checksum Check Job and Log Truncation Job. All of them are triggering the
script, and $JobClassMethod (contain job name that calls the script) helps to
handle those child jobs separately
switch ($JobClassMethod) {
# working with NightlyAttachability Job
    NightlyAttachabilityJob {
        $NightlyAttachabilityJobRequestObject = $NightlyAttachabilityJobRequest
-as [Replay.Core.Contracts.Sql.NightlyAttachabilityJobRequest];
        echo 'Nightly Attachability job results:';
            if($NightlyAttachabilityJobRequestObject -eq $null) {
                echo 'NightlyAttachabilityJobRequestObject parameter is null';
            }
            else {
                echo 'AgentIds:' $NightlyAttachabilityJobRequestObject.AgentIds;
                echo 'IsNightlyJob:'
$NightlyAttachabilityJobRequestObject.IsNightlyJob;
            }
            break;
        }
# working with Rollup Job
    RollupJob {
        $RollupJobRequestObject = $RollupJobRequest -as
[Replay.Core.Contracts.Rollup.RollupJobRequest];
        echo 'Rollup job results:';
            if($RollupJobRequestObject -eq $null) {
                    echo 'RollupJobRequestObject parameter is null';
            }
            else {
                echo 'SimultaneousJobsCount:'
$RollupJobRequestObject.SimultaneousJobsCount;
                    echo 'AgentIds:' $RollupJobRequestObject.AgentIds;
                    echo 'IsNightlyJob:' $RollupJobRequestObject.IsNightlyJob;
            }
            $AgentsCollection = $Agents -as
"System.Collections.Generic.List``1[System.Guid]"
            if($AgentsCollection -eq $null) {
                echo 'AgentsCollection parameter is null';
            }
            else {
                echo 'Agents GUIDs:'
                foreach ($a in $AgentsCollection) {
                    echo $a
            }
        }
        break;
    }
# working with Checksum Check Job
        ChecksumCheckJob {
            $ChecksumCheckJobRequestObject = $ChecksumCheckJobRequest -as
[Replay.Core.Contracts.Exchange.ChecksumChecks.ChecksumCheckJobRequest];
            echo 'Exchange checksumcheck job results:';
            if($ChecksumCheckJobRequestObject -eq $null) {
                echo 'ChecksumCheckJobRequestObject parameter is null';
        }
        else {
                echo 'RecoveryPointId:'
$ChecksumCheckJobRequestObject.RecoveryPointId;
                echo 'AgentIds:' $ChecksumCheckJobRequestObject.AgentIds;
                echo 'IsNightlyJob:'
$ChecksumCheckJobRequestObject.IsNightlyJob;
            }
            break;
        }
# working with Log Truncation Job
    TransferJob {
        $TransferJobRequestObject = $TransferJobRequest -as
[Replay.Core.Contracts.Transfer.TransferJobRequest];
        echo 'Transfer job results:';
        if($TransferJobRequestObject -eq $null) {
                echo 'TransferJobRequestObject parameter is null';
        }
        else {
                echo 'TransferConfiguration:'
$TransferJobRequestObject.TransferConfiguration;
                echo 'StorageConfiguration:'
$TransferJobRequestObject.StorageConfiguration;
            }
            echo 'LatestEpochSeenByCore:' $LatestEpochSeenByCore;
            break;
        }
}
```

PostNightlyJobScript.ps1

The PostNightlyJobScript is run after every nighty job on the Core. It contains the parameter $JobClassName, which helps to handle those child jobs separately.

