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Paragon® Backup & Recovery™ 16

User Guide

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Product Overview

Backup and Recovery 16 is an easy-to-use tool for reliable backup of an entire computer, individual volumes or files. It helps to get consistent point-in-time copies of your PC including OS, running applications, user settings and all data in such a way that you don't even feel any discomfort. Three predefined backup strategies simplify setup of regular backup routines. Full backup images followed by incremental updates of changed data since the last backup strengthened by data retention keep your data precisely up to date with minimal effort and backup storage footprint. Backup data is allowed to store on a local or external device or a network share.

For advanced users, there's a way to create comprehensive backup policies that utilize full, incremental, and differential backup methods and their combinations, where backup runs can be scheduled from every hour till certain days of the month, or evoked by a certain event (system start or user logon).

Several restore options are available for you to rule out an emergency situation as quickly as possible, from fast retrieval of specific files from a backup image, to complete restore of your computer to an earlier state without losing data, reinstalling and reconfiguring your programs. Even when OS fails to start up, you still have a chance to get everything back on track by loading your PC from a WinPE-based rescue media prepared beforehand.

In this guide you will find the answers to many of the technical questions, which might arise while using our program.

Our company is constantly releasing new versions and updates to its software, that's why images shown in this manual may be different from what you see on your screen.

Getting Started

Product Components

- **Windows installation package** for regular system and data protection. It's the main component of the product that includes all the necessary tools to help you safe yourself from a system failure, hardware malfunction or a human factor.
- **WinPE bootable environment** for disaster recovery or data retrieval. You can prepare it on a USB thumb drive or in an ISO file with the program's wizard (highly recommended).

System Requirements

For the Windows installation package

- Windows 7 SP1 and later
- Internet Explorer 10 and later
- Opened ports in Firewall: inbound and outbound 80, 443
- https://bo4-fe.paragon-software.com should be added to the list of trusted sites, besides the security level for the trusted zone should not be higher than **Medium-high**. Go to **Control Panel > Network and Internet > Internet Options > Security** to configure the necessary parameters.

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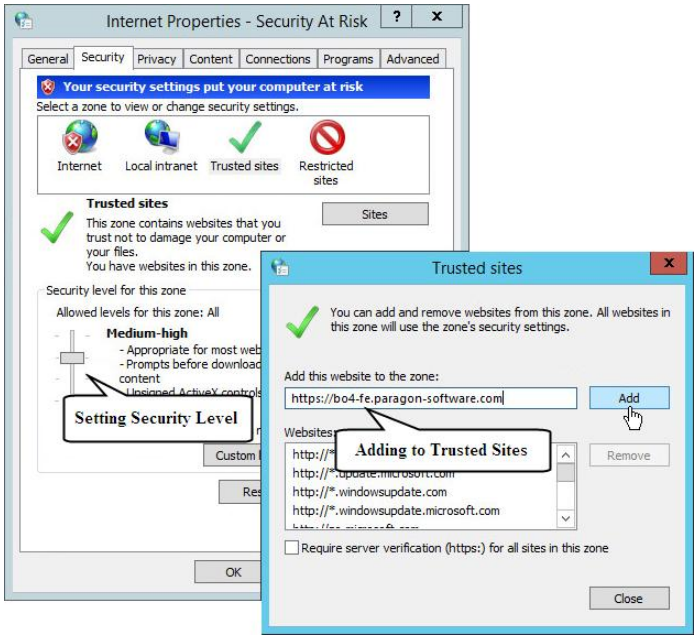

During the installation additional free space (up to 1GB) will be required.

For the WinPE bootable environment

- Intel Pentium III CPU or its equivalent, with 1000 MHz processor clock speed
- At least 1 GB of RAM
- SVGA video adapter and monitor
- Keyboard
- Mouse

Additional requirements

- Network card to send/retrieve data to/from a network computer
- Recordable CD/DVD drive to burn data to compact discs
- External USB hard drive to store data

Installation

Before the installation, please make sure the systems requirements are met. If everything is OK, please do the following to install the product:

In case there is some previous version of the program installed on the computer, the program will offer the user to uninstall it first.

1. Click on the supplied setup file to initiate the installation. First your system will be checked for the presence of Visual Studio C++ 2010 Runtime Library and if not found, you will be prompted to install it (comes with the installation package).

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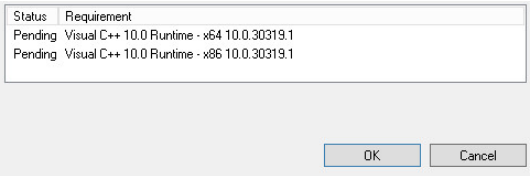

2. The Welcome page will inform that the application is being installed. Click **Next** to continue.
3. Please Read Paragon License Agreement carefully and then select the appropriate option to accept. Otherwise you won't be able to proceed with the installation.

4. Provide the standard customer information, i.e. a user name and an organization. Besides you need to decide whether to make the program available for all users of this computer (if several) or only for the current one.
5. If necessary, click **Change** to install the utility to a different location (by default **C:\Program Files\Paragon Software\Backup and Recovery 16**).
6. On the Ready to Install the Program page click **Install** to start the installation or **Back** to return to any of the previous pages and modify the installation settings.
7. The final page reports the end of the setup process. Click **Finish** to complete the wizard.

First Start

After the installation you can see an icon of Backup and Recovery on the Windows desktop. Double click it to launch the utility.

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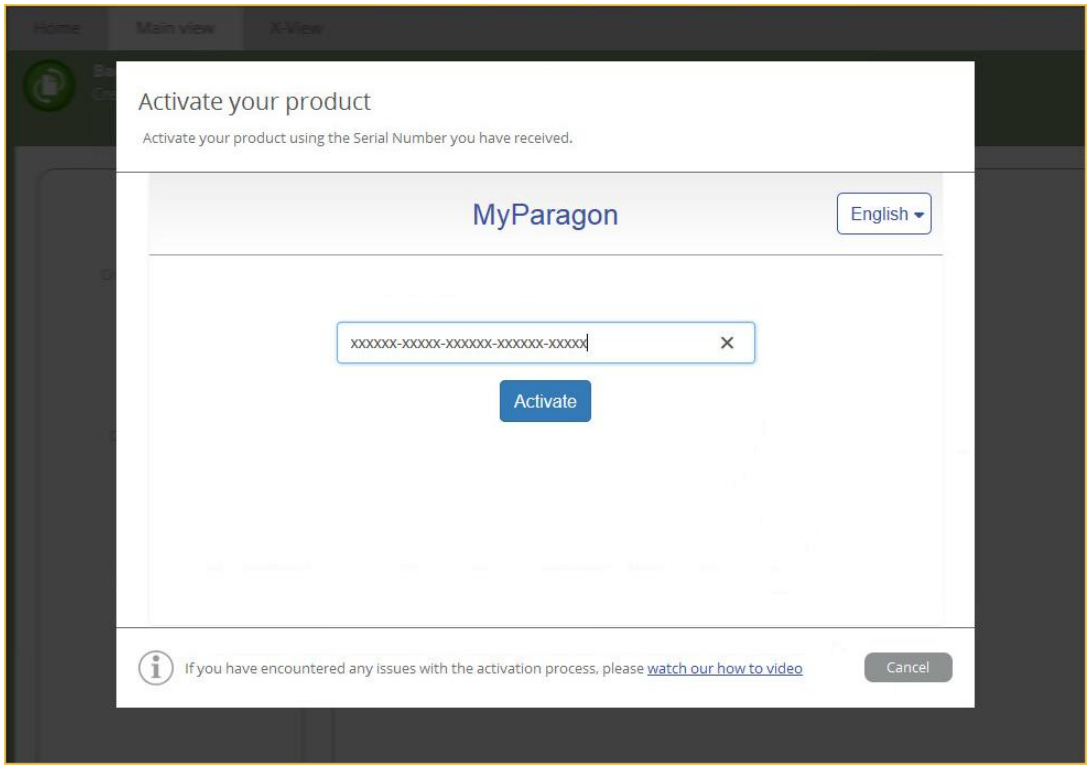
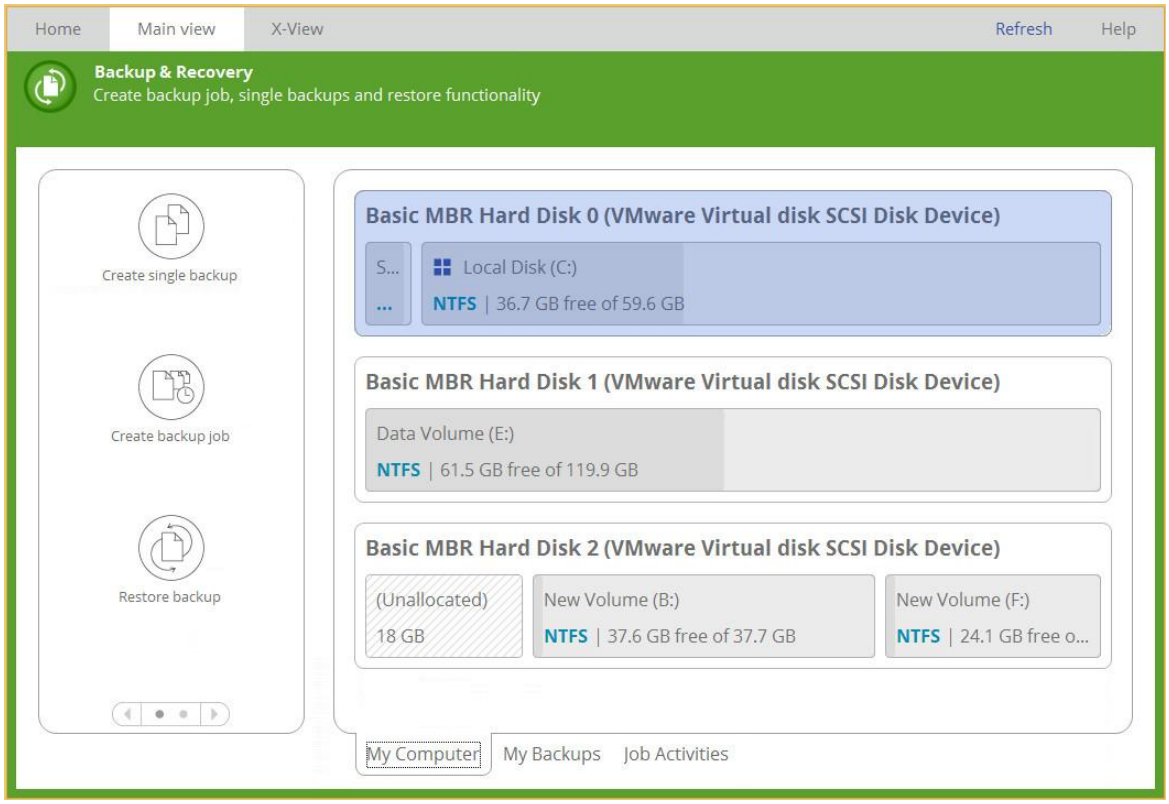


Once started, you will see an activation dialog. Backup and Recovery is a commercially distributed product, which needs activation over the Internet. Enter your serial number, then click **Activate**. For more details, please watch our video guide: **https://www.paragon-software.com/de/home/backup-recovery-kompakt/video.htm.**

If you see a blank window instead of the Activation dialog, please make sure the systems requirements are met.

After the activation, you will get access to the program interface.



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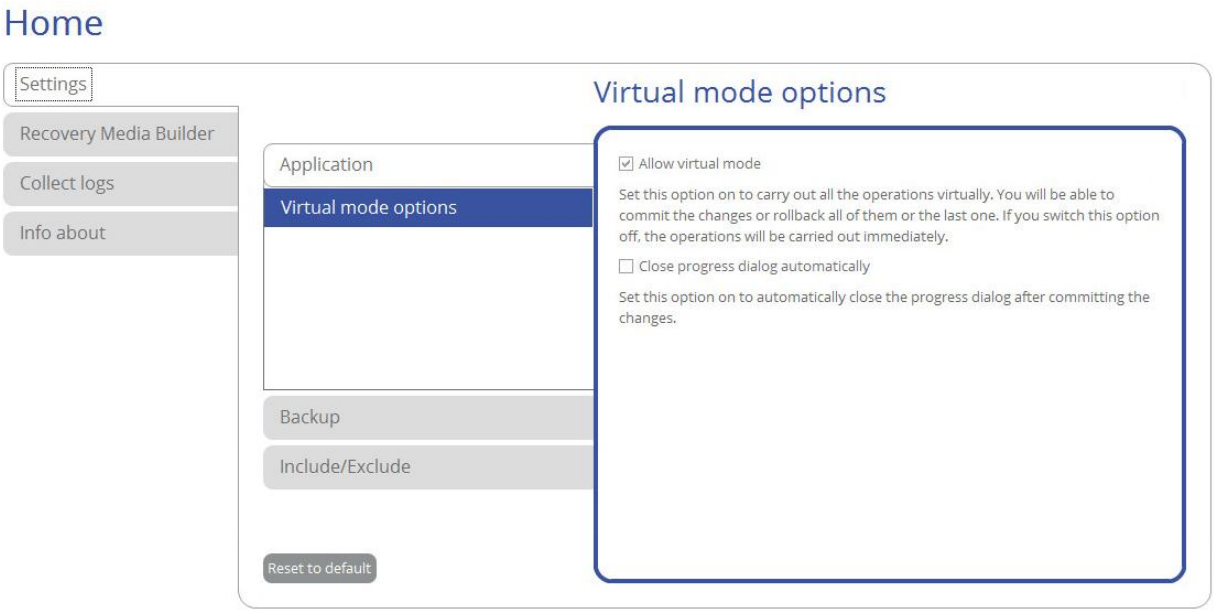
The upper area of the main window contains several tabs: **Home**, **Main View** and **X-View**.

Home

Use this tab to change the program settings, build bootable recovery media, collect program logs, or go to Paragon's website to download a free update, register the product, visit Paragon's Knowledge Base, etc.

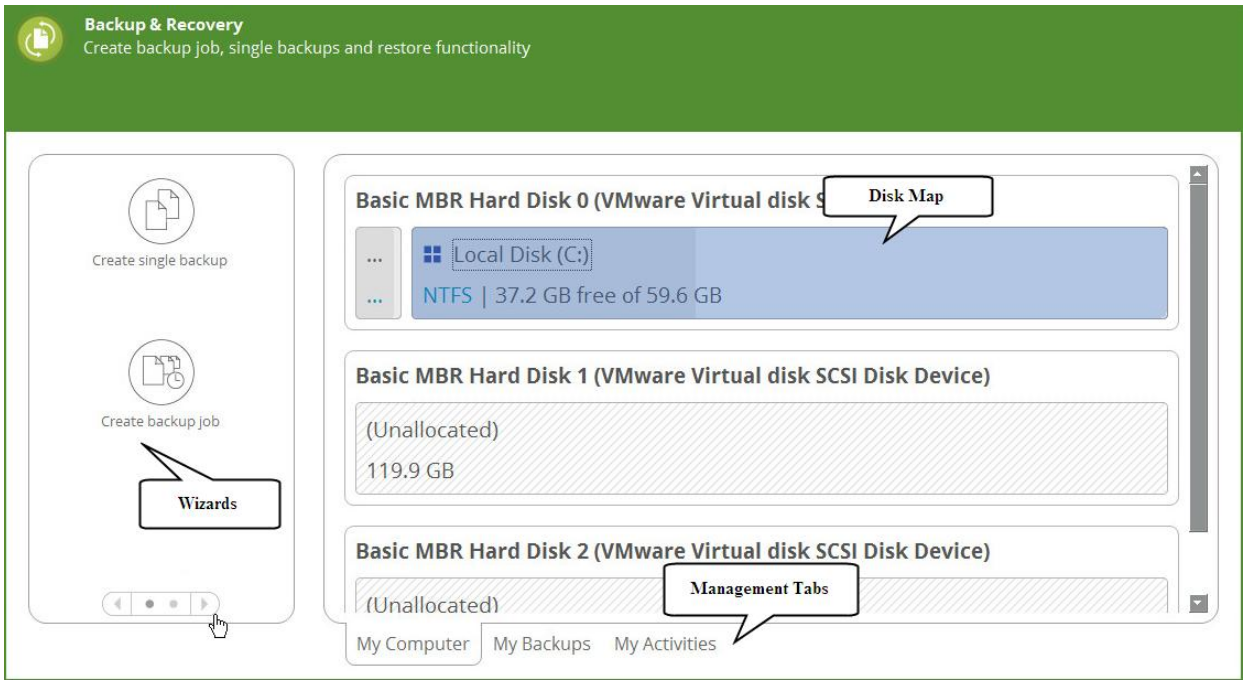


For more details, please consult the following chapters:

- **Changing Program Settings**
- **Building Recovery Media**
- **Troubleshooting**

Main View

It is displayed each time you launch the program. Use this tab to see the layout of system storage devices, open program wizards and dialogs, monitor backup activities and some other actions.



By default, the program does not accomplish operations that may destroy the on-disk data (format, delete, restore, etc.) immediately, but places them on a special list (the so-called virtual mode). First it helps to avoid possible mistakes as you should confirm all provided changes. Second it saves your time and effort when

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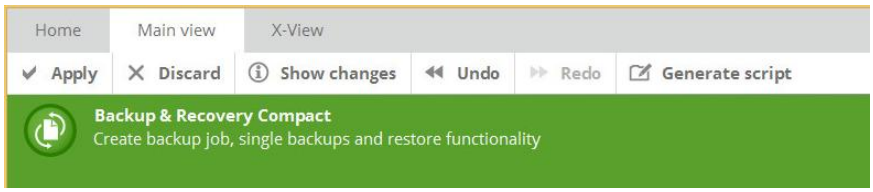
executing several operations, as you don't need to wait for each operation to physically complete before proceeding to the next operation.

A corresponding bar appears in the upper area after you accomplish a potentially dangerous operation.



- **Apply**. Click to physically execute pending changes.
- **Discard**. Click to cancel all pending changes.
- **Show changes**. Click to see and manage pending changes.

Select **Old disk layout** to see your disks before accomplishing pending changes.

Select **New disk layout** to see your disks after accomplishing pending changes. Use the arrow buttons below to see how the target disk layout changes after each operation.

- **Undo**. Click to cancel the last pending operation.

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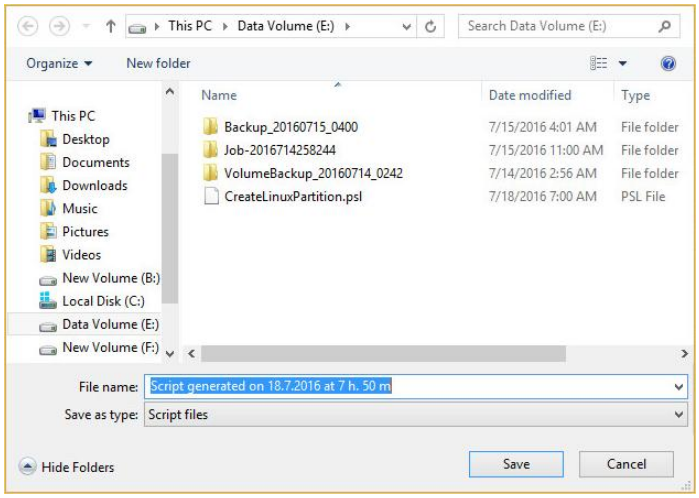
- **Redo**. Click to cancel the last undo pending operation.
- **Generate script**. Generate a script out of all pending changes. A script may describe one or several operations with macro-language commands. The program installation package includes an interpreter utility – SCRIPTS.exe that allows executing any set of operations automatically in the unattended mode. For more details, please consult Using the Command Prompt.

  If necessary, you can change the default location and filename for the created script file.



The Virtual operations bar is also displayed in the X-View mode.

To learn more about scripts, please consult the Paragon Scripting Language manual.

Disk Map

The Disk Map displays the layout of storage devices. Each device is represented with a rectangle bar that contains small-sized bars, which represent partitions or logical disks. By looking at the size of the bar's shaded area it is possible to estimate the used disk space.

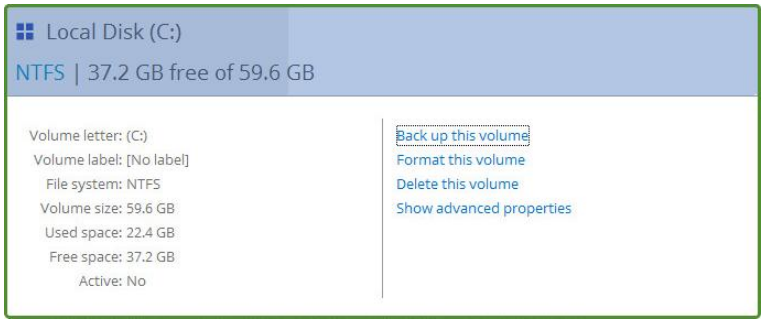
Large-sized bars display the following information about storage devices:

- Type (physical, virtual),
- Used partitioning scheme (MBR or GPT),
- Total capacity.

Small-sized bars display the following information about logical disks and blocks of free space:

- Volume label (if exists),
- Total size,
- File system.

Left click a disk, volume, or block of free space to call a context-sensitive menu with detailed information on the selected object and a list of available operations.



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For more details, please consult the following chapters:

- **Protecting System and Data**
- **Managing Partitions and Disks**

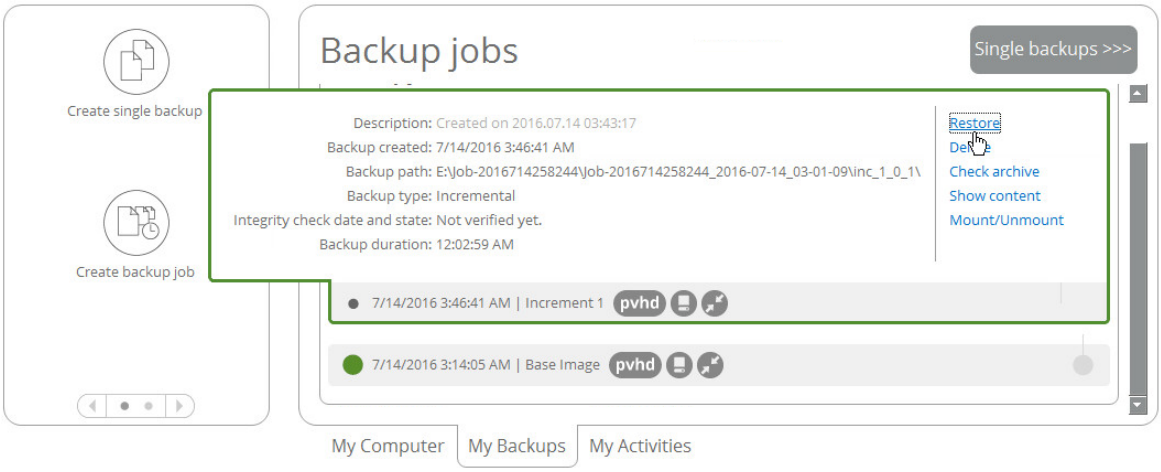
Wizards

For your convenience the program wizards are grouped into several tabs. Use the arrow buttons to switch between them.

- Select **Create single backup** to configure a one-shot backup task. For more details, please consult **Configuring a One-shot Backup Task**.
- Select **Create backup job** to configure a regular backup routine according to one of the predefined backup strategies. For more details, please consult **Configuring a Regular Backup Routine**.
- Select **Restore backup** to configure a restore operation. For more details, please consult **Windows Restore Scenarios**.
- Select **Copy files and folders** to transfer files or directories between local, external, or network storages. For more details, please consult **Transferring Files between Storages**.

Management Tabs

- Select **My Computer** (opened by default) to see the layout of storage devices.
- Select **My Backups > Single backups>>>** to see all configured one-shot backup tasks or **My Backups > Backup jobs>>>** to see configured regular backup routines. Left click a backup image to call a context-sensitive menu with detailed information on the selected object and a list of available operations.



For more details, please consult the following chapters:

- **Restoring Individual Files and Folders**
- **Restoring an Entire Disk or Separate Volumes**
- **Checking Backup Integrity**
- **Mounting a Backup Image**

- Select **My Activities** to see completed, scheduled and currently executed operations and their statuses.

