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To download this document, see Windows MultiPoint Server 2011 Server Deployment Guide (http://go.microsoft.com/fwlink/?LinkId=211313).

Built on Windows Server technology, Windows MultiPoint Server enables multiple local stations (terms shown in italics are defined in the Glossary) to be connected to one computer. Several users can then share that computer at the same time, which enables each user to perform independent work or participate in a group activity.

Physical stations, which are described in more detail in the MultiPoint Server Station Deployment Options section below, consist of a station hub, monitor, keyboard, and mouse. Unlike traditional client/server environments which require a network infrastructure to connect multiple clients to a central server computer, MultiPoint Server supports multiple users without requiring a network since stations can be connected directly to the computer running MultiPoint server. When a network infrastructure is available, MultiPoint Server also supports Remote Desktop Protocol (RDP) connections from client machines, such as desktop, laptops, and thin clients.

MultiPoint Server includes MultiPoint Manager, which helps you, as an administrative user, to monitor and manage MultiPoint Server stations.

With respect to setup, there are two main differences between the Original Equipment Manufacturer (OEM) version and the Volume Licensing version of MultiPoint Server, which are:

- The OEM version is pre-installed on the server with which it is sold.
- The initial customer setup experiences might differ slightly.

Generally, a customer who purchases the OEM solution will connect the required peripheral devices (using explicit instructions from the vendor), turn on the server, and follow instructions on-screen or in the accompanying documentation to complete the setup. This might require fewer deployment tasks to be completed than when MultiPoint Server is purchased through Volume Licensing.

Volume Licensing customers will generally have to consider capacity planning, choose their own hardware, and install the server software (either manually or using Windows deployment tools for larger scenarios).

This document explains how to deploy and configure your MultiPoint Server system. The MultiPoint Server Deployment Task List is provided for you to use as a checklist of the tasks that you must complete for successful deployment. Additional sections provide recommendations for initial planning and configuration tasks such as establishing hardware and software requirements. Detailed information and procedures are provided that are required to complete deployment.
tasks, such as setting up the physical layout of your MultiPoint Server system, configuring user accounts, and updating device drivers.

Finally, sections are included that describe advanced MultiPoint Server configuration tasks in addition to a troubleshooting section that can help assist you with common issues that you might encounter when you deploy MultiPoint Server.
MultiPoint Server Deployment Task List

This task list provides a suggested list of tasks to help you plan and complete the deployment of your MultiPoint Server system. Some tasks will depend on the type of system you purchased and what requirements your system has. Where applicable, references are given to topics that provide additional detail for a task in the list. You can use this task list to help you plan your deployment and to keep track of which deployment tasks you have completed.

The task list also includes a list of advanced configuration tasks that help you optimize the operating system for your organization’s needs. For more information, see Advanced Configuration Tasks in this section.

Deployment Task List

1. Physically set up the computer that will run MultiPoint Server and connect the primary station. For more information about how to set up the primary station, see MultiPoint Server Station Deployment Options.
2. Install the MultiPoint Server operating system, if it is not already installed on the computer, and complete the Windows Welcome experience. For more information about how to install MultiPoint Server, see Install MultiPoint Server.
3. After you complete installation and the Windows welcome experience, you are ready to add standard stations. For more information about physically setting up the MultiPoint Server system, see MultiPoint Server Station Deployment Options.
4. After you have set up the computer and MultiPoint Server stations, some initial configuration steps might be required, as described in Initial MultiPoint Server Configuration Tasks below.

Initial MultiPoint Server configuration tasks

1. Update device drivers for the computer running MultiPoint Server, as described in Update Device Drivers for MultiPoint Server.
2. Start MultiPoint Manager to begin managing your MultiPoint Server stations. For more information about using MultiPoint Manager, see Common MultiPoint Server Tasks.
3. Establish user accounts by performing one of the following:
   a. Set up local user accounts so that your users can start to use the MultiPoint Server system. For information about user accounts, see Configure MultiPoint Server User Accounts.
   b. If you purchased the Premium edition of MultiPoint Server, you can join a domain as described in Understand Your MultiPoint Server Network Environment.
4. You might want to complete additional configuration steps as described in Initial MultiPoint Server Configuration. These steps include the following:
   a. Associate stations with the MultiPoint Server.
A Latin keyboard is required to associate stations.

b. Activate MultiPoint Server.
c. Install client access licenses (CALs).
d. Hot-plug the *multifunction hubs* that have monitors attached.

5. Install and apply software updates, as described in Install and Apply MultiPoint Server Software Updates.

For more information about configuration tasks for MultiPoint Server, see Configure MultiPoint Server.

**Advanced configuration tasks**

The tasks described in this list are advanced configuration tasks that you can perform on MultiPoint Server to optimize performance and set up additional features. These tasks include the following:

1. Install server roles, server role services, and server features, as described in Install Server Roles, Server Role Services, and Server Features for MultiPoint Server.
2. Install and apply language packs, as described in Install MultiPoint Server Language Packs.
3. Allow a single user account to log on to multiple stations at the same time, as described in Allow a Single User to Log on to Multiple Stations.
4. Convert a MultiPoint Server from MAK to KMS activation, or vice versa, as described in Convert a MultiPoint Server from KMS to MAK Activation or Vice Versa.

For more information about more advanced configuration steps for MultiPoint Server, see Advanced MultiPoint Server Configuration Tasks.
Common MultiPoint Server Usage Scenarios

The key to the MultiPoint Server experience is that it can be used for both individual and shared computing experiences. For example, you can:

1. Deploy MultiPoint Server in a computer lab, classroom, training center, or small business environment.
2. Install a program once and access it from any station.
3. Give each user a personal computing experience and private folders without needing a separate computer for each person.
4. Easily share files among groups of users.
5. Allow users to access multimedia content without disturbing others.
MultiPoint Server Site Planning

The location where one or more computers running MultiPoint Server and its associated stations will be deployed can have a significant impact on the quality of the users’ experience and the relative ease of configuring and managing the MultiPoint Server system.

A unique station hub is required for each USB 2.0 connected standard station. And each MultiPoint Server supports only one level of intermediate hubs between the computer and station hubs. The maximum distance from the server to a station hub is 10 meters. If longer distances are required, powered USB extenders can be used between hubs. Alternatively, rich or thin client computers can be used to connect to the computer running MultiPoint Server via the local area network (LAN).

The computer running MultiPoint Server should have convenient access to a power supply and to any peripheral devices that are connected directly to it, such as a printer. Additionally, the computer running MultiPoint Server must have convenient access to a network connection. A network connection is required for accessing both the Internet and, where available, a LAN.

Additional factors to consider include the following:

- Will the MultiPoint Server system be set up in a specific room? Or, will it be set up on a rolling cart or table, so that it can be moved from place to place?

  **Note**

  If you plan this kind of mobile setup, you can associate the stations with MultiPoint Server every time you reconnect them to make sure that each keyboard and mouse is associated with the appropriate monitor.

- Will the primary station be located next to the other stations, or will it be separate? For example, if the MultiPoint Server system is set up in a classroom, will the primary station be on the teacher’s desk; whereas, the standard stations will be positioned elsewhere in the room?

- How many stations will fit in the room?

- Are there enough network connections in the room to support the required number of computers running MultiPoint Server?

- Where are the power outlets located?

- Will you need an additional display device, such as a projector? If you plan to use a projector, will it hang from the ceiling, or will it be positioned on a table?

- What kind of cables will be required, and how many will be needed?
Suggested MultiPoint Server System Layouts

Depending on the available furniture, the size of the room, and the number of computers running MultiPoint Server and stations in the room, there are a variety of ways that the physical stations can be arranged. The following diagrams illustrate five possible alternatives.

Note

Some of these diagrams show a projector connected to the MultiPoint Server system. This is only an example; including a projector in a MultiPoint Server system is optional.