Sample PostNightlyJobScript

```
# receiving parameters from Nightlyjob
param([System.String]$JobClassMethod , [object]$NightlyAttachabilityJobRequest,
[object]$RollupJobRequest, [object]$Agents, [object]$ChecksumCheckJobRequest,
[object]$TransferJobRequest, [int]$LatestEpochSeenByCore, [object]
$TakeSnapshotResponse)
# building path to Core's Common.Contracts.dll and loading this assembly
$regLM = [Microsoft.Win32.Registry]::LocalMachine
$regLM = $regLM.OpenSubKey('SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall
\AppRecovery Core 5')
$regVal = $regLM.GetValue('InstallLocation')
$regVal = $regVal + 'CoreService\Common.Contracts.dll'
[System.Reflection.Assembly]::LoadFrom($regVal)  |  out-null
$regVal2 = $regLM.GetValue('InstallLocation')
$regVal2= $regVal2 + 'CoreService\Core.Contracts.dll'
[System.Reflection.Assembly]::LoadFrom($regVal2) | out-null
# Nightlyjob has four child jobs: NightlyAttachability Job, Rollup Job,
Checksum Check Job and Log Truncation Job. All of them are triggering the
script, and $JobClassMethod (contain job name that calls the script) helps to
handle those child jobs separately
switch ($JobClassMethod) {
# working with NightlyAttachability Job
    NightlyAttachabilityJob {
        $NightlyAttachabilityJobRequestObject = $NightlyAttachabilityJobRequest
-as [Replay.Core.Contracts.Sql.NightlyAttachabilityJobRequest];
        echo 'Nightly Attachability job results:';
        if($NightlyAttachabilityJobRequestObject -eq $null) {
            echo 'NightlyAttachabilityJobRequestObject parameter is null';
        }
        else {
            echo 'AgentIds:' $NightlyAttachabilityJobRequestObject.AgentIds;
            echo 'IsNightlyJob:'
$NightlyAttachabilityJobRequestObject.IsNightlyJob;
        }
        break;
    }
```

```
# working with Rollup Job
    RollupJob {
        $RollupJobRequestObject = $RollupJobRequest -as
[Replay.Core.Contracts.Rollup.RollupJobRequest];
        echo 'Rollup job results:';
        if($RollupJobRequestObject -eq $null) {
            echo 'RollupJobRequestObject parameter is null';
        }
        else {
            echo 'AgentIds:' $RollupJobRequestObject.AgentIds;
            echo 'IsNightlyJob:' $RollupJobRequestObject.IsNightlyJob;
        }
        $AgentsCollection = $Agents -as
"System.Collections.Generic.List``1[System.Guid]"
        if($AgentsCollection -eq $null) {
            echo 'AgentsCollection parameter is null';
        }
        else {
        echo 'Agents GUIDs:'
            foreach ($a in $AgentsCollection) {
                echo $a
                }
            }
            break;
        }
# working with Checksum Check Job
    ChecksumCheckJob {
        $ChecksumCheckJobRequestObject = $ChecksumCheckJobRequest -as
[Replay.Core.Contracts.Exchange.ChecksumChecks.ChecksumCheckJobRequest];
        echo 'Exchange checksumcheck job results:';
        if($ChecksumCheckJobRequestObject -eq $null) {
            echo 'ChecksumCheckJobRequestObject parameter is null';
        }
        else {
            echo 'RecoveryPointId:'
$ChecksumCheckJobRequestObject.RecoveryPointId;
            echo 'AgentIds:' $ChecksumCheckJobRequestObject.AgentIds;
            echo 'IsNightlyJob:' $ChecksumCheckJobRequestObject.IsNightlyJob;
        }
        break;
    }
# working with Log Truncation Job
    TransferJob {
        $TransferJobRequestObject = $TransferJobRequest -as
[Replay.Core.Contracts.Transfer.TransferJobRequest];
        echo 'Transfer job results:';
        if($TransferJobRequestObject -eq $null) {
            echo 'TransferJobRequestObject parameter is null';
        }
        else {
             echo 'TransferConfiguration:'
$TransferJobRequestObject.TransferConfiguration;
            echo 'StorageConfiguration:'
$TransferJobRequestObject.StorageConfiguration;
        }
        echo 'LatestEpochSeenByCore:' $LatestEpochSeenByCore;
        $TakeSnapshotResponseObject = $TakeSnapshotResponse -as
[Replay.Agent.Contracts.Transfer.TakeSnapshotResponse];
        if($TakeSnapshotResponseObject -eq $null) {
            echo 'TakeSnapshotResponseObject parameter is null';
        }
        else {
            echo 'ID of this transfer session:'
$TakeSnapshotResponseObject.SnapshotSetId;
```

```
            echo 'Volumes:' $TakeSnapshotResponseObject.VolumeSnapshots;
        }
        break;
    }
}
```

Using Bourne Shell scripting in Rapid Recovery

Bourne shell (sh) is a shell language or command-line interpreter for Unix-based operating systems. Bourne shell is used in Rapid Recovery with Linux to customize environments and specify certain operations to occur in a predetermined sequence. The .sh is the file extension and naming convention for Bourne shell files.

Bourne Again Shell (BASH) is a similar shell language that implements the same grammar, parameter, and variable expansion, redirection and quoting. BASH also uses the same .sh file extension. The information here applies equally to BASH.

Using pre and post transfer and export script hooks, you can perform system operations before and after a transfer or export. For example, you may want to disable a certain cronjob while a transfer is occurring and enable it once the transfer has finished. As another example, you may need to run commands to flush application-specific data to disk. The contents are written to a temporary file and run using exec. The script then runs using the interpreter defined in the first line of the script, for example, `(#!/usr/bin/env bash)`. If the specified interpreter is not available, the script uses the default shell defined in the $SHELL environment variable.

You can substitute and use any interpreter. For example, on the `#!` line of the script, you can replace "bash" with "zsh" (Z shell), "tcsh" (tee shell), and so on, based on your preference.

You can add available objects from the TransferPrescript parameter or add your own commands to the PreTransferScript.sh and PostTransfer.sh scripts to customize them.