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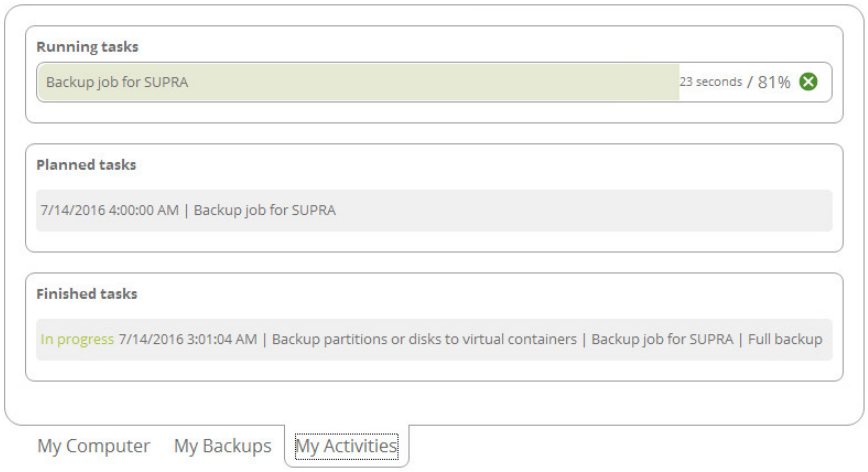
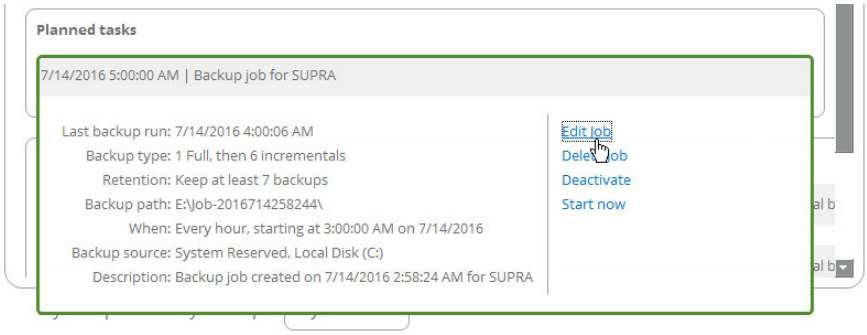
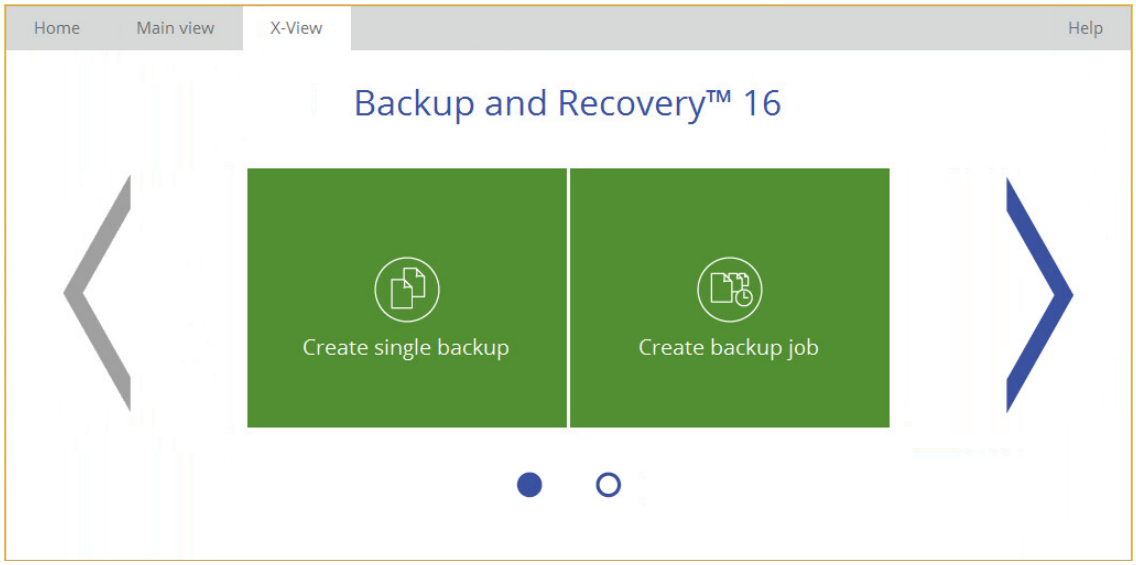


For any scheduled backup job you can call a context-sensitive menu with detailed information on the selected object and a list of available operations. For more details, please consult **Managing Backup Jobs**.



X-View

Use this tab to simplify the working environment and only see the main program wizards. For your convenience the wizards are grouped into several tabs.



Changing Program Settings

Select **Home** > **Settings** to access the program settings. All settings are grouped into several sections, which functions are described in the following paragraphs. By selecting a section from the list, you can open a set of options.

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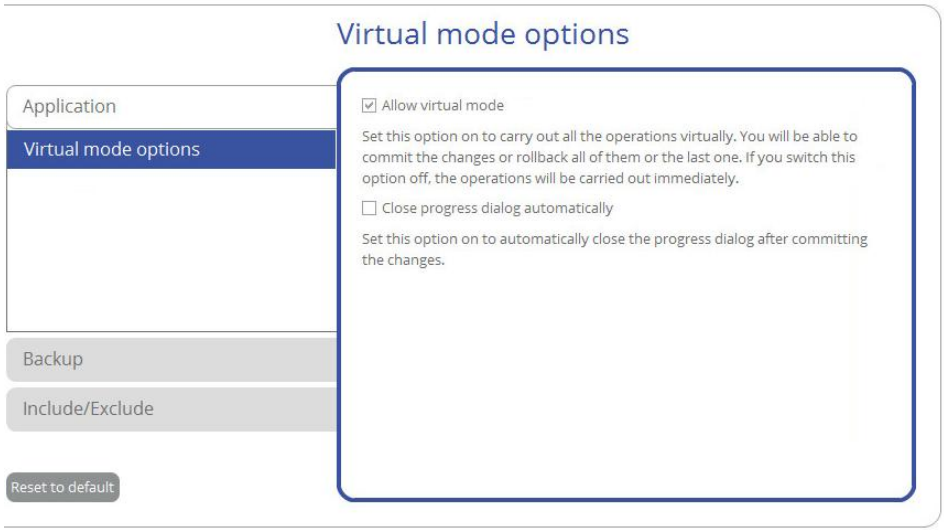
Application Section

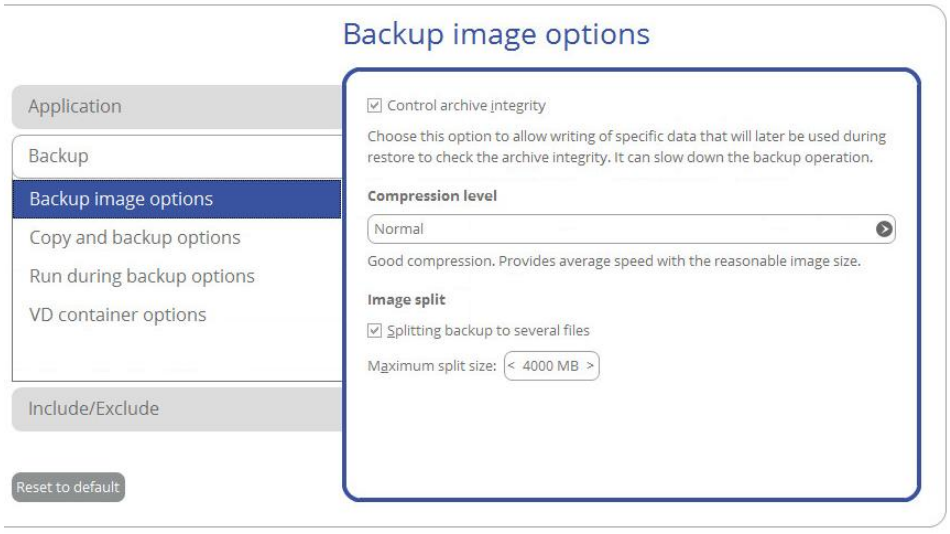
Virtual Mode Options



- **Allow virtual mode** (enabled by default). The virtual mode is an effective way of protection from any troubles, since no potentially dangerous operation is executed until confirmation, thus giving you a second chance to weigh all pros and cons of this or that particular operation. For more details, please consult **Main View**.
- **Close progress dialog automatically**. Mark the checkbox to automatically close the progress dialog after accomplishing operations.

Backup Section

Backup Image Options



- **Control archive integrity** (enabled by default). Use this option to make sure all backup images created with the program are 100 percent flawless. If you decided not to control the archive integrity, the backup operation would take about 3-5% less time.
- **Compression level**. Select the default compression level for all created backup images from the pull-down list.
- **Image split**. By default, every backup image will be split to files of 4GB. This can help to avoid problems caused by a maximum file size limitation of your file system (e.g. 4GB for FAT32). Use the spinner control to set another size or disable this option if necessary.

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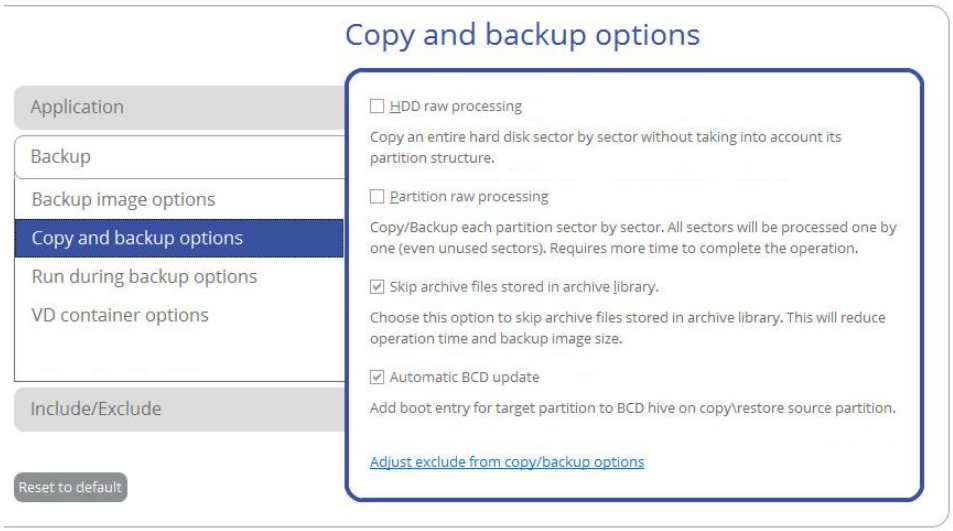
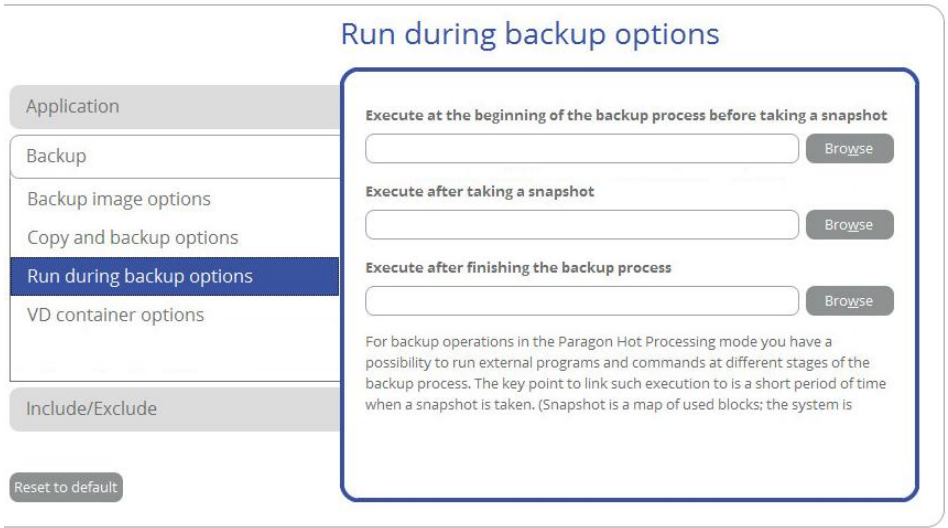
Copy and Backup Options



- **HDD raw processing**. Mark the checkbox to back up a hard disk in the sector-by-sector mode, thus ignoring its information structure (e.g. unallocated space or unused sectors of existing partitions will be processed as well). This can help to avoid problems with hidden data created by certain applications or the system administrator. If you enable this option, the operation will take more time to complete.
- **Partition raw processing**. Mark the checkbox to back up a partition in the sector-by-sector mode to successfully process unknown file systems. If you enable this option for processing supported file systems, the operation will take more time to complete.
- **Skip archive files stored in archive library**. By default, backup images registered in the archive database will be skipped from processing, thus reducing the operation time and the resulted backup size.
- **Automatic BCD Update**. If necessary, unmark the checkbox to suppress automatic update of BCD (Boot Configuration Data) after copy/restore operations.

By clicking the link at the bottom of the window you can jump to the Copy/Backup Exclude Options.

Run during Backup Options



In this section you can specify external applications to execute at various phases of the backup process in order to obtain consistent backup images of systems with high availability requirements (MS SQL, MS Exchange, etc.). The

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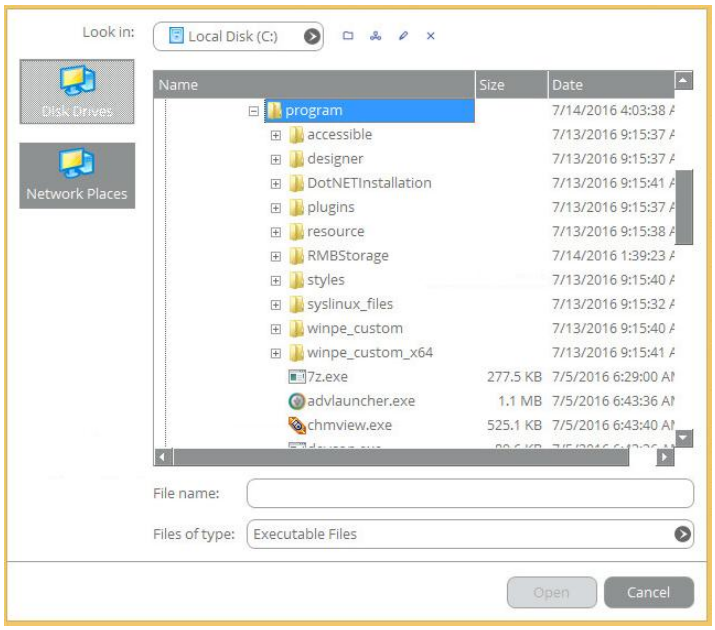
point is to provide a coherent state of all open files and databases involved in a backup, taking into account that applications may still keep writing to disks.

Actually a backup process consists of two phases: the preparation phase (snapshot) and the data-copying phase. There are three points of the backup when external commands/programs can be launched:

- **Execute at the beginning of the backup process before taking a snapshot**. Specify an executable file that will help you to prepare running applications for taking a snapshot. It may contain specific commands/programs to delete unnecessary files, suspend services, flush transactions or caches, etc. Everything depends on the used applications.
- **Execute after taking a snapshot**. Specify an executable file that will run just after taking a snapshot. It may contain specific commands/programs, e.g. to resume the previously suspended services, etc. Everything depends on the used applications.
- **Execute after finishing the backup process**. Specify an executable file that will run after the backup process has been accomplished. It may include commands/ programs that will move the backup image to a particular location, etc.

By clicking the **Browse** button you can get into a browser-like window to choose an executable file.



The program supports three types of executable files (.exe, .bat, .cmd). It's up to you to write batch files to safely prepare applications for backup. There are certain general requirements for that:

- All programs and commands must execute sequentially and finish before the .bat file completes its work.
- It is recommended to use external commands/programs in the following format - **Start/wait program.exe**. The wait option will help to start an application and wait until it completes its work. This guarantees all included commands/programs complete their execution before the batch file does.

You're allowed to set parameters for an executable file directly from the line. However, if the file path contains word gaps it is necessary to enclose it in quotes in order to make the program distinguish between the path and the used parameters.

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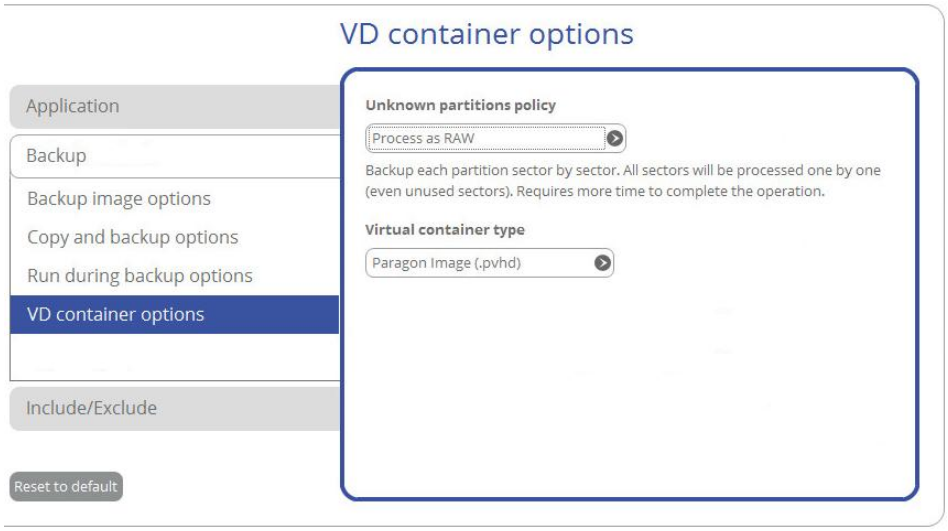
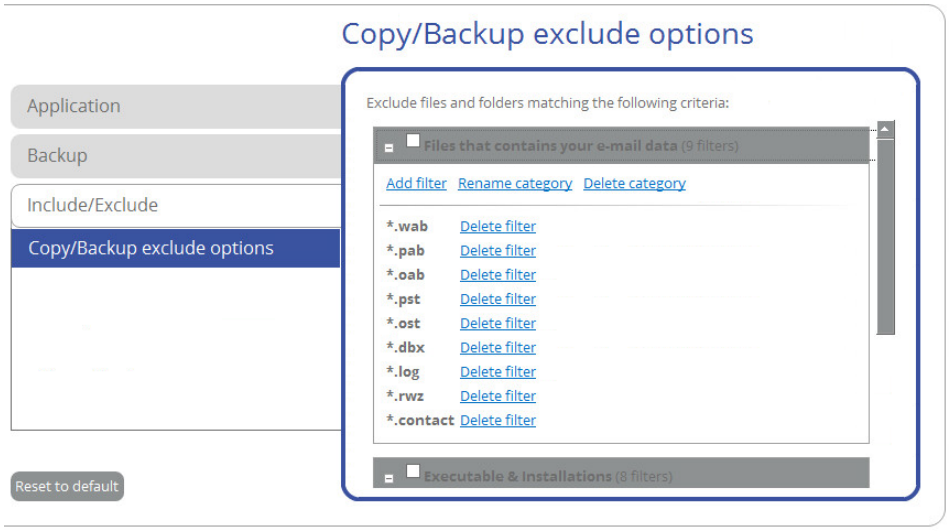
VD Container Options



- **Unknown partitions policy**. Here you can define behavior for processing unknown or unformatted partitions (skip from backup, process in the sector-by-sector mode, or ask the user each time this type of partition has been found).
- **Virtual container type**. By default, the program is configured to back up to pVHD (Paragon Virtual Hard Drive). Use this option to switch the resulted virtual container to VHD, VHDX, or VMDK. Please note that the use of pVHD enables to get full backup images several times smaller than the original objects, while incremental updates – dozens of times smaller when comparing to VHD, VHDX or VMDK, which have some fixed size of blocks, not dynamic. Besides encryption and password protection are only available for pVHD. However, if you're having a VMware or Microsoft hypervisor at your disposal and are planning to do instant virtualization, please make sure the used backup format matches your hypervisor.

Include/Exclude Section

Copy Backup Exclude Options



In this section you can choose data to automatically ignore during copy and backup operations. You're allowed to filter certain files or folders by either creating new or using existing masks, thus effectively managing contents of created backup images and partition/hard disk copies.

To create a new filter, use the **Add filter** link inside one of the existing categories.

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In the opened dialog set the following parameters:

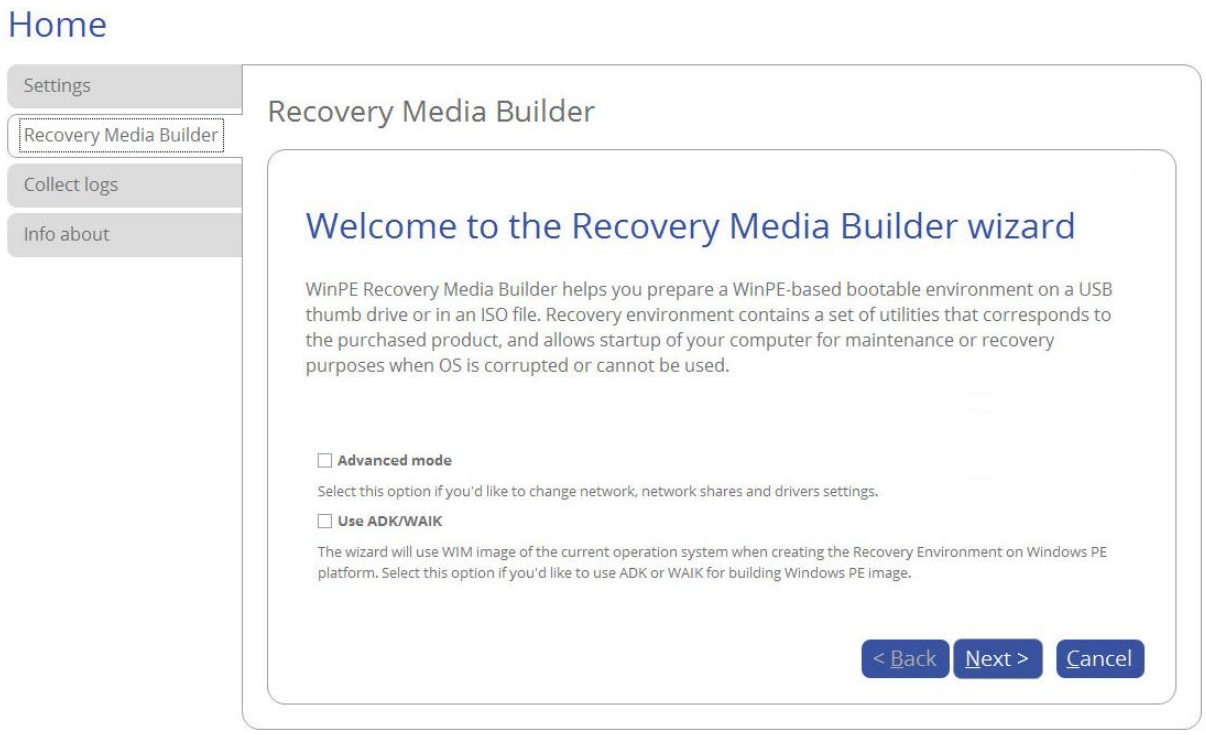
- **Filter**. Click **Browse** to select files or folders you would like to be excluded from processing or specify a filter mask by using * or ? wildcards;
- **Description**. Add a short description to the filter not to miss it up later.

Click **OK** when ready. As a result you will get a new item on the list of filters. By marking/unmarking a checkbox before a category name you can choose whether to use filters it includes or not.

Building Recovery Media

The program includes a user-friendly wizard that will guide you through the process of creating a WinPE-based recovery media on a USB thumb drive or in an ISO file to later burn it to CD/DVD. For advanced users, there are capabilities to add drivers for specific hardware devices, configure network settings, and map network shares in the process.

1. Select **Home** > **Recovery Media Builder**.
2. The welcome page introduces the wizard's functionality. Besides you can see two options here:



- **Advanced mode**. Please mark this option if you'd like the future bootable media to have pre-configured network settings, mapped network resources, or injected drivers for specific storage controllers or network cards.
- **Use ADK/WAIK**. Recovery Media Builder doesn't require Windows Assessment and Deployment Kit (ADK) or Automated Installation Kit (WAIK) to be installed in the system to build a WinPE-based environment, as it can directly use WIM image inside the operating system. However, some system builders remove this image from preinstalled Windows OS. If this is your case, mark the option to use **ADK/WAIK**. You will also need it to create an ISO image of the WinPE environment.

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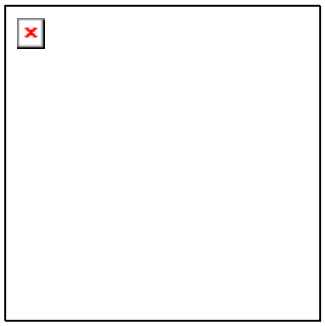
WAIK/ADK is a Microsoft's proprietary tool and can be obtained from its Download Center for free. Please note that you need a genuine Windows installation to be able to download this tool. Moreover you will need to download a version, which is suitable for your Windows OS – Recovery Media Builder automatically detects your system and offers the required download link.

3. Click on **Removable flash media**, then select a thumb drive of at least 512MB in size from the list of flash memory devices available in the system at the moment (if several). If you'd like to create an ISO image of the WinPE environment, please use the corresponding option.

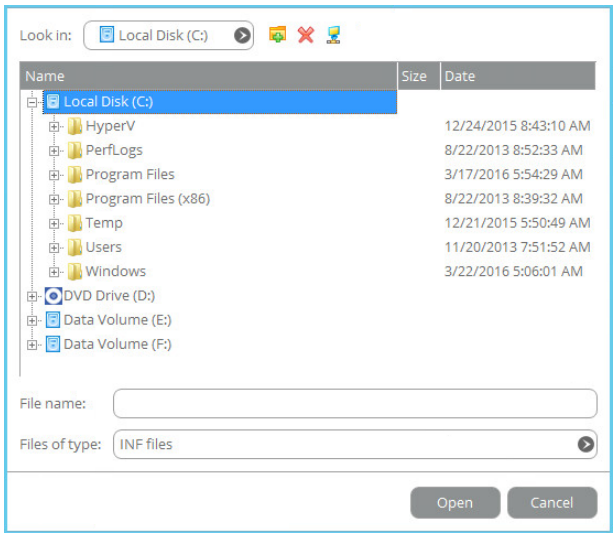


4. If selecting a thumb drive, the wizard will warn you that all data on it will be deleted.

Additional steps of the advanced mode

5. Inject additional drivers for specific storage controllers, network cards, or other devices. First click on the required link.

In the opened dialog browse for an .INF file of the required driver package located on a floppy disk, local disk, CD/DVD or a network share.



If successfully injected, you can see the specified driver on the list. If you'd like to add another driver, please repeat the procedure.

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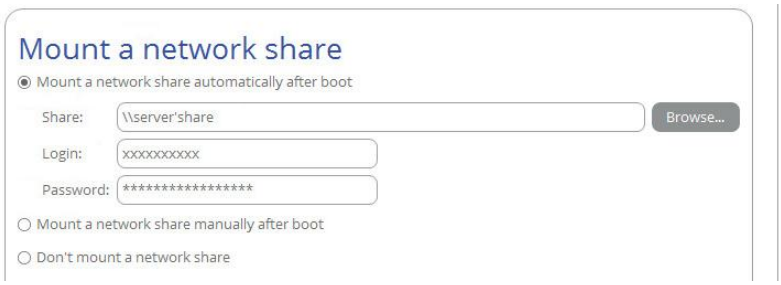
Recovery Media Builder can build 32-bit WinPE media configured to the uEFI mode, which is the only type compatible with Windows pads running on Intel Atom.

By default, WinPE environment doesn't support touch screens, thus Windows pads can only be managed by mouse and/or keyboard. You can add required drivers however through our driver injector.

