

Setting Up Desktop and Application Pools in View

VMware Horizon 6.0

This document supports the version of each product listed and supports all subsequent versions until the document is replaced by a new edition. To check for more recent editions of this document, see <http://www.vmware.com/support/pubs>.

EN-001485-00

vmware[®]

You can find the most up-to-date technical documentation on the VMware Web site at:

<http://www.vmware.com/support/>

The VMware Web site also provides the latest product updates.

If you have comments about this documentation, submit your feedback to:

docfeedback@vmware.com

Copyright © 2014 VMware, Inc. All rights reserved. [Copyright and trademark information.](#)

VMware, Inc.
3401 Hillview Ave.
Palo Alto, CA 94304
www.vmware.com

Contents

Setting Up Desktop and Application Pools in View	7
1 Introduction to Desktop and Application Pools	9
Farms, RDS Hosts, and Desktop and Application Pools	9
Advantages of Desktop Pools	10
Desktop Pools for Specific Types of Workers	11
Advantages of Application Pools	14
2 Preparing Unmanaged Machines	15
Prepare an Unmanaged Machine for Remote Desktop Deployment	15
Install View Agent on an Unmanaged Machine	15
3 Creating and Preparing Virtual Machines	19
Creating Virtual Machines for Remote Desktop Deployment	19
Install View Agent on a Virtual Machine	25
Install View Agent Silently	28
Configure a Virtual Machine with Multiple NICs for View Agent	34
Optimize Guest Operating System Performance for All Windows Versions	34
Optimize Windows 7 and Windows 8 Guest Operating System Performance	35
Optimizing Windows 7 and Windows 8 for Linked-Clone Virtual Machines	36
Preparing Virtual Machines for View Composer	43
Creating Virtual Machine Templates	49
Creating Customization Specifications	50
4 Creating Automated Desktop Pools That Contain Full Virtual Machines	51
Automated Pools That Contain Full Virtual Machines	51
Worksheet for Creating an Automated Pool That Contains Full Virtual Machines	51
Create an Automated Pool That Contains Full Virtual Machines	55
Desktop Settings for Automated Pools That Contain Full Virtual Machines	56
5 Creating Linked-Clone Desktop Pools	57
Linked-Clone Desktop Pools	57
Worksheet for Creating a Linked-Clone Desktop Pool	57
Create a Linked-Clone Desktop Pool	66
Desktop Pool Settings for Linked-Clone Desktop Pools	67
View Composer Support for Linked-Clone SIDs and Third-Party Applications	68
Keeping Linked-Clone Machines Provisioned and Ready During View Composer Operations	72
Use Existing Active Directory Computer Accounts for Linked Clones	73
6 Creating Manual Desktop Pools	75
Manual Desktop Pools	75

- Worksheet for Creating a Manual Desktop Pool 75
- Create a Manual Desktop Pool 77
- Create a Manual Pool That Contains One Machine 77
- Desktop Pool Settings for Manual Pools 78

- 7 Setting Up Remote Desktop Services Hosts 81**
 - Remote Desktop Services Hosts 81
 - Install Remote Desktop Services on Windows Server 2008 R2 SP1 82
 - Install Remote Desktop Services on Windows Server 2012 or 2012 R2 83
 - Restrict Users to a Single Session 83
 - Install View Agent on a Remote Desktop Services Host 84
 - Enable Time Zone Redirection for RDS Desktop and Application Sessions 85
 - Enable Windows Basic Aero-Styled Theme for Applications 86
 - Configure Group Policy to Start Runonce.exe 86
 - RDS Host Performance Options 87

- 8 Creating Farms 89**
 - Farms 89
 - Worksheet for Creating a Farm 90
 - Create a Farm 91

- 9 Creating Application Pools 93**
 - Application Pools 93
 - Worksheet for Creating an Application Pool Manually 93
 - Create an Application Pool 94

- 10 Creating RDS Desktop Pools 95**
 - Understanding RDS Desktop Pools 95
 - Create an RDS Desktop Pool 96
 - Desktop Pool Settings for RDS Desktop Pools 96
 - Configure Adobe Flash Throttling with Internet Explorer for RDS Desktop Pools 97

- 11 Provisioning Desktop Pools 99**
 - User Assignment in Desktop Pools 99
 - Naming Machines Manually or Providing a Naming Pattern 100
 - Manually Customizing Machines 105
 - Desktop Pool Settings for All Desktop Pool Types 107
 - Adobe Flash Quality and Throttling 110
 - Setting Power Policies for Desktop Pools 111
 - Configuring 3D Rendering on Windows 7 or Later Desktops 116
 - Prevent Access to View Desktops Through RDP 120
 - Deploying Large Desktop Pools 120

- 12 Entitling Users and Groups 123**
 - Add Entitlements to a Desktop or Application Pool 123
 - Remove Entitlements from a Desktop or Application Pool 124
 - Review Desktop or Application Pool Entitlements 124
 - Restricting Remote Desktop Access 124

- 13 Configuring Remote Desktop Features 129**
 - Configure Unity Touch 129
 - Configure Flash URL Redirection for Multicast or Unicast Streaming 132
 - Configure Real-Time Audio-Video 136
 - Manage Access to Windows 7 Multimedia Redirection (MMR) 150

- 14 Using USB Devices with Remote Desktops 153**
 - Limitations Regarding USB Device Types 154
 - Overview of Setting Up USB Redirection 154
 - Network Traffic and USB Redirection 155
 - Automatic Connections to USB Devices 156
 - Disabling USB Redirection 156
 - Using Log Files for Troubleshooting and to Determine USB Device IDs 157
 - Using Policies to Control USB Redirection 158
 - Troubleshooting USB Redirection Problems 167

- 15 Reducing and Managing Storage Requirements 169**
 - Managing Storage with vSphere 169
 - Using Virtual SAN for High-Performance Storage and Policy-Based Management 170
 - Reducing Storage Requirements with View Composer 173
 - Storage Sizing for Linked-Clone Desktop Pools 174
 - Storage Overcommit for Linked-Clone Virtual Machines 178
 - Linked-Clone Data Disks 180
 - Storing Linked Clones on Local Datastores 181
 - Storing View Composer Replicas and Linked Clones on Separate Datastores 182
 - Configure View Storage Accelerator for Desktop Pools 183
 - Reclaim Disk Space on Linked-Clone Virtual Machines 184
 - Using View Composer Array Integration with Native NFS Snapshot Technology (VAAI) 186
 - Set Blackout Times for ESXi Operations on View Virtual Machines 187

- 16 Configuring Policies for Desktop and Application Pools 189**
 - Setting Policies in View Administrator 189
 - Using Active Directory Group Policies 191
 - Using View Group Policy Administrative Template Files 192
 - View ADM and ADMX Template Files 193
 - View Agent Configuration ADM Template Settings 193
 - View PCoIP Session Variables ADM Template Settings 199
 - Using Remote Desktop Services Group Policies 210
 - Setting Up Location-Based Printing 218
 - Active Directory Group Policy Example 222

- 17 Configuring User Profiles with View Persona Management 227**
 - Providing User Personas in View 227
 - Using View Persona Management with Standalone Systems 228
 - Migrating User Profiles with View Persona Management 229
 - Persona Management and Windows Roaming Profiles 231
 - Configuring a View Persona Management Deployment 232

Best Practices for Configuring a View Persona Management Deployment 241
View Persona Management Group Policy Settings 244

18 Troubleshooting Machines and Desktop Pools 253
 Display Problem Machines 253
 Send Messages to Desktop Users 254
 Troubleshooting Desktop Pool Creation Problems 254
 Troubleshooting Network Connection Problems 264
 Troubleshooting USB Redirection Problems 268
 Troubleshooting GINA Problems on Windows XP Machines 269
 Manage Machines and Policies for Unentitled Users 270
 Further Troubleshooting Information 270

Index 271

Setting Up Desktop and Application Pools in View

Setting Up Desktop and Application Pools in View describes how to create and provision pools of machines and create pools of remote applications that run on Microsoft Remote Desktop Services (RDS) hosts. It includes information about preparing machines, configuring policies, entitling users and groups, configuring remote desktop features, and configuring user profiles with View Persona Management.

Intended Audience

This information is intended for anyone who wants to create and provision desktop and application pools. The information is written for experienced Windows system administrators who are familiar with virtual machine technology and datacenter operations.

Introduction to Desktop and Application Pools

1

With VMware Horizon with View, you can create desktop pools that include one or hundreds or thousands of virtual desktops. You can deploy desktops that run on virtual machines, physical machines, and Windows Remote Desktop Services (RDS) hosts. Create one virtual machine as a base image, and View can generate a pool of virtual desktops from that image. You can also create application pools that give users remote access to applications.

This chapter includes the following topics:

- [“Farms, RDS Hosts, and Desktop and Application Pools,”](#) on page 9
- [“Advantages of Desktop Pools,”](#) on page 10
- [“Desktop Pools for Specific Types of Workers,”](#) on page 11
- [“Advantages of Application Pools,”](#) on page 14

Farms, RDS Hosts, and Desktop and Application Pools

With View, you can create desktop and application pools to give users remote access to virtual machine-based desktops, session-based desktops, physical computers, and applications. View takes advantage of Microsoft Remote Desktop Services (RDS) and VMware PC-over-IP (PCoIP) technologies to provide high-quality remote access to users.

RDS Hosts

RDS hosts are server computers that have Windows Remote Desktop Services and View Agent installed. These servers host applications and desktop sessions that users can access remotely. To use RDS desktop pools or applications, your end users must have access to Horizon Client 3.0 or later software.

Desktop Pools

There are three types of desktop pools: automated, manual, and RDS. Automated desktop pools use a vCenter Server virtual machine template or snapshot to create a pool of identical virtual machines. Manual desktop pools are a collection of existing vCenter Server virtual machines, physical computers, or third-party virtual machines. In automated or manual pools, each Windows machine is available for one user to access remotely at a time. RDS desktop pools are not a collection of Windows machines, but instead, provide users with desktop sessions on RDS hosts. Multiple users can have desktop sessions on an RDS host simultaneously.

Application Pools

Application pools let you deliver applications to many users. The applications in application pools run on a farm of RDS hosts.

Farms

Farms are collections of RDS hosts and facilitate the management of those hosts. Farms can have a variable number of RDS hosts and provide a common set of applications or RDS desktops to users. When you create an RDS desktop pool or an application pool, you must specify a farm. The RDS hosts in the farm provide desktop and application sessions to users.

Advantages of Desktop Pools

View offers the ability to create and provision pools of desktops as its basis of centralized management.

You create a remote desktop pool from one of the following sources:

- A physical system such as a physical desktop PC or an RDS host
- A virtual machine that is hosted on an ESXi host and managed by vCenter Server
- A virtual machine that runs on a virtualization platform other than vCenter Server that supports View Agent

If you use a vSphere virtual machine as a desktop source, you can automate the process of making as many identical virtual desktops as you need. You can set a minimum and maximum number of virtual desktops to be generated for the pool. Setting these parameters ensures that you always have enough remote desktops available for immediate use but not so many that you overuse available resources.

Using pools to manage desktops allows you to apply settings or deploy applications to all remote desktops in a pool. The following examples show some of the settings available:

- Specify which remote display protocol to use as the default for the remote desktop and whether to let end users override the default.
- If using a virtual machine, specify whether to power off the virtual machine when it is not in use and whether to delete it altogether.
- Specify whether to use a Microsoft Sysprep customization specification or QuickPrep from VMware. Sysprep generates a unique SID and GUID for each virtual machine in the pool.

In addition, using desktop pools provides many conveniences.

Dedicated-assignment pools

Each user is assigned a particular remote desktop and returns to the same desktop at each login. Users can personalize their desktops, install applications, and store data.

Floating-assignment pools

The remote desktop is optionally deleted and re-created after each use, offering a highly controlled environment. A floating-assignment desktop is like a computer lab or kiosk environment where each desktop is loaded with the necessary applications and all desktops have access to necessary data.

Using floating-assignment pools also allows you to create a pool of desktops that can be used by shifts of users. For example, a pool of 100 desktops could be used by 300 users if they worked in shifts of 100 users at a time.

Desktop Pools for Specific Types of Workers

View provides many features to help you conserve storage and reduce the amount of processing power required for various use cases. Many of these features are available as pool settings.

The most fundamental question to consider is whether a certain type of user needs a stateful desktop image or a stateless desktop image. Users who need a stateful desktop image have data in the operating system image itself that must be preserved, maintained, and backed up. For example, these users install some of their own applications or have data that cannot be saved outside of the virtual machine itself, such as on a file server or in an application database.

Stateless desktop images

Stateless architectures have many advantages, such as being easier to support and having lower storage costs. Other benefits include a limited need to back up the linked-clone virtual machines and easier, less expensive disaster recovery and business continuity options.

Stateful desktop images

These images might require traditional image management techniques. Stateful images can have low storage costs in conjunction with certain storage system technologies. Backup and recovery technologies such as VMware Consolidated Backup and VMware Site Recovery Manager are important when considering strategies for backup, disaster recovery, and business continuity.

You create stateless desktop images by using View Composer and creating floating-assignment pools of linked-clone virtual machines.

You create stateful desktop images by creating dedicated-assignment pools of either linked-clone virtual machines or full virtual machines. If you use linked-clone virtual machines, you can configure View Composer persistent disks and folder redirection. Some storage vendors have cost-effective storage solutions for stateful desktop images. These vendors often have their own best practices and provisioning utilities. Using one of these vendors might require that you create a manual dedicated-assignment pool.

Pools for Task Workers

You can standardize on stateless desktop images for task workers so that the image is always in a well-known, easily supportable configuration and so that workers can log in to any available desktop.

Because task workers perform repetitive tasks within a small set of applications, you can create stateless desktop images, which help conserve storage space and processing requirements. Use the following pool settings:

- Create an automated pool so that desktops can be created when the pool is created or can be generated on demand based on pool usage.
- Use floating assignment so that users log in to any available desktop. This setting reduces the number of desktops required if everyone does not need to be logged in at the same time.
- Create View Composer linked-clone desktops so that desktops share the same base image and use less storage space in the datacenter than full virtual machines.
- Determine what action, if any, to take when users log off. Disks grow over time. You can conserve disk space by refreshing the desktop to its original state when users log off. You can also set a schedule for periodically refreshing desktops. For example, you can schedule desktops to refresh daily, weekly, or monthly.

- If applicable, use Virtual SAN datastores. Virtual SAN virtualizes the local physical storage disks available on ESXi hosts into a single datastore shared by all hosts in a vSphere cluster. Virtual SAN also lets you manage virtual machine storage and performance by using storage policy profiles. For more information, see [“Using Virtual SAN for High-Performance Storage and Policy-Based Management,”](#) on page 170.
- If applicable, consider storing desktops on local ESXi datastores. This strategy can offer advantages such as inexpensive hardware, fast virtual-machine provisioning, high-performance power operations, and simple management. For a list of the limitations, see [“Storing Linked Clones on Local Datastores,”](#) on page 181.
- Use the Persona Management feature so that users always have their preferred desktop appearance and application settings, as with Windows user profiles. If you do not have the desktops set to be refreshed or deleted at logoff, you can configure the persona to be removed at logoff.

IMPORTANT View Persona Management facilitates implementing a floating-assignment pool for those users who want to retain settings between sessions. Previously, one of the limitations of floating-assignment desktops was that when end users logged off, they lost all their configuration settings and any data stored in the remote desktop.

Each time end users logged on, their desktop background was set to the default wallpaper, and they would have to configure each application's preferences again. With View Persona Management, an end user of a floating-assignment desktop cannot tell the difference between their session and a session on a dedicated-assignment desktop.

Pools for Knowledge Workers and Power Users

Knowledge workers must be able to create complex documents and have them persist on the desktop. Power users must be able to install their own applications and have them persist. Depending on the nature and amount of personal data that must be retained, the desktop can be stateful or stateless.

Because power users and knowledge workers, such as accountants, sales managers, marketing research analysts, must be able to create and retain documents and settings, you create dedicated-assignment desktops for them. For knowledge workers who do not need user-installed applications except for temporary use, you can create stateless desktop images and save all their personal data outside of the virtual machine, on a file server or in an application database. For other knowledge workers and for power users, you can create stateful desktop images. Use the following pool settings:

- Use dedicated assignment pools so that each knowledge worker or power user logs in to the same desktop every time.
- Use the Persona Management feature so that users always have their preferred desktop appearance and application settings, as with Windows user profiles.
- Use vStorage thin provisioning so that at first, each desktop uses only as much storage space as the disk needs for its initial operation.
- For power users and knowledge workers who must install their own applications, which adds data to the operating system disk, create full virtual machine desktops. Use Mirage to deploy and update applications without overwriting user-installed applications.
- If knowledge workers do not require user-installed applications except for temporary use, you can create View Composer linked-clone desktops. The desktop images share the same base image and use less storage space than full virtual machines.
- If you use View Composer with vSphere 5.1 or later virtual desktops, enable the space reclamation feature for vCenter Server and for the desktop pool. With the space reclamation feature, stale or deleted data within a guest operating system is automatically reclaimed with a wipe and shrink process.

- If you use View Composer linked-clone desktops, implement View Persona Management, roaming profiles, or another profile management solution.

Configure persistent disks so that you can refresh and recompose the linked-clone OS disks while keeping a copy of the user profile on the persistent disks.

Pools for Kiosk Users

Kiosk users might include customers at airline check-in stations, students in classrooms or libraries, medical personnel at medical data entry workstations, or customers at self-service points. Accounts associated with client devices rather than users are entitled to use these desktop pools because users do not need to log in to use the client device or the remote desktop. Users can still be required to provide authentication credentials for some applications.

Virtual machine desktops that are set to run in kiosk mode use stateless desktop images because user data does not need to be preserved in the operating system disk. Kiosk mode desktops are used with thin client devices or locked-down PCs. You must ensure that the desktop application implements authentication mechanisms for secure transactions, that the physical network is secure against tampering and snooping, and that all devices connected to the network are trusted.

As a best practice, use dedicated View Connection Server instances to handle clients in kiosk mode, and create dedicated organizational units and groups in Active Directory for the accounts of these clients. This practice not only partitions these systems against unwarranted intrusion, but also makes it easier to configure and administer the clients.

To set up kiosk mode, you must use the `vmadmin` command-line interface and perform several procedures documented in the topics about kiosk mode in the *View Administration* document. As part of this setup, you can use the following pool settings.

- Create an automated pool so that desktops can be created when the pool is created or can be generated on demand based on pool usage.
- Use floating assignment so that users can access any available desktop in the pool.
- Create View Composer linked-clone desktops so that desktops share the same base image and use less storage space in the datacenter than full virtual machines.
- Institute a refresh policy so that the desktop is refreshed frequently, such as at every user logoff.
- If applicable, use Virtual SAN datastores. Virtual SAN virtualizes the local physical storage disks available on ESXi hosts into a single datastore shared by all hosts in a vSphere cluster. Virtual SAN also lets you manage virtual machine storage and performance by using storage policy profiles. For more information, see [“Using Virtual SAN for High-Performance Storage and Policy-Based Management,”](#) on page 170.
- If applicable, consider storing desktops on local ESXi datastores. This strategy can offer advantages such as inexpensive hardware, fast virtual-machine provisioning, high-performance power operations, and simple management. For a list of the limitations, see [“Storing Linked Clones on Local Datastores,”](#) on page 181.
- Use an Active Directory GPO (group policy object) to configure location-based printing, so that the desktop uses the nearest printer. For a complete list and description of the settings available through Group Policy administrative (ADM) templates, see [Chapter 16, “Configuring Policies for Desktop and Application Pools,”](#) on page 189.
- Use a GPO if you want to override the default policy that enables connecting local USB devices to the desktop when the desktop is launched or when USB devices are plugged in to the client computer.

Advantages of Application Pools

With application pools, you give users access to applications that run on servers in a data center instead of on their personal computers or devices.

Application pools offer several important benefits:

- **Accessibility**

Users can access applications from anywhere on the network. You can also configure secure network access.

- **Device independence**

With application pools, you can support a range of client devices, such as smart phones, tablets, laptops, thin clients, and personal computers. The client devices can run various operating systems, such as Windows, iOS, Mac OS, or Android.

- **Access control**

You can easily and quickly grant or remove access to applications for one user or a group of users.

- **Accelerated deployment**

With application pools, deploying applications can be accelerated because you only deploy applications on servers in a data center and each server can support multiple users.

- **Manageability**

Managing software that is deployed on client computers and devices typically requires significant resources. Management tasks include deployment, configuration, maintenance, support, and upgrades. With application pools, you can simplify software management in an enterprise because the software runs on servers in a data center, which requires fewer installed copies.

- **Security and regulatory compliance**

With application pools, you can improve security because applications and their associated data are centrally located in a data center. Centralized data can address security concerns and regulatory compliance issues.

- **Reduced cost**

Depending on software license agreements, hosting applications in a data center can be more cost-effective. Other factors, including accelerated deployment and improved manageability, can also reduce the cost of software in an enterprise.

Preparing Unmanaged Machines

Users can access remote desktops delivered by machines that are not managed by vCenter Server. These unmanaged machines can include physical computers and virtual machines running on virtualization platforms other than vCenter Server. You must prepare an unmanaged machine to deliver remote desktop access.

For information about preparing machines that are used as Remote Desktop Services (RDS) hosts, see [Chapter 7, “Setting Up Remote Desktop Services Hosts,”](#) on page 81.

This chapter includes the following topics:

- [“Prepare an Unmanaged Machine for Remote Desktop Deployment,”](#) on page 15
- [“Install View Agent on an Unmanaged Machine,”](#) on page 15

Prepare an Unmanaged Machine for Remote Desktop Deployment

You must perform certain tasks to prepare an unmanaged machine for remote desktop deployment.

Prerequisites

- Verify that you have administrative rights on the unmanaged machine.
- To make sure that remote desktop users are added to the local Remote Desktop Users group of the unmanaged machine, create a restricted Remote Desktop Users group in Active Directory. See the *View Installation* document for more information.

Procedure

- 1 Power on the unmanaged machine and verify that it is accessible to the View Connection Server instance.
- 2 Join the unmanaged machine to the Active Directory domain for your remote desktops.
- 3 Configure the Windows firewall to allow Remote Desktop connections to the unmanaged machine.

What to do next

Install View Agent on the unmanaged machine. See [“Install View Agent on an Unmanaged Machine,”](#) on page 15.

Install View Agent on an Unmanaged Machine

You must install View Agent on an all unmanaged machines. View cannot manage an unmanaged machine unless View Agent is installed.

To install View Agent on multiple Windows physical computers without having to respond to wizard prompts, you can install View Agent silently. See [“Install View Agent Silently,”](#) on page 28.

Prerequisites

- Verify that you have administrative rights on the unmanaged machine.
- To use an unmanaged Windows Server 2008 R2 machine as a remote desktop rather than as an RDS host, perform the steps described in “[Prepare Windows Server 2008 R2 for Desktop Use](#),” on page 24.
- Familiarize yourself with the View Agent custom setup options for unmanaged machines. See “[View Agent Custom Setup Options for Unmanaged Machines](#),” on page 17.
- Familiarize yourself with the TCP ports that the View Agent installation program opens on the firewall. See the *View Architecture Planning* document for more information.
- Download the View Agent installer file from the VMware product page at <http://www.vmware.com/products/>.

Procedure

- 1 To start the View Agent installation program, double-click the installer file.

The installer filename is `VMware-viewagent-y.y.y-xxxxxx.exe` or `VMware-viewagent-x86_64-y.y.y-xxxxxx.exe`, where `y.y.y` is the version number and `xxxxxx` is the build number.

- 2 Accept the VMware license terms.
- 3 Select your custom setup options.
- 4 Accept or change the destination folder.
- 5 In the **Server** text box, type the host name or IP address of a View Connection Server host.

During installation, the installer registers the unmanaged machine with this View Connection Server instance. After registration, the specified View Connection Server instance, and any additional instances in the same View Connection Server group, can communicate with the unmanaged machine.

- 6 Select an authentication method to register the unmanaged machine with the View Connection Server instance.

Option	Action
Authenticate as the currently logged in user	The Username and Password text boxes are disabled and you are logged in to the View Connection Server instance with your current username and password.
Specify administrator credentials	You must provide the username and password of a View Connection Server administrator in the Username and Password text boxes.

The user account must be a domain user with access to View LDAP on the View Connection Server instance. A local user does not work.

- 7 Follow the prompts in the View Agent installation program and finish the installation.
- 8 If you selected the USB redirection option, restart the unmanaged machine to enable USB support.

In addition, the **Found New Hardware** wizard might start. Follow the prompts in the wizard to configure the hardware before you restart the unmanaged machine.

The VMware Horizon View Agent service is started on the unmanaged machine.

If Windows Media Player is not installed, the View Agent installation program does not install the multimedia redirection (MMR) feature. If you install Windows Media Player after installing View Agent, you can install the MMR feature by running the View Agent installation program again and selecting the Repair option.

What to do next

Use the unmanaged machine to create a remote desktop. See “[Manual Desktop Pools](#),” on page 75.

View Agent Custom Setup Options for Unmanaged Machines

When you install View Agent on an unmanaged machine, you can select or deselect certain custom setup options. In addition, View Agent installs certain features automatically on all guest operating systems on which they are supported. These features are not optional.

Table 2-1. View Agent Custom Setup Options for Unmanaged Machines

Option	Description
USB Redirection	<p>Gives users access to locally connected USB devices on their desktops.</p> <p>USB redirection is supported on remote desktops that are deployed on single-user machines but is not supported on RDS host-based remote desktops.</p> <p>NOTE You can use group policy settings to disable USB redirection for specific users.</p>
View Persona Management	<p>Synchronizes the user profile on the local desktop with a remote profile repository, so that users have access to their profiles whenever they log in to a desktop.</p>
PCoIP Smartcard	<p>Lets users authenticate with smart cards when they use the PCoIP display protocol.</p> <p>PCoIP Smartcard is supported on remote desktops that are deployed on single-user machines but is not supported on RDS host-based remote desktops.</p>

Table 2-2. View Agent Features That Are Installed Automatically on Unmanaged Machines

Option	Description
PCoIP Agent	<p>Lets users connect to the remote desktop with the PCoIP display protocol.</p> <p>The PCoIP Agent feature is supported on physical machines that are configured with a Teradici TERA host card.</p> <p>NOTE On Windows Vista, if you install the PCoIP Agent component, the Windows group policy Disable or enable software Secure Attention Sequence is enabled and set to Services and Ease of Access applications. If you change this setting, single sign-on does not work correctly.</p>
Wyse Multimedia Redirection (MMR)	<p>Provide multimedia redirection to Windows XP and Windows Vista desktops and clients. This feature delivers a multimedia stream directly to the client computer, allowing the multimedia stream to be processed on the client hardware instead of the remote ESXi host.</p>
Lync	<p>Provides support for Microsoft Lync 2013 Client on remote desktops.</p>
Unity Touch	<p>Allows tablet and smart phone users to interact easily with Windows applications that run on the remote desktop.</p> <p>Users can browse, search, and open Windows applications and files, choose favorite applications and files, and switch between running applications, all without using the Start menu or Taskbar.</p>
Virtual audio driver	<p>Provides a virtual audio driver on the remote desktop.</p>

Creating and Preparing Virtual Machines

3

You can use virtual machines managed by vCenter Server to provision and deploy remote desktops. You can use a virtual machine managed by vCenter Server as a template for an automated pool, a parent for a linked-clone pool, or a machine in a manual pool. You must prepare virtual machines to deliver remote desktop access.

This chapter includes the following topics:

- [“Creating Virtual Machines for Remote Desktop Deployment,”](#) on page 19
- [“Install View Agent on a Virtual Machine,”](#) on page 25
- [“Install View Agent Silently,”](#) on page 28
- [“Configure a Virtual Machine with Multiple NICs for View Agent,”](#) on page 34
- [“Optimize Guest Operating System Performance for All Windows Versions,”](#) on page 34
- [“Optimize Windows 7 and Windows 8 Guest Operating System Performance,”](#) on page 35
- [“Optimizing Windows 7 and Windows 8 for Linked-Clone Virtual Machines,”](#) on page 36
- [“Preparing Virtual Machines for View Composer,”](#) on page 43
- [“Creating Virtual Machine Templates,”](#) on page 49
- [“Creating Customization Specifications,”](#) on page 50

Creating Virtual Machines for Remote Desktop Deployment

The initial virtual machine establishes a virtual hardware profile and operating system to be used for rapid deployment of remote desktops.

- 1 [Create a Virtual Machine for Remote Desktop Deployment](#) on page 20
You use vSphere Client to create virtual machines in vCenter Server for remote desktops.
- 2 [Install a Guest Operating System](#) on page 22
After you create a virtual machine, you must install a guest operating system.
- 3 [Prepare a Guest Operating System for Remote Desktop Deployment](#) on page 22
You must perform certain tasks to prepare a guest operating system for remote desktop deployment.
- 4 [Prepare Windows Server 2008 R2 for Desktop Use](#) on page 24
To use a Windows Server 2008 R2 virtual machine as a single-session View desktop (rather than as an RDS host), you must perform certain steps before you install View Agent in the virtual machine. You must also configure View Administrator to treat Windows Server 2008 R2 as a supported operating system for View desktop use.

Create a Virtual Machine for Remote Desktop Deployment

You use vSphere Client to create virtual machines in vCenter Server for remote desktops.

Prerequisites

- Upload an ISO image file of the guest operating system to a datastore on your ESXi server.
- Familiarize yourself with the custom configuration parameters for virtual machines. See [“Virtual Machine Custom Configuration Parameters,”](#) on page 20.

Procedure

- 1 In vSphere Client, log in to the vCenter Server system.
- 2 Select **File > New > Virtual Machine** to start the New Virtual Machine wizard.
- 3 Select **Custom** and configure custom configuration parameters.
- 4 Select **Edit the virtual machine settings before completion** and click **Continue** to configure hardware settings.
 - a Add a CD/DVD drive, set the media type to use an ISO image file, select the ISO image file of the guest operating system that you uploaded to your datastore, and select **Connect at power on**.
 - b If you are installing a Windows XP guest operating system, add a floppy drive and set the **Device Type** to **Client Device**.
 - c Set **Power-on Boot Delay** to 10,000 milliseconds.
- 5 Click **Finish** to create the virtual machine.

What to do next

Install a guest operating system on the virtual machine.

Virtual Machine Custom Configuration Parameters

You can use virtual machine custom configuration parameters as baseline settings when you create a virtual machine for remote desktop deployment.

You can change certain settings when you use View Administrator to deploy desktop pools from the virtual machine.

Table 3-1. Custom Configuration Parameters

Parameter	Description and Recommendations
Name and Location	The name and location of the virtual machine. If you plan to use the virtual machine as a template, assign a generic name. The location can be any folder within your datacenter inventory.
Host/Cluster	The ESXi server or cluster of server resources that will run the virtual machine. If you plan to use the virtual machine as a template, the location of the initial virtual machine does not necessarily specify where future virtual machines created from template will reside.
Resource Pool	If the physical ESXi server resources are divided into resource pools, you can assign them to the virtual machine.
Datastore	The location of files associated with the virtual machine.

Table 3-1. Custom Configuration Parameters (Continued)

Parameter	Description and Recommendations
Hardware Machine Version	The hardware machine version that is available depends on the ESXi version you are running. As a best practice, select the latest available hardware machine version, which provides the greatest virtual machine functionality. Certain View features require minimum hardware machine versions.
Guest Operating System	The type of operating system that you will install in the virtual machine.
CPUs	The number of virtual processors in the virtual machine. For most guest operating systems, a single processor is sufficient.
Memory	The amount of memory to allocate to the virtual machine. In most cases, 512MB is sufficient.
Network	<p>The number of virtual network adapters (NICs) in the virtual machine.</p> <p>One NIC is usually sufficient. The network name should be consistent across virtual infrastructures. An incorrect network name in a template can cause failures during the instance customization phases.</p> <p>When you install View Agent on a virtual machine that has more than one NIC, you must configure the subnet that View Agent uses. See “Configure a Virtual Machine with Multiple NICs for View Agent,” on page 34 for more information.</p> <p>IMPORTANT For Windows 8, Windows 7, Windows Vista, and Windows Server 2008 R2 operating systems, you must select the VMXNET 3 network adapter. Using the default E1000 adapter can cause customization timeout errors on virtual machines. To use the VMXNET 3 adapter, you must install a Microsoft hotfix patch:</p> <ul style="list-style-type: none"> ■ For Windows 7 SP1: http://support.microsoft.com/kb/2550978 ■ For Windows 7 versions previous to SP1: http://support.microsoft.com/kb/2344941
SCSI Controller	<p>The type of SCSI adapter to use with the virtual machine. For Windows 8, Windows 7, and Windows XP guest operating systems, you should specify the LSI Logic adapter. The LSI Logic adapter has improved performance and works better with generic SCSI devices.</p> <p>LSI Logic SAS is available only for virtual machines with hardware version 7 and later.</p> <p>NOTE Windows XP does not include a driver for the LSI Logic adapter. You must download the driver from the LSI Logic Web site.</p>
Select a Disk	<p>The disk to use with the virtual machine.</p> <p>Create a new virtual disk based on the amount of local storage that you decide to allocate to each user. Allow enough storage space for the OS installation, patches, and locally installed applications.</p> <p>To reduce the need for disk space and management of local data, you should store the user's information, profile, and documents on network shares rather than on a local disk.</p>

Install a Guest Operating System

After you create a virtual machine, you must install a guest operating system.

Prerequisites

- Verify that an ISO image file of the guest operating system is on a datastore on your ESXi server.
- Verify that the CD/DVD drive in the virtual machine points to the ISO image file of the guest operating system and that the CD/DVD drive is configured to connect at power on.
- If you are installing Windows XP and you selected the LSI Logic adapter for the virtual machine, download the LSI20320-R controller driver from the LSI Logic Web site, create a floppy image (.flp) file that contains the driver, and upload the file to a datastore on your server.

Procedure

- 1 In vSphere Client, log in to the vCenter Server system where the virtual machine resides.
- 2 Right-click the virtual machine, select **Power**, and select **Power On** to start the virtual machine.
Because you configured the CD/DVD drive to point to the ISO image of the guest operating system and to connect at power on, the guest operating system installation process begins automatically.
- 3 Click the **Console** tab and follow the installation instructions provided by the operating system vendor.
- 4 If you are installing Windows XP and you selected the LSI Logic adapter for the virtual machine, install the LSI Logic driver during the Windows setup process.
 - a Press F6 to select additional SCSI drivers.
 - b Type **S** to specify an additional device.
 - c On the vSphere Client toolbar, click **Connect Floppy** to select the LSI Logic driver floppy image (.flp) file.
 - d Return to the Windows Setup screen and press Enter to continue the Windows setup process.
 - e When the Windows setup process has finished, disconnect the virtual floppy disk drive.
- 5 If you are installing Windows 7 or Windows 8, activate Windows online.

What to do next

Prepare the guest operating system for View desktop deployment.

Prepare a Guest Operating System for Remote Desktop Deployment

You must perform certain tasks to prepare a guest operating system for remote desktop deployment.

Prerequisites

- Create a virtual machine and install a guest operating system.
- Configure an Active Directory domain controller for your remote desktops. See the *View Installation* document for more information.
- To make sure that desktop users are added to the local Remote Desktop Users group of the virtual machine, create a restricted Remote Desktop Users group in Active Directory. See the *View Installation* document for more information.
- Verify that Remote Desktop Services, called Terminal Services on Windows XP systems, are started on the virtual machine. Remote Desktop Services are required for View Agent installation, SSO, and other View operations. You can disable RDP access to your View desktops by configuring desktop pool settings and group policy settings. See [“Prevent Access to View Desktops Through RDP,”](#) on page 120.

- Verify that you have administrative rights on the guest operating system.
- On Windows Vista operating systems, verify that the Windows Update Service is enabled. If you disable this service on Windows Vista, the View Agent installer fails to install the USB driver.
- On Windows Server 2008 R2 operating systems, prepare the operating system for desktop use. See [“Prepare Windows Server 2008 R2 for Desktop Use,”](#) on page 24.
- If you intend to configure 3D graphics rendering for desktop pools, familiarize yourself with the **Enable 3D Support** setting for virtual machines.

This setting is active on Windows 7 and later operating systems. On ESXi 5.1 and later hosts, you can also select options that determine how the 3D renderer is managed on the ESXi host. For details, see the *vSphere Virtual Machine Administration* document.

Procedure

- 1 In vSphere Client, log in to the vCenter Server system where the virtual machine resides.
- 2 Right-click the virtual machine, select **Power**, and select **Power On** to start the virtual machine.
- 3 Right-click the virtual machine, select **Guest**, and select **Install/Upgrade VMware Tools** to install the latest version of VMware Tools.

NOTE The virtual printing feature is supported only when you install it from View Agent. Virtual printing is not supported if you install it with VMware Tools.

- 4 Use the VMware Tools time synchronization function to ensure that the virtual machine is synchronized to ESXi.

ESXi must synchronize to an external NTP source, for example, the same time source as Active Directory.

Disable other time synchronization mechanisms such as Windows Time Service.

The VMware Tools online help provides information on configuring time synchronization between guest and host.

- 5 Install service packs and updates.
- 6 Install antivirus software.
- 7 Install other applications and software, such as Windows Media Player if you are using MMR and smart card drivers if you are using smart card authentication.

If you plan to use Workspace to offer a catalog that includes ThinApp applications, you must install Workspace for Windows.

On Windows XP systems, install all third-party applications and software (except Microsoft .NET Framework) before you install View Agent.

IMPORTANT If you are installing Microsoft .NET Framework, you must install it after you install View Agent.

- 8 If Horizon Client devices will connect to the virtual machine with the PCoIP display protocol, set the power option **Turn off the display** to **Never**.

If you do not disable this setting, the display will appear to freeze in its last state when power savings mode starts.

- 9 If Horizon Client devices will connect to the virtual machine with the PCoIP display protocol, go to **Control Panel > System > Advanced System Settings > Performance Settings** and change the setting for **Visual Effects** to **Adjust for best performance**.

If you instead use the setting called **Adjust for best appearance** or **Let Windows choose what's best for my computer** and Windows chooses appearance instead of performance, performance is negatively affected.

- 10 If a proxy server is used in your network environment, configure network proxy settings.
- 11 Configure network connection properties.
 - a Assign a static IP address or specify that an IP address is assigned by a DHCP server.
View does not support link-local (169.254.x.x) addresses for View desktops.
 - b Set the preferred and alternate DNS server addresses to your Active Directory server address.

- 12 Join the virtual machine to the Active Directory domain for your remote desktops.

A parent virtual machine that you use for View Composer must either belong to the same Active Directory domain as the domain that the linked-clone desktops will join or be a member of the local WORKGROUP.

- 13 Configure the Windows firewall to allow Remote Desktop connections to the virtual machine.

- 14 (Optional) Disable Hot Plug PCI devices.

This step prevents users from accidentally disconnecting the virtual network device (vNIC) from the virtual machine.

- 15 (Optional) Configure user customization scripts.

What to do next

Install View Agent. See [“Install View Agent on a Virtual Machine,”](#) on page 25.

Prepare Windows Server 2008 R2 for Desktop Use

To use a Windows Server 2008 R2 virtual machine as a single-session View desktop (rather than as an RDS host), you must perform certain steps before you install View Agent in the virtual machine. You must also configure View Administrator to treat Windows Server 2008 R2 as a supported operating system for View desktop use.

Procedure

- 1 Verify that the Remote Desktop Services role is not installed.

When the Remote Desktop Services role is not present, the View Agent installer prompts you to confirm that you want to install View Agent in desktop mode. If the Remote Desktop Services role is present, the View Agent installer does not display this prompt and it treats the Windows Server 2008 R2 machine as an RDS host instead of a single-session View desktop.

- 2 Install Windows Server 2008 R2 Service Pack 1 (SP1).

If you do not install SP1, an error occurs when you install View Agent.

- 3 Install the Windows Server 2008 R2 Desktop Experience feature.

If you do not install this feature, HTML Access does not work correctly on View desktops that are deployed from a Windows Server 2008 R2 virtual machine.

- 4 (Optional) To use Windows Aero on a Windows Server 2008 R2 desktop, manually enable the Desktop Experience feature and start the Themes service.

When you create or edit a desktop pool, you can configure 3D graphics rendering for your desktops. The 3D Renderer setting offers a Software option that enables users to run Windows Aero on the desktops in the pool.

- 5 Configure View Administrator to treat Windows Server 2008 R2 as a supported desktop operating system.

If you do not perform this step, you cannot select Windows Server 2008 R2 machines for desktop use in View Administrator.

- a In View Administrator, select **View Configuration > Global Settings**.
- b In the General pane, click **Edit**.
- c Select the **Enable Windows Server 2008 R2 desktops** check box and click **OK**.

When you enable Windows Server 2008 R2 desktops in View Administrator, View Administrator displays all available Windows Server 2008 R2 machines, including machines on which View Connection Server is installed, as potential machines for desktop use. You cannot install View Agent on machines on which other View software components are installed.

Install View Agent on a Virtual Machine

You must install View Agent on virtual machines that are managed by vCenter Server so that View Connection Server can communicate with them. Install View Agent on all virtual machines that you use as templates for automated desktop pools, parents for linked-clone desktop pools, and machines in manual desktop pools.

To install View Agent on multiple Windows virtual machines without having to respond to wizard prompts, you can install View Agent silently. See [“Install View Agent Silently,”](#) on page 28.

The View Agent software cannot coexist on the same virtual or physical machine with any other View software component, including a security server, View Connection Server, View Composer, or Horizon Client.

Prerequisites

- Prepare the guest operating system for remote desktop deployment. See [“Prepare a Guest Operating System for Remote Desktop Deployment,”](#) on page 22.
- To use a Windows Server 2008 R2 virtual machine as a remote desktop (rather than as an RDS host), perform the steps described in [“Prepare Windows Server 2008 R2 for Desktop Use,”](#) on page 24.
- Download the View Agent installer file from the VMware product page at <http://www.vmware.com/products/>.
- Verify that you have administrative rights on the virtual machine.
- Familiarize yourself with the View Agent custom setup options. See [“View Agent Custom Setup Options,”](#) on page 26.
- Familiarize yourself with the TCP ports that the View Agent installation program opens on the firewall. See the *View Architecture Planning* document for more information.
- If you select the View Composer Agent custom setup option, verify that you have a license to use View Composer.

Procedure

- 1 To start the View Agent installation program, double-click the installer file.
The installer filename is `VMware-viewagent-y.y.y-xxxxxx.exe` or `VMware-viewagent-x86_64-y.y.y-xxxxxx.exe`, where *y.y.y* is the version number and *xxxxxx* is the build number.
- 2 Accept the VMware license terms.
- 3 Select your custom setup options.
To deploy linked-clone desktops, select the **View Composer Agent** option.
- 4 Accept or change the destination folder.
- 5 Follow the prompts in the View Agent installation program and finish the installation.

NOTE If you did not enable Remote Desktop support during guest operating system preparation, the View Agent installation program prompts you to enable it. If you do not enable Remote Desktop support during View Agent installation, you must enable it manually after the installation is finished.

- 6 If you selected the USB redirection option, restart the virtual machine to enable USB support.
In addition, the **Found New Hardware** wizard might start. Follow the prompts in the wizard to configure the hardware before you restart the virtual machine.

The VMware Horizon View Agent service is started on the virtual machine.

If you selected the **View Composer Agent** option, the VMware Horizon View Composer Guest Agent Server service is started on the virtual machine.

If Windows Media Player is not installed, the View Agent installation program does not install the multimedia redirection (MMR) feature. If you install Windows Media Player after installing View Agent, you can install the MMR feature by running the View Agent installation program again and selecting the Repair option.

What to do next

If the virtual machine has multiple NICs, configure the subnet that View Agent uses. See [“Configure a Virtual Machine with Multiple NICs for View Agent,”](#) on page 34.

View Agent Custom Setup Options

When you install View Agent on a virtual machine, you can select or deselect custom setup options. In addition, View Agent installs certain features automatically on all guest operating systems on which they are supported. These features are not optional.

To learn which features are supported on which guest operating systems, see "Feature Support Matrix for View Agent" in the *View Architecture Planning* document.

All custom setup options except PCoIP Smartcard are selected by default.

Table 3-2. View Agent Custom Setup Options

Option	Description
USB Redirection	<p>Gives users access to locally connected USB devices on their desktops.</p> <p>USB redirection is supported on remote desktops that are deployed on single-user machines but is not supported on RDS host-based remote desktops.</p> <p>NOTE You can use group policy settings to disable USB redirection for specific users.</p>
HTML Access	<p>Allows users to connect to View desktops by using HTML Access. The HTML Access Agent must be installed on View desktops to allow users to make connections with HTML Access.</p>
View Composer Agent	<p>Lets View Agent run on the linked-clone desktops that are deployed from this virtual machine.</p>
Real-Time Audio-Video	<p>Redirects webcam and audio devices that are connected to the client system so that they can be used on the remote desktop.</p>
Virtual Printing	<p>Lets users print to any printer available on their Windows client computers. Users do not have to install additional drivers on their desktops.</p> <p>The virtual printing feature is supported only when you install it from View Agent. It is not supported if you install it with VMware Tools.</p>
vCenter Operations Manager Agent	<p>Provides information that allows vCenter Operations Manager for View to monitor View desktops.</p>
View Persona Management	<p>Synchronizes the user profile on the local desktop with a remote profile repository, so that users have access to their profiles whenever they log in to a desktop.</p>
PCoIP Smartcard	<p>Lets users authenticate with smart cards when they use the PCoIP display protocol. This feature is not installed by default.</p> <p>PCoIP Smartcard is supported on remote desktops that are deployed on single-user machines but is not supported on RDS host-based remote desktops.</p>

Table 3-3. View Agent Features That Are Installed Automatically

Option	Description
PCoIP Agent	<p>Lets users connect to the View desktop using the PCoIP display protocol.</p> <p>Installing the PCoIP Agent feature disables sleep mode on Windows 8, Windows 7, and Windows Vista desktops and standby mode on Windows XP desktops. When a user navigates to the Power Options or Shut Down menu, sleep mode or standby mode is inactive. Desktops do not go into sleep or standby mode after a default period of inactivity. Desktops remain in active mode.</p> <p>NOTE If you install the PCoIP Agent feature on Windows Vista, the Windows group policy Disable or enable software Secure Attention Sequence is enabled and set to Services and Ease of Access applications. If you change this setting, single sign-on does not work correctly.</p>
Wyse Multimedia Redirection (MMR)	Provide multimedia redirection to Windows XP and Windows Vista desktops and clients. This feature delivers a multimedia stream directly to the client computer, allowing the multimedia stream to be processed on the client hardware instead of the remote ESXi host.
Win7 Multimedia Redirection (MMR)	Extends multimedia redirection to Windows 7 desktops and clients. This feature delivers a multimedia stream directly to the client computer, allowing the multimedia stream to be processed on the client hardware instead of the remote ESXi host.
Lync	Provides support for Microsoft Lync 2013 Client on View desktops.
Virtual Printing with PCoIP	Provides virtual printing over PCoIP. This feature lets users print to any printer available on their Windows client computers. Users do not have to install additional drivers on their desktops.
Unity Touch	Allows tablet and smart phone users to interact easily with Windows applications that run on the remote desktop. Users can browse, search, and open Windows applications and files, choose favorite applications and files, and switch between running applications, all without using the Start menu or Taskbar.
Virtual video driver	Provides a virtual video driver on the remote desktop.
Virtual audio driver	Provides a virtual audio driver on the remote desktop.

Install View Agent Silently

You can use the silent installation feature of the Microsoft Windows Installer (MSI) to install View Agent on several Windows virtual machines or physical computers. In a silent installation, you use the command line and do not have to respond to wizard prompts.

With silent installation, you can efficiently deploy View components in a large enterprise.

If you do not want to install all features that are installed automatically or by default, you can use the ADDLOCAL MSI property to selectively install individual setup options and features. For details about the ADDLOCAL property, see [Table 3-5](#).

Prerequisites

- Prepare the guest operating system for desktop deployment. See [“Prepare a Guest Operating System for Remote Desktop Deployment,”](#) on page 22.

- To use Windows Server 2008 R2 as a single-session remote desktop (rather than as an RDS host), perform the steps described in “[Prepare Windows Server 2008 R2 for Desktop Use](#),” on page 24.
- Download the View Agent installer file from the VMware product page at <http://www.vmware.com/products/>.
The installer filename is VMware-viewagent-y.y.y-xxxxxx.exe or VMware-viewagent-x86_64-y.y.y-xxxxxx.exe, where y.y.y is the version number and xxxxxx is the build number.
- Verify that you have administrative rights on the virtual machine or physical PC.
- Familiarize yourself with the View Agent custom setup options. See “[View Agent Custom Setup Options](#),” on page 26.
- If you select the View Composer Agent custom setup option, verify that you have a license to use View Composer.
- Familiarize yourself with the MSI installer command-line options. See “[Microsoft Windows Installer Command-Line Options](#),” on page 30.
- Familiarize yourself with the silent installation properties available with View Agent. See “[Silent Installation Properties for View Agent](#),” on page 31.
- Familiarize yourself with the TCP ports that the View Agent installation program opens on the firewall. See the *View Architecture Planning* document for more information.
- Verify that the latest Windows Update patches are installed on the guest operating systems on which you plan to install View Agent silently. In certain cases, an interactive installation by an administrator might be required to execute pending Windows Update patches. Verify that all OS operations and subsequent reboots are completed.

Procedure

- 1 Open a Windows command prompt on the virtual machine or physical PC.
- 2 Type the installation command on one line.

This example installs View Agent in a virtual machine that is managed by vCenter Server. The installer configures the PCoIP, View Composer Agent, Virtual Printing, USB redirection, HTML Access, Unity Touch, Real-Time Audio-Video, and Windows 7 MMR custom setup options.

```
VMware-viewagent-y.y.y-xxxxxx.exe /s /v"/qn VDM_VC_MANAGED_AGENT=1
ADDLOCAL=Core,PCoIP,SVIAgent,ThinPrint,USB,HtmlAccess,UnityTouch,RTAV,MMR"
```

This example installs View Agent on an unmanaged computer and registers the desktop with the specified View Connection Server, cs1.companydomain.com. The installer configures the SSO, Virtual Printing, and USB redirection custom setup options.

```
VMware-viewagent-y.y.y-xxxxxx.exe /s /v"/qn VDM_VC_MANAGED_AGENT=0
VDM_SERVER_NAME=cs1.companydomain.com VDM_SERVER_USERNAME=admin.companydomain.com
VDM_SERVER_PASSWORD=secret ADDLOCAL=Core,ThinPrint,USB"
```

The VMware Horizon View Agent service is started on the virtual machine.

If you selected the **View Composer Agent** option, the VMware Horizon View Composer Guest Agent Server service is started on the virtual machine.

If Windows Media Player is not installed, the View Agent installation program does not install the multimedia redirection (MMR) feature. If you install Windows Media Player after installing View Agent, you can install the MMR feature by running the View Agent installation program again and selecting the Repair option.

What to do next

If the virtual machine has multiple NICs, configure the subnet that View Agent uses. See [“Configure a Virtual Machine with Multiple NICs for View Agent,”](#) on page 34.

Microsoft Windows Installer Command-Line Options

To install View components silently, you must use Microsoft Windows Installer (MSI) command-line options and properties. The View component installers are MSI programs and use standard MSI features.

For details about MSI, see the Microsoft Web site. For MSI command-line options, see the Microsoft Developer Network (MSDN) Library Web site and search for MSI command-line options. To see MSI command-line usage, you can open a command prompt on the View component computer and type `msiexec /?`.

To run a View component installer silently, you begin by silencing the bootstrap program that extracts the installer into a temporary directory and starts an interactive installation.

At the command line, you must enter command-line options that control the installer's bootstrap program.

Table 3-4. Command-Line Options for a View Component's Bootstrap Program

Option	Description
<code>/s</code>	<p>Disables the bootstrap splash screen and extraction dialog, which prevents the display of interactive dialogs.</p> <p>For example: <code>VMware-viewconnectionserver-y.y.y-xxxxxx.exe /s</code></p> <p>The <code>/s</code> option is required to run a silent installation.</p>
<code>/v"MSI_command_line_options"</code>	<p>Instructs the installer to pass the double-quote-enclosed string that you enter at the command line as a set of options for MSI to interpret. You must enclose your command-line entries between double quotes. Place a double quote after the <code>/v</code> and at the end of the command line.</p> <p>For example: <code>VMware-viewagent-y.y.y-xxxxxx.exe /s /v"command_line_options"</code></p> <p>To instruct the MSI installer to interpret a string that contains spaces, enclose the string in two sets of double quotes. For example, you might want to install the View component in an installation path name that contains spaces.</p> <p>For example: <code>VMware-viewconnectionserver-y.y.y-xxxxxx.exe /s /v"command_line_options INSTALLDIR=""d:\abc\my folder""</code></p> <p>In this example, the MSI installer passes on the installation-directory path and does not attempt to interpret the string as two command-line options. Note the final double quote that encloses the entire command line.</p> <p>The <code>/v"command_line_options"</code> option is required to run a silent installation.</p>

You control the remainder of a silent installation by passing command-line options and MSI property values to the MSI installer, `msiexec.exe`. The MSI installer includes the View component's installation code. The installer uses the values and options that you enter in the command line to interpret installation choices and setup options that are specific to the View component.

Table 3-5. MSI Command-Line Options and MSI Properties

MSI Option or Property	Description
/qn	<p>Instructs the MSI installer not to display the installer wizard pages.</p> <p>For example, you might want to install View Agent silently and use only default setup options and features:</p> <pre>VMware-viewagent-y.y.y-xxxxxx.exe /s /v"/qn"</pre> <p>Alternatively, you can use the /qb option to display the wizard pages in a noninteractive, automated installation. As the installation proceeds, the wizard pages are displayed, but you cannot respond to them.</p> <p>The /qn or /qb option is required to run a silent installation.</p>
INSTALLDIR	<p>Specifies an alternative installation path for the View component.</p> <p>Use the format <i>INSTALLDIR=path</i> to specify an installation path. You can ignore this MSI property if you want to install the View component in the default path.</p> <p>This MSI property is optional.</p>
ADDLOCAL	<p>Determines the component-specific features to install. In an interactive installation, the View installer displays custom setup options to select and automatically installs other features. The ADDLOCAL property lets you specify these options and features on the command line. You can use ADDLOCAL to selectively install individual setup options and features. Features that you do not explicitly specify are not installed.</p> <p>Type ADDLOCAL=ALL to install all features that are installed automatically (on supported guest operating systems) and all custom setup options that are installed by default.</p> <p>For example: <code>VMware-viewagent-y.y.y-xxxxxx.exe /s /v"/qn ADDLOCAL=ALL"</code></p> <p>If you do not use the ADDLOCAL property, the default setup options and automatically installed features are installed. Typing ADDLOCAL=ALL and not using the ADDLOCAL property have the same effect.</p> <p>To specify individual setup options and features, type a comma-separated list of setup option names. Do not use spaces between names. Use the format <code>ADDLOCAL=value,value,value...</code>. In contrast to an interactive installation, this method installs only the specified features.</p> <p>For example, you might want to install View Agent in a guest operating system with the View Composer Agent and PCoIP features:</p> <pre>VMware-viewagent-y.y.y-xxxxxx.exe /s /v"/qn ADDLOCAL=Core,SVIAgent,PCoIP"</pre> <p>IMPORTANT The Core feature is required if you specify individual features with <code>ADDLOCAL=value,value,value...</code></p> <p>The ADDLOCAL MSI property is optional.</p>
REBOOT	<p>You can use the REBOOT=ReallySuppress option to allow system configuration tasks to complete before the system reboots.</p> <p>This MSI property is optional.</p>
/l*v log_file	<p>Writes logging information into the specified log file with verbose output.</p> <p>For example: <code>/l*v ""%TEMP%\vmmsi.log""</code></p> <p>This example generates a detailed log file that is similar to the log generated during an interactive installation.</p> <p>You can use this option to record custom features that might apply uniquely to your installation. You can use the recorded information to specify installation features in future silent installations.</p> <p>The /l*v option is optional.</p>

Silent Installation Properties for View Agent

You can include specific properties when you silently install View Agent from the command line. You must use a *PROPERTY=value* format so that Microsoft Windows Installer (MSI) can interpret the properties and values.

Table 3-6 shows the View Agent silent installation properties that you can use at the command-line.

Table 3-6. MSI Properties for Silently Installing View Agent

MSI Property	Description	Default Value
INSTALLDIR	The path and folder in which the View Agent software is installed. For example: <code>INSTALLDIR=""D:\abc\my folder""</code> The sets of two double quotes that enclose the path permit the MSI installer to ignore the space in the path. This MSI property is optional.	%ProgramFiles %\VMware\VMware View\Agent
RDPCHOICE	Determines whether to enable Remote Desktop Protocol (RDP) on the desktop. A value of 1 enables RDP. A value of 0 leaves the RDP setting disabled. This MSI property is optional.	1
UNITY_DEFAULT_APPS	Specifies a default list of default favorite applications that are displayed in the Unity Touch sidebar on a mobile device. This property was created to support the Unity Touch component. It is not a general MSI property. For information about configuring a default list of favorite applications and about the syntax and format to use with this property, see “Configure Favorite Applications Displayed by Unity Touch,” on page 130. This MSI property is optional.	
VDM_VC_MANAGED_AGENT	Determines whether vCenter Server manages the virtual machine on which View Agent is installed. A value of 1 configures the desktop as a vCenter Server-managed virtual machine. A value of 0 configures the desktop as unmanaged by vCenter Server. This MSI property is required.	None
VDM_SERVER_NAME	The host name or IP address of the View Connection Server computer on which the View Agent installer registers an unmanaged desktop. This property applies to unmanaged desktops only. For example: <code>VDM_SERVER_NAME=10.123.01.01</code> This MSI property is required for unmanaged desktops. Do not use this MSI property for virtual-machine desktops that are managed by vCenter Server.	None
VDM_SERVER_USERNAME	The user name of the administrator on the View Connection Server computer. This MSI property applies to unmanaged desktops only. For example: <code>VDM_SERVER_USERNAME=admin.companydomain.com</code> This MSI property is required for unmanaged desktops. Do not use this MSI property for virtual-machine desktops that are managed by vCenter Server.	None
VDM_SERVER_PASSWORD	The View Connection Server administrator user password. For example: <code>VDM_SERVER_PASSWORD=secret</code> This MSI property is required for unmanaged desktops. Do not use this MSI property for virtual-machine desktops that are managed by vCenter Server.	None

In a silent installation command, you can use the MSI property, `ADDLOCAL=`, to specify features that the View Agent installer configures.

If you specify individual features with the `ADDLOCAL=` property, you must include the Core feature.

[Table 3-7](#) shows the View Agent features you can type at the command line that have corresponding setup options that you can deselect or select during an interactive installation. For details about the custom setup options, see [“View Agent Custom Setup Options,”](#) on page 26.

During an interactive installation, all of these features except PCoIP Smartcard are installed by default.

Table 3-7. View Agent Silent Installation Features and Interactive Custom Setup Options

Silent Installation Feature	Custom Setup Option in an Interactive Installation
USB	USB Redirection
HtmlAccess	HTML Access Agent
SVIAgent	View Composer Agent
RTAV	Real-Time Audio-Video
ThinPrint	Virtual Printing
V4V	vCenter Operations Manager for View
VPA	View Persona Management
Smartcard	PCoIP Smartcard. This feature is not installed by default in an interactive installation.

Table 3-8 shows the View Agent features you can type at the command line that are installed automatically during an interactive installation. The features are installed on all guest operating systems on which they are supported. These features do not have corresponding setup options in an interactive installation.

Table 3-8. View Agent Silent Installation Features That Are Installed Automatically in an Interactive Installation

Silent Installation Feature	Description
Core	The core View Agent functions. If you specify individual features with the ADDLOCAL= property, you must include Core. If you specify ADDLOCAL=ALL, the Core features are installed.
ThinPrintPCoIP	Virtual Printing with PCoIP
PCoIP	PCoIP Protocol Agent
VmVideo	Virtual video driver
VmwVaudio	Virtual audio driver
UnityTouch	Unity Touch
MMR	Win7 Multimedia Redirection (MMR)

You install the Flash URL Redirection feature by typing the command-line argument, `FlashURLRedirection`, in a silent installation. This feature is not installed during an interactive installation or by using `ADDLOCAL=ALL` in a silent installation.

For example: `VMware-viewagent-y.y.y-xxxxxx.exe /s /v"/qn VDM_VC_MANAGED_AGENT=1 ADDLOCAL=Core,PCoIP,SVIAgent,ThinPrint,USB,HtmlAccess,UnityTouch,FlashURLRedirection,RTAV,MMR"`

Configure a Virtual Machine with Multiple NICs for View Agent

When you install View Agent on a virtual machine that has more than one NIC, you must configure the subnet that View Agent uses. The subnet determines which network address View Agent provides to the View Connection Server instance for client protocol connections.

Procedure

- ◆ On the virtual machine on which View Agent is installed, open a command prompt, type **regedit.exe**, and create a registry entry to configure the subnet.

For example: `HKLM\Software\VMware, Inc.\VMware VDM\Node Manager\subnet = n.n.n.n/m (REG_SZ)`

In this example, *n.n.n.n* is the TCP/IP subnet and *m* is the number of bits in the subnet mask.

Optimize Guest Operating System Performance for All Windows Versions

You can perform certain steps to optimize guest operating system performance for remote desktop deployment. The steps apply to all Windows operating systems. All of the steps are optional.

These recommendations include turning off the screen saver and not specifying a sleep timer. Your organization might require the use of screen savers. For example, you might have a GPO-managed security policy that locks a desktop a certain time after the screen saver starts. In this case, use a blank screen saver.

Prerequisites

Prepare a guest operating system for remote desktop deployment.

Procedure

- Disable any unused ports, such as COM1, COM2, and LPT.
- Adjust display properties.
 - a Choose a basic theme.
 - b Set the background to a solid color.
 - c Set the screen saver to **None**.
 - d Verify that hardware acceleration is enabled.
- Select a high-performance power option and do not specify a sleep timer.
- Disable the Indexing Service component.

NOTE Indexing improves searches by cataloging files. Do not disable this feature for users who search often.

- Remove or minimize System Restore points.
- Turn off system protection on C:\.
- Disable any unnecessary services.
- Set the sound scheme to **No Sounds**.
- Set visual effects to **Adjust for best performance**.
- Open Windows Media Player and use the default settings.
- Turn off automatic computer maintenance.
- Adjust performance settings for best performance.

- Delete any hidden uninstall folders in C:\Windows, such as \$NtUninstallKB893756\$.
- Delete all event logs.
- Run Disk Cleanup to remove temporary files, empty the Recycle Bin, and remove system files and other items that are no longer needed.
- Run Disk Defragmenter to rearrange fragmented data.
- If users are going to play full-screen videos or run 3D applications on desktops that run in a vSphere 5.1 environment, follow the instructions to modify the registry described in Microsoft KB 235257.

The Microsoft KB is titled "Server Does Not Use All Bandwidth Available When Streaming Files with Bit Rates over 100 Kbps" and is located at <http://support.microsoft.com/kb/235257>. Restart the virtual machine to enable the modified registry setting to take effect.

Without this optimization, brief freezes can occur, or the videos can stutter.

NOTE Making this optimization delivers performance improvements in both ESXi 5.x and ESXi 5.1, but it is required for ESXi 5.1.

What to do next

For Windows 7 and Windows 8 guest operating systems, perform additional optimization tasks. See "[Optimize Windows 7 and Windows 8 Guest Operating System Performance](#)," on page 35.

Optimize Windows 7 and Windows 8 Guest Operating System Performance

You can perform additional steps to optimize Windows 7 and Windows 8 guest operating system performance for remote desktop deployment. All of the steps are optional.

Prerequisites

- Perform the guest operating system optimization steps that apply to all Windows operating systems. See "[Optimize Guest Operating System Performance for All Windows Versions](#)," on page 34.
- Familiarize yourself with the procedure for disabling the Windows Customer Experience Improvement Program. See "[Disable the Windows Customer Experience Improvement Program](#)," on page 36.

Procedure

- 1 Uninstall Tablet PC Components, unless this feature is needed.
- 2 Disable IPv6, unless it is needed.
- 3 Use the File System Utility (fsutil) command to disable the setting that keeps track of the last time a file was accessed.

For example: `fsutil behavior set disablelastaccess 1`

- 4 Start the Registry Editor (regedit.exe) and change the **TimeOutValue** REG_DWORD in HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\Disk to **0x000000be(190)**.
- 5 Turn off the Windows Customer Experience Improvement Program and disable related tasks from the Task Scheduler.
- 6 Shut down the guest operating system and power off the virtual machine.
- 7 Power on the virtual machine.

What to do next

See [“Optimizing Windows 7 and Windows 8 for Linked-Clone Virtual Machines,”](#) on page 36 for information on disabling certain Windows 7 and Windows 8 services and tasks to reduce the growth of View Composer linked-clone virtual machines. Disabling certain services and tasks can also result in performance benefits for full virtual machines.

Disable the Windows Customer Experience Improvement Program

Disabling the Windows Customer Experience Improvement Program and the related Task Scheduler tasks that control this program can improve Windows 7 and Windows 8 system performance in large desktop pools.

Procedure

- 1 In the Windows 7 or Windows 8 guest operating system, start the control panel and click **Action Center > Change Action Center settings**.
- 2 Click **Customer Experience Improvement Program settings**.
- 3 Select **No, I don't want to participate in the program** and click **Save changes**.
- 4 Start the control panel and click **Administrative Tools > Task Scheduler**.
- 5 In the Task Scheduler (Local) pane of the Task Scheduler dialog box, expand the **Task Scheduler Library > Microsoft > Windows** nodes and open the **Application Experience** folder.
- 6 Disable the **AITAgent** and **ProgramDataUpdater** tasks.
- 7 In the **Task Scheduler Library > Microsoft > Windows** node, open the **Customer Experience Improvement Program** folder.
- 8 Disable the **Consolidator**, **KernelCEIPTask**, and **Use CEIP** tasks.

What to do next

Perform other Windows 7 or Windows 8 optimization tasks. See [“Optimize Windows 7 and Windows 8 Guest Operating System Performance,”](#) on page 35.

Optimizing Windows 7 and Windows 8 for Linked-Clone Virtual Machines

By disabling certain Windows 7 or Windows 8 services and tasks, you can reduce the growth of View Composer linked-clone virtual machines. Disabling certain services and tasks can also result in performance benefits for full virtual machines.

Benefits of Disabling Windows 7 and Windows 8 Services and Tasks

Windows 7 and Windows 8 schedule services and tasks that can cause View Composer linked clones to grow, even when the linked-clone machines are idle. The incremental growth of linked-clone OS disks can undo the storage savings that you achieve when you first create the linked-clone machines. You can reduce linked-clone growth by disabling these Windows services.

Windows 7 and Windows 8 introduce new services and schedules older services, such as disk defragmentation, to run by default. These services run in the background if you do not disable them.

Services that affect OS disk growth also generate input/output operations per second (IOPS) on the Windows 7 or Windows 8 virtual machines. Disabling these services can reduce IOPS and improve performance on full virtual machines and linked clones.

Disabling certain services also might benefit Windows XP and Windows Vista operating systems.

These best practices for optimizing Windows 7 and Windows 8 apply to most user environments. However, you must evaluate the effect of disabling each service on your users, applications, and desktops. You might require certain services to stay active.

For example, disabling Windows Update Service makes sense if you refresh and recompose the linked clones. A refresh operation restores the OS disks to their last snapshots, deleting all automatic Windows updates since the last snapshots were taken. A recompose operation recreates the OS disks from a new snapshot that can contain the current Windows updates, making automatic Windows updates redundant.

If you do not use refresh and recompose regularly, you might decide to keep Windows Update Service active.

Overview of Windows 7 and Windows 8 Services and Tasks That Cause Linked-Clone Growth

Certain services and tasks in Windows 7 and Windows 8 can cause linked-clone OS disks to grow incrementally every few hours, even when the linked-clone machines are idle. If you disable these services and tasks, you can control the OS disk growth.

Services that affect OS disk growth also generate IOPS on Windows 7 and Windows 8 virtual machines. You can evaluate the benefits of disabling these services on full virtual machines as well as linked clones.

Before you disable the Windows 7 or Windows 8 services that are shown in [Table 3-9](#), verify that you took the optimization steps in [“Optimize Guest Operating System Performance for All Windows Versions,”](#) on page 34 and [“Optimize Windows 7 and Windows 8 Guest Operating System Performance,”](#) on page 35.

Table 3-9. Impact of Windows 7 and Windows 8 Services and Tasks on OS Disk Growth and IOPS When OS Is Left Idle

Service or Task	Description	Default Occurrence or Startup	Impact on Linked-Clone OS Disks	Impact on IOPS	Turn Off This Service or Task?
Windows Hibernation	Provides a power-saving state by storing open documents and programs in a file before the computer is powered off. The file is reloaded into memory when the computer is restarted, restoring the state when the hibernation was invoked.	Default power-plan settings disable hibernation.	High. By default, the size of the hibernation file, <code>hiberfil.sys</code> , is the same as the installed RAM on the virtual machine. This feature affects all guest operating systems.	High. When hibernation is triggered, the system writes a <code>hiberfil.sys</code> file the size of the installed RAM.	Yes Hibernation provides no benefit in a virtual environment. For instructions, see “Disable Windows Hibernation in the Parent Virtual Machine,” on page 46..
Windows Scheduled Disk Defragmentation	Disk defragmentation is scheduled as a background process.	Once a week	High. Repeated defragmentation operations can increase the size of linked-clone OS disks by several GB and do little to make disk access more efficient on linked clones.	High	Yes

Table 3-9. Impact of Windows 7 and Windows 8 Services and Tasks on OS Disk Growth and IOPS When OS Is Left Idle (Continued)

Service or Task	Description	Default Occurrence or Startup	Impact on Linked-Clone OS Disks	Impact on IOPS	Turn Off This Service or Task?
Windows Update Service	Detects, downloads, and installs updates for Windows and other programs.	Automatic startup	Medium to high. Causes frequent writes to the linked-clones' OS disks because update checks occur often. The impact depends on the updates that are downloaded.	Medium to high	Yes, if you use View Composer recompose to install Windows updates and refresh to return OS disks to their original snapshots.
Windows Diagnostic Policy Service	Detects, troubleshoots, and resolves problems in Windows components. If you stop this service, diagnostics no longer function.	Automatic startup	Medium to high. The service is triggered on demand. The write frequency varies, depending on demand.	Small to medium	Yes, if you do not need the diagnostic tools to function on the desktops.
Prefetch/Superfetch	Stores specific information about applications that you run to help them start faster. This feature was introduced in Windows XP.	Always on, unless it is disabled.	Medium. Causes periodic updates to its layout and database information and individual prefetch files, which are generated on demand.	Medium	Yes, if application startup times are acceptable after you disable this feature.
Windows Registry Backup (RegIdleBackup)	Automatically backs up the Windows registry when the system is idle.	Every 10 days at 12:00 am	Medium. Each time this task runs, it generates registry backup files.	Medium.	Yes. There is no need for Windows Registry Backup. To restore registry data, you can use the View Composer refresh operation.
System Restore	Reverts the Windows system to a previous, healthy state.	When Windows starts up and once a day thereafter.	Small to medium. Captures a system restore point whenever the system detects that it is needed. When the linked clone is idle, this overhead is small.	No major impact.	Yes. Although its impact is small, this task is redundant if you use View Composer refresh to return OS disks to their original snapshots.

Table 3-9. Impact of Windows 7 and Windows 8 Services and Tasks on OS Disk Growth and IOPS When OS Is Left Idle (Continued)

Service or Task	Description	Default Occurrence or Startup	Impact on Linked-Clone OS Disks	Impact on IOPS	Turn Off This Service or Task?
Windows Defender	Provides anti-spyware features.	When Windows starts up. Performs a quick scan once a day. Checks for updates before each scan.	Medium to high. Performs definition updates, scheduled scans, and scans that are started on demand.	Medium to high.	Yes, if other anti-spyware software is installed.
Microsoft Feeds Synchronization task (<code>msfeedssync.exe</code>)	Periodically updates RSS feeds in Windows Internet Explorer Web browsers. This task updates RSS feeds that have automatic RSS feeds synchronization turned on. The process appears in Windows Task Manager only when Internet Explorer is running.	Once a day.	Medium. Affects OS-disk growth if persistent disks are not configured. If persistent disks are configured, the impact is diverted to the persistent disks.	Medium	Yes, if your users do not require automatic RSS feed updates on their desktops.