This section describes the scripts that can be used by administrators at designated occurrences in Rapid Recovery for Windows and Linux. It includes the following topics:

- Input parameters for Bourne Shell scripting
- Sample Bourne Shell scripts

Prerequisites for Bourne Shell scripting

Rapid Recovery provides the ability to run Bourne Shell scripts on the Linux Agent machine before and after a transfer. The following scripts are supported for Linux machines protected with the Rapid Recovery Agent software.

NOTE: Note that if a script is not executable, the transfer job will fail.

- PreTransferScript.sh
- PostTransferScript.sh
- PostExportScript.sh

To use these scripts, ensure that they reside in the `/opt/apprecovery/scripts/` directory.

Supported transfer and post-transfer script parameters

The following parameters are supported on Linux for transfer scripts. For more information, see Sample Bourne Shell scripts.

- TransferPrescriptParameter_VolumeNames=$TransferPrescriptParameter_VolumeNames
- TransferPrescriptParameter_ShadowCopyType=$TransferPrescriptParameter_ShadowCopyType
- TransferPrescriptParameter_TransferConfiguration= $TransferPrescriptParameter_TransferConfiguration
- TransferPrescriptParameter_StorageConfiguration= $TransferPrescriptParameter_StorageConfiguration
- TransferPrescriptParameter_Key=$TransferPrescriptParameter_Key
- TransferPrescriptParameter_ForceBaseImage=$TransferPrescriptParameter_ForceBaseImage
- TransferPrescriptParameter_IsLogTruncation=$TransferPrescriptParameter_IsLogTruncation
- TransferPrescriptParameter_LatestEpochSeenByCore= $TransferPrescriptParameter_LatestEpochSeenByCore

The following parameters are supported on Linux for post transfer scripts.

- TransferPostscriptParameter_VolumeNames=$TransferPostscriptParameter_VolumeNames
- TransferPostscriptParameter_ShadowCopyType=$TransferPostscriptParameter_ShadowCopyType
- TransferPostscriptParameter_TransferConfiguration= $TransferPostscriptParameter_TransferConfiguration
- TransferPostscriptParameter_StorageConfiguration= $TransferPostscriptParameter_StorageConfiguration
- TransferPostscriptParameter_Key=$TransferPostscriptParameter_Key
- TransferPostscriptParameter_ForceBaseImage=$TransferPostscriptParameter_ForceBaseImage
- TransferPostscriptParameter_IsLogTruncation=$TransferPostscriptParameter_IsLogTruncation
- TransferPostscriptParameter_LatestEpochSeenByCore= $TransferPostscriptParameter_LatestEpochSeenByCore

Testing Bourne Shell scripting

You can test the scripts you want to run by using the editor for the script (.sh) files.

NOTE: If the pre-Bourne Shell or post-Bourne Shell scripts fail, the job also fails. Information about the job is available in the /var/log/apprecovery/apprecovery.log file.
Successful scripts return the exit code 0.

Input parameters for Bourne Shell scripting

The parameters for Bourne Shell scripting in Rapid Recovery are described in the following tables.

TransferPrescriptParameters_VolumeNames

The following table presents the available objects for the TransferPrescript parameter.

Table 316. TransferPrescript objects

Method	Description
public VolumeNameCollection VolumeNames (get; set;)	Gets or sets the collection of volume names for transfer. VolumeNames is a data structure that contains the following data: • GuidName. The Guid associated with the volume, used as the name if a DisplayName is not set. • DisplayName. The displayed name of the volume.
public ShadowCopyType ShadowCopyType { get; set; }	Gets or sets the type of copying for transfer. ShadowCopyType is an enumeration with values. The available values are: • Unknown • Copy • Full
public string Key { get; set; }	The Key method generates a pseudorandom (but not cryptographically secure) key, which can be used as a one-time password to authenticate transfer requests.
public bool ForceBaseImage { get; set; }	Gets or sets the value indicating whether the transfer was a forced base image capture.
public bool IsLogTruncation { get; set; }	Gets or sets the value indicating whether logging is being truncated.
public uint LatestEpochSeenByCore { get; set; }	Gets or sets latest epoch value. The LatestEpochSeenByCore method is the ordinal number of the most recent snapshot taken by the Core. This is the 'epoch number' assigned by the filter driver to this particular snapshot at the moment it was taken with VSS.

TransferPostscriptParameter

The following table presents the available objects for the TransferPostscript parameter.

Table 317. TransferPostscript objects

Method	Description
public VolumeNameCollection VolumeNames (get; set;)	Gets or sets the collection of volume names for transfer. VolumeNames is a data structure that contains the following data: • GuidName. The Guid associated with the volume, used as the name if a DisplayName is not set. • DisplayName. The displayed name of the volume.
public ShadowCopyType ShadowCopyType { get; set; }	Gets or sets the type of copying for transfer.ShadowCopyType is an enumeration with values. The available values are: • Unknown • Copy • Full

Method	Description
public string Key { get; set; }	The Key method generates a pseudorandom (but not cryptographically secure) key, which can be used as a one-time password to authenticate transfer requests.
public bool ForceBaseImage { get; set; }	Gets or sets the value indicating whether the transfer was a forced base image capture.
public bool IsLogTruncation { get; set; }	Gets or sets the value indicating whether logging is being truncated.
public uint LatestEpochSeenByCore { get; set; }	Gets or sets latest epoch value. The LatestEpochSeenByCore method is the ordinal number of the most recent snapshot taken by the Core. This is the 'epoch number' assigned by the filter driver to this particular snapshot at the moment it was taken with VSS.