Computer Lab. In this setup, the stations are arranged around the walls of the room, with the students are facing the walls.

Groups. In this setup, there are three computers running MultiPoint Server with stations clustered around each of the computers.
Lecture Room. In this setup, the stations are set up in rows. An advantage of this setup is that all of the students face the instructor.
**Activity Center.** This setup consists of a traditional lecture-room layout for the desks and a single computer running MultiPoint Server and its associated stations.

**Small Business Office.** In this setup, the computer running MultiPoint Server is placed in a central location and users throughout the office connect using Remote Desktop Protocol (RDP) sessions via a local area network (LAN).
MultiPoint Server Virtualization Support

MultiPoint Server Premium supports Microsoft Hyper-V virtualization in two ways. MultiPoint Server Premium can be deployed as a guest operating system running on a Hyper-V host server. When running MultiPoint Server in a virtual machine, only Remote Desktop (RDP) connections are supported, and not USB connected stations (see the following section for more information on stations).

Alternatively, the Premium edition can itself be a Hyper-V host used to run virtual machines. For more information about Microsoft virtualization, see [Hyper-V in Windows Server 2008 and Windows Server 2008 R2](http://go.microsoft.com/fwlink/?LinkId=211308).

**Note**

MultiPoint Server Standard does not support virtualization as a host or guest operation system.

Microsoft RemoteFX

MultiPoint Server takes advantage of Microsoft RemoteFX™, a new feature included in Windows Server 2008 R2 with Service Pack 1 (SP1). It introduces a set of end-user experience enhancements for Remote Desktop Protocol (RDP) that enable a rich desktop environment within your network environment.

Microsoft RemoteFX enables the delivery of a full Windows user experience to a range of client devices including rich clients, thin clients, and ultrathin clients. RemoteFX delivers a rich user experience in a MultiPoint Server environment by providing improved codec support that assists in the delivery of high-definition multimedia content. RemoteFX is integrated with the RDP protocol, which enables shared encryption, authentication, management, and device support.

New functionality provided by RemoteFX in Windows MultiPoint Server 2011 includes an improved encode/decode pipeline which provides:

- Ultrathin client support
- Richer user experience
- Increased host scale

For more information on RemoteFX, see [Microsoft RemoteFX](http://go.microsoft.com/fwlink/?LinkId=211309).
Prepare MultiPoint Server Deployment

When you begin your preparations to deploy MultiPoint Server, you must decide which network scenario best suits your needs, as described in Understand Your MultiPoint Server Network Environment. The decision you make will depend on which edition of MultiPoint Server you have purchased, Standard or Premium, and how many computers you plan to install MultiPoint Server on. For example, if you purchased Windows MultiPoint Server 2011 Premium, you might consider joining the MultiPoint Server system to an Active Directory® domain, if that meets your organization’s requirements.

Note

Windows MultiPoint Server 2011 Standard does not support joining a domain.

Additional deployment preparations can include the purchase and implementation of hardware and software for your MultiPoint Server system.

This section includes deployment preparation topics, including:

- Understand Your MultiPoint Server Network Environment
- MultiPoint Server Software Requirements

Understand Your MultiPoint Server Network Environment

How you deploy your MultiPoint Server system will be determined, at least in part, by your network scenario. For example, will you install MultiPoint Server on only one computer, or will you install it on several computers? Will the MultiPoint Server systems be stand-alone systems, or will they be connected to a local area network together with other computers and network devices, such as an Internet router? Will the computers running MultiPoint Server be connected to an Active Directory domain?

MultiPoint Server in a stand-alone environment

A stand-alone environment is one in which one or more computers running MultiPoint Server are deployed in the same location, but are not connected to each other or to the Internet. In this environment, each MultiPoint Server computer must be managed separately, local user accounts must be created on each computer, and any data transferred from one computer to another must first be copied to a removable storage device, which can then be taken to the target computer to copy the data from the device.

MultiPoint Server on a local area network

The computers running MultiPoint Server can be connected to a local area network (LAN), which can access the Internet using a router which in turn is connected to an Internet Service Provider.
(ISP). An example of a simple network environment of this kind involves a single computer running MultiPoint Server, and a single router connected to an ISP. Typically, Internet routers automatically provide IP and DNS address information to all the computers connected to them via the local network interface. In this case, you can just use the default networking settings and connect the computer to the router. The computer would then automatically obtain its IP and DNS address information, and then connect to the Internet with minimal effort and configuration.

You can also expand this environment by adding additional computers and network devices that are configured to automatically obtain IP and DNS address information. Most network routers provided by ISPs can only manage a limited number of IP addresses. The capability of the routers will determine the number of networked devices that can be added to the network.

**MultiPoint Server in a domain network environment**

If more than a few computers and other networked devices are needed, it is recommend that you set up a Windows Server domain to manage the requirements of larger networks, such as:

- Providing many IP addresses
- Managing domain user accounts
- Configuring network shares for central storage of files
- Configuring access to network printers

In a domain environment, the location of *domain controllers* and *global catalog servers* will affect the speed and reliability with which users will be able to authenticate with the domain and locate resources. Additionally, if resources are shared between servers, or if user applications are accessing database servers or internal Web servers, those should be considered in the network analysis. For more information about network environments and Active Directory, see the *Active Directory Users and Computers* (http://go.microsoft.com/fwlink/?LinkId=191568) content on TechNet.

**Join a domain**

![Note]

This section applies to Windows MultiPoint Server 2011 Premium installations only. Windows MultiPoint Server 2011 supports joining a workgroup only.

If you installed Windows MultiPoint Server 2011 Premium, you can join the MultiPoint Server computer to a domain. Follow the standard procedures for joining a domain as described in Windows Help and Support. For more information about domains, see the TechNet article *Join the Computer to the Domain* (http://go.microsoft.com/fwlink/?LinkID=190200), or search for *join a domain* in Windows Help and Support.

If you join the MultiPoint Server computer to a domain, all users on the domain will have access to MultiPoint Server by default. To make changes to the list of domain users who can access MultiPoint Server, you can edit the membership of the Remote Desktop Users group. Users in this group are the only users who can log on to MultiPoint Server when joined to a domain. Use
the procedures for Windows user account administration to restrict the list of users who can access MultiPoint Server.

For example, by default the user group Everyone is a member of the Remote Desktop Users group, which allows every domain user to log on to the MultiPoint Server. Remove the Everyone user group from the Remote Desktop Users group to restrict the list of users who can access MultiPoint Server, and then add the appropriate domain groups or users to whom you want to give access to MultiPoint Server.

**Note**

Depending on how you define your group policy settings, it is possible that some group policy settings could prevent required configuration settings from being applied to MultiPoint Server. Be sure that you understand and define your group policy settings so that they work correctly for MultiPoint Server. For example, a Group Policy setting that prevents Autologon could present problems with MultiPoint Server logon behavior.

**MultiPoint Server Software Requirements**

There are no software requirements for MultiPoint Server besides the installation of the operating system. Server software or user programs can be installed on the computer running MultiPoint Server as long as the following criteria are met:

- The server hardware and the version of MultiPoint Server must meet the minimum requirements for the software. For example, if a program requires an Active Directory domain, it will not work correctly if it is installed on Windows MultiPoint Server 2011 Standard, which does not support joining a domain.

- You must have the appropriate rights and licenses to use the software. Your MultiPoint Server license and WMS Client Access Licenses (CALs) do not entitle you to use other programs, such as Microsoft Office.

**Note**

Some user programs may require special licensing. Microsoft Office, for example, requires a Volume License for multiple users when it is used in a MultiPoint Server environment.

- Users must comply with the terms and conditions that come with the software.