Disable Scheduled Disk Defragmentation on Windows 7 and Windows 8 Parent Virtual Machines

Before you create linked clones, you must disable scheduled defragmentations on Windows 7 and Windows 8 parent virtual machines. Windows 7 and Windows 8 schedule weekly disk defragmentations by default. Repeated defragmentation operations significantly increase the size of linked-clone OS disks and do not make disk access more efficient on linked clones.

When you create a linked-clone pool from the parent virtual machine, the linked clones share the replica's disk. Subsequent defragmentation operations do not affect the replica's disk, which is read-only. Instead, defragmentations expand each clone's OS disk.

As a best practice, defragment the parent virtual machine one time, before you take a snapshot and create the pool. The linked clones benefit from the defragmentation because they share the replica's optimized, read-only disk.

Prerequisites

- Verify that the applications that you intend to deploy to the linked clones are installed on the virtual machine.
- Verify that View Agent with View Composer Agent is installed on the virtual machine.

Procedure

- 1 In vSphere Client, select the parent virtual machine and select **Open Console**.
- 2 Log in to the Windows 7 or Windows 8 guest operating system as an administrator.
- 3 Click **Start** and type **defrag** in the **Search programs and files** box.
- 4 In the Programs pane, click **Disk Defragmenter**.

- 5 In the **Disk Defragmenter** dialog box, click **Defragment disk**.

The Disk Defragmenter consolidates defragmented files on the virtual machine's hard disk.

- 6 In the **Disk Defragmenter** dialog box, click **Configure schedule**.
- 7 Deselect **Run on a schedule (recommended)** and click **OK**.

Defragmentation operations will not take place on linked-clone virtual machines that are created from this parent virtual machine.

Disable the Windows Update Service on Windows 7 and Windows 8 Virtual Machines

Disabling the Windows Update Service can reduce the number of files that are created and writes that occur when updates are downloaded and installed. This action can reduce linked-clone growth and reduce IOPS in linked clones and full virtual machines.

Disable Windows Update Service if you refresh and recompose the linked-clone desktops. A refresh operation restores the OS disks to their original snapshots, deleting the automatic Windows updates. A recompose operation recreates the OS disks from a new snapshot that can contain Windows updates, making automatic Windows updates redundant.

Do not disable the Windows Update Service if you do not use recompose to install Windows updates in the linked clones.

Prerequisites

Verify that the most recent Windows updates are downloaded and installed on the virtual machine.

Procedure

- 1 In vSphere Client, select the parent virtual machine and select **Open Console**.
- 2 Log in to the Windows 7 or Windows 8 guest operating system as an administrator.
- 3 Click **Start > Control Panel > System and Security > Turn automatic updating on or off**.
- 4 In the Important updates menu, select **Never check for updates**.
- 5 Deselect **Give me recommended updates the same way I receive important updates**.
- 6 Deselect **Allow all users to install updates on this computer** and click **OK**.

Disable the Diagnostic Policy Service on Windows 7 and Windows 8 Virtual Machines

Disabling the Windows Diagnostic Policy Service can minimize the number of system writes and reduce the growth of linked-clone machines.

Do not disable the Windows Diagnostic Policy Service if your users require the diagnostic tools on their desktops.

Procedure

- 1 In vSphere Client, select the parent virtual machine and select **Open Console**.
- 2 Log in to the Windows 7 or Windows 8 guest operating system as an administrator.
- 3 Click **Start > Control Panel > System and Security > Administrative Tools**.
- 4 Select **Services** and click **Open**.
- 5 Double-click **Diagnostic Policy Service**.

- 6 In the Diagnostic Policy Service Properties (Local Computer) dialog, click **Stop**.
- 7 In the Startup type menu, select **Disabled**.
- 8 Click **OK**.

Disable the Prefetch and Superfetch Features on Windows 7 and Windows 8 Virtual Machines

By disabling the Windows prefetch and superfetch features, you can avoid generating prefetch files and the overhead associated with prefetch and superfetch operations. This action can reduce the growth of linked-clone machines and minimize IOPS on full virtual machines and linked clones.

To disable the prefetch and superfetch features, you must edit a Windows registry key and disable the Prefetch service on the virtual machine.

Prerequisites

See the Microsoft TechNet Web site for information on how to use the Windows Registry Editor on Windows 7 and Windows 8.

Procedure

- 1 Start the Windows Registry Editor on the local Windows 7 or Windows 8 virtual machine.
- 2 Navigate to the registry key called **PrefetchParameters**.

The registry key is located in the following path:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\Memory Management\PrefetchParameters.
- 3 Set the **EnablePrefetcher** and **EnableSuperfetch** values to **0**.
- 4 Click **Start > Control Panel > System and Security > Administrative Tools**.
- 5 Select **Services** and click **Open**.
- 6 Double-click the **Superfetch** service.
- 7 In the Superfetch Properties (Local Computer) dialog, click **Stop**.
- 8 In the Startup type menu, select **Disabled**.
- 9 Click **OK**.

Disable Windows Registry Backup on Windows 7 and Windows 8 Virtual Machines

Disabling the Windows registry backup feature, `RegIdleBackup`, can minimize the number of system writes and reduce the growth of linked-clone machines.

Procedure

- 1 In vSphere Client, select the parent virtual machine and select **Open Console**.
- 2 Log in to the Windows 7 or Windows 8 guest operating system as an administrator.
- 3 Click **Start > Control Panel > System and Security > Administrative Tools**.
- 4 Select **Task Scheduler** and click **Open**.
- 5 In the left pane, expand **Task Scheduler Library, Microsoft, Windows**.
- 6 Double-click **Registry** and select **RegIdleBackup**.
- 7 In the Actions pane, click **Disable**.

Disable the System Restore on Windows 7 and Windows 8 Virtual Machines

You do not need to use the Windows System Restore feature if you use View Composer refresh to restore linked-clone OS disks to their original snapshots.

When the operating system is idle, System Restore does not have a visible impact on OS-disk growth. However, when the operating system is in use, System Restore generates restore points based on system use, which can have a significant impact on OS-disk growth.

The function of Windows System Restore is the same as View Composer refresh.

As a best practice, you can disable Windows System Restore and avoid unnecessary growth in your linked clones.

If you do not use refresh, evaluate whether it is best to leave System Restore active in your View environment.

Procedure

- 1 In vSphere Client, select the parent virtual machine and select **Open Console**.
- 2 Log in to the Windows 7 or Windows 8 guest operating system as an administrator.
- 3 Click **Start > Control Panel > System and Security > Administrative Tools**.
- 4 Select **Task Scheduler** and click **Open**.
- 5 In the left pane, expand **Task Scheduler Library, Microsoft, Windows**.
- 6 Double-click **SystemRestore** and select **SR**.
- 7 In the Actions pane, click **Disable**.

Disable Windows Defender on Windows 7 and Windows 8 Virtual Machines

Microsoft Windows Defender can contribute to linked-clone OS disk growth and increase IOPS in linked clones and full virtual machines. Disable Windows Defender if you install other anti-spyware software on the virtual machine.

If Windows Defender is the only anti-spyware installed on the virtual machine, you might prefer to keep Windows Defender active on the desktops in your environment.

Procedure

- 1 In vSphere Client, select the parent virtual machine and select **Open Console**.
- 2 Log in to the Windows 7 or Windows 8 guest operating system as an administrator.
- 3 Click **Start** and type **Windows Defender** in the Search programs and files box.
- 4 Click **Tools > Options > Administrator**.
- 5 Deselect **Use this program** and click **Save**.

Disable Microsoft Feeds Synchronization on Windows 7 and Windows 8 Virtual Machines

Windows Internet Explorer uses the Microsoft Feeds Synchronization task to update RSS feeds in users' Web browsers. This task can contribute to linked-clone growth. Disable this task if your users do not require automatic RSS feed updates in their browsers.

Microsoft Feeds Synchronization can cause OS-disk growth if persistent disks are not configured. If persistent disks are configured, the impact is diverted to the persistent disks. In this situation, you should still disable Microsoft Feeds Synchronization to control persistent-disk growth.

Procedure

- 1 In vSphere Client, select the parent virtual machine and select **Open Console**.
- 2 Log in to the Windows 7 or Windows 8 guest operating system as an administrator.
- 3 Click **Start > Control Panel > Network and Internet > Internet Options**.
- 4 Click the **Content** tab.
- 5 Under Feeds and Web Slices, click **Settings**.
- 6 Deselect **Automatically check feeds and Web Slices for updates** and click **OK**.
- 7 In the Internet Properties dialog, click **OK**.

Preparing Virtual Machines for View Composer

To deploy a linked-clone desktop pool, you must prepare a parent virtual machine that meets the requirements of the View Composer service.

- [Prepare a Parent Virtual Machine](#) on page 43
The View Composer service requires a parent virtual machine from which you generate a base image for creating and managing a linked-clone desktop pool.
- [Activating Windows on Linked-Clone Virtual Machines](#) on page 46
To make sure that View Composer properly activates Windows 8, Windows 7, and Windows Vista operating systems on linked-clone machines, you must use Microsoft volume activation on the parent virtual machine. The volume-activation technology requires a volume license key.
- [Disable Windows Hibernation in the Parent Virtual Machine](#) on page 46
The Windows hibernation option creates a large system file that can increase the size of the linked-clone OS disks that are created from the parent virtual machine. Disabling the hibernation option reduces the size of linked-clones.
- [Configure a Parent Virtual Machine to Use Local Storage](#) on page 47
When you prepare a parent virtual machine for View Composer, you can configure the parent virtual machine and linked clones to store virtual-machine swap files on the local datastore. This optional strategy lets you take advantage of local storage.
- [Keep a Record of the Parent Virtual Machine's Paging-File Size](#) on page 48
When you create a linked-clone pool, you can redirect the linked clones' guest OS paging and temp files to a separate disk. You must configure this disk to be larger than the paging file in the guest OS.
- [Increase the Timeout Limit of QuickPrep Customization Scripts](#) on page 48
View Composer terminates a QuickPrep post-synchronization or power-off script that takes longer than 20 seconds. You can increase the timeout limit for these scripts by changing the `ExecScriptTimeout` Windows registry value on the parent virtual machine.

Prepare a Parent Virtual Machine

The View Composer service requires a parent virtual machine from which you generate a base image for creating and managing a linked-clone desktop pool.

Prerequisites

- Verify that you prepared a virtual machine to use for deploying remote desktops. See [“Creating Virtual Machines for Remote Desktop Deployment,”](#) on page 19.

A parent virtual machine that you use for View Composer must either belong to the same Active Directory domain as the domain that the linked-clone machines will join or be a member of the local WORKGROUP.

IMPORTANT To use features that are supported in View 4.5 or later, such as redirecting disposable data to a separate disk and customizing linked-clone machines with Sysprep, you must deploy the machines from a parent virtual machine on which View Agent 4.5 or later is installed.

You cannot use View Composer to deploy machines that run Windows Vista Ultimate Edition or Windows XP Professional SP1.

-
- Verify that the virtual machine was not converted from a View Composer linked clone. A virtual machine that is converted from a linked clone has the clone's internal disk and state information. A parent virtual machine cannot have state information.

IMPORTANT Linked clones and virtual machines that were converted from linked clones are not supported as parent virtual machines.

-
- If the parent virtual machine runs Windows XP, and your Active Directory runs on Windows Server 2008, apply an update patch on the Windows XP virtual machine. See the Microsoft Support Article 944043 at the following location: <http://support.microsoft.com/kb/944043/en-us>.

If you do not install the Windows Server 2008 read-only domain controller (RODC) compatibility pack for Windows XP, linked clones that are deployed from this parent virtual machine fail to join the domain.

- When you install View Agent on the parent virtual machine, select the **View Composer Agent** option. See “[Install View Agent on a Virtual Machine](#),” on page 25.

To update View Agent in a large environment, you can use standard Windows update mechanisms such as Altiris, SMS, LanDesk, BMC, or other systems management software. You can also use the recompose operation to update View Agent.

NOTE Do not change the log on account for the VMware View Composer Guest Agent Server service in a parent virtual machine. By default, this is the Local System account. If you change this account, the linked clones created from the parent do not start.

-
- To deploy machines that run Windows 8, Windows 7, or Windows Vista, configure a volume license key and activate the parent virtual machine's operating system with volume activation. See “[Activating Windows on Linked-Clone Virtual Machines](#),” on page 46.
 - If the parent virtual machine runs Windows 7 or Windows 8, verify that you followed the best practices for optimizing the operating system. See “[Optimizing Windows 7 and Windows 8 for Linked-Clone Virtual Machines](#),” on page 36.
 - Familiarize yourself with the procedure for disabling searching Windows Update for device drivers. See the Microsoft Technet article, “[Disable Searching Windows Update for Device Drivers](#)” at [http://technet.microsoft.com/en-us/library/cc730606\(v=ws.10\).aspx](http://technet.microsoft.com/en-us/library/cc730606(v=ws.10).aspx).

Procedure

- Remove the DHCP lease on the parent virtual machine to avoid copying a leased IP address to the linked clones in the pool.
 - a On the parent virtual machine, open a command prompt.
 - b Type the `ipconfig /release` command.

- Verify that the system disk contains a single volume.

You cannot deploy linked clones from a parent virtual machine that contains more than one volume. The View Composer service does not support multiple disk partitions. Multiple virtual disks are supported.

NOTE If the parent virtual machine contains multiple virtual disks, when you create a desktop pool, do not select a drive letter for the View Composer persistent disk or disposable data disk that already exists on the parent virtual machine or that conflicts with a drive letter that is used for a network-mounted drive.

- Verify that the virtual machine does not contain an independent disk.

An independent disk is excluded when you take a snapshot of the virtual machine. Linked clones that are created or recomposed from the virtual machine will not contain the independent disk.

- If you plan to configure disposable data disks when you create linked-clone machines, remove default user TEMP and TMP variables from the parent virtual machine.

You can also remove the `pagefile.sys` file to avoid duplicating the file on all the linked clones. If you leave the `pagefile.sys` file on the parent virtual machine, a read-only version of the file is inherited by the linked clones, while a second version of the file is used on the disposable data disk.

- Disable the hibernation option to reduce the size of linked-clone OS disks that are created from the parent virtual machine.
- Before you take a snapshot of the parent virtual machine, disable searching Windows Update for device drivers.

This Windows feature can interfere with the customization of linked-clone machines. As each linked clone is customized, Windows might search for the best drivers on the Internet for that clone, resulting in repeated searches and customization delays.

- In vSphere Client, disable the vApp Options setting on the parent virtual machine.
- On Windows 8.1 and Windows Server 2008 R2 machines, disable the scheduled maintenance task that recovers disk space by removing unused features.

For example: `Schtasks.exe /change /disable /tn "\\Microsoft\Windows\AppxDeploymentClient\Pre-staged app cleanup"`

If left enabled, this maintenance task can remove the Sysprep customization script after the linked clones are created, which would cause subsequent recompose operations to fail with customization operation timeout errors.

You can deploy a linked-clone pool from the parent virtual machine.

What to do next

Use vSphere Client or vSphere Web Client to take a snapshot of the parent virtual machine in its powered-down state. This snapshot is used as the baseline configuration for the first set of linked-clone machines that are anchored to the parent virtual machine.

IMPORTANT Before you take a snapshot, completely shut down the parent virtual machine by using the **Shut Down** command in the guest operating system.

Activating Windows on Linked-Clone Virtual Machines

To make sure that View Composer properly activates Windows 8, Windows 7, and Windows Vista operating systems on linked-clone machines, you must use Microsoft volume activation on the parent virtual machine. The volume-activation technology requires a volume license key.

To activate Windows 8, Windows 7 or Windows Vista with volume activation, you use Key Management Service (KMS), which requires a KMS license key. See your Microsoft dealer to acquire a volume license key and configure volume activation.

NOTE View Composer does not support Multiple Activation Key (MAK) licensing.

Before you create linked-clone machines with View Composer, you must use volume activation to activate the operating system on the parent virtual machine.

NOTE Windows XP machines with volume licenses do not require an activation.

When a linked-clone machine is created, and each time the linked clone is recomposed, the View Composer agent uses the parent virtual machine's KMS server to activate the operating system on the linked clone.

The View Composer QuickPrep tool implements the activation through these steps:

- 1 Invokes a script to remove the existing license status on the linked-clone virtual machine
- 2 Restarts the guest operating system
- 3 Invokes a script that uses KMS licensing to activate the operating system on the clone.

Each time QuickPrep runs on a linked clone, the activation takes place.

For KMS licensing, View Composer uses the KMS server that is configured to activate the parent virtual machine. The KMS server treats an activated linked clone as a computer with a newly issued license.

Disable Windows Hibernation in the Parent Virtual Machine

The Windows hibernation option creates a large system file that can increase the size of the linked-clone OS disks that are created from the parent virtual machine. Disabling the hibernation option reduces the size of linked-clones.

The Windows hibernation option creates a hidden system file, `Hiberfil.sys`. Windows uses this file to store a copy of system memory on the hard disk when the hybrid sleep setting is turned on. When you create a linked-clone pool, the file is created on each linked clone's OS disk.

On Windows 7 or Windows 8 virtual machines, this file can be 10GB.



CAUTION When you make hibernation unavailable, the hybrid sleep setting does not work. Users can lose data if the hybrid sleep setting is turned on and a power loss occurs.

Prerequisites

Familiarize yourself with the Windows hibernation feature. See the Microsoft Support Web site. For information about disabling hibernation on Windows 8, Windows 7 or Windows Vista, see the Microsoft Support Web site and search for how to disable and re-enable hibernation on a computer that is running Windows.

Procedure

- 1 In vSphere Client, select the parent virtual machine and select **Open Console**.
- 2 Log in to the Windows guest operating system as an administrator.

- 3 Disable the hibernation option.

Operating System	Action
Windows 8, Windows 7 or Windows Vista	<ol style="list-style-type: none"> a Click Start and type cmd in the Start Search box. b In the search results list, right-click Command Prompt and click Run as Administrator. c At the User Account Control prompt, click Continue. d At the command prompt, type powercfg.exe /hibernate off and press Enter. e Type exit and press Enter.
Windows XP	<ol style="list-style-type: none"> a Click Start > Run. b Type cmd and click OK. c At the command prompt, type powercfg.exe /hibernate off and press Enter. d Type exit and press Enter.

- 4 Log out of the guest operating system.

When you create linked-clone machines from the parent virtual machine, the `Hiberfil.sys` file is not created on the linked-clone OS disks.

Configure a Parent Virtual Machine to Use Local Storage

When you prepare a parent virtual machine for View Composer, you can configure the parent virtual machine and linked clones to store virtual-machine swap files on the local datastore. This optional strategy lets you take advantage of local storage.

In this procedure, you configure local storage for the virtual-machine swap files, not the paging and temp files in the guest OS. When you create a linked-clone pool, you also can redirect guest OS paging and temp files to a separate disk. See [“Worksheet for Creating a Linked-Clone Desktop Pool,”](#) on page 57.

Prerequisites

Prepare the parent virtual machine to meet the requirements of the View Composer service. See [“Prepare a Parent Virtual Machine,”](#) on page 43.

Procedure

- 1 Configure a swapfile datastore on the ESXi host or cluster on which you will deploy the linked-clone pool.
- 2 When you create the parent virtual machine in vCenter Server, store the virtual-machine swap files on the swapfile datastore on the local ESXi host or cluster:
 - a In vSphere Client, select the parent virtual machine.
 - b Click **Edit Settings** and click the **Options** tab.
 - c Click **Swapfile location** and click **Store in the host's swapfile datastore**.

For detailed instructions, see the VMware vSphere documentation.

When you deploy a pool from this parent virtual machine, the linked clones use the local ESXi host's swapfile datastore.

Keep a Record of the Parent Virtual Machine's Paging-File Size

When you create a linked-clone pool, you can redirect the linked clones' guest OS paging and temp files to a separate disk. You must configure this disk to be larger than the paging file in the guest OS.

When a linked clone that is configured with a separate disk for the disposable files is powered off, View replaces the temporary disk with a copy of the original temporary disk that View Composer created with the linked-clone pool. This feature can slow the growth of linked clones. However, this feature can work only if you configure the disposable-file disk to be large enough to hold the guest OS's paging files.

Before you can configure the disposable-file disk, you must know the maximum paging-file size in the parent virtual machine. The linked clones have the same paging-file size as the parent virtual machine from which they are created.

As a best practice, you can remove the `pagefile.sys` file from the parent virtual machine before you take a snapshot, to avoid duplicating the file on all the linked clones. See [“Prepare a Parent Virtual Machine,”](#) on page 43.

NOTE This feature is not that same as configuring local storage for the virtual-machine swap files. See [“Configure a Parent Virtual Machine to Use Local Storage,”](#) on page 47.

Procedure

- 1 In vSphere Client, right-click the parent virtual machine and click **Open Console**.
- 2 Select **Start > Settings > Control Panel > System**.
- 3 Click the **Advanced** tab.
- 4 In the Performance pane, click **Settings**.
- 5 Click the **Advanced** tab.
- 6 In the Virtual memory pane, click **Change**.
The Virtual Memory page appears.
- 7 Set the paging file size to a larger value than the size of the memory that is assigned to the virtual machine.

IMPORTANT If the **Maximum size (MB)** setting is smaller than the virtual-machine memory size, type a larger value and save the new value.

- 8 Keep a record of the **Maximum size (MB)** setting that is configured in the Paging file size for selected drive pane.

What to do next

When you configure a linked-clone pool from this parent virtual machine, configure a disposable-file disk that is larger than the paging-file size.

Increase the Timeout Limit of QuickPrep Customization Scripts

View Composer terminates a QuickPrep post-synchronization or power-off script that takes longer than 20 seconds. You can increase the timeout limit for these scripts by changing the `ExecScriptTimeout` Windows registry value on the parent virtual machine.

The increased timeout limit is propagated to linked clones that are created from the parent virtual machine. QuickPrep customization scripts can run on the linked clones for the time that you specify.

Alternatively, you can use your customization script to launch another script or process that performs the long-running task.

NOTE Most QuickPrep customization scripts can finish running within the 20-second limit. Test your scripts before you increase the limit.

Prerequisites

- Install View Agent with the **View Composer Agent** option on the parent virtual machine.
- Verify that the parent virtual machine is prepared to create a linked-clone pool. See [“Prepare a Parent Virtual Machine,”](#) on page 43.

Procedure

- 1 On the parent virtual machine, start the Windows Registry Editor.
 - a Select **Start > Command Prompt**.
 - b At the command prompt, type **regedit**.
- 2 In the Windows registry, locate the `vmware-viewcomposer-ga` registry key.
`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\vmware-viewcomposer-ga`
- 3 Click **Edit** and modify the registry value.
 Value Name: `ExecScriptTimeout`
 Value Type: `REG_DWORD`
 Value unit: `milliseconds`
 The default value is 20000 milliseconds.

The timeout value is increased. You do not have to restart Windows for this value to take effect.

What to do next

Take a snapshot of the parent virtual machine and create a linked-clone pool.

Creating Virtual Machine Templates

You must create a virtual machine template before you can create an automated pool that contains full virtual machines.

A virtual machine template is a master copy of a virtual machine that can be used to create and provision new virtual machines. Typically, a template includes an installed guest operating system and a set of applications.

You create virtual machine templates in vSphere Client. You can create a virtual machine template from a previously configured virtual machine, or you can convert a previously configured virtual machine to a virtual machine template.

See the *vSphere Basic System Administration* guide for information on using vSphere Client to create virtual machine templates. See [“Automated Pools That Contain Full Virtual Machines,”](#) on page 51 for information on creating automated pools.

NOTE You do not create a linked-clone pool from a virtual machine template.

Creating Customization Specifications

Customization specifications are optional, but they can greatly expedite automated pool deployments by providing configuration information for general properties such as licensing, domain attachment, and DHCP settings.

With customization specifications, you can customize remote desktops as they are created in View Administrator. You create new customization specifications by using the Customization Specification wizard in vSphere Client. You can also use the Customization Specification wizard to import existing custom `sysprep.ini` files.

See the *vSphere Virtual Machine Administration* document for information on using the Customization Specification wizard.

Make sure that the customization specifications are accurate before you use them in View Administrator. In vSphere Client, deploy and customize a virtual machine from your template using the customization specifications. Fully test the virtual machine, including DHCP and authentication, before you create remote desktops.

NOTE To apply customization specifications to desktop pools that use Windows XP, you must install Microsoft Sysprep tools on your vCenter Server machine.

You do not have to install Sysprep tools in vCenter Server for desktop pools that use Windows 8, Windows 7 or Vista. Sysprep tools are built into these operating systems.

When you use a Sysprep customization specification to join a Windows 8 or Windows 7 desktop to a domain, you must use the fully qualified domain name (FQDN) of the Active Directory domain. You cannot use the NetBIOS name of the Active Directory domain.

Creating Automated Desktop Pools That Contain Full Virtual Machines

4

With an automated desktop pool that contains full virtual machines, you create a virtual machine template and View uses that template to create virtual machines for each desktop. You can optionally create customization specifications to expedite automated pool deployments.

This chapter includes the following topics:

- [“Automated Pools That Contain Full Virtual Machines,”](#) on page 51
- [“Worksheet for Creating an Automated Pool That Contains Full Virtual Machines,”](#) on page 51
- [“Create an Automated Pool That Contains Full Virtual Machines,”](#) on page 55
- [“Desktop Settings for Automated Pools That Contain Full Virtual Machines,”](#) on page 56

Automated Pools That Contain Full Virtual Machines

To create an automated desktop pool, View dynamically provisions machines based on settings that you apply to the pool. View uses a virtual machine template as the basis of the pool. From the template, View creates a new virtual machine in vCenter Server for each desktop.

Worksheet for Creating an Automated Pool That Contains Full Virtual Machines

When you create an automated desktop pool, the View Administrator Add Desktop Pool wizard prompts you to configure certain options. Use this worksheet to prepare your configuration options before you create the pool.

You can print this worksheet and write down the values you want to specify when you run the Add Desktop Pool wizard.

To create a linked-clone pool, see [“Linked-Clone Desktop Pools,”](#) on page 57.

Table 4-1. Worksheet: Configuration Options for Creating an Automated Pool That Contains Full Virtual Machines

Option	Description	Fill In Your Value Here
User assignment	<p>Choose the type of user assignment:</p> <ul style="list-style-type: none"> ■ In a dedicated-assignment pool, each user is assigned to a machine. Users receive the same machine each time they log in to the pool. ■ In a floating-assignment pool, users receive different machines each time they log in. <p>For details, see “User Assignment in Desktop Pools,” on page 99.</p>	
Enable automatic assignment	<p>In a dedicated-assignment pool, a machine is assigned to a user when the user first logs in to the pool. You can also explicitly assign machines to users.</p> <p>If you do not enable automatic assignment, you must explicitly assign a machine to each user. You can assign machines manually even when automatic assignment is enabled.</p>	
vCenter Server	<p>Select the vCenter Server that manages the virtual machines in the pool.</p>	
Desktop Pool ID	<p>The unique name that identifies the pool in View Administrator.</p> <p>If multiple vCenter Servers are running in your environment, make sure that another vCenter Server is not using the same pool ID.</p> <p>A View Connection Server configuration can be a standalone View Connection Server instance or a pod of replicated instances that share a common View LDAP configuration.</p>	
Display name	<p>The pool name that users see when they log in from a client device. If you do not specify a display name, the pool ID is displayed to users.</p>	
Access group	<p>Select an access group in which to place the pool or leave the pool in the default root access group.</p> <p>If you use an access group, you can delegate managing the pool to an administrator who has a specific role. For details, see the role-based delegated administration chapter in the <i>View Administration</i> document.</p> <p>NOTE Access groups are different from vCenter Server folders that store desktop virtual machines. You select a vCenter Server folder later in the wizard with other vCenter Server settings.</p>	
Delete machine after logoff	<p>If you select floating user assignment, choose whether to delete machines after users log off.</p> <p>NOTE You set this option on the Desktop Pool Settings page.</p>	

Table 4-1. Worksheet: Configuration Options for Creating an Automated Pool That Contains Full Virtual Machines (Continued)

Option	Description	Fill In Your Value Here
Desktop Pool Settings	<p>Settings that determine the desktop state, power status when a virtual machine is not in use, display protocol, Adobe Flash quality, and so on. For descriptions, see “Desktop Pool Settings for All Desktop Pool Types,” on page 107.</p> <p>For a list of the settings that apply to automated pools, see “Desktop Settings for Automated Pools That Contain Full Virtual Machines,” on page 56.</p> <p>For more information about power policies and automated pools, see “Setting Power Policies for Desktop Pools,” on page 111.</p>	
Stop provisioning on error	<p>You can direct View to stop provisioning or continue to provision virtual machines in a desktop pool after an error occurs during the provisioning of a virtual machine. If you leave this setting selected, you can prevent a provisioning error from recurring on multiple virtual machines.</p>	
Virtual Machine Naming	<p>Choose whether to provision machines by manually specifying a list of machine names or by providing a naming pattern and the total number of machines.</p> <p>For details, see “Naming Machines Manually or Providing a Naming Pattern,” on page 100.</p>	
Specify names manually	<p>If you specify names manually, prepare a list of machine names and, optionally, the associated user names.</p>	
Naming Pattern	<p>If you use this naming method, provide the pattern.</p> <p>The pattern you specify is used as a prefix in all the machine names, followed by a unique number to identify each machine.</p> <p>For details, see “Using a Naming Pattern for Automated Desktop Pools,” on page 102.</p>	
Maximum number of machines	<p>If you use a naming pattern, specify the total number of machines in the pool.</p> <p>You can also specify a minimum number of machines to provision when you first create the pool.</p>	
Number of spare (powered on) machines	<p>If you specify names manually or use a naming pattern, specify a number of machines to keep available and powered on for new users. For details, see “Naming Machines Manually or Providing a Naming Pattern,” on page 100.</p> <p>When you specify names manually, this option is called # Unassigned machines kept powered on.</p>	

Table 4-1. Worksheet: Configuration Options for Creating an Automated Pool That Contains Full Virtual Machines (Continued)

Option	Description	Fill In Your Value Here
Minimum number of machines	<p>If you use a naming pattern and provision machines on demand, specify a minimum number of machines in the pool.</p> <p>The minimum number of machines is created when you create the pool.</p> <p>If you provision machines on demand, additional machines are created as users connect to the pool for the first time or as you assign machines to users.</p>	
Use vSphere Virtual SAN	<p>Specify whether to use Virtual SAN, if available. Virtual SAN is a software-defined storage tier that virtualizes the local physical storage disks available on a cluster of ESXi hosts. For more information, see “Using Virtual SAN for High-Performance Storage and Policy-Based Management,” on page 170.</p>	
Template	<p>Select the virtual machine template to use for creating the pool.</p>	
vCenter Server folder	<p>Select the folder in vCenter Server in which the desktop pool resides.</p>	
Host or cluster	<p>Select the ESXi host or cluster on which the virtual machines run.</p> <p>In vSphere 5.1 or later, you can select a cluster with up to 32 ESXi hosts.</p>	
Resource pool	<p>Select the vCenter Server resource pool in which the desktop pool resides.</p>	
Datastores	<p>Select one or more datastores on which to store the desktop pool.</p> <p>For clusters, you can use shared or local datastores.</p> <p>NOTE If you use Virtual SAN, select only one datastore.</p>	
Use View Storage Accelerator	<p>Determine whether ESXi hosts cache common virtual machine disk data. View Storage Accelerator can improve performance and reduce the need for extra storage I/O bandwidth to manage boot storms and anti-virus scanning I/O storms.</p> <p>This feature is supported on vSphere 5.0 and later.</p> <p>This feature is enabled by default.</p> <p>For details, see “Configure View Storage Accelerator for Desktop Pools,” on page 183.</p>	
Guest customization	<p>Select a customization specification (SYSPREP) from the list to configure licensing, domain attachment, DHCP settings, and other properties on the machines.</p> <p>Alternatively, you can customize the machines manually after they are created.</p>	

Create an Automated Pool That Contains Full Virtual Machines

You can create an automated desktop pool based on a virtual machine template that you select. View dynamically deploys the desktops, creating a new virtual machine in vCenter Server for each desktop.

To create a linked-clone pool, see [“Linked-Clone Desktop Pools,”](#) on page 57.

Prerequisites

- Prepare a virtual machine template that View will use to create the machines. View Agent must be installed on the template. See [Chapter 3, “Creating and Preparing Virtual Machines,”](#) on page 19.
- If you intend to use a customization specification, make sure that the specifications are accurate. In vSphere Client, deploy and customize a virtual machine from your template using the customization specification. Fully test the resulting virtual machine, including DHCP and authentication.
- Verify that you have a sufficient number of ports on the ESXi virtual switch that is used for the virtual machines that are used as remote desktops. The default value might not be sufficient if you create large desktop pools. The number of virtual switch ports on the ESXi host must equal or exceed the number of virtual machines multiplied by the number of virtual NICs per virtual machine.
- Gather the configuration information you must provide to create the pool. See [“Worksheet for Creating an Automated Pool That Contains Full Virtual Machines,”](#) on page 51.
- Decide how to configure power settings, display protocol, Adobe Flash quality, and other settings. See [“Desktop Pool Settings for All Desktop Pool Types,”](#) on page 107.
- If you intend to provide access to your desktops and applications through Workspace, verify that you create the desktop and application pools as a user who has the Administrators role on the root access group in View Administrator. If you give the user the Administrators role on an access group other than the root access group, Workspace will not recognize the SAML authenticator you configure in View, and you cannot configure the pool in Workspace.

Procedure

- 1 In View Administrator, select **Catalog > Desktop Pools**.
- 2 Click **Add**.
- 3 Select **Automated Desktop Pool**.
- 4 On the vCenter Server page, choose **Full virtual machines**.
- 5 Follow the prompts in the wizard to create the pool.

Use the configuration information that you gathered in the worksheet. You can go directly back to any wizard page that you completed by clicking the page name in the navigation panel.

In View Administrator, you can view the machines as they are added to the pool by selecting **Catalog > Desktop Pools**.

What to do next

Entitle users to access the pool. See [“Add Entitlements to a Desktop or Application Pool,”](#) on page 123.

Desktop Settings for Automated Pools That Contain Full Virtual Machines

You must specify desktop pool settings when you configure automated pools that contain full virtual machines. Different settings apply to pools with dedicated user assignments and floating user assignments.

[Table 4-2](#) lists the settings that apply to automated pools with dedicated assignments and floating assignments.

For descriptions of each desktop pool setting, see [“Desktop Pool Settings for All Desktop Pool Types,”](#) on page 107.

Table 4-2. Settings for Automated Pools That Contain Full Virtual Machines

Setting	Automated Pool, Dedicated Assignment	Automated Pool, Floating Assignment
State	Yes	Yes
Connection Server restrictions	Yes	Yes
Remote machine power policy	Yes	Yes
Automatic logoff after disconnect	Yes	Yes
Allow users to reset their machines	Yes	Yes
Allow multiple sessions per user		Yes
Delete machine after logoff		Yes
Default display protocol	Yes	Yes
Allow users to choose protocol	Yes	Yes
3D Renderer	Yes	Yes
Max number of monitors	Yes	Yes
Max resolution of any one monitor	Yes	Yes
Adobe Flash quality	Yes	Yes
Adobe Flash throttling	Yes	Yes
Override global Mirage settings	Yes	Yes
Mirage Server configuration	Yes	Yes

Creating Linked-Clone Desktop Pools

With a linked-clone desktop pool, View creates a desktop pool based on a parent virtual machine that you select. The View Composer service dynamically creates a new linked-clone virtual machine in vCenter Server for each desktop.

This chapter includes the following topics:

- [“Linked-Clone Desktop Pools,”](#) on page 57
- [“Worksheet for Creating a Linked-Clone Desktop Pool,”](#) on page 57
- [“Create a Linked-Clone Desktop Pool,”](#) on page 66
- [“Desktop Pool Settings for Linked-Clone Desktop Pools,”](#) on page 67
- [“View Composer Support for Linked-Clone SIDs and Third-Party Applications,”](#) on page 68
- [“Keeping Linked-Clone Machines Provisioned and Ready During View Composer Operations,”](#) on page 72
- [“Use Existing Active Directory Computer Accounts for Linked Clones,”](#) on page 73

Linked-Clone Desktop Pools

To create a linked-clone desktop pool, View Composer generates linked-clone virtual machines from a snapshot of a parent virtual machine. View dynamically provisions the linked-clone desktops based on settings that you apply to the pool.

Because linked-clone desktops share a base system-disk image, they use less storage than full virtual machines.

Worksheet for Creating a Linked-Clone Desktop Pool

When you create a linked-clone desktop pool, the View Administrator Add Desktop Pool wizard prompts you to configure certain options. Use this worksheet to prepare your configuration options before you create the pool.

You can print this worksheet and write down the values you want to specify when you run the Add Desktop Pool wizard.

Before you create a linked-clone pool, you must use vCenter Server to take a snapshot of the parent virtual machine that you prepare for the pool. You must shut down the parent virtual machine before you take the snapshot. View Composer uses the snapshot as the base image from which the clones are created.

NOTE You cannot create a linked-clone pool from a virtual machine template.

Table 5-1. Worksheet: Configuration Options for Creating a Linked-Clone Desktop Pool

Option	Description	Fill In Your Value Here
User assignment	<p>Choose the type of user assignment:</p> <ul style="list-style-type: none"> ■ In a dedicated-assignment pool, each user is assigned to a machine. Users receive the same machine each time they log in. ■ In a floating-assignment pool, users receive different machines each time they log in. <p>For details, see “User Assignment in Desktop Pools,” on page 99.</p>	
Enable automatic assignment	<p>In a dedicated-assignment pool, a machine is assigned to a user when the user first logs in to the pool. You can also explicitly assign machines to users.</p> <p>If you do not enable automatic assignment, you must explicitly assign a machine to each user.</p>	
vCenter Server	<p>Select the vCenter Server that manages the virtual machines in the pool.</p>	
Desktop Pool ID	<p>The unique name that identifies the pool in View Administrator.</p> <p>If multiple View Connection Server configurations are running in your environment, make sure that another View Connection Server configuration is not using the same pool ID.</p> <p>A View Connection Server configuration can be a standalone View Connection Server instance or a pod of replicated instances that share a common View LDAP configuration.</p>	
Display name	<p>The pool name that users see when they log in from a client device. If you do not specify a display name, the pool ID is displayed to users.</p>	
Access group	<p>Select an access group in which to place the pool or leave the pool in the default root access group.</p> <p>If you use an access group, you can delegate managing the pool to an administrator who has a specific role. For details, see the role-based delegated administration chapter in the <i>View Administration</i> document.</p> <p>NOTE Access groups are different from vCenter Server folders that store virtual machines that are used as desktops. You select a vCenter Server folder later in the wizard with other vCenter Server settings.</p>	
Delete or refresh machine on logoff	<p>If you select floating user assignment, choose whether to refresh machines, delete machines, or do nothing after users log off.</p> <p>NOTE You set this option on the Desktop Pool Settings page.</p>	

Table 5-1. Worksheet: Configuration Options for Creating a Linked-Clone Desktop Pool (Continued)

Option	Description	Fill In Your Value Here
Desktop Pool Settings	<p>Settings that determine the machine state, power status when a virtual machine is not in use, display protocol, Adobe Flash quality, and so on. For descriptions, see “Desktop Pool Settings for All Desktop Pool Types,” on page 107.</p> <p>For a list of the settings that apply to linked-clone pools, see “Desktop Pool Settings for Linked-Clone Desktop Pools,” on page 67.</p> <p>For more information about power policies and automated pools, see “Setting Power Policies for Desktop Pools,” on page 111.</p>	
Stop provisioning on error	<p>You can direct View to stop provisioning or continue to provision virtual machines in a desktop pool after an error occurs during the provisioning of a virtual machine. If you leave this setting selected, you can prevent a provisioning error from recurring on multiple virtual machines.</p>	
Virtual machine naming	<p>Choose whether to provision machines by manually specifying a list of machine names or by providing a naming pattern and the total number of machines.</p> <p>For details, see “Naming Machines Manually or Providing a Naming Pattern,” on page 100.</p>	
Specify names manually	<p>If you specify names manually, prepare a list of machine names and, optionally, the associated user names.</p>	
Naming pattern	<p>If you use this naming method, provide the pattern.</p> <p>The pattern you specify is used as a prefix in all the machine names, followed by a unique number to identify each machine.</p> <p>For details, see “Using a Naming Pattern for Automated Desktop Pools,” on page 102.</p>	
Max number of machines	<p>If you use a naming pattern, specify the total number of machines in the pool.</p> <p>You can also specify a minimum number of machines to provision when you first create the pool.</p>	
Number of spare (powered on) machines	<p>If you specify names manually or use a naming pattern, specify a number of machines to keep available and powered on for new users. For details, see “Naming Machines Manually or Providing a Naming Pattern,” on page 100.</p> <p>When you specify names manually, this option is called # Unassigned machines kept powered on.</p>	

Table 5-1. Worksheet: Configuration Options for Creating a Linked-Clone Desktop Pool (Continued)

Option	Description	Fill In Your Value Here
Minimum number of ready (provisioned) machines during View Composer maintenance operations	<p>If you specify names manually or use a naming pattern, specify a minimum number of machines that are ready and provisioned while View Composer operations take place.</p> <p>This setting lets you keep machines provisioned and ready to accept connection requests from users while View Composer refreshes, recomposes, or rebalances the machines in the pool.</p> <p>This value must be smaller than the Min number of machines, which you specify if you provision machines on demand.</p> <p>See “Keeping Linked-Clone Machines Provisioned and Ready During View Composer Operations,” on page 72.</p>	
Provision machines on demand or Provision all machines up front	<p>If you use a naming pattern, choose whether to provision all machines when the pool is created or provision machines as they are needed.</p> <ul style="list-style-type: none"> ■ Provision all machines up front. When the pool is created, the system provisions the number of machines you specify in Max number of machines. ■ Provision machines on demand. When the pool is created, the system creates the number of machines that you specify in Min number of machines. Additional machines are created as users connect to the pool for the first time or as you assign machines to users. 	
Min number of machines	<p>If you use a naming pattern and provision desktops on demand, specify a minimum number of machines in the pool.</p> <p>The system creates the minimum number of machines when you create the pool. This number is maintained even when other settings such as Delete or refresh machine on logoff cause machines to be deleted.</p>	
Redirect Windows profile to a persistent disk	<p>If you select dedicated user assignments, choose whether to store Windows user-profile data on a separate View Composer persistent disk or the same disk as the OS data.</p> <p>Separate persistent disks let you preserve user data and settings. View Composer refresh, recompose, and rebalance operations do not affect persistent disks. You can detach a persistent disk from a linked clone and recreate the linked-clone virtual machine from the detached disk. For example, when a machine or pool is deleted, you can detach the persistent disk and recreate the desktop, preserving the original user data and settings.</p> <p>If you store the Windows profile in the OS disk, user data and settings are removed during refresh, recompose, and rebalance operations.</p>	

Table 5-1. Worksheet: Configuration Options for Creating a Linked-Clone Desktop Pool (Continued)

Option	Description	Fill In Your Value Here
Disk size and drive letter for persistent disk	<p>If you store user profile data on a separate View Composer persistent disk, provide the disk size in megabytes and the drive letter.</p> <p>NOTE Do not select a drive letter that already exists on the parent virtual machine or that conflicts with a drive letter that is used for a network-mounted drive.</p>	
Disposable File Redirection	<p>Choose whether to redirect the guest OS's paging and temp files to a separate, nonpersistent disk. If you do, provide the disk size in megabytes.</p> <p>With this configuration, when a linked clone is powered off, the disposable-file disk is replaced with a copy of the original disk that was created with the linked-clone pool. Linked clones can increase in size as users interact with their desktops. Disposable file redirection can save storage space by slowing the growth of linked clones.</p>	
Disk size and drive letter for disposable file disk	<p>If you redirect disposable files to a nonpersistent disk, provide the disk size in megabytes and the drive letter.</p> <p>The disk size should be larger than page-file size of the guest OS. To determine the page-file size, see “Keep a Record of the Parent Virtual Machine's Paging-File Size,” on page 48.</p> <p>When you configure the disposable file disk size, consider that the actual size of a formatted disk partition is slightly smaller than the value you provide in View Administrator.</p> <p>You can select a drive letter for the disposable file disk. The default value, Auto, directs View to assign the drive letter.</p> <p>NOTE Do not select a drive letter that already exists on the parent virtual machine or that conflicts with a drive letter that is used for a network-mounted drive.</p>	
Use vSphere Virtual SAN	<p>Specify whether to use VMware Virtual SAN, if available. Virtual SAN is a software-defined storage tier that virtualizes the local physical storage disks available on a cluster of ESXi hosts. For more information, see “Using Virtual SAN for High-Performance Storage and Policy-Based Management,” on page 170.</p>	
Select separate datastores for persistent and OS disks	<p>(Available only if you do not use Virtual SAN) If you redirect user profiles to separate persistent disks, you can store the persistent disks and OS disks on different datastores.</p>	

Table 5-1. Worksheet: Configuration Options for Creating a Linked-Clone Desktop Pool (Continued)

Option	Description	Fill In Your Value Here
Select separate datastores for replica and OS disks	<p>(Available only if you do not use Virtual SAN) You can store the replica (master) virtual machine disk on a high performance datastore and the linked clones on separate datastores. For details, see “Storing View Composer Replicas and Linked Clones on Separate Datastores,” on page 182. If you store replicas and OS disks on separate datastores, native NFS snapshots cannot be used. Native cloning on a NAS device can only take place if the replica and OS disks are stored on the same datastores.</p>	
Parent VM	<p>Select the parent virtual machine for the pool. NOTE You cannot use View Composer to deploy machines that run Windows Vista Ultimate Edition or Windows XP Professional SP1.</p>	
Snapshot (default image)	<p>Select the snapshot of the parent virtual machine to use as the base image for the pool. Do not delete the snapshot and parent virtual machine from vCenter Server, unless no linked clones in the pool use the default image, and no more linked clones will be created from this default image. The system requires the parent virtual machine and snapshot to provision new linked clones in the pool, according to pool policies. The parent virtual machine and snapshot are also required for View Composer maintenance operations.</p>	
VM folder location	<p>Select the folder in vCenter Server in which the desktop pool resides.</p>	
Host or cluster	<p>Select the ESXi host or cluster on which the desktop virtual machines run. In vSphere 5.1 or later, you can select a cluster with up to 32 ESXi hosts if the replicas are stored on VMFS5 or later datastores or NFS datastores. If you store replicas on a VMFS version earlier than VMFS5, a cluster can have at most eight hosts. In vSphere 5.0, you can select a cluster with more than eight ESXi hosts if the replicas are stored on NFS datastores. If you store replicas on VMFS datastores, a cluster can have at most eight hosts. See “Configuring Desktop Pools on Clusters With More Than Eight Hosts,” on page 121.</p>	
Resource pool	<p>Select the vCenter Server resource pool in which the desktop pool resides.</p>	

Table 5-1. Worksheet: Configuration Options for Creating a Linked-Clone Desktop Pool (Continued)

Option	Description	Fill In Your Value Here
Datastores	<p>Select one or more datastores on which to store the desktop pool.</p> <p>A table on the Select Linked Clone Datastores page of the Add Desktop Pool wizard provides high-level guidelines for estimating the pool's storage requirements. These guidelines can help you determine which datastores are large enough to store the linked-clone disks. For details, see “Storage Sizing for Linked-Clone Desktop Pools,” on page 174.</p> <p>You can use shared or local datastores for an individual ESXi host or for ESXi clusters. If you use local datastores in an ESXi cluster, you must consider the vSphere infrastructure constraints that are imposed on your desktop deployment. See “Storing Linked Clones on Local Datastores,” on page 181.</p> <p>In vSphere 5.1 or later, a cluster can have more than eight ESXi hosts if the replicas are stored on datastores that are VMFS5 or later or NFS. In vSphere 5.0, a cluster can have more than eight ESXi hosts only if the replicas are stored on NFS datastores. See “Configuring Desktop Pools on Clusters With More Than Eight Hosts,” on page 121.</p> <p>For more information about the disks that are created for linked clones, see “Linked-Clone Data Disks,” on page 180.</p> <p>NOTE If you use Virtual SAN, select only one datastore.</p>	
Storage Overcommit	<p>Determine the storage-overcommit level at which linked-clones are created on each datastore.</p> <p>As the level increases, more linked clones fit on the datastore and less space is reserved to let individual clones grow. A high storage-overcommit level lets you create linked clones that have a total logical size larger than the physical storage limit of the datastore. For details, see “Set the Storage Overcommit Level for Linked-Clone Virtual Machines,” on page 179.</p> <p>NOTE This setting has no effect if you use Virtual SAN.</p>	
Use View Storage Accelerator	<p>Determine whether to use View Storage Accelerator, which allows ESXi hosts to cache common virtual machine disk data. View Storage Accelerator can improve performance and reduce the need for extra storage I/O bandwidth to manage boot storms and anti-virus scanning I/O storms.</p> <p>This feature is supported on vSphere 5.0 and later.</p> <p>This feature is enabled by default.</p> <p>For details, see “Configure View Storage Accelerator for Desktop Pools,” on page 183.</p>	

Table 5-1. Worksheet: Configuration Options for Creating a Linked-Clone Desktop Pool (Continued)

Option	Description	Fill In Your Value Here
Use native NFS snapshots (VAAI)	<p>(Available only if you do not use Virtual SAN) If your deployment includes NAS devices that support the vStorage APIs for Array Integration (VAAI), you can use native snapshot technology to clone virtual machines.</p> <p>You can use this feature only if you select datastores that reside on NAS devices that support native cloning operations through VAAI.</p> <p>You cannot use this feature if you store replicas and OS disks on separate datastores. You cannot use this feature in a pool that is enabled for View Storage Accelerator or virtual machine disk space reclamation.</p> <p>This feature is supported on vSphere 5.0 and later.</p> <p>For details, see “Using View Composer Array Integration with Native NFS Snapshot Technology (VAAI),” on page 186.</p>	
Reclaim VM disk space	<p>(Available only if you do not use Virtual SAN) Determine whether to allow ESXi hosts to reclaim unused disk space on linked clones that are created in space-efficient disk format. The space reclamation feature reduces the total storage space required for linked-clone desktops.</p> <p>This feature is supported on vSphere 5.1 and later. The linked-clone virtual machines must be virtual hardware version 9 or later.</p> <p>For details, see “Reclaim Disk Space on Linked-Clone Virtual Machines,” on page 184.</p>	
Initiate reclamation when unused space on VM exceeds:	<p>(Available only if you do not use Virtual SAN) Type the minimum amount of unused disk space, in gigabytes, that must accumulate on a linked-clone OS disk to trigger space reclamation. When the unused disk space exceeds this threshold, View initiates the operation that directs the ESXi host to reclaim space on the OS disk.</p> <p>This value is measured per virtual machine. The unused disk space must exceed the specified threshold on an individual virtual machine before View starts the space reclamation process on that machine.</p> <p>For example: 2 GB.</p> <p>The default value is 1 GB.</p>	
Blackout Times	<p>Configure days and times during which View Storage Accelerator regeneration and the reclamation of virtual machine disk space do not take place.</p> <p>To ensure that ESXi resources are dedicated to foreground tasks when necessary, you can prevent the ESXi hosts from performing these operations during specified periods of time on specified days.</p> <p>For details, see “Set Blackout Times for ESXi Operations on View Virtual Machines,” on page 187.</p>	

Table 5-1. Worksheet: Configuration Options for Creating a Linked-Clone Desktop Pool (Continued)

Option	Description	Fill In Your Value Here
Domain	<p>Select the Active Directory domain and user name.</p> <p>View Composer requires certain user privileges to create a linked-clone pool. The domain and user account are used by QuickPrep or Sysprep to customize the linked-clone machines.</p> <p>You specify this user when you configure View Composer settings for vCenter Server. You can specify multiple domains and users when you configure View Composer settings. When you use the Add Desktop Pool wizard to create a pool, you must select one domain and user from the list.</p> <p>For information about configuring View Composer, see the <i>VMware Horizon View Administration</i> document.</p>	
AD container	<p>Provide the Active Directory container relative distinguished name.</p> <p>For example: CN=Computers</p> <p>When you run the Add Desktop Pool wizard, you can browse your Active Directory tree for the container.</p>	
Allow reuse of pre-existing computer accounts	<p>Select this option to use existing computer accounts in Active Directory for linked clones that are provisioned by View Composer. This option lets you control the computer accounts that are created in Active Directory.</p> <p>When a linked clone is provisioned, if an existing AD computer account name matches the linked clone machine name, View Composer uses the existing computer account. Otherwise, a new computer account is created.</p> <p>The existing computer accounts must be located in the Active Directory container that you specify with the Active Directory container setting.</p> <p>When this option is disabled, a new AD computer account is created when View Composer provisions a linked clone. This option is disabled by default.</p> <p>For details, see “Use Existing Active Directory Computer Accounts for Linked Clones,” on page 73.</p>	
Use QuickPrep or a customization specification (Sysprep)	<p>Choose whether to use QuickPrep or select a customization specification (Sysprep) to configure licensing, domain attachment, DHCP settings, and other properties on the machines.</p> <p>Sysprep is supported for linked clones only on vSphere 4.1 or later software.</p> <p>After you use QuickPrep or Sysprep when you create a pool, you cannot switch to the other customization method later on, when you create or recompose machines in the pool.</p> <p>For details, see “Choosing QuickPrep or Sysprep to Customize Linked-Clone Machines,” on page 69.</p>	

Table 5-1. Worksheet: Configuration Options for Creating a Linked-Clone Desktop Pool (Continued)

Option	Description	Fill In Your Value Here
Power-off script	QuickPrep can run a customization script on linked-clone machines before they are powered off. Provide the path to the script on the parent virtual machine and the script parameters.	
Post-synchronization script	QuickPrep can run a customization script on linked-clone machines after they are created, recomposed, and refreshed. Provide the path to the script on the parent virtual machine and the script parameters.	

Create a Linked-Clone Desktop Pool

You can create an automated, linked-clone desktop pool based on a parent virtual machine that you select. The View Composer service dynamically creates a new linked-clone virtual machine in vCenter Server for each desktop.

To create an automated pool that contains full virtual machines, see [“Automated Pools That Contain Full Virtual Machines,”](#) on page 51.

Prerequisites

- Verify that the View Composer service is installed, either on the same host as vCenter Server or on a separate host, and that a View Composer database is configured. See the *View Installation* document.
- Verify that View Composer settings for vCenter Server are configured in View Administrator. See the *View Administration* document.
- Verify that you have a sufficient number of ports on the ESXi virtual switch that is used for the virtual machines that are used as remote desktops. The default value might not be sufficient if you create large desktop pools. The number of virtual switch ports on the ESXi host must equal or exceed the number of virtual machines multiplied by the number of virtual NICs per virtual machine.
- Verify that you prepared a parent virtual machine. View Agent must be installed on the parent virtual machine. See [Chapter 3, “Creating and Preparing Virtual Machines,”](#) on page 19.
- Take a snapshot of the parent virtual machine in vCenter Server. You must shut down the parent virtual machine before you take the snapshot. View Composer uses the snapshot as the base image from which the clones are created.

NOTE You cannot create a linked-clone pool from a virtual machine template.

- Gather the configuration information you must provide to create the pool. See [“Worksheet for Creating a Linked-Clone Desktop Pool,”](#) on page 57.
- Decide how to configure power settings, display protocol, Adobe Flash quality, and other settings. See [“Desktop Pool Settings for All Desktop Pool Types,”](#) on page 107.
- If you intend to provide access to your desktops and applications through Workspace, verify that you create the desktop and application pools as a user who has the Administrators role on the root access group in View Administrator. If you give the user the Administrators role on an access group other than the root access group, Workspace will not recognize the SAML authenticator you configure in View, and you cannot configure the pool in Workspace.

IMPORTANT While a linked-clone pool is created, do not modify the parent virtual machine in vCenter Server. For example, do not convert the parent virtual machine to a template. The View Composer service requires that the parent virtual machine remain in a static, unaltered state during pool creation.

Procedure

- 1 In View Administrator, select **Catalog > Desktop Pools**.
- 2 Click **Add**.
- 3 Select **Automated Desktop Pool**.
- 4 On the vCenter Server page, choose **View Composer linked clones**.
- 5 Follow the prompts in the wizard to create the pool.

Use the configuration information you gathered in the worksheet. You can go directly back to any wizard page you completed by clicking the page name in the navigation panel.

On the **vCenter Settings** page, you must click **Browse** and select the vCenter Server settings in sequence. You cannot skip a vCenter Server setting:

- a Parent VM
- b Snapshot
- c VM folder location
- d Host or cluster
- e Resource pool
- f Datastores

In View Administrator, you can view the machines as they are added to the pool by selecting **Catalog > Desktop Pools**.

The linked clones might restart one or more times while they are provisioned. If a linked clone is in an error state, the View automatic recovery mechanism attempts to power on, or shut down and restart, the linked clone. If repeated recovery attempts fail, the linked clone is deleted.

View Composer also creates a replica virtual machine that serves as the master image for provisioning the linked clones. To reduce space consumption, the replica is created as a thin disk. If all the virtual machines are recomposed or deleted, and no clones are linked to the replica, the replica virtual machine is deleted from vCenter Server.

If you do not store the replica on a separate datastore, View Composer creates a replica on each datastore on which linked clones are created.

If you store the replica on a separate datastore, one replica is created for the entire pool, even when linked clones are created on multiple datastores.

What to do next

Entitle users to access the pool. See [“Add Entitlements to a Desktop or Application Pool,”](#) on page 123.

Desktop Pool Settings for Linked-Clone Desktop Pools

You must specify machine and desktop pool settings when you configure automated pools that contain linked clones created by View Composer. Different settings apply to pools with dedicated user assignments and floating user assignments.

[Table 5-2](#) lists the settings that apply to linked-clone pools with dedicated assignments and floating assignments.

For descriptions of each setting, see [“Desktop Pool Settings for All Desktop Pool Types,”](#) on page 107.

Table 5-2. Settings for Automated, Linked-Clone Desktop Pools

Setting	Linked-Clone Pool, Dedicated Assignment	Linked-Clone Pool, Floating Assignment
State	Yes	Yes
Connection Server restrictions	Yes	Yes
Remote machine power policy	Yes	Yes
Automatically logoff after disconnect	Yes	Yes
Allow users to reset their machines	Yes	Yes
Allow multiple sessions per user		Yes
Delete or refresh machine on logoff		Yes
Refresh OS disk after logoff	Yes	
Default display protocol	Yes	Yes
Allow users to choose protocol	Yes	Yes
3D Renderer	Yes	Yes
Max number of monitors	Yes	Yes
Max resolution of any one monitor	Yes	Yes
Adobe Flash quality	Yes	Yes
Adobe Flash throttling	Yes	Yes
Override global Mirage settings	Yes	Yes
Mirage Server configuration	Yes	Yes

View Composer Support for Linked-Clone SIDs and Third-Party Applications

View Composer can generate and preserve local computer security identifiers (SIDs) for linked-clone virtual machines in some situations. View Composer can preserve globally unique identifiers (GUIDs) of third-party applications, depending on the way that the applications generate GUIDs.

To understand how View Composer operations affect SIDs and application GUIDs, you should understand how linked-clone machines are created and provisioned:

- 1 View Composer creates a linked clone by taking these actions:
 - a Creates the replica by cloning the parent virtual-machine snapshot.
 - b Creates the linked clone to refer to the replica as its parent disk.
- 2 View Composer and View customize the linked clone with QuickPrep or a Sysprep customization specification, depending on which customization tool you select when you create the pool.
 - If you use Sysprep, a unique SID is generated for each clone.
 - If you use QuickPrep, no new SID is generated. The parent virtual machine's SID is replicated on all provisioned linked-clone machines in the pool.
 - Some applications generate a GUID during customization.
- 3 View creates a snapshot of the linked clone.

The snapshot contains the unique SID generated with Sysprep or common SID generated with QuickPrep.
- 4 View powers on the machine according to the settings you select when you create the pool.

Some applications generate a GUID the first time the machine is powered on.

For a comparison of QuickPrep and Sysprep customization, see [“Choosing QuickPrep or Sysprep to Customize Linked-Clone Machines,”](#) on page 69.

When you refresh the linked clone, View Composer uses the snapshot to restore the clone to its initial state. Its SID is preserved.

If you use QuickPrep, when you recompose the linked clone, the parent virtual machine's SID is preserved on the linked clone as long as you select the same parent virtual machine for the recompose operation. If you select a different parent virtual machine for the recomposition, the new parent's SID is replicated on the clone.

If you use Sysprep, a new SID is always generated on the clone. For details, see [“Recomposing Linked Clones Customized with Sysprep,”](#) on page 72.

[Table 5-3](#) shows the effect of View Composer operations on linked-clone SIDs and third-party application GUIDs.

Table 5-3. View Composer Operations, Linked-Clone SIDs, and Application GUIDs

Support for SIDs or GUIDs	Clone Creation	Refresh	Recompose
Sysprep: Unique SIDs for linked clones	With Sysprep customization, unique SIDs are generated for linked clones.	Unique SIDs are preserved.	Unique SIDs are not preserved.
QuickPrep: Common SIDs for linked clones	With QuickPrep customization, a common SID is generated for all clones in a pool.	Common SID is preserved.	Common SID is preserved.
Third-party application GUIDs	Each application behaves differently. NOTE Sysprep and QuickPrep have the same effect on GUID preservation.	The GUID is preserved if an application generates the GUID before the initial snapshot is taken. The GUID is not preserved if an application generates the GUID after the initial snapshot is taken.	Recompose operations do not preserve an application GUID unless the application writes the GUID on the drive specified as a View Composer persistent disk.

Choosing QuickPrep or Sysprep to Customize Linked-Clone Machines

QuickPrep and Microsoft Sysprep provide different approaches to customizing linked-clone machines. QuickPrep is designed to work efficiently with View Composer. Microsoft Sysprep offers standard customization tools.

When you create linked-clone machines, you must modify each virtual machine so that it can function as a unique computer on the network. View and View Composer provide two methods for personalizing linked-clone machines.

[Table 5-4](#) compares QuickPrep with customization specifications that are created with Microsoft Sysprep.

Table 5-4. Comparing QuickPrep and Microsoft Sysprep

QuickPrep	Customization Specification (Sysprep)
Designed to work with View Composer. For details, see “Customizing Linked-Clone Machines with QuickPrep,” on page 70.	Can be created with the standard Microsoft Sysprep tools.
Uses the same local computer security identifier (SID) for all linked clones in the pool.	Generates a unique local computer SID for each linked clone in the pool.
Can run additional customization scripts before linked clones are powered off and after linked clones are created, refreshed, or recomposed.	Can run an additional script when the user first logs in.

Table 5-4. Comparing QuickPrep and Microsoft Sysprep (Continued)

QuickPrep	Customization Specification (Sysprep)
Joins the linked clone computer to the Active Directory domain.	Joins the linked-clone computer to the Active Directory domain. The domain and administrator information in the Sysprep customization specification is not used. The virtual machine is joined to the domain using the guest customization information that you enter in View Administrator when you create the pool.
For each linked clone, adds a unique ID to the Active Directory domain account.	For each linked clone, adds a unique ID to the Active Directory domain account.
Does not generate a new SID after linked clones are refreshed. The common SID is preserved.	Generates a new SID when each linked clone is customized. Preserves the unique SIDs during a refresh operation, but not during a recompose or rebalance operation.
Does not generate a new SID after linked clones are recomposed. The common SID is preserved.	Runs again after linked clones are recomposed, generating new SIDs for the virtual machines. For details, see “Recomposing Linked Clones Customized with Sysprep,” on page 72.
Runs faster than Sysprep.	Can take longer than QuickPrep.

After you customize a linked-clone pool with QuickPrep or Sysprep, you cannot switch to the other customization method when you create or recompose machines in the pool.

Customizing Linked-Clone Machines with QuickPrep

You can personalize the linked-clone machines that are created from a parent virtual machine by using the QuickPrep system tool. View Composer executes QuickPrep when a linked-clone machine is created or recomposed.

QuickPrep customizes a linked-clone machine in several ways:

- Gives the computer a name that you specify when you create the linked-clone pool.
- Creates a computer account in Active Directory, joining the computer to the appropriate domain.
- Mounts the View Composer persistent disk. The Windows user profile is redirected to this disk.
- Redirects temp and paging files to a separate disk.

These steps might require the linked clones to restart one or more times.

QuickPrep uses KMS volume license keys to activate Windows 8, Windows 7, and Windows Vista linked-clone machines. For details, see the *VMware Horizon View Administration* document.

You can create your own scripts to further customize the linked clones. QuickPrep can run two types of scripts at predefined times:

- After linked clones are created or recomposed
- Immediately before linked clones are powered off

For guidelines and rules for using QuickPrep customization scripts, see [“Running QuickPrep Customization Scripts,”](#) on page 71.

NOTE View Composer requires domain user credentials to join linked-clone machines to an Active Directory domain. For details, see the *View Administration* document.

Running QuickPrep Customization Scripts

With the QuickPrep tool, you can create scripts to customize the linked-clone machines in a pool. You can configure QuickPrep to run customization scripts at two predefined times.

When QuickPrep Scripts Run

The post-synchronization script runs after linked clones are created, recomposed, or rebalanced, and the clones' status is **Ready**. The power-off script runs before linked clones are powered off. The scripts run in the guest operating systems of the linked clones.

How QuickPrep Executes Scripts

The QuickPrep process uses the Windows `CreateProcess` API call to execute scripts. Your script can invoke any process that can be created with the `CreateProcess` API. For example, `cmd`, `vbscript`, `exe`, and batch-file processes work with the API.

In particular, QuickPrep passes the path that is specified for the script as the second parameter to the `CreateProcess` API and sets the first parameter to `NULL`.

For example, if the script path is `c:\myscript.cmd`, the path appears as the second parameter in the function in the View Composer log file: `CreateProcess(NULL,c:\myscript.cmd,...)`.

Providing Paths to QuickPrep Scripts

You provide paths to the QuickPrep customization scripts when you create a linked-clone machine pool or when you edit a pool's guest customization settings. The scripts must reside on the parent virtual machine. You cannot use a UNC path to a network share.

If you use a scripting language that needs an interpreter to execute the script, the script path must start with the interpreter binary.

For example, if you specify the path `C:\script\myvb.vbs` as a QuickPrep customization script, View Composer Agent cannot execute the script. You must specify a path that starts with the interpreter binary path:

```
C:\windows\system32\cscript.exe c:\script\myvb.vbs
```

IMPORTANT Protect QuickPrep customization scripts from access by ordinary users. Place the scripts in a secure folder.

QuickPrep Script Timeout Limit

View Composer terminates a post-synchronization or power-off script that takes longer than 20 seconds. If your script takes longer than 20 seconds, you can increase the timeout limit. For details, see [“Increase the Timeout Limit of QuickPrep Customization Scripts,”](#) on page 48.

Alternatively, you can use your script to launch another script or process that performs the long-running task.

QuickPrep Script Account

QuickPrep runs the scripts under the account under which the VMware View Composer Guest Agent Server service is configured to run. By default, this account is `Local System`.

Do not change this log on account. If you do, the linked clones do not start.

QuickPrep Process Privileges

For security reasons, certain Windows operating system privileges are removed from the View Composer Guest Agent process that invokes QuickPrep customization scripts.

A QuickPrep customization script cannot perform any action that requires a privilege that is removed from the View Composer Guest Agent process.

The following privileges are removed from the process that invokes QuickPrep scripts:

```
SeCreateTokenPrivilege
SeTakeOwnershipPrivilege
SeSecurityPrivilege
SeSystemEnvironmentPrivilege
SeLoadDriverPrivilege
SeSystemtimePrivilege
SeUndockPrivilege
SeManageVolumePrivilege
SeLockMemoryPrivilege
SeIncreaseBasePriorityPrivilege
SeCreatePermanentPrivilege
SeDebugPrivilege
SeAuditPrivilege
```

QuickPrep Script Logs

View Composer logs contain information about QuickPrep script execution. The log records the start and end of execution and logs output or error messages. The log is located in the Windows temp directory:

```
C:\Windows\Temp\vmware-viewcomposer-ga-new.log
```

Recomposing Linked Clones Customized with Sysprep

If you recompose a linked-clone machine that was customized with Sysprep, View runs the Sysprep customization specification again after the OS disk is recomposed. This operation generates a new SID for the linked-clone virtual machine.

If a new SID is generated, the recomposed linked clone functions as a new computer on the network. Some software programs such as system-management tools depend on the SID to identify the computers under their management. These programs might not be able to identify or locate the linked-clone virtual machine.

Also, if third-party software is installed on the system disk, the customization specification might regenerate the GUIDs for that software after the recomposition.

A recomposition restores the linked clone to its original state, before the customization specification was run the first time. In this state, the linked clone does not have a local computer SID or the GUID of any third-party software installed in the system drive. View must run the Sysprep customization specification after the linked clone is recomposed.

Keeping Linked-Clone Machines Provisioned and Ready During View Composer Operations

If your users must be able to access remote desktops at all times, you must maintain a certain number of machines that stay provisioned and ready to accept connection requests from your users even when View Composer maintenance operations take place. You can set a minimum number of provisioned, ready machines while View Composer refreshes, recomposes, or rebalances the linked-clone virtual machines in a pool.

When you specify a **Minimum number of ready (provisioned) machines during View Composer maintenance operations**, View ensures that the specified number of machines stays provisioned and ready while View Composer proceeds through the operation. You can specify the minimum number of ready machines when you create or edit a linked-clone pool.

The following guidelines apply to this setting:

- If you use a naming pattern to provision machines and provision machines on demand, set the number of ready machines during View Composer operations to a smaller value than the specified **Min number of machines**. If the minimum number were smaller, your pool could end up with fewer total machines than the minimum number you want to keep provisioned and ready during View Composer operations. In this case, View Composer maintenance operations could not take place.
- If you provision machines by manually specifying a list of machine names, do not reduce the total pool size (by removing machine names) to a lower number than the minimum number of ready machines. In this case, View Composer maintenance operations could not take place.
- If you set a large minimum number of ready machines in relation to the pool size, View Composer maintenance operations might take longer to complete. While View maintains the minimum number of ready machines during a maintenance operation, the operation might not reach the concurrency limit that is specified in the **Max concurrent View Composer maintenance operations** setting.

For example, if a pool contains 20 machines and the minimum number of ready machines is 15, View Composer can operate on at most five machines at a time. If the concurrency limit for View Composer maintenance operations is 12, the concurrency limit is never reached.

- The term "ready" applies to the state of the linked-clone virtual machine, not the machine status that is displayed in View Administrator. A virtual machine is ready when it is provisioned and ready to be powered on. The machine status reflects the View-managed condition of the machine. For example, a machine can have a status of `Connected`, `Disconnected`, `Agent Unreachable`, `Deleting`, and so on.

Use Existing Active Directory Computer Accounts for Linked Clones

When you create or edit a desktop pool, you can configure View Composer to use existing computer accounts in Active Directory for newly provisioned linked clones.

By default, View Composer generates a new Active Directory computer account for each linked clone that it provisions. The **Allow reuse of pre-existing computer accounts** option lets you control the computer accounts that are created in Active Directory by ensuring that View Composer uses existing AD computer accounts.

With this option enabled, when a linked clone is provisioned, View Composer checks if an existing AD computer account name matches the linked clone machine name. If a match exists, View Composer uses the existing AD computer account. If View Composer does not find a matching AD computer account name, View Composer generates a new AD computer account for the linked clone.

You can set the **Allow reuse of pre-existing computer accounts** option when you create a new desktop pool or edit an existing pool. If you edit a pool and set this option, the setting affects linked-clone machines that are provisioned in the future. Linked clones that are already provisioned are not affected.