Sample Bourne Shell scripts

This section describes the sample Bourne Shell scripts available for administrative users to run on protected machines.

⚠ **CAUTION: The sample Bourne scripts provided in this document will function when run as designed by qualified administrators. Take precautions when modifying functioning scripts to retain working versions. Any modifications to the script samples included here, or any scripts you create, are considered customization, which is not typically covered by Dell Support.**

NOTE: Protected machines use the 'exec' shell command to launch the script. You can indicate which interpreter should run the script by defining that information in the first line of the script. If you don’t specify the interpreter, the default shell interprets the script. If you choose something other than the default shell, you must ensure that the specified interpreter is available on all protected machines.

The sample scripts for protected machines include:

PreTransferScript.sh

The PreTransferScript is run on the protected machine before transferring a snapshot.

The following script stores the values from input parameters in the Pre(Post)TransferScriptResult.txt, which is located and stored in the root home directory.

Sample PreTransferScript

```
#!/bin/bash
echo "TransferPrescriptParameter_VolumeNames=
$TransferPrescriptParameter_VolumeNames
TransferPrescriptParameter_ShadowCopyType=
$TransferPrescriptParameter_ShadowCopyType
TransferPrescriptParameter_Key=$TransferPrescriptParameter_Key
TransferPrescriptParameter_ForceBaseImage=
$TransferPrescriptParameter_ForceBaseImage
TransferPrescriptParameter_IsLogTruncation=
$TransferPrescriptParameter_IsLogTruncation
TransferPrescriptParameter_LatestEpochSeenByCore=
$TransferPrescriptParameter_LatestEpochSeenByCore" > ~/
PreTransferScriptResult.txt
exit 0
```

PostTransferScript.sh

The PostTransferScript is run on the protected machine after transferring a snapshot.

The following script stores the values from input parameters in the Pre(Post)TransferScriptResult.txt, which is located and stored in the root home directory.

Sample PostTransferScript

```
#!/bin/bash
echo "TransferPostscriptParameter_VolumeNames=
$TransferPostscriptParameter_VolumeNames
TransferPostscriptParameter_ShadowCopyType=
$TransferPostscriptParameter_ShadowCopyType
TransferPostscriptParameter_Key=$TransferPostscriptParameter_Key
TransferPostscriptParameter_ForceBaseImage=
$TransferPostscriptParameter_ForceBaseImage
TransferPostscriptParameter_IsLogTruncation=
$TransferPostscriptParameter_IsLogTruncation
TransferPostscriptParameter_LatestEpochSeenByCore=
$TransferPostscriptParameter_LatestEpochSeenByCore" > ~/
PostTransferScriptResult.txt
exit 0
```

PostExportScript.sh

The PostExportScript is run on the protected machine after the transfer.

The following script stores the values from input parameters in the Pre(Post)ExportScriptResult.txt, which is located and stored in the root home directory.

Sample PostExportScript

```
#!/bin/bash
echo
"$curr_name-exported" > /etc/hostname
exit 0
```

D

Rapid Recovery APIs

The purpose of this section is to provide an introduction and overview of the Rapid Recovery Representational State Transfer (REST) Application Program Interfaces (APIs), their use, and their function.

The Rapid Recovery Web Service APIs are RESTful and let you automate and customize certain functions and tasks within the Rapid Recovery software solution to assist you with meeting your business objectives.

These APIs are accessible from the **Downloads** page of the Dell Data Protection | Rapid Recovery License Portal.

Intended audience

Rapid Recovery APIs are intended for use by application developers who want to integrate and extend Rapid Recovery in their application, as well as administrators who want to script interactions with the Rapid Recovery Core server.

Working with Rapid Recovery REST APIs

The Rapid Recovery APIs are REST-style APIs, which means that they use HTTP requests to provide access to resources (data entities) through URI paths. Rapid Recovery APIs use standard HTTP methods such as GET, PUT, POST, and DELETE. Because REST APIs are based on open standards, you can use any language or tool that supports HTTP calls.

There are two ways that application developers and administrators can work with Rapid Recovery APIs. They are:

- Using C# or other .NET languages to directly use Rapid Recovery .NET client DLL files.
- Communicate directly with the HTTP endpoint to generate your own XML.