6. Set up a network connection if needed. You've got several options to choose from:

- **Connect to network automatically**... Specify the following parameters if you'd like to have an active network connection once the bootable environment has been started up:
  - **A network adapter to use**. Select a network adapter (if several in the system) to be used for the network connection.
  - **IP address settings.** Choose whether to get an IP address automatically from a DHCP server or set it manually.
- **Connect to network manually**... If selecting this option you will be prompted to configure network properties each time the computer has been started up from the bootable media.
- **Skip network adjustment**. Please use this option if you don't need network support on the bootable media.

7. Map a network share if needed (not be available if selecting **Skip network adjustment** on the previous step). You've got several options to choose from:



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- **Mount a network share automatically**... Mark this option if you'd like to have a mapped network resource once the computer has been started up from the bootable media. Manually type in a path to the required network share or click **Browse** to find it, then provide user credentials if necessary.

With no pre-defined user credentials your network share will be attempted to map under the Guest account.

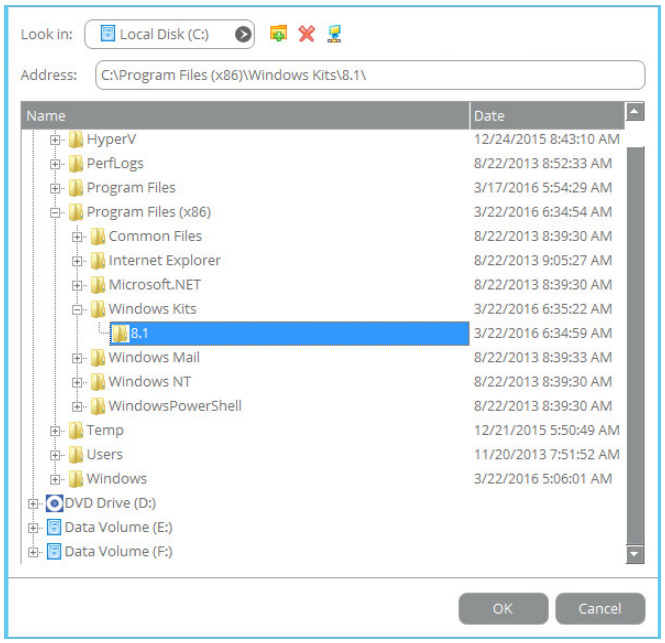
Please use back slashes for WinPE-based media, like \\server\share, while for Linux – forward slashes, like //server/share.

- **Mount a network share manually**... If selecting this option you will be prompted to map a network resource each time the computer has been started up from the bootable media.
- **Don't mount a network share**. Please use this option if you don't need to map network resources.

Additional steps if using WAIK/ADK

8. If you install WAIK or ADK by their default locations, the wizard automatically detects it. Otherwise, you will need to browse for the required folder. If you haven't installed one of these tools yet, click **Download WAIK/ADK** to get them directly from the Microsoft website.

Manually browsing for Windows OS kits:



The wizard won't continue until you install WAIK or ADK.

If running RMB under Windows 7, 8, 8.1, Server 2008 R2, Server 2012 R1/R2, please use ADK 8.1.

9. When done with all parameters, please confirm the operation to proceed.

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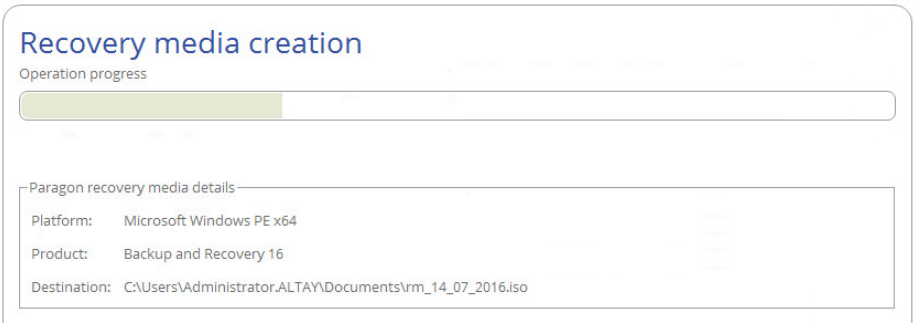
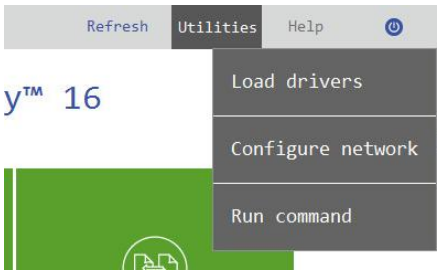


Booting from Recovery Media

The recovery media helps to boot your PC to load in an existing backup, secure important data, or rectify booting errors when Windows OS fails to start up.

1. Start up the computer from the prepared recovery media. To automatically boot from it you should configure the on-board BIOS to start up from CD/USB first.
2. Once loaded, you will see the already familiar **X-View** menu. The recovery environment shares the same interface with the Windows version, so please consult **First Start** for more details.

3. Additionally to the Windows wizards and dialogs, the recovery media includes several more utilities.



For more details, please consult the following chapters:

- **Fixing Boot Problems**
- **Adding Specific Drivers**
- **Configuring Network**

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- Using the Command Prompt

4. Select an operation to start. If you have questions on how to use the program, please refer to the embedded help system, you can find in the right top corner of the window.

Protecting System and Data

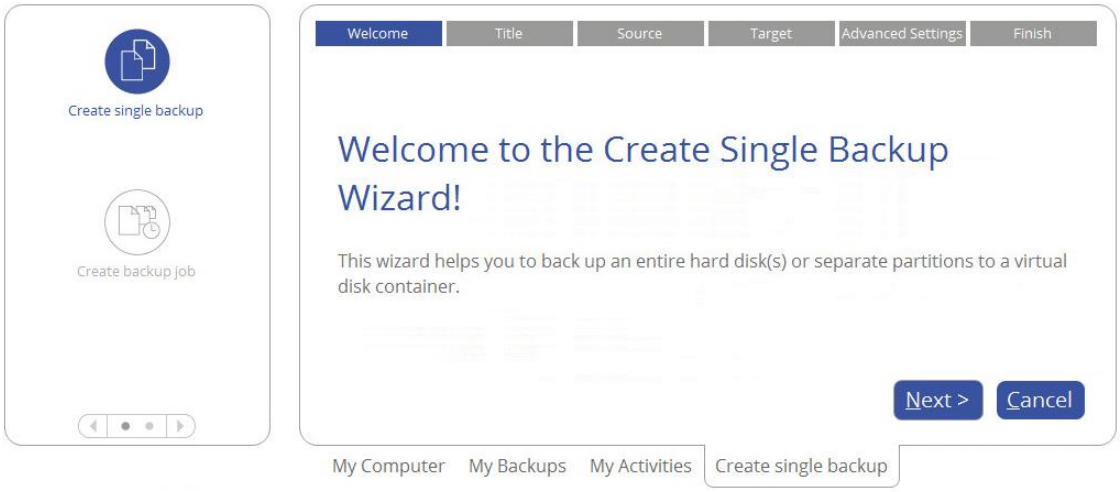
Backup Scenarios

Configuring a One-shot Backup Task

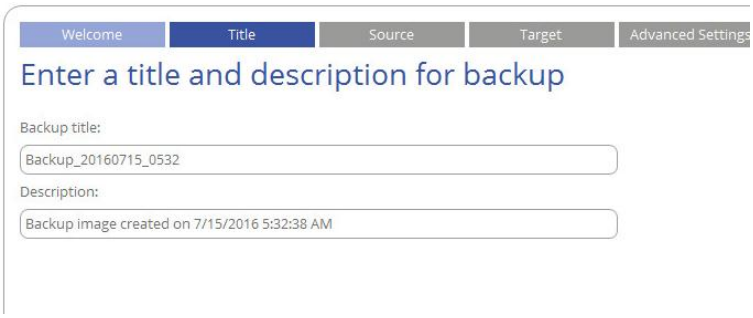
The Create Single Backup Wizard allows you to create a point-in-time full backup image of entire disks, individual volumes or files. Full copies of disks and partitions help to secure your software environment, including the operating system, applications and data. This way, in case of emergency you will be able to recover your system to a working state within several minutes. But what if you need to back up a specific file or folder? Partition-level backup will surely protect the files you want, but it will also back up plenty of data you don't need, eating up time and backup storage. To solve this problem, the program also includes the file-level backup capabilities to protect the needed files like family pictures, favorite music, some project or document, or a financial report you're working on, while avoiding all the rest.

Backup data consistency at a specific point-in-time while OS or applications keep modifying data on disks is achieved by utilizing Microsoft Volume Shadow Copy Service that enables to quiesce a running machine, in other words to freeze its file system and to unlock files to be able to copy them to a backup location.

1. Select **Main View** > **Create a single backup**, then click **Next** on the Welcome page of the wizard.



2. If necessary, edit the default backup name and description containing the current date and time.



3. Initially the wizard prompts you to back up all available storage devices. If you don't need that, select the most suitable option on the left.

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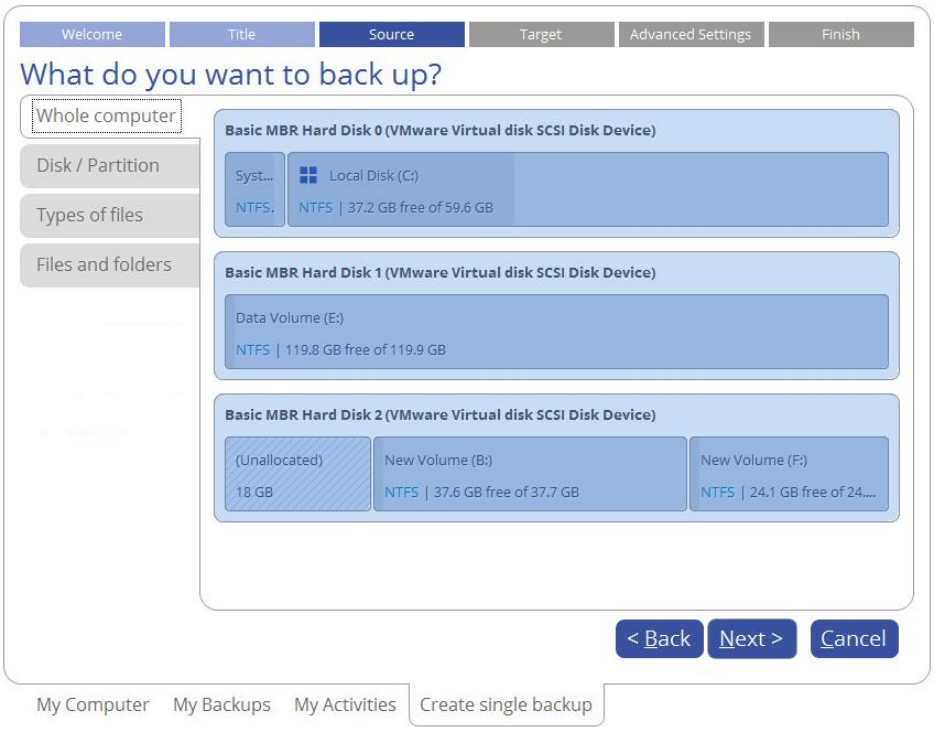
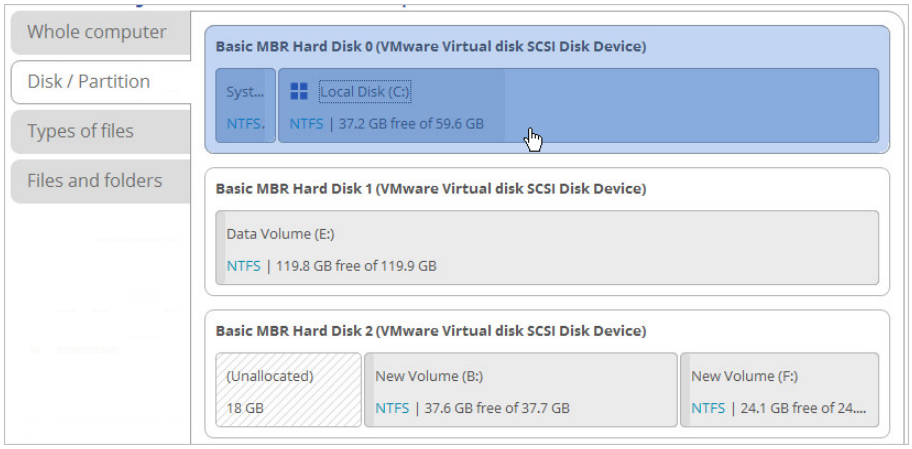
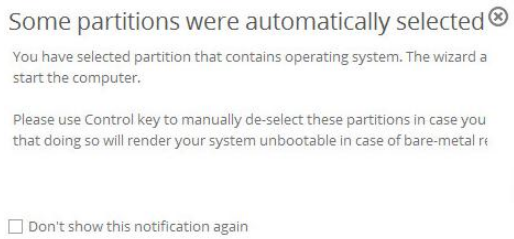


Disk / Partition

Left click an object(s) you'd like to back up.



When selecting a volume that hosts Windows OS you may be warned that the wizard automatically selects another one that contains boot system files to ensure successful startup of the operating system after restore. Though it's not recommended, you can use the Ctrl key to deselect any volume you consider unnecessary.



Types of files

The wizard includes three predefined categories containing file masks for popular document, music, and picture formats. Either select an entire category(ies) or use the arrow icon to expand it and choose a certain file mask(s). If you don't find the required mask, add your own through the **My type filters** option.

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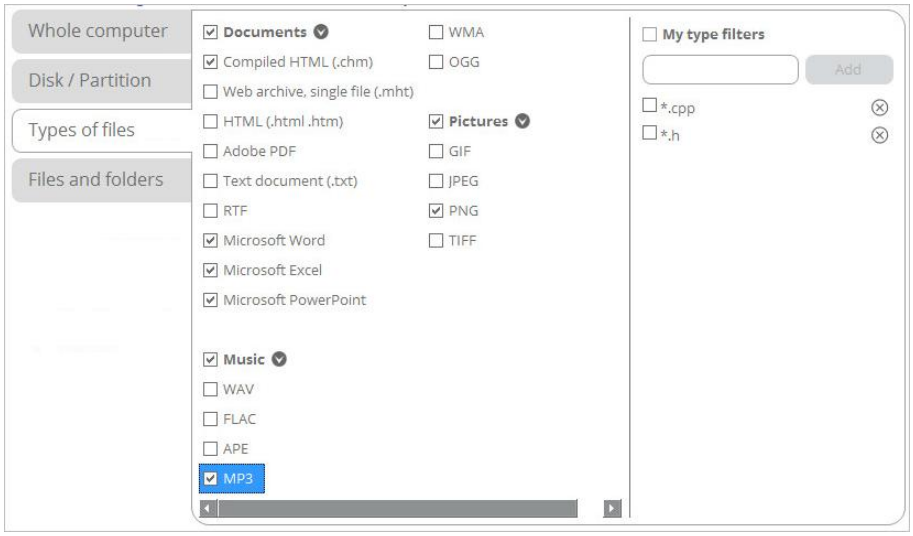
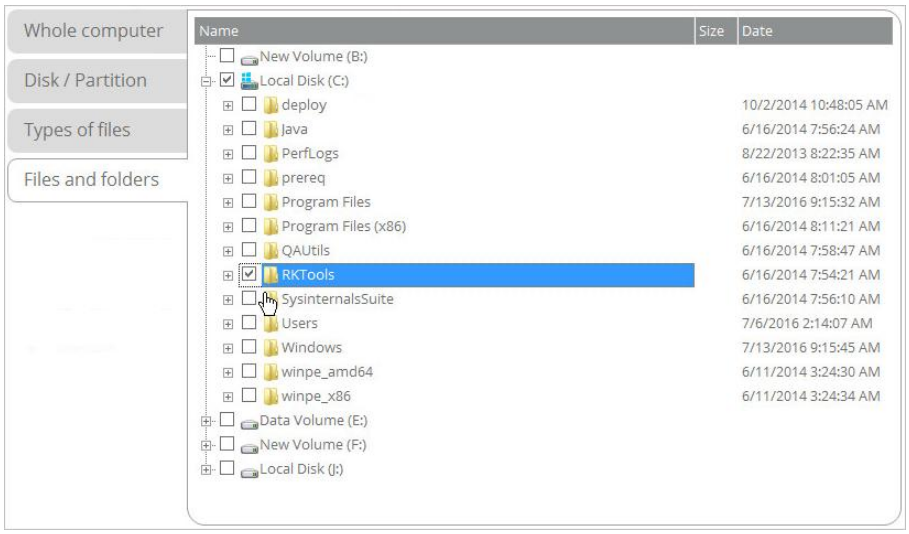


File and folders

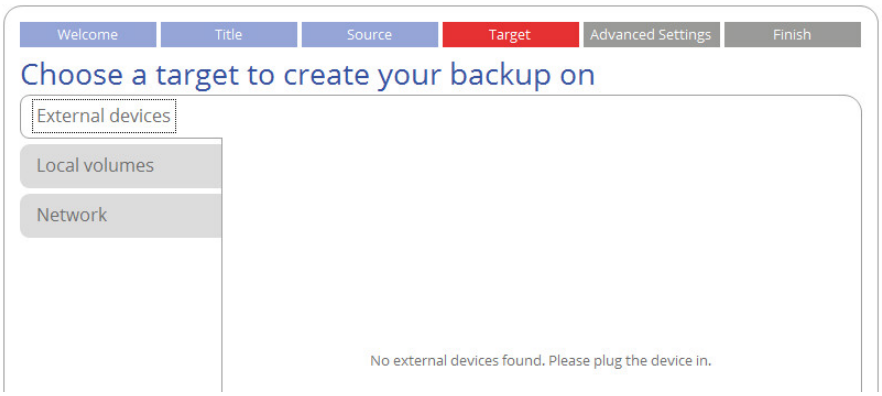
From a list of all partitions available in the system, mark a checkbox opposite a file, folder or even a whole partition to build up contents of the future backup image.



4. Specify location of the resulted backup image.

External devices

If you'd like to save it on an externally connected storage (hard disk, thumb drive, etc.), select **External devices**, then choose it from the list. If it's not present, please make sure it's available in the system, then try again.



Local volumes

If you want to save it locally, select **Local volumes**, then browse to the target folder.

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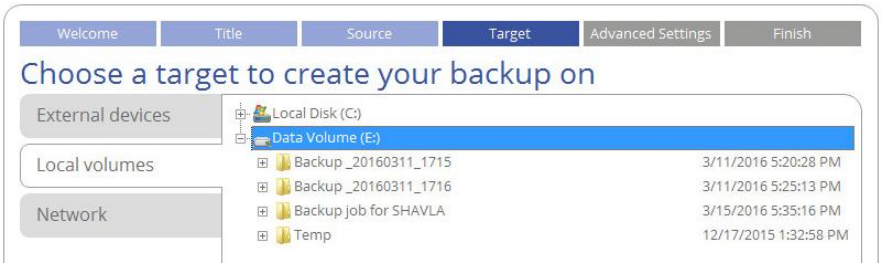
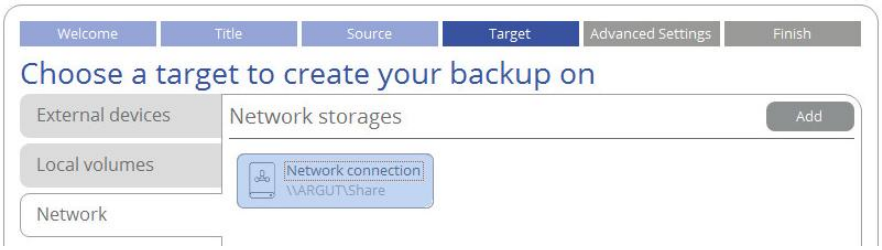
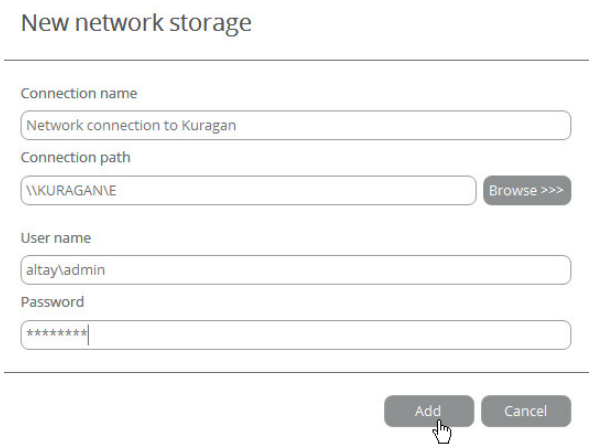


Network

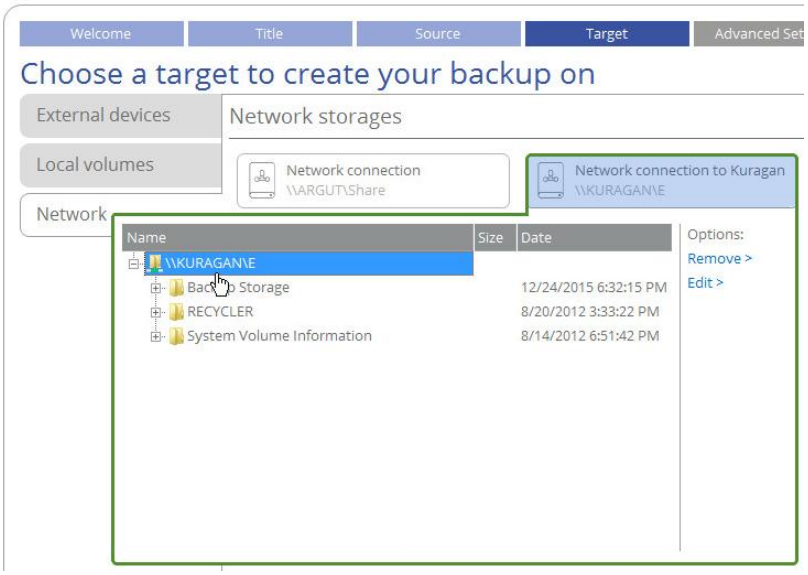
If you're going to save it on a network share, select **Network > Add** to add a network share.



In the opened dialog edit the default connection name if necessary, then specify the required share by manually entering its location or through browsing the network, finally provide access credentials in the corresponding fields.



Once the connection is established, click on it to select and browse its contents. By using the corresponding options on the right you can edit or delete the connection.



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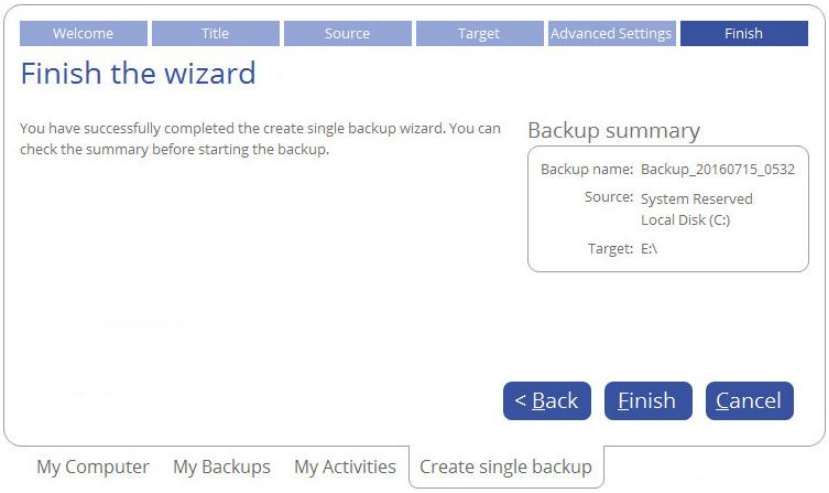
5. If necessary, modify the default backup settings. To make sure you've got a trustworthy fallback position, each backup image is verified for viability immediately after creation. Though it's not recommended, unmark the corresponding option to skip this step and make the backup process a bit faster.

6. Review all parameters of the operation and modify them if necessary by going back to any of the required steps. Click **Finish** to start the backup process.



Creating an Incremental Update

After you get the first full backup image, we recommend you to do incremental updates regularly to keep the backup data up-to-date. An incremental backup only includes data changed since the time of creating the latest image in a chain, so it doesn't include data duplicates, which minimizes the backup storage footprint. Besides, incremental imaging allows having different time stamps of one and the same data.

If you need to regularly update backup data, you'd better use the Create Backup Job Wizard. For more details, please consult Configuring a Regular Backup Routine.

---

1. Select **My Backups > Single backups>>>** to see all configured one-shot backup tasks. Left click a backup image to call a context-sensitive menu, then **Create increment**.

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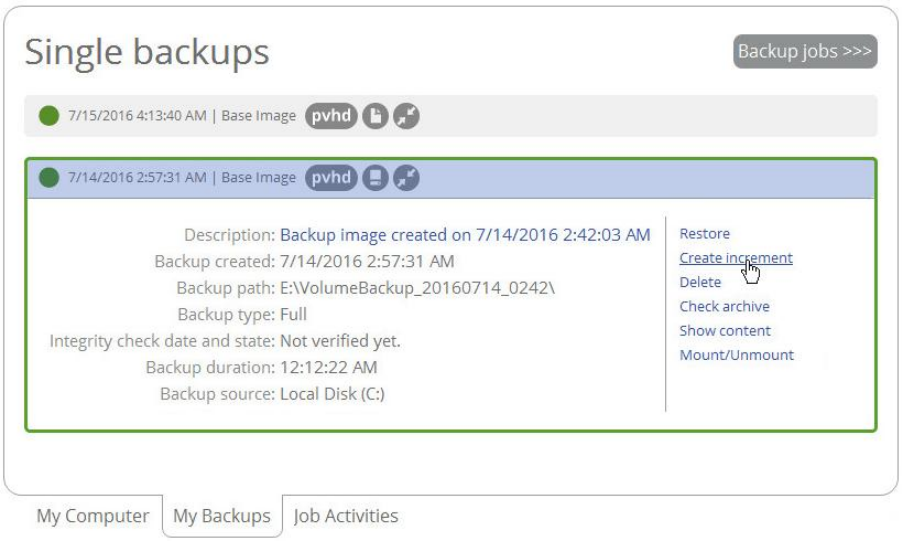
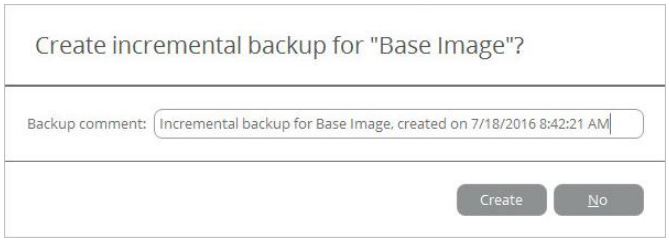


2. Change the default backup name, if necessary. Click **Create** to start the backup process.



Configuring a Regular Backup Routine

If you develop a specific project on a day-to-day basis and have to make a backup every evening so as not to lose the progress of your efforts, backup automation is a must. Besides, the backup automation enables to optimally utilize resources of your PC by scheduling backup tasks during off hours or whenever the computer has the least work-load to perform. Paragon's technicians recommend you to configure regular backup jobs instead of one-short backup tasks to minimize negative aftereffects in case of emergency.