- User programs must be designed and supported to run in Remote Desktop Services sessions.
Deploy a MultiPoint Server System

Now that you have determined which network scenario you are going to support and have the minimum hardware and software requirements, you are ready to set up your MultiPoint Server system. The information in this section provides guidelines about how to install the MultiPoint Server operating system and how to set up the MultiPoint Server stations that will be attached to the computer.

To help complete the deployment of your MultiPoint Server system, a checklist of deployment tasks is provided in MultiPoint Server Deployment Task List. The checklist includes tasks such as software installation, configuration tasks, and setting up user accounts.

Install MultiPoint Server

If MultiPoint Server is not already installed on the computer that you purchased, you must install it before you can continue with your deployment. If this is necessary, you should have been provided with an installation DVD to perform the installation. If you purchased a computer from an OEM with MultiPoint Server pre-installed, you simply need to complete the final setup steps.

Follow the appropriate procedure below for your situation.

Note
Before you start the installation process, set up the computer and connect the components for the primary station to the computer. For more information about how to set up the primary station, see MultiPoint Server Station Deployment Options.

Install the MultiPoint Server operating system on your computer

1. Insert the MultiPoint Server installation DVD into the computer.
2. Start the computer to begin MultiPoint Server installation.

Note
If you are installing MultiPoint Server from a DVD, you might be prompted to press a key to begin the installation.

3. Follow the installation steps as prompted on the screen. The computer might restart several times during the installation process.
4. After the installation is finished, you are ready to physically set up additional MultiPoint Server stations.

Complete MultiPoint Server setup on a pre-installed OEM computer

1. Start the computer to begin MultiPoint Server setup.
2. Follow the on-screen prompts to complete the setup.
3. After setup is finished, you are ready to physically set up additional MultiPoint Server stations.
MultiPoint Server Station Deployment Options

In a MultiPoint Server system environment, stations are the user endpoints for connecting to the computer running MultiPoint Server. When deploying stations, three types of connections are supported. You can use any combination of these connection types for the stations in your environment, which are described more fully in the sections below.

1. Direct Video Connected Stations
2. USB Connected Stations
3. LAN Connected Stations

For direct video and USB connections, a station consists of a monitor, keyboard, mouse, and other peripheral devices, such as speakers, headphones, or USB flash drives that are attached to the computer via station hubs. A station hub is a hardware device that can be used to connect devices to a computer in a MultiPoint Server system. Both USB hubs and multifunction hubs can be used as station hubs.

Two types of station hubs

A USB hub in this context is a generic multiport USB expansion hub that complies with the universal serial bus (USB) specifications. Such hubs typically have two, four, or more USB ports that enable multiple USB devices to be connected to a single USB port on the computer. USB hubs are typically separate devices that may be externally powered or unpowered. Some other devices, such as some keyboards and video monitors, may also incorporate a USB hub into their design.

> Note

Only USB 2.0-compliant hubs are supported by MultiPoint Server.

A multifunction hub is an expansion hub that connects to the computer via a USB port and enables the connection of a variety of non-USB devices, such as monitors, to the hub. Multifunction USB hubs must be USB 2.0-compliant.

A root hub is a USB hub built into the host controller on a computer's motherboard. Station hubs are generally plugged into the root hub on the computer running MultiPoint Server. Root hubs should not be used as station hubs.

For thin clients or traditional desktops and laptops connected via the local area network (LAN), the station hardware is the machine itself and other peripheral devices that are attached to it.

Primary and Standard Stations

Every MultiPoint Server system must have a primary station and one or more standard stations. Both the primary and standard stations are usually defined immediately after you install MultiPoint Server. The primary station is the one which displays the startup process when the computer is turned on and is used for administration. The monitor of the primary station must be connected
directly to a video port on the computer that is running MultiPoint Server, for example, by a DVI or VGA cable. In contrast, standard stations can be connected directly to the video ports on the computer, through USB multifunction devices that include video connections, or through the local area network (LAN) in the case of thin clients or traditional desktops and laptops.

If more than one monitor is connected directly to the computer running MultiPoint Server, only one of these monitors is used as the primary station. We recommend that you connect only the primary station to the computer running MultiPoint Server during the initial deployment. Connect other standard stations to the computer after the initial deployment is completed.

If more than one monitor is connected directly to the computer, you can determine which monitor is connected to the primary station by completing the following procedure.

**To determine which monitor is connected to the primary station**

1. Turn on all monitors that are connected directly to the computer.
2. Start the computer and look at each monitor to see which one displays the MultiPoint Server desktop. This is the primary station.

**Direct Video Connected Stations**

The computer running MultiPoint Server can contain multiple video cards, each of which can have one or more video ports. This allows monitors for multiple stations to be plugged directly into the computer.

Note

Be sure to install all the latest 64-bit video drivers.

Keyboards and mice are then connected via USB hubs or directly to the computer and are associated with each monitor using the MultiPoint Manager console.
MultiPoint Server system with direct video connections

Set up a MultiPoint Server station with a direct video connection
The following steps show how to connect a station which has a monitor that is directly connected to the computer running MultiPoint Server. Also in this example, the keyboard and mouse are connected through USB hubs.

1. Ensure that the computer running MultiPoint Server is turned off and unplugged.
2. Connect the monitor cable to the video display port on the computer:

3. Connect the power cord of the video monitor to a power outlet.
4. Connect the USB station hub to an open USB port on the computer, as shown in the following illustration:
5. Connect a keyboard and mouse to the USB station hub:

6. Connect the power cable of the hub to a power outlet.

7. Repeat the previous steps until all stations have been connected to the computer running MultiPoint Server.

8. Plug the computer power cord into a power outlet.

9. Turn on the computer.

10. MultiPoint Server starts. Follow the instructions that appear on each station’s video monitor to associate the devices to the station.

**USB Connected Stations**

A *multifunction hub* is an expansion hub that connects to the computer through a USB port and enables the connection of a variety of both USB and non-USB devices to the hub. A multifunction hub typically contains a video display port so that the monitor can be connected to the multifunction hub instead of directly to the computer running MultiPoint Server. Multifunction hubs are produced by specific hardware manufacturers and might require the installation of a device-specific driver.

*Note*

Be sure to install all the latest 64-bit video drivers and drivers for the multifunction hub. If you are using *multifunction hubs* that include video ports to create MultiPoint Server stations, the monitor for each station should be connected to the video port on the multifunction hub. The following diagram shows a MultiPoint Server system with a primary station and two additional stations. In this diagram, the monitor of the primary station is connected directly to the MultiPoint Server computer by a DVI cable, and the monitors, keyboards, and mice of the standard stations are connected to multifunction USB hubs.
Use the following procedure to set up stations using a multifunction hub. Complete the setup of the primary station before you set up standard stations.
Set up a MultiPoint Server station using a multifunction hub

1. Ensure that the computer running MultiPoint Server is turned off and unplugged.
2. Connect the multifunction hub to an open USB port on the computer, as shown in the following illustration:

3. Connect the video monitor cable to the DVI or VGA video display port on the multifunction hub:

4. Connect a keyboard and mouse to the multifunction hub:

5. Connect the power cord of the video monitor to a power outlet.
6. Repeat the previous steps until all stations have been connected to the computer running MultiPoint Server.
7. Connect the power cord of the computer to the power outlet.
8. Turn on the computer.
9. MultiPoint Server starts. If prompted, follow the instructions that appear on the station’s video monitor to associate the devices to the station.

Using Intermediate USB Hubs

The use of one USB intermediate hub to go beyond the basic distance limitations of the USB architecture is supported, but a self-powered hub should be located at each end of the connection.
No more than one intermediate hub is supported between the root hub in the host computer and a station hub. One additional hub can be connected to the station hub to support additional peripheral devices connected to the station hub.

**Note**

Microsoft has not verified the use of wireless USB hub devices with MultiPoint Server. Wireless USB keyboards and mice where the wireless USB transceiver is plugged into a wired hub are supported.