The first approach is recommended. The client DLLs are included in the Rapid Recovery SDK. The method for calling Rapid Recovery APIs is consistent with the way you would consume any .NET 4.5X Windows Communication Foundation (WCF) service.

Downloading and viewing Core and Agent APIs

The *Dell Data Protection* | *Rapid Recovery Software Developer Kit (SDK)* includes REST APIs for the Rapid Recovery Core and Rapid Recovery Agent components, and samples and supporting files. These contents are contained in the following folders and then compressed as an archive that includes the following components:

Table 318. Components included in the SDK archive

Folder name	Contents	Description
Core.Contracts	Rapid Recovery Core APIs	Contains APIs to assist developers or administrators to script functions in Rapid Recovery Core. There are 2 sets of service contracts. 1. Open the CoreWeb.Client HTML file in a web browser to view information for general REST standards. The service contracts are listed. When you click any corresponding hyperlinked uniform resource identifier (URI), the browser opens information in the Core.Contracts/docWeb/ directory. The resulting page shows information for general REST service operations, including methods and descriptions. 2. Open the Core.Client HTML file in a web browser to view detailed C# information. When you click any hyperlinked service contract (class), the browser opens information in the Core.Contracts/doc/ directory. The resulting page shows detailed information for all C# methods in the selected class.
Agent.Contracts	Rapid Recovery Agent APIs (deprecated)	Contains APIs that developers or administrators can use to manipulate Rapid Recovery Agent on protected machines. **CAUTION: Agent APIs are deprecated and will be removed from a future version of the SDK. Direct manipulation of the Agent APIs is not recommended. Use of these APIs is considered customization and will not be supported. The information is provided in documentation for historical purposes.** 1. Open the AgentWeb.Client HTML file in a web browser to view information for general REST standards. 2. Open the Agent.Client HTML file in a web browser to view detailed C# information.
AppRecoveryAPISamples	Code samples and dynamic link libraries	AppRecoveryAPISamples contains code samples that are written in C# programming language. These files represent a good starting point to view code snippets if using the APIs to customize your GUI, management systems, and so on. AppRecoveryAPISamples\Dependencies contains dynamic link library (DLL) files that Rapid Recovery Core uses. The DLLs contain data contracts (types the Core is familiar with) and service contracts (management methods and operations that can be used to force Core do something). If you want to customize your own graphic user interface, or use a management system to work with Rapid Recovery Core, these DLLs are required. NOTE: The DLL version used must match the version of the Core.

You can download the SDK as archive (API-Reference-x.x.x-xxxx). Each x represents a digit in the build number for the relevant release.

Complete the steps in this procedure to obtain the SDK, download it to your specified destination, and decompress the files in preparation for using Core and Agent APIs.

1. Log in to the Dell Data Protection | Rapid Recovery License Portal at https://licenseportal.com.
2. In the left navigation menu of the license portal, click **Downloads**.

   The **Downloads** page of the license portal appears.
3. On the **Downloads** page, in the Windows-Based Applications section, scroll down to the description for the SDK and click **Download**.
4. Save the downloaded archive to your preferred location.
5. Decompress the archive.

   In the new API-Reference-x.x.x-xxxx folder, you see the separate sets of files described in the preceding table.
6. Open the key HTML files described in the preceding table in a web browser to see guidance about the APIs.

Recommended additional reading

The *Dell Data Protection* | *Rapid Recovery Installation and Upgrade Guide* provides an overview of the Rapid Recovery architecture, and describes the steps necessary for installing the Rapid Recovery components, and for upgrading the Core or Agent components from earlier versions.

You can view or download this guide from https://support.software.dell.com/rapid-recovery/release-notes-guides/.

About Dell

Dell listens to customers and delivers worldwide innovative technology, business solutions, and services they trust and value. For more information, visit http://software.dell.com.

Contacting Dell

For sales or other inquiries, visit http://software.dell.com/company/contact-us.aspx or call +1-949-754-8000.

Technical support resources

Technical support is available to customers who have purchased Dell software with a valid maintenance contract and to customers who have trial versions. To access the Support Portal, go to https://support.software.dell.com.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. In addition, the Support Portal provides direct access to product support engineers through an online Service Request system.

The Support Portal enables you to:

- Create, update, and manage Service Requests (cases).
- View Knowledge Base articles.
- Obtain product notifications.
- Download software. For trial software, go to http://software.dell.com/trials.
- Engage in community discussions.

Glossary

Agent

The Rapid Recovery Agent is software installed on a physical or virtual machine that lets it be added to protection in the Rapid Recovery Core.

base image

The first backup transfer saved to the Core is called a base image snapshot. All data on all specified volumes (including the operating system, applications, and settings), are saved to the Core. For more information, see snapshot.

Central Management Console

The Rapid Recovery Central Management Console is an optional component intended for environments with two or more Rapid Recovery Cores. This component is a web portal providing a central interface where you can group, manage, and generate reports for multiple Cores using a single Web-based interface.