Paragon's technicians recommend you to configure regular backup jobs instead of one-short backup tasks to minimize negative aftereffects in case of emergency. The Create Backup Job Wizard will help in this process. The three predefined backup strategies should fill the needs of any home user. For advances users there's a way to create comprehensive backup policies that utilize full, incremental, and differential backup methods and their combinations, where backup runs can be scheduled from every hour till certain days of the month, or evoked by a certain event (system start or user logon).

1. Select **Main View** > **Create backup job**, then click **Next** on the Welcome page of the wizard.

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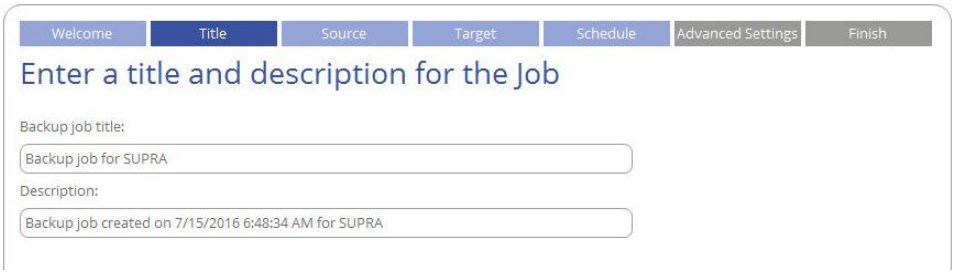
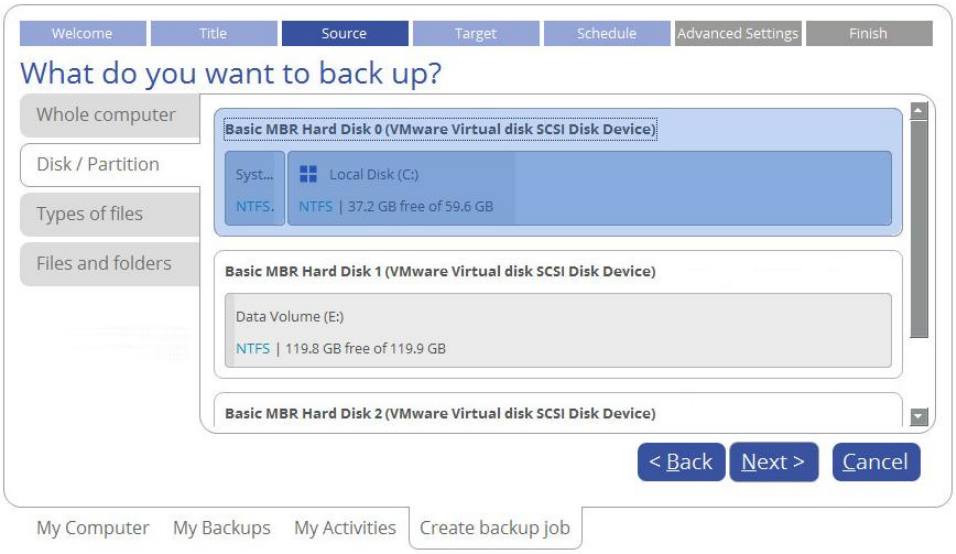
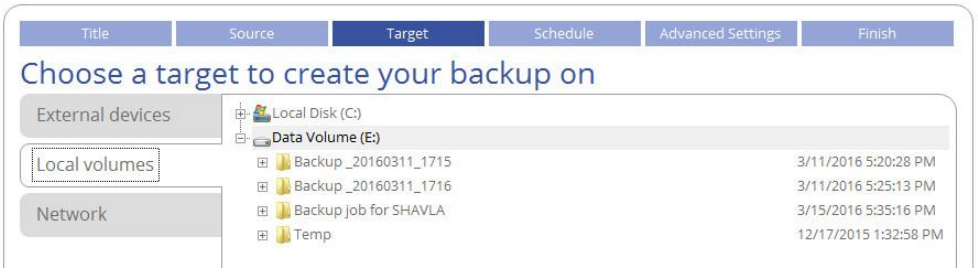
2. If necessary, edit the default backup name and description containing the current date and time.



3. Initially the wizard prompts you to back up all available storage devices. If you don't need that, select the most suitable option on the left, then required objects. For more details, please consult the previous scenario.



4. Specify location of future backup images (local or external storage, or a network share). For more details, please consult the previous scenario.



5. Select one the predefined backup strategies recommended by Paragon's technicians, then adjust it to your needs.

In the current version of the product you're not allowed to modify all parameters of the selected backup strategy during configuration of a backup job. However, you can do it later when editing. For more details, please consult Managing Backup Jobs.

Daily Backup

The daily backup is a necessity when it comes to protecting valuable information that keeps changing constantly, for example some project or document, or a financial report you're working on every day. The main rule here is the more valuable the data, the more frequent backups are required. For production environments like SQL Server or Exchange Server, where multiple transactions occur every second, the

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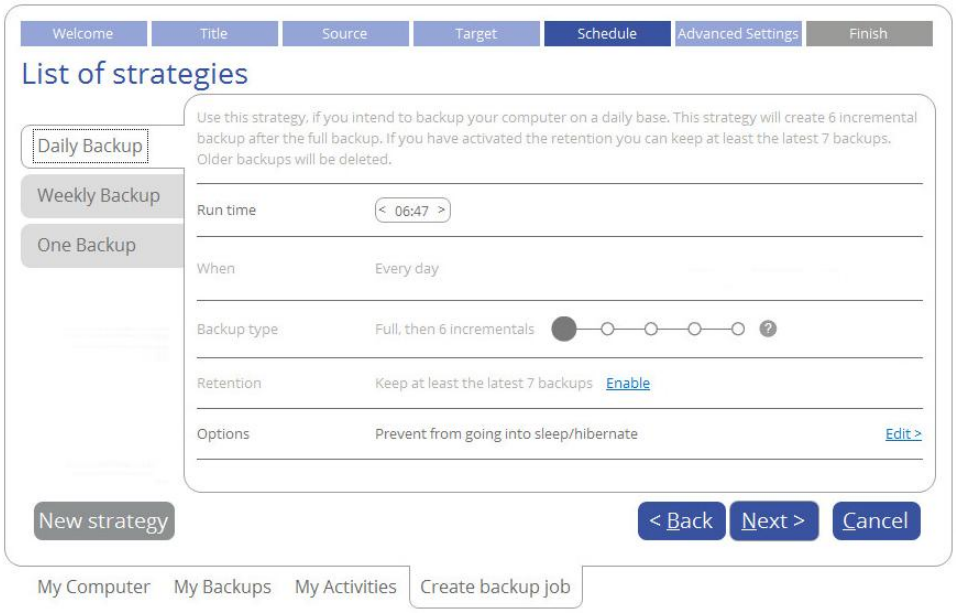
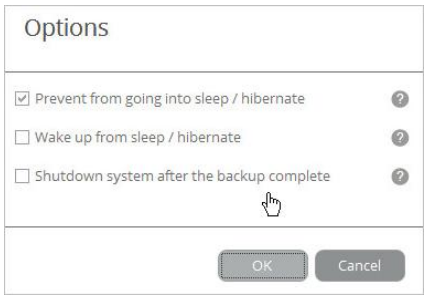
optimal interval between backups is about 30 minutes. By reducing it even further you risk to heavily overload the entire infrastructure. For home users it is the daily backup that is considered optimal.



- The main parameter you need to set is time you believe most convenient for backup, e.g. at night or early in the morning.
- To keep data precisely up to date with minimal time and backup storage footprint, we recommend a seven-day backup cycle of one full backup image followed by six incremental updates. To avoid the situation when backup data eats up the entire storage space, we also suggest enabling a retention policy that will only keep seven latest restore points.
- Finally, there are several auxiliary options you can use to tune up the backup job. Click **Edit >** to see them and adjust. Use the exclamation mark next to the required option to get more details.



Weekly Backup

As you guess, the weekly backup comes into play when your data is not changed very often. Obviously, there's no need to back up your music collection on a daily basis, as in most cases losing the latest album won't be a huge disaster. Thus we recommend this backup strategy for protecting non-critical data when rollback to a state that took place a week ago works fine for you.

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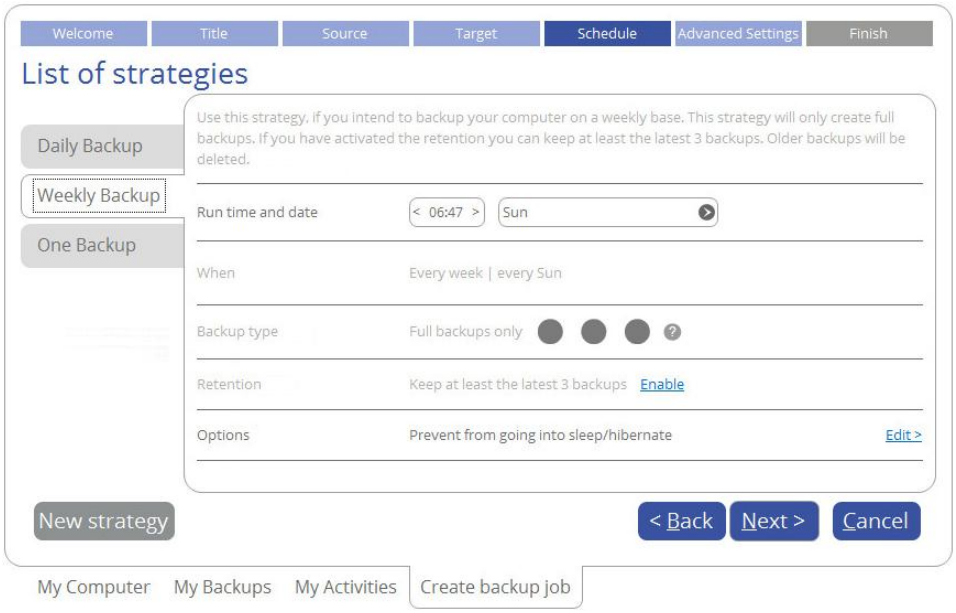
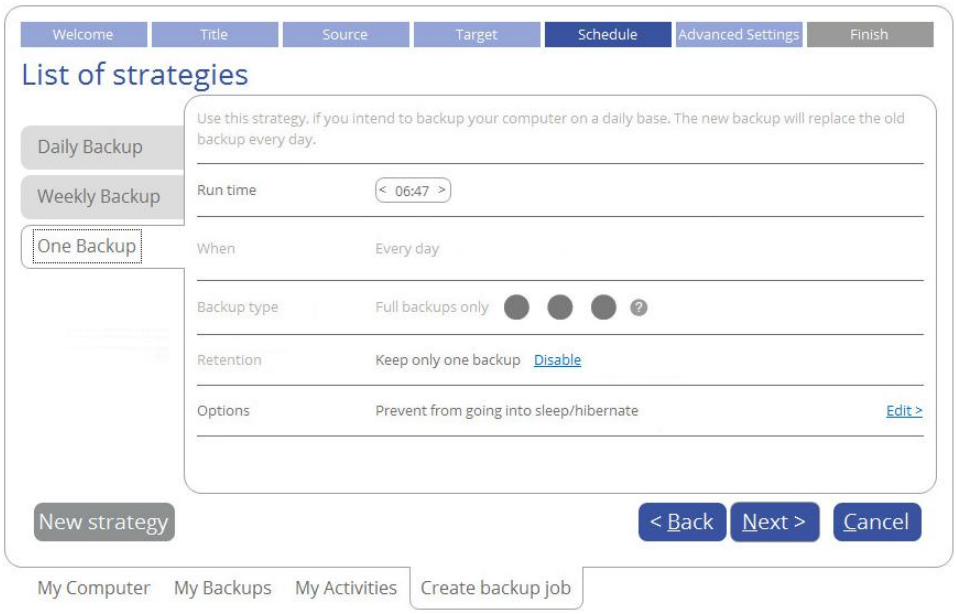


- The main parameters you need to set is time and day of week you believe most convenient for backup, e.g. at Sunday nights.
- We consider the use of the incremental imaging on a weekly basis not optimal, as the amount of data changes may be so huge, so it can nullify primary benefits of this backup method, i.e. small backup times and image files. Furthermore, restore from this incremental chain may be time-consuming. Thus we recommend it to create full backup images only. To avoid the situation when backup data eats up the entire storage space, we also suggest enabling a retention policy that will only keep three latest restore points.
- Finally, there are several auxiliary options you can use to tune up the backup job. Click **Edit >** to see them and adjust. Use the exclamation mark next to the required option to get more details.

One Backup

This backup strategy is daily-based, but only produces and keeps one full backup image on the storage. We suggest using it if you don't need to have several restore points that reflect various time stamps of your data and prefer an external storage device as backup media.



- The main parameter you need to set is time you believe most convenient for backup.
- To avoid the situation when backup data eats up the entire storage space, we also suggest enabling a retention policy that will only keep the latest restore point.

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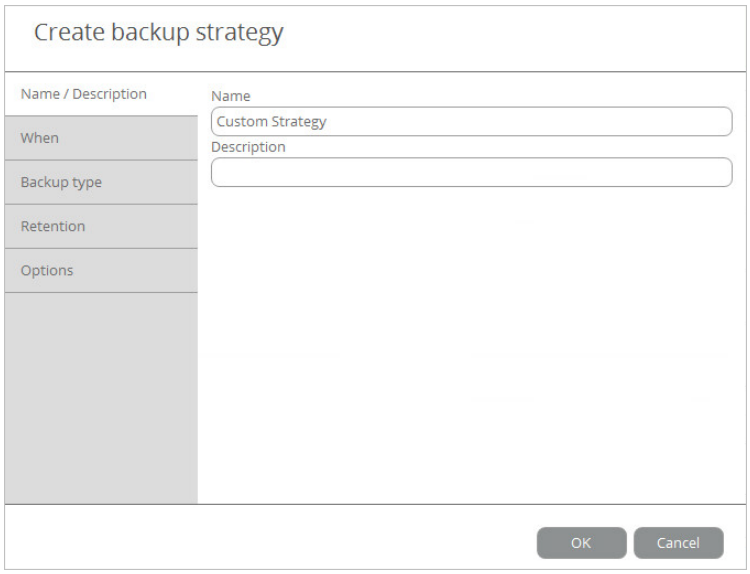
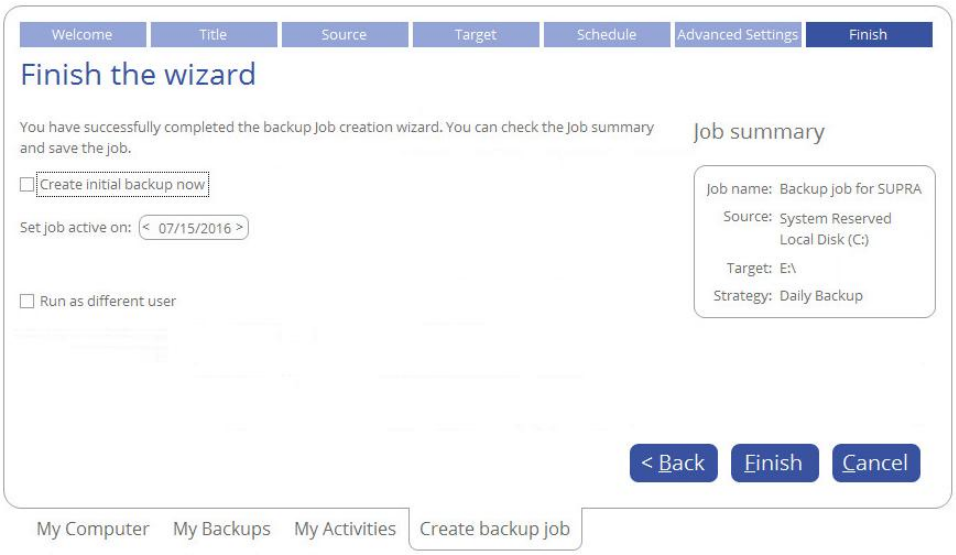
New strategy

Click **New strategy** to create your own backup policy that utilizes full, incremental, and differential backup methods and their combinations, where backup runs can be scheduled from every hour till certain days of the month, or evoked by a certain event (system start, user logon). For more details, please consult **Managing Backup Jobs**.



6. If necessary, modify the default backup settings. To make sure you've got a trustworthy fallback position, each backup image is verified for viability immediately after creation. Though it's not recommended, unmark the corresponding option to skip this step and make the backup process a bit faster.

7. Review all parameters of the operation and modify them if necessary by going back to any of the previous steps. When ready, click **Finish** to complete the wizard.



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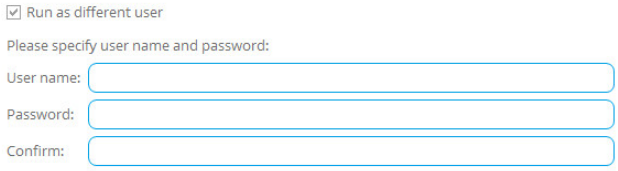
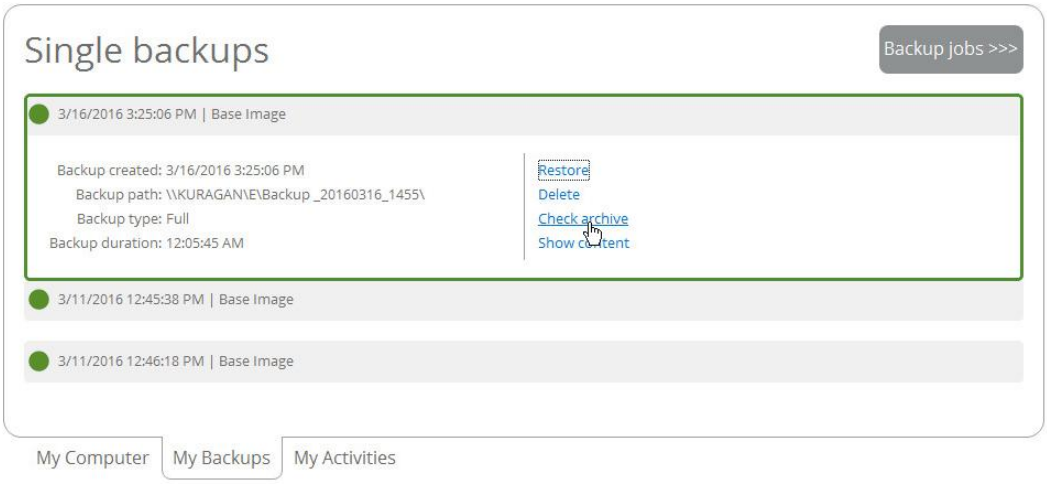
- If you'd like to force creation of the first backup image after completing the wizard, mark the **Create initial backup now** option.
- To allow the scheduled backup tasks while a non-admin user is logged in, specify administrative credentials by marking the corresponding option.



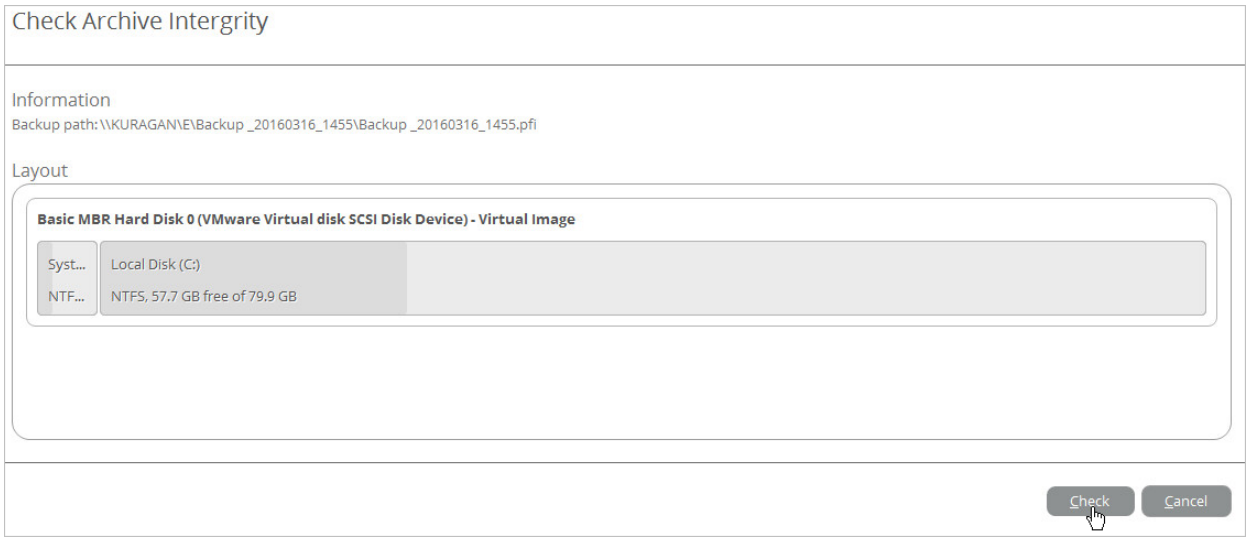
Checking Backup Integrity

Unfortunately, backup media may fail at any moment. You can't predict when this will happen, but you can be certain it will. We suggest verifying integrity of backup images on a regular basis to make sure of their ongoing viability.

1. Select **My Backups > Single backups>>>** to see all configured one-shot backup tasks or **My Backups > Backup jobs>>>** to see configured regular backup routines. Left click a backup image to call a context-sensitive menu, then **Check archive**.



2. In the opened dialog you can see contents of the selected backup image. Click **Check** to start the operation, which takes a couple of minutes.



Only pVHD-type containers are available to check at the moment.

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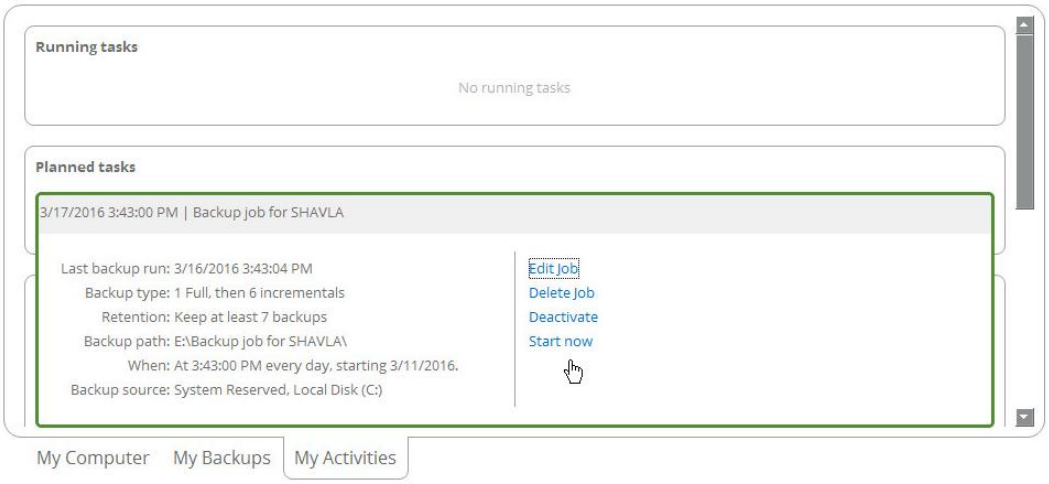
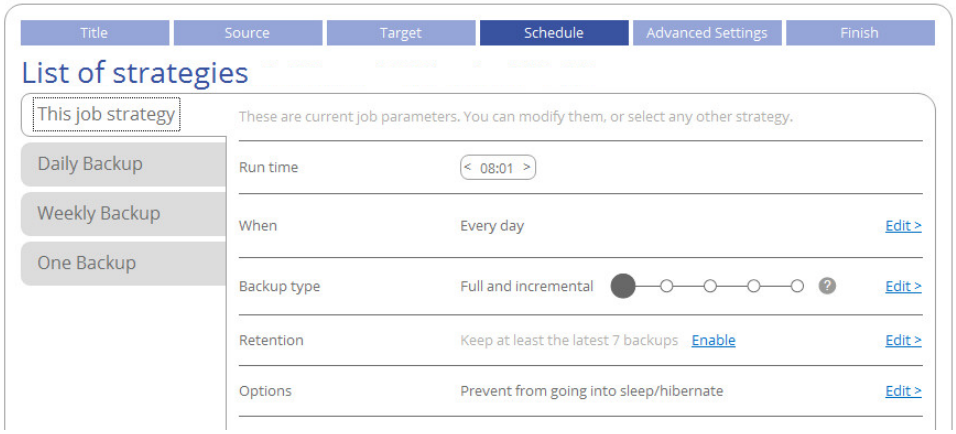
Managing Backup Jobs

1. Select **My Activities**, then left click any of the planned backup jobs to call a context-sensitive menu with detailed information on the selected object and a list of available operations.

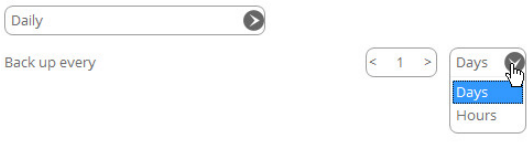


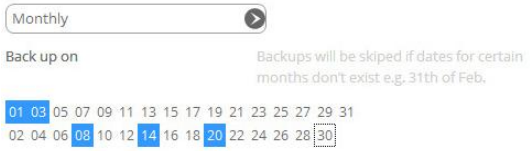
2. Select the required operation from the list:

- **Edit Job**. While being able to only specify the basic parameters during creation of the backup job, right now you're allowed to change every single option of the specified backup strategy by using the **Edit>** link.