The following illustration shows an optimal setup scenario for a MultiPoint Server system with an intermediate hub and three station hubs.

**MultiPoint Server system with an intermediate hub and three station hubs**

![Diagram of MultiPoint Server system with an intermediate hub and three station hubs]

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<td>Station hub. The middle hub is a multifunction hub, and the monitor is plugged into the video port on the multifunction hub. The other station hubs are USB hubs and the monitor is plugged into the computer running MultiPoint Server.</td>
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<tr>
<td>3</td>
<td>Additional hub plugged into a station hub.</td>
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Additional Information about USB Devices

With the exception of station hubs, MultiPoint Server will support any USB 2.0 device connected either to a station hub or directly to the computer. Most of these devices, such as a printer, camera, and so on, will be available from any station. However, when any of the following USB devices is connected to a station hub, it will automatically be associated with that particular station:

- Keyboards
- Mice
- Speakers
- Headphones
- USB flash drives

Typically, the physical components of your MultiPoint Server system include a computer running MultiPoint Server and stations, which consist of the following components:

- Station hub
- Monitor
- Keyboard
- Mouse

USB devices, including USB hubs, can be bus-powered, drawing power directly from the bus; or self-powered, drawing power from an external source. Some devices draw more power than can be supplied from the USB bus and therefore must have an external power source. External USB hubs should be self-powered because the number and variety of devices that could be used at each user station might require more power than can be delivered through the USB connection. The use of self-powered hubs can help prevent performance issues, port failures, and other intermittent issues.

LAN Connected Stations

Thin clients, ultrathin clients, and traditional desktop and laptop PCs can connect to the computer running MultiPoint Server using Remote Desktop Protocol (RDP) via the local area network (LAN). RDP connections provide an end user experience that is very similar to using a monitor, keyboard, and mouse connected directly to the computer running MultiPoint Server through a station hub, but makes use of the local client machine’s own hardware.

Microsoft RemoteFX enabled clients and devices can provide a rich multimedia experience by taking advantage of the processor and video hardware capabilities of the computer running MultiPoint Server to deliver high-definition video.

From an administration perspective, there are some differences when using the MultiPoint Manager console:

- Not limited to physical USB connection distances
- Potential to reuse older PC hardware as stations
- Easier to scale to a higher number of stations
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- No hardware trouble-shooting
- No split-screen functionality
- Fewer options for controlling the station

MultiPoint Server system with LAN connections

1. Connect the power cord of the computer running MultiPoint Server to the power outlet.
2. Turn on the computer.
3. Ensure the computer is connected to the local area network (LAN) via a switch, router, firewall, or other networking device and that it has a proper IP address.
4. Connect the client machine or thin client to the LAN.
5. Connect the power cord of the client machine or thin client to the power outlet.
6. Turn on the client machine or thin client and ensure that it has a proper IP address.
7. On the client machine or thin client, start the Remote Desktop Connection application and enter the name of the computer running MultiPoint Server.
8. Repeat the previous steps until all stations have been connected to the computer running MultiPoint Server.
Configure MultiPoint Server User Accounts

How you configure MultiPoint Server user accounts depends on the complexity of your system. If you have a small system with only a few computers running MultiPoint Server and few user accounts, you may find it most convenient to implement local user accounts. If you decide to implement local user accounts, you will have to determine whether to create individual accounts for each person using the system, or whether to create a generic account for each station that anyone can use to log on. In contrast, if your environment has many computers running MultiPoint Server and many user accounts, setting up a Windows Server domain and implementing domain user accounts will be more useful.

Note

MultiPoint Server includes the MultiPoint Manager application. You can use MultiPoint Manager to manage local user accounts. However, you cannot manage domain user accounts from MultiPoint Manager. For more information, see Managing MultiPoint Server (http://go.microsoft.com/fwlink/?LinkId=205648).

Individual local user accounts

When creating local user accounts, you have the option of assigning each student to a particular computer running MultiPoint Server and creating a single account for each student. Alternatively, you might want to create individual accounts for each student on every available computer running MultiPoint Server. A key advantage of implementing individual user accounts is that each user will have his or her own Windows desktop experience that includes private folders for storing data. There are two approaches to creating individual local user accounts with MultiPoint Server: assign each user to a specific computer running MultiPoint Server, and then create an individual account for each user only on the computer to which they have been assigned; or, create local user accounts for all users on every computer running MultiPoint Server.

From a system management perspective, assigning users to a specific MultiPoint Server might be more convenient. For example, if you have two computers running MultiPoint Server with five stations each, you might create local user accounts as illustrated in the following table.

Table 3: Assigning local user accounts to specific computers running MultiPoint Server

<table>
<thead>
<tr>
<th>Computer A</th>
<th>Computer B</th>
</tr>
</thead>
<tbody>
<tr>
<td>UserAccount_01</td>
<td>UserAccount_06</td>
</tr>
<tr>
<td>UserAccount_02</td>
<td>UserAccount_07</td>
</tr>
<tr>
<td>UserAccount_03</td>
<td>UserAccount_08</td>
</tr>
<tr>
<td>UserAccount_04</td>
<td>UserAccount_09</td>
</tr>
</tbody>
</table>
In this scenario, each user has a single account on a particular computer. Therefore, everyone who has a local account on Computer A can log on to her or his account from any station associated with it. However, these users cannot access their accounts if they use a station associated with Computer B, and vice versa. An advantage to this approach is that, by always connecting to the same computer, users will always be able to find and access their files.

In contrast, it is also possible to replicate individual user accounts on all computers running MultiPoint Server, as illustrated in the following table.

**Table 4: Replicating user accounts on all computers running MultiPoint Server**

<table>
<thead>
<tr>
<th>Computer A</th>
<th>Computer B</th>
</tr>
</thead>
<tbody>
<tr>
<td>UserAccount_05</td>
<td>UserAccount_10</td>
</tr>
</tbody>
</table>

An advantage of taking this approach is that users have a local user account on every available computer running MultiPoint Server. However, the disadvantages might outweigh this advantage. For example, even if the user name and password for a particular person is the same on both computers, the accounts are not linked to each other. Therefore, if a user logs on to his or her account on Computer A on Monday, saves a file, and then logs on to his or her account on Computer B on Tuesday, he or she will not be able to access the file previously saved on Computer A. Additionally, replicating user accounts on multiple computers increases the administrative overhead and storage requirements.

**Generic local user accounts**

If your MultiPoint Server system is not connected to a domain, and you do not want to create an individual account for each user, you can create generic accounts for each station instead. For example, if you have two computers running MultiPoint Server, and five stations associated with each, you might decide to create user accounts similar to those shown in the following table.

**Table 5: Creating generic user accounts**

<table>
<thead>
<tr>
<th>Computer A</th>
<th>Computer B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer_A-Station_01</td>
<td>Computer_B-Station_01</td>
</tr>
</tbody>
</table>
In this scenario, every station account would have the same password, and both the passwords and generic user account names would be available to all users. An advantage to this approach is that the overhead of managing user accounts is likely to be less than if using individual accounts, because there will typically be fewer stations than users. Additionally, the overhead caused by replicating user accounts on every server will also be eliminated. However, this scenario presents its own disadvantages. For example, if you create a single account for Server_A-Station_01 that anyone can use, you can log on to that station and create individual folders for everyone who will use that station. The disadvantage to this approach is that anyone who logs on to that station will have access to all the individual user folders that are associated with the Server_A-Station_01 user ID, regardless of who those files belong to. Also, if users log on to a different station each day—even if the stations are all associated with the same computer running MultiPoint Server—they will not be able to access any of the files that were created on a different station.
Configure MultiPoint Server

This section addresses some basic configuration requirements for MultiPoint Server.
The primary management tool for MultiPoint Server is the MultiPoint Manager user interface (UI).
This section focuses on how to perform additional tasks to monitor and manage MultiPoint Server stations.
For more information about advanced MultiPoint Server configuration tasks, see Advanced MultiPoint Server Configuration Tasks.
This section includes the following topics:
• Update Device Drivers for MultiPoint Server
• Initial MultiPoint Server Configuration

Update Device Drivers for MultiPoint Server
To make sure that your computer running MultiPoint Server behaves as expected, be sure to update the device drivers. Updating device drivers is performed when the MultiPoint Server is in maintenance mode.
Generally, the following types of devices require that the most current drivers are installed:
• Video adapters
• Video displays (monitors)
• Disk controllers
• Network adapters
• Sound controllers
• USB host controllers

⚠️ Important
MultiPoint Server must have the correct video adapter drivers installed. If the correct drivers are not installed, you might not be able to map each station with the computer.