When you set the **Allow reuse of pre-existing computer accounts** option, you can limit the Active Directory permissions assigned to the View Composer user account that generates the desktop pool. Only the following Active Directory permissions are required:

- List Contents
- Read All Properties
- Read Permissions
- Reset Password

You can only limit the Active Directory permissions if you are sure that all machines you intend to provision have existing computer accounts allocated in Active Directory. View Composer generates a new AD computer account if no matching name is found. Additional permissions such as Create Computer Objects are required to create new computer accounts. For a complete list of permissions required for the View Composer user account, see the *VMware Horizon View Administration* document.

This option cannot be disabled if View Composer is currently using at least one existing AD computer account.

Prerequisites

Verify that the existing computer accounts are located in the Active Directory container that you specify with the **Active Directory container** setting. If the existing accounts are located in a different container, provisioning fails for linked clones with those account names, and an error message states that the existing computer accounts already exist in Active Directory.

For example, if you select the **Allow reuse of pre-existing computer accounts** option and specify that the **Active Directory container** is the default value, **CN=Computers**, and the existing computer accounts are located in **OU=mydesktops**, provisioning fails for those accounts.

Procedure

- 1 In Active Directory, create the computer accounts to use for the linked-clone machines.
For example: `machine1`, `machine2`, `machine3`

The computer account names must use consecutive integers so that they match the names that are generated during machine provisioning in View.
- 2 In View Administrator, create a pool by using the Add Desktop Pool wizard or edit the pool in the Edit dialog box.
- 3 On the Provisioning Settings page or tab, select **Use a naming pattern**.
- 4 In the **Naming Pattern** text box, type a machine name that matches the Active Directory computer account name.
For example: `machine`

View appends unique numbers to the pattern to provide a unique name for each machine.
For example: `machine1`, `machine2`, `machine3`
- 5 On the Guest Customization page or tab, select the **Allow reuse of pre-existing computer accounts** option.

Creating Manual Desktop Pools

In a manual desktop pool, each remote desktop that is accessed by an end user is a separate machine. When you create a manual desktop pool, you select existing machines. You can create a pool that contains a single desktop by creating a manual desktop pool and selecting a single machine.

This chapter includes the following topics:

- [“Manual Desktop Pools,”](#) on page 75
- [“Worksheet for Creating a Manual Desktop Pool,”](#) on page 75
- [“Create a Manual Desktop Pool,”](#) on page 77
- [“Create a Manual Pool That Contains One Machine,”](#) on page 77
- [“Desktop Pool Settings for Manual Pools,”](#) on page 78

Manual Desktop Pools

To create a manual desktop pool, View provisions desktops from existing machines. You select a separate machine for each desktop in the pool.

View can use several types of machines in manual pools:

- Virtual machines that are managed by vCenter Server
- Virtual machines that run on a virtualization platform other than vCenter Server
- Physical computers

Worksheet for Creating a Manual Desktop Pool

When you create a manual desktop pool, the View Administrator Add Desktop Pool wizard prompts you to configure certain options. Use this worksheet to prepare your configuration options before you create the pool.

You can print this worksheet and write down the values you want to specify when you run the Add Desktop Pool wizard.

NOTE In a manual pool, you must prepare each machine to deliver remote desktop access. View Agent must be installed and running on each machine.

Table 6-1. Worksheet: Configuration Options for Creating a Manual Desktop Pool

Option	Description	Fill In Your Value Here
User assignment	<p>Choose the type of user assignment:</p> <ul style="list-style-type: none"> ■ In a dedicated-assignment pool, each user is assigned to a machine. Users receive the same machine each time they log in. ■ In a floating-assignment pool, users receive different machines each time they log in. <p>For details, see “User Assignment in Desktop Pools,” on page 99.</p>	
vCenter Server	<p>The vCenter Server that manages the machines. This option appears only if the machines are virtual machines that are managed by vCenter Server.</p>	
Machine Source	<p>The virtual machines or physical computers that you want to include in the desktop pool.</p> <ol style="list-style-type: none"> 1 Decide which type of machine you want to use. You can use either virtual machines that are managed by vCenter Server or unmanaged virtual machines and physical computers. 2 Prepare a list of the vCenter Server virtual machines or unmanaged virtual machines and physical computers that you want to include in the desktop pool. 3 Install View Agent on each machine that you want to include in the desktop pool. <p>To use PCoIP with machines that are unmanaged virtual machines or physical computers, you must use Teradici hardware.</p> <p>NOTE When you enable Windows Server 2008 R2 desktops in View Administrator, View Administrator displays all available Windows Server 2008 R2 machines, including machines on which View Connection Server and other View servers are installed, as potential machine sources.</p> <p>You cannot select machines for the desktop pool if View server software is installed on the machines. View Agent cannot coexist on the same virtual or physical machine with any other View software component, including View Connection Server, security server, View Composer, or Horizon Client.</p>	
Desktop Pool ID	<p>The pool name that users see when they log in and that identifies the pool in View Administrator.</p> <p>If multiple vCenter Servers are running in your environment, make sure that another vCenter Server is not using the same pool ID.</p>	
Desktop Pool Settings	<p>Settings that determine the machine state, power status when a virtual machine is not in use, display protocol, Adobe Flash quality, and so on.</p> <p>For details, see “Desktop Pool Settings for All Desktop Pool Types,” on page 107.</p> <p>For a list of the settings that apply to manual pools, see “Desktop Pool Settings for Manual Pools,” on page 78.</p>	

Create a Manual Desktop Pool

You can create a manual desktop pool that provisions desktops from existing virtual machines or physical computers. You must select the machines that will be included in the desktop pool.

For manual pools with virtual machines that are managed by vCenter Server, View ensures that a spare machine is powered on so that users can connect to it. The spare machine is powered on no matter which power policy is in effect.

Prerequisites

- Prepare the machines to deliver remote desktop access. In a manual pool, you must prepare each machine individually. View Agent must be installed and running on each machine.

To prepare virtual machines managed by vCenter Server, see [Chapter 3, “Creating and Preparing Virtual Machines,”](#) on page 19.

To prepare unmanaged virtual machines and physical computers, see [Chapter 2, “Preparing Unmanaged Machines,”](#) on page 15.

- Gather the configuration information that you must provide to create the pool. See [“Worksheet for Creating a Manual Desktop Pool,”](#) on page 75.
- Decide how to configure power settings, display protocol, Adobe Flash quality, and other settings. See [“Desktop Pool Settings for All Desktop Pool Types,”](#) on page 107.

Procedure

- 1 In View Administrator, select **Catalog > Desktop Pools**.
- 2 Click **Add**.
- 3 Select **Manual Desktop Pool**.
- 4 Follow the prompts in the wizard to create the pool.

Use the configuration information that you gathered in the worksheet. You can go directly back to any wizard page that you completed by clicking the page name in the navigation panel.

In View Administrator, you can view the machines as they are added to the pool by selecting **Catalog > Desktop Pools**.

What to do next

Entitle users to access the pool. See [“Add Entitlements to a Desktop or Application Pool,”](#) on page 123.

Create a Manual Pool That Contains One Machine

You can create a pool that contains a single machine when a user requires a unique, dedicated desktop, or when, at different times, multiple users must access a costly application with a single-host license.

You can provision an individual machine in its own pool by creating a manual desktop pool and selecting a single machine.

To mimic a physical computer that can be shared by multiple users, specify a floating assignment for the users entitled to access the pool.

Whether you configure the single-machine pool with dedicated or floating assignment, power operations are initiated by session management. The virtual machine is powered on when a user requests the desktop and powered off or suspended when the user logs off.

If you configure the **Ensure machines are always powered on** policy, the virtual machine remains powered on. If the user shuts down the virtual machine, it immediately restarts.

Prerequisites

- Prepare the machine to deliver remote desktop access. View Agent must be installed and running on the machine.

To prepare a virtual machine managed by vCenter Server, see [Chapter 3, “Creating and Preparing Virtual Machines,”](#) on page 19.

To prepare an unmanaged virtual machine or physical computer, see [Chapter 2, “Preparing Unmanaged Machines,”](#) on page 15.

- Gather the configuration information you must provide to create the manual pool. See [“Worksheet for Creating a Manual Desktop Pool,”](#) on page 75.
- Decide how to configure power settings, display protocol, Adobe Flash quality, and other settings. See [“Desktop Pool Settings for All Desktop Pool Types,”](#) on page 107.

Procedure

- 1 In View Administrator, select **Catalog > Desktop Pools**.
- 2 Click **Add**.
- 3 Select **Manual Desktop Pool**.
- 4 Select the type of user assignment.

Option	Description
Dedicated	The machine is assigned to one user. Only that user can log in to the desktop.
Floating	The machine is shared by all users who are entitled to the pool. Any entitled user can log in to the desktop as long as another user is not logged in.

- 5 On the Machine Source page, select the machine to be included in the desktop pool.
- 6 Follow the prompts in the wizard to create the pool.

Use the configuration information you gathered in the worksheet. You can go directly back to any wizard page you completed by clicking the page name in the navigation panel.

In View Administrator, you can view the machine being added to the pool by selecting **Catalog > Desktop Pools**.

What to do next

Entitle users to access the pool. See [“Add Entitlements to a Desktop or Application Pool,”](#) on page 123.

Desktop Pool Settings for Manual Pools

You must specify machine and pool settings when you configure manual desktop pools. Not all settings apply to all types of manual pools.

[Table 6-2](#) lists the settings that apply to manual desktop pools that are configured with these properties:

- Dedicated user assignments
- Floating user assignments
- Managed machines (vCenter Server virtual machines)
- Unmanaged machines

These settings also apply to a manual pool that contains a single machine.

For descriptions of each desktop pool setting, see [“Desktop Pool Settings for All Desktop Pool Types,”](#) on page 107.

Table 6-2. Settings for Manual Desktop Pools

Setting	Manual Managed Pool, Dedicated Assignment	Manual Managed Pool, Floating Assignment	Manual Unmanaged Pool, Dedicated Assignment	Manual Unmanaged Pool, Floating Assignment
State	Yes	Yes	Yes	Yes
Connection Server restrictions	Yes	Yes	Yes	Yes
Remote machine power policy	Yes	Yes		
Automatically logoff after disconnect	Yes	Yes	Yes	Yes
Allow users to reset their machines	Yes	Yes		
Allow multiple sessions per user		Yes		Yes
Default display protocol	Yes	Yes	Yes To use PCoIP with a machine that is not managed by vCenter Server, you must install Teradici hardware on the machine.	Yes To use PCoIP with a machine that is not managed by vCenter Server, you must install Teradici hardware on the machine.
Allow users to choose protocol	Yes	Yes	Yes	Yes
3D Renderer	Yes	Yes		
Max number of monitors	Yes	Yes		
Max resolution of any one monitor	Yes	Yes		
Adobe Flash quality	Yes	Yes	Yes	Yes
Adobe Flash throttling	Yes	Yes	Yes	Yes
Override global Mirage settings	Yes	Yes	Yes	Yes
Mirage Server configuration	Yes	Yes	Yes	Yes

Setting Up Remote Desktop Services Hosts

7

Microsoft Remote Desktop Services (RDS) hosts provide desktop sessions and applications that users can access from client devices. If you plan to create RDS desktop pools or application pools, you must first set up RDS hosts.

This chapter includes the following topics:

- [“Remote Desktop Services Hosts,”](#) on page 81
- [“Install Remote Desktop Services on Windows Server 2008 R2 SP1,”](#) on page 82
- [“Install Remote Desktop Services on Windows Server 2012 or 2012 R2,”](#) on page 83
- [“Restrict Users to a Single Session,”](#) on page 83
- [“Install View Agent on a Remote Desktop Services Host,”](#) on page 84
- [“Enable Time Zone Redirection for RDS Desktop and Application Sessions,”](#) on page 85
- [“Enable Windows Basic Aero-Styled Theme for Applications,”](#) on page 86
- [“Configure Group Policy to Start Runonce.exe,”](#) on page 86
- [“RDS Host Performance Options,”](#) on page 87

Remote Desktop Services Hosts

An RDS host is a server computer that hosts applications and desktop sessions for remote access. An RDS host can be a virtual machine or a physical server.

In View, an RDS host is a server that has the Microsoft Remote Desktop Services role, the Microsoft Remote Desktop Session Host service, and View Agent installed. Remote Desktop Services was previously known as Terminal Services. The Remote Desktop Session Host service allows a server to host applications and remote desktop sessions. With View Agent installed on an RDS host, users can connect to applications and desktop sessions by using the display protocol PCoIP. PCoIP provides an optimized user experience for the delivery of remote content, including images, audio and video.

The performance of an RDS host depends on many factors. For information on how to tune the performance of different versions of Windows Server, see

<http://msdn.microsoft.com/library/windows/hardware/gg463392.aspx>.

View supports at most one desktop session and one application session per user on an RDS host.

The process of setting up applications or RDS desktops for remote access involves the following tasks:

- 1 Set up RDS hosts.
- 2 Create a farm. See [Chapter 8, “Creating Farms,”](#) on page 89.

- 3 Create an application pool or an RDS desktop pool. See [Chapter 9, “Creating Application Pools,”](#) on page 93 or [Chapter 10, “Creating RDS Desktop Pools,”](#) on page 95.
- 4 Entitle users and groups. See [Chapter 12, “Entitling Users and Groups,”](#) on page 123.
- 5 (Optional) Enable time zone redirection for RDS desktop and application sessions. See [“Enable Time Zone Redirection for RDS Desktop and Application Sessions,”](#) on page 85.



CAUTION When a user launches an application, for example, a Web browser, it is possible for a user to gain access to the local drives on the RDS host that is hosting the application. This can happen if the application provides functions that cause Windows Explorer to run. To prevent this type of access to the RDS host, follow the procedure that is described in <http://support.microsoft.com/kb/179221> to prevent an application from running Windows Explorer.

Because the procedure described in <http://support.microsoft.com/kb/179221> affects both desktop and application sessions, it is recommended that you do not create RDS desktop pools and application pools on the same farm if you plan to follow the procedure in the Microsoft KB article, so that desktop sessions are not affected.

Installing Applications

If you plan to create application pools, you must install the applications on the RDS hosts. If you want View to automatically display the list of installed applications, you must install the applications so that they are available to all users from the **Start** menu. You can install an application at any time before you create the application pool. If you plan to manually specify an application, you can install the application at any time, either before or after creating an application pool.

IMPORTANT When you install an application, you must install it on all the RDS hosts in a farm and in the same location on each RDS host. If you do not, a health warning will appear on the View Administrator dashboard. In such a situation, if you create an application pool, users might encounter an error when they try to run the application.

When you create an application pool, View automatically displays the applications that are available to all users rather than individual users from the **Start** menu on all of the RDS hosts in a farm. You can choose any applications from that list. In addition, you can manually specify an application that is not available to all users from the **Start** menu. There is no limit on the number of applications that you can install on an RDS host.

Install Remote Desktop Services on Windows Server 2008 R2 SP1

Remote Desktop Services (RDS) is one of the roles that a Windows Server 2008 R2 Service Pack 1 (SP1) can have. You must install this role to set up an RDS host.

Prerequisites

- Verify that the RDS host is running Windows Server 2008 R2 SP1.
- Verify that the RDS host is part of the Active Directory domain for the View deployment.
- Install the Microsoft hotfix rollup that is documented in <http://support.microsoft.com/kb/2775511>.

Procedure

- 1 Log in to the RDS host as an administrator.
- 2 Start Server Manager.
- 3 Select **Roles** in the navigation tree.
- 4 Click **Add Roles** to start the Add Role wizard.

- 5 Select the role **Remote Desktop Services**.
- 6 On the Select Role Services page, select **Remote Desktop Session Host**.
- 7 On the Specify Authentication Method page, select either **Require Network Level Authentication** or **Do not require Network Level Authentication**, whichever is appropriate.
- 8 On the Configure Client Experience page, select the functionality that you want to provide to users.
- 9 Follow the prompts and finish the installation.

What to do next

Restrict users to a single desktop session. See [“Restrict Users to a Single Session,”](#) on page 83.

Install Remote Desktop Services on Windows Server 2012 or 2012 R2

Remote Desktop Services is one of the roles that a Windows Server 2012 or 2012 R2 can have. You must install this role to set up an RDS host.

Prerequisites

- Verify that the RDS host is running Windows Server 2012 or Windows Server 2012 R2.
- Verify that the RDS host is part of the Active Directory domain for the View deployment.

Procedure

- 1 Log in to the RDS host as an administrator.
- 2 Start Server Manager.
- 3 Select **Add roles and features**.
- 4 On the Select Installation Type page, select **Role-based or feature-based installation**.
- 5 On the Select Destination Server page, select a server.
- 6 On the Select Server Roles page, select **Remote Desktop Services**.
- 7 On the Select Features page, accept the defaults.
- 8 On the Select Role Services page, select **Remote Desktop Session Host**.
- 9 Follow the prompts and finish the installation.

What to do next

Restrict users to a single desktop session. See [“Restrict Users to a Single Session,”](#) on page 83.

Restrict Users to a Single Session

View supports at most one desktop session and one application session per user on an RDS host. You must configure the RDS host to restrict users to a single session.

Prerequisites

- Install the Remote Desktop Services role as described in [“Install Remote Desktop Services on Windows Server 2008 R2 SP1,”](#) on page 82 or [“Install Remote Desktop Services on Windows Server 2012 or 2012 R2,”](#) on page 83.

Procedure

- 1 Click **Start > Administrative Tools > Remote Desktop Services > Remote Desktop Session Host Configuration**.
- 2 On the Edit Settings pane, under General, double-click **Restrict each user to a single session**.

- 3 In the Properties dialog box, on the General tab, select **Restrict each user to a single session** and click **OK**.

What to do next

Install View Agent on the RDS host. See [“Install View Agent on a Remote Desktop Services Host,”](#) on page 84.

Install View Agent on a Remote Desktop Services Host

View Agent communicates with View Connection Server and supports the display protocol PCoIP. You must install View Agent on an RDS Host.

Prerequisites

- Install the Remote Desktop Services role as described in [“Install Remote Desktop Services on Windows Server 2008 R2 SP1,”](#) on page 82 or [“Install Remote Desktop Services on Windows Server 2012 or 2012 R2,”](#) on page 83.
- Restrict users to a single desktop session. See [“Restrict Users to a Single Session,”](#) on page 83.
- Familiarize yourself with the View Agent custom setup options. See [“View Agent Custom Setup Options for an RDS Host,”](#) on page 85.
- Download the View Agent installer file from the VMware product page at <http://www.vmware.com/products/>.

Procedure

- 1 Log in as an administrator.
- 2 To start the View Agent installation program, double-click the installer file.
The installer filename is `VMware-viewagent-x86_64-y.y.y-xxxxxx.exe`, where *y.y.y* is the version number and *xxxxxx* is the build number.
- 3 Select your custom setup options.
- 4 In the **Server** text box, type the host name or IP address of a View Connection Server host.
During installation, the installer registers the RDS host with this View Connection Server instance. After registration, the specified View Connection Server instance, and any additional instances in the same View Connection Server group, can communicate with the RDS host.
- 5 Select an authentication method to register the RDS host with the View Connection Server instance.

Option	Description
Authenticate as the currently logged in user	The Username and Password text boxes are disabled and you are logged in to the View Connection Server instance with your current username and password.
Specify administrator credentials	You must provide the username and password of a View Connection Server administrator in the Username and Password text boxes.

The user account must be a domain user with access to View LDAP on the View Connection Server instance. A local user does not work.

- 6 Follow the prompts and finish the installation.

What to do next

Create a farm. See [Chapter 8, “Creating Farms,”](#) on page 89.

View Agent Custom Setup Options for an RDS Host

When you install View Agent on an RDS host, you can select custom setup options. In addition, View Agent installs certain features automatically on all guest operating systems on which they are supported. These features are not optional.

Table 7-1. View Agent Custom Setup Option for an RDS Host

Option	Description
vCenter Operations Manager Agent	Lets View work with the VMware product vCenter Operations Manager for View.

Table 7-2. View Agent Features That Are Installed Automatically on an RDS Host

Option	Description
PCoIP Agent	Allows users to connect to applications and RDS desktops using the PCoIP display protocol. You must install this component if you plan to create application pools because users can only connect to applications using PCoIP.
Unity Touch	Allows tablet and smart phone users to interact with Windows applications that run on the remote desktop. Users can browse, search, and open Windows applications and files, choose favorite applications and files, and switch between running applications without using the Start menu or Taskbar.
PSG Agent	Installs the PCoIP Secure Gateway on RDS hosts to implement the PCoIP display protocol for desktop and application sessions that run on RDS hosts.
VMwareRDS	Provides the VMware implementation of Remote Desktop Services functionality.

For additional features that are supported on RDS hosts, see "Feature Support Matrix for View Agent" in the *View Architecture Planning* document.

Enable Time Zone Redirection for RDS Desktop and Application Sessions

If an RDS host is in one time zone and a user is in another time zone, by default, when the user connects to an RDS desktop, the desktop displays time that is in the time zone of the RDS host. You can enable the Time Zone Redirection group policy setting to make the RDS desktop display time in the local time zone. This policy setting applies to application sessions as well.

Prerequisites

- Verify that the Group Policy Management feature is available on your Active Directory server.
The steps for opening the Group Policy Management Console differ in the Windows 2012, Windows 2008, and Windows 2003 Active Directory versions. See "[Create GPOs for View Group Policies](#)," on page 223.
- Verify that the View RDS ADMX files are added to Active Directory. See "[Add the Remote Desktop Services ADMX Files to Active Directory](#)," on page 210.
- Familiarize yourself with the group policy settings. See "[RDS Device and Resource Redirection Settings](#)," on page 212.

Procedure

- 1 On the Active Directory server, open the Group Policy Management Console.
- 2 Expand your domain and **Group Policy Objects**.

- 3 Right-click the GPO that you created for the group policy settings and select **Edit**.
- 4 In the Group Policy Management Editor, navigate to **Computer Configuration > Policies > Administrative Templates > Windows Components > View RDSH Services > Remote Desktop Session Host > Device and Resource Redirection**.
- 5 Enable the setting **Allow time zone redirection**.

Enable Windows Basic Aero-Styled Theme for Applications

If a user has never connected to a desktop on an RDS host, and the user launches an application that is hosted on the RDS host, the basic Aero-styled theme is not applied to the application even if a GPO setting is configured to load the Aero-styled theme. To make the Aero-styled theme apply to the application, you must configure another GPO setting.

Prerequisites

- Verify that the Group Policy Management feature is available on your Active Directory server.

The steps for opening the Group Policy Management Console differ in the Windows 2012, Windows 2008, and Windows 2003 Active Directory versions. See [“Create GPOs for View Group Policies,”](#) on page 223.

Procedure

- 1 On the Active Directory server, open the Group Policy Management Console.
- 2 Expand your domain and **Group Policy Objects**.
- 3 Right-click the GPO that you created for the group policy settings and select **Edit**.
- 4 In the Group Policy Management Editor, navigate to **User Configuration > Policies > Administrative Templates > Control Panel > Personalization**.
- 5 Enable the setting **Force a specific visual style file or force Windows classic** and set the Path to Visual Style as `%windir%\resources\Themes\Aero\ aero.msstyles`.

Configure Group Policy to Start Runonce.exe

By default, some applications that rely on the Explorer.exe file may not run in an application session. To avoid this issue, you must configure a GPO setting to start runonce.exe.

Prerequisites

- Verify that the Group Policy Management feature is available on your Active Directory server.

The steps for opening the Group Policy Management Console differ in the Windows 2012, Windows 2008, and Windows 2003 Active Directory versions. See [“Create GPOs for View Group Policies,”](#) on page 223.

Procedure

- 1 On the Active Directory server, open the Group Policy Management Console.
- 2 Expand your domain and **Group Policy Objects**.
- 3 Right-click the GPO that you created for the group policy settings and select **Edit**.
- 4 In the Group Policy Management Editor, navigate to **User Configuration > Policies > Windows Settings > Scripts (Logon/Logoff)**.
- 5 Double-click **Logon** and click **Add**.
- 6 In the Script Name box, type `runonce.exe`.

- 7 In the Script Parameters box, type `/AlternateShellStartup`.

RDS Host Performance Options

You can optimize Windows for either foreground programs or background services by setting performance options. By default, View disables certain performance options for RDS hosts for all supported versions of Windows Server.

The following table shows the performance options that are disabled by View.

Table 7-3. Performance Options Disabled by View

Performance Options Disabled by View
Animate windows when minimizing and maximizing
Show shadows under mouse pointer
Show shadows under windows
Use drop shadow for icon labels on the desktop
Show windows contents while dragging

The five performance options that are disabled by View correspond to four View settings in the registry. The following table shows the View settings and their default registry values. The registry values are all located in the registry subkey `HKEY_LOCAL_MACHINE\Software\VMware, Inc.\VMware VDM\Agent\Configuration`. You can re-enable the performance options by setting one or more of the View registry values to **false**.

Table 7-4. View Settings Related to Windows Performance Options

View Setting	Registry Value
Disable cursor shadow	DisableMouseShadows
Disable full window drag	DisableFullWindowDrag
Disable ListView shadow	DisableListViewShadow
Disable Window Animation	DisableWindowAnimation

Creating Farms

A farm is a group of RDS hosts that provides a common set of applications or RDS desktops to users.

This chapter includes the following topics:

- [“Farms,”](#) on page 89
- [“Worksheet for Creating a Farm,”](#) on page 90
- [“Create a Farm,”](#) on page 91

Farms

Farms simplify the task of managing RDS hosts, RDS desktops, and applications in an enterprise. You can create farms to serve groups of users that vary in size or have different desktop or application requirements.

When you create an application pool or an RDS desktop pool, you must specify one and only one farm. The RDS hosts in a farm can host RDS desktops, applications, or both. A farm can support at most one RDS desktop pool, but it can support multiple application pools. A farm can support both types of pools simultaneously.

Farms provide the following conveniences:

- **Load balancing**
By default, View balances the load of the RDS desktop sessions and the application sessions across all the RDS hosts in the farm.
- **Redundancy**
If one RDS host in a farm is offline, the other RDS hosts in the farm continue to provide applications and desktops to users.
- **Scalability**
A farm can have a variable number of RDS hosts. You can create farms with different numbers of RDS hosts to serve user groups of different sizes.

Farms have the following properties:

- A View pod can have a maximum of 200 farms.
- A farm can have a maximum of 200 RDS hosts.

- The RDS hosts in a farm can run any supported version of Windows Server. See "System Requirements for Guest Operating Systems" in the *View Installation* document.

IMPORTANT Microsoft recommends that you configure roaming profiles for users separately for each farm. The profiles should not be shared between farms or users' physical desktops since profile corruption and data loss may occur if a user is simultaneously logged in to two machines that load the same profile.

Worksheet for Creating a Farm

When you create a farm, the Add Farm wizard prompts you to configure certain options.

You can print this worksheet and write down the values you want to specify when you run the Add Farm wizard.

Table 8-1. Worksheet: Configuration Options for Creating a Farm

Option	Description	Fill in Your Value Here
ID	Unique name that identifies the farm in View Administrator.	
Description	Description of this farm.	
Access group	Access group in which to place all the pools in this farm. If you use an access group, you can delegate managing the pool to an administrator who has a specific role. For details, see the role-based delegated administration chapter in the <i>View Administration</i> document.	
Default display protocol	Select PCoIP or RDP . This setting applies to desktop pools only. The display protocol for application pools is always PCoIP . If you select RDP and you plan to use this farm to host application pools, you must set the Allow users to choose protocol option to Yes . The default is PCoIP .	
Allow users to choose protocol	Select Yes or No . This option applies to RDS desktop pools only. If you select Yes , you allow users to choose the display protocol when they connect to an RDS desktop from Horizon Client. The default is Yes .	
Empty session timeout (applications only)	Determines the amount of time that an empty application session is kept open. An application session is empty when all the applications that run in the session are closed. While the session is open, users can open applications faster. You can save system resources if you disconnect or log off empty application sessions. Select Never or set the number of minutes as the timeout value. The default is After 1 minute .	

Table 8-1. Worksheet: Configuration Options for Creating a Farm (Continued)

Option	Description	Fill in Your Value Here
When timeout occurs	Determines whether an empty application session is disconnected or logged off after the Empty session timeout limit is reached. Select Disconnect or Log off . A session that is logged off frees up resources, but opening an application takes longer. The default is Disconnect .	
Log off disconnected session	Determines when a disconnected session is logged off. This setting applies to both desktop and application sessions. Select Never , Immediate , or After ... minutes . Use caution when you select Immediate or After ... minutes . When a disconnected session is logged off, the session is lost. The default is Never .	

Create a Farm

You create a farm as part of the process to give users access to applications or RDS desktops.

Prerequisites

- Set up the RDS hosts that belong to the farm. See [Chapter 7, “Setting Up Remote Desktop Services Hosts,”](#) on page 81.
- Verify that all the RDS hosts have the Available status. In View Administrator, select **View Configuration > Registered Machines** and check the status of each RDS host on the RDS Hosts tab.
- Gather the configuration information you must provide to create the farm. See [“Worksheet for Creating a Farm,”](#) on page 90.

Procedure

- 1 In View Administrator, click **Resources > Farms**.
- 2 Click **Add** to enter the configuration information that you gathered in the worksheet.
- 3 Specify settings for the farm and click **Next**.
- 4 Select the RDS hosts to add to the farm and click **Next**.
- 5 Click **Finish**.

In View Administrator, you can now view the farm by clicking **Resources > Farms**.

What to do next

Create an application pool or an RDS desktop pool. See [Chapter 9, “Creating Application Pools,”](#) on page 93 or [Chapter 10, “Creating RDS Desktop Pools,”](#) on page 95.

Creating Application Pools

One of the tasks that you perform to give users remote access to an application is to create an application pool. Users who are entitled to an application pool can access the application remotely from a variety of client devices.

This chapter includes the following topics:

- [“Application Pools,”](#) on page 93
- [“Worksheet for Creating an Application Pool Manually,”](#) on page 93
- [“Create an Application Pool,”](#) on page 94

Application Pools

With application pools, you can deliver a single application to many users. The application runs on a farm of RDS hosts.

When you create an application pool, you deploy an application in the data center that users can access from anywhere on the network. For an introduction to application pools, see [“Farms, RDS Hosts, and Desktop and Application Pools,”](#) on page 9.

An application pool has a single application and is associated with a single farm. To avoid errors, you must install the application on all of the RDS hosts in the farm.

When you create an application pool, View automatically displays the applications that are available to all users rather than individual users from the **Start** menu on all the RDS hosts in the farm. You can select one or more applications from the list. If you select multiple applications from the list, a separate application pool is created for each application. You can also manually specify an application that is not on the list. If an application that you want to manually specify is not already installed, View displays a warning message.

When you create an application pool, you cannot specify the access group in which to place the pool. For application pools and RDS desktop pools, you specify the access group when you create a farm.

Worksheet for Creating an Application Pool Manually

When you create an application pool and manually specify an application, the Add Application Pools wizard prompts you for information about the application. It is not a requirement that the application is already installed on any RDS host.

NOTE If the application is on a shared folder, make sure that you map the drive using a scheduled task with `runas` set to `local system` and `/persistance:yes`. Otherwise, adding the application pool results in an error because the View Agent service runs as SYSTEM/LOCAL SYSTEM.

You can print this worksheet and write down the properties of an application when you specify the application manually.

Table 9-1. Worksheet: Application Properties for Creating an Application Pool Manually

Property	Description	Fill in Your Value Here
ID	Unique name that identifies the pool in View Administrator. This field is required.	
Display Name	Pool name that users see when they log in to Horizon Client. If you do not specify a display name, it will be the same as ID.	
Version	Version of the application.	
Publisher	Publisher of the application.	
Path	Full pathname of the application. For example, C:\Program Files\app1.exe. This field is required.	
Start Folder	Full pathname of the starting directory for the application.	
Parameters	Parameters to pass to the application when it starts. For example, you can specify <code>-username user1 -loglevel 3</code> .	
Description	Description of this application pool.	

Create an Application Pool

You create an application pool as part of the process to give users access to an application that runs on RDS hosts.

Prerequisites

- Set up RDS hosts. See [Chapter 7, “Setting Up Remote Desktop Services Hosts,”](#) on page 81.
- Create a farm that contains the RDS hosts. See [Chapter 8, “Creating Farms,”](#) on page 89.
- If you plan to add the application pool manually, gather information about the application. See [“Worksheet for Creating an Application Pool Manually,”](#) on page 93.

Procedure

- 1 In View Administrator, click **Catalog > Application Pools**.
- 2 Click **Add**.
- 3 Follow the prompts in the wizard to create the pool.

If you choose to add an application pool manually, use the configuration information you gathered in the worksheet. If you select applications from the list that View Administrator displays, you can select multiple applications. A separate pool is created for each application.

In View Administrator, you can now view the application pool by clicking **Catalog > Application Pools**.

What to do next

Entitle users to access the pool. See [Chapter 12, “Entitling Users and Groups,”](#) on page 123.

Make sure that your end users have access to Horizon Client 3.0 or later software, which is required to support RDS applications.

Creating RDS Desktop Pools

One of the tasks that you perform to give users remote access to session-based desktops is to create a Remote Desktop Services (RDS) desktop pool. An RDS desktop pool has properties that can satisfy some specific needs of a remote desktop deployment.

This chapter includes the following topics:

- [“Understanding RDS Desktop Pools,”](#) on page 95
- [“Create an RDS Desktop Pool,”](#) on page 96
- [“Desktop Pool Settings for RDS Desktop Pools,”](#) on page 96
- [“Configure Adobe Flash Throttling with Internet Explorer for RDS Desktop Pools,”](#) on page 97

Understanding RDS Desktop Pools

An RDS desktop pool is one of three types of desktop pools that you can create. This type of pool was known as a Microsoft Terminal Services pool in previous View releases.

An RDS desktop pool and an RDS desktop have the following characteristics:

- An RDS desktop pool is associated with a farm, which is a group of RDS hosts. Each RDS host is a Windows server that can host multiple RDS desktops.
- An RDS desktop is based on a session to an RDS host. In contrast, a desktop in an automated desktop pool is based on a virtual machine, and a desktop in a manual desktop pool is based on a virtual or physical machine.
- An RDS desktop supports both the RDP and the PCoIP display protocols.
- An RDS desktop pool is only supported on Windows Server operating systems that support the RDS role and are supported by View. See “System Requirements for Guest Operating Systems” in the *View Installation* document.
- View provides load balancing of the RDS hosts in a farm by directing connection requests to the RDS host that has the least number of active sessions.
- Because an RDS desktop pool provides session-based desktops, it does not support operations that are specific to a linked-clone desktop pool, such as refresh, recompose, and rebalance.
- If an RDS host is a virtual machine that is managed by vCenter Server, you can use snapshots as base images. You can use vCenter Server to manage the snapshots. The use of snapshots on RDS host virtual machines is transparent to View.
- RDS desktops do not support View Persona Management.

Create an RDS Desktop Pool

You create an RDS desktop pool as part of the process to give users access to RDS desktops.

Prerequisites

- Set up RDS hosts. See [Chapter 7, “Setting Up Remote Desktop Services Hosts,”](#) on page 81.
- Create a farm that contains the RDS hosts. See [Chapter 8, “Creating Farms,”](#) on page 89.
- Decide how to configure the pool settings. See [“Desktop Pool Settings for RDS Desktop Pools,”](#) on page 96.

Procedure

- 1 In View Administrator, select **Catalog > Desktop Pools**.
- 2 Click **Add**.
- 3 Select **RDS Desktop Pool**.
- 4 Provide a pool ID, display name, and description.

The pool ID is the unique name that identifies the pool in View Administrator. The display name is the name of the RDS desktop pool that users see when they log in to Horizon Client. If you do not specify a display name, it will be the same as the pool ID.

- 5 Select pool settings.
- 6 Select or create a farm for this pool.

In View Administrator, you can now view the RDS desktop pool by selecting **Catalog > Desktop Pools**.

What to do next

Entitle users to access the pool. See [“Add Entitlements to a Desktop or Application Pool,”](#) on page 123.

Make sure that your end users have access to Horizon Client 3.0 or later software, which is required to support RDS desktop pools.

Desktop Pool Settings for RDS Desktop Pools

You can specify certain pool settings when you create an RDS desktop pool. Not all pool settings apply to all types of desktop pools.

For descriptions of all pool settings, see [“Desktop Pool Settings for All Desktop Pool Types,”](#) on page 107. The following pool settings apply to an RDS desktop pool.

Table 10-1. Settings for an RDS Desktop Pool

Setting	Default Value
State	Enabled
Connection Server restrictions	None
Adobe Flash quality	Do not control
Adobe Flash throttling	Disabled

Configure Adobe Flash Throttling with Internet Explorer for RDS Desktop Pools

To ensure that Adobe Flash throttling works with Internet Explorer in RDS desktops, users must enable third-party browser extensions.

Procedure

- 1 Start Horizon Client and log in to a user's desktop.
- 2 In Internet Explorer, click **Tools > Internet Options**.
- 3 Click the **Advanced** tab, select **Enable third-party browser extensions**, and click **OK**.
- 4 Restart Internet Explorer.

Provisioning Desktop Pools

When you create a desktop pool, you select configuration options that determine how the pool is managed and how users interact with the desktops.

These provisioning tasks apply to desktop pools that are deployed on single-user machines. They do not apply to RDS desktop pools. However, the Adobe Flash quality and throttling settings apply to all types of desktop pools, including RDS.

This chapter includes the following topics:

- [“User Assignment in Desktop Pools,”](#) on page 99
- [“Naming Machines Manually or Providing a Naming Pattern,”](#) on page 100
- [“Manually Customizing Machines,”](#) on page 105
- [“Desktop Pool Settings for All Desktop Pool Types,”](#) on page 107
- [“Adobe Flash Quality and Throttling,”](#) on page 110
- [“Setting Power Policies for Desktop Pools,”](#) on page 111
- [“Configuring 3D Rendering on Windows 7 or Later Desktops,”](#) on page 116
- [“Prevent Access to View Desktops Through RDP,”](#) on page 120
- [“Deploying Large Desktop Pools,”](#) on page 120

User Assignment in Desktop Pools

You can configure a desktop pool so that users have dedicated assignments or floating assignments to the machines in the pool. You must choose a user assignment for automated pools that contain full virtual machines, automated linked-clone pools, and manual pools.

With a dedicated assignment, View assigns each entitled user to one machine in the pool. When a user connects to the pool, the user always logs in to the same machine. The user's settings and data are saved between sessions. No other user in the pool can access the machine.

With a floating assignment, View dynamically assigns machines in the pool to entitled users. Users connect to a different machine each time they log in. When a user logs off, the machine is returned to the pool.

You can configure floating-assignment machines to be deleted when users log off. Automatic deletion lets you keep only as many virtual machines as you need at one time. You can use automatic deletion only in automated pools that you provision with a machine-naming pattern and a total number of machines.

Floating-assignment machines let you reduce software licensing costs.

Naming Machines Manually or Providing a Naming Pattern

You can provision the machines in an automated pool by manually specifying a list of machine names or by providing a naming pattern and the number of machines you want in the pool. These two approaches offer different advantages.

If you name machines by specifying a list, you can use your company's naming scheme, and you can associate each machine name with a user.

If you provide a naming pattern, View can dynamically create and assign machines as users need them.

You must use one of these naming methods to provision automated pools that contain full virtual machines or linked clones.

[Table 11-1](#) compares the two naming methods, showing how each method affects the way you create and administer a desktop pool.

Table 11-1. Naming machines Manually or Providing a machine-Naming Pattern

Feature	Providing a Machine-Naming Pattern	Naming Machines Manually
Machine names	View generates machine names. You provide a naming pattern. View adds a unique number to identify each machine. For details, see “Using a Naming Pattern for Automated Desktop Pools,” on page 102.	You specify a list of machine names. In a dedicated-assignment pool, you can pair users with machines by listing user names with the machine names. For details, see “Specify a List of Machine Names,” on page 101.
Pool size	You specify a maximum number of machines.	Your list of machine names determines the number of machines.
To add machines to the pool	You can increase the maximum pool size.	You can add machine names to the list. For details, see “Add Machines to an Automated Pool Provisioned by a List of Names,” on page 104.
On-demand provisioning	Available. View dynamically creates and provisions the specified minimum and spare number of machines as users first log in or as you assign machines to users. View can also create and provision all the machines when you create the pool.	Not available. View creates and provisions all the machines that you specify in your list when the pool is created.
Initial customization	Available. When a machine is provisioned, View can run a customization specification that you select.	Available. When a machine is provisioned, View can run a customization specification that you select.
Manual customization of dedicated machines	To customize machines and return desktop access to your users, you must remove and reassign the ownership of each machine. Depending on whether you assign machines on first log in, you might have to perform these steps twice. You cannot start machines in maintenance mode. After the pool is created, you can manually put the machines into maintenance mode.	You can customize and test machines without having to reassign ownership. When you create the pool, you can start all machines in maintenance mode to prevent users from accessing them. You can customize the machines and exit maintenance mode to return access to your users. For details, see “Manually Customizing Machines,” on page 105.

Table 11-1. Naming machines Manually or Providing a machine-Naming Pattern (Continued)

Feature	Providing a Machine-Naming Pattern	Naming Machines Manually
Dynamic or fixed pool size	<p>Dynamic.</p> <p>If you remove a user assignment from a machine in a dedicated-assignment pool, the machine is returned to the pool of available machines.</p> <p>If you choose to delete machines on logoff in a floating-assignment pool, the pool size can grow or shrink depending on the number of active user sessions.</p>	<p>Fixed.</p> <p>The pool contains the number of machines you provide in the list of machine names.</p> <p>You cannot select the Delete machine on logoff setting if you name machines manually.</p>
Spare machines	<p>You can specify a number of spare machines that View keeps powered on for new users.</p> <p>View creates new machines to maintain the specified number. View stops creating spare machines when it reaches the maximum pool size.</p> <p>View keeps the spare machines powered on even when the pool power policy is Power off or Suspend, or when you do not set a power policy.</p>	<p>You can specify a number of spare machines that View keeps powered on for new users.</p> <p>View does not create new spare machines to maintain the specified number.</p> <p>View keeps the spare machines powered on even when the pool power policy is Power off or Suspend, or when you do not set a power policy.</p>
User assignment	<p>You can use a naming pattern for dedicated-assignment and floating-assignment pools.</p>	<p>You can specify machine names for dedicated-assignment and floating-assignment pools.</p> <p>NOTE In a floating-assignment pool, you cannot associate user names with machine names. The machines are not dedicated to the associated users. In a floating-assignment pool, all machines that are not currently in use remain accessible to any user who logs in.</p>

Specify a List of Machine Names

You can provision an automated desktop pool by manually specifying a list of machine names. This naming method lets you use your company's naming conventions to identify the machines in a pool.

When you explicitly specify machine names, users can see familiar names based on their company's organization when they log in to their remote desktops.

Follow these guidelines for manually specifying machine names:

- Type each machine name on a separate line.
- A machine name can have up to 15 alphanumeric characters.
- You can add a user name to each machine entry. Use a comma to separate the user name from the machine name.

In this example, two machines are specified. The second machine is associated with a user:

```
Desktop-001
Desktop-002,abccorp.com\jdoe
```

NOTE In a floating-assignment pool, you cannot associate user names with machine names. The machines are not dedicated to the associated users. In a floating-assignment pool, all machines that are not currently in use remain accessible to any user who logs in.

Prerequisites

Make sure that each machine name is unique. You cannot use the names of existing virtual machines in vCenter Server.

Procedure

- 1 Create a text file that contains the list of machine names.
If you intend to create a desktop pool with only a few machines, you can type the machine names directly in the Add Desktop Pool wizard. You do not have to create a separate text file.
- 2 In View Administrator start the Add Desktop Pool wizard to begin creating an automated desktop pool.
- 3 On the Provisioning Settings page, select **Specify names manually** and click **Enter names**.
- 4 Copy your list of machine names in the Enter Machine Names page and click **Next**.
The Enter Machine Names wizard displays the desktop list and indicates validation errors with a red !.
- 5 Correct invalid machine names.
 - a Place your cursor over an invalid name to display the related error message at the bottom of the page.
 - b Click **Back**.
 - c Edit the incorrect names and click **Next**.
- 6 Click **Finish**.
- 7 (Optional) Select **Start machines in maintenance mode**.
This option lets you customize the machines before users can log in and use them.
- 8 Follow the prompts in the wizard to finish creating the desktop pool.

View creates a machine for each name in the list. When an entry includes a machine and user name, View assigns the machine to that user.

After the desktop pool is created, you can add machines by importing another list file that contains additional machine names and users. See "Add Machines to an Automated Pool Provisioned by a List of Names" in the *View Administration* document.

Using a Naming Pattern for Automated Desktop Pools

You can provision the machines in a pool by providing a naming pattern and the total number of machines you want in the pool. By default, View uses your pattern as a prefix in all the machine names and appends a unique number to identify each machine.

Length of the Naming Pattern in a Machine Name

Machine names have a 15-character limit, including your naming pattern and the automatically generated number.

Table 11-2. Maximum Length of the Naming Pattern in a Machine Name

If You Set This Number of Machines in the Pool	This Is the Maximum Prefix Length
1-99	13 characters
100-999	12 characters
1,000 or more	11 characters

Names that contain fixed-length tokens have different length limits. See [“Length of the Naming Pattern When You Use a Fixed-Length Token,”](#) on page 103.

Using a Token in a Machine Name

You can place the automatically generated number anywhere else in the name by using a token. When you type the pool name, type **n** surrounded by curly brackets to designate the token.

For example: **amber-{n}-desktop**

When View creates a machine, View replaces **{n}** with a unique number.

You can generate a fixed-length token by typing **{n:fixed=number of digits}**.

View replaces the token with numbers containing the specified number of digits.

For example, if you type **amber-{n:fixed=3}**, View replaces **{n:fixed=3}** with a three-digit number and creates these machine names: **amber-001**, **amber-002**, **amber-003**, and so on.

Length of the Naming Pattern When You Use a Fixed-Length Token

Names that contain fixed-length tokens have a 15-character limit, including your naming pattern and the number of digits in the token.

Table 11-3. Maximum Length of the Naming Pattern When You Use a Fixed-Length Token

Fixed-Length Token	Maximum Length of the Naming Pattern
{n:fixed=1}	14 characters
{n:fixed=2}	13 characters
{n:fixed=3}	12 characters

Machine-Naming Example

This example shows how to create two automated desktop pools that use the same machine names, but different sets of numbers. The strategies that are used in this example achieve a specific user objective and show the flexibility of the machine-naming methods.

The objective is to create two pools with the same naming convention such as VDIABC-XX, where XX represents a number. Each pool has a different set of sequential numbers. For example, the first pool might contain machines VDIABC-01 through VDIABC-10. The second pool contains machines VDIABC-11 through VDIABC-20.

You can use either machine-naming method to satisfy this objective.

- To create fixed sets of machines at one time, specify machine names manually.
- To create machines dynamically when users log in for the first time, provide a naming pattern and use a token to designate the sequential numbers.

Specifying the Names Manually

- 1 Prepare a text file for the first pool that contains a list of machine names from VDIABC-01 through VDIABC-10.

- 2 In View Administrator, create the pool and specify machine names manually.
- 3 Click **Enter Names** and copy your list into the **Enter Machine Names** list box.
- 4 Repeat these steps for the second pool, using the names VDIABC-11 through VDIABC-20.

For detailed instructions, see [“Specify a List of Machine Names,”](#) on page 101.

You can add machines to each pool after it is created. For example, you can add machines VDIABC-21 through VDIABC-30 to the first pool, and VDIABC-31 through VDIABC-40 to the second pool. See [“Add Machines to an Automated Pool Provisioned by a List of Names,”](#) on page 104.

Providing a Naming Pattern With a Token

- 1 In View Administrator, create the first pool and use a naming pattern to provision the machine names.
- 2 In the naming-pattern text box, type **VDIABC-0{n}**.
- 3 Limit the pool's maximum size to 9.
- 4 Repeat these steps for the second pool, but in the naming-pattern text box, type **VDIABC-1{n}**.

The first pool contains machines VDIABC-01 through VDIABC-09. The second pool contains machines VDIABC-11 through VDIABC-19.

Alternatively, you can configure the pools to contain up to 99 machines each by using a fixed-length token of 2 digits:

- For the first pool, type **VDIABC-0{n:fixed=2}**.
- For the second pool, type **VDIABC-1{n:fixed=2}**.

Limit each pool's maximum size to 99. This configuration produces machines that contain a 3-digit sequential naming pattern.

First pool:

VDIABC-001
VDIABC-002
VDIABC-003

Second pool:

VDIABC-101
VDIABC-102
VDIABC-103

For details about naming patterns and tokens, see [“Using a Naming Pattern for Automated Desktop Pools,”](#) on page 102.

Add Machines to an Automated Pool Provisioned by a List of Names

To add machines to an automated desktop pool provisioned by manually specifying machine names, you provide another list of new machine names. This feature lets you expand a desktop pool and continue to use your company's naming conventions.

Follow these guidelines for manually adding machine names:

- Type each machine name on a separate line.
- A machine name can have up to 15 alphanumeric characters.
- You can add a user name to each machine entry. Use a comma to separate the user name from the machine name.

In this example, two machines are added. The second machine is associated with a user:

Desktop-001
 Desktop-002,abccorp.com/jdoe

NOTE In a floating-assignment pool, you cannot associate user names with machine names. The machines are not dedicated to the associated users. In a floating-assignment pool, all machines that are not currently in use remain accessible to any user who logs in.

Prerequisites

Verify that you created the desktop pool by manually specifying machine names. You cannot add machines by providing new machine names if you created the pool by providing a naming pattern.

Procedure

- 1 Create a text file that contains the list of additional machine names.
 If you intend to add only a few machines, you can type the machine names directly in the Add Desktop Pool wizard. You do not have to create a separate text file.
- 2 In View Administrator, select **Catalog > Desktop Pools**.
- 3 Select the desktop pool to be expanded.
- 4 Click **Edit**.
- 5 Click the **Provisioning Settings** tab.
- 6 Click **Add Machines**.
- 7 Copy your list of machine names in the Enter Machine Names page and click **Next**.
 The Enter Machine Names wizard displays the machine list and indicates validation errors with a red **X**.
- 8 Correct invalid machine names.
 - a Place your cursor over an invalid name to display the related error message at the bottom of the page.
 - b Click **Back**.
 - c Edit the incorrect names and click **Next**.
- 9 Click **Finish**.
- 10 Click **OK**.

View adds the new machines to the pool.

In vCenter Server, you can monitor the creation of the new virtual machines.

In View Administrator, you can view the machines as they are added to the desktop pool by selecting **Catalog > Desktop Pools**.

Manually Customizing Machines

After you create an automated pool, you can customize particular machines without reassigning ownership. By starting the machines in maintenance mode, you can modify and test the machines before you release them to their assigned users or make them available to all entitled users in the pool.

Customizing Machines in Maintenance Mode

Maintenance mode prevents users from accessing their desktops. If you start machines in maintenance mode, View places each machine in maintenance mode when the machine is created.

In a dedicated-assignment pool, you can use maintenance mode to log in to a machine without having to reassign ownership to your own administrator account. When you finish the customization, you do not have to return ownership to the user assigned to the machine.

In a floating-assignment pool, you can test machines in maintenance mode before you let users log in.

To perform the same customization on all machines in an automated pool, customize the virtual machine you prepare as a template or parent. View deploys your customization to all the machines. When you create the pool, you can also use a Sysprep customization specification to configure all the machines with licensing, domain attachment, DHCP settings, and other computer properties.

NOTE You can start machines in maintenance mode if you manually specify machine names for the pool, not if you name machines by providing a naming pattern.

Customize Individual Machines

You can customize individual machines after a pool is created by starting the machines in maintenance mode.

Procedure

- 1 In View Administrator, begin creating an automated desktop pool by starting the Add Desktop Pool wizard.
- 2 On the Provisioning Settings page, select **Specify names manually**.
- 3 Select **Start machines in maintenance mode**.
- 4 Complete the Add Desktop Pool wizard to finish creating the desktop pool.
- 5 In vCenter Server, log in, customize, and test the individual virtual machines.

You can customize the machines manually or by using standard Windows systems-management software such as Altiris, SMS, LanDesk, or BMC.

- 6 In View Administrator, select the desktop pool.
- 7 Use the filter tool to select specific machines to release to your users.
- 8 Click **More Commands > Exit Maintenance Mode**.

What to do next

Notify your users that they can log in to their desktops.

Desktop Pool Settings for All Desktop Pool Types

You must specify machine and desktop pool settings when you configure automated pools that contain full virtual machines, linked-clone desktop pools, manual desktop pools, and RDS desktop pools. Not all settings apply to all types of desktop pools.

Table 11-4. Desktop Pool Setting Descriptions

Setting	Options
State	<ul style="list-style-type: none"> ■ Enabled. After being created, the desktop pool is enabled and ready for immediate use. ■ Disabled. After being created, the desktop pool is disabled and unavailable for use, and provisioning is stopped for the pool. This is an appropriate setting if you want to conduct post deployment activities such as testing or other forms of baseline maintenance. <p>When this state is in effect, remote desktops are unavailable for use.</p>
Connection Server restrictions	<ul style="list-style-type: none"> ■ None. The desktop pool can be accessed by any View Connection Server instance. ■ With tags. Select one or more View Connection Server tags to make the desktop pool accessible only to View Connection Server instances that have those tags. You can use the check boxes to select multiple tags. <p>If you intend to provide access to your desktops through Workspace, and you configure View Connection Server restrictions, the Workspace App Portal might display desktops to users when those desktops are actually restricted. Workspace users will be unable to launch these desktops.</p>
Remote machine power policy	<p>Determines how a virtual machine behaves when the user logs off of the associated desktop. For descriptions of the power-policy options, see “Power Policies for Desktop Pools,” on page 111.</p> <p>For more information about how power policies affect automated pools, see “Setting Power Policies for Desktop Pools,” on page 111.</p>
Automatically logoff after disconnect	<ul style="list-style-type: none"> ■ Immediately. Users are logged off as soon as they disconnect. ■ Never. Users are never logged off. ■ After. The time after which users are logged off when they disconnect. Type the duration in minutes. <p>The log off time applies to future disconnections. If a desktop session was already disconnected when you set a log off time, the log off duration for that user starts when you set the log off time, not when the session was originally disconnected. For example, if you set this value to five minutes, and a session was disconnected 10 minutes earlier, View will log off that session five minutes after you set the value.</p>
Allow users to reset their machines	<p>Allow users to reset their own desktops without administrative assistance.</p>
Allow multiple sessions per user	<p>Allow a user to connect to multiple desktops in the pool at the same time.</p>
Delete machine after logoff	<p>Select whether to delete floating-assignment, full virtual machines.</p> <ul style="list-style-type: none"> ■ No. Virtual machines remain in the desktop pool after users log off. ■ Yes. Virtual machines are powered off and deleted as soon as users log off.
Delete or refresh machine on logoff	<p>Select whether to delete, refresh, or leave alone floating-assignment, linked-clone virtual machines.</p> <ul style="list-style-type: none"> ■ Never. Virtual machines remain in the pool and are not refreshed after users log off. ■ Delete immediately. Virtual machines are powered off and deleted as soon as users log off. When users log off, virtual machines immediately go into a <code>Deleting</code> state. ■ Refresh immediately. Virtual machines are refreshed as soon as users log off. When users log off, virtual machines immediately go into maintenance mode to prevent other users from logging in as the refresh operation begins.

Table 11-4. Desktop Pool Setting Descriptions (Continued)

Setting	Options
Max number of monitors	<p>If you use PCoIP as the display protocol, you can select the Maximum number of monitors on which users can display the desktop.</p> <p>When the 3D Renderer setting is not selected, the Max number of monitors setting affects the amount of VRAM that is assigned to machines in the pool. When you increase the number of monitors, more memory is consumed on the associated ESXi hosts.</p> <p>When the 3D Renderer setting is selected, you can select at most two monitors.</p> <p>NOTE You must power off and on existing virtual machines for this setting to take effect. Restarting a virtual machine does not cause the setting to take effect.</p>
Max resolution of any one monitor	<p>If you use PCoIP as the display protocol and you do not select the 3D Renderer setting, you should specify the Maximum resolution of any one monitor.</p> <p>When the 3D Renderer setting is not selected, the Max resolution of any one monitor setting affects the amount of VRAM that is assigned to machines in the pool. When you increase the resolution, more memory is consumed on the associated ESXi hosts.</p> <p>When the 3D Renderer setting is selected, you cannot change the Maximum resolution of any one monitor. The resolution is set to 1920x1200 pixels.</p> <p>NOTE You must power off and on existing virtual machines for this setting to take effect. Restarting a virtual machine does not cause the setting to take effect.</p>
HTML Access	<p>Select Enabled to allow users to connect to remote desktops from within their Web browsers.</p> <p>When a user logs in through the VMware Horizon Web portal page or the Workspace App Portal and selects a remote desktop, the HTML Access agent enables the user to connect to the desktop over HTTPS. The desktop is displayed in the user's browser. Other display protocols, such as PCoIP or RDP, are not used. Horizon Client software does not have to be installed on the client devices.</p> <p>To use HTML Access, you must install HTML Access in your View deployment. For more information, see <i>Using HTML Access</i>, available from https://www.vmware.com/support/viewclients/doc/viewclients_pubs.html.</p> <p>To use HTML Access with Workspace, you must pair View Connection Server with a SAML Authentication server, as described in the <i>View Administration</i> document. Workspace must be installed and configured for use with View Connection Server.</p>
Adobe Flash quality	<p>Determines the quality of Adobe Flash content that is displayed on Web pages.</p> <ul style="list-style-type: none"> ■ Do not control. Quality is determined by Web page settings. ■ Low. This setting results in the most bandwidth savings. If no quality level is specified, the system defaults to Low. ■ Medium. This setting results in moderate bandwidth savings. ■ High. This setting results in the least bandwidth savings. <p>For more information, see <i>"Adobe Flash Quality and Throttling,"</i> on page 110.</p>
Adobe Flash throttling	<p>Determines the frame rate of Adobe Flash movies. If you enable this setting, you can reduce or increase the number of frames displayed per second by selecting an aggressiveness level.</p> <ul style="list-style-type: none"> ■ Disabled. No throttling is performed. The timer interval is not modified. ■ Conservative. Timer interval is 100 milliseconds. This setting results in the lowest number of dropped frames. ■ Moderate. Timer interval is 500 milliseconds. ■ Aggressive. Timer interval is 2500 milliseconds. This setting results in the highest number of dropped frames. <p>For more information, see <i>"Adobe Flash Quality and Throttling,"</i> on page 110.</p>

Table 11-4. Desktop Pool Setting Descriptions (Continued)

Setting	Options
Override global Mirage settings	To specify the same Mirage server for all desktop pools, use the global View configuration setting rather than this pool-specific setting.
Mirage Server configuration	Allows you to specify the URL of a Mirage server, using the format mirage://server-name:port or mirages://server-name:port . Here <i>server-name</i> is the fully qualified domain name. If you do not specify the port number, the default port number 8000 is used. Specifying the Mirage server in View Administrator is an alternative to specifying the Mirage server when installing the Mirage client. To find out which versions of Mirage support having the server specified in View Administrator, see the Mirage documentation, at https://www.vmware.com/support/pubs/mirage_pubs.html .

Adobe Flash Quality and Throttling

You can specify a maximum allowable level of quality for Adobe Flash content that overrides Web page settings. If Adobe Flash quality for a Web page is higher than the maximum level allowed, quality is reduced to the specified maximum. Lower quality results in more bandwidth savings.

To make use of Adobe Flash bandwidth-reduction settings, Adobe Flash must not be running in full screen mode.

[Table 11-5](#) shows the available Adobe Flash render-quality settings.

Table 11-5. Adobe Flash Quality Settings

Quality Setting	Description
Do not control	Quality is determined by Web page settings.
Low	This setting results in the most bandwidth savings.
Medium	This setting results in moderate bandwidth savings.
High	This setting results in the least bandwidth savings.

If no maximum level of quality is specified, the system defaults to a value of **Low**.

Adobe Flash uses timer services to update what is shown on the screen at a given time. A typical Adobe Flash timer interval value is between 4 and 50 milliseconds. By throttling, or prolonging, the interval, you can reduce the frame rate and thereby reduce bandwidth.

[Table 11-6](#) shows the available Adobe Flash throttling settings.

Table 11-6. Adobe Flash Throttling Settings

Throttling Setting	Description
Disabled	No throttling is performed. The timer interval is not modified.
Conservative	Timer interval is 100 milliseconds. This setting results in the lowest number of dropped frames.
Moderate	Timer interval is 500 milliseconds.
Aggressive	Timer interval is 2500 milliseconds. This setting results in the highest number of dropped frames.

Audio speed remains constant regardless of which throttling setting you select.

Setting Power Policies for Desktop Pools

You can configure a power policy for the virtual machines in a desktop pool if the virtual machines are managed by vCenter Server.

Power policies control how a virtual machine behaves when its associated desktop is not in use. A desktop is considered not in use before a user logs in and after a user disconnects or logs off. Power policies also control how a virtual machine behaves after administrative tasks such as refresh, recompose, and rebalance are completed.

You configure power policies when you create or edit desktop pools in View Administrator.

NOTE You cannot configure power policies for desktop pools that have unmanaged machines.

Power Policies for Desktop Pools

Power policies control how a virtual machine behaves when the associated remote desktop is not in use.

You set power policies when you create or edit a desktop pool. [Table 11-7](#) describes the available power policies.

Table 11-7. Power Policies

Power Policy	Description
Take no power action	<p>View does not enforce any power policy after a user logs off. This setting has two consequences.</p> <ul style="list-style-type: none"> View does not change the power state of the virtual machine after a user logs off. <p>For example, if a user shuts down the virtual machine, the virtual machine remains powered off. If a user logs off without shutting down, the virtual machine remains powered on. When a user reconnects to the desktop, the virtual machine restarts if it was powered off.</p> <ul style="list-style-type: none"> View does not enforce any power state after an administrative task is completed. <p>For example, a user might log off without shutting down. The virtual machine remains powered on. When a scheduled recomposition takes place, the virtual machine is powered off. After the recomposition is completed, View does nothing to change the power state of the virtual machine. It remains powered off.</p>
Ensure machines are always powered on	<p>The virtual machine remains powered on, even when it is not in use. If a user shuts down the virtual machine, it immediately restarts. The virtual machine also restarts after an administrative task such as refresh, recompose, or rebalance is completed.</p> <p>Select Ensure machines are always powered on if you run batch processes or system management tools that must contact the virtual machines at scheduled times.</p>

Table 11-7. Power Policies (Continued)

Power Policy	Description
Suspend	<p>The virtual machine enters a suspended state when a user logs off, but not when a user disconnects.</p> <p>You can also configure machines in a dedicated pool to be suspended when a user disconnects without logging off. To configure this policy, you must set an attribute in View LDAP. See “Configure Dedicated Machines To Be Suspended After Users Disconnect,” on page 113.</p> <p>When multiple virtual machines are resumed from a suspended state, some virtual machines might have delays in powering on. Whether any delays occur depends on the ESXi host hardware and the number of virtual machines that are configured on an ESXi host. Users connecting to their desktops from Horizon Client might temporarily see a desktop-not-available message. To access their desktops, users can connect again.</p>
Power off	<p>The virtual machine shuts down when a user logs off, but not when a user disconnects.</p>

NOTE When you add a machine to a manual pool, View powers on the machine to ensure that it is fully configured, even when you select the **Power off** or **Take no power action** power policy. After View Agent is configured, it is marked as Ready, and the normal power-management settings for the pool apply.

For manual pools with machines that are managed by vCenter Server, View ensures that a spare machine is powered on so that users can connect to it. The spare machine is powered on no matter which power policy is in effect.

[Table 11-8](#) describes when View applies the configured power policy.

Table 11-8. When View Applies the Power Policy

Desktop Pool Type	The power policy is applied ...
Manual pool that contains one machine (vCenter Server-managed virtual machine)	<p>Power operations are initiated by session management. The virtual machine is powered on when a user requests the desktop and powered off or suspended when the user logs off.</p> <p>NOTE The Ensure machines are always powered on policy always applies, whether the single-machine pool uses floating or dedicated assignment, and whether the machine is assigned or unassigned.</p>
Automated pool with dedicated assignment	<p>To unassigned machines only.</p> <p>On assigned machines, power operations are initiated by session management. Virtual machines are powered on when a user requests an assigned machine and are powered off or suspended when the user logs off.</p> <p>NOTE The Ensure machines are always powered on policy applies to assigned and unassigned machines.</p>
Automated pool with floating assignment	<p>When a machine is not in use and after a user logs off.</p> <p>When you configure the Power off or Suspend power policy for a floating-assignment desktop pool, set Automatically logoff after disconnect to Immediately to prevent discarded or orphaned sessions.</p>

Table 11-8. When View Applies the Power Policy (Continued)

Desktop Pool Type	The power policy is applied ...
Manual pool with dedicated assignment	To unassigned machines only. On assigned machines, power operations are initiated by session management. Virtual machines are powered on when a user requests an assigned machine and are powered off or suspended when the user logs off. NOTE The Ensure machines are always powered on policy applies to assigned and unassigned machines.
Manual pool with floating assignment	When a machine is not in use and after a user logs off. When you configure the Power off or Suspend power policy for a floating-assignment desktop pool, set Automatically logoff after disconnect to Immediately to prevent discarded or orphaned sessions.

How View applies the configured power policy to automated pools depends on whether a machine is available. See [“How Power Policies Affect Automated Desktop Pools,”](#) on page 113 for more information.

Configure Dedicated Machines To Be Suspended After Users Disconnect

The **Suspend** power policy causes virtual machines to be suspended when a user logs off, but not when a user disconnects. You can also configure machines in a dedicated pool to be suspended when a user disconnects from a desktop without logging off. Using suspend when users disconnect helps to conserve resources.

To enable suspend on disconnect for dedicated machines, you must set an attribute in View LDAP.

Procedure

- 1 Start the ADSI Edit utility on your View Connection Server host.
- 2 In the console tree, select **Connect to**.
- 3 In the **Select or type a domain or server** field, type the server name as **localhost:389**
- 4 Under **Connection point**, click **Select or type a distinguished name or naming context**, type the distinguished name as **DC=vdi,DC=vmware,DC=int**, and click **OK**.
The ADAM ADSI Edit main window appears.
- 5 Expand the ADAM ADSI tree and expand **OU=Properties**.
- 6 Select **OU=Global** and select **CN=Common** in the right pane
- 7 Select **Action > Properties**, and under the **pae-NameValuePair** attribute, add the new entry **suspendOnDisconnect=1**.
- 8 Restart the VMware Horizon View Connection Server service or View Connection Server.

How Power Policies Affect Automated Desktop Pools

How View applies the configured power policy to automated pools depends on whether a machine is available.

A machine in an automated pool is considered available when it meets the following criteria:

- Is active
- Does not contain a user session
- Is not assigned to a user

The View Agent service running on the machine confirms the availability of the machine to View Connection Server.

When you configure an automated pool, you can specify the minimum and maximum number of virtual machines that must be provisioned and the number of spare machines that must be kept powered on and available at any given time.

Power Policy Examples for Automated Pools with Floating Assignments

When you configure an automated pool with floating assignments, you can specify that a particular number of machines must be available at a given time. The spare, available machines are always powered on, no matter how the pool policy is set.

Power Policy Example 1

[Table 11-9](#) describes the floating-assignment, automated pool in this example. The pool uses a machine-naming pattern to provision and name the machines.

Table 11-9. Desktop Pool Settings for Automated Pool with Floating Assignment Example 1

Desktop Pool Setting	Value
Number of machines (minimum)	10
Number of machines (maximum)	20
Number of spare, powered-on machines	2
Remote machine power policy	Power off

When this desktop pool is provisioned, 10 machines are created, two machines are powered on and immediately available, and eight machines are powered off.

For each new user that connects to the pool, a machine is powered on to maintain the number of spare, available machines. When the number of connected users exceeds eight, additional machines, up to the maximum of 20, are created to maintain the number of spare machines. After the maximum number is reached, the machines of the first two users who disconnect remain powered on to maintain the number of spare machines. The machine of each subsequent user is powered off according to the power policy.

Power Policy Example 2

[Table 11-10](#) describes the floating-assignment, automated pool in this example. The pool uses a machine-naming pattern to provision and name the machines.

Table 11-10. Desktop Pool Settings for Automated Pool with Floating Assignments Example 2

Desktop Pool Setting	Value
Number of machines (minimum)	5
Number of machines (maximum)	5
Number of spare, powered-on machines	2
Remote machine power policy	Power off

When this desktop pool is provisioned, five machines are created, two machines are powered on and immediately available, and three machines are powered off.

If a fourth machine in this pool is powered off, one of the existing machines is powered on. An additional machine is not powered on because the maximum of number of machines has already been reached.

Power Policy Example for Automated Pools with Dedicated Assignments

Unlike a powered-on machine in an automated pool with floating assignments, a powered-on machine in an automated pool with dedicated assignments is not necessarily available. It is available only if the machine is not assigned to a user.

Table 11-11 describes the dedicated-assignment, automated pool in this example.

Table 11-11. Desktop Pool Settings for Automated Pool with Dedicated Assignments Example

Desktop Pool Setting	Value
Number of machines (minimum)	3
Number of machines (maximum)	5
Number of spare, powered-on machines	2
Remote machine power policy	Ensure machines are always powered on

When this desktop pool is provisioned, three machines are created and powered on. If the machines are powered off in vCenter Server, they are immediately powered on again, according to the power policy.

After a user connects to a machine in the pool, the machine becomes permanently assigned to that user. After the user disconnects from the machine, the machine is no longer available to any other user. However, the **Ensure machines are always powered on** policy still applies. If the assigned machine is powered off in vCenter Server, it is immediately powered on again.

When another user connects, a second machine is assigned. Because the number of spare machines falls below the limit when the second user connects, another machine is created and powered on. An additional machine is created and powered on each time a new user is assigned until the maximum machine limit is reached.

Preventing View Power Policy Conflicts

When you use View Administrator to configure a power policy, you must compare the power policy to the settings in the guest operating system's Power Options control panel to prevent power policy conflicts.

A virtual machine can become temporarily inaccessible if the power policy configured for the machine is not compatible with a power option configured for the guest operating system. If there are other machines in the same pool, they can also be affected.

The following configuration is an example of a power policy conflict:

- In View Administrator, the power policy **Suspend** is configured for the virtual machine. This policy causes the virtual machine to enter a suspended state when it is not in use.
- In the Power Options control panel in the guest operating system, the option **Put the Computer to sleep** is set to three minutes.

In this configuration, both View Connection Server and the guest operating system can suspend the virtual machine. The guest operating system power option might cause the virtual machine to be unavailable when View Connection Server expects it to be powered on.

Configuring 3D Rendering on Windows 7 or Later Desktops

When you create or edit a Windows 7 or later desktop pool, you can configure 3D graphics rendering for your desktops. Desktops can take advantage of Virtual Shared Graphics Acceleration (vSGA) and Virtual Dedicated Graphics Acceleration (vDGA), which are vSphere features that use physical graphics cards installed on the ESXi hosts and manage the graphics processing unit (GPU) resources among the virtual machines.

When you select the **3D Renderer** hardware-based options, users can take advantage of 3D applications for design, modeling, and multimedia, which typically require GPU hardware to perform well. The **3D Renderer** setting also offers a software option, which provides graphics enhancements that can support less demanding applications such as Windows AERO, Microsoft Office, and Google Earth.

Requirements for 3D Rendering

To enable hardware or software 3D graphics rendering, your pool deployment must meet the following requirements:

- The virtual machines must be Windows 7 or later
- The pool must use the PCoIP as the default display protocol
- Users must not be allowed to choose their own protocol

To support hardware-based 3D rendering, a pool must meet these additional requirements:

- To use vSGA, the virtual machines must run on ESXi 5.1 or later hosts and be managed by vCenter Server 5.1 or later software. This feature allows multiple virtual machines to share the physical GPUs on ESXi hosts. You can use 3D applications for design, modeling, and multimedia.
- To use vDGA, the virtual machines must run on ESXi 5.5 or later hosts, be hardware version 9 or later, and be managed by vCenter Server 5.5 or later software. This feature dedicates a single physical GPU (graphical processing unit) on an ESXi host to a single virtual machine. Use this feature if you require high-end, hardware-accelerated workstation graphics.