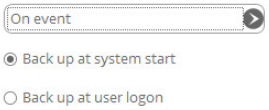


- **When**. Backup runs can be scheduled from every hour till certain days of the month.





Furthermore, you can choose a certain backup trigger event (system start or user logon). If necessary, you can also disable the schedule.



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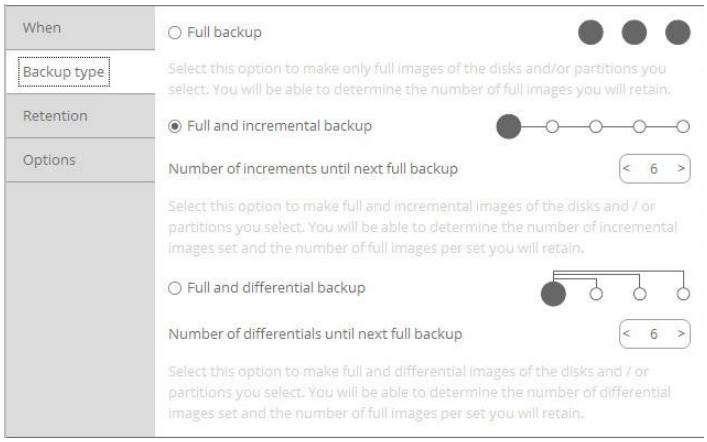
- **Backup Type**. The program supports full, incremental and differential sector-level backup imaging and their combinations, which opens a way to create comprehensive backup policies to suit your needs at best. Below you can find some details on each backup type to help you make the right choice.



A full backup image includes all contents of the specified backup objects (all system hard disks, one or several partitions or disks) at the moment of its creation. If you roll back your system to the initial state on a regular basis, that's exactly what you're looking for. But if you want to have multiple time stamps of the same data, unchanged data will inevitable be duplicated in all images, thus taking additional space on backup media.

As an attempt to solve this problem, there has been developed a supplementary method called a differential backup. Containing only data changed since the time of creating a full or parental backup image it enables to considerably save your system resources. It is achieved by the exact bit-wise comparison of the previous data (saved in the parental image) with the current data (the backup object itself). Unfortunately, this type of backup doesn't help to avoid data duplicates inside several differentials based on one parental image. Thus if you're planning to keep two or more restore points, take a closer look at the incremental imaging.

Unlike differentials, an incremental backup only includes data changed since the time of creating the latest image in a chain, either full or incremental. In general, this type of backup is great except for one thing – restore of an incremental backup requires processing the initial full image and all increments between, which depending on the size of your backup chain may take plenty of time, while restore of a differential backup always involves two objects – one differential and its parental.

- **Retention**. To avoid the situation when backup data eats up the entire storage space, we also suggest enabling a retention policy to automatically get rid of obsolete restore points.

You can choose from the three data retention policies:

  - Keep a certain number of backup images,
  - Keep all backup images created during a certain number of days,
  - Delete an entire backup chain when the storage runs out of space.

- **Delete Job** to delete the backup job.
- **Deactivate** to stop the ongoing backup operation.

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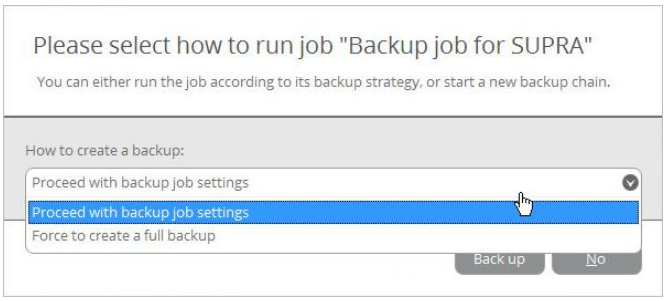
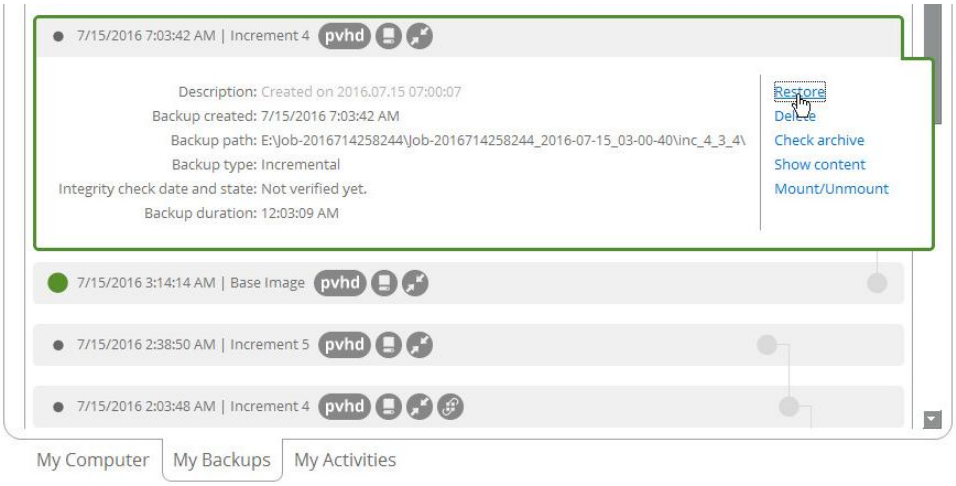
- **Start now** to force creation of the next backup image, either incremental or full, which depends on the used backup strategy. By selecting the corresponding option you may force out-of-turn full backup, thus starting a new backup chain.



Windows Restore Scenarios

Restoring Individual Files and Folders

1. Select **My Backups > Single backups>>>** to see all configured one-shot backup tasks or **My Backups > Backup jobs>>>** to see configured regular backup routines. Left click a backup image to call a context-sensitive menu, then **Restore**.



2. Select **Files and Folders**, then browse the backup image to specify what you need to extract by marking checkboxes next to the required data items.

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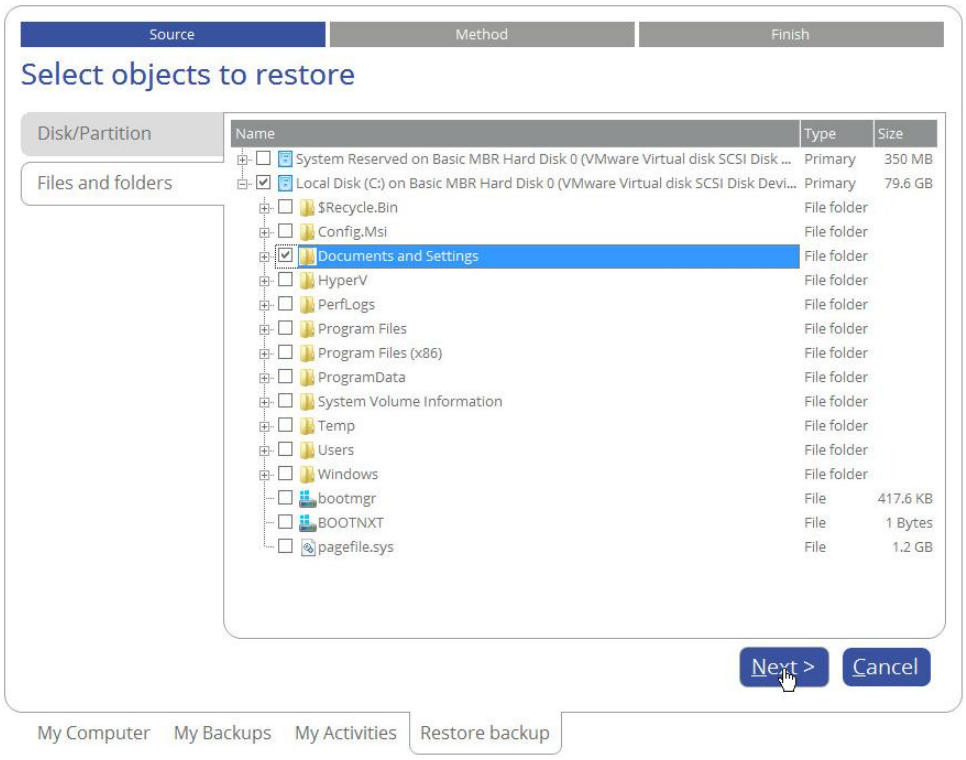
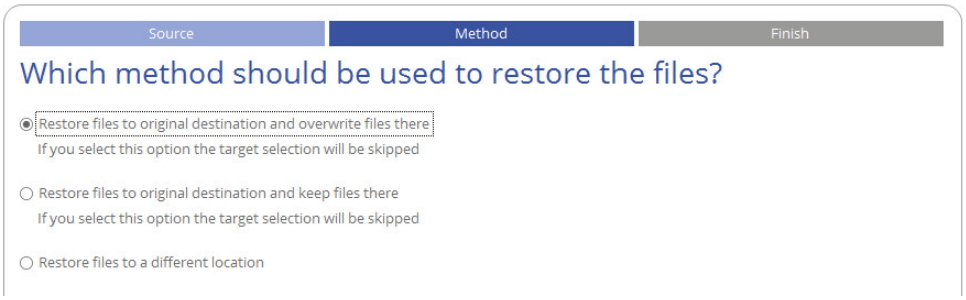


3. Choose a way the selected data will be restored, either to original location by replacing files with identical names, to original location non-destructively, thus keeping two versions of files with the same names, or to a different location. The latter option requires setting a restore path.



4. Choose whether to execute the operation immediately after finishing the wizard, set up another restore operation(s) and then run all at once, or generate a program script for later execution. Click **Finish** to initiate the operation.

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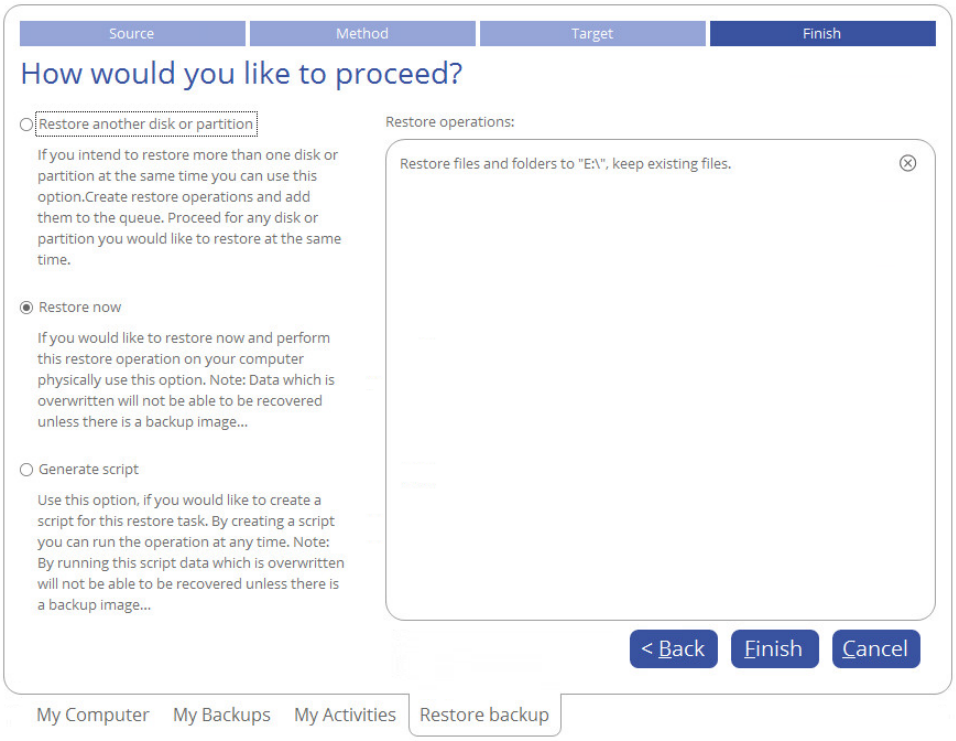
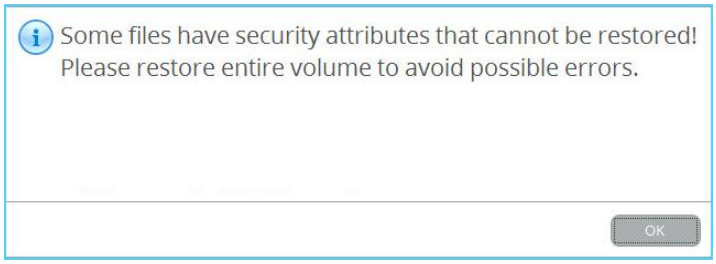
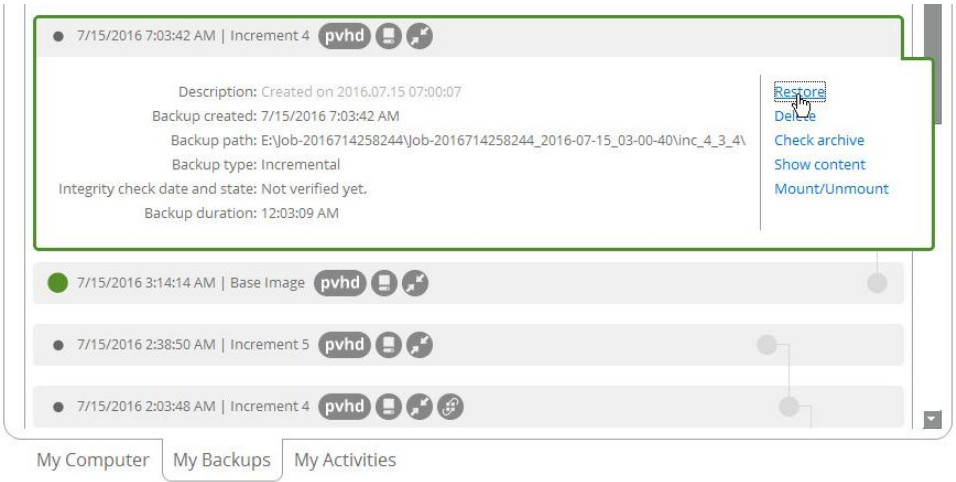


If selecting files with security attributes that cannot be restored at file-level correctly, the wizard will prompt you to restore the corresponding volume entirely.



Restoring an Entire Disk or Separate Volumes

1. Select **My Backups > Single backups>>>** to see all configured one-shot backup tasks or **My Backups > Backup jobs>>>** to see configured regular backup routines. Left click a backup image to call a context-sensitive menu, then **Restore**.



2. Initially the wizard prompts you to specify an entire backup image or individual volumes or disks for restore – that's exactly what we need.

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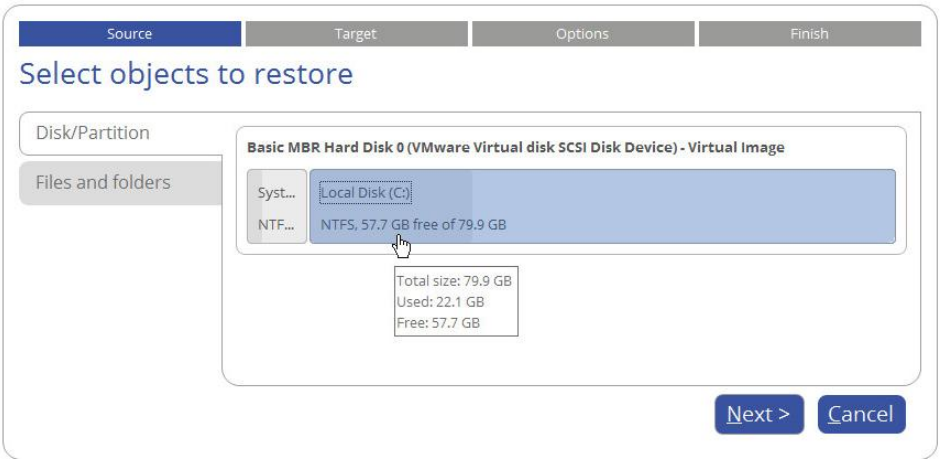
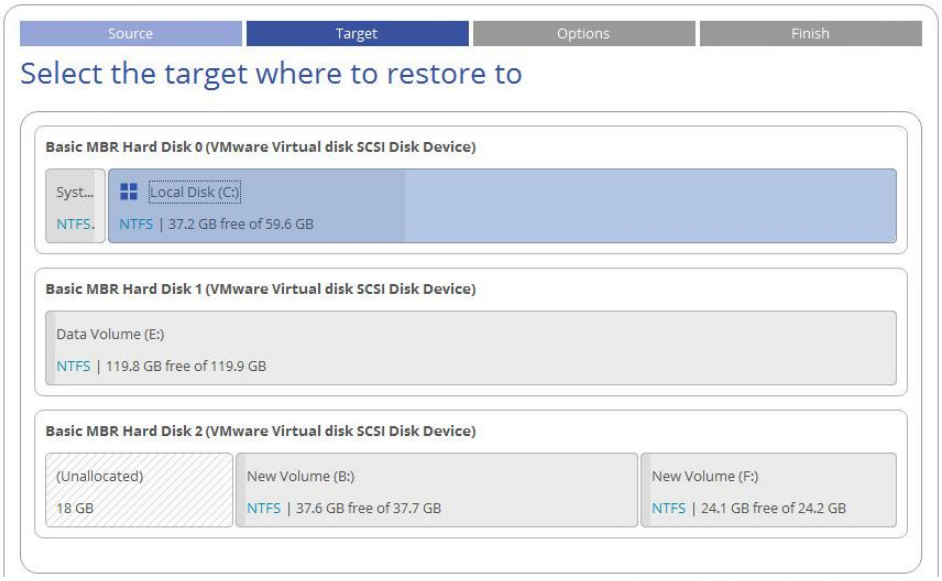


3. The program offers to restore the selected backup object exactly where it belongs. However, you can choose any disk of enough capacity available in your system.



You will get a corresponding warning when trying to rewrite a bootable partition.

4. Next you can see the resulted disk layout. If necessary, specify a number of additional parameters (depends on the selected backup object).

   Restoring a partition

   Change size of the partition and its location as well as assign a particular drive letter. If you've got to do with a 64-bit Windows configured to the uEFI boot mode, the Switch EFI to boot from destination drive option will become available for you to define what instance of Windows OS you'd like to boot from once the operation is over. Anyway you can specify a bootable device at any time through Boot Corrector.

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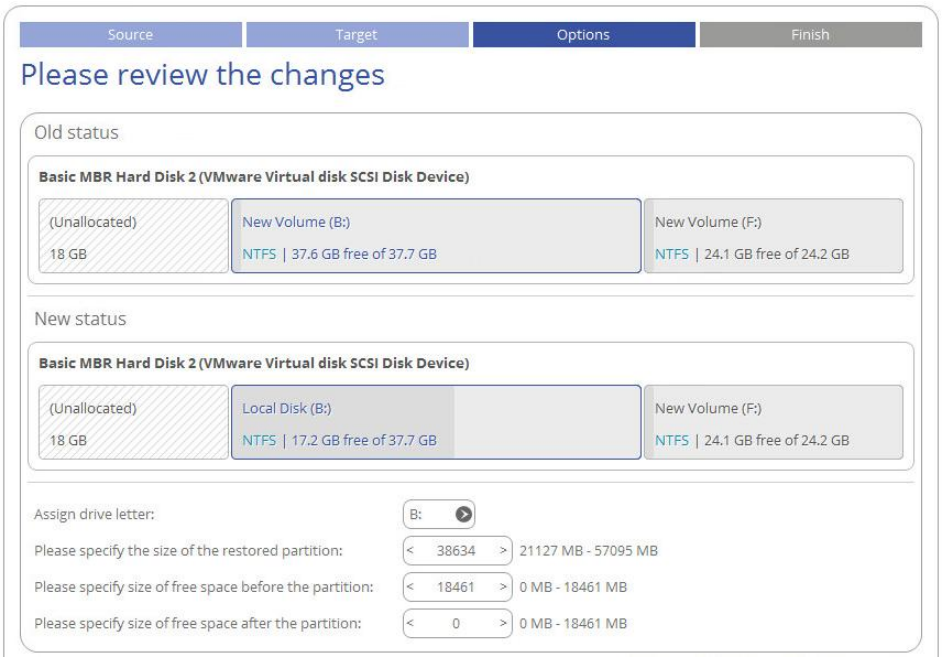
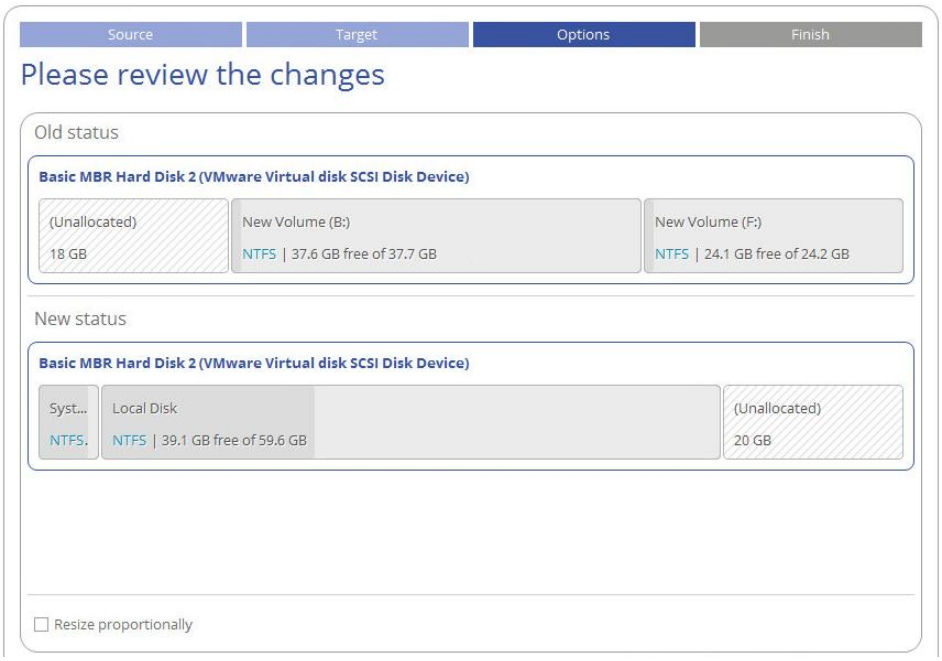


Restoring a disk

If attempting to restore to a larger disk, use the corresponding option to resize on-disk partitions proportionally to occupy the entire target disk.



5. Choose whether to execute the operation immediately after finishing the wizard, set up another restore operation(s) and then run all at once, or generate a program script for later execution. Click **Finish** to initiate the operation.

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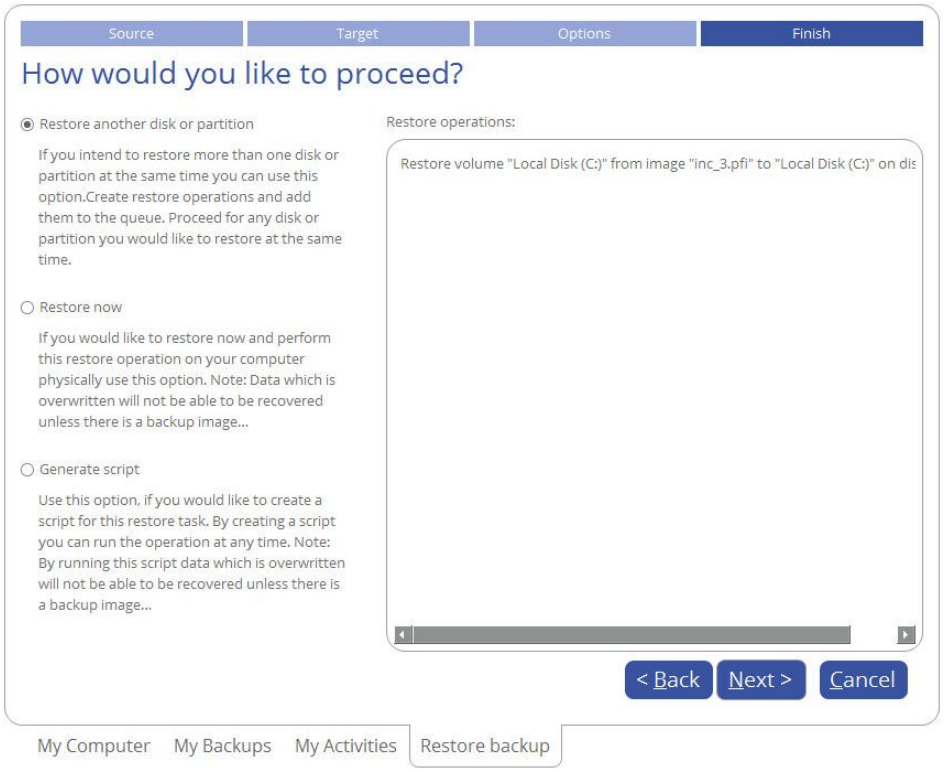

Mounting a Backup Image

You can assign a drive letter to any partition inside an existing backup image. As a result of the operation you will get a new partition in the system to easily browse through its contents and copy the required information even with the standard Windows tools.

Before you start, please read the following limitations:

- Backup partitions will only be mounted for the current session and won't be available after the system restart;
- Backup images containing Windows Storage Spaces are not supported;
- Backup images containing ReFS partitions are not supported;
- Backup images located on physical (unmounted) partitions or in the backup capsule cannot be mounted;
- Backup images containing LVM/LDM volumes are not supported.

1. Select **My Backups > Single backups>>>** to see all configured one-shot backup tasks or **My Backups > Backup jobs>>>** to see configured regular backup routines. Left click a backup image to call a context-sensitive menu, then **Mount/Unmount**.