Initial MultiPoint Server Configuration
After MultiPoint Server has been set up, there are additional configuration tasks that you might have to complete, such as the following:
• Associating stations with MultiPoint Server
• Activating MultiPoint Server
• Installing client access licenses (CALs)
• Hot-plugging multifunction hubs with monitors attached
Associate MultiPoint Server stations

Generally, MultiPoint Server stations are associated automatically when you turn the computer on. MultiPoint Server provides a set of interfaces that allow a driver to pre-associate a monitor with a USB hub so that the association can be achieved without requiring user input. Auto-associating is most likely to be implemented for station hubs that include integrated video adapters, such as those available from some OEM vendors. However, there are some situations that require you to associate a station manually, as described in the following sections.

Associate MultiPoint Server stations manually

Video devices that do not have drivers that support automatically associating stations must be associated manually. Manual association is performed when the MultiPoint Server system is deployed for the first time. Additionally, stations can also be re-associated at any time using the MultiPoint Manager by navigating to the Home tab and clicking on Remap all stations in the task pane.

Note

The character set might differ by language.

After a station has been associated, users can log on and start to use it.

Activate MultiPoint Server

Activation makes sure that the MultiPoint Server operating system on your computer is used according to the Microsoft Software License Terms. You must activate MultiPoint Server within 60 days after installation.

To activate MultiPoint Server
1. On the Start menu, right-click Computer.
2. Click Properties.
3. At the bottom of the screen, click Activate Windows.

Install client access licenses (CALs)

You must obtain client access license (CALs) for each station connected to the computer running MultiPoint Server. For more information about how to install CALs, refer to the MultiPoint Manager help topics.

Hot-plug multifunction hubs with monitors attached

USB display devices, such as monitors, can be “hot-plugged” into the MultiPoint Server’s USB network at any time. If the appropriate drivers for the device are already installed on the computer it can immediately be used for associating stations. When automatic station associating is supported, the USB monitor will be automatically associated to the associated station hub. If automatic station associating is not supported, the newly-connected USB monitor will immediately
display the station-associating screen with a new character displayed. Press the designated key to manually associate the monitor with a station hub.

Install new software on MultiPoint Server

When you are logged on as an administrative user, you can install new programs either in maintenance mode or from a station in normal mode. It is recommended that programs are installed in maintenance mode.

You can install new software on the computer running MultiPoint Server so that all users can run the software, or so that only you can use the software, depending on the installation and licensing options of the software. For more information about how to install software on the computer running MultiPoint Server, see MultiPoint Manager Help.

Important

You must comply with the license terms for the programs you use on MultiPoint Server. If you are using other Microsoft programs or any third-party programs with this Microsoft software or service, the terms that come with such programs apply to your use of them. Microsoft may deem any failure to comply with such terms to also be a breach of your license from Microsoft.
Manage Your MultiPoint Server System

After your MultiPoint Server system is set up, many management and maintenance tasks can be performed by using MultiPoint Manager. Use MultiPoint Manager for typical administrative tasks, such as managing stations, user accounts, and system hardware. For more information about how to use MultiPoint Manager, see Common MultiPoint Server Tasks.

More complex background tasks, such as backing-up your server or balancing resource usage, can be completed using Windows Server Manager Console. For more information about this tool, see Perform Advanced MultiPoint Server Tasks.

To find additional detailed information about how to use and manage MultiPoint Server, see Access Help Documentation for MultiPoint Server.

This section includes:

- Common MultiPoint Server Tasks
- Perform Advanced MultiPoint Server Tasks
- Access Help Documentation for MultiPoint Server

Common MultiPoint Server Tasks

The MultiPoint Manager application lets you monitor and take actions on MultiPoint Server stations. The MultiPoint Manager Help file provides information about how to use MultiPoint Manager daily to manage MultiPoint Server stations.

MultiPoint Manager provides four tabs to access the tasks you need when you are managing MultiPoint Server stations. Each tab, and the tasks that you can perform on them, is described in more detail in each Help topic. The four tabs include the following:

- **Home tab**: Switch modes to perform administrative tasks, restart or shut down the computer, check the status of the system, and get help or support.
- **Desktops tab**: View users' desktop status and end or disconnect user sessions.
- **Stations tab**: View and manage the station hardware.
- **Users tab**: Create and manage standard user accounts and administrative user accounts.

You can open MultiPoint Manager Help in MultiPoint Manager by clicking the Help icon from any page in MultiPoint Manager.

MultiPoint Server Orchestration

Orchestration refers to a set of features that provide the administrator with the ability to view and control what is happening throughout the MultiPoint Server environment. Thumbnail views of the current station desktops that are attached to the computer running MultiPoint Server can be viewed from the Desktops tab of the MultiPoint Manager console. In addition, there are actions...
the administrator can perform on the station desktops individually or as a group to help control or limit the activities performed on the station. These actions include:

- **Blocking sessions:** The administrator can block some or all stations from being used.
- **Open/close an application:** This allows the administrator to open an application on selected stations(s).
- **Internet Explorer Limiting:** The Internet Explorer limiting feature allows the administrator to set an allowed list of web sites users can visit. This can be useful if the administrator wants the users to only visit specific sites. This is not a site filtering feature; a firewall or other software must be used to block or filter objectionable sites if that functionality is desired.
- **Projection:** The purpose of the projection feature is to allow the administrator to project their desktop out to one or more stations, or to replicate the desktop of one of the stations out to one or more other stations.

### Perform Advanced MultiPoint Server Tasks

MultiPoint Server is designed so that non-IT professionals can perform basic management tasks from the MultiPoint Manager user interface (UI). However, sometimes advanced management tasks should be performed by an IT professional. The Server Manager console includes snap-ins for the most common advanced tasks that an administrator might have to perform, such as:

- Scheduling backups
- Managing devices and their associated drivers
- Using Windows System Resource Manager (WSRM) to balance resource usage
- Adding and managing roles, role services, and features
- Managing physical and logical disks
- Viewing event logs
- Performing performance analysis
- Managing scheduled tasks
- Managing the Windows firewall
- Starting and stopping services
- Performing advanced user and security group management

Users should have the appropriate knowledge and experience before they try to use these tools. This section does not include details on how to manage these components. However, detailed information is available for each of these components in Windows Server Help.

This section briefly describes some optional role services and features that might be of special significance to administrators for MultiPoint Server, such as:

- Windows Server Backup, as described in [Configure MultiPoint Server Backups](#).
- Windows System Resource Manager (WSRM), as described in [Manage System Resources](#).
Configure MultiPoint Server Backups

A good backup and recovery plan is important for any size environment. Windows Server Backup is a feature in Windows Server 2008 R2 that provides a set of wizards and other tools for you to perform basic backup and recovery tasks for the server on which it is installed. You can use Windows Server Backup to back up a full server (all volumes), selected volumes, the system state, or specific files or folders, and to create a backup that you can use to rebuild your system. You can recover volumes, folders, files, certain applications, and the system state. And, for disasters like hard disk failures, you can rebuild a system either from scratch or by using alternate hardware. To do this, you must have a backup of the full server or just the volumes that contain operating system files and the Windows Recovery Environment. This restores your complete system onto your old system or onto a new hard disk.