checksum

A checksum is a function that creates blocks of data that are used for the purpose of detecting accidental errors that are created during transmission or storage.

cluster

See Windows failover cluster.

cluster continuous replication (CCR)

A non-shared storage failover cluster solution, that uses built-in asynchronous log shipping technology to create and maintain a copy of each storage group on a second server in a failover cluster. CCR is designed to be either a one or two data center solution, providing both high availability and site resilience. It is one of two types of clustered mailbox server (CMS) deployments available in Exchange 2007.

cluster node

An individual machine that is part of a Windows Failover cluster.

compression

The Storage Networking Industry Association (SNIA) defines compression as the process of encoding data to reduce its size.

Core

The Rapid Recovery Core is the central component of the Rapid Recovery architecture. The Core provides the essential services for backup, recovery, retention, replication, archiving, and management. In the context of replication, the Core is also called a source core. The source core is the originating core, while the target core is the destination (another Rapid Recovery Core on its own dedicated server, where protected machines or clusters are replicated).

Core Console

The Rapid Recovery Core Console is a Web-based interface that lets you fully manage the Rapid Recovery Core.

database availability group (DAG)

A set of up to 16 Microsoft Exchange Server 2010 Mailbox servers that provide automatic, database-level recovery from a database, server, or network failure. DAGs use continuous replication and a subset of Windows failover clustering technologies to provide high availability and site resilience. Mailbox servers in a DAG monitor each other for failures. When a Mailbox server is added to a DAG, it works with the other servers in the DAG to provide automatic, database-level recovery from database failures.

encryption

Data is encrypted with the intent that it is only accessible to authorized users who have the appropriate decryption key. Data is encrypted using 256-bit AES in Cipher Block Chaining (CBC) mode. In CBC, each block of data is XORed with the previous ciphertext block before being encrypted, this way each new ciphertext block depends on all preceding plaintext blocks. A passphrase is used as an initialization vector.

event

An event is a process that is logged by the Core. Events can be viewed within the Core Console by clicking the (Events) icon from the icon bar. The default view when you click the (Events) icon shows the **Tasks** page. This view shows events related to a job. Priority events about which you are notified can be viewed on the **Alerts** page. A log of all events appears in the **Journal** page. By setting up or modifying existing notification groups, you can customize notification for any event. This action raises the priority of the event by displaying it on the **Alerts** page. Members of a notification group are notified of events using the notification methods set in the notification options for the group.

global deduplication

The Storage Networking Industry Association (SNIA) defines data deduplication as the replacement of multiple copies of data—at variable levels of granularity—with references to a shared copy to save storage space or bandwidth. The Rapid Recovery Volume Manager performs global data deduplication within a logical volume. The granularity level of deduplication is 8 KB. The scope of deduplication in Rapid Recovery is limited to protected machines using the same repository and encryption key.

incremental snapshot

Incremental snapshots are backups consisting only of data changed on the protected machine since the last backup. They are saved to the Core regularly, based on the interval defined (for example, every 60 minutes). For more information, see snapshot.

license key

A license key is one method used to register your Rapid Recovery software or appliance. (You can also use a license file.) You can obtain license keys or files when you register on the Dell Data Protection | Rapid Recovery License Portal for an account. For more information, see License Portal.

License Portal

The Dell Data Protection | Rapid Recovery License Portal is a Web interface where users and partners can download software, register Rapid Recovery appliances, and manage license subscriptions. License Portal users can register accounts, download Rapid Recovery Core and Agent software, manage groups, track group activity, register machines, register appliances, invite users, and generate reports. For more information, see the *Dell Data Protection | Rapid Recovery License Portal User Guide*.

Live Recovery

Rapid Recovery Live Recovery is an instant recovery technology for VMs and servers. It provides near-continuous access to data volumes in a virtual or physical server, letting you recover an entire volume with near-zero RTO and a RPO of minutes.

Local Mount Utility

The Local Mount Utility (LMU) is a downloadable application that lets you mount a recovery point on a remote Rapid Recovery Core from any machine.

log truncation

Log truncation is a function that removes log records from the transaction log. For a SQL Server machine, when you force truncation of the SQL Server logs, this process identifies free space on the SQL server. For an Exchange Server machine, hen you force truncation of the Exchange Server logs, this action frees up space on the Exchange server.

management roles

The Rapid Recovery Central Management Console introduces a new concept of management roles which lets you divide administrative responsibility among trusted data and service administrators as well as access control to support secure and efficient delegation of administration.

mountability

Exchange mountability is a corruption detection feature that alerts administrators of potential failures and ensures that all data on the Exchange servers is recovered successfully in the event of a failure.