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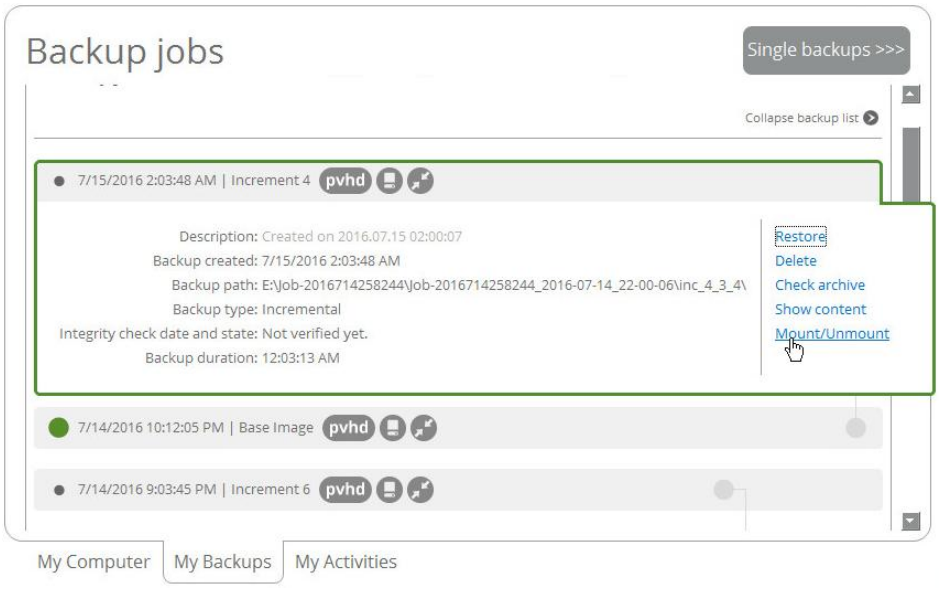
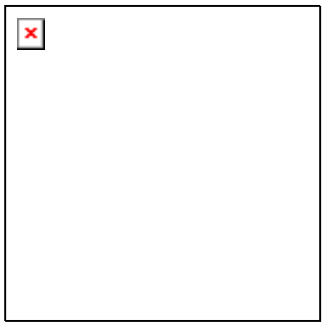
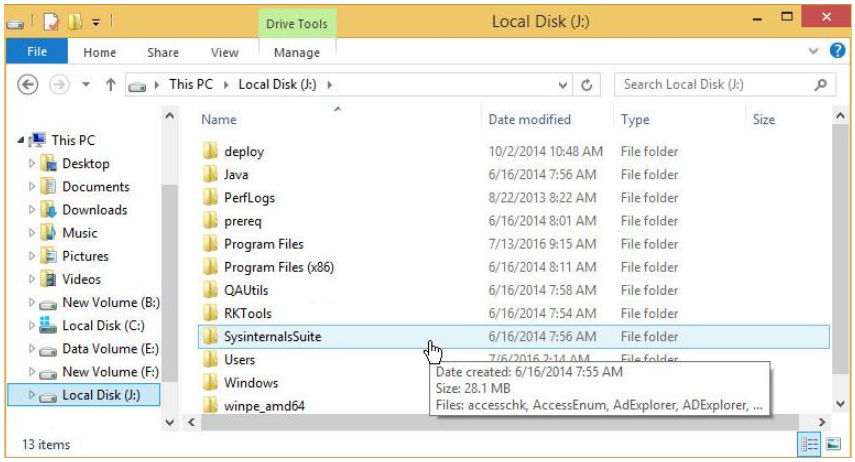


2. In the opened dialog you can see contents of the selected backup image. Select a partition you'd like to mount, then one of the vacant drive letters from the list to associate with the partition. Click **Save** to confirm.



3. Once mounted, you can treat the backup partition as you would any other Windows volume (browse, retrieve files, modify files).



4. Use the same algorithm to unmount the backup image when not required any more.

Transferring Files between Storages

1. Select **Main View** > **Copy files and folders**, then click **Next** on the Welcome page of the wizard.

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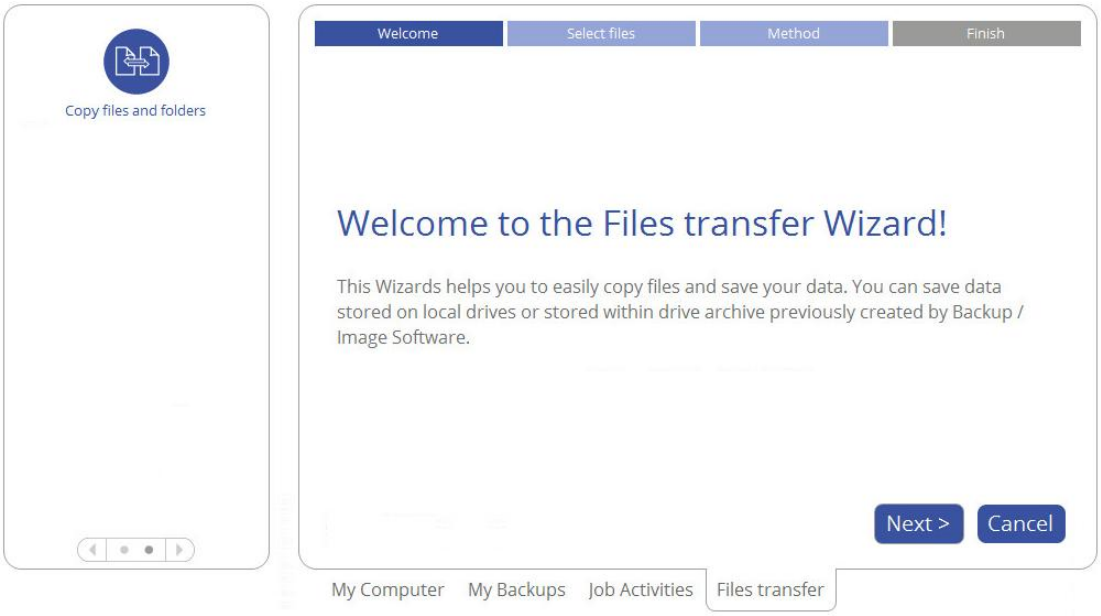
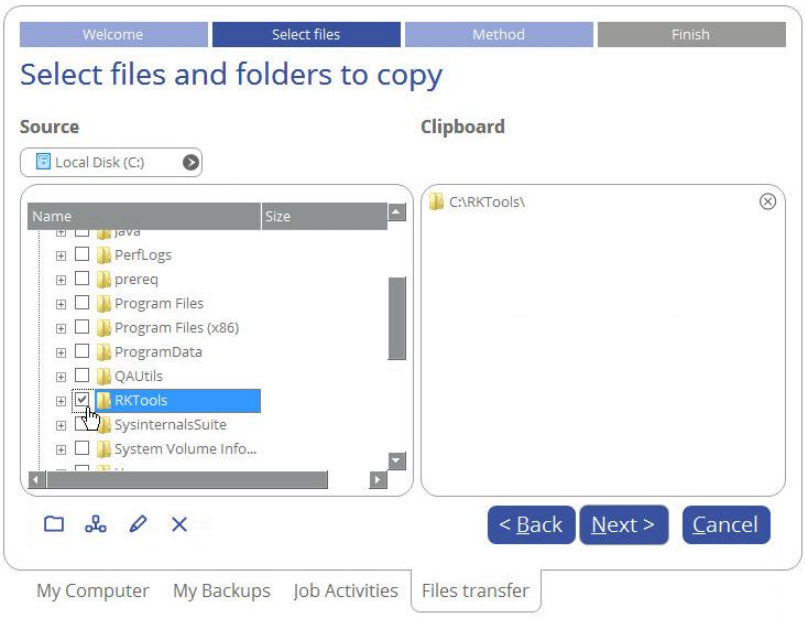


2. Select a source disk, then mark files and directories you want to copy. The wizard enables you to browse both mounted and unmounted (without a drive letter) partitions. It is also possible to map a network drive. All selected files get to the Clipboard.



3. The wizard enables you to copy data to a local or external drive, a network share, a physical partition (without a drive letter), or burn it to a CD/DVD/BD disc. Choose the most suitable option.

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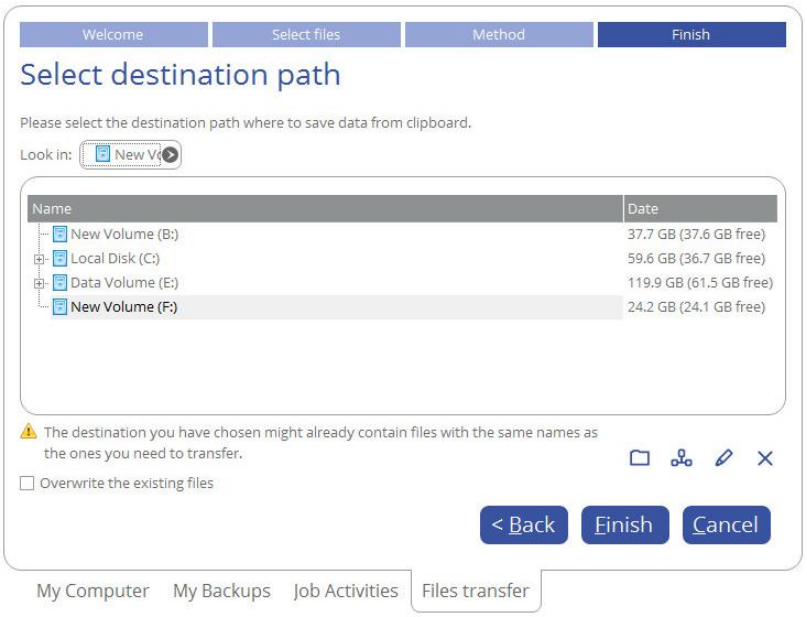
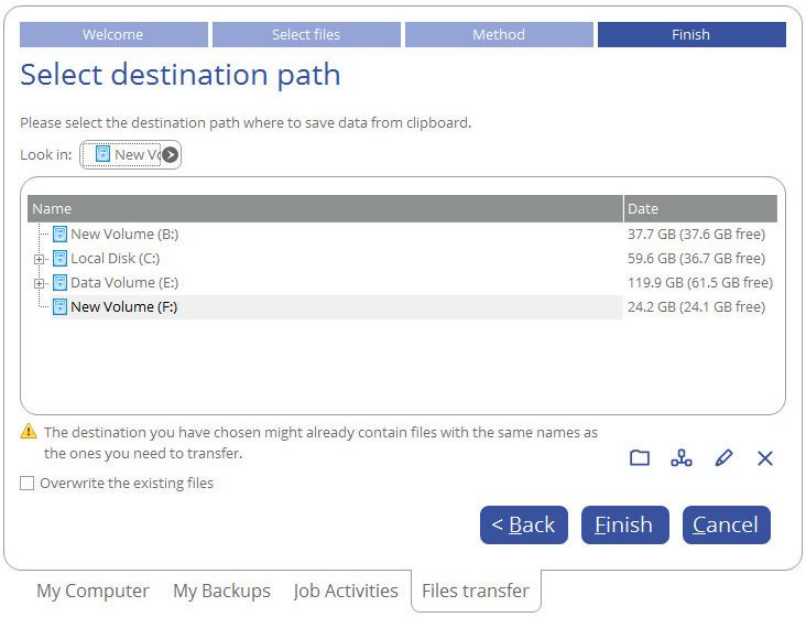


Local/Network

Select a local, external, or network drive to copy the data to. If you'd like to replace files with identical names, mark the corresponding option.



CD/DVD/BD

Select a recorder from the list of available devices and then set a volume label by entering it in the appropriate field.

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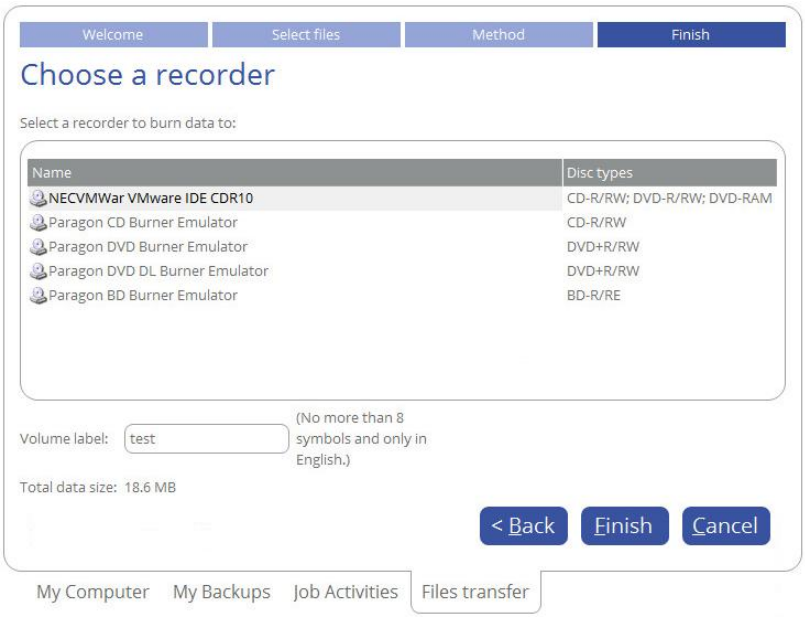


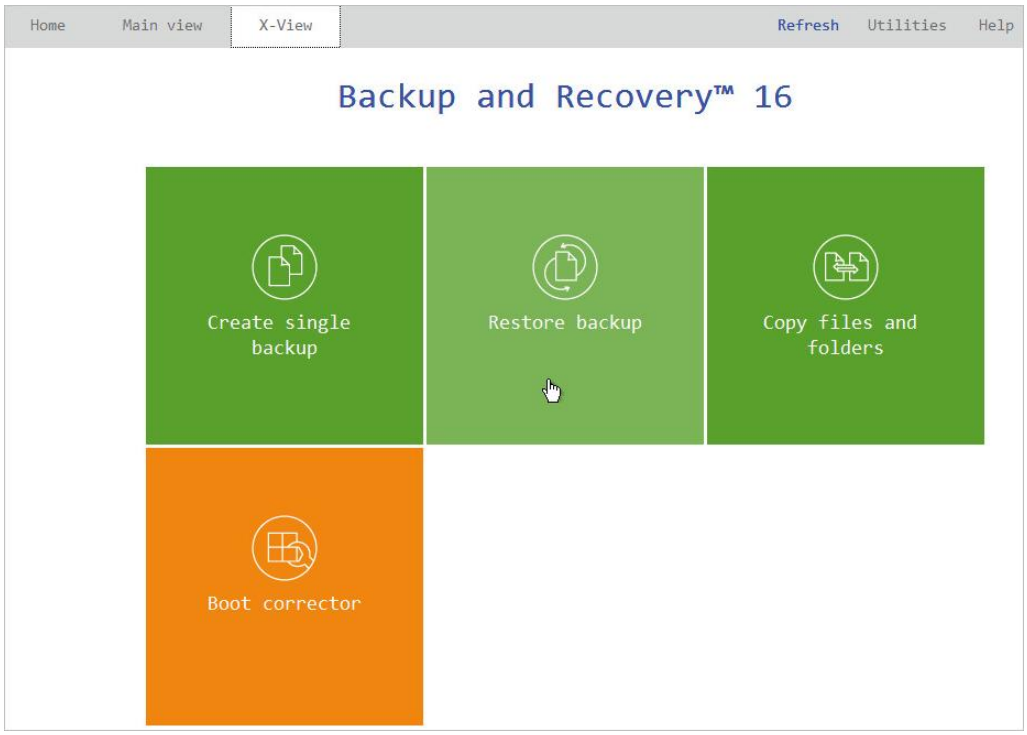
4. Click **Finish** to initiate the operation.

WinPE Restore Scenarios

Restoring a Failed System

If your computer fails to start up because of a software glitch or after you accidentally deleted the entire Windows partition or some system files, you can get it back on track by utilizing a previously prepared recovery media and one of available backup images.

1. Start up the computer from the WinPE recovery media.
2. Select **Restore backup**.



3. The welcome page introduces the wizard's functionality. Click **Next** to continue.

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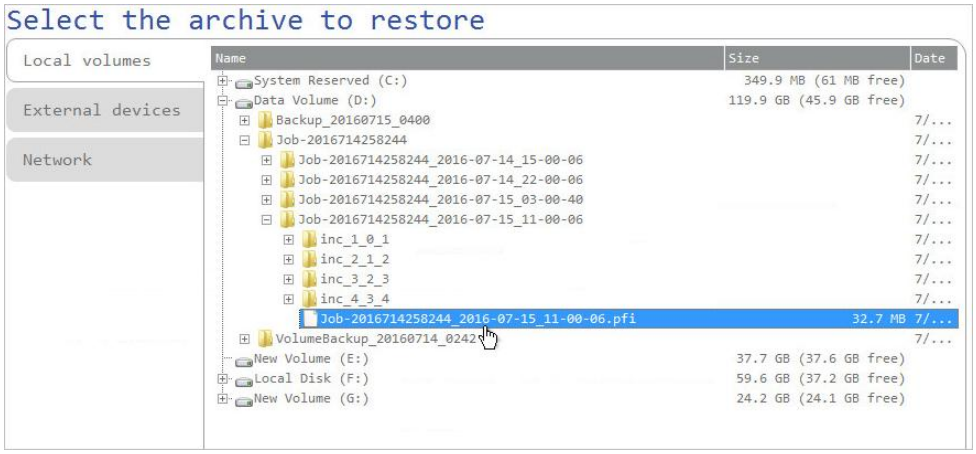
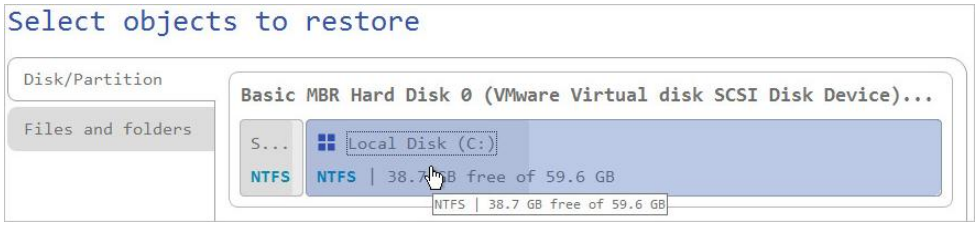
4. Specify a backup image for restore. Depending on the location, first select a corresponding tab on the left, then browse for the required backup image file. To learn how to map a network share, please consult **Configuring Network**.



5. Initially the wizard prompts you to specify an entire backup image or individual volumes or disks for restore – that's exactly what we need. If you need to restore individual files, select **Files and folders**, then backup data you want to recover. For more details, please consult **Restoring Individual Files and Folders**.



6. The program offers to restore the selected backup object exactly where it belongs. However, you can choose any disk of enough capacity available in your system.

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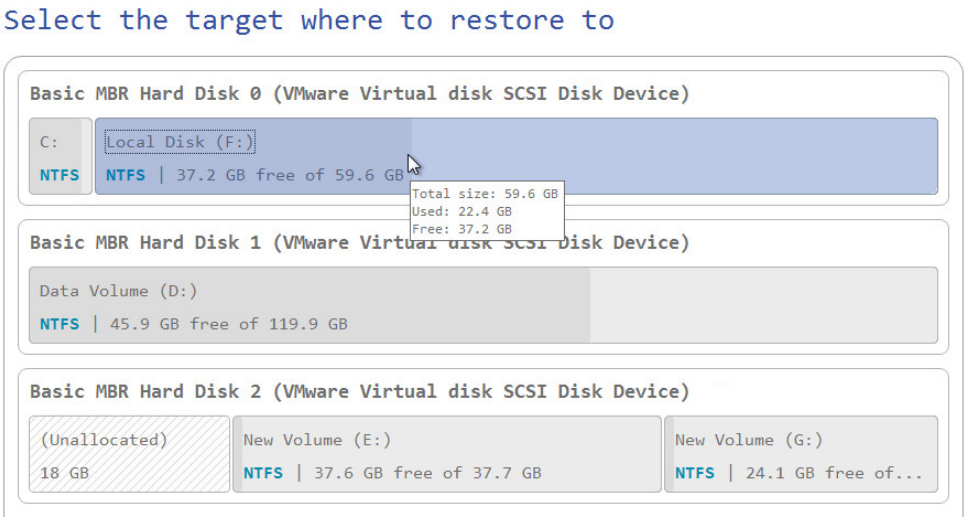
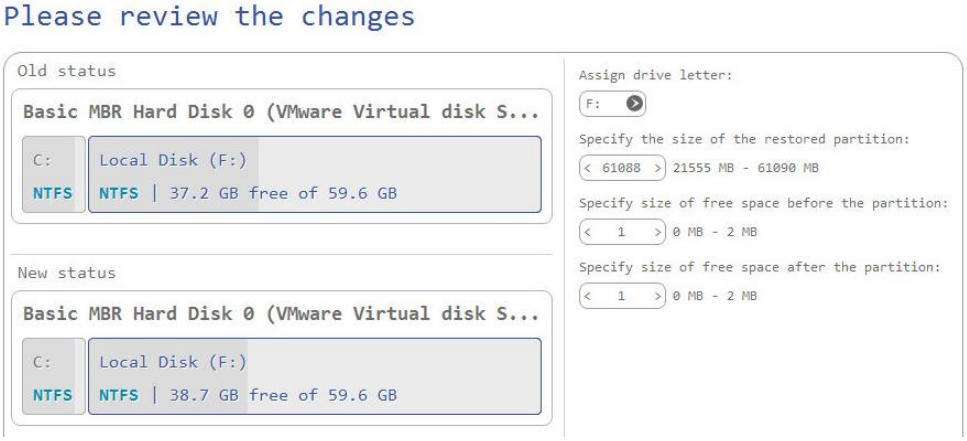


You will get a corresponding warning when trying to rewrite a bootable partition.

7. Next you can see the resulted disk layout. If necessary, specify a number of additional parameters (depends on the selected backup object).

Restoring a partition

Change size of the partition and its location as well as assign a particular drive letter. If you've got to do with a 64-bit Windows configured to the uEFI boot mode, the Switch EFI to boot from destination drive option will become available for you to define what instance of Windows OS you'd like to boot from once the operation is over. Anyway you can specify a bootable device at any time through Boot Corrector.



Restoring a disk

If attempting to restore to a larger disk, use the corresponding option to resize on-disk partitions proportionally to occupy the entire target disk.

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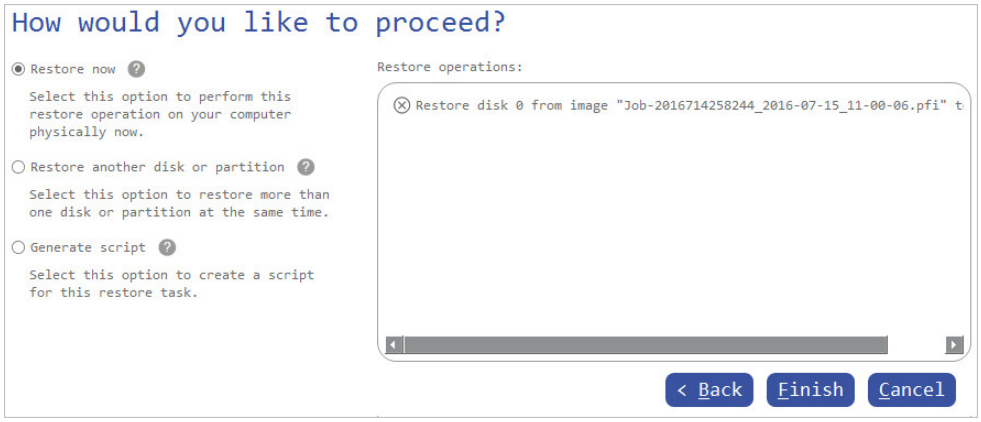
8. Choose whether to execute the operation immediately after finishing the wizard, set up another restore operation(s) and then run all at once, or generate a program script for later execution. Click **Finish** to initiate the operation.



9. In the Progress window you can see in real-time a detailed report on all actions carried out by the program. Mark the checkbox at the bottom of the window to automatically switch off the computer on the successful accomplishment of the restore operation.
10. After completing the operation, please reboot the computer.

Fixing Boot Problems

If Windows OS doesn't boot after replacing a failed hardware device or you have any other boot issue resulting from a human or program error, or a boot virus activity, first try our boot repair tools before taking more radical actions.

1. Start up the computer from the WinPE recovery media.
2. Select **Boot Corrector**.
3. The welcome page introduces the wizard's functionality. Click **Next** to continue.
4. Click on the required operation to select.

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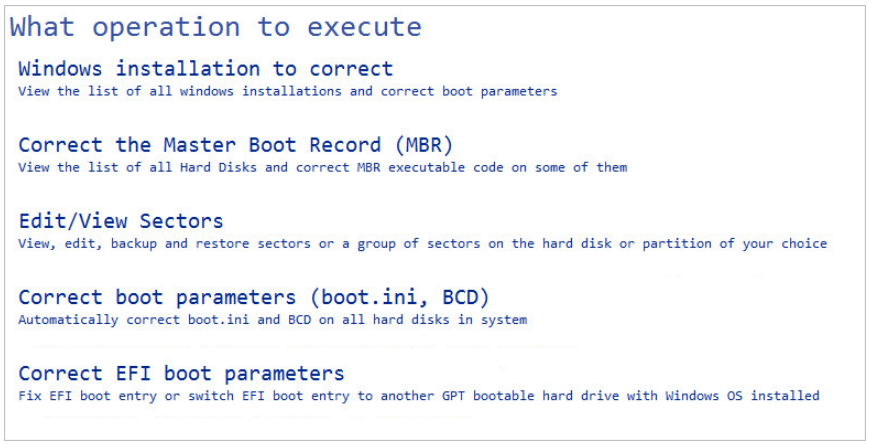
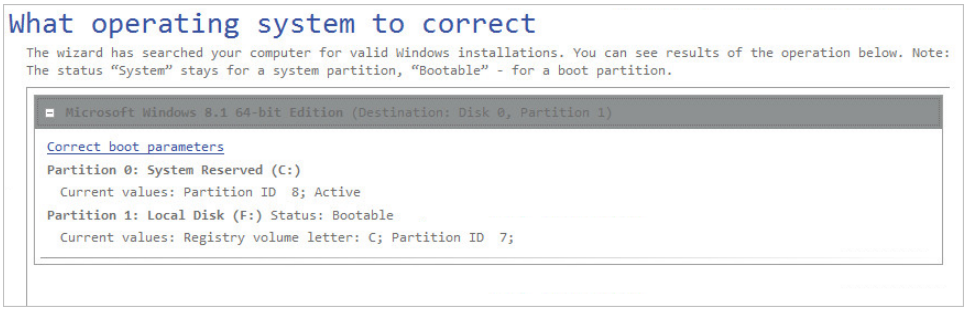
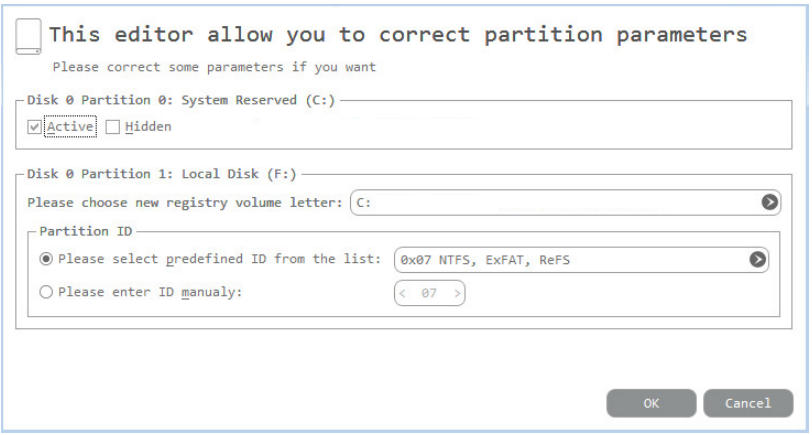


- **Windows installation to correct**. Fix your Windows startup ability, if it fails to complete the startup procedure due to an unknown reason.