A key feature of Windows Server Backup is the ability to schedule backups to run automatically. Use the following procedure to set up the type of backup you require.

To configure backups using Windows Server Backup

1. At the command prompt, type `mmc` to open Microsoft Management Console (MMC).
2. In the navigation pane, right-click the **Windows Server Backup** node.
3. Choose one of the following backup options:
   - Backup Schedule
   - Backup Once
4. Follow the prompts in the wizard.

**Note**

By default, the Windows Server Backup feature is not installed and can be added by running the **Add Features Wizard** from Server Manager.


Manage System Resources

You can use Windows System Resource Manager (WSRM) to allocate processor and memory resources to applications, users, Remote Desktop Services sessions, and Internet Information Services (IIS) application pools. It can be especially useful on MultiPoint Server to balance server resource usage between sessions.

For example, if you have widely varying usages between user sessions, such as one user downloading videos or playing video games, and other users reading e-mail or using word-processing programs, you can use a built-in resource management policy, such as Equal_Per_Session, that allocates resources equally to all user sessions.

For more information about how to use the built-in or custom resource management policies in WSRM for MultiPoint Server, see Windows Server Help.
For more information about Windows System Resource Manager, see the TechNet article Windows System Resource Manager, (http://go.microsoft.com/fwlink/?LinkId=191036).

Access Help Documentation for MultiPoint Server

The primary interface for managing MultiPoint Server is MultiPoint Manager. MultiPoint Manager Help describes many of the tasks that you can perform in MultiPoint Manager. For more information about how to use MultiPoint Manager, see Common MultiPoint Server Tasks.

In addition to this material, you have access to Windows Server Help. Windows Help and Support includes detailed instructions about important subjects, such as user privacy and computer security, in addition to detailed technical information referred to in this document.

Note

Some topics in Windows Server Help describe functionality that might not apply to MultiPoint Server.

*Standard users* typically cannot perform certain activities that affect all other users of the MultiPoint Server system, such as installing software or changing security settings. However standard users have access to Windows Server Help.
Advanced MultiPoint Server Configuration Tasks

This section addresses advanced configuration tasks that you can perform on MultiPoint Server. It assumes that the reader who will perform these tasks already has a basic knowledge of:

- Using Server Manager and its various diagnostic and configuration snap-ins
- Installing and managing role services and features

MultiPoint Server includes the same Microsoft Management Console (MMC) and management tools as Windows Server® 2008 R2. This section addresses how to complete more advanced configuration tasks, including the following:

- Install Server Roles, Server Role Services, and Server Features for MultiPoint Server
- Install MultiPoint Server Language Packs
- Convert a MultiPoint Server from KMS to MAK Activation or Vice Versa

Install Server Roles, Server Role Services, and Server Features for MultiPoint Server

MultiPoint Server is designed to enable remote desktop experiences for multiple users on one desktop-class, local-host machine. It is not intended for use as a general-purpose server. It is expected that all local computer resources will be available for desktop workload local administrative tasks. By default, after you complete the MultiPoint Server installation, there are several server roles, server role services, and server features installed. In addition, several other server roles, role services, and server features are not installed, but are supported by MultiPoint Server and can be installed if desired.

Table 6 lists the server roles that are either installed by default or that you can install by using Server Manager in MultiPoint Server. For more information about how to use Server Manager, see Perform Advanced MultiPoint Server Tasks, or Windows Help and Support.

### Table 6: Supported server roles

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Max # of Sessions</td>
<td>10 sessions enforced</td>
<td>20 sessions enforced</td>
</tr>
<tr>
<td>Max SMB Connections</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Max RRAS Connections</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Max IAS Connections</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Max TSG Connections</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Max x64 Sockets</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Max RAM</th>
<th>8 GB</th>
<th>32 GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual Image Guest Rights</td>
<td>None</td>
<td>1+1</td>
</tr>
<tr>
<td>Domain Join</td>
<td>Not Supported</td>
<td>Yes</td>
</tr>
<tr>
<td>Domain Requirements</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Direct Access</td>
<td>Not Supported</td>
<td>Not Supported</td>
</tr>
</tbody>
</table>

#### Application Server

| Storage, Media & Data Protection Apps | Yes | Yes |
| Management, security, networking & access apps | Partial | Partial |
| Line of business apps | Partial | Partial |
| End user client apps | Yes | Yes |

#### Server Roles

| Active Directory Domain Services | Not Supported | Not Supported |
| Group Policy Server | No | Yes |
| Hyper-V Guest | Not Supported | Yes |
| Hyper-V Host | Not Supported | Yes |

Using MultiPoint Server in any of the following ways is untested and unsupported, and may be blocked, depending on your version:

- As a file and print server with more than 30 concurrent SMB connections in the Standard edition or 60 in the Premium edition.
- As a domain controller
- As a remote access server (except for remote administration)
- As a Remote Desktop Services gateway
- As an IAS server

### Install and Apply MultiPoint Server Language Packs

MultiPoint Server is available, fully localized, in the following languages:

- English (en-US)
- French (fr-FR)
- German (de-DE)
- Honk Kong Chinese (zh-HK)
- Hungarian (hu-HU)
In addition, MultiPoint Server supports the installation of 35 language packs that include the 16 fully localized languages and 23 additional languages. These language packs are available for download at Microsoft.com. Installing a language pack lets you change the display language for the core operating system to a language that differs from when MultiPoint Server was installed. For more information on installing language packs, see Language Pack Installation and Removal (http://go.microsoft.com/fwlink/?LinkId=211315).

After you have installed the language packs that you plan to offer your users, you can set the language for MultiPoint Server to use. You can set the language in two different areas in Control Panel, as described in Setting the MultiPoint Server Display Language.

Display Language Scenarios describes how the language is displayed in different areas in the MultiPoint Server UI after you set the display language.

### Setting the MultiPoint Server Display Language

There are two different areas in Control Panel where you can set the language that you want your system to use. Each setting affects the display language for different areas in the UI. Set the display language in the following areas in Control Panel:

- In Control Panel, use the **Keyboards and Languages** tab on the **Region and Language** dialog box to set the display language of the menus and dialog boxes that display for the user account. For more information about how to set the display language for MultiPoint Manager and the user accounts, search for **set display languages** in Windows Help and Support.

- In Control Panel, use the **Administrative** tab on the **Region and Language** dialog box to apply your regional and language settings to the Welcome screen and system accounts. This setting changes the language of the MultiPoint Server Welcome screen and logon screen. For more information about how to set the display language for the Welcome screen and system accounts, search for **apply region and language settings** in Windows Help and Support.
Display Language Scenarios

The language displayed in MultiPoint Server depends on whether the language that you set is fully localized for MultiPoint Server, as described in the following two scenarios.

Setting a fully localized display language

If you install a language pack that is one of the 16 fully localized MultiPoint Server languages, and you set the MultiPoint Server system to use that language as described in Setting the MultiPoint Server Display Language (that is, for the display language for a user account and also for the language of the Welcome screen and system accounts), MultiPoint Manager and the MultiPoint Server setup screens will be displayed in the language that you installed and set.

Setting a display language that is not fully localized

If you install a language pack that is not one of the 12 fully localized MultiPoint Server languages, the language that displays in MultiPoint Manager and the MultiPoint Server setup screens might be set to English, depending on how you set the display language for the installed language pack. The following two scenarios describe this behavior:

- **Set the display language for the user account and do not set the language for the Welcome screen and system accounts**
  
  If you set the display language for the user account to a language that is not one of the fully localized languages, but do not set the language for the Welcome screen and system accounts, MultiPoint Manager will display in English, and the MultiPoint Server setup screens will display in the language of the fully localized version of MultiPoint Server that you installed.