To use vDGA, you must enable GPU pass-through on the ESXi hosts and configure the individual virtual machines to use dedicated PCI devices after the desktop pool is created in View. You cannot configure the parent virtual machine or template for vDGA and then create a desktop pool, because the same physical GPU would be dedicated to every virtual machine in the pool. See "vDGA Installation" in the [VMware white paper](#) about graphics acceleration.

For linked-clone virtual machines, vDGA settings are preserved after refresh, recompose, and rebalance operations.

- GPU graphics cards and the associated vSphere Installation Bundles (VIBs) must be installed on the ESXi hosts. For a list of supported GPU hardware, see the VMware Hardware Compatibility List at <http://www.vmware.com/resources/compatibility/search.php>.
- Windows 7 machines must be virtual hardware version 8 or later. Windows 8 machines must be virtual hardware version 9 or later.

To support software 3D rendering, a pool must meet these additional requirements:

- The virtual machines must run on ESXi 5.0 or later hosts and be managed by vCenter Server 5.0 or later software.
- The machines must be virtual hardware version 8 or later.

When you configure or edit the **3D Renderer** setting, you must power off existing virtual machines, verify that the machines are reconfigured in vCenter Server, and power on the machines to cause the new setting to take effect. Restarting a virtual machine does not cause the new setting to take effect.

Configuring 3D Rendering

You select options to determine the way View manages 3D rendering. For details, see [“3D Rendering Options,”](#) on page 117.

When you enable the **3D Renderer** setting, you can configure the amount of VRAM that is assigned to the virtual machines in the pool by moving the slider in the Configure VRAM for 3D guests dialog box. The minimum VRAM size is 64MB. For virtual hardware version 9 virtual machines, the default VRAM size is 96MB, and you can configure a maximum size of 512MB. For virtual hardware version 8 virtual machines, the default VRAM size is 64MB, and you can configure a maximum size of 128MB.

The VRAM settings that you configure in View Administrator take precedence over the VRAM settings that can be configured for the virtual machines in vSphere Client or vSphere Web Client, unless you select the **Manage using vSphere Client** option.

When you enable the **3D Renderer** setting, you can configure the **Max number of monitors** setting for one or two monitors. You cannot select more than two monitors. Also, the **Max resolution of any one monitor** setting is set to 1920x1200 pixels.

3D Rendering Options

The **3D Renderer** setting for desktop pools provides options that let you configure graphics rendering in different ways.

Table 11-12. 3D Renderer Options for Pools Running on vSphere 5.1 or Later

Option	Description
Manage using vSphere Client	<p>The 3D Renderer option that is set in vSphere Web Client (or vSphere Client in vSphere 5.1) for a virtual machine determines the type of 3D graphics rendering that takes place. View does not control 3D rendering.</p> <p>In the vSphere Web Client or vSphere Client, you can configure the Automatic, Software, or Hardware options. These options have the same effect as they do when you set them in View Administrator.</p> <p>When you select the Manage using vSphere Client option, the Configure VRAM for 3D Guests, Max number of monitors, and Max resolution of any one monitor settings are inactive in View Administrator. You can configure these settings for a virtual machine in the vSphere Web Client or vSphere Client.</p>
Automatic	<p>3D rendering is enabled. The ESXi host controls the type of 3D rendering that takes place.</p> <p>For example, the ESXi host reserves GPU hardware resources on a first-come, first-served basis as virtual machines are powered on. If all GPU hardware resources are already reserved when a virtual machine is powered on, ESXi uses the software renderer for that machine.</p> <p>When you configure hardware-based 3D rendering, you can examine the GPU resources that are allocated to each virtual machine on an ESXi host. For details, see “Examining GPU Resources on an ESXi Host,” on page 119.</p>
Software	<p>3D rendering is enabled. The ESXi host uses software 3D graphics rendering. If a GPU graphics card is installed on the ESXi host, this pool will not use it.</p> <p>In the Configure VRAM for 3D Guests dialog box, you can use the slider to increase the amount of VRAM that is reserved.</p>

Table 11-12. 3D Renderer Options for Pools Running on vSphere 5.1 or Later (Continued)

Option	Description
Hardware	<p>3D rendering is enabled. The ESXi host reserves GPU hardware resources on a first-come, first-served basis as virtual machines are powered on.</p> <p>The ESXi host allocates VRAM to a virtual machine based on the value that is set in the Configure VRAM for 3D Guests dialog box.</p> <p>IMPORTANT If you configure the Hardware option, consider these potential constraints:</p> <ul style="list-style-type: none"> ■ If a user tries to connect to a machine when all GPU hardware resources are reserved, the virtual machine will not power on, and the user will receive an error message. ■ A machine cannot be moved by vMotion to an ESXi host that does not have GPU hardware configured. ■ To use vSGA (Virtual Shared Graphics Acceleration), all ESXi hosts in the cluster must be version 5.1 or later. If a virtual machine is created on an ESXi 5.0 host in a mixed cluster, the machine will not power on. ■ To use vDGA (Virtual Dedicated Graphics Acceleration), all ESXi hosts in the cluster must be version 5.5 or later, and the virtual machines must be hardware version 9 or later. <p>When you configure hardware-based 3D rendering, you can examine the GPU resources that are allocated to each virtual machine on an ESXi host. For details, see “Examining GPU Resources on an ESXi Host,” on page 119.</p>
Disabled	3D rendering is inactive.

Table 11-13. 3D Renderer Options for Pools Running on vSphere 5.0

Option	Description
Enabled	<p>The 3D Renderer option is enabled. The ESXi host uses software 3D graphics rendering.</p> <p>When software rendering is configured, the default VRAM size is 64MB, the minimum size. In the Configure VRAM for 3D Guests dialog box, you can use the slider to increase the amount of VRAM that is reserved. With software rendering, the ESXi host allocates up to a maximum of 128MB per virtual machine. If you set a higher VRAM size, it is ignored.</p>
Disabled	3D rendering is inactive.

If a desktop pool is running on earlier vSphere version than 5.0, the **3D Renderer** setting is inactive and is not available in View Administrator.

Best Practices for Configuring 3D Rendering

The 3D rendering options and other pool settings offer various advantages and drawbacks. Select the option that best supports your vSphere hardware infrastructure and your users' requirements for graphics rendering.

NOTE This topic provides an overview of the controls you find in View Administrator. For detailed information about all the various choices and requirements for 3D rendering, see the [VMware white paper](#) about graphics acceleration.

The **Automatic** option is the best choice for many View deployments that require 3D rendering. This option ensures that some type of 3D rendering takes place even when GPU resources are completely reserved. In a mixed cluster of ESXi 5.1 and ESXi 5.0 hosts, this option ensures that a virtual machine is powered on successfully and uses 3D rendering even if, for example, vMotion moved the virtual machine to an ESXi 5.0 host.

The only drawback with the **Automatic** option is that you cannot easily tell whether a virtual machine is using hardware or software 3D rendering.

The **Hardware** option guarantees that every virtual machine in the pool uses hardware 3D rendering, provided that GPU resources are available on the ESXi hosts. This option might be the best choice when all your users run graphically intensive applications.

With the **Hardware** option, you must strictly control your vSphere environment:

- For vSGA (Virtual Shared Graphics Acceleration), all ESXi hosts must be version 5.1 or later and must have GPU graphics cards installed.
- For vDGA (Virtual Dedicated Graphics Acceleration), all ESXi hosts must be version 5.5 or later and must have GPU graphics cards installed.

When all GPU resources on an ESXi host are reserved, View cannot power on a virtual machine for the next user who tries to log in to a desktop. You must manage the allocation of GPU resources and the use of vMotion to ensure that resources are available for your desktops.

Select the **Manage using vSphere Client** option to support a mixed configuration of 3D rendering and VRAM sizes for virtual machines in a pool. In vSphere Web Client, you can configure individual virtual machines with different options and VRAM values.

Select the **Software** option if you have ESXi 5.0 hosts only, or if ESXi 5.1 or later hosts do not have GPU graphics cards, or if your users only run applications, such as AERO and Microsoft Office, that do not require hardware graphics acceleration.

Configuring Desktop Settings to Manage GPU Resources

You can configure other desktop settings to ensure that GPU resources are not wasted when users are not actively using them.

For floating pools, set a session timeout so that GPU resources are freed up for other users when a user is not using the desktop.

For dedicated pools, you can configure the **Automatically logoff after disconnect** setting to **Immediately** and a **Suspend** power policy if these settings are appropriate for your users. For example, do not use these settings for a pool of researchers who execute long-running simulations.

Examining GPU Resources on an ESXi Host

To better manage the GPU resources that are available on an ESXi host, you can examine the current GPU resource reservation. The ESXi command-line query utility, `gpupvm`, lists the GPUs that are installed on an ESXi host and displays the amount of GPU memory that is reserved for each virtual machine on the host. Note that this GPU memory reservation is not the same as virtual machine VRAM size.

To run the utility, type `gpupvm` from a shell prompt on the ESXi host. You can use a console on the host or an SSH connection.

For example, the utility might display the following output:

```
~ # gpupvm
Xserver unix:0, GPU maximum memory 2076672KB
  pid 118561, VM "JB-w7-64-FC3", reserved 131072KB of GPU memory.
  pid 64408, VM "JB-w7-64-FC5", reserved 261120KB of GPU memory.
GPU memory left 1684480KB.
```

Prevent Access to View Desktops Through RDP

In certain View environments, it is a priority to prohibit access to View desktops through the RDP display protocol. You can prevent users and administrators from using RDP to access View desktops by configuring pool settings and a group policy setting.

By default, while a user is logged in to a View desktop session, you can use RDP to connect to the virtual machine from outside of View. The RDP connection terminates the View desktop session, and the View user's unsaved data and settings might be lost. The View user cannot log in to the desktop until the external RDP connection is closed. To avoid this situation, disable the `AllowDirectRDP` setting.

NOTE Remote Desktop Services, called Terminal Services on Windows XP systems, must be started on the virtual machine that you use to create pools and on the virtual machines that are deployed in the pools. Remote Desktop Services are required for View Agent installation, SSO, and other View session-management operations.

Prerequisites

Verify that the View Agent Configuration Administrative Template (ADM) file is installed in Active Directory. See [“Using View Group Policy Administrative Template Files,”](#) on page 192.

Procedure

- 1 Select PCoIP as the display protocol that you want View Connection Server to use to communicate with Horizon Client devices.

Option	Description
Create a desktop pool	<ol style="list-style-type: none"> a In View Administrator, start the Add Desktop Pool wizard. b On the Desktop Pool Settings page, select PCoIP as the default display protocol.
Edit an existing desktop pool	<ol style="list-style-type: none"> a In View Administrator, select the desktop pool and click Edit. b On the Desktop Pool Settings tab, select PCoIP as the default display protocol.

- 2 For the **Allow users to choose protocol** setting, select **No**.
- 3 Prevent devices that are not running Horizon Client from connecting directly to View desktops through RDP by disabling the `AllowDirectRDP` group policy setting.
 - a On your Active Directory server, open the Group Policy Management Console and select **Computer Configuration > Policies > Administrative Templates > Classic Administrative Templates (ADM) > VMware View Agent Configuration**.
 - b Disable the `AllowDirectRDP` setting.

Deploying Large Desktop Pools

When many users require the same desktop image, you can create one large automated pool from a single template or parent virtual machine. By using a single base image and pool name, you can avoid dividing the machines arbitrarily into smaller groups that must be managed separately. This strategy simplifies your View deployment and administration tasks.

To support large pools, you can create pools on ESXi clusters that contain up to 32 ESXi hosts. You can also configure a pool to use multiple network labels, making the IP addresses of multiple port groups available for the virtual machines in the pool.

Configuring Desktop Pools on Clusters With More Than Eight Hosts

In vSphere 5.1 and later, you can deploy a linked clone desktop pool on a cluster that contains up to 32 ESXi hosts. All ESXi hosts in the cluster must be version 5.1 or later. The hosts can use VMFS or NFS datastores. VMFS datastores must be VMFS5 or later.

In vSphere 5.0, you can deploy linked clones on a cluster that contains more than eight ESXi hosts, but you must store the replica disks on NFS datastores. You can store replica disks on VMFS datastores only with clusters that contain eight or fewer hosts.

In vSphere 5.0, the following rules apply when you configure a linked clone pool on a cluster that contains more than eight hosts:

- If you store replica disks on the same datastores as OS disks, you must store the replica and OS disks on NFS datastores.
- If you store replica disks on separate datastores than OS disks, the replica disks must be stored on NFS datastores. The OS disks can be stored on NFS or VMFS datastores.
- If you store View Composer persistent disks on separate datastores, the persistent disks can be configured on NFS or VMFS datastores.

In vSphere 4.1 and earlier releases, you can deploy desktop pools only with clusters that contain eight or fewer hosts.

Assigning Multiple Network Labels to a Desktop Pool

In View 5.2 and later releases, you can configure an automated desktop pool to use multiple network labels. You can assign multiple network labels to a linked-clone pool or an automated pool that contains full virtual machines.

In past releases, virtual machines in the pool inherited the network labels that were used by the NICs on the parent virtual machine or template. A typical parent virtual machine or template contains one NIC and one network label. A network label defines a port group and VLAN. The netmask of one VLAN typically provides a limited range of available IP addresses.

In View 5.2 and later releases, you can assign network labels that are available in vCenter Server for all the ESXi hosts in the cluster where the desktop pool is deployed. By configuring multiple network labels for the pool, you greatly expand the number of IP addresses that can be assigned to the virtual machines in the pool.

You must use View PowerCLI cmdlets to assign multiple network labels to a pool. You cannot perform this task in View Administrator.

For details about using View PowerCLI to perform this task, see "Assign Multiple Network Labels to a Desktop Pool" in the chapter "Using View PowerCLI" in the *View Integration* document.

Entitling Users and Groups

You configure entitlements to control which remote desktops and applications your users can access. You can also configure the restricted entitlements feature to control desktop access based on the View Connection Server instance that users connect to when they select remote desktops.

In a Cloud Pod Architecture environment, you create global entitlements to entitle users or groups to multiple desktops across multiple pods in a pod federation. When you use global entitlements, you do not need to configure and manage local entitlements for remote desktops. For information about global entitlements and setting up a Cloud Pod Architecture environment, see the *Administering View Cloud Pod Architecture* document.

This chapter includes the following topics:

- [“Add Entitlements to a Desktop or Application Pool,”](#) on page 123
- [“Remove Entitlements from a Desktop or Application Pool,”](#) on page 124
- [“Review Desktop or Application Pool Entitlements,”](#) on page 124
- [“Restricting Remote Desktop Access,”](#) on page 124

Add Entitlements to a Desktop or Application Pool

Before users can access remote desktops or applications, they must be entitled to use a desktop or application pool.

Prerequisites

Create a desktop or application pool.

Procedure

- 1 Select the desktop or application pool.

Option	Action
Add an entitlement for a desktop pool	In View Administrator, select Catalog > Desktop Pools and click the name of the desktop pool.
Add an entitlement for an application pool	In View Administrator, select Catalog > Application Pools and click the name of the application pool.

- 2 Select **Add entitlement** from the **Entitlements** drop-down menu.

- 3 Click **Add**, select one or more search criteria, and click **Find** to find users or groups based on your search criteria.

NOTE Domain local groups are filtered out of search results for mixed-mode domains. You cannot entitle users in domain local groups if your domain is configured in mixed mode.

- 4 Select the users or groups you want to entitle to the desktops or applications in the pool and click **OK**.
- 5 Click **OK** to save your changes.

Remove Entitlements from a Desktop or Application Pool

You can remove entitlements from a desktop or application pool to prevent specific users or groups from accessing a desktop or application.

Procedure

- 1 Select the desktop or application pool.

Option	Description
Remove an entitlement for a desktop pool	In View Administrator, select Catalog > Desktop Pools and click the name of the desktop pool.
Remove an entitlement for an application pool	In View Administrator, select Catalog > Application Pools and click the name of the application pool.

- 2 Select **Remove entitlement** from the **Entitlements** drop-down menu.
- 3 Select the user or group whose entitlement you want to remove and click **Remove**.
- 4 Click **OK** to save your changes.

Review Desktop or Application Pool Entitlements

You can review the desktop or application pools to which a user or group is entitled.

Procedure

- 1 In View Administrator, select **Users and Groups** and click the name of the user or group.
- 2 Click the **Entitlements** tab and review the desktop or application pools to which the user or group is entitled.

Option	Action
List the desktop pools to which the user or group is entitled	Click Desktop Pools .
List the application pools to which the user or group is entitled	Click Application Pools .

Restricting Remote Desktop Access

You can configure the restricted entitlements feature to restrict remote desktop access based on the View Connection Server instance that users connect to when they select desktops.

With restricted entitlements, you assign one or more tags to a View Connection Server instance. Then, when configuring a desktop pool, you select the tags of the View Connection Server instances that you want to be able to access the desktop pool.

When users log in through a tagged View Connection Server instance, they can access only those desktop pools that have at least one matching tag or no tags.

NOTE You cannot configure the restricted entitlements feature to restrict access to remote applications.

- [Restricted Entitlement Example](#) on page 125
This example shows a View deployment that includes two View Connection Server instances. The first instance supports internal users. The second instance is paired with a security server and supports external users.
- [Tag Matching](#) on page 126
The restricted entitlements feature uses tag matching to determine whether a View Connection Server instance can access a particular desktop pool.
- [Considerations and Limitations for Restricted Entitlements](#) on page 127
Before implementing restricted entitlements, you must be aware of certain considerations and limitations.
- [Assign a Tag to a View Connection Server Instance](#) on page 127
When you assign a tag to a View Connection Server instance, users who connect to that View Connection Server can access only those desktop pools that have a matching tag or no tags.
- [Assign a Tag to a Desktop Pool](#) on page 127
When you assign a tag to a desktop pool, only users who connect to a View Connection Server instance that has a matching tag can access the desktops in that pool.

Restricted Entitlement Example

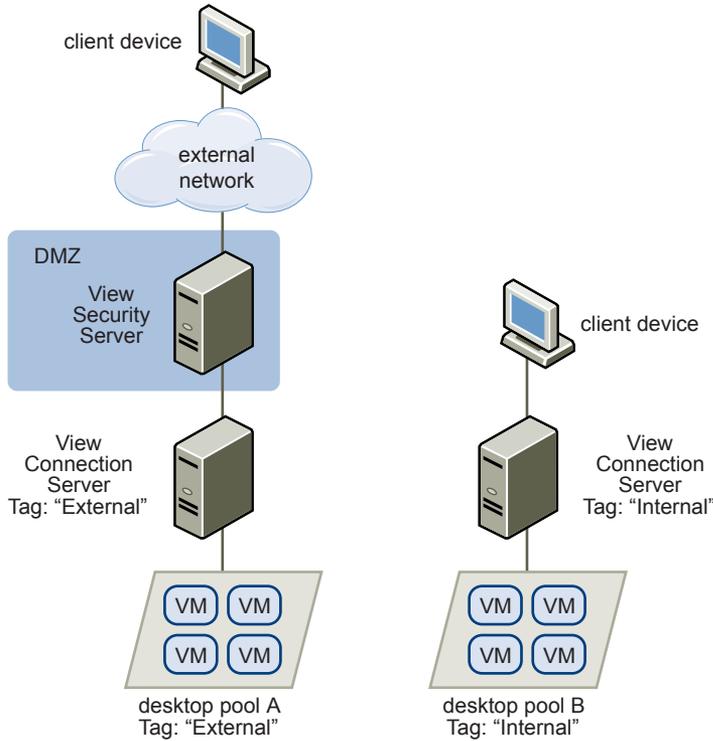
This example shows a View deployment that includes two View Connection Server instances. The first instance supports internal users. The second instance is paired with a security server and supports external users.

To prevent external users from accessing certain desktops, you could set up restricted entitlements as follows:

- Assign the tag "Internal" to the View Connection Server instance that supports your internal users.
- Assign the tag "External" to the View Connection Server instance that is paired with the security server and supports your external users.
- Assign the "Internal" tag to the desktop pools that should be accessible only to internal users.
- Assign the "External" tag to the desktop pools that should be accessible only to external users.

External users cannot see the desktop pools tagged as Internal because they log in through the View Connection Server tagged as External, and internal users cannot see the desktop pools tagged as External because they log in through the View Connection Server tagged as Internal. [Figure 12-1](#) illustrates this configuration.

Figure 12-1. Restricted Entitlement Configuration



You can also use restricted entitlements to control desktop access based on the user-authentication method that you configure for a particular View Connection Server instance. For example, you can make certain desktop pools available only to users who have authenticated with a smart card.

Tag Matching

The restricted entitlements feature uses tag matching to determine whether a View Connection Server instance can access a particular desktop pool.

At the most basic level, tag matching determines that a View Connection Server instance with a specific tag can access a desktop pool that has the same tag.

The absence of tag assignments can also affect whether a View Connection Server instance can access a desktop pool. For example, View Connection Server instances that do not have any tags can only access desktop pools that also do not have any tags.

Table 12-1 shows how the restricted entitlement feature determines when a View Connection Server can access a desktop pool.

Table 12-1. Tag Matching Rules

View Connection Server	Desktop Pool	Access Permitted?
No tags	No tags	Yes
No tags	One or more tags	No
One or more tags	No tags	Yes
One or more tags	One or more tags	Only when tags match

The restricted entitlements feature only enforces tag matching. You must design your network topology to force certain clients to connect through a particular View Connection Server instance.

Considerations and Limitations for Restricted Entitlements

Before implementing restricted entitlements, you must be aware of certain considerations and limitations.

- A single View Connection Server instance or desktop pool can have multiple tags.
- Multiple View Connection Server instances and desktop pools can have the same tag.
- Desktop pools that do not have any tags can be accessed by any View Connection Server instance.
- View Connection Server instances that do not have any tags can only access desktop pools that also do not have any tags.
- If you use a security server, you must configure restricted entitlements on the View Connection Server instance the security server is paired with. You cannot configure restricted entitlements on a security server.
- You cannot modify or remove a tag from a View Connection Server instance if that tag is still assigned to a desktop pool and no other View Connection Server instances have a matching tag.
- Restricted entitlements take precedence over other desktop entitlements or assignments. For example, even if a user is assigned to a particular machine, the user will not be able to access that machine if the desktop pool's tag does not match the tag assigned to the View Connection Server instance that the user connected to.
- If you intend to provide access to your desktops through Workspace, and you configure View Connection Server restrictions, the Workspace App Portal might display desktops to users when those desktops are actually restricted. When a Workspace user attempts to log in to a desktop, it will not launch if the desktop pool's tag does not match the tag assigned to the View Connection Server instance that the user is connected to.

Assign a Tag to a View Connection Server Instance

When you assign a tag to a View Connection Server instance, users who connect to that View Connection Server can access only those desktop pools that have a matching tag or no tags.

Procedure

- 1 In View Administrator, select **View Configuration > Servers**.
- 2 Click the **Connection Servers** tab, select the View Connection Server instance, and click **Edit**.
- 3 Type one or more tags in the **Tags** text box.
Separate multiple tags with a comma or semicolon.
- 4 Click **OK** to save your changes.

What to do next

Assign the tag to desktop pools.

Assign a Tag to a Desktop Pool

When you assign a tag to a desktop pool, only users who connect to a View Connection Server instance that has a matching tag can access the desktops in that pool.

You can assign a tag when you add or edit a desktop pool.

Prerequisites

Assign tags to one or more View Connection Server instances.

Procedure

1 In View Administrator, select **Catalog > Desktop Pools**.

2 Select the pool that you want to assign a tag to.

Option	Action
Assign a tag to a new pool	Click Add to start the Add Desktop Pool wizard and define and identify the pool.
Assign a tag to an existing pool	Select the pool and click Edit .

3 Go to the Desktop Pool Settings page.

Option	Action
Pool settings for a new pool	Click Desktop Pool Settings in the Add Desktop Pool wizard.
Pool settings for an existing pool	Click the Desktop Pool Settings tab.

4 Click **Browse** next to **Connection Server restrictions** and configure the View Connection Server instances that can access the desktop pool.

Option	Action
Make the pool accessible to any View Connection Server instance	Select No Restrictions .
Make the pool accessible only to View Connection Server instances that have those tags	Select Restricted to these tags and select one or more tags. You can use the check boxes to select multiple tags.

5 Click **OK** to save your changes.

Configuring Remote Desktop Features

13

Certain remote desktop features that are installed with View Agent can be updated in Feature Pack Update releases as well as in core View releases. You can configure these features to enhance the remote desktop experience of your end users.

These features include HTML Access, Unity Touch, Flash URL Redirection, Real-Time Audio-Video, Windows 7 Multimedia Redirection (MMR), and USB Redirection.

For information about HTML Access, see the *Using HTML Access* document, located on the VMware Horizon Client Documentation Web page.

For information about USB Redirection, see [Chapter 14, “Using USB Devices with Remote Desktops,”](#) on page 153.

This chapter includes the following topics:

- [“Configure Unity Touch,”](#) on page 129
- [“Configure Flash URL Redirection for Multicast or Unicast Streaming,”](#) on page 132
- [“Configure Real-Time Audio-Video,”](#) on page 136
- [“Manage Access to Windows 7 Multimedia Redirection \(MMR\),”](#) on page 150

Configure Unity Touch

With Unity Touch, tablet and smart phone users can easily browse, search, and open Windows applications and files, choose favorite applications and files, and switch between running applications, all without using the Start menu or Taskbar. You can configure a default list of favorite applications that appear in the Unity Touch sidebar, and you can disable or enable the Unity Touch feature after it is installed.

The VMware Horizon Client documents for iOS and Android devices provide more information about end user features provided by Unity Touch.

System Requirements for Unity Touch

Horizon Client software and the mobile devices on which you install Horizon Client must meet certain version requirements to support Unity Touch.

View desktop

To support Unity Touch, the following software must be installed in the virtual machine that the end user will access:

- You install the Unity Touch feature by installing View Agent 6.0 or later. See [“Install View Agent on a Virtual Machine,”](#) on page 25.

- Operating systems: Windows XP SP3 (32-bit), Windows Vista (32-bit), Windows 7 (32-bit or 64-bit), Windows 8 (32-bit or 64-bit), Windows 8.1 (32-bit or 64-bit), or Windows Server 2008 R2

Horizon Client software

Unity Touch is supported on the following Horizon Client versions:

- Horizon Client 2.0 for iOS or later
- Horizon Client 2.0 for Android or later

Mobile device operating systems

Unity Touch is supported on the following mobile device operating systems:

- iOS 5.0 and later
- Android 3 (Honeycomb), Android 4 (Ice Cream Sandwich), and Android 4.1 and 4.2 (Jelly Bean)

Configure Favorite Applications Displayed by Unity Touch

With the Unity Touch feature, tablet and smart phone users can quickly navigate to a View desktop application or file from a Unity Touch sidebar. Although end users can specify which favorite applications appear in the sidebar, for added convenience, administrators can configure a default list of favorite applications.

If you use floating-assignment desktop pools, the favorite applications and favorite files that end users specify will be lost when they disconnect from a desktop unless you enable roaming user profiles in Active Directory.

The default list of favorite applications list remains in effect when an end user first connects to a desktop that is enabled with Unity Touch. However, if the user configures his or her own favorite application list, the default list is ignored. The user's favorite application list stays in the user's roaming profile and is available when the user connects to different machines in a floating or dedicated pool.

If you create a default list of favorite applications and one or more of the applications are not installed in the View desktop operating system, or the paths to these applications are not found in the Start menu, the applications do not appear in the list of favorites. You can use this behavior to set up one master default list of favorite applications that can be applied to multiple virtual machine images with different sets of installed applications.

For example, if Microsoft Office and Microsoft Visio are installed on one virtual machine, and Windows Powershell and VMware vSphere Client are installed on a second virtual machine, you can create one list that includes all four applications. Only the installed applications appear as default favorite applications on each respective desktop.

You can use different methods to specify a default list of favorite applications:

- Add a value to the Windows registry on the virtual machines in the desktop pool
- Create an administrative installation package from the View Agent installer and distribute the package to the virtual machines
- Run the View Agent installer from the command line on the virtual machines

NOTE Unity Touch assumes that shortcuts to applications are located in the Programs folder in the **Start** menu. If any shortcut is located outside of the Programs folder, attach the prefix **Programs** to the shortcut path. For example, `Windows Update.lnk` is located in the `ProgramData\Microsoft\Windows\Start Menu` folder. To publish this shortcut as a default favorite application, add the prefix **Programs** to the shortcut path. For example: `"Programs/Windows Update.lnk"`.

Prerequisites

- Verify that View Agent is installed on the virtual machine.
- Verify that you have administrative rights on the virtual machine. For this procedure, you might need to edit a registry setting.
- If you have floating-assignment desktop pools, use Active Directory to set up roaming user profiles. Follow the instructions provided by Microsoft.

Users of floating-assignment desktop pools will be able to see their list of favorite applications and favorite files every time they log in.

Procedure

- (Optional) Create a default list of favorite applications by adding a value to the Windows registry.
 - a Open regedit and navigate to the HKLM\Software\VMware, Inc.\VMware Unity registry setting. On a 64-bit virtual machine, navigate to the HKLM\Software\Wow6432Node\VMware, Inc.\VMware Unity directory.
 - b Create a string value called FavAppList.
 - c Specify the default favorite applications.

Use the following format to specify the shortcut paths to the applications that are used in the Start menu.

```
path-to-app-1|path-to-app-2|path-to-app-3|...
```

For example:

```
Programs/Accessories/Accessibility/Speech Recognition.lnk|Programs/VMware/VMware vSphere Client.lnk|Programs/Microsoft Office/Microsoft Office 2010 Tools/Microsoft Office 2010 Language Preferences.lnk
```

- (Optional) Create a default list of favorite applications by creating an administrative installation package from the View Agent installer.
 - a From the command line, use the following format to create the administrative installation package.

```
VMware-viewagent-x86_64-y.y.y-xxxxxx.exe /s /a /v"/qn TARGETDIR=""a network share to store the admin install package"" UNITY_DEFAULT_APPS=""the list of default favorite apps that should be set in the registry""
```

For example:

```
VMware-viewagent-x86_x64-y.y.y-xxxxxx.exe /s /a /v"/qn TARGETDIR=""\\foo-installer-share\ViewFeaturePack\"" UNITY_DEFAULT_APPS=""Programs/Accessories/Accessibility/Ease of Access.lnk|Programs/Accessories/System Tools/Character Map.lnk|Programs/Accessories/Windows PowerShell/Windows PowerShell.lnk|Programs/Internet Explorer (64-bit).lnk|Programs/Google Chrome/Google Chrome.lnk|Programs/iTunes/iTunes.lnk|Programs/Microsoft Office/Microsoft SharePoint Workspace 2010.lnk|Programs/PuTTY/PuTTY.lnk|Programs/Skype/Skype.lnk|Programs/WebEx/Productivity Tools/WebEx Settings.lnk|""
```

- b Distribute the administrative installation package from the network share to the desktop virtual machines by using a standard Microsoft Windows Installer (MSI) deployment method that is employed in your organization.

- (Optional) Create a default list of favorite applications by running the View Agent installer on a command line directly on a virtual machine.

Use the following format.

```
VMware-viewagent-x86_x64-y.y.y-xxxxxx.exe /s /v"/qn UNITY_DEFAULT_APPS=""the list of default favorite apps that should be set in the registry"""
```

NOTE The preceding command combines installing View Agent with specifying the default list of favorite applications. You do not have to install View Agent before you run this command.

What to do next

If you performed this task directly on a virtual machine (by editing the Windows registry or installing View Agent from the command line), you must deploy the newly configured virtual machine. You can create a snapshot or make a template and create a desktop pool, or recompose an existing pool. Or you can create an Active Directory group policy to deploy the new configuration.

Disable or Enable Unity Touch

When you install View Agent, the Unity Touch installation option is selected by default and the feature is enabled. You can disable or reenabling the Unity Touch feature on selected virtual machines by setting a value on a Windows registry key on those machines.

You can use the registry to enable Unity Touch only if Unity Touch was installed by the View Agent installer and then disabled through the registry. If Unity Touch was never installed, that is, if the option was deselected when you installed View Agent, and you then set the registry value to enable Unity Touch, certain Unity Touch functions will not work correctly.

Procedure

- 1 Start the Windows Registry Editor on the virtual machine.
- 2 Navigate to the Windows registry key that controls Unity Touch.

Option	Description
Windows 7 64-bit	HKEY_LOCAL_MACHINE\Software\Wow6432Node\VMware, Inc.\VMware Unity\enabled = <i>value</i>
Windows 7 32-bit	HKEY_LOCAL_MACHINE\Software\VMware, Inc.\VMware Unity\enabled = <i>value</i>

- 3 Set the value to disable or enable Unity Touch.

Option	Value
Disabled	0
Enabled	1

By default, the value is set to 1.

Configure Flash URL Redirection for Multicast or Unicast Streaming

Customers can now use Adobe Media Server and multicast or unicast to deliver live video events in a virtual desktop infrastructure (VDI) environment. To deliver multicast or unicast live video streams within a VDI environment, the media stream should be sent directly from the media source to the endpoints, bypassing the remote desktops. The Flash URL Redirection feature supports this capability by intercepting and redirecting the ShockWave Flash (SWF) file from the remote desktop to the client endpoint.

The Flash content is then displayed using the clients' local Flash media players.

Streaming Flash content directly from the Adobe Media Server to the client endpoints lowers the load on the datacenter ESXi host, removes the extra routing through the datacenter, and reduces the bandwidth required to simultaneously stream Flash content to multiple client endpoints.

The Flash URL redirection feature uses a JavaScript that is embedded inside an HTML Web page by the Web page administrator. Whenever a remote desktop user clicks on the designated URL link from within a Web page, the JavaScript intercepts and redirects the SWF file from the remote desktop session to the client endpoint. The endpoint then opens a local Flash Projector outside of the remote desktop session and plays the media stream locally.

To configure Flash URL Redirection, you must set up your HTML Web page and your client devices.

Procedure

- 1 [System Requirements for Flash URL Redirection](#) on page 133
To support Flash URL Redirection, your View deployment must meet certain software and hardware requirements.
- 2 [Verify that the Flash URL Redirection Feature Is Installed](#) on page 134
Before you use this feature, verify that the Flash URL Redirection feature is installed and running on your virtual desktops.
- 3 [Set Up the Web Pages That Provide Multicast or Unicast Streams](#) on page 135
To allow Flash URL redirection to take place, you must embed a JavaScript command in the MIME HTML (MHTML) Web pages that provide links to the multicast or unicast streams. Users display these Web pages in the browsers on their remote desktops to access the video streams.
- 4 [Set Up Client Devices for Flash URL Redirection](#) on page 135
The Flash URL Redirection feature redirects the SWF file from remote desktops to client devices. To allow these client devices to play Flash videos from a multicast or unicast stream, you must verify that the appropriate Adobe Flash Player is installed on the client devices. The clients also must have IP connectivity to the media source.
- 5 [Disable or Enable Flash URL Redirection](#) on page 136
Flash URL Redirection is enabled when you perform a silent installation of View Agent with the command-line argument, `FlashURLRedirection`. You can disable or reenab the Flash URL Redirection feature on selected remote desktops by setting a value on a Windows registry key on those virtual machines.

System Requirements for Flash URL Redirection

To support Flash URL Redirection, your View deployment must meet certain software and hardware requirements.

View desktop

- You install Flash URL Redirection by typing the command-line argument, `FlashURLRedirection`, in a silent installation of View Agent 6.0 or later. See [“Silent Installation Properties for View Agent,”](#) on page 31.
- The desktops must run Windows 7 64-bit or 32-bit operating systems.

- Supported desktop browsers include Internet Explorer 8, 9, and 10, Chrome 29.x, and Firefox 20.x.

Flash media player and ShockWave Flash (SWF)

You must integrate an appropriate Flash media player such as Strobe Media Playback into your Web site. To stream multicast content, you can use `multicastplayer.swf` or `StrobeMediaPlayback.swf` in your Web pages. To stream live unicast content, you must use `StrobeMediaPlayback.swf`. You can also use `StrobeMediaPlayback.swf` for other supported features such as RTMP streaming and HTTP dynamic streaming.

Horizon Client software

The following Horizon Client releases support multicast and unicast:

- Horizon Client 2.2 for Linux or a later release
- Horizon Client 2.2 for Windows or a later release

The following Horizon Client releases support multicast only (they do not support unicast):

- Horizon Client 2.0 or 2.1 for Linux
- Horizon Client 5.4 for Windows

Horizon Client computer or client access device

- Flash URL Redirection is supported on all operating systems that run Horizon Client for Linux on x86 Thin client devices. This feature is not supported on ARM processors.
- Flash URL Redirection is supported on all operating systems that run Horizon Client for Windows. For details, see the *Using VMware Horizon Client for Windows* document.
- On Windows client devices, you must install Adobe Flash Player 10.1 or later for Internet Explorer.
- On Linux Thin client devices, you must install the `libexpat.so.0` and `libflashplayer.so` files. See [“Set Up Client Devices for Flash URL Redirection,”](#) on page 135.

NOTE With Flash URL Redirection, the multicast or unicast stream is redirected to client devices that might be outside your organization's firewall. Your clients must have access to the Adobe Web server that hosts the ShockWave Flash (SWF) file that initiates the multicast or unicast streaming. If needed, configure your firewall to open the appropriate ports to allow client devices to access this server.

Verify that the Flash URL Redirection Feature Is Installed

Before you use this feature, verify that the Flash URL Redirection feature is installed and running on your virtual desktops.

The Flash URL Redirection feature must be present on every desktop where you intend to support multicast or unicast redirection. For View Agent installation instructions, see [“Silent Installation Properties for View Agent,”](#) on page 31.

Procedure

- 1 Start a remote desktop session that uses PCoIP.
- 2 Open the Task Manager.

- 3 Verify that the `ViewMPServer.exe` process is running on the desktop.

Set Up the Web Pages That Provide Multicast or Unicast Streams

To allow Flash URL redirection to take place, you must embed a JavaScript command in the MIME HTML (MHTML) Web pages that provide links to the multicast or unicast streams. Users display these Web pages in the browsers on their remote desktops to access the video streams.

In addition, you can customize the English error message that is displayed to end users when a problem occurs with Flash URL redirection. Take this optional step if you want to display a localized error message to your end users. You must embed the `var vmwareScriptErrorMessage` configuration, together with your localized text string, in the MHTML Web page.

Prerequisites

Verify that the `swfobject.js` library is imported in the MHTML Web page.

Procedure

- 1 Embed the `viewmp.js` JavaScript command in the MHTML Web page.
For example: `<script type="text/javascript" src="http://localhost:33333/viewmp.js"></script>`
- 2 (Optional) Customize the Flash URL redirection error message that is sent to end users.
For example: `"var vmwareScriptErrorMessage=localized error message"`
- 3 Make sure to embed the `viewmp.js` JavaScript command, and optionally customize the Flash URL redirection error message, before the ShockWave Flash (SWF) file is imported into the MHTML Web page.

When a user displays the Web page in a remote desktop, the `viewmp.js` JavaScript command invokes the Flash URL Redirection mechanism on the remote desktop, which redirects the SWF file from the desktop to the hosting client device.

Set Up Client Devices for Flash URL Redirection

The Flash URL Redirection feature redirects the SWF file from remote desktops to client devices. To allow these client devices to play Flash videos from a multicast or unicast stream, you must verify that the appropriate Adobe Flash Player is installed on the client devices. The clients also must have IP connectivity to the media source.

NOTE With Flash URL Redirection, the multicast or unicast stream is redirected to client devices that might be outside your organization's firewall. Your clients must have access to the Adobe Web server that hosts the SWF file that initiates the multicast or unicast streaming. If needed, configure your firewall to open the appropriate ports to allow client devices to access this server.

Procedure

- ◆ Install Adobe Flash Player on your client devices.

Operating System	Action
Windows	Install Adobe Flash Player 10.1 or later for Internet Explorer.
Linux	<p>a Install the <code>libexpat.so.0</code> file, or verify that this file is already installed.</p> <p>Ensure that the file is installed in the <code>/usr/lib</code> or <code>/usr/local/lib</code> directory.</p> <p>b Install the <code>libflashplayer.so</code> file, or verify that this file is already installed.</p> <p>Ensure that the file is installed in the appropriate Flash plug-in directory for your Linux operating system.</p> <p>c Install the <code>wget</code> program, or verify that the program file is already installed.</p>

Disable or Enable Flash URL Redirection

Flash URL Redirection is enabled when you perform a silent installation of View Agent with the command-line argument, `FlashURLRedirection`. You can disable or reenble the Flash URL Redirection feature on selected remote desktops by setting a value on a Windows registry key on those virtual machines.

Procedure

- 1 Start the Windows Registry Editor on the virtual machine.
- 2 Navigate to the Windows registry key that controls Flash URL Redirection.

Option	Description
Windows 7 64-bit	HKEY_LOCAL_MACHINE\Software\Wow6432Node\VMware, Inc.\VMware ViewMP\enabled = <i>value</i>
Windows 7 32-bit	HKEY_LOCAL_MACHINE\Software\VMware, Inc.\VMware ViewMP\enabled = <i>value</i>

- 3 Set the value to disable or enable Flash URL Redirection.

Option	Value
Disabled	0
Enabled	1

By default, the value is set to 1.

Configure Real-Time Audio-Video

Real-Time Audio-Video allows View users to run Skype, Webex, Google Hangouts, and other online conferencing applications on their remote desktops. With Real-Time Audio-Video, webcam and audio devices that are connected locally to the client system are redirected to the remote desktop. This feature redirects video and audio data to the desktop with a significantly lower bandwidth than can be achieved by using USB redirection.

Real-Time Audio-Video is compatible with standard conferencing applications and browser-based video applications, and supports standard webcams, audio USB devices, and analog audio input.

This feature installs the VMware Virtual Webcam and VMware Virtual Microphone on the desktop operating system. The VMware Virtual Webcam uses a kernel-mode webcam driver that provides enhanced compatibility with browser-based video applications and other 3rd-party conferencing software.

When a conferencing or video application is launched, it displays and uses these VMware virtual devices, which handle the audio-video redirection from the locally-connected devices on the client. The VMware Virtual Webcam and Microphone appear in the Device Manager on the desktop operating system.

NOTE Real-Time Audio-Video also installs an earlier version of the VMware Virtual Webcam. You might see two versions of the VMware Virtual Webcam in certain conferencing applications. The earlier version is called VMware Virtual Webcam (legacy).

The drivers for the audio and webcam devices must be installed on your Horizon Client systems to enable the redirection.

Configuration Choices for Real-Time Audio-Video

After you install View Agent with Real-Time Audio-Video, the feature works on your View desktops without any further configuration. The default values for the webcam frame rate and image resolution are recommended for most standard devices and applications.

You can configure group policy settings to change these default values to adapt to particular applications, webcams, or environments. You can also set a policy to disable or enable the feature altogether. An ADM Template file lets you install Real-Time Audio-Video group policy settings on Active Directory or on individual desktops. See “[Configuring Real-Time Audio-Video Group Policy Settings](#),” on page 147.

If users have multiple webcams and audio input devices built in or connected to their client computers, you can configure preferred webcams and audio input devices that will be redirected to their desktops. See “[Selecting Preferred Webcams and Microphones](#),” on page 138.

NOTE You can select a preferred audio device, but no other audio configuration options are available.

When webcam images and audio input are redirected to a remote desktop, you cannot access the webcam and audio devices on the local computer. Conversely, when these devices are in use on the local computer, you cannot access them on the remote desktop.

For information about supported applications, see the VMware knowledge base article, *Guidelines for Using Real-Time Audio-Video with 3rd-Party Applications on Horizon View Desktops*, at <http://kb.vmware.com/kb/2053754>.

System Requirements for Real-Time Audio-Video

Real-Time Audio-Video works with standard webcam, USB audio, and analog audio devices, and with standard conferencing applications like Skype, WebEx, and Google Hangouts. To support Real-Time Audio-Video, your View deployment must meet certain software and hardware requirements.

- | | |
|--|--|
| View remote desktop | You install the Real-Time Audio-Video feature by installing View Agent 6.0 or later. This feature is supported in desktop pools that are deployed on single-user virtual machines but not in RDS desktop pools. See “ Install View Agent on a Virtual Machine ,” on page 25. |
| Horizon Client software | Horizon Client 2.2 for Windows or a later release

Horizon Client 2.2 for Linux or a later release. This feature is available only with the version of Horizon Client for Linux provided by third-party vendors.

Horizon Client 2.3 for Mac OS X or a later release |
| Horizon Client computer or client access device | <ul style="list-style-type: none"> ■ All operating systems that run Horizon Client for Windows. ■ All operating systems that run Horizon Client for Linux on x86 devices. This feature is not supported on ARM processors. |

- Mac OS X Mountain Lion (10.8) and later. It is disabled on all earlier Mac OS X operating systems.
- For details about supported client operating systems, see the *Using VMware Horizon Client* document for the appropriate system or device.
- The webcam and audio device drivers must be installed, and the webcam and audio device must be operable, on the client computer. To support Real-Time Audio-Video, you do not have to install the device drivers on the desktop operating system where View Agent is installed.

Display protocol for View

PCoIP

Real-Time Audio-Video is not supported in RDP desktop sessions.

Ensuring That Real-Time Audio-Video Is Used Instead of USB Redirection

Real-Time Audio-Video supports webcam and audio input redirection for use in conferencing applications. The USB redirection feature that can be installed with View Agent does not support webcam redirection. If you redirect audio input devices through USB redirection, the audio stream does not synchronize properly with video during Real-Time Audio-Video sessions, and you lose the benefit of reducing the demand on network bandwidth. You can take steps to ensure that webcams and audio input devices are redirected to your desktops through Real-Time Audio-Video, not USB redirection.

If your desktops are configured with USB redirection, end users can connect and display their locally connected USB devices by selecting the **Connect USB Device** option in the Windows client menu bar or the **Desktop > USB** menu in the Mac OS X client. Linux clients block USB redirection of audio and video devices by default and do not provide the USB device options to end users.

If an end user selects a USB device from the **Connect USB Device** or **Desktop > USB** list, that device becomes unusable for video or audio conferencing. For example, if a user makes a Skype call, the video image might not appear or the audio stream might be degraded. If an end user selects a device during a conferencing session, the webcam or audio redirection is disrupted.

To hide these devices from end users and prevent potential disruptions, you can configure USB redirection group policy settings to disable the display of webcams and audio input devices in VMware Horizon Client.

In particular, you can create USB redirection filtering rules for View Agent and specify the `audio-in` and `video` Device Family Names to be disabled. For information about setting group policies and specifying filtering rules for USB redirection, see [“Using Policies to Control USB Redirection,”](#) on page 158.



CAUTION If you do not set up USB redirection filtering rules to disable the USB device families, inform your end users that they cannot select webcam or audio devices from the **Connect USB Device** or **Desktop > USB** list in the VMware Horizon Client menu bar.

Selecting Preferred Webcams and Microphones

If a client computer has more than one webcam and microphone, you can configure a preferred webcam and default microphone that Real-Time Audio-Video will redirect to the desktop. These devices can be built in or connected to the local client computer.

On a Windows client computer, you select a preferred webcam by setting a registry key value. On a Mac OS X client computer, you can specify a preferred webcam or microphone by using the Mac OS X defaults system. On a Linux client computer, you can specify a preferred webcam or microphone by editing a configuration file. Real-Time Audio-Video redirects the preferred webcam if it is available. If not, Real-Time Audio-Video uses the first webcam that is provided by system enumeration.

To select a default microphone, you can configure the Sound control in the Windows, Mac OS X, or Linux operating system on the client computer.

Select a Default Microphone on a Windows Client System

If you have multiple microphones on your client system, only one of them is used on your View desktop. To specify which microphone is the default, you can use the Sound control on your client system.

With the Real-Time Audio-Video feature, audio input devices and audio output devices work without requiring the use of USB redirection, and the amount of network bandwidth required is greatly reduced. Analog audio input devices are also supported.

IMPORTANT If you are using a USB microphone, do not connect it from the **Connect USB Device** menu in Horizon Client. To do so routes the device through USB redirection so that the device cannot use the Real-Time Audio-Video feature.

Prerequisites

- Verify that you have a USB microphone or another type of microphone installed and operational on your client system.
- Verify that you are using the PCoIP display protocol for your remote desktop.

Procedure

- 1 If you are currently on a call, stop the call.
- 2 Right-click the speaker icon in your system tray and select **Recording devices**.
You can alternatively open the Sound control from the Control Panel and click the **Recording** tab.
- 3 In the **Recording** tab of the Sound dialog box, right-click the microphone you prefer to use.
- 4 Select **Set as Default Device** and click **OK**.
- 5 Start a new call from your View desktop.

Select a Preferred Webcam on a Windows Client System

With the Real-Time Audio-Video feature, if you have multiple webcams on your client system, only one of them is used on your View desktop. To specify which webcam is preferred, you can set a registry key value.

The preferred webcam is used on the remote desktop if it is available, and if not, another webcam is used.

Prerequisites

- Verify that you have a USB webcam installed and operational on your client system.
- Verify that you are using the PCoIP display protocol for your remote desktop.

Procedure

- 1 Attach the webcam you want to use.
- 2 Start a call and then stop a call.
This process creates a log file.

- Open the debug log file with a text editor.

Operating System	Log File Location
Windows XP	C:\Documents and Settings\username\Local Settings\Application Data\VMware\VDM\Logs\debug-20YY-MM-DD-XXXXXX.txt
Windows 7 or Windows 8	C:\Users\%username%\AppData\Local\VMware\VDM\Logs\debug-20YY-MM-DD-XXXXXX.txt

The format of the log file is debug-20YY-MM-DD-XXXXXX.txt, where 20YY is the year, MM is the month, DD is the day, and XXXXXX is a number.

- Search the log file for [ViewMMDevRedir] VideoInputBase::LogDevEnum to find the log file entries that reference the attached webcams.

Here is an excerpt from the log file identifying the Microsoft Lifecam HD-5000 webcam:

```
[ViewMMDevRedir] VideoInputBase::LogDevEnum - 2 Device(s) found
```

```
[ViewMMDevRedir] VideoInputBase::LogDevEnum - Index=0 Name=Integrated Webcam
UserId=vid_1bcf&pid_2b83&mi_00#7&1b2e878b&0&0000 SystemId=\\?\usb#vid_1bcf&pid_2b83&mi_00#
```

```
[ViewMMDevRedir] VideoInputBase::LogDevEnum - Index=1 Name=Microsoft LifeCam HD-5000
UserId=vid_045e&pid_076d&mi_00#8&11811f49&0&0000 SystemId=\\?\usb#vid_045e&pid_076d&mi_00#
```

- Copy the user ID of the preferred webcam.

For example, copy vid_045e&pid_076d&mi_00#8&11811f49&0&0000 to set the Microsoft LifeCam HD-5000 as the default webcam.

- Start the Registry Editor (regedit.exe) and navigate to HKEY_LOCAL_MACHINE\SOFTWARE\VMware, Inc.\VMware VDM\RTAV.

- Paste the ID portion of the string into the REG_SZ value, **srcWCamId**.

For example, paste vid_045e&pid_076d&mi_00#8&11811f49&0&0000 into **srcWCamId**.

- Save your changes and exit the registry.

- Start a new call.

Select a Default Microphone on a Mac OS X Client System

If you have multiple microphones on your client system, only one microphone is used on your remote desktop. You can use System Preferences on your client system to specify which microphone is the default microphone on the remote desktop.

With the Real-Time Audio-Video feature, audio input devices and audio output devices work without requiring the use of USB redirection, and the amount of network bandwidth required is greatly reduced. Analog audio input devices are also supported.

This procedure describes how to choose a microphone from the user interface of the client system. Administrators can also configure a preferred microphone by using the Mac OS X defaults system. See [“Configure a Preferred Webcam or Microphone on a Mac OS X Client System,”](#) on page 142.

IMPORTANT If you are using a USB microphone, do not connect it from the **Connection > USB** menu in Horizon Client. To do so routes the device through USB redirection and the device cannot use the Real-Time Audio-Video feature.

Prerequisites

- Verify that you have a USB microphone or another type of microphone installed and operational on your client system.
- Verify that you are using the PCoIP display protocol for your remote desktop.

Procedure

- 1 On your client system, select **Apple menu > System Preferences** and click **Sound**.
- 2 Open the Input pane of Sound preferences.
- 3 Select the microphone that you prefer to use.

The next time that you connect to a remote desktop and start a call, the desktop uses the default microphone that you selected on the client system.

Configuring Real-Time Audio-Video on a Mac OS X Client

You can configure Real-Time Audio-Video settings at the command line by using the Mac OS X defaults system. With the defaults system, you can read, write, and delete Mac OS X user defaults by using Terminal (`/Applications/Utilities/Terminal.app`).

Mac OS X defaults belong to domains. Domains typically correspond to individual applications. The domain for the Real-Time Audio-Video feature is `com.vmware.rtav`.

Syntax for Configuring Real-Time Audio-Video

You can use the following commands to configure the Real-Time Audio-Video feature.

Table 13-1. Command Syntax for Real-Time Audio-Video Configuration

Command	Description
<code>defaults write com.vmware.rtav srcWCamId "webcam-userid"</code>	Sets the preferred webcam to use on remote desktops. When this value is not set, the webcam is selected automatically by system enumeration. You can specify any webcam connected to (or built into) the client system.
<code>defaults write com.vmware.rtav srcAudioInId "audio-device-userid"</code>	Sets the preferred microphone (audio-in device) to use on remote desktops. When this value is not set, remote desktops use the default recording device set on the client system. You can specify any microphone connected to (or built into) the client system.
<code>defaults write com.vmware.rtav srcWCamFrameWidth pixels</code>	Sets the image width. The value defaults to a hardcoded value of 320 pixels. You can change the image width to any pixel value.
<code>defaults write com.vmware.rtav srcWCamFrameHeight pixels</code>	Sets the image height. The value defaults to a hardcoded value of 240 pixels. You can change the image height to any pixel value.
<code>defaults write com.vmware.rtav srcWCamFrameRate fps</code>	Sets the frame rate. The value defaults to 15 fps. You can change the frame rate to any value.
<code>defaults write com.vmware.rtav LogLevel "level"</code>	Sets the logging level for the Real-Time Audio-Video log file (<code>/Library/Logs/VMware/vmware-RTAV-pid.log</code>). You can set the logging level to trace or debug.
<code>defaults write com.vmware.rtav IsDisabled value</code>	Determines whether Real-Time Audio-Video is enabled or disabled. Real-Time Audio-Video is enabled by default. (This value is not in effect.) To disable Real-Time Audio-Video on the client, set the value to true.

Table 13-1. Command Syntax for Real-Time Audio-Video Configuration (Continued)

Command	Description
<code>defaults read com.vmware.rtav</code>	Displays Real-Time Audio-Video configuration settings.
<code>defaults delete com.vmware.rtav <i>setting</i></code>	Deletes a Real-Time Audio-Video configuration setting, for example: <code>defaults delete com.vmware.rtav srcWCamFrameWidth</code>

NOTE You can adjust frame rates from 1 fps up to a maximum of 25 fps and resolution up to a maximum of 1920x1080. A high resolution at a fast frame rate might not be supported on all devices or in all environments.

Configure a Preferred Webcam or Microphone on a Mac OS X Client System

With the Real-Time Audio-Video feature, if you have multiple webcams or microphones on your client system, only one webcam and one microphone can be used on your remote desktop. You specify which webcam and microphone are preferred at the command line by using the Mac OS X defaults system.

With the Real-Time Audio-Video feature, webcams, audio input devices, and audio output devices work without requiring USB redirection, and the amount of network bandwidth required is greatly reduced. Analog audio input devices are also supported.

In most environments, there is no need to configure a preferred microphone or webcam. If you do not set a preferred microphone, remote desktops use the default audio device set in the client system's System Preferences. See [“Select a Default Microphone on a Mac OS X Client System,”](#) on page 140. If you do not configure a preferred webcam, the remote desktop selects the webcam by enumeration.

Prerequisites

- If you are configuring a preferred USB webcam, verify that the webcam is installed and operational on your client system.
- If you are configuring a preferred USB microphone or other type of microphone, verify that the microphone is installed and operational on your client system.
- Verify that you are using the PCoIP display protocol for your remote desktop.

Procedure

- 1 On your Mac OS X client system, start a webcam or microphone application to trigger an enumeration of camera devices or audio devices to the Real-Time Audio-Video log file.
 - a Attach the webcam or audio device.
 - b In the **Applications** folder, double-click **VMware Horizon View Client** to start Horizon Client.
 - c Start a call and then stop the call.

- 2 Find log entries for the webcam or microphone in the Real-Time Audio-Video log file.
 - a In a text editor, open the Real-Time Audio-Video log file.

The Real-Time Audio-Video log file is named `/Library/Logs/VMware/vmware-RTAV-pid.log`, where *pid* is the process ID of the current session.

- b Search the Real-Time Audio-Video log file for entries that identify the attached webcams or microphones.

The following example shows how webcam entries might appear in the Real-Time Audio-Video log file:

```
2013-12-16T12:18:17.404Z| vthread-3| I120: RTAV: static void VideoInputBase::LogDevEnum() -
1 Device(s) found
2013-12-16T12:18:17.404Z| vthread-3| I120: RTAV: static void VideoInputBase::LogDevEnum() -
Name=FaceTime HD Camera (Built-in)  UserId=FaceTime HD Camera (Built-
in)#0xfa20000005ac8509  SystemId=0xfa20000005ac8509
```

The following example shows how microphone entries might appear in the Real-Time Audio-Video log file:

```
2013-12-16T12:18:17.404Z| vthread-3| I120: RTAV: int
AVCaptureEnumerateAudioDevices(MMDev::DeviceList&) -
2013-12-16T12:18:17.404Z| vthread-3| I120: RTAV: static void AudioCaptureBase::LogDevEnum()
- 2 Device(s) found
2013-12-16T12:18:17.404Z| vthread-3| I120: RTAV: static void AudioCaptureBase::LogDevEnum()
- Index=255  Name=Built-in Microphone  UserId=Built-in Microphone#AppleHDAEngineInput:1B,
0,1,0:1  SystemId=AppleHDAEngineInput:1B,0,1,0:1
2013-12-16T12:18:17.404Z| vthread-3| I120: RTAV: static void AudioCaptureBase::LogDevEnum()
- Index=255  Name=Built-in Input  UserId=Built-in Input#AppleHDAEngineInput:1B,0,1,1:2
SystemId=AppleHDAEngineInput:1B,0,1,1:2
```

- 3 Find the webcam or microphone that you prefer in the Real-Time Audio-Video log file and make a note of its user ID.

The user ID appears after the string `UserId=` in the log file. For example, the user ID of the internal face time camera is `FaceTime HD Camera (Built-in)` and the user ID of the internal microphone is `Built-in Microphone`.

- 4 In Terminal (`/Applications/Utilities/Terminal.app`), use the `defaults write` command to set the preferred webcam or microphone.

Option	Action
Set the preferred webcam	Type defaults write com.vmware.rtav srcWCamId "<i>webcam-userid</i>" , where <i>webcam-userid</i> is the user ID of the preferred webcam, which you obtained from the Real-Time Audio-Video log file. For example: defaults write com.vmware.rtav srcWCamId "HD Webcam C525"
Set the preferred microphone	Type defaults write com.vmware.rtav srcAudioInId "<i>audio-device- userid</i>" , where <i>audio-device- userid</i> is the user ID of the preferred microphone, which you obtained from the Real-Time Audio-Video log file. For example: defaults write com.vmware.rtav srcAudioInId "Built-in Microphone"

- 5 (Optional) Use the `defaults read` command to verify your changes to the Real-Time Audio-Video feature.

For example: **defaults read com.vmware.rtav**

The command lists all of the Real-Time Audio-Video settings.

The next time you connect to a remote desktop and start a new call, the desktop uses the preferred webcam or microphone that you configured, if it is available. If the preferred webcam or microphone is not available, the remote desktop can use another available webcam or microphone.

Select a Default Microphone on a Linux Client System

If you have multiple microphones on your client system, only one of them is used on your View desktop. To specify which microphone is the default, you can use the Sound control on your client system.

With the Real-Time Audio-Video feature, audio input devices and audio output devices work without requiring the use of USB redirection, and the amount of network bandwidth required is greatly reduced. Analog audio input devices are also supported.

This procedure describes choosing a default microphone from the user interface of the client system. Administrators can also configure a preferred microphone by editing a configuration file. See [“Select a Preferred Webcam or Microphone on a Linux Client System,”](#) on page 144.

Prerequisites

- Verify that you have a USB microphone or another type of microphone installed and operational on your client system.
- Verify that you are using the PCoIP display protocol for your remote desktop.

Procedure

- 1 In the Ubuntu graphical user interface, select **System > Preferences > Sound**.
You can alternatively click the **Sound** icon on the right side of the toolbar at the top of the screen.
- 2 Click the **Input** tab in the Sound Preferences dialog box.
- 3 Select the preferred device and click **Close**.

Select a Preferred Webcam or Microphone on a Linux Client System

With the Real-Time Audio-Video feature, if you have multiple webcams and microphones on your client system, only one webcam and one microphone can be used on your View desktop. To specify which webcam and microphone are preferred, you can edit a configuration file.

The preferred webcam or microphone is used on the View desktop if it is available, and if not, another webcam or microphone is used.

With the Real-Time Audio-Video feature, webcams, audio input devices, and audio output devices work without requiring the use of USB redirection, and the amount network bandwidth required is greatly reduced. Analog audio input devices are also supported.

To set the properties in the `/etc/vmware/config` file and specify a preferred device, you must determine the device ID.

- For webcams, you set the `rtav.srcWCamId` property to the value of the webcam description found in the log file, as described in the procedure that follows.
- For audio devices, you set the `rtav.srcAudioInId` property to the value of the Pulse Audio `device.description` field.

To find the value of this field you can search the log file, as described in the procedure that follows.

Prerequisites

Depending on whether you are configuring a preferred webcam, preferred microphone, or both, perform the appropriate prerequisite tasks:

- Verify that you have a USB webcam installed and operational on your client system.

- Verify that you have a USB microphone or another type of microphone installed and operational on your client system.
- Verify that you are using the PCoIP display protocol for your remote desktop.

Procedure

- 1 Launch the client, and start a webcam or microphone application to trigger an enumeration of camera devices or audio devices to the client log.
 - a Attach the webcam or audio device you want to use.
 - b Use the command `vmware-view` to start Horizon Client.
 - c Start a call and then stop the call.

This process creates a log file.

2 Find log entries for the webcam or microphone.

- a Open the debug log file with a text editor.

The log file with real-time audio-video log messages is located at `/tmp/vmware-<username>/vmware-mks-<pid>.log`. The client log is located at `/tmp/vmware-<username>/vmware-view-<pid>.log`.

- b Search the log file to find the log file entries that reference the attached webcams and microphones.

The following example shows an extract of the webcam selection:

```
main| I120: RTAV: static void VideoInputBase::LogDevEnum() - 3 Device(s) found
main| I120: RTAV: static void VideoInputBase::LogDevEnum() - Name=UVC Camera (046d:
0819)   UserId=UVC Camera (046d:0819)#/sys/devices/pci0000:00/0000:00:1a.
7/usb1/1-3/1-3.4/1-3.4.5   SystemId=/dev/video1
main| I120: RTAV: static void VideoInputBase::LogDevEnum() - Name=gspca main driver
UserId=gspca main driver#/sys/devices/pci0000:00/0000:00:1a.7/usb1/1-3/1-3.4/1-3.4.7
SystemId=/dev/video2
main| I120: RTAV: static void VideoInputBase::LogDevEnum() - Name=Microsoft®
LifeCam HD-6000 for Notebooks   UserId=Microsoft LifeCam HD-6000 for
Notebooks#/sys/devices/pci0000:00/0000:00:1a.7/usb1/1-3/1-3.6   SystemId=/dev/video0
main| W110: RTAV: static bool AudioCaptureLin::EnumCaptureDevices(MMDev::DeviceList&) -
enumeration data unavailable
```

The following example shows an extract of the audio device selection, and the current audio level for each:

```
vthread-18| I120: RTAV: bool AudioCaptureLin::TriggerEnumDevices() - Triggering
enumeration
vthread-18| I120: RTAV: static void AudioCaptureLin::PulseAudioGetSourceCB(pa_context*,
const pa_source_info*, int, void*) - PulseAudio Get Source (idx=1 'alsa_output.usb-
Logitech_Logitech_USB_Headset-00-Headset.analog-stereo.monitor' 'Monitor of Logitech USB
Headset Analog Stereo')

vthread-18| I120: RTAV: static void AudioCaptureLin::PulseAudioGetSourceCB(pa_context*,
const pa_source_info*, int, void*) - channel:0 vol:65536
vthread-18| I120: RTAV: static void AudioCaptureLin::PulseAudioGetSourceCB(pa_context*,
const pa_source_info*, int, void*) - channel:1 vol:65536
vthread-18| I120: RTAV: static void AudioCaptureLin::PulseAudioGetSourceCB(pa_context*,
const pa_source_info*, int, void*) - PulseAudio Get Source (idx=2 'alsa_input.usb-
Logitech_Logitech_USB_Headset-00-Headset.analog-mono' 'Logitech USB Headset Analog Mono')

vthread-18| I120: RTAV: static void AudioCaptureLin::PulseAudioGetSourceCB(pa_context*,
const pa_source_info*, int, void*) - channel:0 vol:98304
vthread-18| I120: RTAV: static void AudioCaptureLin::PulseAudioGetSourceCB(pa_context*,
const pa_source_info*, int, void*) - PulseAudio Get Source (idx=3 'alsa_output.usb-
Microsoft_Microsoft_LifeChat_LX-6000-00-LX6000.analog-stereo.monitor' 'Monitor of
Microsoft LifeChat LX-6000 Analog Stereo')

vthread-18| I120: RTAV: static void AudioCaptureLin::PulseAudioGetSourceCB(pa_context*,
const pa_source_info*, int, void*) - channel:0 vol:65536
```

Warnings are shown if any of the source audio levels for the selected device do not meet the PulseAudio criteria if the source is not set to 100% (0dB), or if the selected source device is muted, as follows:

```
vthread-18| I120: RTAV: static void AudioCaptureLin::PulseAudioSourceInfoCB(pa_context*,
const pa_source_info*, int, void*) - Note, selected device channel volume: 0: 67%
vthread-18| I120: RTAV: static void AudioCaptureLin::PulseAudioSourceInfoCB(pa_context*,
const pa_source_info*, int, void*) - Note, selected device channel is muted
```

- 3 Copy the description of the device and use it to set the appropriate property in the `/etc/vmware/config` file.

For a webcam example, copy Microsoft® LifeCam HD-6000 for Notebooks to specify the Microsoft webcam as the preferred webcam and set the property as follows:

```
rtav.srcWCamId="Microsoft® LifeCam HD-6000 for Notebooks"
```

For this example you could also set the property to `rtav.srcWCamId="Microsoft"`.

For an audio device example, copy Logitech USB Headset Analog Mono to specify the Logitech headset as the preferred audio device and set the property as follows:

```
rtav.srcAudioInId="Logitech USB Headset Analog Mono"
```

- 4 Save your changes and close the `/etc/vmware/config` configuration file.
- 5 Log off of the desktop session and start a new session.

Configuring Real-Time Audio-Video Group Policy Settings

You can configure group policy settings that control the behavior of Real-Time Audio-Video (RTAV) on your View desktops. These settings determine a virtual webcam's maximum frame rate and image resolution. The settings allow you to manage the maximum bandwidth that any one user can consume. An additional setting disables or enables the RTAV feature.

You do not have to configure these policy settings. Real-Time Audio-Video works with the frame rate and image resolution that are set for the webcam on client systems. The default settings are recommended for most webcam and audio applications.

For examples of bandwidth use during Real-Time Audio-Video, see [“Real-Time Audio-Video Bandwidth,”](#) on page 149.

These policy settings affect your View desktops, not the client systems to which the physical devices are connected. To configure these settings on your desktops, add the RTAV Group Policy Administrative Template (ADM) file in Active Directory.

For information about configuring settings on client systems, see the VMware knowledge base article, *Setting Frame Rates and Resolution for Real-Time Audio-Video on Horizon View Clients*, at <http://kb.vmware.com/kb/2053644>.

Add the RTAV ADM Template in Active Directory and Configure the Settings

You can add the policy settings in the RTAV ADM file, `vdm_agent_rtav.adm`, to group policy objects (GPOs) in Active Directory and configure the settings in the Group Policy Object Editor.

Prerequisites

- Verify that the RTAV setup option is installed on your desktops. This setup option is installed by default but can be deselected during installation. The settings have no effect if RTAV is not installed. See [“Install View Agent on a Virtual Machine,”](#) on page 25.
- Verify that Active Directory GPOs are created for the RTAV group policy settings. The GPOs must be linked to the OU that contains your desktops. See [“Active Directory Group Policy Example,”](#) on page 222.
- Verify that the Microsoft MMC and the Group Policy Object Editor snap-in are available on your Active Directory server.
- Familiarize yourself with RTAV group policy settings. See [“Real-Time Audio-Video Group Policy Settings,”](#) on page 148.

Procedure

- 1 Download the View GPO Bundle .zip file from the VMware Horizon (with View) download site at <http://www.vmware.com/go/downloadview>.

The file is named VMware-Horizon-View-GPO-Bundle-x.x.x-yyyyyyy.zip, where x.x.x is the version and yyyyyyy is the build number. All ADM and ADMX files that provide group policy settings for View are available in this file.
- 2 Unzip the VMware-Horizon-View-GPO-Bundle-x.x.x-yyyyyyy.zip file and copy the RTAV ADM file, vdm_agent_rtav.adm, to your Active Directory server.
- 3 On the Active Directory server, edit the GPO by selecting **Start > Administrative Tools > Group Policy Management**, right-clicking the GPO, and selecting **Edit**.
- 4 In the Group Policy Object Editor, right-click the **Computer Configuration > Administrative Templates** folder and select **Add/Remove Templates**.
- 5 Click **Add**, browse to the vdm_agent_rtav.adm file, and click **Open**.
- 6 Click **Close** to apply the policy settings in the ADM file to the GPO.

The settings are located in the **Computer Configuration > Policies > Administrative Templates > Classic Administrative Templates > VMware View Agent Configuration > View RTAV Configuration** folder.
- 7 Configure the RTAV group policy settings.

Real-Time Audio-Video Group Policy Settings

The Real-Time Audio-Video (RTAV) group policy settings control the virtual webcam's maximum frame rate and maximum image resolution. An additional setting lets you disable or enable the RTAV feature. These policy settings affect View desktops, not the client systems where the physical devices are connected.

If you do not configure the RTAV group policy settings, RTAV uses the values that are set on the client systems. On client systems, the default webcam frame rate is 15 frames per second. The default webcam image resolution is 320x240 pixels.

The **Resolution - Max image...** group policy settings determine the maximum values that can be used. The frame rate and resolution that are set on client systems are absolute values. For example, if you configure the RTAV settings for maximum image resolution to 640x480 pixels, the webcam displays any resolution that is set on the client up to 640x480 pixels. If you set the image resolution on the client to a value higher than 640x480 pixels, the client resolution is capped at 640x480 pixels.

Not all configurations can achieve the maximum group policy settings of 1920x1080 resolution at 25 frames per second. The maximum frame rate that your configuration can achieve for a given resolution depends upon the webcam being used, the client system hardware, the View Agent virtual hardware, and the available bandwidth.

The **Resolution - Default image...** group policy settings determine the default values that are used when resolution values are not set by the user.

