

# Microsoft Hyper-V Server 2008 R2 Getting Started Guide

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## Abstract

This guide helps you get started with Microsoft® Hyper-V™ Server 2008 R2 by providing information about its features, hardware requirements, and how to set up and manage it.

For more information about Hyper-V Server 2008 R2, see the [Microsoft Hyper-V Server Web site](http://go.microsoft.com/fwlink/?LinkId=129170) (<http://go.microsoft.com/fwlink/?LinkId=129170>). This document is also available in an [online format](http://go.microsoft.com/fwlink/?LinkId=158005) (<http://go.microsoft.com/fwlink/?LinkId=158005>).

**Microsoft**

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# Microsoft Hyper-V Server 2008 R2 Getting Started Guide

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Microsoft® Hyper-V™ Server 2008 R2 is the next generation of Microsoft Hyper-V Server 2008, which is a hypervisor-based product that was first released in September 2008. Hyper-V Server provides a simplified, reliable, and optimized virtualization solution, which enables improved server utilization and reduced costs. Because Hyper-V Server is a dedicated stand-alone product that contains only the Windows® hypervisor, a Windows Server® driver model, and virtualization components, it provides a small footprint and minimal overhead. It can easily fit into customers' existing IT environments, leveraging their existing provisioning, management, support tools, processes, and skills.

## New Features

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Hyper-V Server 2008 R2 contains the same virtualization feature set as the Hyper-V role in Windows Server 2008 R2. Some of the features included in Hyper-V Server 2008 R2 are:

- **Live migration:** Hyper-V Server 2008 R2 includes support for live migration. Live migration enables customers to move running virtual machines from one host to another without service interruptions.
- **Failover clustering:** Hyper-V Server 2008 R2 includes host clustering technology to enable support for unplanned downtime. With live migration and failover clustering, customers receive high availability and dynamic migration capabilities for planned and unplanned downtimes.
- **Processor and memory support:** Hyper-V Server 2008 R2 supports up to 8-socket physical systems and provides support for up to 64 cores. In addition, Hyper-V Server 2008 R2 supports up to 1 TB of RAM on a physical system.
- **Updated Server Configuration tool:** The Server Configuration tool is designed to simplify the most common configuration tasks. It helps you configure the initial settings without having to type command-line strings. In Hyper-V Server 2008, this utility is called Hyper-V Configuration Utility (HVConfig). In Hyper-V Server 2008 R2, this tool is called the Server Configuration tool (SConfig.cmd). It is included in Hyper-V Server 2008 R2 and in the Server Core installation option of Windows Server 2008 R2. Two configuration options are available only when you run the Server Configuration tool on a server running Hyper-V Server 2008 R2:
  - An option to have the Server Configuration tool start automatically every time you log on to a computer running Hyper-V Server with the Administrator account
  - An option to configure failover clustering

For a detailed feature and support comparison between Hyper-V Server 2008, Hyper-V Server 2008 R2, and Windows Server 2008 R2, see the [Virtualization Platform Comparison](#) section.

## Virtualization Platform Comparison

The following table provides an overview comparison of the features and support in the following products:

- Hyper-V Server 2008
- Hyper-V Server 2008 R2
- Windows Server 2008 R2 (Enterprise and Datacenter editions)

Capabilities	Hyper-V Server 2008	Hyper-V Server 2008 R2	Windows Server 2008 R2
x64-based processor architecture only	Yes	Yes	Yes
Hypervisor-based	Yes	Yes	Yes
Product type	Stand-alone product	Stand-alone product	Operating system
Number of sockets (licensing)	Up to 4	Up to 8	Up to 8 (Enterprise) Up to 64 (Datacenter)
Number of cores supported by the hypervisor	24 (with Service Pack 2 or <a href="http://go.microsoft.com/fwlink/?LinkId=157983">KB956710</a> ( <a href="http://go.microsoft.com/fwlink/?LinkId=157983">http://go.microsoft.com/fwlink/?LinkId=157983</a> ))	64	64
Memory	Up to 32 GB	Up to 1 TB	Up to 1 TB
Virtual machine migration	None	Quick and live migration	Quick and live migration (Enterprise and Datacenter)
Maximum number of cluster nodes	Not applicable	16	16