Object File System

The Rapid Recovery Scalable Object Store is an object file system component. It treats all data blocks, from which snapshots are derived, as objects. It stores, retrieves, maintains, and replicates these objects. It is designed to deliver scalable input and output (I/O) performance in tandem with global data deduplication, encryption, and retention management. The Object File System interfaces directly with industry standard storage technologies.

passphrase

A passphrase is a key used in the encryption the data. If the passphrase is lost, data cannot be recovered.

PowerShell scripting

Windows PowerShell is a Microsoft .NET Framework-connected environment designed for administrative automation. Rapid Recovery includes comprehensive client SDKs for PowerShell scripting that enables administrators to automate the administration and management of Rapid Recovery resources by the execution of commands either directly or through scripts.

prohibited characters

Prohibited characters are characters that should not be used when naming an object in the Rapid Recovery Core Console. For example, when defining a display name for a protected machine, do not use any of the following special characters:

Table 319. Prohibited characters

Character	Character name	Prohibited from
?	question mark	machine display name, encryption key, repository, path description
|	pipe	machine display name, encryption key, repository, path description
:	colon	machine display name, encryption key, repository Use of this symbol is supported when specifying a path; for example, c:\data.

Character	Character name	Prohibited from
/	forward slash	machine display name, encryption key, repository, path description
\	back slash	machine display name, encryption key, repository Use of this symbol is supported when specifying a local or network path; for example, c:\data or \\ComputerName\SharedFolder\
*	asterisk	machine display name, encryption key, repository, path description
"	quotation mark	machine display name, encryption key, repository, path description
<	open angle bracket	machine display name, encryption key, repository, path description
>	close angle bracket	machine display name, encryption key, repository, path description

prohibited phrases

Prohibited phrases are phrases (or sets of characters) that should not be used as the name for any object in the Rapid Recovery Core Console, because they are reserved for the use of operating systems. It is best practice is to avoid using these phrases at all if possible. For example, when defining a display name for a protected machine, do not use any of the following phrases:

Table 320. Prohibited phrases

Phrase	General use	Prohibited from
con	console	machine display name, encryption key, repository, path description
prn	printer port	machine display name, encryption key
aux	auxiliary port	machine display name, encryption key
nul	null value	machine display name, encryption key
com1, com2... *through* com9	communication port	machine display name, encryption key
lpt1, lpt2... *through* lpt9	line print terminal port	machine display name, encryption key, repository, path description

protected machine

A protected machine—sometimes called an "agent"— is a physical computer or virtual machine that is protected in the Rapid Recovery Core. Backup data is transmitted from the protected machine to the repository specified in the Core using a predefined protection interval. The base image transmits all data to a recovery point (including the operating system, applications, and settings). Each subsequent incremental snapshot commits only the changed blocks on the specified disk volumes of the protected machine. Software-based protected machines have the Rapid Recovery Agent software installed. Some virtual machines can also be protected agentlessly, with some limitations.

quorum

For a failover cluster, the number of elements that must be online for a given cluster to continue running. The elements relevant in this context are cluster nodes. This term can also refer to the quorum-capable resource selected to maintain the configuration data necessary to recover the cluster. This data contains details of all of the changes that have been applied to the cluster database. The quorum resource is generally accessible to other cluster resources so that any cluster node has access to the most recent database changes. By default there is only one quorum resource per server cluster. A particular quorum configuration (settings for a failover cluster) determines the point at which too many failures stop the cluster from running.

Rapid Recovery

Rapid Recovery sets a new standard for unified data protection by combining backup, replication, and recovery in a single solution that is engineered to be the fastest and most reliable backup for protecting virtual machines (VM), as well as physical and cloud environments.

recovery points

Recovery points are a collection of snapshots of various disk volumes. For example, C:, D:, and E:.

recovery points-only machine

A recovery points-only machine is the representation on the Core of recovery points from a machine that was previously protected on the Core, and since removed. If you remove replication but retain the recovery points, this also results in a recovery points-only machine. Information can be viewed and recovered at a file level. You cannot use a recovery points-only machine to perform BMR or to restore full volumes, nor can you add more data to a recovery points-only machine.

remote Core

A remote Core represents an Rapid Recovery Core that is accessed by a non-Core machine using the Local Mount Utility or the Central Management Console.

replication

Replication is the process of copying recovery points from one Rapid Recovery Core and transmitting them to another Rapid Recovery Core for disaster recovery purposes. The process requires a paired source-target relationship between two or more Cores. Replication is managed on a per-protected-machine basis. Any machine (or all machines) protected or replicated on a source Core can be configured to replicate to a target Core. It is the recovery points that are copied to the target Core.

repository

A repository is a collection of base image and incremental snapshots captured from the machines protected on a Rapid Recovery Core. Repositories must be created on fast primary storage devices. The storage location for a DVM repository can be local to the Core machine (in which case it is hosted on a supported Windows OS only). It can use direct-attached storage, a storage area network, or an appropriately rated network-attached server.