Group Policy Setting	Description
Disable RTAV	<p>When you enable this setting, the Real-Time Audio-Video feature is disabled.</p> <p>When this setting is not configured or disabled, Real-Time Audio-Video is enabled.</p> <p>This setting is located in the View RTAV Configuration folder.</p>
Max frames per second	<p>Determines the maximum rate per second at which the webcam can capture frames. You can use this setting to limit the webcam frame rate in low-bandwidth network environments.</p> <p>The minimum value is one frame per second. The maximum value is 25 frames per second.</p> <p>When this setting is not configured or disabled, no maximum frame rate is set. Real-Time Audio-Video uses the frame rate that is selected for the webcam on the client system.</p> <p>By default, client webcams have a frame rate of 15 frames per second. If no setting is configured on the client system and the Max frames per second setting is not configured or disabled, the webcam captures 15 frames per second.</p> <p>This setting is located in the View RTAV Configuration > View RTAV Webcam Settings folder.</p>
Resolution - Max image width in pixels	<p>Determines the maximum width, in pixels, of image frames that are captured by the webcam. By setting a low maximum image width, you can lower the resolution of captured frames, which can improve the imaging experience in low-bandwidth network environments.</p> <p>When this setting is not configured or disabled, a maximum image width is not set. RTAV uses the image width that is set on the client system. The default width of a webcam image on a client system is 320 pixels.</p> <p>The maximum limit for any webcam image is 1920x1080 pixels. If you configure this setting with a value that is higher than 1920 pixels, the effective maximum image width is 1920 pixels.</p> <p>This setting is located in the View RTAV Configuration > View RTAV Webcam Settings folder.</p>
Resolution - Max image height in pixels	<p>Determines the maximum height, in pixels, of image frames that are captured by the webcam. By setting a low maximum image height, you can lower the resolution of captured frames, which can improve the imaging experience in low-bandwidth network environments.</p> <p>When this setting is not configured or disabled, a maximum image height is not set. RTAV uses the image height that is set on the client system. The default height of a webcam image on a client system is 240 pixels.</p> <p>The maximum limit for any webcam image is 1920x1080 pixels. If you configure this setting with a value that is higher than 1080 pixels, the effective maximum image height is 1080 pixels.</p> <p>This setting is located in the View RTAV Configuration > View RTAV Webcam Settings folder.</p>
Resolution - Default image resolution width in pixels	<p>Determines the default resolution width, in pixels, of image frames that are captured by the webcam.</p> <p>This setting is used when no resolution value is defined by the user.</p> <p>When this setting is not configured or disabled, the default image width is 320 pixels.</p> <p>The value that is configured by this policy setting takes effect only if both View Agent 6.0 or later and Horizon Client 3.0 or later are used. For older versions of View Agent and Horizon Client, this policy setting has no effect, and the default image width is 320 pixels.</p> <p>This setting is located in the View RTAV Configuration > View RTAV Webcam Settings folder.</p>
Resolution - Default image resolution height in pixels	<p>Determines the default resolution height, in pixels, of image frames that are captured by the webcam.</p> <p>This setting is used when no resolution value is defined by the user.</p> <p>When this setting is not configured or disabled, the default image height is 240 pixels.</p> <p>The value that is configured by this policy setting takes effect only if both View Agent 6.0 or later and Horizon Client 3.0 or later are used. For older versions of View Agent and Horizon Client, this policy setting has no effect, and the default image height is 240 pixels.</p> <p>This setting is located in the View RTAV Configuration > View RTAV Webcam Settings folder.</p>

Real-Time Audio-Video Bandwidth

Real-Time Audio-Video bandwidth varies according to the webcam's image resolution and frame rate, and the image and audio data being captured.

The sample tests shown in [Table 13-2](#) measure the bandwidth that Real-Time Audio-Video uses in a View environment with standard webcam and audio input devices. The tests measure the bandwidth to send both video and audio data from Horizon Client to View Agent. The total bandwidth that is required to run a desktop session from Horizon Client might be higher than these numbers. In these tests, the webcam captures images at 15 frames per second for each image resolution.

Table 13-2. Sample Bandwidth Results for Sending Real-Time Audio-Video Data from Horizon Client to View Agent

Image Resolution (Width x Height)	Bandwidth Used (Kbps)
160 x 120	225
320 x 240	320
640 x 480	600

Manage Access to Windows 7 Multimedia Redirection (MMR)

View provides the Windows 7 MMR feature for Windows 7 desktops and clients, and the Wyse MMR feature for Windows XP and Windows Vista desktops.

MMR delivers the multimedia stream directly to client computers. With MMR, the multimedia stream is processed, that is, decoded, on the client system. The client system plays the media content, thereby offloading the demand on the ESXi host.

MMR data is sent across the network without application-based encryption and might contain sensitive data, depending on the content being redirected. To ensure that this data cannot be monitored on the network, use MMR only on a secure network.

Enabling Multimedia Redirection in View

You can take steps to ensure that MMR is accessible only to Horizon Client systems that have sufficient resources to handle local multimedia decoding and that are connected to View on a secure network.

By default, the global policy in View Administrator, **Multimedia redirection (MMR)** is set to **Deny**.

To use MMR, you must explicitly set this value to **Allow**.

To control access to MMR, you can enable or disable the **Multimedia redirection (MMR)** policy globally, for individual desktop pools, or for specific users.

This policy affects MMR for Windows 7, Windows XP, and Windows Vista desktops.

For instructions for setting global policies in View Administrator, see [“View Policies,”](#) on page 191.

System Requirements for Windows 7 Multimedia Redirection

To support Windows 7 Multimedia Redirection (MMR), your View deployment must meet certain software and hardware requirements.

View desktop

- The desktops must run 64-bit or 32-bit Windows 7 operating systems.
- **3D Rendering** must be enabled on the desktop pool.
- The desktop virtual machines must be virtual hardware version 8 or later.
- Users must play videos on Windows Media Player 12 or later.

Horizon Client software

Horizon Client 2.2 for Windows or a later release

Horizon Client computer or client access device

- The clients must run 64-bit or 32-bit Windows 7 or Windows 8 operating systems.
- The clients must have DirectX Video Acceleration (DXVA)-compatible video cards that can decode the selected videos.

- Windows Media Player 12 or later must be installed on the clients to allow redirection to the local hardware.

Supported media formats

Media formats must comply with the H.264 video compression standard. The M4V, MP4, and MOV file formats are supported. Your virtual desktops must use one of these file formats, and local decoders for these formats must exist on the client systems.

View policies

In View Administrator, set the **Multimedia redirection (MMR)** policy to **Allow**. The default value is **Deny**.

Back-end firewall

If your View deployment includes a back-end firewall between your DMZ-based security servers and your internal network, verify that the back-end firewall allows traffic to port 9427 on your desktops.

For a comparison of the Windows 7 Multimedia Redirection (MMR) component and the Wyse MMR component, which operates on Windows XP and Windows Vista desktops, see [“Multimedia Redirection Support on Desktop Operating Systems,”](#) on page 151.

Multimedia Redirection Support on Desktop Operating Systems

The Windows 7 Multimedia Redirection (MMR) and Wyse MMR components are installed with View Agent. The Wyse MMR component operates on Windows XP and Windows Vista desktops. Windows 7 MMR has somewhat different characteristics and requirements than the Wyse MMR component.

Table 13-3. View Desktop Operating System Support for Multimedia Redirection

Desktop Operating System	Virtual Machine Requirements	Supported Media Formats	Supported Clients	Audio Redirection
Windows XP, Windows Vista	Windows Media Player 10 or later must be installed.	Many formats are supported. For example: MPEG2-1; MPEG2; MPEG-4 Part 2; WMV 7, 8, and 9; WMA; AVI; ACE; MPT3; WAV	Windows XP, Windows Vista, Windows 7 Windows Media Player 10 or later must be installed.	The audio stream is redirected to the client system.
Windows 7	The desktops must be virtual hardware version 8 or later. 3D Rendering must be enabled. Windows Media Player 12 or later must be installed.	H.264 compression standard in M4V, MP4, or MOV format.	Windows 7, Windows 8 The clients must have DirectX Video Acceleration (DXVA)-compatible video cards that can decode the selected videos. Windows Media Player 12 or later must be installed.	The audio stream is not redirected. Audio is delivered over PCoIP from the remote desktop to the client system.
Windows 8	Not supported	Not supported	Not supported	Not supported

For more information about MMR system requirements on Horizon Client devices, see the *Using VMware Horizon Client for Windows* document.

Ensure That Clients Can Initiate Windows 7 MMR

Windows 7 MMR uses a handshake between the Horizon Client system and the desktop to validate requests for multimedia redirection. Under certain network conditions, this handshake can take too long to complete, which causes MMR not to be initiated. To ensure that Windows 7 MMR can be initiated, you can configure a Windows registry key on the desktop to increase the time allowed for the validation handshake to complete.

The Windows registry key controls the handshake Time to Live (TTL) value and is set in milliseconds. The key is in REG_DWORD (hex) format. The default value is 5000 milliseconds (five seconds).

Before you deploy Windows 7 MMR to your View users, test a few client systems to check if the default time allowed to complete the handshake is adequate in your environment. If your network conditions require a longer handshake than five seconds, increase the TTL value.

Procedure

- 1 Start the Windows Registry Editor on the remote desktop.
- 2 Navigate to the Windows registry key that controls the MMR validation handshake.

Option	Description
Windows 7 64-bit	HKEY_LOCAL_MACHINE\Software\Wow6432Node\VMware, Inc.\VMware VDPService\handshakeTTL
Windows 7 32-bit	HKEY_LOCAL_MACHINE\Software\VMware, Inc.\VMware VDPService\handshakeTTL

- 3 Increase the handshakeTTL value to a number that is greater than 5000.
- 4 Restart Windows Media Player on the desktop to allow the updated value to take effect.

Using USB Devices with Remote Desktops

14

Administrators can configure the ability to use USB devices, such as thumb flash drives, cameras, VoIP (voice-over-IP) devices, and printers, from a remote desktop. This feature is called USB redirection, and it supports using either the RDP or the PCoIP display protocol. A remote desktop can accommodate up to 32 USB devices.

When you use this feature, most USB devices that are attached to the local client system become available in the remote desktop. You can even connect to and manage an iPad from a remote desktop. For example, you can sync your iPad with iTunes installed in your remote desktop. On some client devices, such as Windows and Mac OS X computers, the USB devices are listed in a menu in Horizon Client. You use the menu to connect and disconnect the devices.

In most cases, you cannot use a USB device in your client system and in your remote desktop at the same time. Only a few types of USB devices can be shared between the remote desktop and the local computer. These devices include smart card readers and human interface devices such as keyboards and pointing devices.

Administrators can specify which types of USB devices end users are allowed to connect to. For composite devices that contain multiple types of devices, such as a video input device and a storage device, on some client systems, administrators can split the device so that one device (for example, the video input device) is allowed but the other device (for example, the storage device) is not.

The USB redirection feature is available in desktop pools that are deployed on single-user machines. The feature is not available in RDS desktop pools.

NOTE The USB redirection feature is available only on some types of clients. To find out whether this feature is supported on a particular type of client, see the feature support matrix included in the "Using VMware Horizon Client" document for the specific type of desktop or mobile client device. Go to https://www.vmware.com/support/viewclients/doc/viewclients_pubs.html.

This chapter includes the following topics:

- "Limitations Regarding USB Device Types," on page 154
- "Overview of Setting Up USB Redirection," on page 154
- "Network Traffic and USB Redirection," on page 155
- "Automatic Connections to USB Devices," on page 156
- "Disabling USB Redirection," on page 156
- "Using Log Files for Troubleshooting and to Determine USB Device IDs," on page 157
- "Using Policies to Control USB Redirection," on page 158
- "Troubleshooting USB Redirection Problems," on page 167

Limitations Regarding USB Device Types

Although View does not explicitly prevent any devices from working in a remote desktop, due to factors such as network latency and bandwidth, some devices work better than others. By default, some devices are automatically filtered, or blocked, from being used.

Although super-speed USB3 devices are not currently supported in View, USB3 devices do often work when plugged into a USB2 or USB3 port on the client machine, but they run in USB2 mode. This method usually works when running Windows 8.x. On other operating systems, the USB chipset on the motherboard of the client system affects whether the USB3 device can work in USB2 mode when redirected to the remote desktop.

The following types of devices might not be suitable for USB redirection to a remote desktop:

- Due to the bandwidth requirements of webcams, which typically consume more than 60 Mbps of bandwidth, webcams are not supported through USB redirection. For webcams, you can use the Real-Time Audio-Video feature.
- The redirection of USB audio devices depends on the state of the network and is not reliable. Some devices require a high data throughput even when they are idle. If you have the Real-Time Audio-Video feature, audio input and output devices will work well using that feature, and you do not need to use USB redirection for those devices.
- Performance of some USB devices varies greatly, depending on the network latency and reliability, especially over a WAN. For example, a single USB storage device read-request requires three round-trips between the client and the remote desktop. A read of a complete file might require multiple USB read operations, and the larger the latency, the longer the round-trip will take.

The file structure can be very large, depending on the format. Large USB disk drives can take several minutes to appear in the desktop. Formatting a USB device as NTFS rather than FAT helps to decrease the initial connection time. An unreliable network link causes retries, and performance is further reduced.

Similarly, USB DVD writers, which require a steady bit-rate of data to allow the burn operation to complete correctly, as well as scanners and touch devices such as signature tablets, do not work well over a latent network such as a WAN.

- The redirection of USB scanners depends on the state of the network and is not reliable.

Overview of Setting Up USB Redirection

To set up your deployment so that end users can connect removable devices, such as USB flash drives, cameras, and headsets, you must install certain components on both the remote desktop and the client device, and you must verify that the global setting for USB devices is enabled in View Administrator.

This checklist includes both required and optional tasks for setting up USB redirection in your enterprise.

NOTE The USB redirection feature is available only on some types of clients, such as Windows, Mac OS X, and partner-supplied Linux clients. To find out whether this feature is supported on a particular type of client, see the feature support matrix included in the "Using VMware Horizon Client" document for the specific type of client device. Go to

https://www.vmware.com/support/viewclients/doc/viewclients_pubs.html.

- 1 When you run the View Agent installation wizard on the remote desktop source, be sure to include the USB Redirection component.

This component is included by default. VMware recommends always including this component. You can use group policy settings to disable USB redirection for some remote desktops and users, or to restrict which types of USB devices can be redirected.

- 2 When you run the VMware Horizon Client installation wizard on the client system, be sure to include the USB Redirection component.

This component is included by default.

- 3 Verify that access to USB devices from a remote desktop is enabled in View Administrator.

In View Administrator, go to **Policies > Global Policies** and verify that **USB access** is set to **Allow**.

- 4 (Optional) Configure View Agent group policies to specify which types of devices are allowed to be redirected.

See [“Using Policies to Control USB Redirection,”](#) on page 158.

- 5 (Optional) Configure similar settings on the client device.

You can also configure whether devices are automatically connected when Horizon Client connects to the remote desktop or when the end user plugs in a USB device. The method of configuring USB settings on the client device depends on the type of device. For example, for Windows client endpoints, you can configure group policies, whereas for Mac OS X endpoints, you use a command-line command. For instructions, see the "Using VMware Horizon Client" document for the specific type of client device.

- 6 Have end users connect to a remote desktop and plug their USB devices into the local client system.

If the driver for the USB device is not already installed in the remote desktop, the guest operating system detects the USB device and searches for a suitable driver, just as it would on a physical Windows computer.

Network Traffic and USB Redirection

USB redirection works independently of the display protocol (RDP or PCoIP) and USB traffic usually uses TCP port 32111.

Network traffic between a client system and a remote desktop can travel various routes, depending on whether the client system is inside the corporate network and how the administrator has chosen to set up security.

- 1 If the client system is inside the corporate network, so that a direct connection can be made between the client and desktop, USB traffic uses TCP port 32111.
- 2 If the client system is outside the corporate network, the client can connect through a View security server.

A security server resides within a DMZ and acts as a proxy host for connections inside your trusted network. This design provides an additional layer of security by shielding the View Connection Server instance from the public-facing Internet and by forcing all unprotected session requests through the security server.

A DMZ-based security server deployment requires a few ports to be opened on the firewall to allow clients to connect with security servers inside the DMZ. You must also configure ports for communication between security servers and the View Connection Server instances in the internal network.

For information on specific ports, see "Firewall Rules for DMZ-Based Security Servers" in the *View Architecture Planning Guide*.

- 3 If the client system is outside the corporate network, you can use View Administrator to enable the HTTPS Secure Tunnel. The client then makes a further HTTPS connection to the View Connection Server or security server host when users connect to a remote desktop. The connection is tunneled using HTTPS port 443 to the security server, and then the onward connection for USB traffic from the server to the remote desktop uses TCP port 32111. USB device performance is slightly degraded when using this tunnel.

NOTE If you are using a zero client, USB traffic is redirected using a PCoIP virtual channel, rather than through TCP 32111. Data is encapsulated and encrypted by the PCoIP Secure Gateway using TCP/UDP port 4172. If you are using only zero clients, it is not necessary to open TCP port 32111.

Automatic Connections to USB Devices

On some client systems, administrators, end users, or both can configure automatic connections of USB devices to a remote desktop. Automatic connections can be made either when the user plugs a USB device in to the client system or when the client connects to the remote desktop.

Some devices, such as smart phones and tablets, require automatic connections because these devices are restarted, and therefore disconnected, during an upgrade. If these devices are not set to automatically reconnect to the remote desktop, during an upgrade, after the devices restart, they connect to the local client system instead.

Configuration properties for automatic USB connections that administrators set on the client, or that end users set by using a Horizon Client menu item, apply to all USB devices unless the devices are configured to be excluded from USB redirection. For example, in some client versions, webcams and microphones are excluded from USB redirection by default because these devices work better through the Real-Time Audio-Video feature. In some cases, a USB device might not be excluded from redirection by default but might require administrators to explicitly exclude the device from redirection. For example, the following types of USB devices are not good candidates for USB redirection and must not be automatically connected to a remote desktop:

- USB Ethernet devices. If you redirect a USB Ethernet device, your client system might lose network connectivity if that device is the only Ethernet device.
- Touch screen devices. If you redirect a touch screen device, the remote desktop will receive touch input but not keyboard input.

If you have set the remote desktop to autoconnect USB devices, you can configure a policy to exclude specific devices such as touch screens and network devices. For more information, see [“Configuring Filter Policy Settings for USB Devices,”](#) on page 161.

On Windows clients, as an alternative to using settings that automatically connect all but excluded devices, you can edit a configuration file on the client that sets Horizon Client to reconnect only a specific device or devices, such as smart phones and tablets, to the remote desktop. For instructions, see *Using VMware Horizon Client for Windows*.

Disabling USB Redirection

Some highly security-sensitive applications require that USB redirection be disabled. You can disable USB redirection for all desktop pools, for specific desktop pools, or for specific users in a desktop pool.

Use any of the following strategies, as appropriate for your situation:

- In View Administrator, edit the **USB access** policy for a specific pool to either allow or deny access.
- In View Administrator, after you set the policy at the desktop pool level, you can override the policy for a specific virtual machine in the pool.
- When installing View Agent, deselect the **USB redirection** component. VMware does not recommend this strategy because it offers less flexibility than using policy settings.

- Set the Exclude All Devices policy to **true**, on the agent side or on the client side, as appropriate.

If you set the Exclude All Devices policy to **true**, Horizon Client prevents all USB devices from being redirected. You can use other policy settings to allow specific devices or families of devices to be redirected. If you set the policy to **false**, Horizon Client allows all USB devices to be redirected except those that are blocked by other policy settings. You can set the policy on both View Agent and Horizon Client. The following table shows how the Exclude All Devices policy that you can set for View Agent and Horizon Client combine to produce an effective policy for the client computer. By default, all USB devices are allowed to be redirected unless otherwise blocked.

Table 14-1. Effect of Combining Exclude All Devices Policies

Exclude All Devices Policy on View Agent	Exclude All Devices Policy on Horizon Client	Combined Effective Exclude All Devices Policy
false or not defined (include all USB devices)	false or not defined (include all USB devices)	Include all USB devices
false (include all USB devices)	true (exclude all USB devices)	Exclude all USB devices
true (exclude all USB devices)	Any or not defined	Exclude all USB devices

If you have set Disable Remote Configuration Download policy to **true**, the value of Exclude All Devices on View Agent is not passed to Horizon Client, but View Agent and Horizon Client enforce the local value of Exclude All Devices.

These policies are included in the View Agent Configuration ADM template file (`vdm_agent.adm`). For more information, see [“USB Settings in the View Agent Configuration ADM Template,”](#) on page 165.

Using Log Files for Troubleshooting and to Determine USB Device IDs

Useful log files for USB are located on both the client system and the remote desktop operating system. Use the log files in both locations for troubleshooting. To find product IDs for specific devices, use the client-side logs.

If you are trying to configure USB device splitting or filtering, or if you are trying to determine why a particular device does not appear in a Horizon Client menu, look in the client-side logs. Client logs are produced for the USB arbitrator and the Horizon View USB Service. Logging on Windows and Linux clients is enabled by default. On Mac OS X clients, logging is disabled by default. To enable logging on Mac OS X clients, see [Using VMware Horizon Client for Mac OS X](#).

When you configure policies for splitting and filtering out USB devices, some values you set require the VID (vendor ID) and PID (product ID) for the USB device. To find the VID and PID, you can search on the Internet for the product name combined with `vid` and `pid`. Alternatively, you can look in the client-side log file after you plug in the USB device to the local system when Horizon Client is running. The following table shows the default location of the log files.

Table 14-2. Log File Locations

Client or Agent	Path to Log Files
Windows client	%PROGRAMDATA%\VMware\VDM\logs\debug-*.txt C:\Windows\Temp\vmware-SYSTEM\vmware-usbarb-*.log
Windows agent (on remote desktop)	%PROGRAMDATA%\VMware\VDM\logs\debug-*.txt
Mac OS X client	/var/root/Library/Logs/VMware/vmware-view-usbd-xxxx.log /Library/Logs/VMware/vmware-usbarbitrator-xxxx.log
Linux client	(Default location) /tmp/vmware-root/vmware-view-usbd-*.log

If a problem with the device occurs after the device is redirected to the remote desktop, examine both the client- and agent-side logs.

Using Policies to Control USB Redirection

You can configure USB policies for both the remote desktop (View Agent) and Horizon Client. These policies specify whether the client device should split composite USB devices into separate components for redirection. You can split devices to restrict the types of USB devices that the client makes available for redirection, and to make View Agent prevent certain USB devices from being forwarded from a client computer.

If you have older versions of View Agent or Horizon Client installed, not all the features of the USB redirection policies are available. [Table 14-3](#) shows how View applies the policies for different combinations of View Agent and Horizon Client.

Table 14-3. Compatibility of USB Policy Settings

View Agent Version	Horizon Client Version	Effect of USB Policy Settings on USB Redirection
5.1 or later	5.1 or later	USB policy settings are applicable to both View Agent and Horizon Client. You can use View Agent USB policy settings to block USB devices from being forwarded to a desktop. View Agent can send device splitting and filtering policy settings to Horizon Client. You can use Horizon Client USB policy settings to prevent USB devices from being redirected from a client computer to a desktop.
5.1 or later	5.0.x or earlier	USB policy settings apply only to View Agent. You can use View Agent USB policy settings to block USB devices from being forwarded to a desktop. You cannot use Horizon Client USB policy settings to control which devices can be redirected from a client computer to a desktop. Horizon Client cannot receive device splitting and filtering policy settings from View Agent. Existing registry settings for USB redirection by Horizon Client remain valid.
5.0.x or earlier	5.1 or later	USB policy settings apply only to Horizon Client. You can use Horizon Client USB policy settings to prevent USB devices from being redirected from a client computer to a desktop. You cannot use View Agent USB policy settings to block USB devices from being forwarded to a desktop. View Agent cannot send device splitting and filtering policy settings to Horizon Client.
5.0.x or earlier	5.0.x or earlier	USB policy settings do not apply. Existing registry settings for USB redirection by Horizon Client remain valid.

If you upgrade Horizon Client, any existing registry settings for USB redirection, such as `HardwareIdFilters`, remain valid until you define USB policies for Horizon Client.

On client devices that do not support client-side USB policies, you can use the USB policies for View Agent to control which USB devices are allowed to be forwarded from the client to a desktop.

Configuring Device Splitting Policy Settings for Composite USB Devices

Composite USB devices consist of a combination of two or more different devices, such as a video input device and a storage device or a microphone and a mouse device. If you want to allow one or more of the components to be available for redirection, you can split the composite device into its component interfaces, exclude certain interfaces from redirection and include others.

You can set a policy that automatically splits composite devices. If automatic device splitting does not work for a specific device, or if automatic splitting does not produce the results your application requires, you can split composite devices manually.

Automatic Device Splitting

If you enable automatic device splitting View attempts to split the functions, or devices, in a composite device according to the filter rules that are in effect. For example, a dictation microphone might be split automatically so that the mouse device remains local to the client, but the rest of the devices are forwarded to the remote desktop.

The following table shows how the value of the `Allow Auto Device Splitting` setting determines whether Horizon Client attempts to split composite USB devices automatically. By default, automatic splitting is disabled.

Table 14-4. Effect of Combining Disable Automatic Splitting Policies

Allow Auto Device Splitting Policy on View Agent	Allow Auto Device Splitting Policy on Horizon Client	Combined Effective Allow Auto Device Splitting Policy
Allow – Default Client Setting	false (automatic splitting disabled)	Automatic splitting disabled
Allow – Default Client Setting	true (automatic splitting enabled)	Automatic splitting enabled
Allow – Default Client Setting	Not defined	Automatic splitting enabled
Allow – Override Client Setting	Any or not defined	Automatic splitting enabled
Not defined	Not defined	Automatic splitting disabled

NOTE These policies are included in the View Agent Configuration ADM template file (`vdm_agent.adm`). For more information, see [“USB Settings in the View Agent Configuration ADM Template,”](#) on page 165.

By default, View disables automatic splitting, and excludes any audio-output, keyboard, mouse, or smart-card components of a composite USB device from redirection.

View applies the device splitting policy settings before it applies any filter policy settings. If you have enabled automatic splitting and do not explicitly exclude a composite USB device from being split by specifying its vendor and product IDs, View examines each interface of the composite USB device to decide which interfaces should be excluded or included according to the filter policy settings. If you have disabled automatic device splitting and do not explicitly specify the vendor and product IDs of a composite USB device that you want to split, View applies the filter policy settings to the entire device.

If you enable automatic splitting, you can use the `Exclude Vid/Pid Device From Split` policy to specify the composite USB devices that you want to exclude from splitting.

Manual Device Splitting

You can use the `Split Vid/Pid Device` policy to specify the vendor and product IDs of a composite USB device that you want to split. You can also specify the interfaces of the components of a composite USB device that you want to exclude from redirection. View does not apply any filter policy settings to components that you exclude in this way.

IMPORTANT If you use the `Split Vid/Pid Device` policy, View does not automatically include the components that you have not explicitly excluded. You must specify a filter policy such as `Include Vid/Pid Device` to include those components.

[Table 14-5](#) shows the modifiers that specify how Horizon Client handles a View Agent device splitting policy setting if there is an equivalent device splitting policy setting for Horizon Client. These modifiers apply to all device-splitting policy settings.

Table 14-5. Splitting Modifiers for Device-Splitting Policy Settings on View Agent

Modifier	Description
m (merge)	Horizon Client applies the View Agent device splitting policy setting in addition to the Horizon Client device splitting policy setting.
o (override)	Horizon Client uses the View Agent device splitting policy setting instead of the Horizon Client device splitting policy setting.

Table 14-6 shows examples of how Horizon Client processes the settings for Exclude Device From Split by Vendor/Product ID when you specify different splitting modifiers.

Table 14-6. Examples of Applying Splitting Modifiers to Device-Splitting Policy Settings

Exclude Device From Split by Vendor/Product ID on View Agent	Exclude Device From Split by Vendor/Product ID on Horizon Client	Effective Exclude Device From Split by Vendor/Product ID Policy Setting Used by Horizon Client
m:vid-XXXX_pid-XXXX	vid-YYYY_pid-YYYY	vid-XXXX_pid-XXXX;vid-YYYY_pid-YYYY
o:vid-XXXX_pid-XXXX	vid-YYYY_pid-YYYY	vid-XXXX_pid-XXXX
m:vid-XXXX_pid-XXXX;vid-YYYY_pid-YYYY	vid-YYYY_pid-YYYY	vid-XXXX_pid-XXXX;vid-YYYY_pid-YYYY
o:vid-XXXX_pid-XXXX;vid-YYYY_pid-YYYY	vid-YYYY_pid-YYYY	vid-XXXX_pid-XXXX;vid-YYYY_pid-YYYY

View Agent does not apply the device splitting policy settings on its side of the connection.

Horizon Client evaluates the device splitting policy settings in the following order of precedence.

- Exclude Vid/Pid Device From Split
- Split Vid/Pid Device

A device splitting policy setting that excludes a device from being split takes precedence over any policy setting to split the device. If you define any interfaces or devices to be excluded from splitting, Horizon Client excludes the matching component devices from being available for redirection.

Examples of Setting Policies to Split Composite USB Devices

Set splitting policies for desktops to exclude devices with specific vendor and product IDs from redirection after automatic splitting and pass these policies to client computers:

- For View Agent, set the Allow Auto Device Splitting policy to Allow – Override Client Setting.
- For View Agent, set the Exclude VidPid From Split policy to **o:vid-xxx_pid-yyyy**, where *xxx* and *yyyy* are the appropriate IDs.

Allow automatic device splitting for desktops and specify policies for splitting specific devices on client computers:

- For View Agent, set the Allow Auto Device Splitting policy to Allow – Override Client Setting.
- For the client device, set the Include Vid/Pid Device filter policy to include the specific device that you want to split; for example, **vid-0781_pid-554c**.
- For the client device, set the Split Vid/Pid Device policy to **vid-0781_pid-554c(exintf:00;exintf:01)** for example, to split a specified composite USB device so that interface 00 and interface 01 are excluded from redirection.

Configuring Filter Policy Settings for USB Devices

Filter policy settings that you configure for View Agent and Horizon Client establish which USB devices can be redirected from a client computer to a remote desktop. USB device filtering is often used by companies to disable the use of mass storage devices on remote desktops, or to block a specific type of device from being forwarded, such as a USB-to-Ethernet adapter that connects the client device to the remote desktop.

When you connect to a desktop, Horizon Client downloads the View Agent USB policy settings and uses them in conjunction with the Horizon Client USB policy settings to decide which USB devices it will allow you to redirect from the client computer.

View applies any device splitting policy settings before it applies the filter policy settings. If you have split a composite USB device, View examines each of the device's interfaces to decide which should be excluded or included according to the filter policy settings. If you have not split a composite USB device, View applies the filter policy settings to the entire device.

The device splitting policies are included in the View Agent Configuration ADM template file (`vdm_agent.adm`). For more information, see [“USB Settings in the View Agent Configuration ADM Template,”](#) on page 165.

Interaction of Agent-Enforced USB Settings

The following table shows the modifiers that specify how Horizon Client handles a View Agent filter policy setting for an agent-enforceable setting if an equivalent filter policy setting exists for Horizon Client.

Table 14-7. Filter Modifiers for Agent-Enforceable Settings

Modifier	Description
m (merge)	Horizon Client applies the View Agent filter policy setting in addition to the Horizon Client filter policy setting. In the case of Boolean, or true/false, settings, if the client policy is not set, the agent settings are used. If the client policy is set, the agent settings are ignored, except for the <code>Exclude All Devices</code> setting. If the <code>Exclude All Devices</code> policy is set on the agent side, the policy overrides the client setting.
o (override)	Horizon Client uses the View Agent filter policy setting instead of the Horizon Client filter policy setting.

For example, the following policy on the agent side overrides any include rules on the client side, and only device VID-0911_PID-149a will have an include rule applied:

```
IncludeVidPid: o:VID-0911_PID-149a
```

You can also use asterisks as wildcard characters; for example: `o:vid-0911_pid-****`

IMPORTANT If you configure the agent side without the **o** or **m** modifier, the configuration rule is considered invalid and will be ignored.

Interaction of Client-Interpreted USB Settings

The following table shows the modifiers that specify how Horizon Client handles a View Agent filter policy setting for a client-interpreted setting.

Table 14-8. Filter Modifiers for Client-Interpreted Settings

Modifier	Description
Default (d in the registry setting)	If a Horizon Client filter policy setting does not exist, Horizon Client uses the View Agent filter policy setting. If a Horizon Client filter policy setting exists, Horizon Client applies that policy setting and ignores the View Agent filter policy setting.
Override (o in the registry setting)	Horizon Client uses the View Agent filter policy setting instead of any equivalent Horizon Client filter policy setting.

View Agent does not apply the filter policy settings for client-interpreted settings on its side of the connection.

The following table shows examples of how Horizon Client processes the settings for `Allow Smart Cards` when you specify different filter modifiers.

Table 14-9. Examples of Applying Filter Modifiers to Client-Interpreted Settings

Allow Smart Cards Setting on View Agent	Allow Smart Cards Setting on Horizon Client	Effective Allow Smart Cards Policy Setting Used by Horizon Client
Disable – Default Client Setting (d: false in the registry setting)	true (Allow)	true (Allow)
Disable – Override Client Setting (o: false in the registry setting)	true (Allow)	false (Disable)

If you set the `Disable Remote Configuration Download` policy to **true**, Horizon Client ignores any filter policy settings that it receives from View Agent.

View Agent always applies the filter policy settings in agent-enforceable settings on its side of the connection even if you configure Horizon Client to use a different filter policy setting or disable Horizon Client from downloading filter policy settings from View Agent. Horizon Client does not report that View Agent is blocking a device from being forwarded.

Precedence of Settings

Horizon Client evaluates the filter policy settings according to an order of precedence. A filter policy setting that excludes a matching device from being redirected takes precedence over the equivalent filter policy setting that includes the device. If Horizon Client does not encounter a filter policy setting to exclude a device, Horizon Client allows the device to be redirected unless you have set the `Exclude All Devices` policy to **true**. However, if you have configured a filter policy setting on View Agent to exclude the device, the desktop blocks any attempt to redirect the device to it.

Horizon Client evaluates the filter policy settings in order of precedence, taking into account the Horizon Client settings and the View Agent settings together with the modifier values that you apply to the View Agent settings. The following list shows the order of precedence, with item 1 having the highest precedence.

- 1 Exclude Path
- 2 Include Path
- 3 Exclude Vid/Pid Device
- 4 Include Vid/Pid Device
- 5 Exclude Device Family
- 6 Include Device Family

- 7 Allow Audio Input Devices, Allow Audio Output Devices, Allow HIDBootable, Allow HID (Non Bootable and Not Mouse Keyboard), Allow Keyboard and Mouse Devices, Allow Smart Cards, and Allow Video Devices
- 8 Combined effective Exclude All Devices policy evaluated to exclude or include all USB devices

You can set Exclude Path and Include Path filter policy settings only for Horizon Client. The Allow filter policy settings that refer to separate device families have equal precedence.

If you configure a policy setting to exclude devices based on vendor and product ID values, Horizon Client excludes a device whose vendor and product ID values match this policy setting even though you might have configured an Allow policy setting for the family to which the device belongs.

The order of precedence for policy settings resolves conflicts between policy settings. If you configure Allow Smart Cards to allow the redirection of smart cards, any higher precedence exclusion policy setting overrides this policy. For example, you might have configured an Exclude Vid/Pid Device policy setting to exclude smart-card devices with matching path or vendor and product ID values, or you might have configured an Exclude Device Family policy setting that also excludes the smart-card device family entirely.

If you have configured any View Agent filter policy settings, View Agent evaluates and enforces the filter policy settings in the following order of precedence on the remote desktop, with item 1 having the highest precedence.

- 1 Exclude Vid/Pid Device
- 2 Include Vid/Pid Device
- 3 Exclude Device Family
- 4 Include Device Family
- 5 Agent-enforced Exclude All Devices policy set to exclude or include all USB devices

View Agent enforces this limited set of filter policy settings on its side of the connection.

By defining filter policy settings for View Agent, you can create a filtering policy for non-managed client computers. The feature also allows you to block devices from being forwarded from client computers, even if the filter policy settings for Horizon Client permit the redirection.

For example, if you configure a policy that permits Horizon Client to allow a device to be redirected, View Agent blocks the device if you configure a policy for View Agent to exclude the device.

Examples of Setting Policies to Filter USB Devices

The vendor IDs and product IDs used in these examples are examples only. For information about determining the vendor ID and product ID for a specify device, see [“Using Log Files for Troubleshooting and to Determine USB Device IDs,”](#) on page 157.

- On the client, exclude a particular device from being redirected:
Exclude Vid/Pid Device: Vid-0341_Pid-1a11
 - Block all storage devices from being redirected to this desktop pool. Use an agent-side setting:
Exclude Device Family: o:storage
 - For all users in a desktop pool, block audio and video devices to ensure that these devices will always be available for the Real-Time Audio-Video feature. Use an agent-side setting:
Exclude Device Family: o:video;audio
- Note that another strategy would be to exclude specific devices by vendor and product ID.

- On the client, block all devices from being redirected except one particular device:
 - Exclude All Devices: true
 - Include Vid/Pid Device: Vid-0123_Pid-abcd
- Exclude all devices made by a particular company because these devices cause problems for your end users. Use an agent-side setting:
 - Exclude Vid/Pid Device: o:Vid-0341_Pid-*
- On the client, include two specific devices but exclude all others:
 - Exclude All Devices: true
 - Include Vid/Pid Device: Vid-0123_Pid-abcd;Vid-1abc_Pid-0001

USB Device Families

You can specify a family when you are creating USB filtering rules for Horizon Client or View Agent.

NOTE Some devices do not report a device family.

Table 14-10. USB Device Families

Device Family Name	Description
audio	Any audio-input or audio-output device.
audio-in	Audio-input devices such as microphones.
audio-out	Audio-output devices such as loudspeakers and headphones.
bluetooth	Bluetooth-connected devices.
comm	Communications devices such as modems and wired networking adapters.
hid	Human interface devices excluding keyboards and pointing devices.
hid-bootable	Human interface devices that are available at boot time excluding keyboards and pointing devices.
imaging	Imaging devices such as scanners.
keyboard	Keyboard device.
mouse	Pointing device such as a mouse.
other	Family not specified.
pda	Personal digital assistants.
physical	Force feedback devices such as force feedback joysticks.
printer	Printing devices.
security	Security devices such as fingerprint readers.
smart-card	Smart-card devices.
storage	Mass storage devices such as flash drives and external hard disk drives.
unknown	Family not known.
vendor	Devices with vendor-specific functions.
video	Video-input devices.
wireless	Wireless networking adapters.
wusb	Wireless USB devices.

USB Settings in the View Agent Configuration ADM Template

You can define USB policy settings for both View Agent and Horizon Client. On connection, Horizon Client downloads the USB policy settings from View Agent and uses them in conjunction with the Horizon Client USB policy settings to decide which devices it will allow to be available for redirection from the client computer.

The View Agent Configuration ADM template file (`vdm_agent.adm`) contains policy settings related to the authentication and environmental components of View Agent, including USB redirection. The settings apply at the computer level. View Agent preferentially reads the settings from the GPO at the computer level, and otherwise from the registry at `HKLM\Software\Policies\VMware, Inc.\VMware VDM\Agent\USB`

Settings for Configuring USB Device Splitting

The following table describes each policy setting for splitting composite USB devices in the View Agent Configuration ADM template file. View Agent does not enforce these settings. View Agent passes the settings to Horizon Client for interpretation and enforcement according to whether you specify the merge (m) or override (o) modifier. Horizon Client uses the settings to decide whether to split composite USB devices into their component devices, and whether to exclude the component devices from being available for redirection. For a description of how View applies the policies for splitting composite USB devices, see [“Configuring Device Splitting Policy Settings for Composite USB Devices,”](#) on page 158.

Table 14-11. View Agent Configuration Template: Device-Splitting Settings

Setting	Properties
Allow Auto Device Splitting Property: AllowAutoDeviceSplitting	Allows the automatic splitting of composite USB devices. The default value is undefined, which equates to false .
Exclude Vid/Pid Device From Split Property: SplitExcludeVidPid	Excludes a composite USB device specified by vendor and product IDs from splitting. The format of the setting is <code>{m o}:vid-xxx1_pid-yyy2[;vid-xxx2_pid-yyy2]...</code> You must specify ID numbers in hexadecimal. You can use the wildcard character (*) in place of individual digits in an ID. For example: o:vid-0781_pid-55** The default value is undefined.
Split Vid/Pid Device Property: SplitVidPid	Treats the components of a composite USB device specified by vendor and product IDs as separate devices. The format of the setting is <code>{m o}:vid-xxx_pid-yyy(exintf:zz[;exintf:ww])</code> or <code>{m o}:vid-xxx_pid-yyy(exintf:zz[;exintf:ww)</code> You can use the <code>exintf</code> keyword to exclude components from redirection by specifying their interface number. You must specify ID numbers in hexadecimal, and interface numbers in decimal including any leading zero. You can use the wildcard character (*) in place of individual digits in an ID. For example: o:vid-0781_pid-554c(exintf:01;exintf:02) NOTE View does not automatically include the components that you have not explicitly excluded. You must specify a filter policy such as <code>Include Vid/Pid Device</code> to include those components. The default value is undefined.

View Agent-Enforced USB Settings

The following table describes each agent-enforced policy setting for USB in the View Agent Configuration ADM template file. View Agent uses the settings to decide if a USB device can be forwarded to the host machine. View Agent also passes the settings to Horizon Client for interpretation and enforcement according to whether you specify the merge (m) or override (o) modifier. Horizon Client uses the settings to decide if a USB device is available for redirection. As View Agent always enforces an agent-enforced policy setting that you specify, the effect might be to counteract the policy that you have set for Horizon Client. For a description of how View applies the policies for filtering USB devices, see [“Configuring Filter Policy Settings for USB Devices,”](#) on page 161.

Table 14-12. View Agent Configuration Template: Agent-Enforced Settings

Setting	Properties
Exclude All Devices Property: ExcludeAllDevices	<p>Excludes all USB devices from being forwarded. If set to true, you can use other policy settings to allow specific devices or families of devices to be forwarded. If set to false, you can use other policy settings to prevent specific devices or families of devices from being forwarded.</p> <p>If set to true and passed to Horizon Client, this setting always overrides the setting on Horizon Client. You cannot use the merge (m) or override (o) modifier with this setting.</p> <p>The default value is undefined, which equates to false.</p>
Exclude Device Family Property: ExcludeFamily	<p>Excludes families of devices from being forwarded. The format of the setting is {m o}:family_name_1[;family_name_2]...</p> <p>For example: o:bluetooth;smart-card</p> <p>If you have enabled automatic device splitting, View examines the device family of each interface of a composite USB device to decide which interfaces should be excluded. If you have disabled automatic device splitting, View examines the device family of the whole composite USB device.</p> <p>The default value is undefined.</p>
Exclude Vid/Pid Device Property: ExcludeVidPid	<p>Excludes devices with specified vendor and product IDs from being forwarded. The format of the setting is {m o}:vid-xxx1_pid-yyy2[;vid-xxx2_pid-yyy2]...</p> <p>You must specify ID numbers in hexadecimal. You can use the wildcard character (*) in place of individual digits in an ID.</p> <p>For example: m:vid-0781_pid-****;vid-0561_pid-554c</p> <p>The default value is undefined.</p>
Include Device Family Property: IncludeFamily	<p>Includes families of devices that can be forwarded. The format of the setting is {m o}:family_name_1[;family_name_2]...</p> <p>For example: m:storage</p> <p>The default value is undefined.</p>
Include Vid/Pid Device Property: IncludeVidPid	<p>Includes devices with specified vendor and product IDs that can be forwarded. The format of the setting is {m o}:vid-xxx1_pid-yyy2[;vid-xxx2_pid-yyy2]...</p> <p>You must specify ID numbers in hexadecimal. You can use the wildcard character (*) in place of individual digits in an ID.</p> <p>For example: o:vid-0561_pid-554c</p> <p>The default value is undefined.</p>

Client-Interpreted USB Settings

The following table describes each client-interpreted policy setting in the View Agent Configuration ADM template file. View Agent does not enforce these settings. View Agent passes the settings to Horizon Client for interpretation and enforcement. Horizon Client uses the settings to decide if a USB device is available for redirection.

Table 14-13. View Agent Configuration Template: Client-Interpreted Settings

Setting	Properties
Allow Audio Input Devices Property: AllowAudioIn	Allows audio input devices to be forwarded. The default value is undefined, which equates to true .
Allow Audio Output Devices Property: AllowAudioOut	Allows audio output devices to be forwarded. The default value is undefined, which equates to false .
Allow HIDBootable Property: AllowHIDBootable	Allows input devices other than keyboards or mice that are available at boot time (also known as hid-bootable devices) to be forwarded. The default value is undefined, which equates to true .
Allow Other Input Devices	Allows input devices other than hid-bootable devices or keyboards with integrated pointing devices to be forwarded. The default value is undefined.
Allow Keyboard and Mouse Devices Property: AllowKeyboardMouse	Allows keyboards with integrated pointing devices (such as a mouse, trackball, or touch pad) to be forwarded. The default value is undefined, which equates to false .
Allow Smart Cards Property: AllowSmartcard	Allows smart-card devices to be forwarded. The default value is undefined, which equates to false .
Allow Video Devices Property: AllowVideo	Allows video devices to be forwarded. The default value is undefined, which equates to true .

Troubleshooting USB Redirection Problems

Various problems can arise with USB redirection in Horizon Client.

Problem

USB redirection in Horizon Client fails to make local devices available on the remote desktop, or some devices do not appear to be available for redirection in Horizon Client.

Cause

The following are possible causes for USB redirection failing to function correctly or as expected.

- The device is a composite USB device and one of the devices it includes is blocked by default. For example, a dictation device that includes a mouse is blocked by default because mouse devices are blocked by default. To work around this problem, see “[Configuring Device Splitting Policy Settings for Composite USB Devices](#),” on page 158.
- USB redirection is not supported for Windows 2008 systems or for session-based RDS-hosted remote desktops.
- Webcams are not supported for redirection.
- The redirection of USB audio devices depends on the state of the network and is not reliable. Some devices require a high data throughput even when they are idle.
- USB redirection is not supported for boot devices. If you run Horizon Client on a Windows system that boots from a USB device, and you redirect this device to the remote desktop, the local operating system might become unresponsive or unusable. See <http://kb.vmware.com/kb/1021409>.
- By default, Horizon Client for Windows does not allow you to select keyboard, mouse, smart card and audio-out devices for redirection. See <http://kb.vmware.com/kb/1011600>.
- RDP does not support the redirection of USB HIDs for the console session, or of smart card readers. See <http://kb.vmware.com/kb/1011600>.

- Windows Mobile Device Center can prevent the redirection of USB devices for RDP sessions. See <http://kb.vmware.com/kb/1019205>.
- For some USB HIDs, you must configure the virtual machine to update the position of the mouse pointer. See <http://kb.vmware.com/kb/1022076>.
- Some audio devices might require changes to policy settings or to registry settings. See <http://kb.vmware.com/kb/1023868>.
- Network latency can cause slow device interaction or cause applications to appear frozen because they are designed to interact with local devices. Very large USB disk drives might take several minutes to appear in Windows Explorer.
- USB flash cards formatted with the FAT32 file system are slow to load. See <http://kb.vmware.com/kb/1022836>.
- A process or service on the local system opened the device before you connected to the remote desktop.
- A redirected USB device stops working if you reconnect a desktop session even if the desktop shows that the device is available.
- USB redirection is disabled in View Administrator.
- Missing or disabled USB redirection drivers on the guest.

Solution

- If available, use PCoIP instead of RDP as the desktop protocol.
- If a redirected device remains unavailable or stops working after a temporary disconnection, remove the device, plug it in again, and retry the redirection.
- In View Administrator, go to **Policies > Global Policies**, and verify that USB access is set to **Allow** under View Policies.
- Examine the log on the guest for entries of class `ws_vhub`, and the log on the client for entries of class `vmware-view-usbd`.

Entries with these classes are written to the logs if a user is not an administrator, or if the USB redirection drivers are not installed or are not working. For the location of these log files, see [“Using Log Files for Troubleshooting and to Determine USB Device IDs,”](#) on page 157.

- Open the Device Manager on the guest, expand Universal Serial Bus controllers, and reinstall the VMware View Virtual USB Host Controller and VMware View Virtual USB Hub drivers if these drivers are missing or re-enable them if they are disabled.

Reducing and Managing Storage Requirements

15

Deploying desktops on virtual machines that are managed by vCenter Server provides all the storage efficiencies that were previously available only for virtualized servers. Using View Composer increases the storage savings because all virtual machines in a pool share a virtual disk with a base image.

This chapter includes the following topics:

- [“Managing Storage with vSphere,”](#) on page 169
- [“Using Virtual SAN for High-Performance Storage and Policy-Based Management,”](#) on page 170
- [“Reducing Storage Requirements with View Composer,”](#) on page 173
- [“Storage Sizing for Linked-Clone Desktop Pools,”](#) on page 174
- [“Storage Overcommit for Linked-Clone Virtual Machines,”](#) on page 178
- [“Linked-Clone Data Disks,”](#) on page 180
- [“Storing Linked Clones on Local Datastores,”](#) on page 181
- [“Storing View Composer Replicas and Linked Clones on Separate Datastores,”](#) on page 182
- [“Configure View Storage Accelerator for Desktop Pools,”](#) on page 183
- [“Reclaim Disk Space on Linked-Clone Virtual Machines,”](#) on page 184
- [“Using View Composer Array Integration with Native NFS Snapshot Technology \(VAAI\),”](#) on page 186
- [“Set Blackout Times for ESXi Operations on View Virtual Machines,”](#) on page 187

Managing Storage with vSphere

vSphere lets you virtualize disk volumes and file systems so that you can manage and configure storage without having to consider where the data is physically stored.

Fibre Channel SAN arrays, iSCSI SAN arrays, and NAS arrays are widely used storage technologies supported by vSphere to meet different datacenter storage needs. The storage arrays are connected to and shared between groups of servers through storage area networks. This arrangement allows aggregation of the storage resources and provides more flexibility in provisioning them to virtual machines.

Compatible vSphere 4.1 or Later Features

With vSphere 4.1 or later, you can now also use the following features:

- vStorage thin provisioning, which lets you start out with as little disk space as necessary and grow the disk to add space later

- Tiered storage, which allows you to distribute virtual disks in the View environment across high-performance storage and lower-cost storage tiers, to maximize performance and cost savings
- Local storage on the ESXi host for the virtual machine swap files in the guest operating system

Compatible vSphere 5.0 and 5.1 or Later Features

With vSphere 5.0 or a later release, you can use the following features:

- With the View storage accelerator feature, you can configure ESXi hosts to cache virtual machine disk data.
Using this content-based read cache (CBRC) can reduce IOPS and improve performance during boot storms, when many machines start up and run anti-virus scans at the same time. Instead of reading the entire OS from the storage system over and over, a host can read common data blocks from cache.
- If remote desktops use the space-efficient disk format available with vSphere 5.1 and later, stale or deleted data within a guest operating system is automatically reclaimed with a wipe and shrink process.
- You can deploy a desktop pool on a cluster that contains up to 32 ESXi hosts, with certain restrictions.
Replica disks must be stored on VMFS5 or later datastores or NFS datastores. If you store replicas on a VMFS version earlier than VMFS5, a cluster can have at most eight hosts. OS disks and persistent disks can be stored on NFS or VMFS datastores.

Compatible vSphere 5.5 Update 1 or Later Features

With vSphere 5.5 Update 1 or a later release, you can use Virtual SAN, which virtualizes the local physical solid-state disks and hard disk drives available on ESXi hosts into a single datastore shared by all hosts in a cluster. Virtual SAN provides high-performance storage with policy-based management, so that you specify only one datastore when creating a desktop pool, and the various components, such as virtual machine files, replicas, user data, and operating system files, are placed on the appropriate solid-state drive (SSD) disks or direct-attached hard disks (HDDs).

Virtual SAN also lets you manage virtual machine storage and performance by using storage policy profiles. If the policy becomes noncompliant because of a host, disk, or network failure, or workload changes, Virtual SAN reconfigures the data of the affected virtual machines and optimizes the use of resources across the cluster. You can deploy a desktop pool on a cluster that contains up to 32 ESXi hosts.

NOTE Virtual SAN is compatible with the View storage accelerator feature but not with the space-efficient disk format feature, which reclaims disk space by wiping and shrinking disks.

Using Virtual SAN for High-Performance Storage and Policy-Based Management

VMware Virtual SAN is a software-defined storage tier, available with vSphere 5.5 Update 1 or a later release, that virtualizes the local physical storage disks available on a cluster of vSphere hosts. You specify only one datastore when creating a desktop pool, and the various components, such as virtual machine files, replicas, user data, and operating system files, are placed on the appropriate solid-state drive (SSD) disks or direct-attached hard disks (HDDs).

Virtual SAN implements a policy-based approach to storage management. When you use Virtual SAN, View defines virtual machine storage requirements, such as capacity, performance, and availability, in the form of default storage policy profiles, which you can modify. Storage is provisioned and automatically configured according to the assigned policies. You can use Virtual SAN for either linked-clone desktop pools or full-clone desktop pools.

Each virtual machine maintains its policy regardless of its physical location in the cluster. If the policy becomes noncompliant because of a host, disk, or network failure, or workload changes, Virtual SAN reconfigures the data of the affected virtual machines and load-balances to meet the policies of each virtual machine.

While supporting VMware features that require shared storage, such as HA, vMotion, and DRS, Virtual SAN eliminates the need for an external shared storage infrastructure and simplifies storage configuration and virtual machine provisioning activities.

Virtual SAN Workflow in View

- 1 Use vCenter Server 5.5 Update 1 or a later release to enable Virtual SAN. For more information, see the *vSphere Storage* document.
- 2 When creating a desktop pool in View Administrator, under **Storage Policy Management**, select **Use vSphere Virtual SAN**, and select the Virtual SAN datastore to use.

After you select **Use vSphere Virtual SAN**, only Virtual SAN datastores are displayed.

Default storage policy profiles are created according to the options you choose. For example, if you create a linked-clone, floating desktop pool, a replica disk profile and an operating system disk profile are automatically created. If you create a linked-clone, persistent desktop pool, a replica disk profile and a persistent disk profile are created. For all desktop pools, a profile is created for virtual machine files.

- 3 To move existing View Composer desktop pools from another type of datastore to a Virtual SAN datastore, in View Administrator, edit the pool to deselect the old datastore and select the Virtual SAN datastore instead, and use the Rebalance command .
- 4 (Optional) Use vCenter Server to modify the parameters of the storage policy profiles, which include things like the number of failures to tolerate and the amount of SSD read cache to reserve.
The names of the policies are OS_DISK (for operating system files), PERSISTENT_DISK (for user data files), REPLICATED_DISK (for replicas), and VM_HOME (for virtual machine files such as .vmx and .vmsn files). Changes to the policy are propagated to newly created virtual machines and to all existing virtual machines in the desktop pool.
- 5 Use vCenter Server to monitor the Virtual SAN cluster and the disks that participate in the datastore. For more information, see the *vSphere Storage* document and the *vSphere Monitoring and Performance* documentation.
- 6 (Optional) For View Composer linked-clone desktop pools, use the Refresh and Recompose commands as you normally would.

Requirements and Limitations

The Virtual SAN feature has the following limitations when used in a View deployment:

- This release does not support using the View space-efficient disk format feature, which reclaims disk space by wiping and shrinking disks.
- Virtual SAN does not support the View Composer Array Integration (VAAI) feature because Virtual SAN does not use NAS devices.

NOTE Virtual SAN is compatible with the View Storage Accelerator feature. Virtual SAN provides a caching layer on SSD disks, and the View Storage Accelerator feature provides a content-based cache that reduces IOPS and improves performance during boot storms.

The Virtual SAN feature has the following requirements:

- vSphere 5.5 Update 1 or a later release.

- Appropriate hardware. For example, VMware recommends a 10GB NIC and at least one SSD and one HDD for each capacity-contributing node. For specifics, see the [VMware Compatibility Guide](#).
- A cluster of at least three ESXi hosts. You need enough ESXi hosts to accommodate your setup. For more information, see the *vSphere Configuration Maximums* document, available from <https://www.vmware.com/support/pubs/vsphere-esxi-vcenter-server-pubs.html>.
- SSD capacity that is at least 10 percent of HDD capacity.
- Enough HDDs to accommodate your setup. Do not exceed more than 75% utilization on a magnetic disk.

For more information about Virtual SAN requirements, see "Working with Virtual SAN" in the *vSphere Storage* document.

Default Storage Policy Profiles for Virtual SAN Datastores

When you use Virtual SAN, View defines virtual machine storage requirements, such as capacity, performance, and availability, in the form of default storage policy profiles, which you can modify. Storage is provisioned and automatically configured according to the assigned policies.

The default policies that are created during desktop pool creation depend on the type of pool you create. The names of the policies are OS_DISK (for operating system files), PERSISTENT_DISK (for user data files), REPLICATED_DISK (for replicas), and VM_HOME (for virtual machine files such as .vmx and .vmsn files). For example, a REPLICATED_DISK policy is created only for linked-clone pools. Changes to the policy are propagated to newly created virtual machines and to all existing virtual machines in the desktop pool.

Virtual SAN offers a storage policy framework so that you can control the behavior of various virtual machine objects that reside on the Virtual SAN datastore. An example of an object in Virtual SAN is a virtual disk (VMDK) file, and there are four characteristics of each object that are controlled through policy:

- **Stripes:** Number of stripes of data. The number of disk stripes affects how many magnetic disks you have (HDDs).
- **Resiliency:** Number of failures to tolerate. The number of host failures to tolerate depends, of course, on the number of hosts you have.
- **Storage Provisioning:** Thick or Thin.
- **Cache Reservation:** Read-cache reservation.

The stripes and cache reservation settings are used to control performance. The resiliency setting controls availability. The storage provisioning setting controls capacity. These settings, taken together, affect how many vSphere hosts and magnetic disks are required.

For example, if you set the number of disk stripes per object to 2, Virtual SAN will stripe the object across at least 2 HDDs. In conjunction with this setting, if you set the number of host failures to tolerate to 1, Virtual SAN will create an additional copy for resiliency and therefore require 4 HDDs. Additionally, setting the number of host failures to tolerate to 1 requires a minimum of 3 ESXi hosts, 2 for resiliency and the third to break the tie in case of partitioning.

NOTE If you inadvertently attempt to use settings that contradict each other, when you attempt to apply the settings, the operation will fail, and an error message will tell you, for example, that you do not have enough hosts.

There is no requirement for any user action associated with these default policies. Policies are created for both linked-clone desktop pools and full-clone desktop pools.

You can use either the vSphere Command-Line Interface (`esxccli`) or the vSphere Web Client to change the default storage policy profiles. Each virtual machine maintains its policy regardless of its physical location in the cluster. If the policy becomes noncompliant because of a host, disk, or network failure, or workload changes, Virtual SAN reconfigures the data of the affected virtual machines and load-balances to meet the policies of each virtual machine.

Reducing Storage Requirements with View Composer

Because View Composer creates desktop images that share virtual disks with a base image, you can reduce the required storage capacity by 50 to 90 percent.

View Composer uses a base image, or parent virtual machine, and creates a pool of up to 2,000 linked-clone virtual machines. Each linked clone acts like an independent desktop, with a unique host name and IP address, yet the linked clone requires significantly less storage.

Replica and Linked Clones on the Same Datastore

When you create a linked-clone desktop pool, a full clone is first made from the parent virtual machine. The full clone, or replica, and the clones linked to it can be placed on the same data store, or LUN (logical unit number). If necessary, you can use the rebalance feature to move the replica and linked clones from one LUN to another or to move linked clones to a Virtual SAN datastore or from a Virtual SAN datastore to a LUN.

Replica and Linked Clones on Different Datastores

Alternatively, you can place View Composer replicas and linked clones on separate datastores with different performance characteristics. For example, you can store the replica virtual machines on a solid-state drive (SSD). Solid-state drives have low storage capacity and high read performance, typically supporting tens of thousands of I/Os per second (IOPS). You can store linked clones on traditional, spinning media-backed datastores. These disks provide lower performance, but are less expensive and provide higher storage capacity, which makes them suited for storing the many linked clones in a large pool. Tiered storage configurations can be used to cost-effectively handle intensive I/O scenarios such as simultaneous rebooting of many virtual machines or running scheduled antivirus scans.

For more information, see the best-practices guide called *Storage Considerations for VMware View*.

If you use Virtual SAN datastores, you cannot manually select different datastores for replicas and linked clones. Because Virtual SAN automatically places objects on the appropriate type of disk and caches of all I/O operations, there is no need to use replica tiering for Virtual SAN datastores.

Disposable Disks for Paging and Temp Files

When you create a linked-clone pool, you can also optionally configure a separate, disposable virtual disk to store the guest operating system's paging and temp files that are generated during user sessions. When the virtual machine is powered off, the disposable disk is deleted. Using disposable disks can save storage space by slowing the growth of linked clones and reducing the space used by powered off virtual machines.

Persistent Disks for Dedicated Desktops

When you create dedicated-assignment desktop pools, View Composer can also optionally create a separate persistent virtual disk for each virtual desktop. The end user's Windows profile and application data are saved on the persistent disk. When a linked clone is refreshed, recomposed, or rebalanced, the contents of the persistent virtual disk are preserved. VMware recommends that you keep View Composer persistent disks on a separate datastore. You can then back up the whole LUN that holds persistent disks.

Virtual SAN Datastores That Aggregate Local Storage Disks from a vSphere Cluster

Virtual SAN virtualizes the local physical storage disks available on ESXi hosts into a single datastore shared by all hosts in a vSphere cluster. A Virtual SAN datastore consists of solid-state drive (SSD) disks and hard disk drives (HDDs), also called data disks. SSD disks are used for read caching and write buffering. Data disks are used for persistent storage. This strategy provides high-performance storage with automatic caching, so that you specify only one datastore when creating a desktop pool, and the various components, such as virtual machine files, replicas, user data, and operating system files, are placed on the appropriate SSD or data disks.

NOTE The Virtual SAN feature requires vSphere 5.5 Update 1 or a later release, and requires the appropriate hardware. See the [VMware Compatibility Guide](#).

When you use Virtual SAN, View defines virtual machine storage requirements, such as capacity, performance, and availability, in the form of default storage policy profiles, which you can modify. Virtual SAN lays out the virtual disk across the logical datastore to meet the specified requirements. Virtual SAN also monitors and reports on the policy compliance during the life cycle of the virtual machine. If the policy becomes noncompliant because of a host, disk, or network failure, or workload changes, Virtual SAN reconfigures the data of the affected virtual machines and optimizes the use of resources across the cluster.

NOTE When you create a linked-clone desktop pool, a full clone is first made from the parent virtual machine. From this full clone, or replica, linked clones are created. If you use a Virtual SAN datastore, by default an extra copy of the replica and linked clones are created according to the availability policy.

Storage Sizing for Linked-Clone Desktop Pools

View provides high-level guidelines that can help you determine how much storage a linked-clone desktop pool requires. A table in the Add Desktop Pool wizard shows a general estimate of the linked-clone disks' storage requirements when the pool is created and as the linked clones grow over time.

The storage-sizing table also displays the free space on the datastores that you select for storing OS disks, View Composer persistent disks, and replicas. You can decide which datastores to use by comparing the actual free space with the estimated requirements for the linked-clone disks.

The formulas that View uses can only provide a general estimate of storage use. Your linked clones' actual storage growth depends on many factors:

- Amount of memory assigned to the parent virtual machine
- Frequency of refresh operations
- Size of the guest operating system's paging file
- Whether you redirect paging and temp files to a separate disk
- Whether you configure separate View Composer persistent disks
- Workload on the linked-clone machines, determined primarily by the types of applications that users run in the guest operating system

NOTE In a deployment that includes hundreds or thousands of linked clones, configure your linked-clone pools so that particular sets of datastores are dedicated to particular ESXi clusters. Do not configure pools randomly across all the datastores so that most or all ESXi hosts must access most or all LUNs.

When too many ESXi hosts attempt to write to linked-clone OS disks on a particular LUN, contention problems can occur, degrading performance and interfering with scalability. For more information about datastore planning in large deployments, see the *View Architecture Planning* document.

Sizing Guidelines for Linked-Clone Pools

When you create or edit a linked-clone desktop pool, the Select Linked Clone Datastores page displays a table that provides storage-sizing guidelines. The table can help you to decide which datastores to select for the linked-clone disks. The guidelines calculate space needed for new linked clones.

Sizing Table for Linked-Clone Disks

Table 15-1 shows an example of storage-sizing recommendations that might be displayed for a pool of 10 virtual machines if the parent virtual machine has 1GB of memory and a 10GB replica. In this example, different datastores are selected for OS disks and View Composer persistent disks.

Table 15-1. Example Sizing Table for Linked-Clone Disks

Data Type	Selected Free Space (GB)	Min Recommended (GB)	50% Utilization (GB)	Max Recommended (GB)
OS disks	184.23	40.00	80.00	130.00
Persistent disks	28.56	4.00	10.00	20.00

The **Selected Free Space** column shows the total available space on all of the datastores that you selected for a disk type such as OS disks.

The **Min Recommended** column shows the minimum amount of recommended storage for a pool.

The **50% Utilization** column shows the recommended storage when the linked-clone disks grow to 50% of the parent virtual machine.

The **Max Recommended** column shows the recommended storage when the linked-clone disks approach the full size of the parent virtual machine.

If you store OS disks and persistent disks on the same datastore, View calculates the storage requirements of both disk types. The **Data Type** is shown as **Linked clones** instead of a particular disk type.

If you store View Composer replicas on a separate datastore, the table also shows storage recommendations for the replicas and adjusts the recommendations for OS disks.

Sizing Guidelines

The table provides general guidelines. Your storage calculations must account for additional factors that can affect actual storage growth in the linked-clone pool.

For OS disks, your sizing estimates depend on how frequently you refresh and recompose the pool.

If you refresh your linked-clone pool between once a day and once a week, make sure that the **Selected Free Space** can accommodate storage use between the **Min Recommended** and **50% Utilization** estimates.

If you rarely refresh or recompose the pool, the linked-clone disks continue to grow. Make sure that the **Selected Free Space** can accommodate storage use between the **50 % Utilization** and **Max Recommended** estimates.

For persistent disks, your sizing estimates depend on the amount of Windows profile data that users generate on their desktops. Refresh and recompose operations do not affect persistent disks.

Sizing Guidelines When You Edit an Existing Desktop Pool

View estimates the storage space that is needed for new linked clones. When you create a desktop pool, the sizing guidelines encompass the entire pool. When you edit an existing desktop pool, the guidelines encompass only the new linked clones that you add to the pool.

For example, if you add 100 linked clones to a desktop pool and select a new datastore, View estimates space requirements for the 100 new clones.

If you select a new datastore but keep the desktop pool the same size, or reduce the number of linked clones, the sizing guidelines show as 0. The values of 0 reflect that no new clones must be created on the selected datastore. Space requirements for the existing clones are already accounted for.

How View Calculates the Minimum Sizing Recommendations

To arrive at a minimum recommendation for OS disks, View estimates that each clone consumes twice its memory size when it is first created and started up. If no memory is reserved for a clone, an ESXi swap file is created for a clone as soon as it is powered on. The size of the guest operating system's paging file also affects the growth of a clone's OS disk.

In the minimum recommendation for OS disks, View also includes space for two replicas on each datastore. View Composer creates one replica when a pool is created. When the pool is recomposed for the first time, View Composer creates a second replica on the datastore, anchors the linked clones to the new replica, and deletes the first replica if no other clones are using original snapshot. The datastore must have the capacity to store two replicas during the recompose operation.

By default, replicas use vSphere thin provisioning, but to keep the guidelines simple, View accounts for two replicas that use the same space as the parent virtual machine.

To arrive at a minimum recommendation for persistent disks, View calculates 20% of the disk size that you specify on the **View Composer Disks** page of the Add Desktop Pool wizard.

NOTE The calculations for persistent disks are based on static threshold values, in gigabytes. For example, if you specify a persistent disk size of any value between 1024MB and 2047MB, View calculates the persistent disk size as 1GB. If you specify a disk size of 2048MB, View calculates the disk size as 2GB.

To arrive at a recommendation for storing replicas on a separate datastore, View allows space for two replicas on the datastore. The same value is calculated for minimum and maximum usage.

For details, see [“Sizing Formulas for Linked-Clone Pools,”](#) on page 176.

Sizing Guidelines and Storage Overcommit

After you estimate storage requirements, select datastores, and deploy the pool, View provisions linked-clone virtual machines on different datastores based on the free space and the existing clones on each datastore.

Based on the storage-overcommit option that you select on the Select Linked Clone Datastores page in the Add Desktop Pool wizard, View stops provisioning new clones and reserves free space for the existing clones. This behavior ensures that a growth buffer exists for each machine in the datastore.

If you select an aggressive storage-overcommit level, the estimated storage requirements might exceed the capacity shown in the **Selected Free Space** column. The storage-overcommit level affects how many virtual machines that View actually creates on a datastore.

For details, see [“Set the Storage Overcommit Level for Linked-Clone Virtual Machines,”](#) on page 179.

Sizing Formulas for Linked-Clone Pools

Storage-sizing formulas can help you estimate the size of linked-clone disks relative to the free space on the datastores that you select for OS disks, View Composer persistent disks, and replicas.

Storage Sizing Formulas

[Table 15-2](#) shows the formulas that calculate the estimated sizes of linked-clone disks when you create a pool and as the linked-clone machines grow over time. These formulas include the space for replica disks that are stored with the clones on the datastore.

If you edit an existing pool or store replicas on a separate datastore, View uses a different sizing formula. See [“Sizing Formulas for Creating Linked Clones When You Edit a Pool or Store Replicas on a Separate Datastore,”](#) on page 177.

Table 15-2. Storage Sizing Formulas for Linked-Clone Disks on Selected Datastores

Data Type	Selected Free Space (GB)	Min Recommended (GB)	50% Utilization (GB)	Max Recommended (GB)
OS disks	Free space on the selected datastores	Number of VMs * (2 * memory of VM) + (2 * replica disk)	Number of VMs * (50% of replica disk + memory of VM) + (2 * replica disk)	Number of VMs * (100% of replica disk + memory of VM) + (2 * replica disk)
Persistent disks	Free space on the selected datastores	Number of VMs * 20% of persistent disk	Number of VMs * 50% of persistent disk	Number of VMs * 100% of persistent disk

Example of a Storage Sizing Estimate

In this example, the parent virtual machine is configured with 1GB of memory. The parent virtual machine's disk size is 10GB. A linked-clone pool is created with 10 machines. Persistent disks are configured as 2048MB in size.

The OS disks are configured on a datastore that currently has 184.23GB of available space. The persistent disks are configured on a different datastore with 28.56GB of available space.

[Table 15-3](#) shows how the sizing formulas calculate estimated storage requirements for the sample linked-clone desktop pool.

Table 15-3. Example of a Sizing Estimate for Linked-Clone Disks Deployed on Selected Datastores

Data Type	Selected Free Space (GB)	Min Recommended (GB)	50% Utilization (GB)	Max Recommended (GB)
OS disks	184.23	10 * (2*1GB) + (2*10GB) = 40.00	10 * (50% of 10GB + 1GB) + (2*10GB) = 80.00	10 * (100% of 10GB + 1GB) + (2*10GB) = 130.00
Persistent disks	28.56	10 * (20% of 2GB) = 4.00	10 * (50% of 2GB) = 10.00	10 * (100% of 2GB) = 20.00

Sizing Formulas for Creating Linked Clones When You Edit a Pool or Store Replicas on a Separate Datastore

View calculates different sizing formulas when you edit an existing linked-clone desktop pool, or store replicas on a separate datastore, than when you first create a pool.

If you edit an existing pool and select datastores for the pool, View Composer creates new clones on the selected datastores. The new clones are anchored to the existing snapshot and use the existing replica disk. No new replicas are created.

View estimates the sizing requirements of new clones that are added to the desktop pool. View does not include the existing clones in the calculation.

If you store replicas on a separate datastore, the other selected datastores are dedicated to linked-clone disks.

In these cases, View does not include space for replicas when it calculates storage recommendations for linked-clone disks.

[Table 15-4](#) shows the formulas that calculate the estimated sizes of linked-clone disks when you edit a pool or store replicas on a separate datastore.

Table 15-4. Storage Sizing Formulas for Linked-Clone Disks When You Edit a Pool or Store Replicas on a Separate Datastore

Data Type	Selected Free Space (GB)	Min Recommended (GB)	50% Utilization (GB)	Max Recommended (GB)
OS disks	Free space on the selected datastores	Number of new VMs * (2 * memory of VM)	Number of new VMs * (50% of replica disk + memory of VM)	Number of new VMs * (100% of replica disk + memory of VM)
Persistent disks	Free space on the selected datastores	Number of new VMs * 20% of persistent disk	Number of new VMs * 50% of persistent disk	Number of new VMs * 100% of persistent disk

Example of a Storage Sizing Estimate When You Edit a Pool or Store Replicas on a Separate Datastore

In this example, the parent virtual machine is configured with 1GB of memory. The parent virtual machine's disk size is 10GB. A linked-clone pool is created with 10 machines. Persistent disks are configured as 2048MB in size.