Capabilities	Hyper-V Server 2008	Hyper-V Server 2008 R2	Windows Server 2008 R2
Administrative UI	Command line, text-based configuration tool, and remote GUI management (with Remote Server Administration Tools or a Full installation of Windows Server 2008 R2)	Command line, text-based configuration tool, and remote GUI management (with Remote Server Administration Tools or a Full installation of Windows Server 2008 R2)	Command line, text-based configuration tool, remote management, and local GUI (Hyper-V Manager MMC)
Management	Existing management tools	Existing management tools	Existing management tools
Manageable by System Center Virtual Machine Manager	Yes (Virtual Machine Manager 2008 and Virtual Machine Manager 2008 R2)	Yes (Virtual Machine Manager 2008 R2)	Yes (Virtual Machine Manager 2008 R2)
Virtualization rights for Windows Server guest virtual machines	0	0	4 virtual machines (Enterprise) Unlimited virtual machines (Datacenter)
Number of running virtual machine guests	As many as physical resources allow, up to 192	As many as physical resources allow, up to 384	As many as physical resources allow, up to 384
Maximum number of virtual processors	8 times the number of logical processors	8 times the number of logical processors	8 times the number of logical processors

Hyper-V Server 2008 and Hyper-V Server 2008 R2 also provide the following support:

- **Storage**

Direct-attached storage: You can use Serial Advanced Technology Attachment (SATA), external Serial Advanced Technology Attachment (eSATA), Parallel Advanced Technology Attachment (PATA), Serial Attached SCSI (SAS), SCSI, and Firewire.

Storage area networks (SANs): You can use Internet SCSI (iSCSI), Fibre Channel, and SAS technologies.

- **Guest operating system support**

See [article 954958](#) in the Microsoft Knowledge Base (<http://go.microsoft.com/fwlink/?LinkId=157981>).

## Setting Up Microsoft Hyper-V Server 2008 R2

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The following sections describe the steps to install and set up Hyper-V Server 2008 R2:

- [Review Prerequisites for Installation](#)
- [Install Hyper-V Server 2008 R2](#)
- [Manage Hardware and Drivers](#)
- [Configure Hyper-V Server 2008 R2 for Remote Management](#)
- [Manage Hyper-V Server 2008 R2 Remotely](#)
- [Configure Virtual Networks](#)
- [Configure and Manage Failover Clustering](#)

## Review Prerequisites for Installation

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Hyper-V virtualization technology requires specific hardware. You can identify systems that support x64-based architecture and Hyper-V by searching the [Windows Server catalog](#) for Hyper-V as an additional qualification (<http://go.microsoft.com/fwlink/?LinkId=111228>).

Hyper-V Server 2008 R2 has hardware requirements that are similar to the Hyper-V role in Windows Server 2008 R2.

### Processor

- **Minimum:** An x64-based processor with hardware-assisted virtualization. This is available in processors that include a virtualization option—specifically, processors with Intel Virtualization Technology (Intel VT) or AMD Virtualization (AMD-V) technology.

- Hardware-enforced Data Execution Prevention (DEP) must be available and enabled. Specifically, you must enable the Intel XD (“execute disable”) bit or the AMD NX (“no execute”) bit.

## Memory

- Minimum: 1 GB RAM; recommended: 2+ GB RAM
- Maximum: 1 TB

## Network adapters

- Minimum: 1
- Recommended: 2 or more

## Additional considerations

- The settings for hardware-assisted virtualization and hardware-enforced DEP are available in the BIOS. However, the names of the settings may differ from the names identified previously.  
For more information about whether a specific processor model supports Hyper-V, check with the manufacturer of the computer.
- If you modify the settings for hardware-assisted virtualization or hardware-enforced DEP, you may need to turn off the power to the computer and then turn it back on. Restarting the computer may not apply the changes to the settings.

## Install Hyper-V Server 2008 R2

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Follow the steps below to install and set the initial configuration of Microsoft Hyper-V Server 2008 R2.