REST APIs

Representational State Transfer (REST) is a simple stateless software architecture designed for scalability. Rapid Recovery uses this architecture for its Application Program Interfaces (APIs) to automate and customize certain functions and tasks. There is a separate set of REST APIs for Core functionality and for protected machine (agent) functionality.

restore

The process of restoring one or more storage volumes on a machine from recovery points saved on the Rapid Recovery Core is known as performing a restore. This was formerly known as rollback.

retention

Retention defines the length of time the backup snapshots of protected machines are stored on the Rapid Recovery Core. Retention policy is enforced on the recovery points through the rollup process.

rollup

The rollup process is an internal nightly maintenance procedure that enforces the retention policy by collapsing and eliminating dated recovery points. Rapid Recovery reduces rollup to metadata operations only.

seeding

In replication, the initial transfer of deduplicated base images and incremental snapshots of protected agents, which can add up to hundreds or thousands of gigabytes of data. Initial replication can be seeded to the target core using external media, which is useful for large sets of data or sites with slow links.

server cluster

See Windows failover cluster.

SharePoint backup

A SharePoint backup is a copy of data that is used to restore and recover that data on a SharePoint server after a system failure. From the SharePoint backup, you can perform recovery of the complete SharePoint farm, or one or more components of the farm.

single copy cluster

A shared storage failover cluster solution, that uses a single copy of a storage group on storage that is shared between the nodes in the cluster. It is one of two types of clustered mailbox server deployments available in Exchange 2007.

Smart Agent

The Rapid Recovery Smart Agent is installed on the machines protected by the Rapid Recovery Core. The smart agent tracks the changed blocks on the disk volume and snapshots the changed blocks at a predefined interval of protection.

snapshot

A snapshot is a common industry term that defines the ability to capture and store the state of a disk volume at a given point, while applications are running. The snapshot is critical if system recovery is needed due to an outage or system failure. Rapid Recovery snapshots are application aware, which means that all open transactions and rolling transaction logs are completed and caches are flushed prior to creating the snapshot. Rapid Recovery uses Microsoft Volume Shadow Services (VSS) to facilitate application crash consistent snapshots.

SQL attachability

SQL attachability is a test run within the Rapid Recovery Core to ensure that all SQL recovery points are without error and are available for backup in the event of a failure.

SQL backup

A SQL backup is a copy of data that is used to restore and recover that data on a SQL server after a system failure. From the SQL backup, you can perform recovery of the complete SQL database, or one or more of the components of the SQL database.

SQL differential backup

A differential database backup is a cumulative copy of all changes in data since the last full backup of the SQL database. Differential backups are typically faster to create than full database backups, and reduce the number of transaction logs required to recover the database.

target Core

The target Core, which is sometimes referred to as replica Core, is the Rapid Recovery Core receiving the replicated data (recovery points) from the source Core.

Transport Layer Security

Transport Layer Security (TLS) is a modern cryptographic network protocol designed to ensure communication security over the Internet. This protocol, defined by the Internet Engineering Task Force, is the successor to Secure Sockets Layer (SSL). The SSL term is still generally used, and the protocols are interoperable (a TLS client can downgrade to communicate to an SSL server).

True Scale

True Scale is the scalable architecture of Rapid Recovery.

Universal Recovery

Rapid Recovery Universal Recovery technology provides unlimited machine restoration flexibility. It enables you to perform monolithic recovery to- and from- any physical or virtual platform of your choice as well as incremental recovery updates to virtual machines from any physical or virtual source. It also lets you perform application-level, item-level, and object-level recovery of individual files, folders, email, calendar items, databases, and applications.

Verified Recovery

Verified Recovery technology is used to perform automated recovery testing and verification of backups. It supports various file systems and servers.

virtual standby

Virtual standby is a process that creates a clone virtual machine of a protected machine. The original source machine can be physical or virtual, but the product is always virtual. You can create a virtual standby one time on demand, or you can define requirements to create the bootable VM, and continually update it after each snapshot is captured on the original protected machine.

Volume Manager

The Rapid Recovery Volume Manager manages objects and then stores and presents them as a logical volume. It leverages dynamic pipeline architecture to deliver TruScale scalability, parallelism, and asynchronous input-and-output (I/O) model for high throughput with minimal I/O latency.

white labeling

Rapid Recovery provides the ability for providers of backup and disaster recovery services to white label or re-brand Rapid Recovery with their own identity; and then sell or distribute it as their own product or service.

Windows failover cluster

A group of independent computers that work together to increase the availability of applications and services. The clustered servers (called nodes) are connected by physical cables and by software. If one of the cluster nodes fails, another node begins to provide service (a process known as failover). Users experience a minimum of disruptions in service. Rapid Recovery supports the protection of a number of SQL Server and Exchange Server cluster types.