The OS disks are configured on a datastore that currently has 184.23GB of available space. The persistent disks are configured on a different datastore with 28.56GB of available space.

Table 15-5 shows how the sizing formulas calculate estimated storage requirements for the sample linked-clone pool.

Table 15-5. Example of a Sizing Estimate for Linked-Clone Disks When You Edit a Pool or Store Replicas on a Separate Datastore

Data Type	Selected Free Space (GB)	Min Recommended (GB)	50% Utilization (GB)	Max Recommended (GB)
OS disks	184.23	10 * (2*1GB) = 20.00	10 * (50% of 10GB + 1GB) = 60.00	10 * (100% of 10GB + 1GB) = 110.00
Persistent disks	28.56	10 * (20% of 2GB) = 4.00	10 * (50% of 2GB) = 10.00	10 * (100% of 2GB) = 20.00

Storage Overcommit for Linked-Clone Virtual Machines

With the storage overcommit feature, you can reduce storage costs by placing more linked-clone virtual machines on a datastore than is possible with full virtual machines. The linked clones can use a logical storage space several times greater than the physical capacity of the datastore.

This feature helps you choose a storage level that lets you overcommit the datastore's capacity and sets a limit on the number of linked clones that View creates. You can avoid either wasting storage by provisioning too conservatively or risking that the linked clones will run out of disk space and cause their desktop applications to fail.

For example, you can create at most ten full virtual machines on a 100GB datastore, if each virtual machine is 10GB. When you create linked clones from a 10GB parent virtual machine, each clone is a fraction of that size.

If you set a conservative overcommit level, View allows the clones to use four times the physical size of the datastore, measuring each clone as if it were the size of the parent virtual machine. On a 100GB datastore, with a 10GB parent, View provisions approximately 40 linked clones. View does not provision more clones, even if the datastore has free space. This limit keeps a growth buffer for the existing clones.

Table 15-6 shows the storage overcommit levels you can set.

Table 15-6. Storage Overcommit Levels

Option	Storage Overcommit Level
None	Storage is not overcommitted.
Conservative	4 times the size of the datastore. This is the default level.
Moderate	7 times the size of the datastore.
Aggressive	15 times the size of the datastore.

Storage overcommit levels provide a high-level guide for determining storage capacity. To determine the best level, monitor the growth of linked clones in your environment.

Set an aggressive level if your OS disks will never grow to their maximum possible size. An aggressive overcommit level demands attention. To make sure that the linked clones do not run out of disk space, you can periodically refresh or rebalance the desktop pool and reduce the linked clones' OS data to its original size.

For example, it would make sense to set an aggressive overcommit level for a floating-assignment desktop pool in which the virtual machines are set to delete or refresh after logoff.

You can vary storage overcommit levels among different types of datastores to address the different levels of throughput in each datastore. For example, a NAS datastore can have a different setting than a SAN datastore.

Set the Storage Overcommit Level for Linked-Clone Virtual Machines

You can control how aggressively View creates linked-clone virtual machines on a datastore by using the storage overcommit feature. This feature lets you create linked clones that have a total logical size larger than the physical storage limit of the datastore.

This feature works only with linked-clone pools.

The storage overcommit level calculates the amount of storage greater than the physical size of the datastore that the clones would use if each clone were a full virtual machine. For details, see [“Storage Overcommit for Linked-Clone Virtual Machines,”](#) on page 178.

Procedure

- 1 In View Administrator, select **Catalog > Desktop Pools**.
- 2 When you create a new desktop pool or edit an existing pool, navigate to the vCenter Settings page.

Option	Action
New desktop pool	<ol style="list-style-type: none"> a Click Add. b Proceed through the Add Desktop Pool wizard until the vCenter Settings page appears.
Existing desktop pool	<ol style="list-style-type: none"> a Select the linked-clone pool and click Edit. b Click the vCenter Settings tab.

- 3 On the vCenter Settings page, click **Browse** next to **Datastores**.
- 4 Select the datastore on the Select Linked Clone Datastores page.

A drop-down menu appears in the Storage Overcommit column for the selected datastore.

- 5 Select the storage overcommit level from the drop-down menu.

Option	Description
None	Storage is not overcommitted.
Conservative	4 times the size of the datastore. This is the default level.

Option	Description
Moderate	7 times the size of the datastore.
Aggressive	15 times the size of the datastore.
Unbounded	View does not limit the number of linked-clone machines that it creates based on the physical capacity of the datastore. Select this level only if you are certain that the datastore has enough storage capacity to accommodate all of the machines and their future growth.

6 Click OK.

Linked-Clone Data Disks

View Composer creates more than one data disk to store the components of a linked-clone virtual machine.

OS Disk

View Composer creates an OS disk for each linked clone. This disk stores the system data that the clone needs to remain linked to the base image and to function as a unique virtual machine.

QuickPrep Configuration-Data Disk

View Composer creates a second disk with the OS disk. The second disk stores QuickPrep configuration data and other OS-related data that must be preserved during refresh and recompose operations. This disk is small, typically about 20MB. This disk is created whether you use QuickPrep or Sysprep to customize the virtual machine.

If you configure separate View Composer persistent disks to store user profiles, three disks are associated with each linked clone: the OS disk, the second virtual machine disk, and the View Composer persistent disk.

The second virtual machine disk is stored on the same datastore as the OS disk. You cannot configure this disk.

View Composer Persistent Disk

In a dedicated-assignment pool, you can configure separate View Composer persistent disks to store Windows user-profile data. This disk is optional.

Separate persistent disks let you preserve user data and settings. View Composer refresh, recompose, and rebalance operations do not affect persistent disks. You can detach a persistent disk from a linked clone and attach it to another linked clone.

If you do not configure separate persistent disks, the Windows profile is stored in the OS disk. User data and settings are removed during refresh, recompose, and rebalance operations.

You can store persistent disks on the same datastore as the OS disk or on a different datastore.

Disposable-Data Disk

When you create a linked-clone pool, you can configure a separate, nonpersistent disk to store the guest OS's paging and temp files that are generated during user sessions. You must specify the disk size in megabytes.

This disk is optional.

When the linked clone is powered off, View replaces the disposable-data disk with a copy of the original disk that View Composer created with the linked-clone pool. Linked clones can increase in size as users interact with their desktops. Using disposable-data disks can save storage space by slowing the growth of linked clones.

The disposable-data disk is stored on the same datastore as the OS disk.

Storing Linked Clones on Local Datastores

Linked-clone virtual machines can be stored on local datastores, which are internal spare disks on ESXi hosts. Local storage offers advantages such as inexpensive hardware, fast virtual-machine provisioning, high performance power operations, and simple management. However, using local storage limits the vSphere infrastructure configuration options that are available to you. Using local storage is beneficial in certain View environments but not appropriate in others.

NOTE The limitations described in this topic do not apply to Virtual SAN datastores, which also use local storage disks but require specific hardware.

Using local datastores is most likely to work well if the View desktops in your environment are stateless. For example, you might use local datastores if you deploy stateless kiosks or classroom and training stations.

Consider using local datastores if your virtual machines have floating assignments, are not dedicated to individual end users, do not require persistent disks for user data, and can be deleted or refreshed at regular intervals such as on user logoff. This approach lets you control the disk usage on each local datastore without having to move or load-balance the virtual machines across datastores.

However, you must consider the restrictions that using local datastores imposes on your View desktop deployment:

- You cannot use VMotion to manage volumes.
- You cannot load-balance virtual machines across a resource pool. For example, you cannot use the View Composer rebalance operation with linked-clones that are stored on local datastores.
- You cannot use VMware High Availability.
- You cannot use the vSphere Distributed Resource Scheduler (DRS).
- You cannot store a View Composer replica and linked clones on separate datastores if the replica is on a local datastore.

When you store linked clones on local datastores, VMware strongly recommends that you store the replica on the same volume as the linked clones. Although it is possible to store linked clones on local datastores and the replica on a shared datastore if all ESXi hosts in the cluster can access the replica, VMware does not recommend this configuration.

- If you select local spinning-disk drives, performance might not match that of a commercially available storage array. Local spinning-disk drives and a storage array might have similar capacity, but local spinning-disk drives do not have the same throughput as a storage array. Throughput increases as the number of spindles grows.

If you select direct attached solid-state disks (SSDs), performance is likely to exceed that of many storage arrays.

You can store linked clones on a local datastore without constraints if you configure the desktop pool on a single ESXi host or a cluster that contains a single ESXi host. However, using a single ESXi host limits the size of the desktop pool that you can configure.

To configure a large desktop pool, you must select a cluster that contains multiple ESXi hosts with the collective capacity to support a large number of virtual machines.

If you intend to take advantage of the benefits of local storage, you must carefully consider the consequences of not having VMotion, HA, DRS, and other features available. If you manage local disk usage by controlling the number and disk growth of the virtual machines, if you use floating assignments and perform regular refresh and delete operations, you can successfully deploy linked clones to local datastores.

Storing View Composer Replicas and Linked Clones on Separate Datastores

You can place View Composer replicas and linked clones on separate datastores with different performance characteristics. This flexible configuration can speed up intensive operations such as provisioning many linked clones at once or running antivirus scans.

For example, you can store the replica virtual machines on a solid-state disk-backed datastore. Solid-state disks have low storage capacity and high read performance, typically supporting 20,000 I/Os per second (IOPS). View Composer creates only one replica for each View Composer base-image snapshot on each ESXi cluster, so replicas do not require much storage space. A solid-state disk can improve the speed at which ESXi reads a replica's OS disk when a task is performed concurrently on many linked clones.

You can store linked clones on traditional, spinning media-backed datastores. These disks provide lower performance, typically supporting 200 IOPS. They are cheap and provide high storage capacity, which makes them suited for storing the many linked clones in a large pool. ESXi does not need to perform intensive, simultaneous read operations on a linked clone.

Configuring replicas and linked clones in this way can reduce the impact of I/O storms that occur when many linked clones are created at once. For example, if you deploy a floating-assignment pool with a delete-machine-on-logoff policy, and your users start work at the same time, View must concurrently provision new machines for them.

IMPORTANT This feature is designed for specific storage configurations provided by vendors who offer high-performance disk solutions. Do not store replicas on a separate datastore if your storage hardware does not support high-read performance.

You must follow certain requirements when you store the replica and linked clones in a pool on separate datastores:

- You can specify only one separate replica datastore for a pool.
- If a replica datastore is shared, it must be accessible from all ESXi hosts in the cluster.
- If the linked-clone datastores are shared, the replica datastore must be shared. The replica cannot reside on a local datastore.

If the linked-clone datastores are local, VMware strongly recommends that you store the replica on the same volume as the linked clones. Although it is possible to store linked clones on local datastores and the replica on a shared datastore if all ESXi hosts in the cluster can access the replica, VMware does not recommend this configuration.

NOTE This limitation does not apply if you use Virtual SAN datastores, which aggregate local storage disks across all ESXi hosts in the cluster. With Virtual SAN datastores, the storage is both local and shared.

Availability Considerations for Storing Replicas on a Separate Datastore or Shared Datastores

You can store View Composer replicas on a separate datastore or on the same datastores as linked-clone virtual machines. These configurations affect the availability of the pool in different ways.

When you store replicas on the same datastores as linked clones, to enhance availability, View Composer creates a separate replica on each datastore. If a datastore becomes unavailable, only the linked clones on that datastore are affected. Linked clones on other datastores continue to run.

When you store replicas on a separate datastore, all linked clones in the pool are anchored to the replicas on that datastore. If the datastore becomes unavailable, the entire pool is unavailable.

To enhance the availability of the linked-clone virtual machines, you can configure a high-availability solution for the datastore on which you store the replicas.

Configure View Storage Accelerator for Desktop Pools

You can configure desktop pools to enable ESXi hosts to cache virtual machine disk data. This feature, called View Storage Accelerator, uses the Content Based Read Cache (CBRC) feature in ESXi hosts. View Storage Accelerator can reduce IOPS and improve performance during boot storms, when many machines start up or run anti-virus scans at once. The feature is also beneficial when administrators or users load applications or data frequently. To use this feature, you must make sure that View Storage Accelerator is enabled for individual desktop pools.

View Storage Accelerator is enabled for a pool by default. You can enable or disable View Storage Accelerator when you create or edit a pool.

You can enable View Storage Accelerator on pools that contain linked clones and pools that contain full virtual machines.

Native NFS snapshot technology (VAAI) is not supported in pools that are enabled for View Storage Accelerator.

View Storage Accelerator is now qualified to work in configurations that use View replica tiering, in which replicas are stored on a separate datastore than linked clones. Although the performance benefits of using View Storage Accelerator with View replica tiering are not materially significant, certain capacity-related benefits might be realized by storing the replicas on a separate datastore. Hence, this combination is tested and supported.

When a virtual machine is created, View indexes the contents of each virtual disk file. The indexes are stored in a virtual machine digest file. At runtime, the ESXi host reads the digest files and caches common blocks of data in memory. To keep the ESXi host cache up to date, View regenerates the digest files at specified intervals and when the virtual machine is recomposed. You can modify the regeneration interval.

Prerequisites

- Verify that your vCenter Server and ESXi hosts are version 5.0 or later.
In an ESXi cluster, verify that all the hosts are version 5.0 or later.
- Verify that the vCenter Server user was assigned the **Global > Act as vCenter Server** privilege in vCenter Server. See the topics in the *View Installation* documentation that describe View and View Composer privileges required for the vCenter Server user.
- Verify that View Storage Accelerator is enabled in vCenter Server. See the *View Administration* document.

Procedure

- 1 In View Administrator, display the Advanced Storage Options page.

Option	Description
New desktop pool	Start the Add Desktop Pool wizard to begin creating an automated desktop pool. Follow the wizard configuration prompts until you reach the Advanced Storage page.
Existing desktop pool	Select the existing pool, click Edit , and click the Advanced Storage tab. In an existing pool, View Storage Accelerator digest files are not configured for virtual machines until they are powered off.

- 2 To enable View Storage Accelerator for the pool, make sure that the **Use View Storage Accelerator** check box is selected.

This setting is selected by default. To disable the setting, uncheck the **Use View Storage Accelerator** box.

- 3 (Optional) Specify which disk types to cache by selecting **OS disks** only or **OS and persistent disks** from the **Disk Types** menu.

OS disks is selected by default.

If you configure View Storage Accelerator for full virtual machines, you cannot select a disk type. View Storage Accelerator is performed on the whole virtual machine.

- 4 (Optional) In the **Regenerate storage accelerator after** text box, specify the interval, in days, after which the regeneration for View Storage Accelerator digest files take place.

The default regeneration interval is seven days.

What to do next

You can configure blackout days and times during which disk space reclamation and View Storage Accelerator regeneration do not take place. See [“Set Blackout Times for ESXi Operations on View Virtual Machines,”](#) on page 187.

Reclaim Disk Space on Linked-Clone Virtual Machines

In vSphere 5.1 and later, you can configure the disk space reclamation feature for linked-clone desktop pools. Starting in vSphere 5.1, View creates linked-clone virtual machines in an efficient disk format that allows ESXi hosts to reclaim unused disk space on the linked clones, reducing the total storage space required for linked clones.

As users interact with their desktops, the linked clones' OS disks grow and can eventually use almost as much disk space as full-clone virtual machines. Disk space reclamation reduces the size of the OS disks without requiring you to refresh or recompose the linked clones. Space can be reclaimed while the virtual machines are powered on and users are interacting with their desktops.

In View Administrator, you cannot directly initiate disk space reclamation for a pool. You determine when View initiates disk space reclamation by specifying the minimum amount of unused disk space that must accumulate on a linked-clone OS disk to trigger the operation. When the unused disk space exceeds the specified threshold, View directs the ESXi host to reclaim space on that OS disk. View applies the threshold to each virtual machine in the pool.

You can use the `vdadmin -M` option to initiate disk space reclamation on a particular virtual machine for demonstration or troubleshooting purposes. See the *VMware Horizon View Administration* document.

You can configure disk space reclamation on linked clones when you create a new pool or edit an existing pool. For an existing pool, see "Tasks for Upgrading Pools to Use Space Reclamation" in the *VMware Horizon View Upgrades* document.

If a View Composer is refreshing, recomposing, or rebalancing linked clones, disk space reclamation does not take place on those linked clones.

Disk space reclamation operates only on OS disks in linked clones. The feature does not affect View Composer persistent disks and does not operate on full-clone virtual machines.

Native NFS snapshot technology (VAAI) is not supported in pools that contain virtual machines with space-efficient disks.

Prerequisites

- Verify that your vCenter Server and ESXi hosts, including all ESXi hosts in a cluster, are version 5.1 with ESXi 5.1 download patch ESXi510-201212001 or later.
- Verify that VMware Tools that are provided with vSphere version 5.1 or later are installed on all the linked-clone virtual machines in the pool.
- Verify that all the linked-clone virtual machines in the pool are virtual hardware version 9 or later.
- Verify that the virtual machines use SCSI controllers. Disk space reclamation is not supported on virtual machines with IDE controllers.
- For Windows 8 or 8.1 virtual machines, verify that the machines are running in vSphere 5.5 or later. Disk space reclamation is supported on Windows 8 or 8.1 virtual machines in vSphere 5.5 or later.
- For Windows 7 or Windows XP virtual machines, verify that the machines are running in vSphere 5.1 or later.
- Verify that disk space reclamation is enabled in vCenter Server. This option ensures that the virtual machines in the pool are created in the efficient disk format that is required to reclaim disk space. See the *VMware Horizon View Administration* document.

Procedure

- 1 In View Administrator, display the Advanced Storage page.

Option	Description
New desktop pool	Start the Add Desktop Pool wizard to begin creating an automated desktop pool. Follow the wizard configuration prompts until you reach the Advanced Storage page.
Existing desktop pool	Select the existing pool, click Edit , and click the Advanced Storage tab. To upgrade a pool to support space reclamation, see "Upgrade Desktop Pools for Space Reclamation" in the <i>VMware Horizon View Upgrades</i> document.

- 2 Select the **Reclaim VM disk space** check box.
- 3 In the **Initiate reclamation when unused space on VM exceeds** text box, type the minimum amount of unused disk space, in gigabytes, that must accumulate on a linked-clone OS disk before ESXi starts reclaiming space on that disk.

For example: 2 GB.

The default value is 1 GB.

What to do next

You can configure blackout days and times during which disk space reclamation and regeneration for View Storage Accelerator do not take place. See [“Set Blackout Times for ESXi Operations on View Virtual Machines,”](#) on page 187.

In View Administrator, you can select **Catalog > Desktop Pools** and select a machine to display the last time space reclamation occurred and the last amount of space reclaimed on the machine.

Using View Composer Array Integration with Native NFS Snapshot Technology (VAAI)

If your deployment includes NAS devices that support the vStorage APIs for Array Integration (VAAI), you can enable the View Composer Array Integration (VCAI) feature on linked-clone pools. This feature uses native NFS snapshot technology to clone virtual machines.

With this technology, the NFS disk array clones the virtual machine files without having the ESXi host read and write the data. This operation might reduce the time and network load when virtual machines are cloned.

Apply these guidelines for using native NFS snapshot technology:

- You can use this feature only if you configure desktop pools on datastores that reside on NAS devices that support native cloning operations through VAAI.
- You can use View Composer features to manage linked clones that are created by native NFS snapshot technology. For example, you can refresh, recompose, rebalance, create persistent disks, and run QuickPrep customization scripts on these clones.
- You cannot use this feature if you store replicas and OS disks on separate datastores.
- This feature is supported on vSphere 5.0 and later.
- If you edit a pool and select or deselect the native NFS cloning feature, existing virtual machines are not affected.

To change existing virtual machines from native NFS clones to traditional redo log clones, you must deselect the native NFS cloning feature and recompose the pool to a new base image. To change the cloning method for all virtual machines in a pool and use a different datastore, you must select the new datastore, deselect the native NFS cloning feature, rebalance the pool to the new datastore, and recompose the pool to a new base image.

Similarly, to change virtual machines from traditional redo log clones to native NFS clones, you must select a NAS datastore that supports VAAI, select the native NFS cloning feature, rebalance the pool to the NAS datastore, and recompose the pool.

- On an ESXi cluster, to configure native cloning on a selected NFS datastore in View Administrator, you might have to install vendor-specific NAS plug-ins that support native cloning operations on VAAI on all ESXi hosts in the cluster. See your storage vendor documentation for guidance on configuration requirements.
- Native NFS snapshot technology (VAAI) is not supported in pools that are enabled for View Storage Accelerator or virtual machine disk space reclamation.
- See VMware Knowledge Base (KB) article 2061611 for answers to frequently asked questions about VCAI support in Horizon View.

IMPORTANT NAS storage vendors might provide additional settings that can affect the performance and operation of VAAI. You should follow the vendor's recommendations and configure the appropriate settings on both the NAS storage array and ESXi. See your storage vendor documentation for guidance on configuring vendor-recommended settings.

Set Blackout Times for ESXi Operations on View Virtual Machines

Regenerating digest files for View Storage Accelerator and reclaiming virtual machine disk space can use ESXi resources. To ensure that ESXi resources are dedicated to foreground tasks when necessary, you can prevent the ESXi hosts from performing these operations during specified periods of time on specified days.

For example, you can specify a blackout period during weekday morning hours when users start work, and boot storms and anti-virus scanning I/O storms take place. You can specify different blackout times on different days.

Disk space reclamation and View Storage Accelerator digest file regeneration do not occur during blackout times that you set. You cannot set separate blackout times for each operation.

View allows View Storage Accelerator digest files to be created for new machines during the provisioning stage, even when a blackout time is in effect.

Prerequisites

- Verify that **Enable View Storage Accelerator**, **Enable space reclamation**, or both features are selected for vCenter Server.
- Verify that **Use View Storage Accelerator**, **Reclaim VM disk space**, or both features are selected for the desktop pool.

Procedure

- 1 On the Advanced Storage page in the Add Desktop Pool wizard, go to **Blackout Times** and click **Add**.
If you are editing an existing pool, click the **Advanced Storage** tab.
- 2 Check the blackout days and specify the starting and ending times.
The time selector uses a 24-hour clock. For example, 10:00 is 10:00 a.m., and 22:00 is 10:00 p.m.
- 3 Click **OK**.
- 4 To add another blackout period, click **Add** and specify another period.
- 5 To modify or remove a blackout period, select the period from the Blackout times list and click **Edit** or **Remove**.

Configuring Policies for Desktop and Application Pools

16

You can configure policies to control the behavior of desktop and application pools, machines, and users. You use View Administrator to set policies for client sessions. You can use Active Directory group policy settings to control the behavior of View Agent, Horizon Client for Windows, and features that affect single-user machines, RDS hosts, or the PCoIP display protocol.

This chapter includes the following topics:

- [“Setting Policies in View Administrator,”](#) on page 189
- [“Using Active Directory Group Policies,”](#) on page 191
- [“Using View Group Policy Administrative Template Files,”](#) on page 192
- [“View ADM and ADMX Template Files,”](#) on page 193
- [“View Agent Configuration ADM Template Settings,”](#) on page 193
- [“View PCoIP Session Variables ADM Template Settings,”](#) on page 199
- [“Using Remote Desktop Services Group Policies,”](#) on page 210
- [“Setting Up Location-Based Printing,”](#) on page 218
- [“Active Directory Group Policy Example,”](#) on page 222

Setting Policies in View Administrator

You use View Administrator to configure policies for client sessions.

You can set these policies to affect specific users, specific desktop pools, or all client sessions users. Policies that affect specific users and desktop pools are called user-level policies and desktop pool-level policies. Policies that affect all sessions and users are called global policies.

User-level policies inherit settings from the equivalent desktop pool-level policy settings. Similarly, desktop pool-level policies inherit settings from the equivalent global policy settings. A desktop pool-level policy setting takes precedence over the equivalent global policy setting. A user-level policy setting takes precedence over the equivalent global and desktop pool-level policy settings.

Lower-level policy settings can be more or less restrictive than the equivalent higher-level settings. For example, you can set a global policy to **Deny** and the equivalent desktop pool-level policy to **Allow**, or vice versa.

Configure Global Policy Settings

You can configure global policies to control the behavior of all client sessions users.

Prerequisites

Familiarize yourself with the policy descriptions. See [“View Policies,”](#) on page 191.

Procedure

- 1 In View Administrator, select **Policies > Global Policies**.
- 2 Click **Edit policies** in the **View Policies** pane.
- 3 Click **OK** to save your changes.

Configure Policies for Desktop Pools

You can configure desktop-level policies to affect specific desktop pools. Desktop-level policy settings take precedence over their equivalent global policy settings.

Prerequisites

Familiarize yourself with the policy descriptions. See [“View Policies,”](#) on page 191.

Procedure

- 1 In View Administrator, select **Catalog > Desktop Pools**.
- 2 Double-click the ID of the desktop pool and click the **Policies** tab.
The **Policies** tab shows the current policy settings. When a setting is inherited from the equivalent global policy, **Inherit** appears in the **Desktop Pool Policy** column.
- 3 Click **Edit Policies** in the **View Policies** pane.
- 4 Click **OK** to save your changes.

Configure Policies for Users

You can configure user-level policies to affect specific users. User-level policy settings always take precedence over their equivalent global and desktop pool-level policy settings.

Prerequisites

Familiarize yourself with the policy descriptions. See [“View Policies,”](#) on page 191.

Procedure

- 1 In View Administrator, select **Catalog > Desktop Pools**.
- 2 Double-click the ID of the desktop pool and click the **Policies** tab.
The **Policies** tab shows the current policy settings. When a setting is inherited from the equivalent global policy, **Inherit** appears in the **Desktop Pool Policy** column.
- 3 Click **User Overrides** and then click **Add User**.
- 4 To find a user, click **Add**, type the name or description of the user, and then click **Find**.
- 5 Select one or more users from the list, click **OK**, and then click **Next**.
The Add Individual Policy dialog box appears.
- 6 Configure the View policies and click **Finish** to save your changes.

View Policies

You can configure View policies to affect all client sessions, or you can apply them to affect specific desktop pools or users.

Table 16-1 describes each View policy setting.

Table 16-1. View Policies

Policy	Description
Multimedia redirection (MMR)	<p>Determines whether MMR is enabled for client systems.</p> <p>MMR is a Microsoft DirectShow filter that forwards multimedia data from specific codecs on remote desktops directly through a TCP socket to the client system. The data is then decoded directly on the client system, where it is played.</p> <p>The default value is Deny.</p> <p>If client systems have insufficient resources to handle local multimedia decoding, leave the setting as Deny.</p> <p>MMR does not work correctly if the client system's video display hardware does not have overlay support.</p> <p>Multimedia Redirection (MMR) data is sent across the network without application-based encryption and might contain sensitive data, depending on the content being redirected. To ensure that this data cannot be monitored on the network, use MMR only on a secure network.</p>
USB Access	<p>Determines whether remote desktops can use USB devices connected to the client system.</p> <p>The default value is Allow. To prevent the use of external devices for security reasons, change the setting to Deny.</p>
PCoIP hardware acceleration	<p>Determines whether to enable hardware acceleration of the PCoIP display protocol and specifies the acceleration priority that is assigned to the PCoIP user session.</p> <p>This setting has an effect only if a PCoIP hardware acceleration device is present on the physical computer that hosts the remote desktop.</p> <p>The default value is Allow at Medium priority.</p>

Using Active Directory Group Policies

You can use Microsoft Windows Group Policy to optimize and secure remote desktops, control the behavior of View components, and to configure location-based printing.

Group Policy is a feature of Microsoft Windows operating systems that provides centralized management and configuration of computers and remote users in an Active Directory environment.

Group policy settings are contained in entities called group policy objects (GPOs). GPOs are associated with Active Directory objects. You can apply GPOs to View components at a domain-wide level to control various areas of the View environment. After they are applied, GPO settings are stored in the local Windows Registry of the specified component.

You use the Microsoft Windows Group Policy Object Editor to manage group policy settings. The Group Policy Object Editor is a Microsoft Management Console (MMC) snap-in. The MMC is part of the Microsoft Group Policy Management Console (GPMC). See the Microsoft TechNet Web site for information on installing and using the GPMC.

Creating an OU for Remote Desktops

You should create an organizational unit (OU) in Active Directory specifically for your remote desktops.

To prevent group policy settings from being applied to other Windows servers or workstations in the same domain as your remote desktops, create a GPO for your View group policies and link it to the OU that contains your remote desktops.

See the Microsoft Active Directory documentation on the Microsoft TechNet Web site for information on creating OUs and GPOs.

Enabling Loopback Processing for Remote Desktops

By default, a user's policy settings come from the set of GPOs that are applied to the user object in Active Directory. However, in the View environment, GPOs should apply to users based on the computer they log in to.

When you enable loopback processing, a consistent set of policies applies to all users that log in to a particular computer, regardless of their location in Active Directory.

See the Microsoft Active Directory documentation for information on enabling loopback processing.

NOTE Loopback processing is only one approach to handling GPOs in View. You might need to implement a different approach.

Using View Group Policy Administrative Template Files

View provides several component-specific Group Policy Administrative (ADM and ADMX) template files. You can optimize and secure remote desktops and applications by adding the policy settings in these ADM and ADMX template files to a new or existing GPO in Active Directory.

All ADM and ADMX files that provide group policy settings for View are available in a bundled .zip file named `VMware-Horizon-View-GPO-Bundle-x.x.x-yyyyyy.zip`, where `x.x.x` is the version and `yyyyyy` is the build number. You can download the file from the VMware Horizon (with View) download site at <http://www.vmware.com/go/downloadview>.

The View ADM and ADMX template files contain both Computer Configuration and User Configuration group policies.

- The Computer Configuration policies set policies that apply to all remote desktops, regardless of who connects to the desktop.
- The User Configuration policies set policies that apply to all users, regardless of the remote desktop or application they connect to. User Configuration policies override equivalent Computer Configuration policies.

Microsoft Windows applies policies at desktop startup and when users log in.

View ADM and ADMX Template Files

The View ADM and ADMX template files provide group policy settings that let you control and optimize View components.

Table 16-2. View ADM and ADMX Template Files

Template Name	Template File	Description
View Agent Configuration	vdm_agent.adm	Contains policy settings related to the authentication and environmental components of View Agent. See “View Agent Configuration ADM Template Settings,” on page 193.
Horizon Client Configuration	vdm_client.adm	Contains policy settings related to Horizon Client for Windows. Clients that connect from outside the View Connection Server host domain are not affected by policies applied to Horizon Client. See the <i>Using VMware Horizon Client for Windows</i> document.
View Server Configuration	vdm_server.adm	Contains policy settings related to View Connection Server. See the <i>View Administration</i> document.
View Common Configuration	vdm_common.adm	Contains policy settings that are common to all View components. See the <i>View Administration</i> document.
View PCoIP Session Variables	pcoip.adm	Contains policy settings related to the PCoIP display protocol. See “View PCoIP Session Variables ADM Template Settings,” on page 199.
View PCoIP Client Session Variables	pcoip_client.adm	Contains policy settings related to the PCoIP display protocol that affect Horizon Client for Windows. See the <i>Using VMware Horizon Client for Windows</i> document.
View Persona Management Configuration	ViewPM.adm	Contains policy settings related to View Persona Management. See “View Persona Management Group Policy Settings,” on page 244.
View Remote Desktop Services	vmware_rdsh.admx vmware_rdsh_server.admx	Contains policy settings related to Remote Desktop Services. See “Using Remote Desktop Services Group Policies,” on page 210.

View Agent Configuration ADM Template Settings

The View Agent Configuration ADM template file (vdm_agent.adm) contains policy settings related to the authentication and environmental components of View Agent.

This ADM file is available in a bundled .zip file named VMware-Horizon-View-GPO-Bundle-x.x.x-yyyyyy.zip, which you can download from the VMware Horizon (with View) download site at <http://www.vmware.com/go/downloadview>.

The following table describes policy settings in the View Agent Configuration ADM template file other than those settings that are used with USB devices. The template contains both Computer Configuration and User Configuration settings. The User Configuration setting overrides the equivalent Computer Configuration setting.

Table 16-3. View Agent Configuration Template Settings

Setting	Computer	User	Properties
AllowDirectRDP	X		<p>Determines whether clients other than Horizon Client devices can connect directly to View desktops with RDP. When this setting is disabled, View Agent permits only View-managed connections through Horizon Client.</p> <p>When connecting to a remote desktop from Horizon Client for Mac OS X, do not disable the AllowDirectRDP setting. If this setting is disabled, the connection fails with an <code>Access is denied</code> error.</p> <p>By default, while a user is logged in to a View desktop session, you can use RDP to connect to the virtual machine from outside of View. The RDP connection terminates the View desktop session, and the View user's unsaved data and settings might be lost. The View user cannot log in to the desktop until the external RDP connection is closed. To avoid this situation, disable the AllowDirectRDP setting.</p> <p>This setting is enabled by default.</p>
AllowSingleSignon	X		<p>Determines whether single sign-on (SSO) is used to connect users to View desktops. When this setting is enabled, users are required to enter only their credentials when connecting with Horizon Client. When it is disabled, users must reauthenticate when the remote connection is made.</p> <p>This setting is enabled by default.</p>
CommandsToRunOnConnect	X		<p>Specifies a list of commands or command scripts to be run when a session is connected for the first time.</p> <p>See "Running Commands on View Desktops," on page 198 for more information.</p>
CommandsToRunOnDisconnect	X		<p>Specifies a list of commands or command scripts to be run when a session is disconnected.</p> <p>See "Running Commands on View Desktops," on page 198 for more information.</p>
CommandsToRunOnReconnect	X		<p>Specifies a list of commands or command scripts to be run when a session is reconnected after a disconnect.</p> <p>See "Running Commands on View Desktops," on page 198 for more information.</p>
Connect using DNS Name	X		<p>Determines whether View Connection Server uses the DNS name instead of the IP address of the host when connecting. This setting is typically enabled in a NAT or firewall situation when Horizon Client or View Connection Server cannot use the remote desktop IP address directly.</p> <p>This setting is disabled by default.</p>

Table 16-3. View Agent Configuration Template Settings (Continued)

Setting	Computer	User	Properties
ConnectionTicketTimeout	X		Specifies the amount of time in seconds that the View connection ticket is valid. Horizon Client devices use a connection ticket for verification and single sign-on when connecting to View Agent. For security reasons, a connection ticket is valid for a limited amount of time. When a user connects to a View desktop, authentication must take place within the connection ticket timeout period or the session times out. If this setting is not configured, the default timeout period is 900 seconds.
CredentialFilterExceptions	X		Specifies the executable files that are not allowed to load the agent CredentialFilter. Filenames must not include a path or suffix. Use a semicolon to separate multiple filenames.
Disable Time Zone Synchronization	X	X	Determines whether the time zone of the View desktop is synchronized with the time zone of the connected client. An enabled setting applies only if the <code>Disable time zone forwarding</code> setting of the Horizon Client Configuration policy is not set to disabled. This setting is disabled by default.
Enable multi-media acceleration	X		Determines whether multimedia redirection (MMR) is enabled on the View desktop. MMR is a Microsoft DirectShow filter that forwards multimedia data from specific codecs on the remote system directly through a TCP socket to the client. The data is then decoded directly on the client, where it is played. You can disable MMR if the client has insufficient resources to handle local multimedia decoding. MMR does not work correctly if the Horizon Client video display hardware does not have overlay support. This setting is enabled by default.
Force MMR to use software overlay	X		Determines whether the multimedia redirection (MMR) feature uses a software overlay instead of a hardware overlay. MMR uses video display hardware with overlay support for better performance. Because hardware overlays typically exist only on the primary monitor in a multi-monitor system, video is not displayed when it is dragged from the primary monitor to a secondary monitor. Enabling this setting forces MMR to use a software overlay on all monitors. This setting is disabled by default.
ShowDiskActivityIcon	X		This setting is not supported in this release.
Toggle Display Settings Control	X		Determines whether to disable the Settings tab in the Display control panel when a client session uses the PCoIP display protocol. This setting is enabled by default.

USB Settings for the View Agent

See [“USB Settings in the View Agent Configuration ADM Template,”](#) on page 165.

Client System Information Sent to View Desktops

When a user connects or reconnects to a View desktop, Horizon Client gathers information about the client system and View Connection Server sends that information to the remote desktop.

View Agent writes the client computer information to the system registry path `HKCU\Volatile Environment` on remote desktops that are deployed on single-user machines.

For remote desktops that are deployed in RDS sessions, View Agent writes the client computer information to the system registry path `HKCU\Volatile Environment\x`, where *x* is the session ID, on the RDS host.

You can add commands to the View Agent `CommandsToRunOnConnect`, `CommandsToRunOnReconnect`, and `CommandsToRunOnDisconnect` group policy settings to run commands or command scripts that read this information from the system registry when users connect and reconnect to desktops. See [“Running Commands on View Desktops,”](#) on page 198 for more information.

[Table 16-4](#) describes the registry keys that contain client system information and lists the types of client systems that support them.

Table 16-4. Client System Information

Registry Key	Description	Supported Desktops	Supported Client Systems
<code>ViewClient_IP_Address</code>	The IP address of the client system.	VDI (single-user machine) RDS	Windows, Linux, Mac, Android, iOS, Metro
<code>ViewClient_MAC_Address</code>	The MAC address of the client system.	VDI (single-user machine) RDS	Windows, Linux, Mac, Android
<code>ViewClient_Machine_Name</code>	The machine name of the client system.	VDI (single-user machine) RDS	Windows, Linux, Mac, Android, iOS, Metro
<code>ViewClient_Machine_Domain</code>	The domain of the client system.	VDI (single-user machine) RDS	Windows, Metro
<code>ViewClient_LoggedOn_Username</code>	The user name that was used to log in to the client system.	VDI (single-user machine) RDS	Windows, Linux, Mac
<code>ViewClient_LoggedOn_Domainname</code>	The domain name that was used to log in to the client system.	VDI (single-user machine) RDS	Windows, Metro For Linux and Mac clients, see <code>ViewClient_Machine_Domain.ViewClient_LoggedOn_Domainname</code> is not given by the Linux or Mac client because Linux and Mac accounts are not bound to Windows domains.
<code>ViewClient_Type</code>	The thin client name or operating system type of the client system.	VDI (single-user machine) RDS	Windows, Linux, Mac, Android, iOS, Metro
<code>ViewClient_Broker_DNS_Name</code>	The DNS name of the View Connection Server instance.	VDI (single-user machine) RDS	Value is sent directly from View Connection Server, not gathered by Horizon Client.

Table 16-4. Client System Information (Continued)

Registry Key	Description	Supported Desktops	Supported Client Systems
ViewClient_Broker_URL	The URL of the View Connection Server instance.	VDI (single-user machine) RDS	Value is sent directly from View Connection Server, not gathered by Horizon Client.
ViewClient_Broker_Tunnel	The status of the tunnel connection for the View Connection Server, which can be either <code>true</code> (enabled) or <code>false</code> (disabled).	VDI (single-user machine) RDS	Value is sent directly from View Connection Server, not gathered by Horizon Client.
ViewClient_Broker_Tunnel_URL	The URL of the View Connection Server tunnel connection, if the tunnel connection is enabled.	VDI (single-user machine) RDS	Value is sent directly from View Connection Server, not gathered by Horizon Client.
ViewClient_Broker_Remote_IP_Address	The IP address of the client system that is seen by the View Connection Server instance.	VDI (single-user machine) RDS	Value is sent directly from View Connection Server, not gathered by Horizon Client.
ViewClient_TZID	The Olson time zone ID. To disable time zone synchronization, enable the <code>View Agent Disable Time Zone Synchronization</code> group policy setting.	VDI (single-user machine) RDS	Windows, Linux, Mac, Android, iOS
ViewClient_Windows_Timezone	The GMT standard time. To disable time zone synchronization, enable the <code>View Agent Disable Time Zone Synchronization</code> group policy setting.	VDI (single-user machine) RDS	Windows, Metro
ViewClient_Broker_DomainName	Domain name used to authenticate to View Connection Server.	VDI (single-user machine) RDS	Value is sent directly from View Connection Server, not gathered by Horizon Client.
ViewClient_Broker_UserName	Username used to authenticate to View Connection Server.	VDI (single-user machine) RDS	Value is sent directly from View Connection Server, not gathered by Horizon Client.
ViewClient_Client_ID	Specifies the <code>Unique Client HardwareId</code> used as a link to the license key.	VDI (single-user machine) RDS	Windows, Linux, Mac, Android, iOS, Metro
ViewClient_Displays.Number	Specifies the number of monitors being used on the client.	VDI (single-user machine) RDS	Windows, Linux, Mac, Android, iOS, Metro
ViewClient_Displays.Topology	Specifies the arrangement, resolution, and dimensions of displays on the client.	VDI (single-user machine) RDS	Windows, Linux, Mac, Android, iOS, Metro
ViewClient_Keyboard.Type	Specifies the type of keyboard being used on the client. For example: Japanese, Korean.	VDI (single-user machine) RDS	Windows
ViewClient_Launch_SessionType	Specifies the session type. The type can be desktop or application.	VDI (single-user machine) RDS	Value is sent directly from View Connection Server, not gathered by Horizon Client.
ViewClient_Mouse.Identifier	Specifies the type of mouse.	VDI (single-user machine) RDS	Windows

Table 16-4. Client System Information (Continued)

Registry Key	Description	Supported Desktops	Supported Client Systems
ViewClient_Mouse.NumButtons	Specifies the number of buttons supported by the mouse.	VDI (single-user machine) RDS	Windows
ViewClient_Mouse.SampleRate	Specifies the rate, in reports per second, at which input from a PS/2 mouse is sampled.	VDI (single-user machine) RDS	Windows
ViewClient_Protocol	Specifies the protocol being used.	VDI (single-user machine) RDS	Windows, Linux, Mac, Android, iOS, Metro
ViewClient_Language	Specifies the operating system language.	VDI (single-user machine) RDS	Windows, Linux, Mac, Android, iOS, Metro
ViewClient_Launch_ID	Specifies the desktop pool Unique ID.	VDI (single-user machine)	Windows, Linux, Mac, Android, iOS, Metro

NOTE The definitions of `ViewClient_LoggedOn_Username` and `ViewClient_LoggedOn_Domainname` in [Table 16-4](#) apply to Horizon Client 2.2 for Windows or later releases.

For Horizon Client 5.4 for Windows or earlier releases, `ViewClient_LoggedOn_Username` sends the user name that was entered in Horizon Client, and `ViewClient_LoggedOn_Domainname` sends the domain name that was entered in Horizon Client.

Horizon Client 2.2 for Windows is a later release than Horizon Client 5.4 for Windows. Starting with Horizon Client 2.2, the release numbers for Windows are consistent with the Horizon Client releases on other operating systems and devices.

Running Commands on View Desktops

You can use the View Agent `CommandsToRunOnConnect`, `CommandsToRunOnReconnect`, and `CommandsToRunOnDisconnect` group policy settings to run commands and command scripts on View desktops when users connect, reconnect, and disconnect.

To run a command or a command script, add the command name or the file path of the script to the group policy setting's list of commands. For example:

```
date
```

```
C:\Scripts\myscript.cmd
```

To run scripts that require console access, prepend the `-C` or `-c` option followed by a space. For example:

```
-c C:\Scripts\Cli_clip.cmd
```

```
-C e:\procexp.exe
```

Supported file types include `.CMD`, `.BAT`, and `.EXE`. `.VBS` files will not run unless they are parsed with `csript.exe` or `wscript.exe`. For example:

```
-C C:\WINDOWS\system32\wscript.exe C:\Scripts\checking.vbs
```

The total length of the string, including the `-C` or `-c` option, should not exceed 260 characters.

View PCoIP Session Variables ADM Template Settings

The View PCoIP Session Variables ADM template file (`pcoip.adm`) contains policy settings related to the PCoIP display protocol. You can configure settings to default values that can be overridden by an administrator, or you can configure settings to non-overridable values.

This ADM file is available in a bundled .zip file named `VMware-Horizon-View-GPO-Bundle-x.x.x-yyyyyy.zip`, which you can download from the VMware Horizon (with View) download site at <http://www.vmware.com/go/downloadview>.

The View PCoIP Session Variables ADM template file contains two subcategories:

Overridable Administrator Defaults	Specifies PCoIP session variable default values. These settings can be overridden by an administrator. These settings write registry keys values to <code>HKLM\Software\Policies\Teradici\PCoIP\pcoip_admin_defaults</code> .
Not Overridable Administrator Settings	Contains the same settings as Overridable Administrator Defaults, but these settings cannot be overridden by an administrator. These settings write registry key values to <code>HKLM\Software\Policies\Teradici\PCoIP\pcoip_admin</code> .

The template contains Computer Configuration settings only.

Non-Policy Registry Keys

If a local machine setting needs to be applied and cannot be placed under `HKLM\Software\Policies\Teradici`, local machine settings can be placed in registry keys in `HKLM\Software\Teradici`. The same registry keys can be placed in `HKLM\Software\Teradici` as in `HKLM\Software\Policies\Teradici`. If the same registry key is present in both locations, the setting in `HKLM\Software\Policies\Teradici` overrides the local machine value.

View PCoIP General Session Variables

The View PCoIP Session Variables ADM template file contains group policy settings that configure general session characteristics such as PCoIP image quality, USB devices, and network ports.

Table 16-5. View PCoIP General Session Variables

Setting	Description
Configure clipboard redirection	<p>Determines the direction in which clipboard redirection is allowed. You can select one of these values:</p> <ul style="list-style-type: none"> ■ Enabled client to agent only (That is, allow copy and paste only from the client system to the remote desktop.) ■ Disabled in both directions ■ Enabled in both directions ■ Enabled agent to client only (That is, allow copy and paste only from the remote desktop to the client system.) <p>Clipboard redirection is implemented as a virtual channel. If virtual channels are disabled, clipboard redirection does not function.</p> <p>This setting applies to View Agent only.</p> <p>When this setting is disabled or not configured, the default value is Enabled client to agent only.</p>
Configure PCoIP client image cache size policy	<p>Controls the size of the PCoIP client image cache. The client uses image caching to store portions of the display that were previously transmitted. Image caching reduces the amount of data that is retransmitted.</p> <p>This setting applies only to Windows and Linux clients when Horizon Client, View Agent, and View Connection Server are a View 5.0 or later release.</p> <p>When this setting is not configured or disabled, PCoIP uses a default client image cache size of 250MB.</p> <p>When you enable this setting, you can configure a client image cache size from a minimum of 50 MB to a maximum of 300 MB. The default value is 250MB.</p>
Configure PCoIP event log cleanup by size in MB	<p>Enables the configuration of the PCoIP event log cleanup by size in MB.</p> <p>When this policy is configured, the setting controls how large a log file can grow before it is cleaned up. For a non-zero setting of <i>m</i>, log files larger than <i>m</i> MB are automatically and silently deleted. A setting of 0 indicates that no file cleanup by size takes place.</p> <p>When this policy is disabled or not configured, the default event log cleanup by size is 100 MB.</p> <p>The log file cleanup is performed once at session startup. A change to the setting is not applied until the next session.</p>
Configure PCoIP event log cleanup by time in days	<p>Enables the configuration of the PCoIP event log cleanup by time in days.</p> <p>When this policy is configured, the setting controls how many days can pass before the log file is cleaned up. For a non-zero setting of <i>n</i>, log files older than <i>n</i> days are automatically and silently deleted. A setting of 0 indicates that no file cleanup by time takes place.</p> <p>When this policy is disabled or not configured, the default event log cleanup is 7 days.</p> <p>The log file cleanup is performed once at session startup. A change to the setting is not applied until the next session.</p>

Table 16-5. View PCoIP General Session Variables (Continued)

Setting	Description
Configure PCoIP event log verbosity	<p>Sets the PCoIP event log verbosity. The values range from 0 (least verbose) to 3 (most verbose).</p> <p>When this setting is enabled, you can set the verbosity level from 0 to 3. When the setting is not configured or disabled, the default event log verbosity level is 2.</p> <p>When this setting is modified during an active PCoIP session, the new setting takes effect immediately.</p>
Configure PCoIP image quality levels	<p>Controls how PCoIP renders images during periods of network congestion. The Minimum Image Quality, Maximum Initial Image Quality, and Maximum Frame Rate values interoperate to provide fine control in network-bandwidth constrained environments.</p> <p>Use the Minimum Image Quality value to balance image quality and frame rate for limited-bandwidth scenarios. You can specify a value between 30 and 100. The default value is 40. A lower value allows higher frame-rates, but with a potentially lower quality display. A higher value provides higher image quality, but with potentially lower frame rates when network bandwidth is constrained. When network bandwidth is not constrained, PCoIP maintains maximum quality regardless of this value.</p> <p>Use the Maximum Initial Image Quality value to reduce the network bandwidth peaks required by PCoIP by limiting the initial quality of the changed regions of the display image. You can specify a value between 30 and 100. The default value is 80. A lower value reduces the image quality of content changes and decreases peak bandwidth requirements. A higher value increases the image quality of content changes and increases peak bandwidth requirements. Unchanged regions of the image progressively build to a lossless (perfect) quality regardless of this value. A value of 80 or lower best utilizes the available bandwidth.</p> <p>The Minimum Image Quality value cannot exceed the Maximum Initial Image Quality value.</p> <p>Use the Maximum Frame Rate value to manage the average bandwidth consumed per user by limiting the number of screen updates per second. You can specify a value between 1 and 120 frames per second. The default value is 30. A higher value can use more bandwidth but provides less jitter, which allows smoother transitions in changing images such as video. A lower value uses less bandwidth but results in more jitter.</p> <p>These image quality values apply to the soft host only and have no effect on a soft client.</p> <p>When this setting is disabled or not configured, the default values are used.</p> <p>When this setting is modified during an active PCoIP session, the new setting takes effect immediately.</p>

Table 16-5. View PCoIP General Session Variables (Continued)

Setting	Description
Configure PCoIP session encryption algorithms	<p>Controls the encryption algorithms advertised by the PCoIP endpoint during session negotiation.</p> <p>Checking one of the check boxes disables the associated encryption algorithm. You must enable at least one algorithm.</p> <p>This setting applies to both agent and client. The endpoints negotiate the actual session encryption algorithm that is used. If FIPS140-2 approved mode is enabled, the Disable AES-128-GCM encryption value is always overridden so that AES-128-GCM encryption is enabled.</p> <p>Supported encryption algorithms, in order of preference, are SALSA20/12-256, AES-GCM-128, and AES-GCM-256. By default, all supported encryption algorithms are available for negotiation by this endpoint.</p> <p>If both endpoints are configured to support all three algorithms and the connection does not use a Security Gateway (SG), the SALSA20 algorithm will be negotiated and used. However, if the connection uses an SG, SALSA20 is automatically disabled and AES128 will be negotiated and used. If either endpoint or the SG disables SALSA20 and either endpoint disables AES128, then AES256 will be negotiated and used.</p>

Table 16-5. View PCoIP General Session Variables (Continued)

Setting	Description								
Configure PCoIP USB allowed and unallowed device rules	<p>Specifies the USB devices that are authorized and not authorized for PCoIP sessions that use a zero client that runs Teradici firmware. USB devices that are used in PCoIP sessions must appear in the USB authorization table. USB devices that appear in the USB unauthorization table cannot be used in PCoIP sessions.</p> <p>You can define a maximum of 10 USB authorization rules and a maximum of 10 USB unauthorization rules. Separate multiple rules with the vertical bar () character.</p> <p>Each rule can be a combination of a Vendor ID (VID) and a Product ID (PID), or a rule can describe a class of USB devices. A class rule can allow or disallow an entire device class, a single subclass, or a protocol within a subclass.</p> <p>The format of a combination VID/PID rule is 1xxxxyyyy, where xxxx is the VID in hexadecimal format and yyyy is the PID in hexadecimal format. For example, the rule to authorize or block a device with VID 0x1a2b and PID 0x3c4d is 11a2b3c4d.</p> <p>For class rules, use one of the following formats:</p> <table border="0" data-bbox="735 751 1321 1108"> <tr> <td data-bbox="735 751 874 800">Allow all USB devices</td> <td data-bbox="943 751 1129 814">Format: 23XXXXXX Example: 23XXXXXX</td> </tr> <tr> <td data-bbox="735 835 874 940">Allow USB devices with a specific class ID</td> <td data-bbox="943 835 1155 898">Format: 22classXXXX Example: 22aaXXXX</td> </tr> <tr> <td data-bbox="735 961 895 1010">Allow a specific subclass</td> <td data-bbox="943 961 1238 1024">Format: 21class-subclassXX Example: 21aabbXX</td> </tr> <tr> <td data-bbox="735 1045 895 1094">Allow a specific protocol</td> <td data-bbox="943 1045 1321 1108">Format: 20class-subclass-protocol Example: 20aabbcc</td> </tr> </table> <p>For example, the USB authorization string to allow USB HID (mouse and keyboard) devices (class ID 0x03) and webcams (class ID 0x0e) is 2203XXXX 220eXXXX. The USB unauthorization string to disallow USB Mass Storage devices (class ID 0x08) is 2208XXXX.</p> <p>An empty USB authorization string means that no USB devices are authorized. An empty USB unauthorization string means that no USB devices are banned.</p> <p>This setting applies to View Agent only and only when the remote desktop is in a session with a zero client that runs Teradici firmware. Device use is negotiated between the endpoints.</p> <p>By default, all devices are allowed and none are disallowed.</p>	Allow all USB devices	Format: 23XXXXXX Example: 23XXXXXX	Allow USB devices with a specific class ID	Format: 22classXXXX Example: 22aaXXXX	Allow a specific subclass	Format: 21class-subclassXX Example: 21aabbXX	Allow a specific protocol	Format: 20class-subclass-protocol Example: 20aabbcc
Allow all USB devices	Format: 23XXXXXX Example: 23XXXXXX								
Allow USB devices with a specific class ID	Format: 22classXXXX Example: 22aaXXXX								
Allow a specific subclass	Format: 21class-subclassXX Example: 21aabbXX								
Allow a specific protocol	Format: 20class-subclass-protocol Example: 20aabbcc								

Table 16-5. View PCoIP General Session Variables (Continued)

Setting	Description
Configure PCoIP virtual channels	<p>Specifies the virtual channels that can and cannot operate over PCoIP sessions. This setting also determines whether to disable clipboard processing on the PCoIP host.</p> <p>Virtual channels that are used in PCoIP sessions must appear on the virtual channel authorization list. Virtual channels that appear in the unauthorized virtual channel list cannot be used in PCoIP sessions.</p> <p>You can specify a maximum of 15 virtual channels for use in PCoIP sessions.</p> <p>Separate multiple channel names with the vertical bar () character. For example, the virtual channel authorization string to allow the <code>mksvchan</code> and <code>vdp_rdpvbridge</code> virtual channels is <code>mksvchan vdp_vdpvbridge</code>.</p> <p>If a channel name contains the vertical bar or backslash (\) character, insert a backslash character before it. For example, type the channel name <code>awk ward\channel</code> as <code>awk\ ward\channel</code>.</p> <p>When the authorized virtual channel list is empty, all virtual channels are disallowed. When the unauthorized virtual channel list is empty, all virtual channels are allowed.</p> <p>The virtual channels setting applies to both agent and client. Virtual channels must be enabled on both agent and client for virtual channels to be used.</p> <p>The virtual channels setting provides a separate check box that allows you to disable remote clipboard processing on the PCoIP host. This value applies to the agent only.</p> <p>By default, all virtual channels are enabled, including clipboard processing.</p>
Configure the PCoIP transport header	<p>Configures the PCoIP transport header and sets the transport session priority.</p> <p>The PCoIP transport header is a 32-bit header that is added to all PCoIP UDP packets (only if the transport header is enabled and supported by both sides). The PCoIP transport header allows network devices to make better prioritization/QoS decisions when dealing with network congestion. The transport header is enabled by default.</p> <p>The transport session priority determines the PCoIP session priority reported in the PCoIP transport header. Network devices make better prioritization/QoS decisions based on the specified transport session priority.</p> <p>When the <code>Configure the PCoIP transport header</code> setting is enabled, the following transport session priorities are available:</p> <ul style="list-style-type: none"> ■ High ■ Medium (default value) ■ Low ■ Undefined <p>The transport session priority value is negotiated by the PCoIP agent and client. If the PCoIP agent specifies a transport session priority value, the session uses the agent-specified session priority. If only the client has specified a transport session priority, the session uses the client-specified session priority. If neither agent nor client has specified a transport session priority, or Undefined Priority is specified, the session uses the default value, Medium priority.</p>

Table 16-5. View PCoIP General Session Variables (Continued)

Setting	Description
Configure the TCP port to which the PCoIP host binds and listens	<p>Specifies the TCP agent port bound to by software PCoIP hosts.</p> <p>The TCP port value specifies the base TCP port that the agent attempts to bind to. The TCP port range value determines how many additional ports to try if the base port is not available. The port range must be between 1 and 10.</p> <p>The range spans from the base port to the sum of the base port and port range. For example, if the base port is 4172 and the port range is 10, the range spans from 4172 to 4182.</p> <p>Do not set the size of the retry port range to 0. Setting this value to 0 causes a connection failure when users log in to the desktop with the PCoIP display protocol. Horizon Client returns the error message, <code>The Display protocol for this desktop is currently not available. Please contact your system administrator.</code></p> <p>This setting applies to View Agent only.</p> <p>On single-user machines, the default base TCP port is 4172 in View 4.5 and later. The default base port is 50002 in View 4.0.x and earlier. By default, the port range is 1.</p> <p>On RDS hosts, the default base TCP port is 4173. When PCoIP is used with RDS hosts, a separate PCoIP port is used for each user connection. The default port range that is set by the Remote Desktop Service is large enough to accommodate the expected maximum of concurrent user connections.</p> <p>IMPORTANT As a best practice, do not use this policy setting to change the default port range on RDS hosts, or change the TCP port value from the default of 4173. Most important, do not set the TCP port value to 4172. Resetting this value to 4172 will adversely affect PCoIP performance in RDS sessions.</p>
Configure the UDP port to which the PCoIP host binds and listens	<p>Specifies the UDP agent port bound to by software PCoIP hosts.</p> <p>The UDP port value specifies the base UDP port that the agent attempts to bind to. The UDP port range value determines how many additional ports to try if the base port is not available. The port range must be between 1 and 10.</p> <p>Do not set the size of the retry port range to 0. Setting this value to 0 causes a connection failure when users log in to the desktop with the PCoIP display protocol. Horizon Client returns the error message, <code>The Display protocol for this desktop is currently not available. Please contact your system administrator.</code></p> <p>The range spans from the base port to the sum of the base port and port range. For example, if the base port is 4172 and the port range is 10, the range spans from 4172 to 4182.</p> <p>This setting applies to View Agent only.</p> <p>On single-user machines, the default base UDP port is 4172 for View 4.5 and later and 50002 for View 4.0.x and earlier. By default, the port range is 10.</p> <p>On RDS hosts, the default base UDP port is 4173. When PCoIP is used with RDS hosts, a separate PCoIP port is used for each user connection. The default port range that is set by the Remote Desktop Service is large enough to accommodate the expected maximum of concurrent user connections.</p> <p>IMPORTANT As a best practice, do not use this policy setting to change the default port range on RDS hosts, or change the UDP port value from the default of 4173. Most important, do not set the UDP port value to 4172. Resetting this value to 4172 will adversely affect PCoIP performance in RDS sessions.</p>

Table 16-5. View PCoIP General Session Variables (Continued)

Setting	Description
Enable access to a PCoIP session from a vSphere console	<p>Determines whether to allow a vSphere Client console to display an active PCoIP session and send input to the desktop.</p> <p>By default, when a client is attached through PCoIP, the vSphere Client console screen is blank and the console cannot send input. The default setting ensures that a malicious user cannot view the user's desktop or provide input to the host locally when a PCoIP remote session is active. This setting applies to View Agent only.</p> <p>When this setting is disabled or not configured, console access is not allowed. When this setting is enabled, the console displays the PCoIP session and console input is allowed.</p> <p>When this setting is enabled, the console can display a PCoIP session that is running on a Windows 7 system only when the Windows 7 virtual machine is hardware v8. Hardware v8 is available only on ESXi 5.0 and later. By contrast, console input to a Windows 7 system is allowed when the virtual machine is any hardware version.</p> <p>On a Windows XP or Windows Vista system, the console can display a PCoIP session when the virtual machine is any hardware version.</p>
Enable the FIPS 140-2 approved mode of operation	<p>Determines whether to use only FIPS 140-2 approved cryptographic algorithms and protocols to establish a remote PCoIP connection. Enabling this setting overrides the disabling of AES128-GCM encryption.</p> <p>This setting applies to both agent and client. You can configure either endpoint or both endpoints to operate in FIPS mode. Configuring a single endpoint to operate in FIPS mode limits the encryption algorithms that are available for session negotiation.</p> <p>FIPS mode is available for View 4.5 and later. For View 4.0.x and earlier, FIPS mode is not available, and configuring this setting has no effect.</p> <p>When this setting is disabled or not configured, FIPS mode is not used.</p>
Enable/disable audio in the PCoIP session	<p>Determines whether audio is enabled in PCoIP sessions. Both endpoints must have audio enabled. When this setting is enabled, PCoIP audio is allowed. When it is disabled, PCoIP audio is disabled. When this setting is not configured, audio is enabled by default.</p>
Enable/disable microphone noise and DC offset filter in PCoIP session	<p>Determines whether to enable the microphone noise and DC offset filter for microphone input during PCoIP sessions.</p> <p>This setting applies to View Agent and Teradici audio driver only.</p> <p>When this setting is not configured, the Teradici audio driver uses the microphone noise and DC offset filter by default.</p>
Turn on PCoIP user default input language synchronization	<p>Determines whether the default input language for the user in the PCoIP session is synchronized with the default input language of the PCoIP client endpoint. When this setting is enabled, synchronization is allowed. When this setting is disabled or not configured, synchronization is disallowed.</p> <p>This setting applies to View Agent only.</p>

View PCoIP Session Bandwidth Variables

The View PCoIP Session Variables ADM template file contains group policy settings that configure PCoIP session bandwidth characteristics.

Table 16-6. View PCoIP Session Bandwidth Variables

Setting	Description
Configure the maximum PCoIP session bandwidth	<p>Specifies the maximum bandwidth, in kilobits per second, in a PCoIP session. The bandwidth includes all imaging, audio, virtual channel, USB, and control PCoIP traffic.</p> <p>Set this value to the overall capacity of the link to which your endpoint is connected, taking into consideration the number of expected concurrent PCoIP sessions. For example, with a single-user VDI configuration (a single PCoIP session) that connects through a 4Mbit/s Internet connection, set this value to 4Mbit, or 10% less than this value to leave some allowance for other network traffic. When you expect multiple concurrent PCoIP sessions to share a link, comprising either multiple VDI users or an RDS configuration, you might want to adjust the setting accordingly. However, lowering this value will restrict the maximum bandwidth for each active session.</p> <p>Setting this value prevents the agent from attempting to transmit at a higher rate than the link capacity, which would cause excessive packet loss and a poorer user experience. This value is symmetric. It forces the client and agent to use the lower of the two values that are set on the client and agent side. For example, setting a 4Mbit/s maximum bandwidth forces the agent to transmit at a lower rate, even though the setting is configured on the client.</p> <p>When this setting is disabled or not configured on an endpoint, the endpoint imposes no bandwidth constraints. When this setting is configured, the setting is used as the endpoint's maximum bandwidth constraint in kilobits per second.</p> <p>The default value when this setting is not configured is 900000 kilobits per second.</p> <p>This setting applies to View Agent and the client. If the two endpoints have different settings, the lower value is used.</p>
Configure the PCoIP session bandwidth floor	<p>Specifies a lower limit, in kilobits per second, for the bandwidth that is reserved by the PCoIP session.</p> <p>This setting configures the minimum expected bandwidth transmission rate for the endpoint. When you use this setting to reserve bandwidth for an endpoint, the user does not have to wait for bandwidth to become available, which improves session responsiveness.</p> <p>Make sure that you do not over-subscribe the total reserved bandwidth for all endpoints. Make sure that the sum of bandwidth floors for all connections in your configuration does not exceed the network capability.</p> <p>The default value is 0, which means that no minimum bandwidth is reserved. When this setting is disabled or not configured, no minimum bandwidth is reserved.</p> <p>This setting applies to View Agent and the client, but the setting only affects the endpoint on which it is configured.</p> <p>When this setting is modified during an active PCoIP session, the change takes effect immediately.</p>

Table 16-6. View PCoIP Session Bandwidth Variables (Continued)

Setting	Description
Configure the PCoIP session MTU	<p>Specifies the Maximum Transmission Unit (MTU) size for UDP packets for a PCoIP session.</p> <p>The MTU size includes IP and UDP packet headers. TCP uses the standard MTU discovery mechanism to set MTU and is not affected by this setting.</p> <p>The maximum MTU size is 1500 bytes. The minimum MTU size is 500 bytes. The default value is 1300 bytes.</p> <p>Typically, you do not have to change the MTU size. Change this value if you have an unusual network setup that causes PCoIP packet fragmentation.</p> <p>This setting applies to View Agent and the client. If the two endpoints have different MTU size settings, the lowest size is used.</p> <p>If this setting is disabled or not configured, the client uses the default value in the negotiation with View Agent.</p>
Configure the PCoIP session audio bandwidth limit	<p>Specifies the maximum bandwidth that can be used for audio (sound playback) in a PCoIP session.</p> <p>The audio processing monitors the bandwidth used for audio. The processing selects the audio compression algorithm that provides the best audio possible, given the current bandwidth utilization. If a bandwidth limit is set, the processing reduces quality by changing the compression algorithm selection until the bandwidth limit is reached. If minimum quality audio cannot be provided within the bandwidth limit specified, audio is disabled.</p> <p>To allow for uncompressed high quality stereo audio, set this value to higher than 1600 kbit/s. A value of 450 kbit/s and higher allows for stereo, high-quality, compressed audio. A value between 50 kbit/s and 450 kbit/s results in audio that ranges between FM radio and phone call quality. A value below 50 kbit/s might result in no audio playback.</p> <p>This setting applies to View Agent only. You must enable audio on both endpoints before this setting has any effect.</p> <p>In addition, this setting has no effect on USB audio.</p> <p>If this setting is disabled or not configured, a default audio bandwidth limit of 500 kilobits per second is configured to constrain the audio compression algorithm selected. If the setting is configured, the value is measured in kilobits per second, with a default audio bandwidth limit of 500 kilobits per second.</p> <p>This setting applies to View 4.6 and later. It has no effect on earlier versions of View.</p> <p>When this setting is modified during an active PCoIP session, the change takes effect immediately.</p>
Turn off Build-to-Lossless feature	<p>Specifies whether to turn the build-to-lossless feature of the PCoIP protocol off or on. This feature is turned off by default.</p> <p>If this setting is enabled or not configured, the build-to-lossless feature is turned off, and images and other desktop and application content are never built to a lossless state. In network environments with constrained bandwidth, turning off the build-to-lossless feature can provide bandwidth savings.</p> <p>If this setting is disabled, the build-to-lossless feature is turned on. Turning on the build-to-lossless feature is recommended in environments that require images and other desktop and application content to be built to a lossless state.</p> <p>When this setting is modified during an active PCoIP session, the change takes effect immediately.</p> <p>For more information about the PCoIP build-to-lossless feature, see “View PCoIP Build-to-Lossless Feature,” on page 209.</p>

View PCoIP Session Variables for the Keyboard

The View PCoIP Session Variables ADM template file contains group policy settings that configure PCoIP session characteristics that affect the use of the keyboard.

Table 16-7. View PCoIP Session Variables for the Keyboard

Setting	Description
Disable sending CAD when users press Ctrl+Alt+Del	<p>When this policy is enabled, users must press Ctrl+Alt+Insert instead of Ctrl+Alt+Del to send a Secure Attention Sequence (SAS) to the remote desktop during a PCoIP session.</p> <p>You might want to enable this setting if users become confused when they press Ctrl+Alt+Del to lock the client endpoint and an SAS is sent to both the host and the guest.</p> <p>This setting applies to View Agent only and has no effect on a client.</p> <p>When this policy is not configured or is disabled, users can press Ctrl+Alt+Del or Ctrl+Alt+Insert to send an SAS to the remote desktop.</p>
Use alternate key for sending Secure Attention Sequence	<p>Specifies an alternate key, instead of the Insert key, for sending a Secure Attention Sequence (SAS).</p> <p>You can use this setting to preserve the Ctrl+Alt+Ins key sequence in virtual machines that are launched from inside a remote desktop during a PCoIP session.</p> <p>For example, a user can launch a vSphere Client from inside a PCoIP desktop and open a console on a virtual machine in vCenter Server. If the Ctrl+Alt+Ins sequence is used inside the guest operating system on the vCenter Server virtual machine, a Ctrl+Alt+Del SAS is sent to the virtual machine. This setting allows the Ctrl+Alt+<i>Alternate Key</i> sequence to send a Ctrl+Alt+Del SAS to the PCoIP desktop.</p> <p>When this setting is enabled, you must select an alternate key from a drop-down menu. You cannot enable the setting and leave the value unspecified.</p> <p>When this setting is disabled or not configured, the Ctrl+Alt+Ins key sequence is used as the SAS.</p> <p>This setting applies to View Agent only and has no effect on a client.</p>

View PCoIP Build-to-Lossless Feature

You can configure the PCoIP display protocol to use an encoding approach called progressive build, or build-to-lossless, which works to provide the optimal overall user experience even under constrained network conditions. This feature is turned off by default.

The build-to-lossless feature provides a highly compressed initial image, called a lossy image, that is then progressively built to a full lossless state. A lossless state means that the image appears with the full fidelity intended.

On a LAN, PCoIP always displays text using lossless compression. If the build-to-lossless feature is turned on, and if available bandwidth per session drops below 1Mbps, PCoIP initially displays a lossy text image and rapidly builds the image to a lossless state. This approach allows the desktop to remain responsive and display the best possible image during varying network conditions, providing an optimal experience for users.

The build-to-lossless feature provides the following characteristics:

- Dynamically adjusts image quality
- Reduces image quality on congested networks
- Maintains responsiveness by reducing screen update latency
- Resumes maximum image quality when the network is no longer congested

You can turn on the build-to-lossless feature by disabling the Turn off Build-to-Lossless feature group policy setting. See “[View PCoIP Session Bandwidth Variables](#),” on page 207.

Using Remote Desktop Services Group Policies

You can use Remote Desktop Services (RDS) group policies to control the configuration and performance of RDS hosts and RDS desktop and application sessions. View provides ADMX files that contain the Microsoft RDS group policies that are supported in View.

As a best practice, configure the group policies that are provided in the View ADMX files rather than the corresponding Microsoft group policies. The View group policies are certified to support your View deployment.

Add the Remote Desktop Services ADMX Files to Active Directory

You can add the policy settings in the View RDS ADMX files to group policy objects (GPOs) in Active Directory. You can also install the RDS ADMX files on individual RDS hosts.

Prerequisites

- Create GPOs for the RDS group policy settings and link them to the OU that contains your RDS hosts.
- Verify that the Group Policy Management feature is available on your Active Directory server.

The steps for opening the Group Policy Management Console differ in the Windows 2012, Windows 2008, and Windows 2003 Active Directory versions. See “[Create GPOs for View Group Policies](#),” on page 223.

Procedure

- 1 Download the View GPO Bundle .zip file from the VMware Horizon (with View) download site at <http://www.vmware.com/go/downloadview>.

The file is named `VMware-Horizon-View-GPO-Bundle-x.x.x-yyyyyyy.zip`, where `x.x.x` is the version and `yyyyyyy` is the build number. All ADM and ADMX files that provide group policy settings for View are available in this file.

- 2 Unzip the `VMware-Horizon-View-GPO-Bundle-x.x.x-yyyyyyy.zip` file and copy the RDS ADMX files to your Active Directory or RDS host.
 - a Copy the `vmware_rdsh.admx` and `vmware_rdsh_server.admx` files to the `C:\Windows\PolicyDefinitions` folder on your Active Directory or RDS host.
 - b (Optional) If you want to localize the policy settings, copy the ADML files, `vmware_rdsh.adml` and `vmware_rdsh_server.adml` to the appropriate subfolder in `C:\Windows\PolicyDefinitions\` on your Active Directory or RDS host.
- 3 On the Active Directory host, open the Group Policy Management Editor.