  For example, if you installed the German version of MultiPoint Server and the Polish language pack, MultiPoint Manager will display in English, and the MultiPoint Server setup screens will display in German.

- **Set the language for the Welcome screen and system accounts and do not set the display language for the user account**
  
  If you set the language for the Welcome screen and system accounts to a language that is not one of the fully localized languages, but do not set the display language for the user account, MultiPoint Manager will display in the language of the fully localized version of MultiPoint Server that you installed, and the MultiPoint Server setup screens will display in English.

  For example, if you installed the German version of MultiPoint Server and the Polish language pack, MultiPoint Manager will display in German, and the MultiPoint Server setup screens will display in English.
Convert a MultiPoint Server from KMS to MAK Activation or Vice Versa

Note

This section applies to Volume License installations only.

When you install MultiPoint Server on a new computer, it installs a product key that uses Microsoft Key Management Service (KMS) to activate the computer. However, if your MultiPoint Server is in an environment that previously used multiple activation keys (MAK) for activation, and your organization changes to using KMS, you can manually convert the existing computers running MultiPoint Server to KMS by installing the applicable startup product key. The updated product key enables these computers to automatically activate using a KMS host server.

The startup product key to use is:

736RG-XDKJK-V34PF-BHK87-J6X3K

You can use the same procedure to convert a KMS-activated system to MAK activation.

For more information about how to use KMS and installing the applicable product key, see Volume Activation Technical Reference Guide (http://go.microsoft.com/fwlink/?LinkId=182919).
Troubleshooting MultiPoint Server Deployment Issues

There are several tools and techniques that you can use to troubleshoot problems with your MultiPoint Server system that depends on the type of issue that you are trying to resolve. This section provides information about resolving the following potential issues:

- **MultiPoint Server USB Device Issues**: This section describes issues with USB station devices and provides information and solutions to help fix these issues.
- **MultiPoint Server Issues Accessing User Accounts and Files**: This section describes issues that can occur when you are accessing MultiPoint Server user files or accounts.
- **Issues Finding Files on a MultiPoint Server**: This section describes problems that can occur when you are trying to find files on a computer running MultiPoint Server.
- **Issues Accessing Shared Files on a MultiPoint Server**: This section describes problems that can occur when you are trying to access shared files on a computer running MultiPoint Server.
- **Issues Managing Network Accounts with MultiPoint Manager**: This section describes issues that might occur when you are managing network accounts using MultiPoint Server.
- **MultiPoint Server IP Address Issues**: This section describes networking issues expected to duplicate IP addresses on computers running MultiPoint Server.
- **Analyze MultiPoint Server Performance Issues**: This section describes performance issues with MultiPoint Server that might occur and ways to troubleshoot them.
- **View MultiPoint Server Errors with Event Viewer**: This section includes information about how to use Event Viewer to browse and manage event logs to troubleshoot issues.

**MultiPoint Server USB Device Issues**

Because USB technology plays a key role in the operation of MultiPoint Server, faulty equipment or a configuration that does not meet USB 2.0 or MultiPoint Server standards can cause issues related to connectivity, performance, and other intermittent issues.

The best way to prevent such issues is to make sure that all standards and best practices are observed when configuring the USB network. These standards and practices include the following:

- Only USB 2.0 devices and hubs are supported for use with MultiPoint Server.
- All hubs external to the computer should have their own external power source. MultiPoint Server station hubs should be no farther from root hub than at the third level away from the computer.
- Observe cable length limitations for single connections and for the total length between the root hub and a device.
- Ensure that all controllers, hubs, and devices have the latest supported drivers.
OEMs might support a different version of a driver than is available from the component manufacturer’s Web site.

- Care must be taken not overload controllers with high-speed devices such as monitors or multifunction station hubs.
- Consider the power requirements and limitations for hubs, ports, and devices.

If errors occur that might be related to USB devices, consider these general troubleshooting steps:

- Clearly define the problem behavior, such as:
  - What is the message or behavior observed?
  - What is a user doing when the problem occurs?
  - Is the behavior reproducible?

- Determine the scope of the issue
  - Is the issue isolated to a specific station or set of stations?
  - Is the problem behavior consistent or intermittent, and does it occur more often when there are more users on the system?

- Collect and analyze the appropriate logs
  - Event logs
  - Performance Monitor logs

- Get a clear picture of the USB topology in a tree view of all USB controllers, hubs, and devices.

Troubleshooting MultiPoint Server Issues with Accessing User Accounts and Files

The inability to access files on a computer running MultiPoint Server can occur from several different root causes. Possible causes include the station to which a user is logged on, how user accounts have been configured, and whether files have been configured.

**Cannot access a user’s files**

If users have local accounts on more than one computer running MultiPoint Server, they will not be able to access files saved on one server as long as they are logged on to a station connected to a different server.

**Cannot access public files**

Files can only be edited by one person at a time. Therefore, if a file has been shared among multiple users or is stored in the Public Documents folder and one user has the file open for editing, other users will only be able to access a read-only version of the file. For a second user to
change the original document, the first user must save and close the file before the second user attempts to open it.

Troubleshooting Issues with Finding Files on a MultiPoint Server

This topic addresses the different reasons that a user might not be able to find their files on a given computer running MultiPoint Server.

Cannot find file when a user is logged on to a generic station account

If a user has saved a file while logged on to a MultiPoint Server station using a generic user account and cannot find his or her personal files, check for one of the following possible causes:

- The file was saved on a different computer. Search for the file on each computer running MultiPoint Server.
- The file was replaced or deleted by someone else who logged on to that station. Search in the Deleted Items folder.
- The file was saved in an unexpected folder, either on the server or on the network. Search for the file in the C:\ directory and include all sub-directories. Also search for the file in shared network folders.

Cannot find file when a user is logged on to a local user account

If a user has saved a file while logged on to a MultiPoint Server station using a local user account, check for one of the following possible causes:

- The file was saved on a different computer server. If users have individual, local user accounts on each computer running MultiPoint Server, the file could have been saved on a different server. Search for the file on each computer running MultiPoint Server.
- The file was deleted. Search in the Deleted Items folder.
- The file was saved in an unexpected folder. Search for the file in the C:\ directory and include all sub-directories.

Cannot find file when logged on to a domain user account

If a user has saved a file while logged on to a MultiPoint Server station using a domain user account, check for one of the following possible causes:

- The file was saved in an unexpected folder. Search for the file in shared network folders.
- The file was deleted. Search in the Deleted Items folder.
Troubleshooting Issues with Accessing Shared Files on a MultiPoint Server

If you have trouble accessing documents shared with other users on the MultiPoint Server system, the problem might be that the files you are trying to access were not saved in the Public Documents folder in Windows Explorer.

The Windows Explorer location at which you save a document or other files can affect the privacy or public access of those files. By default, the Documents library in Windows Explorer includes two folders: My Documents (which is private) and Public Documents (which is public). The other document libraries contain similar pairs of private and public folders. If you or someone else wants to share a document or file with other users, you must save it to the Public Documents folder in Windows Explorer.

You can also share content by saving it to a USB storage device, such as a USB flash drive or mass storage device (external hard disk). When you attach a USB storage device directly to the computer running MultiPoint Server, that storage device will appear as a removable storage device to all users across the MultiPoint Server system, and the files stored on that storage device will be available to all users.

Use the following procedure to make sure that the file that you want to access is in the Public Documents folder.