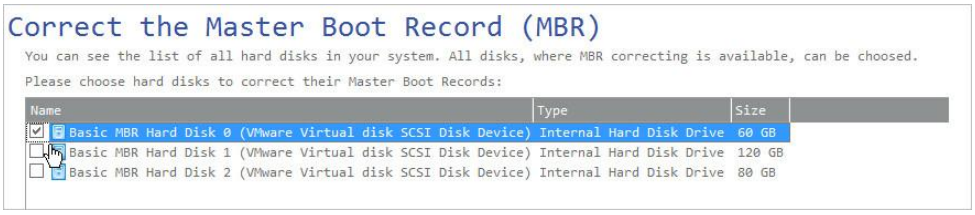
  Choose a failed Windows installation from the list of found installations (if several). If necessary, click on the plus icon to get more info on the selected item.



  If you want to manually correct the chosen installation, click **Correct boot parameters**, then edit the required parameters. Otherwise, click **Next** to let the wizard fix the installation automatically.



- **Correct the Master Boot Record**. Use this option to overwrite the current bootable code in the MBR (Master Boot Record) by the standard bootstrap code, thus repairing a corrupted bootable code after a boot virus attack or a malfunction of boot management software.



- **Edit/View Sectors**. You can directly access and modify sectors of an entire disk drive or individual partition, save and restore sectors from specified files as well as navigate through the system metadata.

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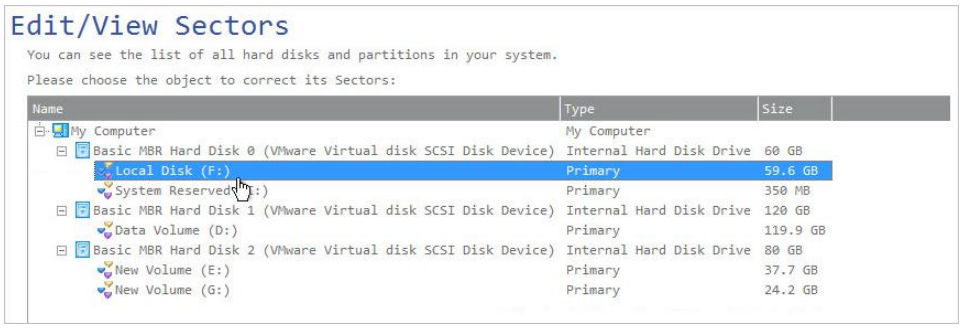
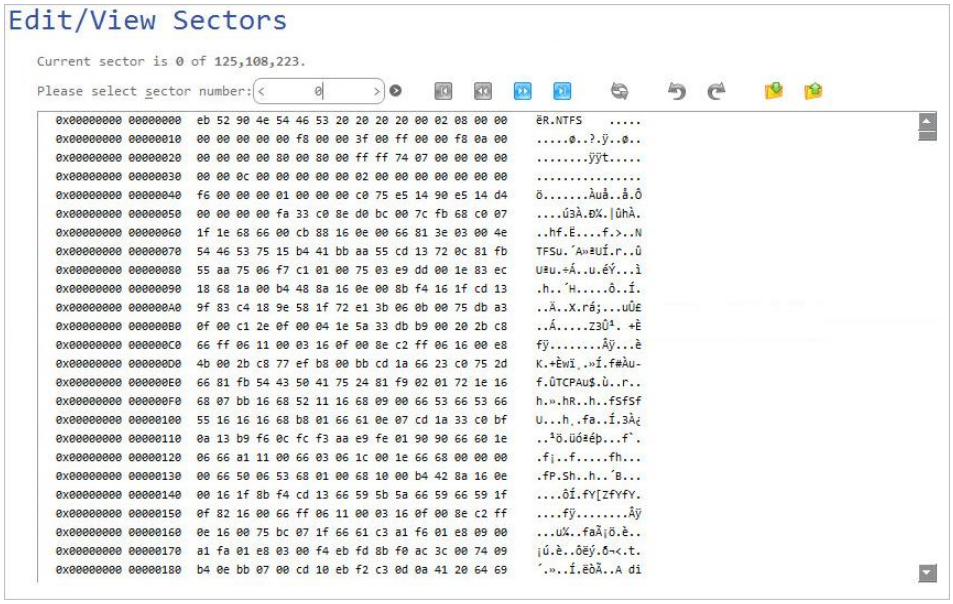
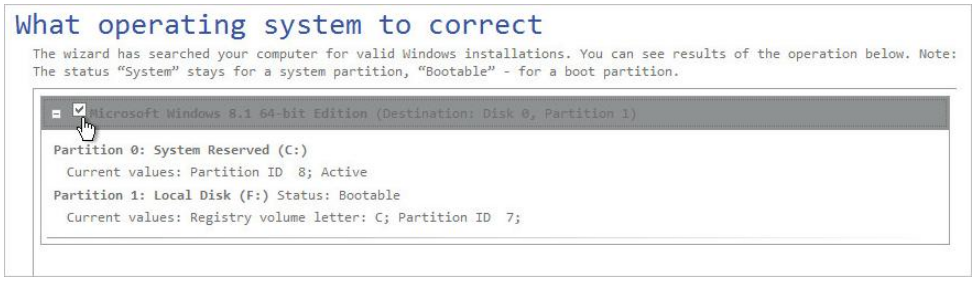




- **Correct boot parameters (boot.ini, BCD)**. If you have several operating systems on your disk (Windows Vista and later) after copying a system partition for instance, update their BCD (Boot Configuration Data) files to be able to choose an OS to start up.
- **Correct EFI boot parameters**. The wizard will detect and list all available GPT partitions that accommodate 64-bit Windows OS. Choose the one you need to boot from, to let the wizard modify the EFI boot entry correspondingly. Please note that this option is available on the 64-bit WinPE media only.



5. When done with all parameters, please confirm the operation to proceed.
6. After completing the operation, please reboot the computer.

Extra WinPE Scenarios

Unlocking Bitlocked Volumes

The program allows you to accomplish backup, restore, or copying of Windows BitLocker encrypted volumes, but only when they are unlocked. Until that the locked volumes will be recognized in the program's interface as "Unknown".

1. Start up the computer from the WinPE recovery media.

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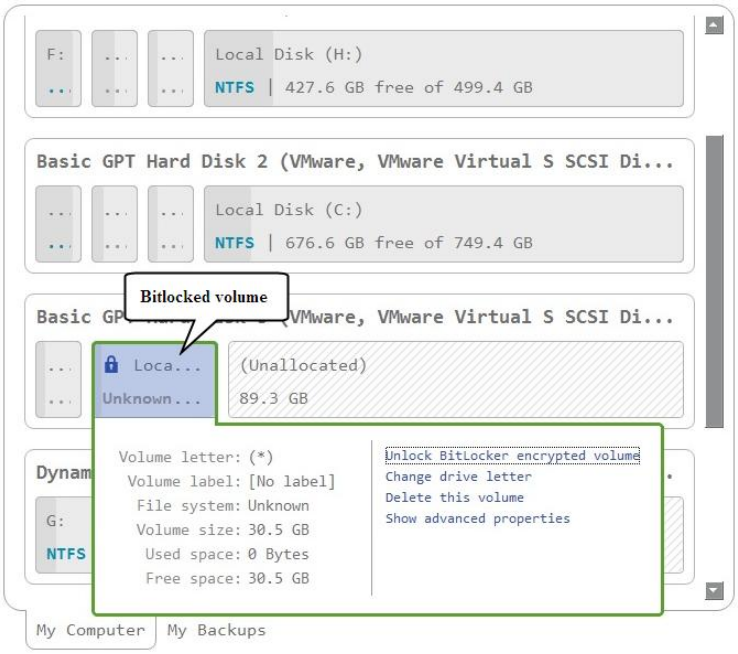
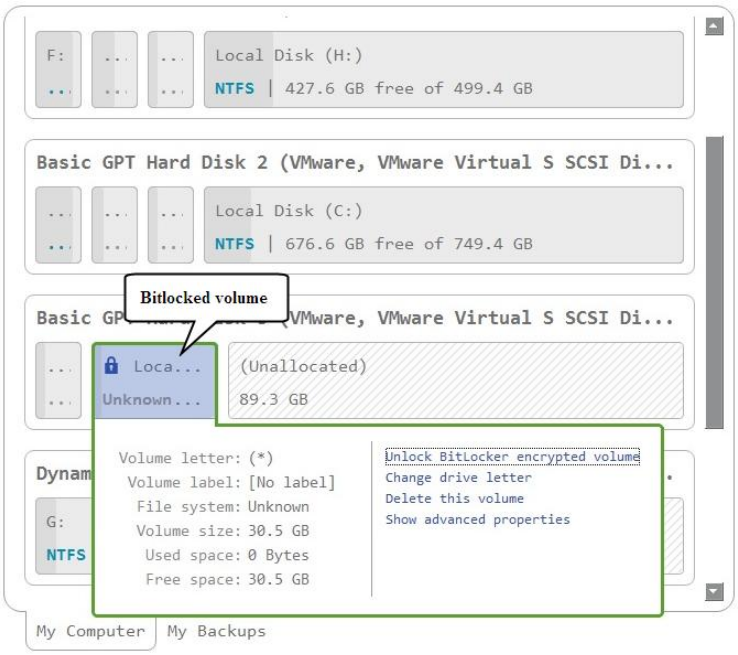
2. Open **Main View > My Computer**. Left click a volume detected as “Unknown”, then select **Unlock Bitlocker encrypted volume** in the opened menu.



3. Either enter a password or provide a path to a recovery key (**recoverykey.bek**). For more details, please consult documentation provided by Microsoft.



4. Click **Unlock** when ready. All introduced changes to the disk layout will be pended until confirmed.
5. As a result of the operation the volume gets correctly recognized and is available to work with.

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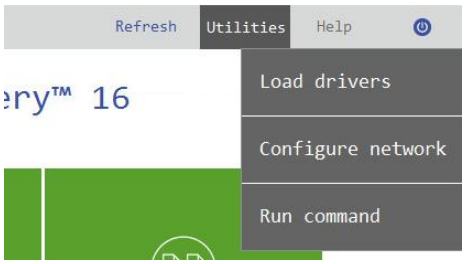
The same action can be accomplished in the Windows version of the program.

Adding Specific Drivers

The WinPE recovery media offers excellent hardware support. However, in case of not having a driver for your disk controller, for example, your hard disks will be unavailable to work with. Please use this scenario to inject drivers for unknown storage controllers, network cards, or other devices.

To avoid this action every time you start up the recovery media, we recommend you to inject additional drivers during its creation. For more details, please consult Building Recovery Media.

1. Start up the computer from the WinPE recovery media.
2. Select **Utilities > Load drivers**.



3. Use the corresponding link to browse for an .INF file of the required driver package on a floppy disk, local disk, CD/DVD or a network share. To learn how to map a network share, please consult **Configuring Network**.

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The chosen package gets on the list. Repeat this action to inject more drivers. Click **Load drivers** to accomplish the operation.

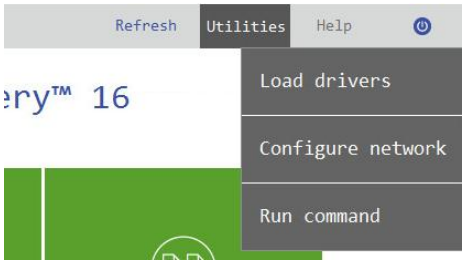
The WinPE environment can either be 32- or 64-bit, so are to be drivers for injection.

Configuring Network

If your local network has a DHCP server, a network connection will be automatically configured once the WinPE recovery media has loaded. Otherwise, you will need to do it manually by providing an IP address, a network mask, default gateway, etc. in Network Configurator. Additionally, this wizard will help you map a network share, ping a network resource, or measure transit delays of packets across an Internet Protocol (IP) network to track down problematic nodes.

To avoid this action every time you start up the recovery media, we recommend you to pre-configure network settings and map network resources during its creation. For more details, please consult Building Recovery Media.

1. Start up the computer from the WinPE recovery media.
2. Select **Utilities > Configure network**.



3. Provide an IP address, a network mask, default gateway, etc. to configure your network device according to network environment.

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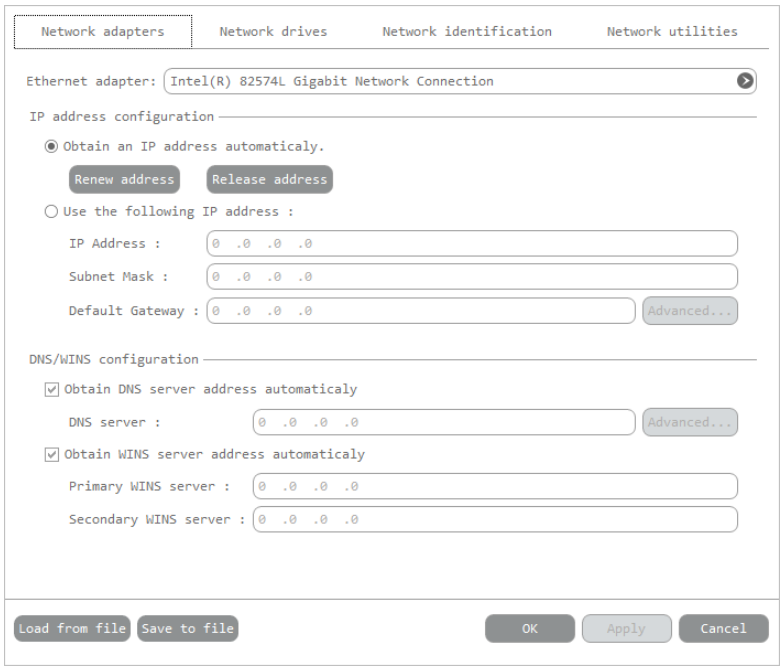
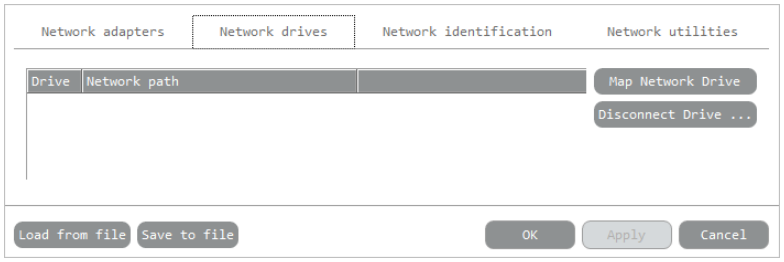
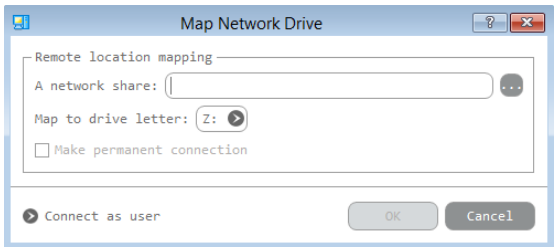


4. Use the **Network drivers** tab to manage network shares.

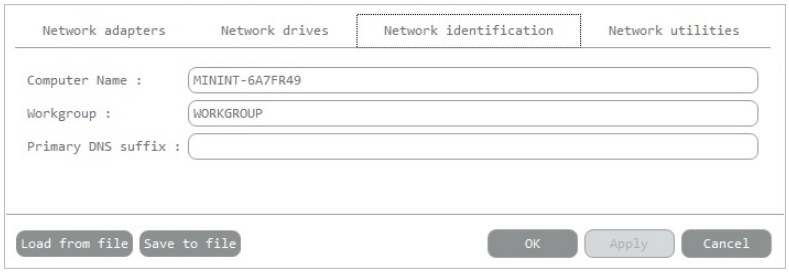


5. Click **Map Network Drive** to map a network share.



- Click the standard browse button [...] to browse for the required network share or manually enter a path to it;
- Define a letter from the pull-down list of available drive letters;
- If you'd like to make this connection permanent, mark the corresponding checkbox. Otherwise it will only be available for the current session;
- Click the **Connect as user** button at the foot of the dialog page to specify a user name and password to access the selected network share, if necessary.

6. Use the **Network identification** tab to change a network name of your computer (generated automatically) and a workgroup name.



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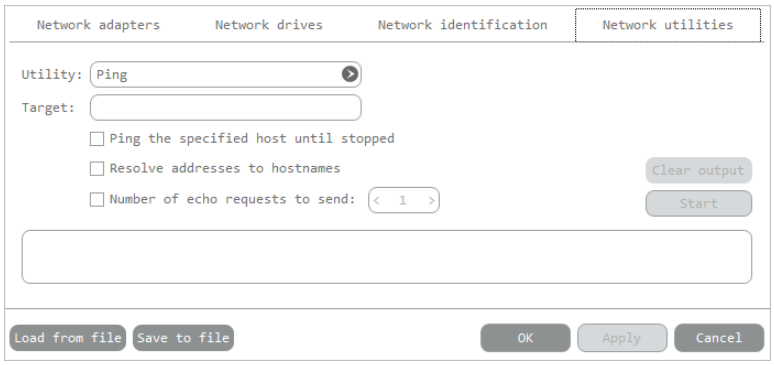
7. By default, the wizard saves all network settings in the “netconf.ini” file located on the WinPE RAM drive, thus it will only be available until you restart the computer. However, you can just once configure your network device and then save this file to some other destination, for instance a local drive, and this way avoid constant re-configuration, just by providing a path to it. So click **Save to file** to save the “netconfig.ini” file to the required destination.

Network Troubleshooter

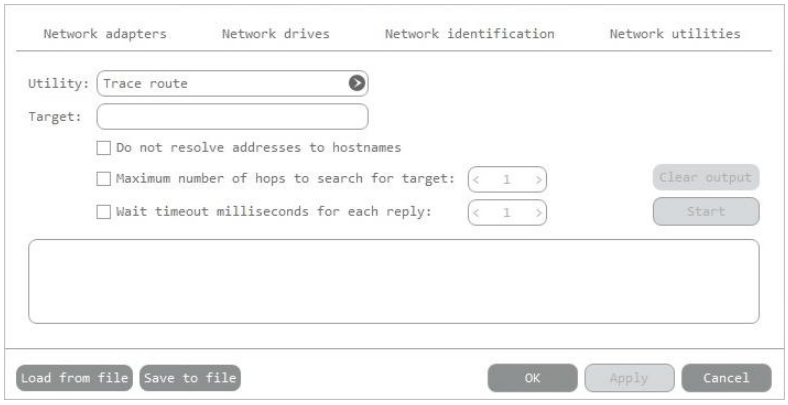
Network Configurator includes a traceroute/ping utility that enables to get detailed information on particular routes and measure transit delays of packets across an Internet Protocol (IP) network. So with its help you can easily track down problematic nodes.

1. Start up the computer from the WinPE recovery media.
2. Select **Utilities > Configure network**.
3. Click on the **Network identification** tab, then select **Ping** to ping a network host. Click **Start** when you’re ready with all parameters.



- **Target**. Type in the required IP address or its DNS name.
- **Ping the specified host until stopped**. Mark the option to ping the chosen host for indefinite time.
- **Resolve addresses to hostnames**. Mark the option to display hostnames instead of IP addresses.
- **Number of echo requests to send**. By default, the utility sends 1 echo request, which you can modify however.

4. Select **Trace route** to trace a route to a network host. Click **Start** when you’re ready with all parameters.



- **Do not resolve addresses to hostnames**. Mark the option to display IP addresses instead of hostnames.
- **Maximum number of hops to search for target**. By default the utility goes through maximum 30 hops when searching for the target host, which you can modify however.
- **Wait timeout milliseconds for each reply.** By default the utility waits 4 seconds for each echo reply message. If not received within the timeout, an asterisk (*) is displayed.

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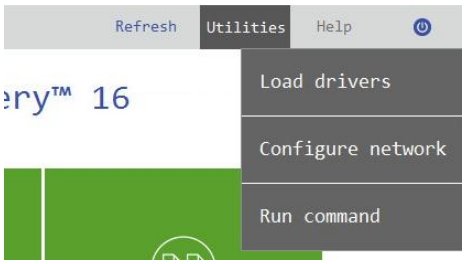
Using the Command Prompt

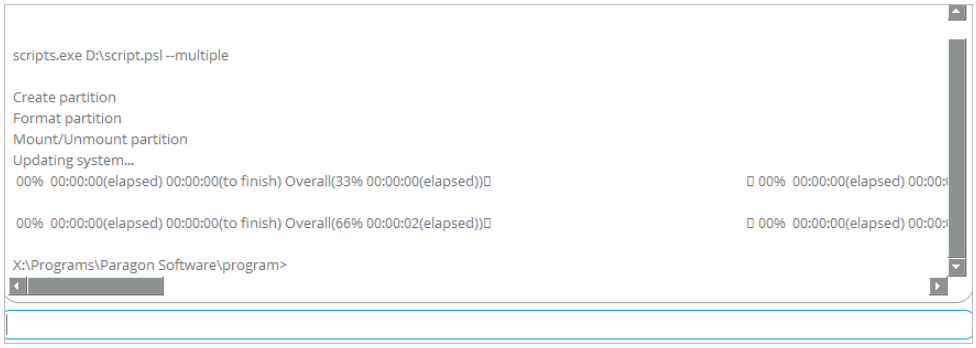
The primarily function of the command prompt is running generated program scripts with different parameters. Additionally, it can help you with opening Notepad or Diskpart, running batch files, or solving a variety of issues such as failure to connect to the internet or website loading problems.

1. Start up the computer from the WinPE recovery media.
2. Select **Utilities > Run command**.

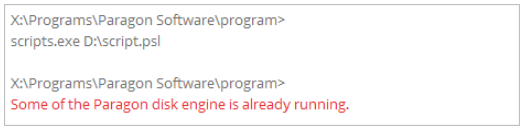


3. The embedded command prompt utility is similar to Windows CMD. It supports the auto-complete and commands history features:
   - **Arrow up/Arrow down** to navigate the history,
   - **Tab** to complete or select a path,
   - **Esc** to clear a text field,
   - **Return** to run a command.

   Type in **scripts.exe <path to a generated script file> --multiple** to run the required program script.



The 'multiple' parameter is obligatory to use in WindowsPE. To learn more about scripts, please consult the Paragon Scripting Language manual.



Managing Partitions and Disks

Partitioning lets you divide a single physical drive into a number of logical drives, each of which serves as a container with its own drive letter and volume label, thus enabling the operating system to process data more efficiently. Partitioning also makes it possible to organize data so that it is easy to find and manage. By detaching the OS from the rest of the data you can tackle one more crucial issue – in case of a system malfunction, you can get the system back on track in minutes by recovering it from a backup image located on the other partition of the hard drive. Finally partitioning is a necessity if you're planning to run several OSs on a single hard drive to effectively delineate the boundaries of each OS.

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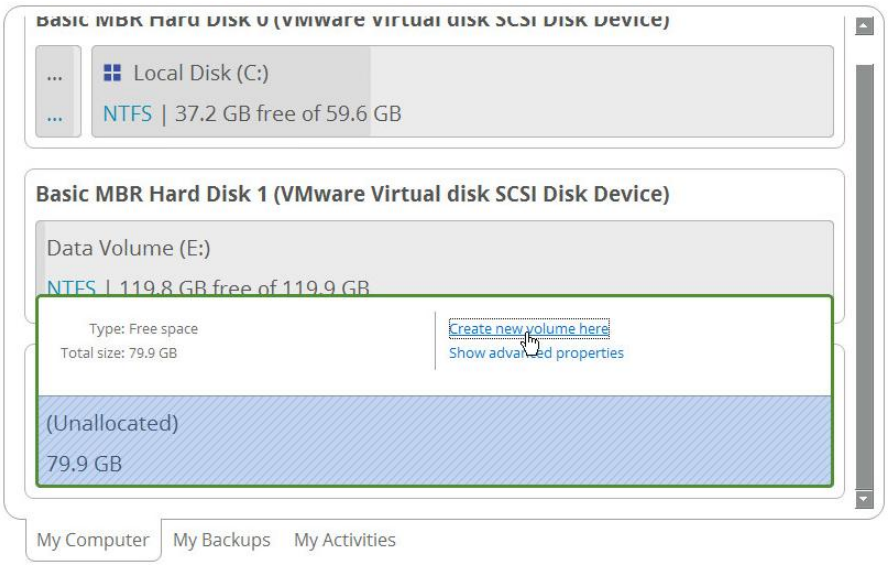
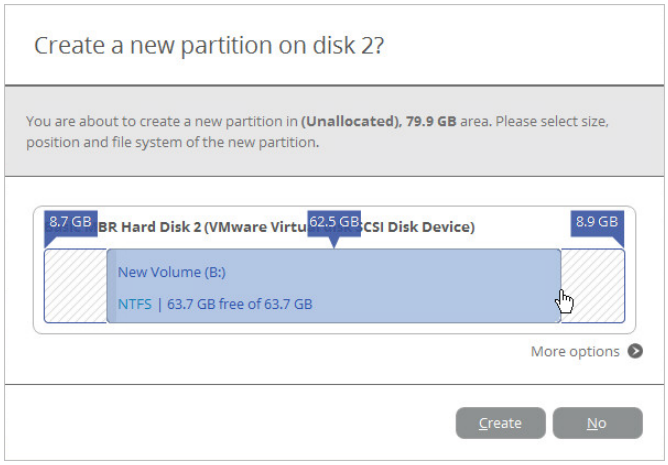
Creating a Partition

1. Open **Main View > My Computer**, then left click a block of free space on a disk you'd like to partition. Select **Create new volume here** in the opened menu.