On an individual RDS host, you can open the Local Group Policy Editor with the `gpedit.msc` utility.

The View RDS group policy settings are installed in the **Computer Configuration > Policies > Administrative Templates > Windows Components > View RDSH Services > Remote Desktop Session Host** folder.
- 4 (Optional) Configure the group policy settings in the **View RDSH Services > Remote Desktop Session Host** folder.

RDS Application Compatibility Settings

The RDS Application Compatibility group policy settings control Windows installer compatibility, remote desktop IP virtualization, network adapter selection, and the use of the RDS host IP address.

Table 16-8. RDS Application Compatibility Group Policy Settings

Setting	Description
Turn off Windows Installer RDS Compatibility	<p>This policy setting specifies whether Windows Installer RDS Compatibility runs on a per user basis for fully installed applications. Windows Installer allows one instance of the <code>msiexec</code> process to run at a time. By default, Windows Installer RDS Compatibility is turned on.</p> <p>If you enable this policy setting, Windows Installer RDS Compatibility is turned off, and only one instance of the <code>msiexec</code> process can run at a time.</p> <p>If you disable or do not configure this policy setting, Windows Installer RDS Compatibility is turned on, and multiple per user application installation requests are queued and handled by the <code>msiexec</code> process in the order in which they are received.</p>
Turn on Remote Desktop IP Virtualization	<p>This policy setting specifies whether Remote Desktop IP Virtualization is turned on.</p> <p>By default, Remote Desktop IP Virtualization is turned off.</p> <p>If you enable this policy setting, Remote Desktop IP Virtualization is turned on. You can select the mode in which this setting is applied. If you are using Per Program mode, you must enter a list of programs to use virtual IP addresses. List each program on a separate line (do not enter any blank lines between programs). For example:</p> <pre>explorer.exe mstsc.exe</pre> <p>If you disable or do not configure this policy setting, Remote Desktop IP Virtualization is turned off.</p>
Select the network adapter to be used for Remote Desktop IP Virtualization	<p>This policy setting specifies the IP address and network mask that corresponds to the network adapter used for virtual IP addresses. The IP address and network mask should be entered in Classless Inter-Domain Routing notation. For example: 192.0.2.96/24.</p> <p>If you enable this policy setting, the specified IP address and network mask are used to select the network adapter used for the virtual IP addresses.</p> <p>If you disable or do not configure this policy setting, Remote Desktop IP Virtualization is turned off. A network adapter must be configured for Remote Desktop IP Virtualization to work.</p>
Do not use Remote Desktop Session Host server IP address when virtual IP address is not available	<p>This policy setting specifies whether a session uses the IP address of the Remote Desktop Session Host server if a virtual IP address is not available.</p> <p>If you enable this policy setting, the IP address of the RD Session Host server is not used if a virtual IP is not available. The session will not have network connectivity.</p> <p>If you disable or do not configure this policy setting, the IP address of the RD Session Host server is used if a virtual IP is not available.</p>

RDS Connections Settings

The RDS Connections group policy setting lets you disable Fair Share CPU Scheduling.

Table 16-9. RDS Connections Group Policy Settings

Setting	Description
Turn off Fair Share CPU Scheduling	<p>Fair Share CPU Scheduling dynamically distributes processor time across all Remote Desktop Services sessions on the same RD Session Host server, based on the number of sessions and the demand for processor time within each session.</p> <p>If you enable this policy setting, Fair Share CPU Scheduling is turned off.</p> <p>If you disable or do not configure this policy setting, Fair Share CPU Scheduling is turned on.</p>

RDS Device and Resource Redirection Settings

The RDS device and resource redirection group policy settings control access to devices and resources on a client computer in Remote Desktop Services sessions.

Table 16-10. RDS Device and Resource Redirection Group Policy Settings

Setting	Description
Allow time zone redirection	<p>This policy setting determines whether the client computer redirects its time zone settings to the Remote Desktop Services session.</p> <p>If you enable this policy setting, clients that are capable of time zone redirection send their time zone information to the server. The server base time is then used to calculate the current session time (current session time = server base time + client time zone).</p> <p>If you disable or do not configure this policy setting, the client computer does not redirect its time zone information and the session time zone is the same as the server time zone.</p>

RDS Licensing Settings

The RDS Licensing group policy settings control the order in which RDS license servers are located, whether problem notifications are displayed, and whether Per User or Per Device licensing is used for RDS Client Access Licenses (CALs).

Table 16-11. RDS Licensing Group Policy Settings

Setting	Description
Use the specified Remote Desktop license servers	<p>This policy setting allows you to specify the order in which an RD Session Host server attempts to locate Remote Desktop license servers.</p> <p>If you enable this policy setting, an RD Session Host server first attempts to locate the license servers that you specify. If the specified license servers cannot be located, the RD Session Host server will attempt automatic license server discovery.</p> <p>In the automatic license server discovery process, an RD Session Host server in a Windows Server-based domain attempts to contact a license server in the following order:</p> <ol style="list-style-type: none"> 1 License servers that are specified in the Remote Desktop Session Host Configuration tool 2 License servers that are published in Active Directory Domain Services 3 License servers that are installed on domain controllers in the same domain as the RD Session Host server <p>If you disable or do not configure this policy setting, the RD Session Host server uses the license server discovery mode specified in the Remote Desktop Session Host Configuration tool.</p>
Hide notifications about RD Licensing problems that affect the RD Session Host server	<p>This policy setting determines whether notifications are displayed on an RD Session Host server when there are problems with RD Licensing that affect the RD Session Host server.</p> <p>By default, notifications are displayed on an RD Session Host server after you log on as a local administrator, if there are problems with RD Licensing that affect the RD Session Host server. If applicable, a notification will also be displayed that notes the number of days until the licensing grace period for the RD Session Host server will expire.</p> <p>If you enable this policy setting, these notifications will not be displayed on the RD Session Host server.</p> <p>If you disable or do not configure this policy setting, these notifications will be displayed on the RD Session Host server after you log on as a local administrator.</p>
Set the Remote Desktop licensing mode	<p>This policy setting allows you to specify the type of Remote Desktop Services client access license (RDS CAL) that is required to connect to this RD Session Host server.</p> <p>You can use this policy setting to select one of two licensing modes: Per User or Per Device.</p> <p>Per User licensing mode requires that each user account connecting to this RD Session Host server have an RDS Per User CAL.</p> <p>Per Device licensing mode requires that each device connecting to this RD Session Host server have an RDS Per Device CAL.</p> <p>If you enable this policy setting, the licensing mode that you specify takes precedence over the licensing mode that is specified during the installation of Remote Desktop Session Host or specified in the Remote Desktop Session Host Configuration tool.</p>

Table 16-11. RDS Licensing Group Policy Settings (Continued)

Setting	Description
	If you disable or do not configure this policy setting, the licensing mode that is specified during the installation of Remote Desktop Session Host role service or specified in the Remote Desktop Session Host Configuration tool is used.

RDS Profiles Settings

The RDS Profiles group policy settings control roaming profile and home directory settings for Remote Desktop Services sessions.

Table 16-12. RDS Profiles Group Policy Settings

Setting	Description
Limit the size of the entire roaming user profile cache	<p>This policy setting allows you to limit the size of the entire roaming user profile cache on the local drive. This policy setting only applies to a computer on which the Remote Desktop Session Host role service is installed.</p> <p>NOTE If you want to limit the size of an individual user profile, use the Limit profile size policy setting located in User Configuration\Policies\Administrative Templates\System\User Profiles.</p> <p>If you enable this policy setting, you must specify a monitoring interval (in minutes) and a maximum size (in gigabytes) for the entire roaming user profile cache. The monitoring interval determines how often the size of the entire roaming user profile cache is checked. When the size of the entire roaming user profile cache exceeds the maximum size that you have specified, the oldest (least recently used) roaming user profiles will be deleted until the size of the entire roaming user profile cache is less than the maximum size specified.</p> <p>If you disable or do not configure this policy setting, no restriction is placed on the size of the entire roaming user profile cache on the local drive.</p> <p>Note: This policy setting is ignored if the Prevent Roaming Profile changes from propagating to the server policy setting located in Computer Configuration\Policies\Administrative Templates\System\User Profiles is enabled.</p>
Set Remote Desktop Services User Home Directory	<p>Specifies whether Remote Desktop Services uses the specified network share or local directory path as the root of the user's home directory for a Remote Desktop Services session.</p> <p>To use this setting, select the location for the home directory (network or local) from the Location drop-down list. If you choose to place the directory on a network share, type the Home Dir Root Path in the form <code>\\Computersname\Sharename</code>, and then select the drive letter to which you want the network share to be mapped.</p> <p>If you choose to keep the home directory on the local computer, type the Home Dir Root Path in the form <code>Drive:\Path</code>, without environment variables or ellipses. Do not specify a placeholder for user alias, because Remote Desktop Services automatically appends this at logon.</p> <p>NOTE The Drive Letter field is ignored if you choose to specify a local path. If you choose to specify a local path but then type the name of a network share in Home Dir Root Path, Remote Desktop Services places user home directories in the network location.</p> <p>If the status is set to Enabled, Remote Desktop Services creates the user's home directory in the specified location on the local computer or the network. The home directory path for each user is the specified Home Dir Root Path and the user's alias.</p> <p>If the status is set to Disabled or Not Configured, the user's home directory is as specified at the server.</p>

Table 16-12. RDS Profiles Group Policy Settings (Continued)

Setting	Description
Use mandatory profiles on the RD Session Host server	<p>This policy setting allows you to specify whether Remote Desktop Services uses a mandatory profile for all users connecting remotely to the RD Session Host server.</p> <p>If you enable this policy setting, Remote Desktop Services uses the path specified in the Set path for Remote Desktop Services Roaming User Profile policy setting as the root folder for the mandatory user profile. All users connecting remotely to the RD Session Host server use the same user profile.</p> <p>If you disable or do not configure this policy setting, mandatory user profiles are not used by users connecting remotely to the RD Session Host server.</p> <p>NOTE For this policy setting to take effect, you must also enable and configure the Set path for Remote Desktop Services Roaming User Profile policy setting.</p>
Set path for Remote Desktop Services Roaming User Profile	<p>This policy setting allows you to specify the network path that Remote Desktop Services uses for roaming user profiles.</p> <p>By default, Remote Desktop Services stores all user profiles locally on the RD Session Host server. You can use this policy setting to specify a network share where user profiles can be centrally stored, allowing a user to access the same profile for sessions on all RD Session Host servers that are configured to use the network share for user profiles.</p> <p>If you enable this policy setting, Remote Desktop Services uses the specified path as the root directory for all user profiles. The profiles are contained in subfolders named for the account name of each user.</p> <p>To configure this policy setting, type the path to the network share in the form of <code>\\Computername\Sharename</code>. Do not specify a placeholder for the user account name, because Remote Desktop Services automatically adds this when the user logs on and the profile is created. If the specified network share does not exist, Remote Desktop Services displays an error message on the RD Session Host server and will store the user profiles locally on the RD Session Host server.</p> <p>If you disable or do not configure this policy setting, user profiles are stored locally on the RD Session Host server. You can configure a user's profile path on the Remote Desktop Services Profile tab on the user's account Properties dialog box.</p> <p>Notes:</p> <ol style="list-style-type: none"> <li data-bbox="831 1415 1398 1570">1 The roaming user profiles enabled by the policy setting apply only to Remote Desktop Services connections. A user might also have a Windows roaming user profile configured. The Remote Desktop Services roaming user profile always takes precedence in a Remote Desktop Services session. <li data-bbox="831 1581 1422 1875">2 To configure a mandatory Remote Desktop Services roaming user profile for all users connecting remotely to the RD Session Host server, use this policy setting together with the Use mandatory profiles on the RD Session Host server policy setting located in Computer Configuration\Administrative Templates\Windows Components\Remote Desktop Services\RD Session Host\Profiles. The path set in the Set path for Remote Desktop Services Roaming User Profile policy setting should contain the mandatory profile.

RDS Remote Session Environment Settings

The RDS Remote Session Environment group policy settings control configuration of the user interface in Remote Desktop Services sessions.

Table 16-13. RDS Remote Session Environment Group Policy Settings

Setting	Description
Remove Windows Security item from Start menu	<p>Specifies whether to remove the Windows Security item from the Settings menu on Remote Desktop clients. You can use this setting to prevent inexperienced users from logging off from Remote Desktop Services inadvertently.</p> <p>If the status is set to Enabled, Windows Security does not appear in Settings on the Start menu. As a result, users must type a security attention sequence, such as CTRL+ALT+END, to open the Windows Security dialog box on the client computer.</p> <p>If the status is set to Disabled or Not Configured, Windows Security remains in the Settings menu.</p>

RDS Security Settings

The RDS Security group policy setting controls whether to let local administrators customize permissions.

Table 16-14. RDS Security Group Policy Settings

Setting	Description
Do not allow local administrators to customize permissions	<p>Specifies whether to disable the administrator rights to customize security permissions in the Remote Desktop Session Host Configuration tool.</p> <p>You can use this setting to prevent administrators from making changes to the user groups on the Permissions tab in the Remote Desktop Session Host Configuration tool. By default, administrators are able to make such changes.</p> <p>If the status is set to Enabled, the Permissions tab in the Remote Desktop Session Host Configuration tool cannot be used to customize per-connection security descriptors or to change the default security descriptors for an existing group. All of the security descriptors are Read Only.</p> <p>If the status is set to Disabled or Not Configured, server administrators have full Read/Write privileges to the user security descriptors on the Permissions tab in the Remote Desktop Session Host Configuration tool.</p> <p>NOTE The preferred method of managing user access is by adding a user to the Remote Desktop Users group.</p>

RDS Temporary Folders Settings

The RDS Connections group policy settings control the creation and deletion of temporary folders for Remote Desktop Services sessions.

Table 16-15. RDS Temporary Folders Group Policy Settings

Setting	Description
Do not delete temp folder upon exit	<p>Specifies whether Remote Desktop Services retains a user's per-session temporary folders at logoff.</p> <p>You can use this setting to maintain a user's session-specific temporary folders on a remote computer, even if the user logs off from a session. By default, Remote Desktop Services deletes a user's temporary folders when the user logs off.</p> <p>If the status is set to Enabled, users' per-session temporary folders are retained when the user logs off from a session.</p> <p>If the status is set to Disabled, temporary folders are deleted when a user logs off, even if the administrator specifies otherwise in the Remote Desktop Session Host Configuration tool.</p> <p>If the status is set to Not Configured, Remote Desktop Services deletes the temporary folders from the remote computer at logoff, unless specified otherwise by the server administrator.</p> <p>NOTE This setting only takes effect if per-session temporary folders are in use on the server. That is, if you enable the "Do not use temporary folders per session" setting, this setting has no effect.</p>
Do not use temporary folders per session	<p>This policy setting allows you to prevent Remote Desktop Services from creating session-specific temporary folders.</p> <p>You can use this policy setting to disable the creation of separate temporary folders on a remote computer for each session. By default, Remote Desktop Services creates a separate temporary folder for each active session that a user maintains on a remote computer. These temporary folders are created on the remote computer in a Temp folder under the user's profile folder and are named with the <code>sessionid</code>.</p> <p>If you enable this policy setting, per-session temporary folders are not created. Instead, a user's temporary files for all sessions on the remote computer are stored in a common Temp folder under the user's profile folder on the remote computer.</p> <p>If you disable this policy setting, per-session temporary folders are always created, even if you specify otherwise in the Remote Desktop Session Host Configuration tool.</p> <p>If you do not configure this policy setting, per-session temporary folders are created unless you specify otherwise in the Remote Desktop Session Host Configuration tool.</p>

Setting Up Location-Based Printing

The location-based printing feature maps printers that are physically near client systems to View desktops, enabling users to print to their local and network printers from their View desktops.

The location-based printing feature is available for both Windows and non-Windows client systems. Location-based printing allows IT organizations to map View desktops to the printer that is closest to the endpoint client device. For example, as a doctor moves from room to room in a hospital, each time the doctor prints a document, the print job is sent to the nearest printer.

To use the location-based printing feature, you must install the Virtual Printing setup option with View Agent and install the correct printer drivers on the desktop.

You set up location-based printing by configuring the Active Directory group policy setting `AutoConnect Map Additional Printers for VMware View`, which is located in the Microsoft Group Policy Object Editor in the **Software Settings** folder under **Computer Configuration**.

NOTE `AutoConnect Map Additional Printers for VMware View` is a computer-specific policy. Computer-specific policies apply to all View desktops, regardless of who connects to the desktop.

`AutoConnect Map Additional Printers for VMware View` is implemented as a name translation table. You use each row in the table to identify a specific printer and define a set of translation rules for that printer. The translation rules determine whether the printer is mapped to the View desktop for a particular client system.

When a user connects to a View desktop, View compares the client system to the translation rules associated with each printer in the table. If the client system meets all of the translation rules set for a printer, or if a printer has no associated translation rules, View maps the printer to the View desktop during the user's session.

You can define translation rules based on the client system's IP address, name, and MAC address, and on the user's name and group. You can specify one translation rule, or a combination of several translation rules, for a specific printer.

The information used to map the printer to the View desktop is stored in a registry entry on the View desktop in `HKEY_LOCAL_MACHINE\SOFTWARE\Policies\thinprint\tpautoconnect`.

Register the Location-Based Printing Group Policy DLL File

Before you can configure the group policy setting for location-based printing, you must register the DLL file `TPVMGPoACmap.dll`.

View provides 32-bit and 64-bit versions of `TPVMGPoACmap.dll` in the directory `install_directory\VMware\VMware View\Server\extras\GroupPolicyFiles\ThinPrint` on your View Connection Server host.

Procedure

- 1 Copy the appropriate version of `TPVMGPoACmap.dll` to your Active Directory server or to the domain computer that you use to configure group policies.
- 2 Use the `regsvr32` utility to register the `TPVMGPoACmap.dll` file.

For example: `regsvr32 "C:\TPVMGPoACmap.dll"`

What to do next

Configure the group policy setting for location-based printing.

Configure the Location-Based Printing Group Policy

To set up location-based printing, you configure the `AutoConnect Map Additional Printers for VMware View` group policy setting. The group policy setting is a name translation table that maps printers to View desktops.

Prerequisites

- Verify that the Microsoft MMC and the Group Policy Object Editor snap-in are available on your Active Directory server or on the domain computer that you use to configure group policies.

- Register the DLL file `TPVMGPOACmap.dll` on your Active Directory server or on the domain computer that you use to configure group policies. See “[Register the Location-Based Printing Group Policy DLL File](#),” on page 219.
- Familiarize yourself with syntax of the `AutoConnect Map Additional Printers for VMware View` group policy setting. See “[Location-Based Printing Group Policy Setting Syntax](#),” on page 220.
- Create a GPO for the location-based group policy setting and link it to the OU that contains your View desktops. See “[Create GPOs for View Group Policies](#),” on page 223 for an example of how to create GPOs for View group policies.
- Verify that the Virtual Printing setup option was installed with View Agent on your desktops. To verify, check if the TP AutoConnect Service and TP VC Gateway Service are installed in the desktop operating system.
- Because print jobs are sent directly from the View desktop to the printer, verify that the required printer drivers are installed on your desktops.

Procedure

- 1 On the Active Directory server, edit the GPO.

AD Version	Navigation Path
Windows 2003	<ol style="list-style-type: none"> a Select Start > All Programs > Administrative Tools > Active Directory Users and Computers. b Right-click the OU that contains your View desktops and select Properties. c On the Group Policy tab, click Open to open the Group Policy Management plug-in. d In the right pane, right-click the GPO that you created for the location-based printing group policy setting and select Edit.
Windows 2008	<ol style="list-style-type: none"> a Select Start > Administrative Tools > Group Policy Management. b Expand your domain, right-click the GPO that you created for the location-based printing group policy setting and select Edit.

The Group Policy Object Editor window appears.

- 2 Expand **Computer Configuration**, open the **Software Settings** folder, and select **AutoConnect Map Additional Printers for VMware View**.
- 3 In the Policy pane, double-click **Configure AutoConnect Map Additional Printers**.

The AutoConnect Map Additional Printers for VMware View window appears.

- 4 Select **Enabled** to enable the group policy setting.

The translation table headings and buttons appear in the group policy window.

IMPORTANT Clicking **Disabled** deletes all table entries. As a precaution, save your configuration so that you can import it later.

- 5 Add the printers that you want to map to View desktops and define their associated translation rules.
- 6 Click **OK** to save your changes.

Location-Based Printing Group Policy Setting Syntax

You use the `AutoConnect Map Additional Printers for VMware View` group policy setting to map printers to remote desktops.

`AutoConnect Map Additional Printers for VMware View` is a name translation table that identifies printers and defines associated translation rules. [Table 16-16](#) describes the syntax of the translation table.

Location-based printing maps local printers to remote desktops but does not support mapping network printers that are configured by using UNC paths.

Table 16-16. Translation Table Columns and Values

Column	Description
IP Range	<p>A translation rule that specifies a range of IP addresses for client systems.</p> <p>To specify IP addresses in a specific range, use the following notation: <i>ip_address-ip_address</i></p> <p>For example: 10.112.116.0-10.112.119.255</p> <p>To specify all of the IP addresses in a specific subnet, use the following notation: <i>ip_address/subnet_mask_bits</i></p> <p>For example: 10.112.4.0/22</p> <p>This notation specifies the usable IPv4 addresses from 10.112.4.1 to 10.112.7.254.</p> <p>Type an asterisk to match any IP address.</p>
Client Name	<p>A translation rule that specifies a computer name.</p> <p>For example: Mary's Computer</p> <p>Type an asterisk to match any computer name.</p>
Mac Address	<p>A translation rule that specifies a MAC address. In the GPO editor, you must use the same format that the client system uses. For example:</p> <ul style="list-style-type: none"> ■ Windows clients use hyphens: 01-23-45-67-89-ab ■ Linux clients use colons: 01:23:45:67:89:ab <p>Type an asterisk to match any MAC address.</p>
User/Group	<p>A translation rule that specifies a user or group name.</p> <p>To specify a particular user or group, use the following notation: <i>\\domain\user_or_group</i></p> <p>For example: \\mydomain\Mary</p> <p>Type an asterisk to match any user or group name.</p>
Printer Name	<p>The name of the printer when it is mapped to the remote desktop.</p> <p>For example: PRINTER-2-CLR</p> <p>The mapped name does not have to match the printer name on the client system.</p> <p>The printer must be local to the client device. Mapping a network printer in a UNC path is not supported.</p>
Printer Driver	<p>The name of the driver that the printer uses.</p> <p>For example: HP Color LaserJet 4700 PS</p> <p>IMPORTANT Because print jobs are sent directly from the desktop to the printer, the printer driver must be installed on the desktop.</p>
IP Port/ThinPrint Port	<p>For network printers, the IP address of the printer prepended with IP_.</p> <p>For example: IP_10.114.24.1</p> <p>The default port is 9001. You can specify a non-default port by appending the port number to the IP address.</p> <p>For example: IP_10.114.24.1:9004</p>
Default	Indicates whether the printer is the default printer.

You use the buttons that appear above the column headings to add, delete, and move rows and save and import table entries. Each button has an equivalent keyboard shortcut. Mouse over each button to see a description of the button and its equivalent keyboard shortcut. For example, to insert a row at the end of the table, click the first table button or press Alt+A. Click the last two buttons to import and save table entries.

Table 16-17 shows an example of two translation table rows.

Table 16-17. Location-Based Printing Group Policy Setting Example

IP Range	Client Name	Mac Address	User/ Group	Printer Name	Printer Driver	IP Port/ThinPrint Port	Default
*	*	*	*	PRINTER-1-CLR	HP Color LaserJet 4700 PS	IP_10.114.24.1	
10.112.116.140-10.112.116.145	*	*	*	PRINTER-2-CLR	HP Color LaserJet 4700 PS	IP_10.114.24.2	X

The network printer specified in the first row will be mapped to a remote desktop for any client system because asterisks appear in all of the translation rule columns. The network printer specified in the second row will be mapped to a remote desktop only if the client system has an IP address in the range 10.112.116.140 through 10.112.116.145.

Active Directory Group Policy Example

One way to implement Active Directory group policies in View is to create an OU for the View machines that deliver remote desktop sessions and link one or more GPOs to that OU. You can use these GPOs to apply group policy settings to your View machines.

You can link GPOs directly to a domain if the policy settings apply to all computers in the domain. As a best practice, however, most deployments should link GPOs to individual OUs to avoid policy processing on all computers in the domain.

You can configure policies on your Active Directory Server or on any computer in your domain. This example shows how to configure policies directly on your Active Directory server.

NOTE Because every View environment is different, you might need to perform different steps to meet your organization's specific needs.

Create an OU for View Machines

To apply group policies to the View machines that deliver remote desktop sessions without affecting other Windows computers in the same Active Directory domain, create an OU specifically for your View machines. You might create one OU for your entire View deployment or separate OUs for single-user machines and RDS hosts.

Procedure

- 1 On your Active Directory server, select **Start > All Programs > Administrative Tools > Active Directory Users and Computers**.
- 2 Right-click the domain that contains your View machines and select **New > Organizational Unit**.
- 3 Type a name for the OU and click **OK**.
The new OU appears in the left pane.
- 4 To add View machines to the new OU:
 - a Click **Computers** in the left pane.
All the computer objects in the domain appear in the right pane.
 - b Right-click the name of the computer object that represents the View machine in the right panel and select **Move**.
 - c Select the OU and click **OK**.
The View machine appears in the right pane when you select the OU.

What to do next

Create GPOs for View group policies.

Create GPOs for View Group Policies

Create GPOs to contain group policies for View components and location-based printing and link them to the OU for your View machines.

Prerequisites

- Create an OU for your View machines.
- Verify that the Group Policy Management feature is available on your Active Directory server.

Procedure

- 1 On the Active Directory server, open the Group Policy Management Console.

AD Version	Navigation Path
Windows 2012	Select Server Manager > Tools > Group Policy Management .
Windows 2008	Select Start > Administrative Tools > Group Policy Management .
Windows 2003	<ol style="list-style-type: none"> a Select Start > All Programs > Administrative Tools > Active Directory Users and Computers. b Right-click the OU that contains your View machines and select Properties. c On the Group Policy tab, click Open to open the Group Policy Management plug-in.

- 2 Expand your domain, right-click the OU that contains your View machines, and select **Create a GPO in this domain, and Link it here**.

On Windows 2003 Active Directory, this option is named **Create and Link a GPO Here**.

- 3 Type a name for the GPO and click **OK**.

The new GPO appears under the OU in the left pane.

- 4 (Optional) To apply the GPO only to specific View machines in the OU:

- a Select the GPO in the left pane.
- b Select **Security Filtering** > **Add**.
- c Type the computer names of the View machines and click **OK**.

The View machines appear in the Security Filtering pane. The settings in the GPO apply only to these machines.

What to do next

Add the View ADM templates to the GPO for group policies.

Add View ADM Templates to a GPO

To apply View component group policy settings to your remote desktops and applications, add their ADM template files to GPOs.

Prerequisites

- Create GPOs for the View component group policy settings and link them to the OU that contains your View machines.
- Verify that the Group Policy Management feature is available on your Active Directory server.

The steps for opening the Group Policy Management Console differ in the Windows 2012, Windows 2008, and Windows 2003 Active Directory versions. See “[Create GPOs for View Group Policies](#),” on page 223.

Procedure

- 1 Download the View GPO Bundle .zip file from the VMware Horizon (with View) download site at <http://www.vmware.com/go/downloadview>.

The file is named `VMware-Horizon-View-GPO-Bundle-x.x.x-yyyyyyy.zip`, where `x.x.x` is the version and `yyyyyyy` is the build number. All ADM and ADMX files that provide group policy settings for View are available in this file.

- 2 Copy the file to your Active Directory server and unzip the file.
- 3 On the Active Directory server, open the Group Policy Management Console.
- 4 Expand your domain, right-click the GPO that you created for the group policy settings, and select **Edit**.
- 5 In the Group Policy Management Editor, right-click the **Computer Configuration > Policies > Administrative Templates: Policy definitions** folder and select **Add/Remove Templates**.
- 6 Click **Add**, browse to the ADM Template file, and click **Open**.
- 7 Click **Close** to apply the policy settings in the ADM Template file to the GPO.

In Windows Server 2012 or 2008 Active Directory, the template name appears in the left pane under **Administrative Templates > Classic Administrative Templates (ADM)**. In Windows Server 2003 Active Directory, the template appears under **Administrative Templates**.

- 8 Configure the group policy settings.

What to do next

Enable loopback processing for your View machines.

Enable Loopback Processing for Remote Desktops

To make User Configuration settings that usually apply to a computer apply to all of the users that log in to that computer, enable loopback processing.

Prerequisites

- Create GPOs for the View component group policy settings and link them to the OU that contains your View machines.
- Verify that the Group Policy Management feature is available on your Active Directory server.

The steps for opening the Group Policy Management Console differ in the Windows 2012, Windows 2008, and Windows 2003 Active Directory versions. See “[Create GPOs for View Group Policies](#),” on page 223.

Procedure

- 1 On the Active Directory server, open the Group Policy Management Console.
- 2 Expand your domain, right-click the GPO that you created for the group policy settings, and select **Edit**.
- 3 In the Group Policy Management Editor, expand the **Computer Configuration, Policies, Administrative Templates: Policy definitions**, and **System** folders.
- 4 Double-click the **Group Policy** folder.
- 5 In the right pane, double-click **Configure user Group Policy loopback processing mode**.

- 6 Select **Enabled** and then select a loopback processing mode from the **Mode** drop-down menu.

Option	Action
Merge	The user policy settings applied are the combination of those included in both the computer and user GPOs. Where conflicts exist, the computer GPOs take precedence.
Replace	The user policy is defined entirely from the GPOs associated with the computer. Any GPOs associated with the user are ignored.

- 7 Click **OK** to save your changes.

Configuring User Profiles with View Persona Management

17

With View Persona Management, you can configure user profiles that are dynamically synchronized with a remote profile repository. This feature gives users access to a personalized desktop experience whenever they log in to a desktop. View Persona Management expands the functionality and improves the performance of Windows roaming profiles, but does not require Windows roaming profiles to operate.

You configure group policy settings to enable View Persona Management and control various aspects of your View Persona Management deployment.

To enable and use View Persona Management, you must have the appropriate VMware Horizon license. See the VMware End User Licensing Agreement (EULA) at <http://www.vmware.com/download/eula>.

This chapter includes the following topics:

- [“Providing User Personas in View,”](#) on page 227
- [“Using View Persona Management with Standalone Systems,”](#) on page 228
- [“Migrating User Profiles with View Persona Management,”](#) on page 229
- [“Persona Management and Windows Roaming Profiles,”](#) on page 231
- [“Configuring a View Persona Management Deployment,”](#) on page 232
- [“Best Practices for Configuring a View Persona Management Deployment,”](#) on page 241
- [“View Persona Management Group Policy Settings,”](#) on page 244

Providing User Personas in View

With the View Persona Management feature, a user's remote profile is dynamically downloaded when the user logs in to a View desktop. You can configure View to store user profiles in a secure, centralized repository. View downloads persona information as the user needs it.

View Persona Management is an alternative to Windows roaming profiles. View Persona Management expands functionality and improves performance compared to Windows roaming profiles.

You can configure and manage personas entirely within View. You do not have to configure Windows roaming profiles. If you have a Windows roaming profiles configuration, you can use your existing repository configuration with View.

A user profile is independent of the View desktop. When a user logs in to any desktop, the same profile appears.

For example, a user might log in to a floating-assignment, linked-clone desktop pool and change the desktop background and Microsoft Word settings. When the user starts the next session, the virtual machine is different, but the user sees the same settings.

A user profile comprises a variety of user-generated information:

- User-specific data and desktop settings
- Application data and settings
- Windows registry entries configured by user applications

Also, if you provision desktops with ThinApp applications, the ThinApp sandbox data can be stored in the user profile and roamed with the user.

View Persona Management minimizes the time it takes to log in to and log off of desktops. Login and logoff time can be a problem with Windows roaming profiles.

- During login, View downloads only the files that Windows requires, such as user registry files. Other files are copied to the local desktop when the user or an application opens them from the local profile folder.
- View copies recent changes in the local profile to the remote repository, typically once every few minutes. The default is every 10 minutes. You can specify how often to upload the local profile.
- During logoff, only files that were updated since the last replication are copied to the remote repository.

Using View Persona Management with Standalone Systems

You can install a standalone version of View Persona Management on physical computers and virtual machines that are not managed by View. With this software, you can manage user profiles across View desktops and standalone systems.

The standalone View Persona Management software operates on Windows XP SP3, Windows Vista, Windows 7, and Windows 8 operating systems.

You can use the standalone View Persona Management software to accomplish these goals:

- Share user profiles across standalone systems and View desktops.

Your users can continue to use standalone systems as well as View desktops with View Persona Management. If you use the same View Persona Management group policy settings to control View desktops and physical systems, users can receive their up-to-date profiles each time they log in, whether they use their legacy computers or View desktops.

NOTE View Persona Management does not support concurrent active sessions. A user must log out of one session before logging in to another.

- Migrate user profiles from physical systems to View desktops

If you intend to re-purpose legacy physical computers for use in a View deployment, you can install standalone View Persona Management on the legacy systems before you roll out View desktops to your users. When users log in to their legacy systems, their profiles are stored on the View remote profile repository. When users log in to their View desktops for the first time, their existing profiles are downloaded to their View desktops.

- Perform a staged migration from physical systems to View desktops

If you migrate your deployment in stages, users who do not yet have access to View desktops can use standalone View Persona Management. As each set of View desktops is deployed, users can access their profiles on their View desktops, and the legacy systems can be phased out. This scenario is a hybrid of the previous scenarios.

- Support up-to-date profiles when users go offline.

Users of standalone laptops can disconnect from the network. When a user reconnects, View Persona Management uploads the latest changes in the user's local profile to the remote profile repository.

NOTE Before a user can go offline, the user profile must be completely downloaded to the local system.

Migrating User Profiles with View Persona Management

With View Persona Management, you can migrate existing user profiles in a variety of settings to View desktops. When users log in to their View desktops after a profile migration is complete, they are presented with the personal settings and data that they used on their legacy systems.

By migrating user profiles, you can accomplish the following desktop migration goals:

- You can upgrade your users' systems from Windows XP to Windows 7 or Windows 8 and migrate your users from physical computers to View for the first time.
- In an existing View deployment, you can upgrade from Windows XP View desktops to Windows 7 or Windows 8 View desktops.
- You can migrate from physical computers to View desktops without upgrading the operating systems.

To support these scenarios, View Persona Management provides a profile migration utility and a standalone View Persona Management installer for physical or virtual machines that do not have View Agent 5.x installed.

[Table 17-1](#) shows various migration scenarios and outlines the tasks you should perform in each scenario.

Table 17-1. User Profile Migration Scenarios

If This Is Your Original Deployment...	And This Is Your Destination Deployment...	Perform These Tasks:
Windows XP physical computers	Windows 7 View desktops or Windows 8 View desktops	<ol style="list-style-type: none"> 1 Configure Windows 7 or Windows 8 View desktops with View Persona Management for your users. See “Configuring a View Persona Management Deployment,” on page 232. NOTE Do not roll out the Windows 7 or Windows 8 View desktops to your users until you complete step 2. 2 Run the View V1 to V2 profile migration utility. <ul style="list-style-type: none"> ■ For the source profiles, specify the local profiles on the Windows XP physical computers. ■ For the destination profiles, specify the remote profile repository that you configured for the View deployment. <p>For details, see the <i>View User Profile Migration</i> document.</p> 3 Allow your users to log in to their Windows 7 or Windows 8 View desktops.
<p>Windows XP physical computers or virtual machines that use a roaming user profile solution. For example, your deployment might use one of these solutions:</p> <ul style="list-style-type: none"> ■ View Persona Management ■ RTO Virtual Profiles ■ Windows roaming profiles <p>In this scenario, the original user profiles must be maintained in a remote profile repository.</p>	Windows 7 View desktops or Windows 8 View desktops	<ol style="list-style-type: none"> 1 Configure Windows 7 or Windows 8 View desktops with View Persona Management for your users. See “Configuring a View Persona Management Deployment,” on page 232. NOTE Do not roll out the Windows 7 or Windows 8 View desktops to your users until you complete step 2. 2 Run the View V1 to V2 profile migration utility. <ul style="list-style-type: none"> ■ For the source profiles, specify the remote profile repository for the Windows XP systems. ■ For the destination profiles, specify the remote profile repository that you configured for the View deployment. <p>For details, see the <i>View User Profile Migration</i> document.</p> 3 Allow your users to log in to their Windows 7 View desktops.

Table 17-1. User Profile Migration Scenarios (Continued)

If This Is Your Original Deployment...	And This Is Your Destination Deployment...	Perform These Tasks:
Windows XP physical computers or virtual machines. The legacy systems cannot have View Agent 5.x installed.	Windows XP View desktops	<ol style="list-style-type: none"> 1 Configure Windows XP View desktops with View Persona Management for your users. See “Configuring a View Persona Management Deployment,” on page 232. 2 Install the standalone View Persona Management software on the Windows XP systems. See “Install Standalone View Persona Management,” on page 236. 3 Configure the legacy Windows XP systems to use the same remote profile repository as the View desktops. See “Configure a User Profile Repository,” on page 232. The easiest approach is to use the same View Persona Management group policy settings in Active Directory to control both the legacy systems and the View desktops. See “Add the View Persona Management ADM Template File,” on page 237. 4 Roll out your Windows XP View desktops to your users.
Windows 7 or Windows 8 physical computers or virtual machines. The legacy systems cannot have View Agent 5.x installed.	Windows 7 View desktops or Windows 8 View desktops	<ol style="list-style-type: none"> 1 Configure Windows 7 or Windows 8 View desktops with View Persona Management for your users. See “Configuring a View Persona Management Deployment,” on page 232. 2 Install the standalone View Persona Management software on the Windows 7 or Windows 8 systems. See “Install Standalone View Persona Management,” on page 236. 3 Configure the legacy Windows 7 or Windows 8 systems to use the same remote profile repository as the View desktops. See “Configure a User Profile Repository,” on page 232. The easiest approach is to use the same View Persona Management group policy settings in Active Directory to control both the legacy systems and the View desktops. See “Add the View Persona Management ADM Template File,” on page 237. 4 Roll out your Windows 7 or Windows 8 View desktops to your users.

Persona Management and Windows Roaming Profiles

When Persona Management is enabled, you cannot manage View users' personas by using the Windows roaming profiles functions.

For example, if you log in to a desktop's guest operating system, navigate to the **Advanced** tab in the System Properties dialog box, and change the User Profiles settings from **Roaming profile** to **Local profile**, View Persona Management continues to synchronize the user's persona between the local desktop and the remote persona repository.

However, you can specify files and folders within users' personas that are managed by Windows roaming profiles functionality instead of View Persona Management. You use the **Windows Roaming Profiles Synchronization** policy to specify these files and folders.

Configuring a View Persona Management Deployment

To configure View Persona Management, you set up a remote repository that stores user profiles, install View Agent with the **View Persona Management** setup option on virtual machines that deliver remote desktop sessions, add and configure View Persona Management group policy settings, and deploy desktop pools.

You can also configure View Persona Management for a non-View deployment. You install the standalone version of View Persona Management on your users' non-View laptops, desktops, or virtual machines. You must also set up a remote repository and configure View Persona Management group policy settings.

Overview of Setting Up a View Persona Management Deployment

To set up a View desktop deployment or standalone computers with View Persona Management, you must perform several high-level tasks.

This sequence is recommended, although you can perform these tasks in a different sequence. For example, you can configure or reconfigure group policy settings in Active Directory after you deploy desktop pools.

- 1 Configure a remote repository to store user profiles.

You can configure a network share or use an existing Active Directory user profile path that you configured for Windows roaming profiles.

- 2 Install View Agent with the **View Persona Management** setup option on the virtual machines that you use to create desktop pools.

To configure View Persona Management for non-View laptops, desktops, or virtual machines, install the standalone View Persona Management software on each computer in your targeted deployment.

- 3 Add the View Persona Management Administrative (ADM) Template file to your Active Directory server or the Local Computer Policy configuration on the parent virtual machine.

To configure View Persona Management for your whole View or non-View deployment, add the ADM Template file to Active Directory.

To configure View Persona Management for one desktop pool, you can take these approaches:

- Add the ADM Template file to the virtual machine that you use to create the pool.
- Add the ADM Template file to Active Directory and apply the group policy settings to the OU that contains the machines in the pool.

- 4 Enable View Persona Management by enabling the **Manage user persona** group policy setting.
- 5 If you configured a network share for the remote profile repository, enable the **Persona repository location** group policy setting and specify the network share path.
- 6 (Optional) Configure other group policy settings in Active Directory or the Local Computer Policy configuration.
- 7 Create desktop pools from the virtual machines on which you installed View Agent with the **View Persona Management** setup option.

Configure a User Profile Repository

You can configure a remote repository to store the user data and settings, application-specific data, and other user-generated information in user profiles. If Windows roaming profiles are configured in your deployment, you can use an existing Active Directory user profile path instead.

NOTE You can configure View Persona Management without having to configure Windows roaming profiles.

Prerequisites

- Familiarize yourself with the minimum access permissions that are required to configure a shared folder. See “[Setting Access Permissions on Shared Folders for View Persona Management](#),” on page 233.
- Familiarize yourself with the guidelines for creating a user profile repository. See “[Creating a Network Share for View Persona Management](#),” on page 234

Procedure

- 1 Determine whether to use an existing Active Directory user profile path or configure a user profile repository on a network share.

Option	Action
Use an existing Active Directory user profile path	If you have an existing Windows roaming profiles configuration, you can use the user profile path in Active Directory that supports roaming profiles. You can skip the remaining steps in this procedure.
Configure a network share to store the user profile repository	If you do not have an existing Windows roaming profiles configuration, you must configure a network share for the user profile repository. Follow the remaining steps in this procedure.

- 2 Create a shared folder on a computer that your users can access from the guest operating systems on their desktops.

If %username% is not part of the folder path that you configure, View Persona Management appends %username%.%userdomain% to the path.

For example: \\server.domain.com\VPRepository\%username%.%userdomain%

- 3 Set access permissions for the shared folders that contain user profiles.



CAUTION Make sure that access permissions are configured correctly. The incorrect configuration of access permissions on the shared folder is the most common cause of problems with View Persona Management.

Setting Access Permissions on Shared Folders for View Persona Management

View Persona Management and Windows roaming profiles require a specific minimum level of permissions on the user profile repository. View Persona Management also requires that the security group of the users who put data on the shared folder must have read attributes on the share.

Set the required access permissions on your user profile repository and redirected folder share.

Table 17-2. Minimum NTFS Permissions Required for the User Profile Repository and Redirected Folder Share

User Account	Minimum Permissions Required
Creator Owner	Full Control, Subfolders and Files Only
Administrator	None. Instead, enable the Windows group policy setting, Add the Administrators security group to the roaming user profiles . In the Group Policy Object Editor, this policy setting is located in Computer Configuration\Administrative Templates\System\User Profiles\ .
Security group of users needing to put data on share	List Folder/Read Data, Create Folders/Append Data, Read Attributes - This Folder Only
Everyone	No permissions
Local System	Full Control, This Folder, Subfolders and Files

Table 17-3. Share Level (SMB) Permissions Required for User Profile Repository and Redirected Folder Share

User Account	Default Permissions	Minimum Permissions Required
Everyone	Read only	No permissions
Security group of users needing to put data on share	N/A	Full Control

For information about roaming user profiles security, see the Microsoft TechNet topic, *Security Recommendations for Roaming User Profiles Shared Folders*.

[http://technet.microsoft.com/en-us/library/cc757013\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc757013(WS.10).aspx)

Creating a Network Share for View Persona Management

You must follow certain guidelines when you create a shared folder to use as a profile repository.

- If you use Windows 8 desktops and your network share uses a OneFS file system on an EMC Isilon NAS device, the OneFS file system must be version 6.5.5.11 or later.
- You can create the shared folder on a server, a network-attached storage (NAS) device, or a network server.
- The shared folder does not have to be in the same domain as View Connection Server.
- The shared folder must be in the same Active Directory forest as the users who store profiles in the shared folder.
- You must use a shared drive that is large enough to store the user profile information for your users. To support a large View deployment, you can configure separate repositories for different desktop pools.

If users are entitled to more than one pool, the pools that share users must be configured with the same profile repository. If you entitle a user to two pools with two different profile repositories, the user cannot access the same version of the profile from desktops in each pool.

- You must create the full profile path under which the user profile folders will be created. If part of the path does not exist, Windows creates the missing folders when the first user logs in and assigns the user's security restrictions to those folders. Windows assigns the same security restrictions to every folder it creates under that path.

For example, for user1 you might configure the View Persona Management path `\\server\VPRepository\profiles\user1`. If you create the network share `\\server\VPRepository`, and the `profiles` folder does not exist, Windows creates the path `\profiles\user1` when user1 logs in. Windows restricts access to the `\profiles\user1` folders to the user1 account. If another user logs in with a profile path in `\\server\VPRepository\profiles`, the second user cannot access the repository and the user's profile fails to be replicated.

Install View Agent with the View Persona Management Option

To use View Persona Management with View desktops, you must install View Agent with the **View Persona Management** setup option on the virtual machines that you use to create desktop pools.

For an automated pool, you install View Agent with the **View Persona Management** setup option on the virtual machine that you use as a parent or template. When you create a desktop pool from the virtual machine, the View Persona Management software is deployed on your View desktops.

For a manual pool, you must install View Agent with the **View Persona Management** setup option on each virtual machine that is used as a desktop in the pool. Use Active Directory to configure View Persona Management group policies for a manual pool. The alternative is to add the ADM Template file and configure group policies on each individual machine.

NOTE A user cannot access the same profile if the user switches between desktops that have v1 user profiles and v2 user profiles. Windows XP uses v1 profiles. Windows 8 and Windows 7 use v2 profiles.

For example, if a user logs in to a Windows XP desktop and later logs in to a Windows 7 desktop, the Windows 7 virtual machine cannot read the v1 profile that was created during the Windows XP desktop session.

You can use the View profile migration command-line utility to migrate Windows XP profiles to Windows 7 or Windows 8 profiles. See the *View User Profile Migration* document.

Prerequisites

- Verify that you are performing the installation on a Windows 8, Windows 7, Windows Vista, or Windows XP virtual machine. View Persona Management does not operate on Microsoft RDS hosts.

Installing View Agent with the **View Persona Management** setup option does not work on physical computers. You can install the standalone View Persona Management software on physical computers. See [“Install Standalone View Persona Management,”](#) on page 236.
- Verify that you can log in as an administrator on the virtual machine.
- Verify that a native RTO Virtual Profiles 2.0 is not installed on the virtual machine. If a native RTO Virtual Profile 2.0 is present, uninstall it before you install View Agent with the **View Persona Management** setup option.
- On Windows XP virtual machines, download and install the Microsoft User Profile Hive Cleanup Service (UPHClean) in the guest operating system. See [“Installing UPHClean on Windows XP Machines That Use View Persona Management,”](#) on page 235.
- Familiarize yourself with installing View Agent. See [“Install View Agent on a Virtual Machine,”](#) on page 25 or [“Install View Agent on an Unmanaged Machine,”](#) on page 15.

Procedure

- ◆ When you install View Agent on a virtual machine, select the **View Persona Management** setup option.

What to do next

Add the View Persona Management ADM Template file to your Active Directory server or the Local Computer Policy configuration on the virtual machine itself. See [“Add the View Persona Management ADM Template File,”](#) on page 237.

Installing UPHClean on Windows XP Machines That Use View Persona Management

The Microsoft User Profile Hive Cleanup Service (UPHClean) ensures that user sessions are completely terminated when a user logs off. UPHClean cleans registry key handles that might be stranded by other processes and applications. This service helps to ensure that the user's registry hive is unloaded so that it can be uploaded successfully and the local persona can be deleted.

If you configure View Persona Management on Windows XP virtual machines, download and install UPHClean in the guest operating system.

You can download the UPHClean service at the following location:

<http://www.microsoft.com/download/en/details.aspx?displaylang=en&id=6676>.

The UPHClean service is included with Windows 7 and Windows Vista operating systems. You do not have to install the service on these operating systems.

Install Standalone View Persona Management

To use View Persona Management with non-View physical computers or virtual machines, install the standalone version of View Persona Management. You can run an interactive installation or a silent installation at the command line.

Install the standalone View Persona Management software on each individual computer or virtual machine in your targeted deployment.

Prerequisites

- Verify that you are performing the installation on a Windows 8, Windows 7, Windows Vista, or Windows XP SP3 physical computer or virtual machine. View Persona Management does not operate on Windows Servers or Microsoft RDS hosts. Verify that the system satisfies the requirements described in "Supported Operating Systems for Standalone View Persona Management" in the *View Installation* document.
- Verify that you can log in as an administrator on the system.
- Verify that View Agent 5.x or later is not installed on the computer.
- Verify that a native RTO Virtual Profiles 2.0 is not installed on the virtual machine.
- If you intend to perform a silent installation, familiarize yourself with the MSI installer command-line options. See "[Microsoft Windows Installer Command-Line Options](#)," on page 30.

Procedure

- 1 Download the standalone View Persona Management installer file from the VMware product page at <http://www.vmware.com/products/>.

The installer filename is VMware-personamanagement-y.y.y-xxxxxx.exe or VMware-personamanagement-x86_64-y.y.y-xxxxxx.exe, where y.y.y is the version number and xxxxxx is the build number.

- 2 Run the installation program interactively or perform a silent installation.

Option	Description
Interactive installation	<ol style="list-style-type: none"> a To start the installation program, double-click the installer file. b Accept the VMware license terms. c Click Install. <p>By default, View Persona Management is installed in the C:\Program Files\VMware\VMware View Persona Management directory.</p> <ol style="list-style-type: none"> d Click Finish.
Silent installation	<p>Open a Windows command prompt on the machine and type the installation command on one line.</p> <p>For example: VMware-personamanagement-y.y.y-xxxxxx.exe /s /v"/qn /l*v ""c:\persona.log"" ALLUSERS=1"</p> <p>IMPORTANT You must include the ALLUSERS=1 property in the command line.</p>

- 3 Restart your system to allow the installation changes to take effect.

What to do next

Add the View Persona Management ADM Template file to your Active Directory or local group policy configuration.

Add the View Persona Management ADM Template File

The View Persona Management Administrative (ADM) Template file contains group policy settings that allow you to configure View Persona Management. Before you can configure the policies, you must add the ADM Template file to the local systems or Active Directory server.

To configure View Persona Management on a single system, you can add the group policy settings to the Local Computer Policy configuration on that local system.

To configure View Persona Management for a desktop pool, you can add the group policy settings to the Local Computer Policy configuration on the virtual machine that you use as a parent or template for deploying the desktop pool.

To configure View Persona Management at the domain-wide level and apply the configuration to many View machines or your whole deployment, you can add the group policy settings to Group Policy Objects (GPOs) on your Active Directory server. In Active Directory, you can create an OU for the View machines that use View Persona Management, create one or more GPOs, and link the GPOs to the OU. To configure separate View Persona Management policies for different types of users, you can create OUs for particular sets of View machines and apply different GPOs to the OUs.

For example, you might create one OU for View machines with View Persona Management and another OU for physical computers on which the standalone View Persona Management software is installed.

For an example of implementing Active Directory group policies in View, see “[Active Directory Group Policy Example](#),” on page 222.

Add the Persona Management ADM Template to a Single System

To configure View Persona Management for a single desktop pool, you must add the Persona Management ADM Template file to the Local Computer Policy on the virtual machine that you use to create the pool. To configure View Persona Management on a single system, you must add the Persona Management ADM Template file to that system.

Prerequisites

- Verify that View Agent is installed with the View Persona Management setup option on the system. See “[Install View Agent with the View Persona Management Option](#),” on page 234.
- Verify that you can log in as an administrator on the system.

Procedure

- 1 Download the View GPO Bundle .zip file from the VMware Horizon (with View) download site at <http://www.vmware.com/go/downloadview>.

The file is named `VMware-Horizon-View-GPO-Bundle-x.x.x-yyyyyy.zip`, where `x.x.x` is the version and `yyyyyy` is the build number. All ADM and ADMX files that provide group policy settings for View are available in this file.

- 2 Unzip the file and copy the the ADM file, `ViewPM.adm`, to the local system.
- 3 On the local system, click **Start > Run**.
- 4 Type `gpedit.msc` and click **OK**.

- 5 In the Local Computer Policy window, navigate to **Computer Configuration** and right-click **Administrative Templates**.

NOTE Do not select **Administrative Templates** under **User Configuration**.

- 6 Click **Add/Remove Templates** and click **Add**.
- 7 Browse to the directory that contains the ViewPM.adm file.
- 8 Select the ViewPM.adm file and click **Add**.
- 9 Close the Add/Remove Templates window.

The View Persona Management group policy settings are added to the Local Computer Policy configuration on the local system. You must use `gpedit.msc` to display this configuration.

What to do next

Configure the View Persona Management group policy settings on the local system. See “[Configure View Persona Management Policies](#),” on page 239.

Add the Persona Management ADM Template to Active Directory

To configure View Persona Management for your deployment, you can add the Persona Management ADM Template file to a Group Policy Object (GPO) in your Active Directory server.

Prerequisites

- Create GPOs for your View Persona Management deployment and link them to the OU that contains the View machines that use View Persona Management. See “[Active Directory Group Policy Example](#),” on page 222.
- Verify that the Microsoft MMC and the Group Policy Object Editor snap-in are available on your Active Directory server.
- Verify that View Agent is installed with the View Persona Management setup option on a system that is accessible to your Active Directory server. See “[Install View Agent with the View Persona Management Option](#),” on page 234.

Procedure

- 1 Download the View GPO Bundle .zip file from the VMware Horizon (with View) download site at <http://www.vmware.com/go/downloadview>.

The file is named `VMware-Horizon-View-GPO-Bundle-x.x.x-yyyyyy.zip`, where `x.x.x` is the version and `yyyyyy` is the build number. All ADM and ADMX files that provide group policy settings for View are available in this file.
- 2 Unzip the file and copy the View Persona Management ADM Template file, `ViewPM.adm`, to your Active Directory server.
- 3 On your Active Directory server, open the Group Policy Management Console.

For example, start the Run dialog box, type `gpmmc.msc`, and click **OK**.
- 4 In the left pane, select the domain or OU that contains your View machines.
- 5 In the right pane, right-click the GPO that you created for the group policy settings and select **Edit**.

The Group Policy Object Editor window appears.
- 6 In the Group Policy Object Editor, right-click **Administrative Templates** under **Computer Configuration** and select **Add/Remove Templates**.
- 7 Click **Add**, browse to the `ViewPM.adm` file, and click **Open**.

- 8 Click **Close** to apply the policy settings in the ADM Template file to the GPO.

The name of the template appears in the left pane under **Administrative Templates**.

What to do next

Configure the View Persona Management group policy settings on your Active Directory server.

Configure View Persona Management Policies

To use View Persona Management, you must enable the **Manage user persona** group policy setting, which activates the View Persona Management software. To set up a user profile repository without using an Active Directory user profile path, you must configure the **Persona repository location** group policy setting.

You can configure the optional group policy settings to configure other aspects of your View Persona Management deployment.

If Windows roaming profiles are already configured in your deployment, you can use an existing Active Directory user profile path. You can leave the **Persona repository location** setting disabled or not configured.

Prerequisites

- Familiarize yourself with the **Manage user persona** and **Persona repository location** group policy settings. See [“Roaming and Synchronization Group Policy Settings,”](#) on page 245.
- If you are setting group policies on a local system, familiarize yourself with opening the Group Policy window. See steps [Step 3](#) and [Step 4](#) in [“Add the Persona Management ADM Template to a Single System,”](#) on page 237.
- If you are setting group policies on your Active Directory server, familiarize yourself with starting the Group Policy Object Editor. See steps [Step 3](#) through [Step 5](#) in [“Add the Persona Management ADM Template to Active Directory,”](#) on page 238.

Procedure

- 1 Open the Group Policy window.

Option	Description
Local system	Open the Local Computer Policy window.
Active Directory server	Open the Group Policy Object Editor window.

- 2 Expand the **Computer Configuration** folder and navigate to the **Persona Management** folder.

Option	Description
Windows XP or Windows Server 2003	Expand the following folders: Administrative Templates, VMware View Agent Configuration, Persona Management
Windows Vista and later or Windows Server 2008 and later	Expand the following folders: Administrative Templates, Classic Administrative Templates (ADM), VMware View Agent Configuration, Persona Management

- 3 Open the **Roaming & Synchronization** folder.
- 4 Double-click **Manage user persona** and click **Enabled**.

This setting activates View Persona Management. When this setting is disabled or not configured, View Persona Management does not function.

- 5 Type the profile upload interval, in minutes, and click **OK**.
The profile upload interval determines how often View Persona Management copies user profile changes to the remote repository. The default upload interval is 10 minutes.
- 6 Double-click **Persona repository location** and click **Enabled**.
If you have an existing Windows roaming profiles deployment, you can use an Active Directory user profile path for the remote profile repository. You do not have to configure a **Persona repository location**.
- 7 Type the UNC path to a network file server share that stores the user profiles.
For example: \\server.domain.com\UserProfilesRepository\%username%
The network share must be accessible to the virtual machines in your deployment.
If you intend to use an Active Directory user profile path, you do not have to specify a UNC path.
- 8 If an Active Directory user profile path is configured in your deployment, determine whether to use or override this path.

Option	Action
Use the network share.	Check the Override Active Directory user profile path if it is configured check box.
Use an Active Directory user profile path, if one exists.	Do not check the Override Active Directory user profile path if it is configured check box.

- 9 Click **OK**.
- 10 (Optional) Configure other View Persona Management group policy settings.

Create Desktop Pools That Use Persona Management

To use View Persona Management with View desktops, you must create desktop pools with a View Persona Management agent installed on each machine.

You cannot use View Persona Management on RDS desktop pools, which run on Remote Desktop Services (RDS) hosts.

Prerequisites

- Verify that View Agent with the **View Persona Management** setup option is installed on the virtual machine that you use to create the desktop pool. See [“Install View Agent with the View Persona Management Option,”](#) on page 234.
- If you intend to configure View Persona Management policies for this desktop pool only, verify that you added the View Persona Management ADM Template file to the virtual machine and configured group policy settings in the Local Computer Policy configuration. See [“Add the Persona Management ADM Template to a Single System,”](#) on page 237 and [“Configure View Persona Management Policies,”](#) on page 239.

Procedure

- Generate a snapshot or template from the virtual machine and create an automated desktop pool.
You can configure View Persona Management with pools that contain full virtual machines or linked clones. The pools can use dedicated or floating assignments.
- (Optional) To use View Persona Management with manual desktop pools, select machines on which View Agent with the **View Persona Management** option is installed.

NOTE After you deploy View Persona Management on your View desktop pools, if you remove the **View Persona Management** setup option on the View machines, or uninstall View Agent altogether, the local user profiles are removed from the machines of users who are not currently logged in. For users who are currently logged in, the user profiles are downloaded from the remote profile repository during the uninstall process.

Best Practices for Configuring a View Persona Management Deployment

You should follow best practices for configuring View Persona Management to enhance your users' desktop experience, improve desktop performance, and ensure that View Persona Management operates efficiently with other View features.

Determining Whether to Remove Local User Profiles at Logoff

By default, View Persona Management does not delete user profiles from the local machines when users log off. The **Remove local persona at log off** policy is disabled. In many cases, the default setting is a best practice because it reduces I/O operations and avoids redundant behavior.

For example, keep this policy disabled if you deploy floating-assignment pools and either refresh or delete the machines on logoff. The local profile is deleted when the virtual machine is refreshed or deleted. In a floating-assignment, automated pool, full virtual machines can be deleted after logoff. In a floating-assignment, linked-clone pool, the clones can be refreshed or deleted on logoff.

If you deploy dedicated-assignment pools, you can keep the policy disabled because users return to the same machines at each session. With the policy disabled, when a user logs in, View Persona Management does not have to download files that are present in the local profile. If you configure dedicated-assignment, linked-clone pools with persistent disks, keep the policy disabled to avoid deleting user data from the persistent disks.

In some cases, you might want to enable the **Remove local persona at log off** policy.

Handling Deployments That Include View Persona Management and Windows Roaming Profiles

In deployments in which Windows roaming profiles are configured, and users access View desktops with View Persona Management and standard desktops with Windows roaming profiles, the best practice is to use different profiles for the two desktop environments. If a View desktop and the client computer from which the desktop is launched are in the same domain, and you use an Active Directory GPO to configure both Windows roaming profiles and View Persona Management, enable the **Persona repository location** policy and select **Override Active Directory user profile path if it is configured**.

This approach prevents Windows roaming profiles from overwriting a View Persona Management profile when the user logs off from the client computer.

If users intend to share data between existing Windows roaming profiles and View Persona Management profiles, you can configure Windows folder redirection.

Configuring Paths for Redirected Folders

When you use the **Folder Redirection** group policy setting, configure the folder path to include %username%, but make sure that the last subfolder in the path uses the name of the redirected folder, such as My Videos. The last folder in the path is displayed as the folder name on the user's desktop.

For example, if you configure a path such as \\myserver\videos\%username%\My Videos, the folder name that appears on the user's desktop is My Videos.

If %username% is the last subfolder in the path, the user's name appears as the folder name. For example, instead of seeing a My Videos folder on the desktop, the user JDoe sees a folder named JDoe and cannot easily identify the folder.

Using the Windows Event Log to Monitor the View Persona Management Deployment

To help you manage your deployment, View Persona Management provides improved log messages and profile size and file and folder count tracking. View Persona Management uses the file and folder counts to suggest folders for redirection in the Windows event log and provides statistics for these folders. For example, when a user logs in, the Windows event log might display the following suggestions to redirect folders:

```
Profile path: \\server.domain.com\persona\user1V2
...
Folders to redirect:
\\server.domain.com\persona\user1V2 Reason: Folder size larger than 1GB
\\server.domain.com\persona\user1V2\Documents Reason: More than 10000 files and folders
```

Additional Best Practices

You can also follow these recommendations:

- By default, many antivirus products do not scan offline files. For example, when a user logs in to a desktop, these anti-virus products do not scan user profile files that are not specified in the **Files and folders to preload** or **Windows roaming profiles synchronization** group policy setting. For many deployments, the default behavior is the best practice because it reduces the I/O required to download files during on-demand scans.

If you do want to retrieve files from the remote repository and enable scanning of offline files, see the documentation for your antivirus product.

- It is highly recommended that you use standard practices to back up network shares on which View Persona Management stores the profile repository.

NOTE Do not use backup software such as MozyPro or Windows Volume backup services with View Persona Management to back up user profiles on View desktops.

View Persona Management ensures that user profiles are backed up to the remote profile repository, eliminating the need for additional tools to back up user data on the desktops. In certain cases, tools such as MozyPro or Windows Volume backup services can interfere with View Persona Management and cause data loss or corruption.

- You can set View Persona Management policies to enhance performance when users start ThinApp applications. See [“Configuring User Profiles to Include ThinApp Sandbox Folders,”](#) on page 243.
- If your users generate substantial persona data, and you plan to use refresh and recompose to manage dedicated-assignment, linked-clone desktops, configure your desktop pool to use separate View Composer persistent disks. Persistent disks can enhance the performance of View Persona Management. See [“Configuring View Composer Persistent Disks with View Persona Management,”](#) on page 243.
- If you configure View Persona Management for standalone laptops, make sure that the profiles are kept synchronized when users go offline. See [“Manage User Profiles on Standalone Laptops,”](#) on page 243.
- Do not use Windows Client-Side Caching with View Persona Management. The Windows Client-Side Caching system is a mechanism that supports the Windows Offline Files feature. If this system is in effect on the local system, View Persona Management features such as folder redirection, offline file population during logon, background download, and replication of local profile files to the remote profile repository do not work properly.

As a best practice, disable the Windows Offline Files feature before you begin using View Persona Management. If you encounter issues with View Persona Management because Windows Client-Side Caching is in effect on your desktops, you can resolve these issues by synchronizing the profile data that currently resides in the local Client-Side Caching database and disabling the Windows Offline Files feature. For instructions, see [KB 2016416: View Persona Management features do not function when Windows Client-Side Caching is in effect](#).

Configuring User Profiles to Include ThinApp Sandbox Folders

View Persona Management maintains user settings that are associated with ThinApp applications by including ThinApp sandbox folders in user profiles. You can set View Persona Management policies to enhance performance when users start ThinApp applications.

View Persona Management preloads ThinApp sandbox folders and files in the local user profile when a user logs in. The ThinApp sandbox folders are created before a user can complete the log on. To enhance performance, View Persona Management does not download the ThinApp sandbox data during the login, although files are created on the local desktop with the same basic attributes and sizes as the ThinApp sandbox files in the user's remote profile.

As a best practice, download the actual ThinApp sandbox data in the background. Enable the **Folders to background download** group policy setting and add the ThinApp sandbox folders. See [“Roaming and Synchronization Group Policy Settings,”](#) on page 245.

The actual ThinApp sandbox files can be large. With the **Folders to background download** setting, users do not have to wait for large files to download when they start an application. Also, users do not have to wait for the files to preload when they log in, as they might if you use the **Files and folders to preload** setting with large files.

Configuring View Composer Persistent Disks with View Persona Management

With View Composer persistent disks, you can preserve user data and settings while you manage linked-clone OS disks with refresh, recompose, and rebalance operations. Configuring persistent disks can enhance the performance of View Persona Management when users generate a large amount of persona information. You can configure persistent disks only with dedicated-assignment, linked-clone desktops.

View Persona Management maintains each user profile on a remote repository that is configured on a network share. After a user logs into a desktop, the persona files are dynamically downloaded as the user needs them.

If you configure persistent disks with View Persona Management, you can refresh and recompose the linked-clone OS disks and keep a local copy of the each user profile on the persistent disks.

The persistent disks can act as a cache for the user profiles. When a user requires persona files, View Persona Management does not need to download data that is the same on the local persistent disk and the remote repository. Only unsynchronized persona data needs to be downloaded.

If you configure persistent disks, do not enable the **Remove local persona at log off** policy. Enabling this policy deletes the user data from the persistent disks when users log off.

Manage User Profiles on Standalone Laptops

If you install View Persona Management on standalone (non-View) laptops, make sure that the user profiles are kept synchronized when users take their standalone laptops offline.

To ensure that a standalone laptop user has an up-to-date local profile, you can configure the View Persona Management group policy setting, **Enable background download for laptops**. This setting downloads the entire user profile to the standalone laptop in the background.

As a best practice, notify your users to make sure that their user profiles are completely downloaded before they disconnect from the network. Tell users to wait for the `Background download complete` notice to appear on their laptop screens before they disconnect.

To allow the `Background download complete` notice to be displayed on user laptops, configure the View Persona Management group policy setting, `Show critical errors to users via tray icon alerts`.

If a user disconnects from the network before the profile download is complete, the local profile and remote profile might become unsynchronized. While the user is offline, the user might update a local file that was not fully downloaded. When the user reconnects to the network, the local profile is uploaded, overwriting the remote profile. Data that was in the original remote profile might be lost.

The following steps provide an example you might follow.

Prerequisites

Verify that View Persona Management is configured for your users' standalone laptops. See [“Configuring a View Persona Management Deployment,”](#) on page 232.

Procedure

- 1 In the Active Directory OU that controls your standalone laptops, enable the `Enable background download for laptops` setting.

In the Group Policy Object Editor, expand the following folders: **Computer Configuration, Administrative Templates, Classic Administrative Templates (ADM), VMware View Agent Configuration, Persona Management, Roaming & Synchronization.**

The **Classic Administrative Templates (ADM)** folder appears only in Windows Vista or later and Windows Server 2008 or later releases.

- 2 For standalone laptops, you must use a non-View method to notify users when they log in.

For example, you might distribute this message:

Your personal data is dynamically downloaded to your laptop after you log in. Make sure your personal data has finished downloading before you disconnect your laptop from the network. A "Background download complete" notice pops up when your personal data finishes downloading.

View Persona Management Group Policy Settings

The View Persona Management ADM Template file contains group policy settings that you add to the Group Policy configuration on individual systems or on an Active Directory server. You must configure the group policy settings to set up and control various aspects of View Persona Management.

The ADM Template file is named `ViewPM.adm`.

This ADM file is available in a bundled `.zip` file named `VMware-Horizon-View-GPO-Bundle-x.x.x-yyyyyy.zip`, which you can download from the VMware Horizon (with View) download site at <http://www.vmware.com/go/downloadview>.

After you add the `ViewPM.adm` file to your Group Policy configuration, the policy settings are located in the **Persona Management** folder in the Group Policy window.

Table 17-4. Location of View Persona Management Settings in the Group Policy Window

Operating System	Location
Windows Vista and later or Windows Server 2008 and later	Computer Configuration > Administrative Templates > Classic Administrative Templates (ADM) > VMware View Agent Configuration > Persona Management
Windows XP or Windows Server 2003	Computer Configuration > Administrative Templates > VMware View Agent Configuration > Persona Management

The group policy settings are contained in these folders:

- Roaming & Synchronization
- Folder Redirection
- Desktop UI
- Logging

Roaming and Synchronization Group Policy Settings

The roaming and synchronization group policy settings turn View Persona Management on and off, set the location of the remote profile repository, determine which folders and files belong to the user profile, and control how to synchronize folders and files.