To find a file in the Public Documents folder

1. Browse to the location in Windows Explorer where the file should be saved. For example, if it is a document, browse to the Documents library.
2. In the Documents library, open the Public Documents folder to find the document.
3. If it is not in the Public Documents folder, have the user who created the document open the My Documents folder at his or her station to see whether the document was saved in that private folder instead. If so, the user can move the document to the Public Documents folder so that all users can open or view the file.
4. If the file is still not found, see whether the file is located on a USB storage device plugged into the computer, and then copy it to the Public Documents folder. If the file is not on the USB storage device, try using the Windows Search folder to locate the file.

💡 Tip
For more information about how to use the Search folder in Windows, search for Find a file or folder in Windows Help and Support.

Troubleshooting Issues with Managing Network Accounts with MultiPoint Manager

MultiPoint Manager does not support managing domain accounts. To manage user accounts that reside on a domain, use the tools available within Active Directory. For more information, see the Active Directory Users, Computers, and Groups article on TechNet (http://go.microsoft.com/fwlink/?LinkId=186878).
Troubleshooting MultiPoint Server IP Address Issues

By design, MultiPoint Server enables users to access a single computer by logging on to any of the stations associated with it. Consequently, each station connected to a given MultiPoint Server has the same IP address of every other station associated with the same server. However, you will be able to set Internet filters per computer, but not per user.

For information about how to configure IP addresses on the server, see the TechNet article Configure a Static IP Address (http://go.microsoft.com/fwlink/?LinkID=155459).

For information about how to enable virtual IP addresses per application or per user, see the TechNet article Use IP Virtualization for MultiPoint Server IP-related Issues (http://go.microsoft.com/fwlink/?LinkId=199956).

Analyzing MultiPoint Server Performance Issues

Depending on the nature and the scope of performance issues, they could be rooted in the USB infrastructure or in hardware or software components on the server. For more information about how to address USB-related problems, see MultiPoint Server USB Device Issues. To analyze performance issues, use Performance Monitor. In addition, the number and types of applications running on the stations connected to any given computer running MultiPoint Server could also affect system performance.

For more information about how to analyze performance issues, see the TechNet article Windows Performance Monitor (http://go.microsoft.com/fwlink/?LinkID=140807).

Viewing MultiPoint Server Errors with Event Viewer

Event Viewer is a Microsoft Management Console (MMC) snap-in that enables you to browse and manage event logs. It is a tool that you can use to monitor the health of the computer running MultiPoint Server and troubleshoot issues when they occur. To open Event Viewer and review errors on the computer running MultiPoint Server, follow these steps.

To view MultiPoint Server errors in Event Viewer

1. At a command prompt, type `eventvwr.msc`.
2. In Event Viewer, in the left pane, click Applications and Services Logs, click Microsoft, click Windows, click WMS, and then click Application.
3. In the Application window, review the list of events for the error that you want to research.
4. Highlight the event that you want to view, and then review the information about the error on the General tab, in the Event window. The information about the error can help you troubleshoot the error.
Additional Resources for MultiPoint Server

For more information about how to use Windows Server tools to manage your MultiPoint Server system, see Windows Server® 2008 and Windows Server® 2008 R2 online Help (http://go.microsoft.com/fwlink/?LinkId=164565).
Glossary

administrative user account
A user account for those who will manage the MultiPoint Server system.

associate a station
To specify which monitor is used with which station hub and peripheral devices, such as a keyboard and mouse. This can be done by pressing a specified key on the station’s keyboard when prompted to do so.

domain
A collection of computers in a networked environment that share a common database, directory database, or tree. A domain is administered as a unit with common rules and procedures, which can include security policies, and each domain has a unique name.

domain controller
In an Active Directory forest, a server that contains a writable copy of the Active Directory database, participates in Active Directory replication, and controls access to network resources.

domain user account
A user account hosted on a domain controller. Domain user accounts can be accessed from any computer connected to the domain; they are not tied to any particular computer. See also, domain.

DNS server
A server that maintains information about a portion of the Domain Name Service (DNS) database and that responds to and resolves DNS queries.

DHCP Server service
A computer running the DHCP server service that offers dynamic configuration of IP addresses and related information to DHCP-enabled clients.

expansion hub
A USB 2.0 powered hub that lets you connect devices beyond the basic distance
limitations of the USB architecture.

**global catalog servers**
A domain controller that holds a copy of the global catalog for the forest.

**hot plugging**
A computer feature that enables equipment to be connected to an active device, such as a computer, when the device is powered on.

**intermediate hub**
A powered USB 2.0 hub that lets you connect several MultiPoint Server station hubs to a single port. It can also serve as an expansion hub.

**local user account**
A user account on a specific computer. A local user account is available only on the computer where the local account is defined.

**maintenance mode**
A state of the MultiPoint Server system in which the administrative user performs system maintenance tasks. In this mode, there are no stations. Switching to this mode ends all MultiPoint Server user sessions.

**multifunction hub**
An expansion hub that connects to the computer via a USB port and enables the connection of a variety of non-USB devices to the hub. Multi-function hubs are produced by specific hardware manufacturers and may require the installation of a device-specific driver. Multi-function hubs generally support connecting a video monitor directly to the hub (via VGA, DVI, DisplayPort, etc.), a mouse and keyboard (either PS/2 or USB) and optionally audio connections and extra USB ports. The hub itself connects to the computer by USB, and can be powered or unpowered. See also, *USB hubs*.

The following diagram shows an example of setting up a station with a multifunction hub:
MultiPoint Server

MultiPoint Server system
A collection of hardware and software that consists of one computer running MultiPoint Server and at least one MultiPoint Server station.
The following illustration shows one example layout of a MultiPoint Server system:

This illustration shows four stations, but as many as 10 associated standard stations are supported in the Standard edition and 20 in the Premium edition. Both editions also support one additional primary station.

partition
A section of space on a physical disk that functions as if it were a separate disk.

primary station
A MultiPoint Server station that is the first to start when the MultiPoint Server system is turned on. The monitor of the primary station must always be connected directly to a video port on the computer running MultiPoint Server. See also: station.

roaming profile
A server-based user profile that is downloaded to the local computer when a user logs on and is updated both locally and on the server when the user logs off.
root hub
A USB hub plugged directly into the host controller on the motherboard, and controls all traffic on the universal serial bus. Station hubs are generally plugged into the root hub.

standard station
A hardware collection that consists of one monitor, one station hub, and other peripheral devices attached to that station hub. The station monitor can be connected directly to a video output on the computer or via a USB video connection. Also referred to as a station.

standard user account
A user account for individuals who will regularly access stations, but who will not manage the MultiPoint Server system.

station
A hardware collection in a MultiPoint Server system that consists of a monitor, station hub, keyboard, mouse, and other peripheral devices attached to that station hub. Also referred to as a standard station.

station hub
A hardware device that connects peripheral USB devices to a computer in a MultiPoint Server system. A station hub is a required component of a station. See also: multifunction hubs and USB hubs.

USB hub
A generic multiport USB expansion hub that complies with the universal serial bus (USB) 2.0 or later specifications. Such hubs typically have two, four, or more USB ports that allow for multiple USB devices to be connected to a single USB port on the computer. USB hubs are typically separate devices that can be externally powered or unpowered. Some other devices, such as some keyboards and video monitors, can also incorporate a USB hub into their design. When used as a station hub with MultiPoint Server, we recommend that you use a maximum four-port hub. If you plan to connect USB devices other than a keyboard and mouse to the hub, use an externally powered hub for best performance. See also: multifunction hub.

The following illustration shows an example of setting up a station with a USB hub:
Windows MultiPoint Server 2011 Standard

A Windows operating system that enables multiple users to share one computer at the same time. It gives each user his or her own independent Windows computing experience. Also referred to as MultiPoint Server.

Windows MultiPoint Server 2011 Premium

A Windows operating system, designed for use in academic settings, which enables multiple users to share one computer at the same time. It gives each user his or her own independent Windows computing experience. Also referred to as MultiPoint Server.