2. By default, there will be created an NTFS partition the size of the selected free block. Drag-and-drop borders of the free block on the Disk Map to define the partition size and position. If you want to modify other properties, click **More options**.



3. In the opened dialog you can change any predefined partition property.

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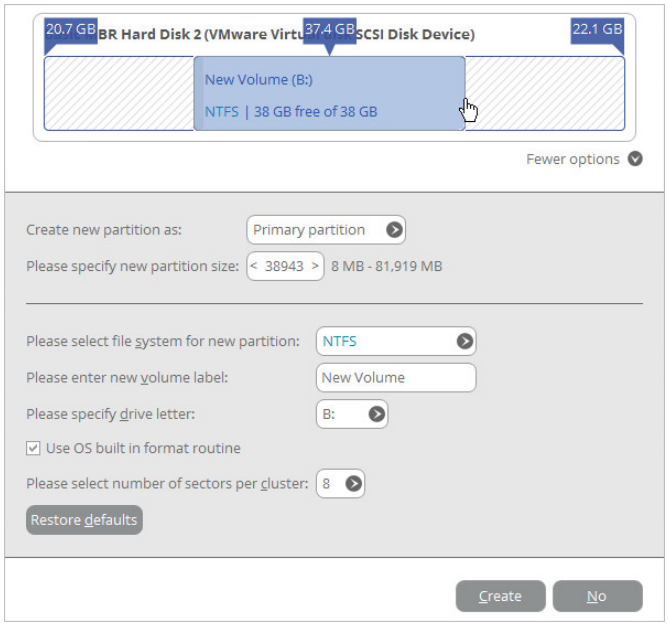

- Select the desired partition type (Primary, Extended, or Logical). The available alternatives depend on the selected block of free space – within a Logical block, only Logical partitions can be created; Within a Primary block, both Primary partitions or the Extended Partition are allowed to create.
- Drag-and-drop borders of the free block on the Disk Map to define the partition size and position. An accurate value in MB can be set in the corresponding field.
- To store data on the created partition you need to format it to one of the supported file systems:
  - FAT32 – use for data disks that are 32GB or less
  - NTFS – the primary file system for Windows OS
  - Ext 2/3/4 – the primary file system for Linux OS
  - Apple HFS – the primary file system for Mac OS X
- Enter a volume label to easily identify the partition later (optional parameter).
- Choose one of the vacant drive letters from the list to associate with the partition. The drive letter plays an important role in telling Windows where to look data.
- By default, the amount of sectors per cluster will be specified according to the used OS and the chosen file system. If you'd like to set another value, unmark the **Use OS built-in routine** and define the desired value in the corresponding field. The cluster size is one of the crucial parameters of any file system. Its value implicitly affects the performance of the files input-output activity since it defines the size of the file system metadata. Besides, the so-called waste space factor also depends on it.

4. Click **Create** when ready. All introduced changes to the disk layout will be pended until confirmed.

Formatting a Partition

When you create a new partition you will be prompted to choose the desired file system format as described above. This section explains how to format an existing partition.

1. Open **Main View > My Computer**, then left click an existing partition. Select **Format this volume** in the opened menu.

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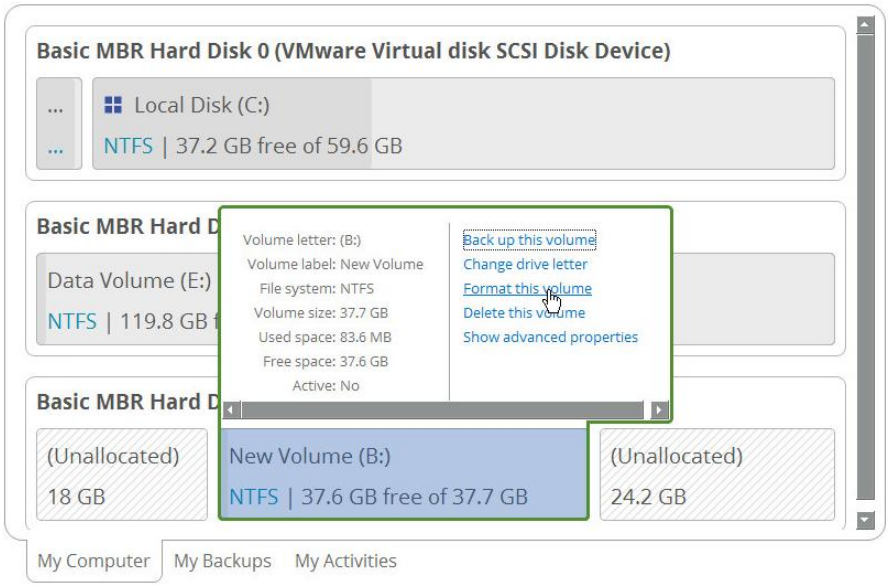
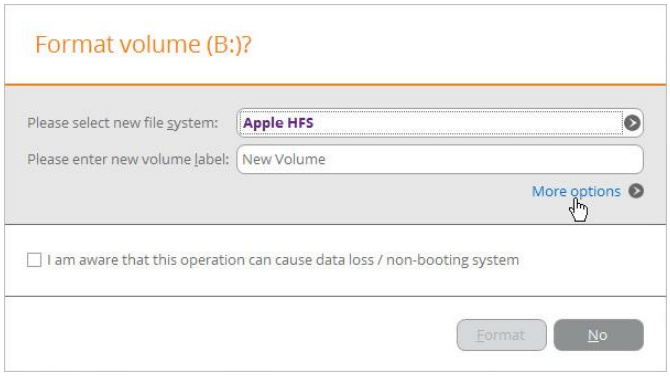


2. Select the desired file system from the list of the supported file systems and enter a volume label to easily identify the partition later (optional parameter). Since the selected partition may contain data, which will be lost after formatting, you need to confirm the operation.



3. If you want to change the default amount of sectors per cluster, click **More options**. The cluster size is one of the crucial parameters of any file system. Its value implicitly affects the performance of the files input-output activity since it defines the size of the file system metadata. Besides, the so-called waste space factor also depends on it.

4. Click **Format** when ready. All introduced changes to the disk layout will be pended until confirmed.

Deleting a Partition

1. Open **Main View > My Computer**, then left click an existing partition. Select **Delete this volume** in the opened menu.

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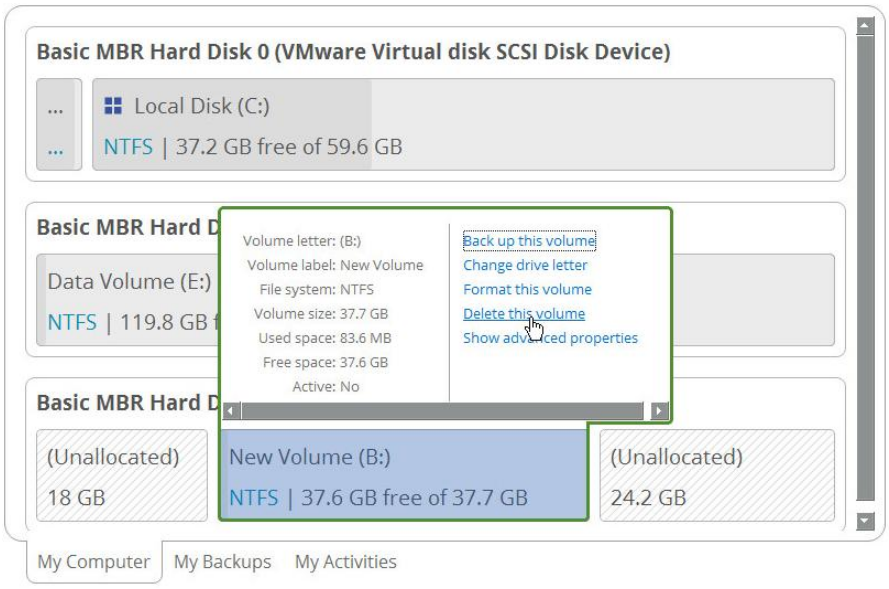
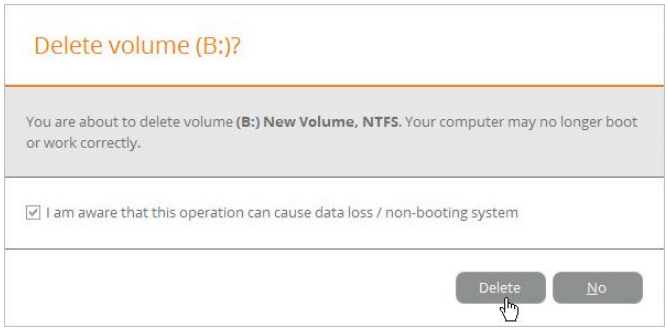


2. Since the selected partition may contain data, which will be lost after deleting, you need to confirm the operation.



3. Click **Delete** when ready. All introduced changes to the disk layout will be pended until confirmed.

Moving/Resizing a Partition

Open **Main View > My Computer**, then drag-and-drop borders of a partition on the Disk Map to define its size and position. All introduced changes to the disk layout will be pended until confirmed.

Changing Drive Letter

1. Open **Main View > My Computer**, then left click an existing partition. Select **Change drive letter** in the opened menu.

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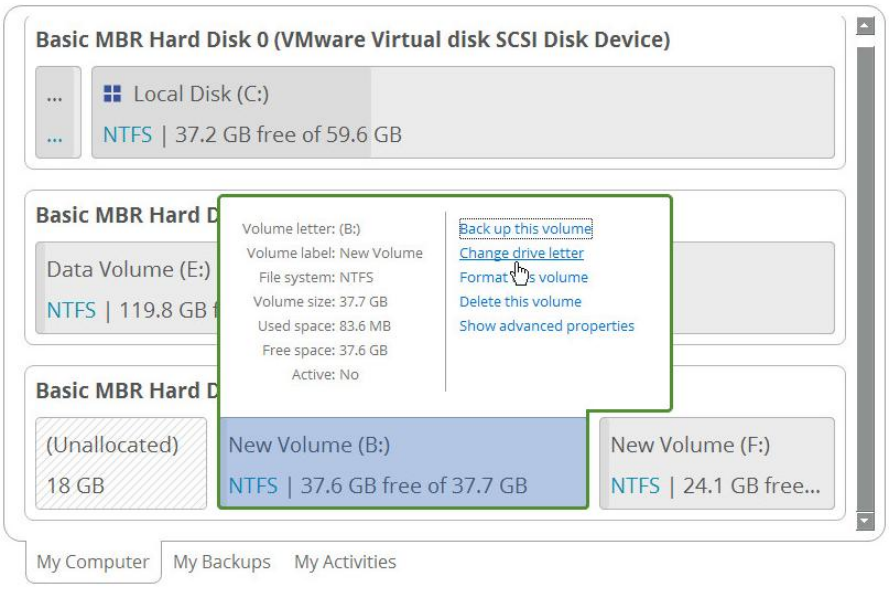
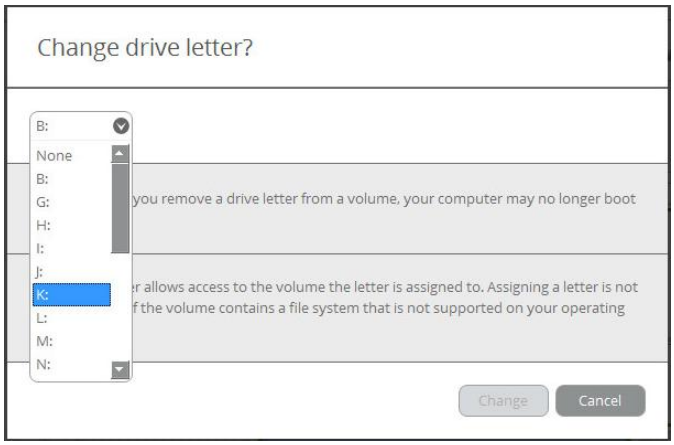


2. Choose one of the vacant drive letters from the list to associate with the partition. The drive letter plays an important role in telling Windows where to look data.



After changing drive letter of the system partition, your Windows OS won't start up.

Some programs may not run properly either if changing drive letter of a data partition.

3. Click **Change** when ready. All introduced changes to the disk layout will be pended until confirmed.

Getting Disk/Partition Properties

1. Open **Main View > My Computer**, then left click an existing partition or disk. Select **Show advanced properties** in the opened menu.

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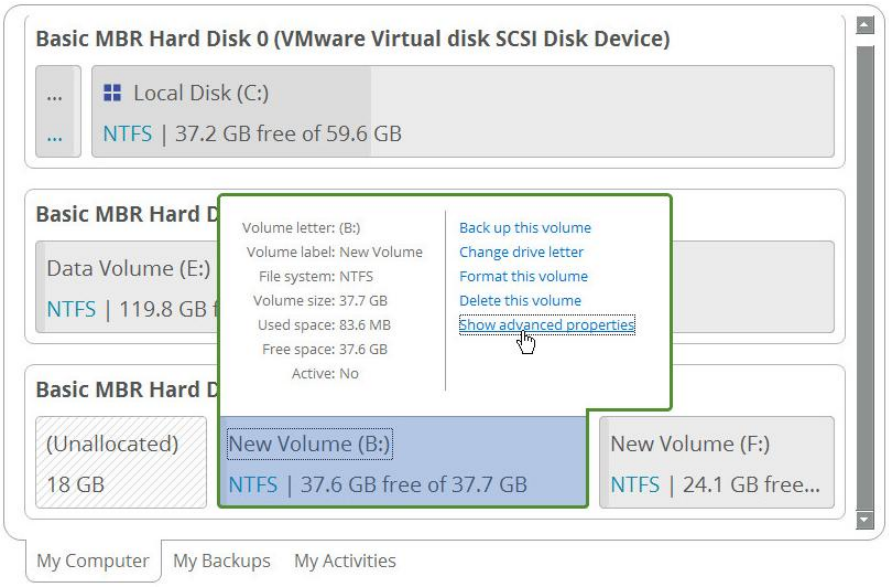
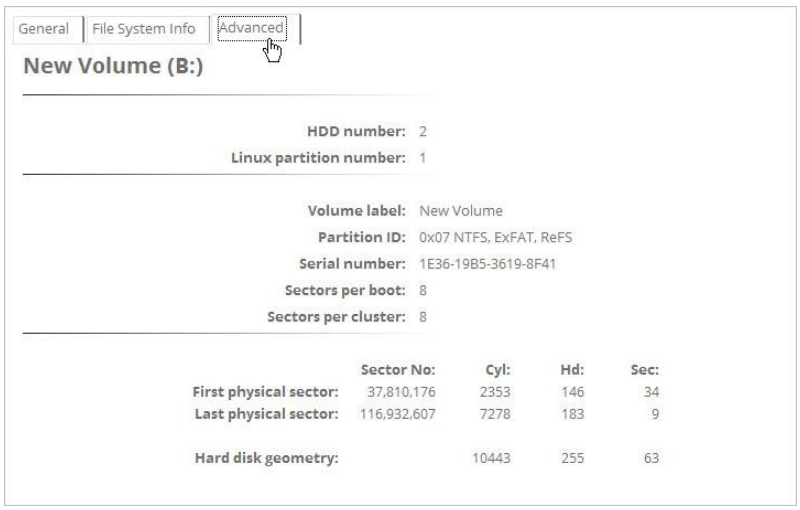


2. The program displays detailed information on the properties of an entire storage device or individual partition. Besides the general information, such as capacity, used space or file system type it provides the possibility to get info on hard disk geometry, cluster size, exact partition location, etc.

Disk Properties:

Partition Properties:



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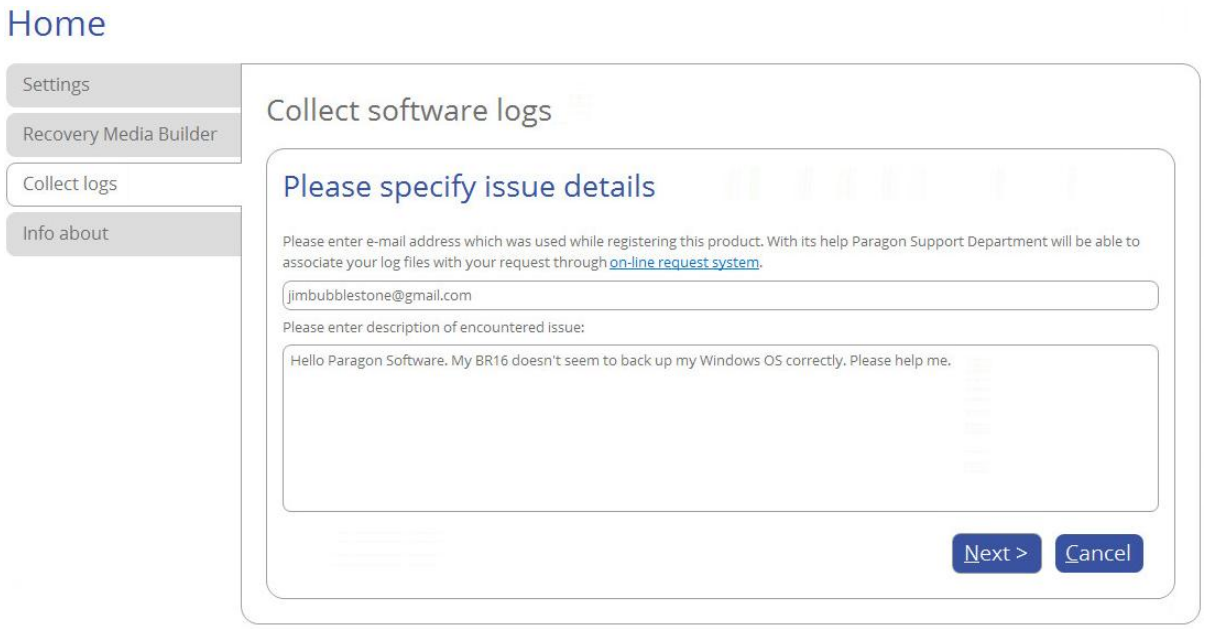
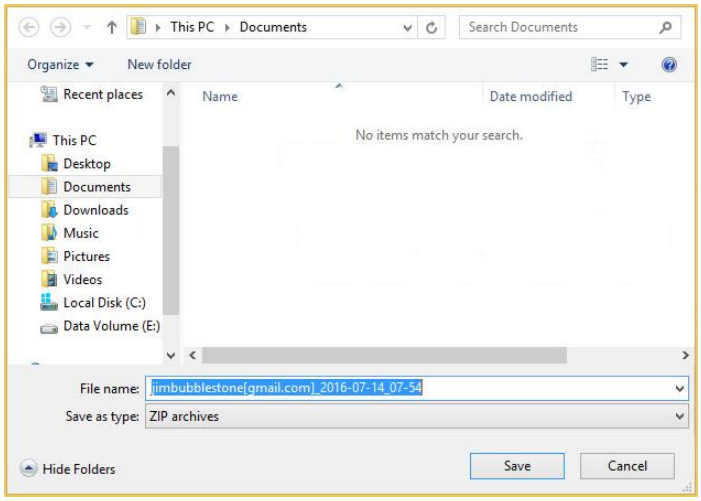
Troubleshooting

In case of having difficulties with handling the product you can address our support engineers for assistance. To help you solve your problem with minimal time, our engineers need operation logs and your brief description.

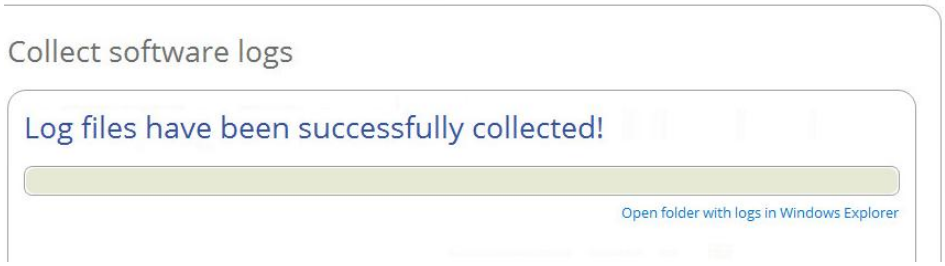
1. Select **Home** > **Collect logs**. Provide an e-mail address used for registering the product, then describe the encountered problem in the corresponding fields. Please don't worry - we respect your privacy, so none of your confidential data will be exposed.



2. Browse for the required location of the log files package and edit the default file name, if necessary. Click **Save** when ready.



3. Once the operation is over, click **Open folder with logs…** to check the prepared package doesn't contain anything confidential, but layouts of your disks, performed operations, etc.



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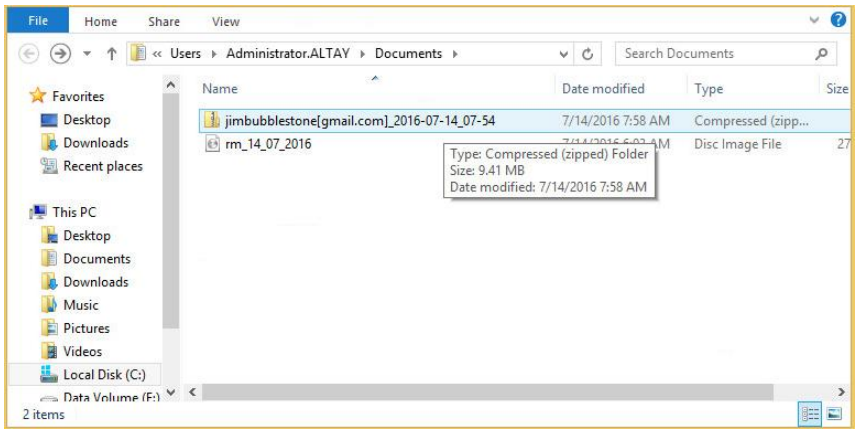
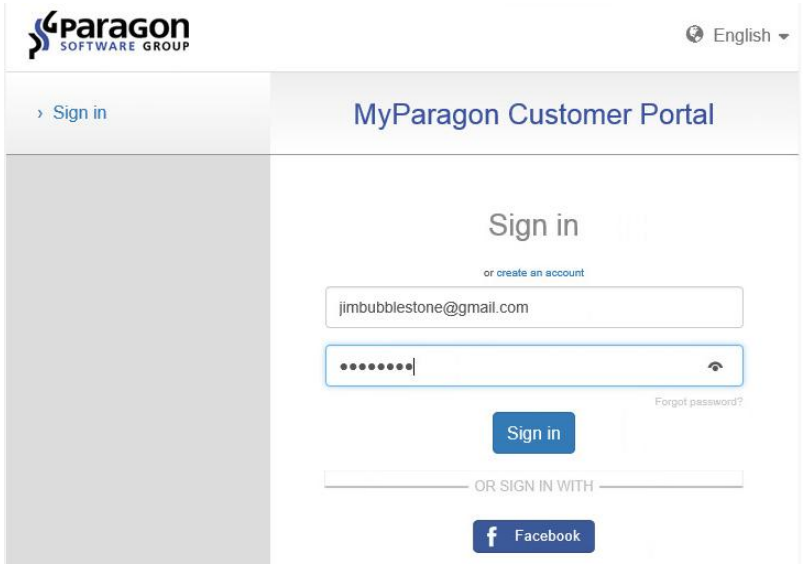
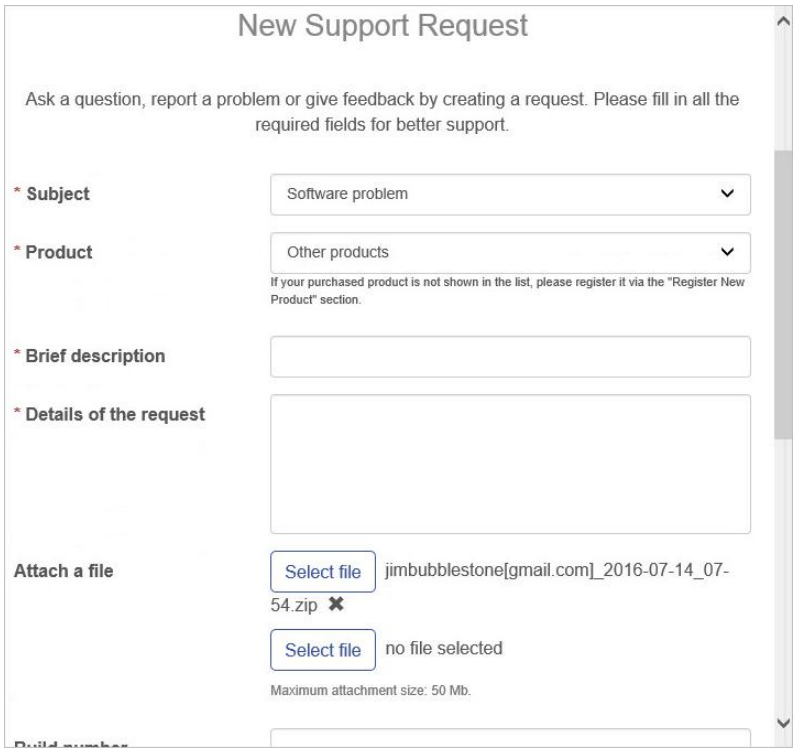


4. Use the link on the first page of the wizard to sign in to MyParagon Customer Portal.



5. Fill out the ticket request form, attach the prepared logs package, then click **Post request**. That's all. Our support engineers will get in touch with you in a little while.



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