Group Policy Setting	Description
Manage user persona	<p>Determines whether to manage user profiles dynamically with View Persona Management or with Windows roaming profiles. This setting turns View Persona Management on and off.</p> <p>When this setting is enabled, View Persona Management manages user profiles.</p> <p>When the setting is enabled, you can specify a profile upload interval in minutes. This value determines how often changes in the user profile are copied to the remote repository. The default value is 10 minutes.</p> <p>When this setting is disabled or not configured, user profiles are managed by Windows.</p>
Persona repository location	<p>Specifies the location of the user profile repository. This setting also determines whether to use a network share that is specified in View Persona Management or a path that is configured in Active Directory to support Windows roaming profiles.</p> <p>When this setting is enabled, you can use the Share path to determine the location of the user profile repository.</p> <p>In the Share path text box, you specify a UNC path to a network share that is accessible to View Persona Management desktops. This setting lets View Persona Management control the location of the user profile repository.</p> <p>For example: <code>\\server.domain.com\VPRepository</code></p> <p>If <code>%username%</code> is not part of the folder path that you configure, View Persona Management appends <code>%username%.%userdomain%</code> to the path.</p> <p>For example: <code>\\server.domain.com\VPRepository\%username%.%userdomain%</code></p> <p>If you specify a location in the Share path, you do not have to set up roaming profiles in Windows or configure a user profile path in Active Directory to support Windows roaming profiles.</p> <p>For details about configuring a UNC network share for View Persona Management, see “Configure a User Profile Repository,” on page 232.</p> <p>By default, the Active Directory user profile path is used.</p> <p>Specifically, when the Share path is left blank, the Active Directory user profile path is used. The Share path is blank and inactive when this setting is disabled or not configured. You can also leave the path blank when this setting is enabled.</p> <p>When this setting is enabled, you can select the Override Active Directory user profile path if it is configured check box to make sure that View Persona Management uses the path specified in the Share path. By default, this check box is unchecked, and View Persona Management uses the Active Directory user profile path when both locations are configured.</p>
Remove local persona at log off	<p>Deletes each user's locally stored profile from the View machine when the user logs off.</p> <p>You can also check a box to delete each user's local settings folders when the user profile is removed. When using Windows 8, Windows 7, or Windows Vista, checking this box removes the <code>AppData\Local</code> folder. In Windows XP, checking the box removes the <code>Local Settings</code> folder.</p> <p>For guidelines for using this setting, see “Best Practices for Configuring a View Persona Management Deployment,” on page 241.</p> <p>When this setting is disabled or not configured, the locally stored user profiles, including local settings folders, are not deleted when users log off.</p>

Group Policy Setting	Description
Roam local settings folders	<p>Roams the local settings folders with the rest of each user profile.</p> <p>For Windows 8, Windows 7, or Windows Vista, this policy affects the <code>AppData\Local</code> folder. For Windows XP, this policy affects the <code>Local Settings</code> folder.</p> <p>By default, local settings are not roamed.</p>
Files and folders to preload	<p>Specifies a list of files and folders that are downloaded to the local user profile when the user logs in. Changes in the files are copied to the remote repository as they occur.</p> <p>In some situations, you might want to preload specific files and folders into the locally stored user profile. Use this setting to specify these files and folders.</p> <p>Specify paths that are relative to the root of the local profile. Do not specify a drive in a pathname. For example: <code>Application Data\Microsoft\Certificates</code></p> <p>After the specified files and folders are preloaded, View Persona Management manages the files and folders in the same way that it manages other profile data. When a user updates preloaded files or folders, View Persona Management copies the updated data to the remote profile repository during the session, at the next profile upload interval.</p>
Files and folders to preload (exceptions)	<p>Prevents the specified files and folders from being preloaded.</p> <p>The selected folder paths must reside within the folders that you specify in the Files and folders to preload setting.</p> <p>Specify paths that are relative to the root of the local profile. Do not specify a drive in a pathname.</p>
Windows roaming profiles synchronization	<p>Specifies a list of files and folders that are managed by standard Windows roaming profiles. The files and folders are retrieved from the remote repository when the user logs in. The files are not copied to the remote repository until the user logs off.</p> <p>For the specified files and folders, View Persona Management ignores the profile replication interval that is configured by the Profile upload interval in the Manage user persona setting.</p> <p>Specify paths that are relative to the root of the local profile. Do not specify a drive in a pathname.</p>
Windows roaming profiles synchronization (exceptions)	<p>The selected files and folders are exceptions to the paths that are specified in the Windows roaming profiles synchronization setting.</p> <p>The selected folder paths must reside within the folders that you specify in the Windows roaming profiles synchronization setting.</p> <p>Specify paths that are relative to the root of the local profile. Do not specify a drive in a pathname.</p>
Files and folders excluded from roaming	<p>Specifies a list of files and folders that are not roamed with the rest of the user profile. The specified files and folders exist only on the local system.</p> <p>Some situations require specific files and folders to reside only in the locally stored user profile. For example, you can exclude temporary and cached files from roaming. These files do not need to be replicated to the remote repository.</p> <p>Specify paths that are relative to the root of the local profile. Do not specify a drive in a pathname.</p> <p>By default, the user profile's temp folder, ThinApp cache folder, and cache folders for Internet Explorer, Firefox, Chrome, and Opera are excluded from roaming.</p>
Files and folders excluded from roaming (exceptions)	<p>The selected files and folders are exceptions to the paths that are specified in the Files and folders excluded from roaming setting.</p> <p>The selected folder paths must reside within the folders that you specify in the Files and folders excluded from roaming setting.</p> <p>Specify paths that are relative to the root of the local profile. Do not specify a drive in a pathname.</p>
Enable background download for laptops	<p>Downloads all files in the user profile when a user logs in to a laptop on which the View Persona Management software is installed. Files are downloaded in the background.</p> <p>When the operation is complete, a pop-up notification appears on the user's screen: Background download complete. To allow this notification to appear on the user's laptop, you must enable the Show critical errors to users via tray icon alerts setting.</p> <p>NOTE If you enable this setting, as a best practice, notify your users to make sure that the profile is completely downloaded before the users disconnect from the network.</p> <p>If a user takes a standalone laptop offline before the profile download is complete, the user might not have access to local profile files. While the user is offline, the user will be unable to open a local file that was not fully downloaded.</p> <p>See “Manage User Profiles on Standalone Laptops,” on page 243.</p>

Group Policy Setting	Description
Folders to background download	<p>The selected folders are downloaded in the background after a user logs in to the desktop.</p> <p>In certain cases, you can optimize View Persona Management by downloading the contents of specific folders in the background. With this setting, users do not have to wait for large files to download when they start an application. Also, users do not have to wait for the files to preload when they log in, as they might if you use the Files and folders to preload setting with very large files.</p> <p>For example, you can include VMware ThinApp sandbox folders in the Folders to background download setting. The background download does not affect performance when a user logs in or uses other applications on the desktop. When the user starts the ThinApp application, the required ThinApp sandbox files are likely to be downloaded from the remote repository, improving the application startup time.</p> <p>Specify paths that are relative to the root of the local profile. Do not specify a drive in a pathname.</p>
Folders to background download (exceptions)	<p>The selected folders are exceptions to the paths that are specified in the Folders to background download setting.</p> <p>The selected folder paths must reside within the folders that you specify in the Folders to background download setting.</p> <p>Specify paths that are relative to the root of the local profile. Do not specify a drive in a pathname.</p>
Excluded processes	<p>The I/O of the specified processes are ignored by View Persona Management.</p> <p>You might have to add certain anti-virus applications to the Excluded processes list to prevent performance problems. If an anti-virus application does not have a feature to disable offline file retrieval during its on-demand scans, the Excluded processes setting prevents the application from retrieving files unnecessarily. However, View Persona Management does replicate changes to files and settings in the users' profiles that are made by excluded processes.</p> <p>To add processes to the Excluded processes list, enable this setting, click Show, type the process name, and click OK. For example: process.exe.</p>
Cleanup CLFS files	<p>Deletes the files that are generated by Common Log File System (CLFS) for <code>ntuser.dat</code> and <code>usrclass.dat</code> from the roaming profile on logon.</p> <p>Enable this setting only if you have to repair user profiles that are experiencing a problem with these files. Otherwise, leave the setting disabled or not configured.</p>

Folder Redirection Group Policy Settings

With folder redirection group policy settings, you can redirect user profile folders to a network share. When a folder is redirected, all data is stored directly on the network share during the user session.

You can use these settings to redirect folders that must be highly available. View Persona Management copies updates from the local user profile to the remote profile as often as once a minute, depending on the value you set for the profile upload interval. However, if a network outage or failure on the local system occurs, a user's updates since the last replication might not be saved in the remote profile. In situations where users cannot afford a temporary loss of a few minutes of recent work, you can redirect those folders that store this critical data.

The following rules and guidelines apply to folder redirection:

- When you enable this setting for a folder, you must type the UNC path of the network share to which the folder is redirected.
- If `%username%` is not part of the folder path that you configure, View Persona Management appends `%username%` to the UNC path.
- As a best practice, configure the folder path to include `%username%`, but make sure that the last subfolder in the path uses the name of the redirected folder, such as `My Videos`. The last folder in the path is displayed as the folder name on the user's desktop. For details, see [“Configuring Paths for Redirected Folders,”](#) on page 241.
- You configure a separate setting for each folder. You can select particular folders for redirection and leave others on the local View desktop. You can also redirect different folders to different UNC paths.

- If a folder redirection setting is disabled or not configured, the folder is stored on the local View desktop and managed according to the View Persona Management group policy settings.
- If View Persona Management and Windows roaming profiles are configured to redirect the same folder, View Persona Management's folder redirection takes precedence over Windows roaming profiles.
- Folder redirection applies only to applications that use the Windows shell APIs to redirect common folder paths. For example, if an application writes a file to %USERPROFILE%\AppData\Roaming, the file is written to the local profile and not redirected to the network location.
- By default, Windows folder redirection gives users exclusive rights to redirected folders. To grant domain administrators access to newly redirected folders, you can use a View Persona Management group policy setting.

Windows folder redirection has a check box called **Grant user exclusive rights to folder-name**, which gives the specified user exclusive rights to the redirected folder. As a security measure, this check box is selected by default. When this check box is selected, administrators do not have access to the redirected folder. If an administrator attempts to force change the access rights for a user's redirected folder, View Persona Management no longer works for that user.

You can make newly redirected folders accessible to domain administrators by using the **Add the administrators group to redirected folders** group policy setting. This setting lets you grant the domain administrators group full control over each redirected folder. See [Table 17-5](#).

For existing redirected folders, see [“Granting Domain Administrators Access to Existing Redirected Folders,”](#) on page 249.

You can specify folder paths that are excluded from folder redirection. See [Table 17-5](#).



CAUTION View does not support enabling folder redirection to a folder that is already in a profile managed by View Persona Management. This configuration can cause failures in View Persona Management and loss of user data.

For example, if the root folder in the remote profile repository is \\Server\%username%, and you redirect folders to \\Server\%username%\Desktop, these settings would cause a failure of folder redirection in View Persona Management and the loss of any contents that were previously in the \\Server\%username%\Desktop folder.

You can redirect the following folders to a network share:

- Application Data (roaming)
- Contacts
- Cookies
- Desktop
- Downloads
- Favorites
- History
- Links
- My Documents
- My Music
- My Pictures
- My Videos
- Network Neighborhood

- Printer Neighborhood
- Recent Items
- Save Games
- Searches
- Start Menu
- Startup Items
- Templates
- Temporary Internet Files

Certain folders are available only in Windows Vista and later operating systems.

Table 17-5. Group Policy Settings That Control Folder Redirection

Group Policy Setting	Description
Add the administrators group to redirected folders	Determines whether to add the administrators group to each redirected folder. Users have exclusive rights to redirected folders by default. When you enable this setting, administrators can also access redirected folders. By default, this setting is not configured.
Files and Folders excluded from Folder Redirection	The selected file and folder paths are not redirected to a network share. In some scenarios, specific files and folders must remain in the local user profile. To add a folder path to the Files and Folders excluded from Folder Redirection list, enable this setting, click Show , type the path name, and click OK . Specify folder paths that are relative to the root of the user's local profile. For example: Desktop\New Folder .
Files and folders excluded from Folder Redirection (exceptions)	The selected file and folder paths are exceptions to the paths that are specified in the Files and Folders excluded from Folder Redirection setting. To add a folder path to the Files and folders excluded from Folder Redirection (exceptions) list, enable this setting, click Show , type the path name, and click OK . Specify folder paths that reside within a folder that is specified in the Folders excluded from Folder Redirection setting and are relative to the root of the user's local profile. For example: Desktop\New Folder\Unique Folder .

Granting Domain Administrators Access to Existing Redirected Folders

By default, Windows folder redirection gives users exclusive rights to redirected folders. To grant domain administrators access to existing redirected folders, you must use the `icacls` utility.

If you are setting up new redirected folders for use with View Persona Management, you can make the newly redirected folders accessible to domain administrators by using the **Add the administrators group to redirected folders** group policy setting. See [Table 17-5](#).

Procedure

- 1 Set ownership for the administrator on the files and folders.

```
icacls "\\file-server\persona-share\*" /setowner "domain\admin" /T /C /L /Q
```

For example: `icacls "\\myserver-123abc\folders*" /setowner "mycompanydomain\vcadmin" /T /C /L /Q`

- 2 Modify the ACLs for the files and folders.

```
icacls "\\file-server\persona-share\*" /grant "admin-group":F /T /C /L /Q
```

For example: `icacls "\\myserver-123abc\folders*" /grant "Domain-Admins":F /T /C /L /Q`

- 3 For each user folder, revert ownership from the administrator to the corresponding user.

```
icacls "\\file-server\persona-share\*" /setowner "domain\folder-owner" /T /C /L /Q
```

For example: `icacls "\\myserver-123abc\folders*" /setowner "mycompanydomain\user1" /T /C /L /Q`

Desktop UI Group Policy Settings

The desktop UI group policy settings control View Persona Management settings that users see on their desktops.

Group Policy Setting	Description
Hide local offline file icon	Determines whether to hide the offline icon when a user views locally stored files that belong to the user profile. Enabling this setting hides the offline icon in Windows Explorer and most Windows dialog boxes. By default, the offline icon is hidden.
Show progress when downloading large files	Determines whether to display a progress window on a user's desktop when the client retrieves large files from the remote repository. When this setting is enabled, you can specify the minimum file size, in megabytes, to begin displaying the progress window. The window is displayed when View Persona Management determines that the specified amount of data will be retrieved from the remote repository. This value is an aggregate of all files that are retrieved at one time. For example, if the setting value is 50MB and a 40MB file is retrieved, the window is not displayed. If a 30MB file is retrieved while the first file is still being downloaded, the aggregate download exceeds the value and the progress window is displayed. The window appears when a file starts downloading. By default, this value is 50MB. By default, this progress window is not displayed.
Show critical errors to users via tray icon alerts	Displays critical error icon alerts in the desktop tray when replication or network connectivity failures occur. By default, these icon alerts are hidden.

Logging Group Policy Settings

The logging group policy settings determine the name, location, and behavior of the View Persona Management log files.

Group Policy Setting	Description
Logging filename	Specifies the full pathname of the local View Persona Management log file. On Windows 8 and Windows 7 computers, the default path is <code>ProgramData\VMware\VDM\logs\filename</code> . On Windows XP computers, the default path is <code>All Users\Application Data\VMware\VDM\logs\filename</code> . The default logging filename is <code>VMWVvp.txt</code> .
Logging destination	Determines whether to write all log messages to the log file, the debug port, or both destinations. By default, logging messages are sent to the log file.
Logging flags	Determines the types of messages to log. When this setting is configured, you can select any or all log message types to generate: <ul style="list-style-type: none"> ■ Log error messages. ■ Log information messages. ■ Log debug messages. By default, error and information log message types are generated.

Group Policy Setting	Description
Debug flags	<p>Determines the types of debug messages to log. View Persona Management handles debug messages in the same way that it handles log messages. When this setting is enabled, you can select any or all debug message types to generate:</p> <ul style="list-style-type: none">■ Debug error messages■ Debug information messages■ Debug port messages <p>By default, no debug messages are generated.</p>
Log history depth	<p>Determines the number of historical log files that View Persona Management maintains. You can set a minimum of one and a maximum of 10 historical log files to be maintained. By default, one historical log file is maintained.</p>
Upload log to network	<p>Uploads the View Persona Management log file to the specified network share when the user logs off. When this setting is enabled, specify the network share path. The network share path must be a UNC path. View Persona Management does not create the network share. By default, the log file is not uploaded to the network share.</p>

Troubleshooting Machines and Desktop Pools

18

You can use a variety of procedures to diagnose and fix problems that you encounter when you create and use machines and desktop pools.

Users might experience difficulty when they use Horizon Client to access desktops and applications. You can use troubleshooting procedures to investigate the causes of such problems and attempt to correct them yourself, or you can obtain assistance from VMware Technical Support.

This chapter includes the following topics:

- [“Display Problem Machines,”](#) on page 253
- [“Send Messages to Desktop Users,”](#) on page 254
- [“Troubleshooting Desktop Pool Creation Problems,”](#) on page 254
- [“Troubleshooting Network Connection Problems,”](#) on page 264
- [“Troubleshooting USB Redirection Problems,”](#) on page 268
- [“Troubleshooting GINA Problems on Windows XP Machines,”](#) on page 269
- [“Manage Machines and Policies for Unentitled Users,”](#) on page 270
- [“Further Troubleshooting Information,”](#) on page 270

Display Problem Machines

You can display a list of the machines whose operation View has detected as being suspect.

View Administrator displays machines that exhibit the following problems:

- Are powered on, but which are not responding.
- Remain in the provisioning state for a long time.
- Are ready, but which report that they are not accepting connections.
- Appear to be missing from a vCenter Server.
- Have active logins on the console, logins by users who are not entitled, or logins not made via a View Connection Server instance.

Procedure

- 1 In View Administrator, select **Resources > Machines**.
- 2 On the vCenter VMs tab, click **Problem Machines**.

What to do next

The action that you should take depends on the problem that View Administrator reports for a machine.

- If a linked-clone machine is in an error state, the View automatic recovery mechanism attempts to power on, or shut down and restart, the linked clone. If repeated recovery attempts fail, the linked clone is deleted. In certain situations, a linked clone might be repeatedly deleted and recreated. See [“Troubleshooting Machines That Are Repeatedly Deleted and Recreated,”](#) on page 259.
- If a machine is powered on, but does not respond, restart its virtual machine. If the machine still does not respond, verify that the version of the View Agent is supported for the machine operating system. You can use the `vdmadmin` command with the `-A` option to display the View Agent version. For more information, see the *View Administration* document.
- If a machine remains in the provisioning state for a long time, delete its virtual machine, and clone it again. Verify that there is sufficient disk space to provision the machine. See [“Virtual Machines Are Stuck in the Provisioning State,”](#) on page 257.
- If a machine reports that it is ready, but does not accept connections, check the firewall configuration to make sure that the display protocol (RDP or PCoIP) is not blocked. See [“Connection Problems Between Machines and View Connection Server Instances,”](#) on page 264.
- If a machine appears to be missing from a vCenter Server, verify whether its virtual machine is configured on the expected vCenter Server, or if it has been moved to another vCenter Server.
- If a machine has an active login, but this is not on the console, the session must be remote. If you cannot contact the logged-in users, you might need to restart the virtual machine to forcibly log out the users.

Send Messages to Desktop Users

You might sometimes need to send messages to users who are currently logged into desktops. For example, if you need to perform maintenance on machine, you can ask the users to log out temporarily, or warn them of a future interruption of service. You can send a message to multiple users.

Procedure

- 1 In View Administrator, click **Catalog > Desktop Pools**.
- 2 Double-click a pool and click the **Sessions** tab.
- 3 Select one or more machines and click **Send Message**.
- 4 Type the message, select the message type, and click **OK**.

A message type can be **Info**, **Warning**, or **Error**.

The message is sent to all selected machines in active sessions.

Troubleshooting Desktop Pool Creation Problems

You can use several procedures for diagnosing and fixing problems with the creation of desktop pools.

Pool Creation Fails if Customization Specifications Cannot Be Found

If you try to create a desktop pool, the operation fails if the customization specifications cannot be found.

Problem

You cannot create a desktop pool, and you see the following message in the event database.

```
Provisioning error occurred for Machine Machine_Name: Customization failed for Machine
```

Cause

The most likely cause of this problem is that you have insufficient permissions to access the customization specifications, or to create a pool. Another possible cause is that the customization specification has been renamed or deleted.

Solution

- Verify that you have sufficient permissions to access the customization specifications, and to create a pool.
- If the customization specification no longer exists because it has been renamed or deleted, choose a different specification.

Pool Creation Fails Because of a Permissions Problem

You cannot create a desktop pool if there is a permissions problem with an ESX/ESXi host, ESX/ESXi cluster, or datacenter.

Problem

You cannot create a desktop pool in View Administrator because the templates, ESX/ESXi host, ESX/ESXi cluster, or datacenter are not accessible.

Cause

This problem has a number of possible causes.

- You do not have the correct permissions to create a pool.
- You do not have the correct permissions to access the templates.
- You do not have the correct permissions to access the ESX/ESXi host, ESX/ESXi cluster, or datacenter.

Solution

- If the Template Selection screen does not show any available templates, verify that you have sufficient permissions to access the templates.
- Verify that you have sufficient permissions to access the ESX/ESXi host, ESX/ESXi cluster, or datacenter.
- Verify that you have sufficient permissions to create a pool.

Pool Provisioning Fails Due to a Configuration Problem

If a template is not available or a virtual machine image has been moved or deleted, provisioning of a desktop pool can fail.

Problem

A desktop pool is not provisioned, and you see the following message in the event database.

Provisioning error occurred on Pool *Desktop_ID* because of a configuration problem

Cause

This problem has a number of possible causes.

- A template is not accessible.
- The name of a template has been changed in vCenter.
- A template has been moved to a different folder in vCenter.
- A virtual machine image has been moved between ESX/ESXi hosts, or it has been deleted.

Solution

- Verify that the template is accessible.
- Verify that the correct name and folder are specified for the template.
- If a virtual machine image has been moved between ESX/ESXi hosts, move the virtual machine to the correct vCenter folder.
- If a virtual machine image has been deleted, delete the entry for the virtual machine in View Administrator and recreate or restore the image.

Pool Provisioning Fails Due to a View Connection Server Instance Being Unable to Connect to vCenter

If a Connection Server is not able to connect to vCenter, provisioning of a desktop pool can fail.

Problem

Provisioning of a desktop pool fails, and you see one of the following error messages in the event database.

- Cannot log in to vCenter at address *VC_Address*
- The status of vCenter at address *VC_Address* is unknown

Cause

The View Connection Server instance cannot connect to vCenter for one of the following reasons.

- The Web service on the vCenter Server has stopped.
- There are networking problems between the View Connection Server host and the vCenter Server.
- The port numbers and login details for vCenter or View Composer have changed.

Solution

- Verify that the Web service is running on the vCenter.
- Verify that there are no network problems between the View Connection Server host and the vCenter.
- In View Administrator, verify the port numbers and login details that are configured for vCenter and View Composer.

Pool Provisioning Fails Due to Datastore Problems

If a datastore is out of disk space, or you do not have permission to access the datastore, provisioning of a desktop pool can fail.

Problem

Provisioning of a desktop pool fails, and you see one of the following error messages in the event database.

- Provisioning error occurred for Machine *Machine_Name*: Cloning failed for Machine
- Provisioning error occurred on Pool *Desktop_ID* because available free disk space is reserved for linked clones
- Provisioning error occurred on Pool *Desktop_ID* because of a resource problem

Cause

You do not have permission to access the selected datastore, or the datastore being used for the pool is out of disk space.

Solution

- Verify that you have sufficient permissions to access the selected datastore.
- Verify whether the disk on which the datastore is configured is full.
- If the disk is full or the space is reserved, free up space on the disk, rebalance the available datastores, or migrate the datastore to a larger disk.

Pool Provisioning Fails Due to vCenter Server Being Overloaded

If vCenter Server is overloaded with requests, provisioning of a desktop pool can fail.

Problem

Provisioning of a desktop pool fails, and you see the following error message in the event database.

Provisioning error occurred on Pool *Desktop_ID* because of a timeout while customizing

Cause

vCenter is overloaded with requests.

Solution

- In View Administrator, reduce the maximum number of concurrent provisioning and power operations for vCenter Server.
- Configure additional vCenter Server instances.

For more information about configuring vCenter Server, see the *VMware Horizon View Installation* document.

Virtual Machines Are Stuck in the Provisioning State

After being cloned, virtual machines are stuck in the Provisioning state.

Problem

Virtual machines are stuck in the Provisioning state.

Cause

The most likely cause of this problem is that you restarted the View Connection Server instance during a cloning operation.

Solution

- ◆ Delete the virtual machines and clone them again.

Virtual Machines Are Stuck in the Customizing State

After being cloned, virtual machines are stuck in the Customizing state.

Problem

Virtual machines are stuck in the Customizing state.

Cause

The most likely cause of this problem is that there is not enough disk space to start the virtual machine. A virtual machine must start before customization can take place.

Solution

- Delete the virtual machine to recover from a stuck customization.

- If the disk is full, free up space on the disk or migrate the datastore to a larger disk.

Removing Orphaned or Deleted Linked Clones

Under certain conditions, linked-clone data in View, View Composer, and vCenter Server might get out of synchronization, and you might be unable to provision or delete linked-clone machines.

Problem

- You cannot provision a linked-clone desktop pool.
- Provisioning linked-clone machines fails, and the following error occurs: `Virtual machine with Input Specification already exists`
- In View Administrator, linked-clone machines are stuck in a `Deleting` state. You cannot restart the `Delete` command in View Administrator because the machines are already in the `Deleting` state.

Cause

This issue occurs if the View Composer database contains information about linked clones that is inconsistent with the information in View LDAP, Active Directory, or vCenter Server. Several situations can cause this inconsistency:

- The linked-clone virtual machine name is changed manually in vCenter Server after the pool was created, causing View Composer and vCenter Server refer to the same virtual machine with different names.
- A storage failure or manual operation causes the virtual machine to be deleted from vCenter Server. The linked-clone virtual machine data still exists in the View Composer database, View LDAP, and Active Directory.
- While a pool is being deleted from View Administrator, a networking or other failure leaves the virtual machine in vCenter Server.

Solution

If the virtual machine name was renamed in vSphere Client after the desktop pool was provisioned, try renaming the virtual machine to the name that was used when it was deployed in View.

If other database information is inconsistent, use the `SviConfig RemoveSviClone` command to remove these items:

- The linked clone database entries from the View Composer database
- The linked clone machine account from Active Directory
- The linked clone virtual machine from vCenter Server

The `SviConfig` utility is located on the computer on which View Composer is installed in the following location:

- 32-bit computers: `Install_drive\Program Files\VMware\VMware View Composer`
- 64-bit computers: `Install_drive\Program Files (x86)\VMware\VMware View Composer`

IMPORTANT Only experienced View Composer administrators should use the `SviConfig` utility. This utility is intended to resolve issues relating to the View Composer service.

Take these steps:

- 1 Verify that the View Composer service is running.

- 2 From a Windows command prompt on the View Composer computer, run the SviConfig RemoveSviClone command in the following form:

```
sviconfig -operation=removesviclone
          -VmName=virtual machine name
          [-AdminUser=local administrator username]
          -AdminPassword=local administrator password
          [-ServerUrl=View Composer server URL]
```

For example:

```
sviconfig -operation=removesviclone -vmname=MyLinkedClone
          -adminuser=Admin -adminpassword=Pass -serverurl=ViewComposerURL
```

The VmName and AdminPassword parameters are required. The default value of the AdminUser parameter is Administrator. The default value of the ServerURL parameter is `https://localhost:18443/SviService/v2_0`

For more information about removing virtual machine information from View LDAP, see VMware Knowledge Base article 2015112: *Manually deleting linked clones or stale virtual desktop entries from VMware View Manager 4.5 and later.*

Troubleshooting Machines That Are Repeatedly Deleted and Recreated

View can repeatedly delete and recreate linked-clone and full-clone machines that are in an Error state.

Problem

A linked-clone or full-clone machine is created in an Error state, deleted, and recreated in an Error state. This cycle keeps repeating.

Cause

When a large desktop pool is provisioned, one or more virtual machines might end up in an Error state. The View automatic recovery mechanism attempts to power on the failed virtual machine. If the virtual machine does not power on after a certain number of attempts, View deletes the virtual machine.

Following the pool size requirements, View creates a new virtual machine, often with the same machine name as the original machine. If the new virtual machine is provisioned with the same error, that virtual machine is deleted, and the cycle repeats.

Automatic recovery is performed on linked-clone and full-clone machines.

If automatic recovery attempts fail for a virtual machine, View deletes the virtual machine only if it is a floating machine or a dedicated machine that is not assigned to a user. Also, View does not delete virtual machines when pool provisioning is disabled.

Solution

Examine the parent virtual machine or template that was used to create the desktop pool. Check for errors in the virtual machine or guest operating system that might cause the error in the virtual machine.

For linked clones, resolve errors in the parent virtual machine and take a new snapshot.

- If many machines are in an Error state, use the new snapshot or template to recreate the pool.
- If most machines are healthy, select the desktop pool in View Administrator, click **Edit**, select the vCenter Settings tab, select the new snapshot as a default base image, and save your edits.

New linked-clone machines are created using the new snapshot.

For full clones, resolve errors in the virtual machine, generate a new template, and recreate the pool.

Troubleshooting QuickPrep Customization Problems

A View Composer QuickPrep customization script can fail for a variety of reasons.

Problem

A QuickPrep post-synchronization or power-off script does not execute. In some cases, a script might complete successfully on some linked clones, but fail on others.

Cause

A few common causes exist for QuickPrep script failures:

- The script times out
- The script path refers to a script that requires an interpreter
- The account under which the script runs does not have sufficient permission to execute a script task

Solution

- Examine the customization script log.

QuickPrep customization information is written to a log file in Windows temp directory:

```
C:\Windows\Temp\vmware-viewcomposer-ga-new.log
```

- Determine if the script timed out.

View Composer terminates a customization script that takes longer than 20 seconds. The log file displays a message showing that the script has started and a later message indicating the timeout:

```
2010-02-21 21:05:47,687 [1500] INFO Ready -
[Ready.cpp, 102] Running the PostSync script: cmd /c
C:\temp\build\composer.bat
2010-02-21 21:06:07,348 [1500] FATAL Guest -
[Guest.cpp, 428] script cmd /c
C:\temp\build\composer.bat timed out
```

To solve a timeout problem, increase the timeout limit for the script and run it again.

- Determine if the script path is valid.

If you use a scripting language that needs an interpreter to execute the script, the script path must start with the interpreter binary.

For example, if you specify the path `C:\script\myvb.vbs` as a QuickPrep customization script, View Composer Agent cannot execute the script. You must specify a path that starts with the interpreter binary path:

```
C:\windows\system32\cscript.exe c:\script\myvb.vbs
```

- Determine if the account under which the script runs has appropriate permissions to perform script tasks.

QuickPrep runs the scripts under the account under which the VMware View Composer Guest Agent Server service is configured to run. By default, this account is `Local System`.

Do not change this log on account. If you do, the linked clones do not start.

Finding and Unprotecting Unused View Composer Replicas

Under certain conditions, View Composer replicas might remain in vCenter Server when they no longer have any linked clones associated with them.

Problem

An unused replica remains in a vCenter Server folder. You are unable to remove the replica by using vSphere Client.

Cause

Network outages during View Composer operations, or removing the associated linked clones directly from vSphere without using the proper View commands, might leave an unused replica in vCenter Server.

Replicas are protected entities in vCenter Server. They cannot be removed by ordinary vCenter Server or vSphere Client management commands.

Solution

Use the `SviConfig FindUnusedReplica` command to find the replica in a specified folder. You can use the `-Move` parameter to move the replica to another folder. The `-Move` parameter unprotects an unused replica before moving it.

IMPORTANT Only experienced View Composer administrators should use the `SviConfig` utility. This utility is intended to resolve issues relating to the View Composer service.

The `SviConfig` utility is located in the following location on the computer on which View Composer is installed:

- 32-bit computers: `Install_drive\Program Files\VMware\VMware View Composer`
- 64-bit computers: `Install_drive\Program Files (x86)\VMware\VMware View Composer`

Before you begin, verify that no linked clones are associated with the replica.

Familiarize yourself with the `SviConfig FindUnusedReplica` parameters:

- `DsnName`. The DSN that must be used to connect to the database.
- `UserName`. The user name used to connect to the database. If this parameter is not specified, Windows authentication is used.
- `Password`. The password for the user that connects to the database. If this parameter is not specified and Windows authentication is not used, you are prompted to enter the password later.
- `ReplicaFolder`. The name of the replica folder. Use an empty string for the root folder. The default value is `VMwareViewComposerReplicaFolder`.
- `UnusedReplicaFolder`. The name of the folder to contain all unused replicas. The default value is `UnusedViewComposerReplicaFolder`. Use this parameter to specify the destination folder when you use the `Move` parameter.
- `OutputDir`. The name of the output directory in which the list of unused replicas, stored in the `unused-replica-*.txt` file, is generated. The default value is the current working directory.
- `Move`. Determines whether to unprotect unused replica virtual machines and move them to a specified folder. The `UnusedReplicaFolder` parameter specifies the destination folder. The default value of the `Move` parameter is `false`.

The `DsnName`, `Username`, and `Password` parameters are required. The `DsnName` cannot be an empty string.

Take these steps:

- 1 Stop the View Composer service.
- 2 From a Windows command prompt on the View Composer computer, run the SviConfig FindUnusedReplica command in the following form:

```
sviconfig -operation=findunusedreplica
          -DsnName=name of the DSN
          -Username=Database administrator username
          -Password=Database administrator password
          [-ReplicaFolder=Replica folder name]
          [-UnusedReplicaFolder=Unused replica folder name.]
          [-OutputDir=Output file directory]
          [-Move=true or false]
```

For example:

```
sviconfig -operation=FindUnusedReplica -DsnName=SVI
          -Username=SVIUser -Password=1234 -Move=True
```

- 3 Restart the View Composer service.
- 4 (Optional) After the replica is moved to the new folder, remove the replica virtual machine from vCenter Server.

Windows XP Linked Clones Fail to Join the Domain

Windows XP linked-clone virtual machines can fail to join the domain if your Active Directory runs on Windows Server 2008.

Problem

When linked-clone machines are provisioned, the linked clones fail to join the domain. View Administrator displays View Composer provisioning error messages. For example:

```
5/17/10 3:11:50 PM PDT: View Composer agent initialization state error (18): Failed to join the
domain (waited 565 seconds)
```

Cause

This issue can occur if your Active Directory runs on Windows Server 2008. The Windows Server 2008 read-only domain controller (RODC) is not backward-compatible with Windows XP virtual machines.

Solution

- 1 Check the View Composer log for the following error message:


```
0x4f1: The system detected a possible attempt to compromise security. Please ensure that you
can contact the server that authenticated you.
```

By default, the View Composer log file is generated in the Windows Temp directory:
C:\Windows\Temp\vmware-viewcomposer-ga-new.log
- 2 On the parent virtual machine, apply the Windows Server 2008 RODC compatibility update for Windows XP.

See Microsoft Support Article 944043 at the following location:
<http://support.microsoft.com/kb/944043/en-us>.
- 3 Take a snapshot of the updated parent virtual machine.
- 4 Recompose the linked-clone machines from the updated parent virtual machine and snapshot.

View Composer Provisioning Errors

If an error occurs when View Composer provisions or recomposes linked-clone machines, an error code indicates the cause of the failure. The error code appears in the machine-status column in View Administrator.

Table 18-1 describes the View Composer provisioning error codes.

This table lists errors that are associated with View Composer and QuickPrep customization. Additional errors can occur in View Connection Server and other View components that can interfere with machine provisioning.

Table 18-1. View Composer Provisioning Errors

Error	Description
0	The policy was applied successfully. NOTE Result code 0 does not appear in View Administrator. The linked-clone machine proceeds to a Ready state, unless a View error outside the domain of View Composer occurs. This result code is included for completeness.
1	Failed to set the computer name.
2	Failed to redirect the user profiles to the View Composer persistent disk.
3	Failed to set the computer's domain account password.
4	Failed to back up a user's profile keys. The next time the user logs in to this linked-clone machine after the recompose operation, the OS creates a new profile directory for the user. As a new profile is created, the user cannot see the old profile data.
5	Failed to restore a user's profile. The user should not log in to the machine in this state because the profile state is undefined.
6	Errors not covered by other error codes. The View Composer agent log files in the guest OS can provide more information about the causes of these errors. For example, a Windows Plug and Play (PnP) timeout can generate this error code. In this situation, View Composer times out after waiting for the PnP service to install new volumes for the linked-clone virtual machine. PnP mounts up to three disks, depending on how the pool was configured: <ul style="list-style-type: none"> ■ View Composer persistent disk ■ Nonpersistent disk for redirecting guest OS temp and paging files ■ Internal disk that stores QuickPrep configuration and other OS-related data. This disk is always configured with a linked clone. The timeout length is 10 minutes. If PnP does not finish mounting the disks within 10 minutes, View Composer fails with error code 6.
7	Too many View Composer persistent disks are attached to the linked clone. A clone can have at most three View Composer persistent disks.
8	A persistent disk could not be mounted on the datastore that was selected when the pool was created.
9	View Composer could not redirect disposable-data files to the nonpersistent disk. Either the paging file or the temp-files folders were not redirected.
10	View Composer cannot find the QuickPrep configuration policy file on the specified internal disk.
12	View Composer cannot find the internal disk that contains the QuickPrep configuration policy file and other OS-related data.
13	More than one persistent disk is configured to redirect the Windows user profile.
14	View Composer failed to unmount the internal disk.
15	The computer name that View Composer read from configuration-policy file does not match the current system name after the linked clone is initially powered on.
16	The View Composer agent did not start because the volume license for the guest OS was not activated.

Table 18-1. View Composer Provisioning Errors (Continued)

Error	Description
17	The View Composer agent did not start. The agent timed out while waiting for Sysprep to start.
18	The View Composer agent failed to join the linked-clone virtual machine to a domain during customization.
19	The View Composer agent failed to execute a post-synchronization script.
20	The View Composer agent failed to handle a machine password synchronization event. This error might be transient. If the linked clone joins the domain, the password is fine. If the clone fails to join the domain, restart the operation you performed before the error occurred. If you restarted the clone, restart it again. If you refreshed the clone, refresh it again. If the clone still fails to join the domain, recompose the clone.

Troubleshooting Network Connection Problems

You can use a variety of procedures for diagnosing and fixing problems with network connections with machines, Horizon Client devices, and View Connection Server instances.

Connection Problems Between Machines and View Connection Server Instances

You might experience connection problems between machines and View Connection Server instances.

Problem

If connectivity between a machine and a View Connection Server instance fails, you see one of the following messages in the event database.

- Provisioning error occurred for Machine *Machine_Name*: Customization error due to no network communication between the View agent and Connection Server
- Provisioning error occurred on Pool *Desktop_ID* because of a networking problem with a View Agent
- Unable to launch from Pool *Desktop_ID* for user *User_Display_Name*: Failed to connect to Machine *MachineName* using *Protocol*

Cause

The connectivity problems between a machine and a View Connection Server instance can occur for different reasons.

- Lookup failure on the machine for the DNS name of the View Connection Server host.
- The ports for JMS, RDP, or AJP13 communication being blocked by firewall rules.
- The failure of the JMS router on the View Connection Server host.

Solution

- At a command prompt on the machine, type the `nslookup` command.

```
nslookup CS_FQDN
```

CS_FQDN is the fully qualified domain name (FQDN) of the View Connection Server host. If the command fails to return the IP address of the View Connection Server host, apply general network troubleshooting techniques to correct the DNS configuration.

- At a command prompt on the machine, verify that TCP port 4001, which View Agent uses to establish JMS communication with the View Connection Server host, is working by typing the `telnet` command.

```
telnet CS_FQDN 4001
```

If the `telnet` connection is established, network connectivity for JMS is working.

- If a security server is deployed in the DMZ, verify that exception rules are configured in the inner firewall to allow RDP connectivity between the security server and virtual machines on TCP port 3389.
- If secure connections are bypassed, verify that the firewall rules allow a client to establish either a direct RDP connection to the virtual machine on TCP port 3389, or a direct PCoIP connection to the virtual machine on TCP port 4172 and UDP port 4172.
- Verify that exception rules are configured in the inner firewall to allow connections between each Security Server and its associated View Connection Server host on TCP port 4001 (JMS) and TCP port 8009 (AJP13).

Connection Problems Between Horizon Client and the PCoIP Secure Gateway

You might experience connection problems between Horizon Client and a security server or View Connection Server host when the PCoIP Secure Gateway is configured to authenticate external users that communicate over PCoIP.

Problem

Clients that use PCoIP cannot connect to or display View desktops. The initial login to a security server or View Connection Server instance succeeds, but the connection fails when the user selects a View desktop. This issue occurs when the PCoIP Secure Gateway is configured on a security server or View Connection Server host.

NOTE Typically, the PCoIP Secure Gateway is leveraged on a security server. In a network configuration in which external clients connect directly to a View Connection Server host, the PCoIP Secure Gateway can also be configured on View Connection Server.

Cause

Problems connecting to the PCoIP Secure Gateway can occur for different reasons.

- Windows Firewall has closed a port that is required for the PCoIP Secure Gateway.
- The PCoIP Secure Gateway is not enabled on the security server or View Connection Server instance.
- The PCoIP External URL setting is configured incorrectly. You must specify this setting as the external IP address that clients can access over the Internet.
- The PCoIP External URL or secure tunnel External URL is configured to point to a different security server or View Connection Server host. When you configure these two external URLs on a security server or View Connection Server host, both external URLs must be addresses for the current host.
- The client is connecting through an external web proxy that has closed a port required for the PCoIP Secure Gateway. For example, a web proxy in a hotel network or public wireless connection might block the required ports.
- The View Connection Server instance that is paired with the security server on which the PCoIP Secure Gateway is configured is version View 4.5 or earlier. The security server and paired View Connection Server instance must be View 4.6 or later.

Solution

- Check that the following network ports are opened on the firewall for the security server or View Connection Server host.

Port	Description
TCP 4172	From Horizon Client to the security server or View Connection Server host.
UDP 4172	Between Horizon Client and the security server or View Connection Server host, in both directions.
TCP 4172	From the security server or View Connection Server host to the View desktop.
UDP 4172	Between the security server or View Connection Server host and the View desktop, in both directions.

- In View Administrator, enable the PCoIP Secure Gateway and make sure that the PCoIP External URL is configured correctly.
 - Click **View Configuration > Servers**.
 - Select the security server on the **Security Servers** tab or the View Connection Server instance on the **Connection Servers** tab and click **Edit**.
 - Select **Use PCoIP Secure Gateway for PCoIP connections to machine**.
The PCoIP Secure Gateway is disabled by default.
 - In the **PCoIP External URL** text box, make sure that the URL contains the external IP address for the security server or View Connection Server instance that clients can access over the Internet.
Specify port 4172. Do not include a protocol name.
For example: **10.20.30.40:4172**
 - Make sure that both the **PCoIP External URL** and secure tunnel **External URL** are the addresses that client systems use to reach this host.
For example, if you configure a View Connection Server host, do not specify the **PCoIP External URL** for this host and the secure tunnel **External URL** for a paired security server.
 - Click **OK**.
- If the user is connecting through a web proxy that is outside of your network, and the proxy is blocking a required port, direct the user to connect from a different network location.

Connection Problems Between Machines and View Connection Server Instances

You might experience connection problems between machines and View Connection Server instances.

Problem

If connectivity between a machine and a View Connection Server instance fails, you see one of the following messages in the event database.

- Provisioning error occurred for Machine *Machine_Name*: Customization error due to no network communication between the View agent and Connection Server
- Provisioning error occurred on Pool *Desktop_ID* because of a networking problem with a View Agent
- Unable to launch from Pool *Desktop_ID* for user *User_Display_Name*: Failed to connect to Machine *MachineName* using *Protocol*

Cause

The connectivity problems between a machine and a View Connection Server instance can occur for different reasons.

- Lookup failure on the machine for the DNS name of the View Connection Server host.
- The ports for JMS, RDP, or AJP13 communication being blocked by firewall rules.
- The failure of the JMS router on the View Connection Server host.

Solution

- At a command prompt on the machine, type the `nslookup` command.

```
nslookup CS_FQDN
```

`CS_FQDN` is the fully qualified domain name (FQDN) of the View Connection Server host. If the command fails to return the IP address of the View Connection Server host, apply general network troubleshooting techniques to correct the DNS configuration.

- At a command prompt on the machine, verify that TCP port 4001, which View Agent uses to establish JMS communication with the View Connection Server host, is working by typing the `telnet` command.

```
telnet CS_FQDN 4001
```

If the `telnet` connection is established, network connectivity for JMS is working.

- If a security server is deployed in the DMZ, verify that exception rules are configured in the inner firewall to allow RDP connectivity between the security server and virtual machines on TCP port 3389.
- If secure connections are bypassed, verify that the firewall rules allow a client to establish either a direct RDP connection to the virtual machine on TCP port 3389, or a direct PCoIP connection to the virtual machine on TCP port 4172 and UDP port 4172.
- Verify that exception rules are configured in the inner firewall to allow connections between each Security Server and its associated View Connection Server host on TCP port 4001 (JMS) and TCP port 8009 (AJP13).

Connection Problems Due to Incorrect Assignment of IP Addresses to Cloned Machines

You might not be able to connect to cloned machines if they have static IP addresses.

Problem

You cannot use Horizon Client to connect to cloned machines.

Cause

Cloned machines are incorrectly configured to use a static IP address instead of using DHCP to obtain their IP addresses.

Solution

- 1 Verify that the template for a desktop pool on vCenter Server is configured to use DHCP to assign IP addresses to machines.
- 2 In the vSphere Web Client, clone one virtual machine manually from the desktop pool and verify that it obtains its IP address from DHCP correctly.

Troubleshooting USB Redirection Problems

Various problems can arise with USB redirection in Horizon Client.

Problem

USB redirection in Horizon Client fails to make local devices available on the remote desktop, or some devices do not appear to be available for redirection in Horizon Client.

Cause

The following are possible causes for USB redirection failing to function correctly or as expected.

- The device is a composite USB device and one of the devices it includes is blocked by default. For example, a dictation device that includes a mouse is blocked by default because mouse devices are blocked by default. To work around this problem, see [“Configuring Device Splitting Policy Settings for Composite USB Devices,”](#) on page 158.
- USB redirection is not supported for Windows 2008 systems or for session-based RDS-hosted remote desktops.
- Webcams are not supported for redirection.
- The redirection of USB audio devices depends on the state of the network and is not reliable. Some devices require a high data throughput even when they are idle.
- USB redirection is not supported for boot devices. If you run Horizon Client on a Windows system that boots from a USB device, and you redirect this device to the remote desktop, the local operating system might become unresponsive or unusable. See <http://kb.vmware.com/kb/1021409>.
- By default, Horizon Client for Windows does not allow you to select keyboard, mouse, smart card and audio-out devices for redirection. See <http://kb.vmware.com/kb/1011600>.
- RDP does not support the redirection of USB HIDs for the console session, or of smart card readers. See <http://kb.vmware.com/kb/1011600>.
- Windows Mobile Device Center can prevent the redirection of USB devices for RDP sessions. See <http://kb.vmware.com/kb/1019205>.
- For some USB HIDs, you must configure the virtual machine to update the position of the mouse pointer. See <http://kb.vmware.com/kb/1022076>.
- Some audio devices might require changes to policy settings or to registry settings. See <http://kb.vmware.com/kb/1023868>.
- Network latency can cause slow device interaction or cause applications to appear frozen because they are designed to interact with local devices. Very large USB disk drives might take several minutes to appear in Windows Explorer.
- USB flash cards formatted with the FAT32 file system are slow to load. See <http://kb.vmware.com/kb/1022836>.
- A process or service on the local system opened the device before you connected to the remote desktop.
- A redirected USB device stops working if you reconnect a desktop session even if the desktop shows that the device is available.
- USB redirection is disabled in View Administrator.
- Missing or disabled USB redirection drivers on the guest.

Solution

- If available, use PCoIP instead of RDP as the desktop protocol.

- If a redirected device remains unavailable or stops working after a temporary disconnection, remove the device, plug it in again, and retry the redirection.
- In View Administrator, go to **Policies > Global Policies**, and verify that USB access is set to **Allow** under View Policies.
- Examine the log on the guest for entries of class `ws_vhub`, and the log on the client for entries of class `vmware-view-usbd`.

Entries with these classes are written to the logs if a user is not an administrator, or if the USB redirection drivers are not installed or are not working. For the location of these log files, see [“Using Log Files for Troubleshooting and to Determine USB Device IDs,”](#) on page 157.

- Open the Device Manager on the guest, expand Universal Serial Bus controllers, and reinstall the VMware View Virtual USB Host Controller and VMware View Virtual USB Hub drivers if these drivers are missing or re-enable them if they are disabled.

Troubleshooting GINA Problems on Windows XP Machines

On Windows XP machines, problems can occur with chaining the VMware View Graphical Identification and Authentication (GINA) dynamic link library (dll) files.

Problem

The following problems can occur on Windows XP machines:

- A machine does not start up
- When a machine starts up or shuts down, the following error is displayed: `Cannot start gina.dll module. A required component is missing: gina.dll. Please install the application again.`
- When you start a machine, an unexpected login prompt appears
- You cannot log in to your machine

Cause

Startup and login problems can occur on Windows XP machines when the View GINA dll files are not chained properly with third-party GINAs that might reside on the virtual machines.

To ensure that the GINA is chained properly, you must configure the WinLogon GINA to be the View GINA and make sure that the `vdmGinaChainDLL` is created and contains the third-party GINAs.

If you did not install any software that chains to a different GINA, the default is `msgina.dll`, which is located at `%systemroot%\system32\msgina.dll` on the virtual machine.

Solution

- 1 Log in to the parent virtual machine, template virtual machine, or View machine.
- 2 Click **Start > Run**, type **Regedit**, and press Enter.
- 3 Navigate to the following Windows registry key:


```
HKEY_LOCAL_MACHINE\Software\Microsoft\Windows NT\Current Version\Winlogon\GinaDLL
```
- 4 Ensure that the `GinaDLL` key has the following value:


```
install_directory\VMware\VMware View\Agent\bin\wsgina.dll
```

install_directory is the path where you installed View Agent.

- 5 If the `vdmGinaChainDLL` string value does not exist, create it.
 - a Navigate to the following registry key:
`HKEY_LOCAL_MACHINE\Software\Microsoft\Windows NT\Current Version`
 - b Create the `vdmGinaChainDLL` key.
- 6 Place the third-party GINA dll names in the `vdmGinaChainDLL` key.
- 7 If you still experience problems with the Windows XP machines, ensure that no vendor-specific GINA keys are loaded in the registry.

If third-party GINA keys are loaded, the chaining GINA might still be calling the default GINA, `msgina`. Some network management and security software products place their GINA replacement dlls in their own installation directories, in registry paths such as this one:

```
HKEY_LOCAL_MACHINE\Software\Vendor_ID_or_Name\GINA_key_reference\GINA_Load_Instruction =  
msgina
```

Remove these GINA keys from the vendor-specific location and place them in the `vdmGinaChainDLL` key.

Manage Machines and Policies for Unentitled Users

You can display the machines that are allocated to users whose entitlement has been removed, and you can also display the policies that have been applied to unentitled users.

A user who is unentitled might have left the organization permanently, or you might have suspended their account for an extended period of time. These users are assigned a machine but they are no longer entitled to use the machine pool.

You can also use the `vdmadmin` command with the `-O` or `-P` option to display unentitled machines and policies. For more information, see the *View Administration* document.

Procedure

- 1 In View Administrator, select **Resources > Machines**.
- 2 Select **More Commands > View Unentitled Machines**.
- 3 Remove the machine assignments for unentitled users.
- 4 Select **More Commands > View Unentitled Machines** or **More Commands > View Unentitled Policies** as appropriate.
- 5 Change or remove the policies that are applied to unentitled users.

Further Troubleshooting Information

You can find further troubleshooting information in VMware Knowledge Base articles.

The VMware Knowledge Base (KB) is continually updated with new troubleshooting information for VMware products.

For more information about troubleshooting View, see the KB articles that are available on the VMware KB Web site:

<http://kb.vmware.com/selfservice/microsites/microsite.do>

Index

Numerics

- 3D renderer
 - best practices **118**
 - configuring **116**
 - options **117**

A

- access permissions, shared folders for Persona Management **233**
- Active Directory
 - troubleshooting linked clones failing to join the domain **262**
 - using existing computer accounts for linked clones **73**
- ADM Template file
 - adding to a local system **237**
 - adding to Active Directory **238**
 - installing **237**
- ADM template file, Real-Time Audio-Video **147**
- ADM template files
 - PCoIP Session Variables **199**
 - PCoIP session bandwidth settings **207**
 - View components **192**
 - View Agent Configuration **193**
 - where to find **193**
- ADMX files, adding to Active Directory **210**
- Adobe Flash
 - quality modes **110**
 - throttling modes **110**
- Adobe Flash Throttling Throttling, RDS desktop pools **97**
- Adobe Flash URL redirection, system requirements **133**
- Always on policy **111**
- application compatibility, RDS group policy settings **211**
- application pools
 - advantages **14**
 - creating **93, 94**
 - introduction **9**
 - worksheet for creating **93**
- application sessions, time zone redirection **85**
- applications, enable Windows basic Aero-styled theme **86**
- automated desktop pools
 - adding machines manually **104**
 - assigning multiple network labels **121**
 - creating **51, 55**

- customizing machines in maintenance mode **106**
- deploying large pools **120**
- desktop settings **56, 107**
- machine-naming example **103**
- maintenance mode **105, 106**
- naming machines manually **100, 101**
- power policies **113–115**
- using a machine-naming pattern **100**
- worksheet for creating **51**
- automatic Windows updates, disabling **40**

B

- bandwidth, Real-Time Audio-Video **149**
- base image for virtual desktops **169, 173**
- best practices, View Persona Management **241**
- blackout times
 - for disk space reclamation **187**
 - for View Storage Accelerator **187**

C

- CBRC, configuring for desktop pools **183**
- client devices, setting up for Flash URL Redirection **135**
- client session policies
 - configuring global **190**
 - configuring pool-level **190**
 - configuring user-level **190**
 - defined **189**
 - general **191**
 - inheritance **189**
- client systems, passing information to desktops **196**
- cluster, more than eight hosts **121**
- command scripts, running on desktops **198**
- CommandsToRunOnConnect group policy setting **198**
- composite USB devices **158**
- connection issues
 - between Horizon Client and the PCoIP Secure Gateway **265**
 - between machines and View Connection Server **264, 266**
 - linked-clone machines with static IP addresses **267**
- connection ticket timeout **193**
- connections, troubleshooting **264**

- custom setup options
 - installing View Agent on an RDS host **85**
 - View Agent **17, 26**
- customization specifications
 - creating **50**
 - recomposing linked-clone machines **72**
- customization scripts
 - increasing QuickPrep timeout limits **48**
 - using QuickPrep for linked-clone machines **70, 71**
- customizing machines, maintenance mode **105**

D

- datastores
 - local storage **181**
 - sizing linked-clone pools **174**
 - storage sizing table **175**
 - storing linked clones and replicas **182, 183**
- dedicated-assignment desktop pools **10, 173**
- dedicated-assignment pools
 - choosing a user assignment type **99**
 - maintenance mode **106**
- defragmentation, disabling on linked clones **39**
- delta disks, storage overcommit **178**
- desktop pool managementdesktop pool
 - management, reclaiming disk space **184**
- desktop pool creation
 - choosing a user assignment type **99**
 - customizing in maintenance mode **106**
 - deploying large pools **120**
 - machine-naming example **103**
 - on more than 8 hosts **121**
 - provisioning options **99**
 - with Persona Management **240**
- desktop pool troubleshooting
 - cloning failure **256**
 - creation problems **254**
 - customization failure **257**
 - failure due to configuration problems **255**
 - failure due to missing customization specifications **254**
 - failure due to permissions problems **255**
 - failure due to vCenter being overloaded **257**
 - free disk space problems **256**
 - inability to connect to vCenter **256**
 - inability to log in to vCenter **256**
 - resource problems **256**
 - timeout while customizing **257**
 - vCenter status unknown **256**
 - virtual machines stuck in Provisioning state **257**
- desktop pools, introduction **9**
- desktop settings
 - automated desktop pools **56, 107**

- linked-clone desktops **67**
- manual desktop pools **107**
- RDS desktop pools **96, 107**
- desktop sources, preparing for desktop
 - deployment **19**
- desktop UI, group policy settings **250**
- desktops, MMR support **151**
- device families **164**
- Diagnostic Policy Service, disabling **40**
- disposable file redirection, paging-file size **48**
- disposable-data disks, linked-clone virtual
 - machines **180**
- Do nothing policy **111**

E

- entitlements
 - adding to desktop pools **123**
 - adding to desktop or application pools **123**
 - removing from desktop or application
 - pools **124**
 - restricting **124**
 - reviewing **124**
- ESXi hosts, using more than eight in a
 - cluster **121**

F

- farms
 - creating **89, 91**
 - introduction **9**
 - worksheet for creating **90**
- Favorite Applications, configuring **130**
- Fibre Channel SAN arrays **169**
- Flash URL Redirection
 - configuring **132**
 - disabling **136**
 - enabling **136**
 - setting up clients **135**
 - system requirements **133**
 - verifying installation **134**
- floating-assignment desktop pools **10**
- floating-assignment pools
 - choosing a user assignment type **99**
 - maintenance mode **106**
- folder redirection
 - granting domain administrator rights **249**
 - group policy settings **247**

G

- GINA
 - chaining 3rd-party software dlls **269**
 - View Agent dll **269**
- global policies, configuring **190**
- GPOs
 - creating for desktops **223**
 - creating for View component policies **191**

- gpupvm utility, examining GPU resources **119**
- graphics, 3D renderer **116**
- group policies
 - ADM template files **193**
 - applying to GPOs **223**
 - examples **222**
 - Remote Desktop Services **210**
 - View Agent configuration **193**
 - View components **192**
- group policies for desktop pools **189**
- group policy settings
 - adding RDS ADMX files **210**
 - adding to a local system **237**
 - adding to Active Directory **238**
 - desktop UI settings **250**
 - folder redirection **247**
 - logging **250**
 - manage user persona **245**
 - persona repository location **245**
 - Real-Time Audio-Video **148**
 - roaming and synchronization **245**
 - runonce.exe **86**
 - View Persona Management **244**
- guest operating systems
 - installing **22**
 - optimizing performance **34, 35**
 - paging-file size **48**
 - preparing for desktop deployment **22**
- GUIDs, support in View Composer **68**

H

- Horizon Client, connection problems to the
 PCoIP Secure Gateway **265**
- host caching, for desktop pools **183**

I

- individual desktops, creating **77**
- installation
 - guest operating system **22**
 - silent **28**
 - silent installation options **30**
 - standalone View Persona Management **236**
 - View Agent **15, 25, 28**
- IOPS
 - benefits of disabling Windows 7 services **36**
 - benefits of disabling Windows 8 services **36**
- IP addresses, troubleshooting for linked-cloned
 machine connections **267**
- iSCSI SAN arrays **169**

K

- keyboard settings, PCoIP session variables **209**
- kiosk mode **13**

- KMS license keys, volume action on linked
 clones **46**
- Knowledge Base articles, where to find **270**
- knowledge workers **12**

L

- laptops
 - installing View Persona Management **228**
 - Persona Management configuration **243**
- licensing, RDS group policy settings **213**
- linked clones **173**
- linked-clone desktop creation
 - desktop settings **67**
 - storage sizing **174**
 - understanding **57**
 - using View Composer **66**
 - worksheet for creating **57**
- linked-clone desktop pools **57**
- linked-clone desktop pool creation, storing swap
 files **43**
- linked-clone machine creation
 - choosing a naming pattern **102**
 - choosing QuickPrep or Sysprep **69**
 - customizing **69**
 - data disk creation **180**
 - setting minimum ready machines **72**
 - setting the storage overcommit level **179**
 - storage overcommit feature **178**
 - storage sizing table **175, 176**
 - storing replicas and linked clones on separate
 datastores **182, 183**
 - storing swap files **47**
 - support for unique SIDs **68**
 - using existing AD computer accounts **73**
 - using local datastores **181**
 - Windows 7 and Vista volume activation **46**
- linked-clone machine troubleshooting
 - connection problems **267**
 - deleting orphaned clones **258**
 - provisioning error codes **263**
 - repeated deletions **259**
 - Windows XP machines fail to join the
 domain **262**
- Linux Thin clients, setting up for Flash URL
 Redirection **135**
- local datastore, linked-clone swap files **43, 47**
- location-based printing
 - configuring **218**
 - group policy **218–220**
 - registry key **218**
 - TPVMGPOACmap.dll file **219**
- logging, group policy settings **250**

- loopback processing
 - benefits **192**
 - enabling **224**
- LSI20320-R controllers, installing driver **22**
- LUNs **173**
- M**
- machine recomposition, Sysprep **72**
- machine settings, manual desktop pools **78**
- machine troubleshooting
 - connection issues **264, 266**
 - displaying orphaned machines **270**
 - displaying problem machines **253**
 - repeated deletions **259**
- maintenance mode
 - customizing machines **106**
 - starting machines **105, 106**
- manage user persona
 - configuring **239**
 - group policy settings **245**
- manual desktop pools
 - configuring a single machine **77**
 - creating **75, 77**
 - desktop settings **107**
 - machine settings **78**
 - worksheet for creating **75**
- messages, sending to desktop users **254**
- MHTML Web pages, setting up for multicast **135**
- microphone **139, 140, 144**
- microphones, selecting default **138**
- Microsoft Feeds Synchronization
 - disabling on Windows 7 **42**
 - disabling on Windows 8 **42**
- Microsoft Windows Defender
 - disabling in Windows 7 **42**
 - disabling in Windows 8 **42**
- Microsoft Windows Installer, properties for View Agent **31**
- migrating, user profiles **229**
- MMR, system requirements **150**
- multicast redirection
 - configuring **132**
 - system requirements **133**
- multimedia redirection
 - enabling **150**
 - managing across a network **150**
 - setting handshake value **152**
 - system requirements **150**
 - Windows operating systems **151**
- multiple NICs, configuring for View Agent **34**

- N**
- naming desktop pools
 - example **103**
 - manually specifying names **101**
- naming machines
 - manually specifying names **100**
 - providing a naming pattern **100**
- naming patterns, linked-clone machines **102**
- NAS arrays **169**
- NAS devices, native NFS snapshots **186**
- network connections, troubleshooting **264**
- network labels, configuring for a pool **121**
- network share
 - access permissions for Persona Management **233**
 - guidelines for creating **234**
- NFS datastores, clusters with more than eight hosts **121**
- O**
- orphaned machines, displaying **270**
- OS disks
 - disabling Windows 7 services **36**
 - disabling Windows 8 services **36**
 - growth caused by Windows 7 services **37**
 - growth caused by Windows 8 services **37**
 - linked-clone virtual machines **180**
 - storage overcommit **179**
 - storage sizing formulas for editing pools **176, 177**
- OS_DISKpolicy profile **172**
- OUs, creating for remote desktops **192, 222**
- P**
- paging-file size, parent virtual machine **48**
- parent virtual machines
 - disabling hibernation **46**
 - disabling defragmentation on Windows 7 **39**
 - disabling defragmentation on Windows 8 **39**
 - disabling Windows 7 services **36**
 - preparing for View Composer **43**
- parent virtual machine **173**
- PCoIP Agent, View Agent feature **85**
- PCoIP Secure Gateway, connection problems **265**
- PCoIP Server, View Agent custom option **26**
- PCoIP session variables
 - build-to-lossless feature **209**
 - general session variables **200**
 - group policy settings **199**
 - keyboard settings **209**
 - session bandwidth settings **207**
- PCoIP Smartcard, View Agent custom option **17, 26**
- pcoip.adm, ADM template files **193**

- performance optimization, guest operating system **34, 35**
 - persistent disks
 - creating **57**
 - linked-clone desktops **180**
 - Persona Management **243**
 - storage sizing formulas for editing pools **176, 177**
 - PERSISTENT_DISK policy profile **172**
 - Persona Management
 - best practices **241**
 - configuration overview **232**
 - configuring a deployment **232**
 - configuring and managing **227**
 - creating desktop pools **240**
 - enabling **239**
 - migrating user profiles **229**
 - setting the repository location **239**
 - standalone installation **236**
 - standalone laptops **243**
 - standalone systems **228**
 - View Agent installation option **234**
 - View Composer persistent disks **243**
 - Windows roaming profiles **231**
 - with View **227**
 - persona repository location, group policy settings **245**
 - physical computers
 - installing View Agent **15**
 - preparing for desktop delivery **15**
 - policies
 - Active Directory **191**
 - automated pools **113**
 - client session **189**
 - client session inheritance **189**
 - configuring persona management **227**
 - displaying unentitled **270**
 - general client session **191**
 - global **190**
 - pool-level **190**
 - power **111, 113**
 - user-level **190**
 - pools
 - desktop **11, 173**
 - kiosk users **13**
 - knowledge workers **12**
 - task workers **11**
 - pools, desktop **10**
 - post-synchronization script, customizing linked-clone machines **71**
 - Power Off VM policy **111**
 - power policies
 - automated desktop pools **114, 115**
 - avoiding conflicts **115**
 - machines and pools **111**
 - power-off script, customizing linked-clone machines **71**
 - prefetch and superfetch, disabling **41**
 - printing, location-based **218**
 - problem machines, displaying **253**
 - product ID **157**
- ## Q
- QuickPrep
 - customization errors **263**
 - customization scripts **70, 71**
 - increasing timeout limit for customization scripts **48**
 - troubleshooting customization failure **260**
 - View Composer **69, 70**
- ## R
- RDP, disabling access to desktops **120**
 - RDS hosts
 - installing applications **81**
 - installing Remote Desktop Services on Windows Server 2008 R2 SP1 **82**
 - installing Remote Desktop Services on Windows Server 2012 or 2012 R2 **83**
 - installing View Agent **84**
 - introduction **9**
 - performance options **87**
 - Restrict Users to a Single Desktop Session **83**
 - setting up **81**
 - RDS desktop pools
 - Adobe Flash Throttling **97**
 - creating **95, 96**
 - desktop settings **96, 107**
 - RDS desktop sessions, time zone redirection **85**
 - RDS hosts, add ADMX files **210**
 - read-only domain controllers, troubleshooting
 - linked clones failing to join the domain **262**
 - Real-Time Audio-Video
 - bandwidth **149**
 - configuring **136**
 - configuring group policy settings **147**
 - group policy settings **148**
 - preventing conflicts with USB redirection **138**
 - system requirements **137**
 - Real-Time Audio-Video, adding the ADM template **147**
 - Real-Time Audio-Video, configuration choices **137**
 - rebalance feature **173**
 - rebalancing linked-clone machines, setting minimum ready machines **72**

- recomposing machines, setting minimum ready machines **72**
- recomposing linked-clone machines, Sysprep **72**
- refresh, setting minimum ready machines **72**
- registry backup (RegIdleBackup), disabling **41**
- regulatory compliance **14**
- remote repository, configuring **232**
- Remote Desktop connections
 - disabling RDP **120**
 - enabling **22**
- Remote Desktop Services
 - adding ADMX files to Active Directory **210**
 - application compatibility group policies **211**
 - connections group policies **212**
 - device and resource redirection group policies **212**
 - licensing group policies **213**
 - profiles group policies **215**
 - remote session environment group policies **217**
 - security group policies **217**
 - temporary folders group policies **218**
- Remote Desktop Services (RDS) hosts
 - setting up **81**
 - See *also* RDS hosts
- Remote Desktop Services group policies **210**
- Remote Desktop Users group **22**
- remote desktops, USB redirection problems **167, 268**
- remote desktops, configuring features **129**
- REPLICA_DISK policy profile **172**
- replicas **173**
- restricted entitlements
 - assigning tags to desktop pools **127**
 - configuring **127**
 - examples **125**
 - limitations **127**
 - tag matching **126**
 - understanding **124**
- roaming and synchronization, group policy settings **245**
- roaming profiles, See persona management

S

- SBPM (storage-based policy management) **170**
- security **14**
- security server, connection problems to the PCoIP Secure Gateway **265**
- security servers, restricted entitlements limitations **127**
- sending messages to desktop users **254**
- shared folders, access permissions for Persona Management **233**

- shared storage **169**
- SIDs, support in View Composer **68**
- silent installation, View Agent **28**
- silent installation options **30**
- single sign-on, group policy settings **193**
- solid-state disks, storing View Composer replicas **182**
- sparse disks, configuring for desktop pools **184**
- splitting composite USB devices **158**
- SSO, group policy settings **193**
- storage
 - reclaiming disk space **184**
 - reducing, with View Composer **169, 173**
- storage overcommit, linked clones **178, 179**
- storage-based policy management **170**
- Suspend VM policy, on disconnect **113**
- swap files, linked-clone machines **43, 47**
- Sysprep
 - linked-clone machines **69**
 - recomposing linked-clone machines **72**
- system requirements, Unity Touch **129**
- System Restore, disabling **42**

T

- task workers **11**
- terminal servers, preparing for desktop delivery **15**
- ThinApp applications, configuring user profiles **243**
- third-party applications, support in View Composer **68**
- time synchronization, guest OS and ESXi host **22**
- time zone redirection **85**
- timeout limit, QuickPrep customization scripts **48**
- TPVMGPoACmap.dll file **219**
- troubleshooting machines and desktop pools **253**

U

- unentitled users, displaying **270**
- unicast redirection
 - configuring **132**
 - system requirements **133**
- Unity Touch
 - configuring **129**
 - disabling or enabling **132**
 - system requirements **129**
- Unity Touch feature **130**
- unmanaged machines
 - defined **15**
 - installing View Agent **15**
 - preparing for desktop delivery **15**
- Update Service, disabling **40**

- UPHClean service, using with Persona Management **235**
 - USB device families **164**
 - USB device filtersUSB device filters **161**
 - USB devices
 - support for **154**
 - using with View desktops **153, 154**
 - USB redirection
 - automatic connections **156**
 - configuring in View Agent **17, 26**
 - controlling using policies **158, 165**
 - disabling **156**
 - ports for **155**
 - preventing conflicts with Real-Time Audio-Video **138**
 - troubleshooting failure **167, 268**
 - user persona, configuring policies **227**
 - user profile path, configuring **232**
 - user profile repository, guidelines for creating **234**
 - user profiles
 - ThinApp sandbox folders **243**
 - See also* persona management
 - users
 - displaying unentitled **270**
 - sending messages **254**
- V**
- VAAI, creating linked clones **186**
 - vCenter Server **10**
 - vdm_agent.adm **193**
 - vdm_client.adm **193**
 - vdm_common.adm **193**
 - vdm_server.adm **193**
 - vendor ID **157**
 - vid/pid **157**
 - View Storage Accelerator, configuring for desktop pools **183**
 - View Agent
 - configuring multiple NICs **34**
 - custom setup options **17, 26**
 - custom setup options on an RDS host **85**
 - installing silently **28**
 - installing on a virtual machine **25**
 - installing on unmanaged machines **15**
 - silent installation properties **31**
 - with View Persona Management **234**
 - View Composer **173**
 - View Composer Agent
 - View Agent custom option **26**
 - View Agent custom setup option **26**
 - View Composer Array Integration, enabling for desktop pools **186**
 - View Composer configuration
 - support for unique SIDs **68**
 - volume activation **46**
 - View Composer persistent disks
 - storage sizing formulas **176**
 - storage sizing formulas for editing pools **177**
 - View Composer troubleshooting
 - finding unused replicas **261**
 - provisioning error codes **263**
 - QuickPrep script failure **260**
 - View Composer use
 - choosing QuickPrep or Sysprep **69**
 - considerations for storing replicas on separate datastores **183**
 - creating data disks **180**
 - creating linked-clone pools **57, 66**
 - local datastores **181**
 - preparing a parent virtual machine **43**
 - QuickPrep **70**
 - storing replicas and linked clones on separate datastores **182**
 - worksheet for creating linked-clone pools **57**
 - View Connection Server
 - assigning tags for restricted entitlement **127**
 - troubleshooting connection issues **264, 266**
 - ViewPM.adm, ADM template files **193**
 - ViewPM.adm file
 - adding to Active Directory **238**
 - adding to a local system **237**
 - virtual machines
 - creating templates **49**
 - custom configuration parameters **20**
 - customization failures **257**
 - disabling Windows 7 services **36**
 - disabling Windows 8 services **36**
 - installing guest operating system **22**
 - preparing for desktop deployment **19, 20**
 - stuck in Provisioning state **257**
 - Virtual Printing, View Agent custom option **26**
 - virtual profiles, *See* persona management
 - Virtual SAN **169, 170, 173**
 - VM_HOMEpolicy profile **172**
 - VMFS datastores, clusters with more than eight hosts **121**
 - VMware Tools, installing **22**
 - volume activation, linked-clone machines **46**
 - vSAN **169, 170, 173**
 - vSphere **169**
- W**
- Web pages, providing multicast streams **135**
 - webcam **139, 142, 144**
 - webcams, selecting preferred **138**

- Windows registry
 - disabling or enabling Flash URL Redirection **136**
 - disabling or enabling Unity Touch **132**
- Windows 7
 - 3D rendering **116**
 - benefits of disabling services **36**
 - customization specifications **50**
 - disabling hibernation **46**
 - disabling customer experience improvement program **36**
 - disabling defragmentation for linked clones **39**
 - disabling Microsoft Feeds Synchronization **42**
 - disabling prefetch and superfetch **41**
 - disabling registry backup **41**
 - disabling System Restore **42**
 - disabling Windows Defender **42**
 - disabling Windows Diagnostic Policy Service **40**
 - disabling Windows Update Service **40**
 - services that cause OS disk growth **37**
 - volume activation with linked clones **46**
- Windows 8
 - benefits of disabling services **36**
 - customization specifications **50**
 - disabling hibernation **46**
 - disabling services **36**
 - disabling customer experience improvement program **36**
 - disabling defragmentation for linked clones **39**
 - disabling Microsoft Feeds Synchronization **42**
 - disabling prefetch and superfetch **41**
 - disabling registry backup **41**
 - disabling System Restore **42**
 - disabling Windows Defender **42**
 - disabling Windows Diagnostic Policy Service **40**
 - disabling Windows Update Service **40**
 - services that cause OS disk growth **37**
 - volume activation with linked clones **46**
- Windows roaming profiles, Persona Management **231**
- Windows Server 2008 R2 desktops **24**
- Windows Vista
 - disabling hibernation **46**
 - volume activation with linked clones **46**
- Windows XP
 - disabling hibernation **46**
 - troubleshooting GINA chaining **269**
 - troubleshooting linked clones failing to join the domain **262**
- worker types **11**