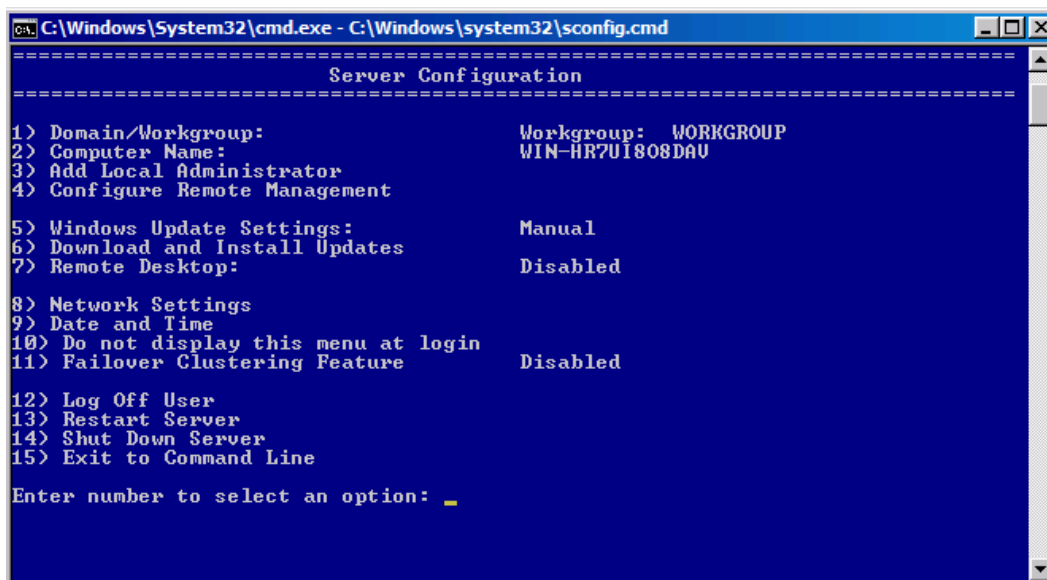
### Install Hyper-V Server 2008 R2

1. Start the computer from the installation media.
2. In the Setup Wizard, click the language you want to use during the installation.
3. In the next screen, select the language to be installed, along with the time and currency formats and the keyboard layout, and then click **Next**.
4. Click **Install Now**, and then accept the license terms.
5. In the next screen, specify the location where you want Hyper-V Server 2008 R2 to be installed, and then click **Next**.
6. As the installation proceeds, the computer will restart several times. When the installation

- is complete, you will have the opportunity to set up the Administrator account. Click **OK**.
7. Type a strong password for the Administrator account, confirm it, and then press ENTER.
  8. When you see the message **Your password has been changed**, click **OK**.

## Configure Hyper-V Server 2008 R2

Hyper-V Server does not contain a graphical user interface. Instead, you configure Hyper-V Server using the Server Configuration tool (Sconfig.cmd). You can use an ordinary command prompt for operations that are not available in the Server Configuration tool. You must be a member of the Administrators group to use the tool.



```
=====
                        Server Configuration
=====
1) Domain/Workgroup:                Workgroup: WORKGROUP
2) Computer Name:                  WIN-HR7UI808DAU
3) Add Local Administrator
4) Configure Remote Management

5) Windows Update Settings:        Manual
6) Download and Install Updates
7) Remote Desktop:                 Disabled

8) Network Settings
9) Date and Time
10) Do not display this menu at login
11) Failover Clustering Feature    Disabled

12) Log Off User
13) Restart Server
14) Shut Down Server
15) Exit to Command Line

Enter number to select an option: _
```

The Server Configuration tool is also available in Server Core installations of Windows Server 2008 R2, although the options available in the tool are slightly different in that environment. The majority of the options in the Server Configuration tool are documented in the [Server Core Installation Option Getting Started Guide](http://go.microsoft.com/fwlink/?LinkID=134202) (<http://go.microsoft.com/fwlink/?LinkID=134202>).

Two options appear only when you run the Server Configuration tool in Hyper-V Server 2008 R2:

- **10) Do not display this menu at login**
- **11) Failover Clustering Feature**

Option 10 simply allows you to control whether or not the Server Configuration tool automatically starts whenever you log on to the computer with an account in the Administrators group.

To enable or disable failover clustering, type **11** and press ENTER. The tool will show the current status of failover clustering.

See the [Command Reference](http://go.microsoft.com/fwlink/?LinkID=132012) for a complete collection of all command-line operations and options (<http://go.microsoft.com/fwlink/?LinkID=132012>).

Because there is no user interface, Hyper-V Server is designed to be managed remotely in the following ways:

- Using Hyper-V Manager from [Remote Server Administration Tools](http://go.microsoft.com/fwlink/?LinkID=130862) (<http://go.microsoft.com/fwlink/?LinkID=130862>)
- Using the Hyper-V Manager Microsoft Management Console (MMC) snap-in from a server running Windows Server 2008 R2
- Using System Center Virtual Machine Manager R2

## Manage Hardware and Drivers

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Follow these procedures to add hardware, obtain a list of drivers, or disable drivers on a server running Hyper-V Server 2008 R2.

### Adding hardware

#### ▶ To add hardware

1. Follow the instructions provided by the hardware vendor for installing the hardware. If the driver is already included in Hyper-V Server 2008 R2, Plug and Play will start and install the driver. If the driver for the hardware is not included, proceed with the following steps.



#### Note

Hyper-V Server 2008 R2 uses the Windows Server driver model. Any drivers that work with Windows Server 2008 R2 will also work with Hyper-V Server 2008 R2.

2. Copy the driver files to a temporary folder on the server running Hyper-V Server 2008 R2.
3. At a command prompt, navigate to the folder where the temporary files are located, and then run the following command, where *driverinf* is the file name of the .inf file for the driver:

```
Pnputil -i -a <driverinf>
```

4. If prompted, restart the computer.

#### ▶ To obtain a list of drivers

1. At a command prompt, type:

```
Sc query type= driver
```



#### Note

You must include the space after the equal sign for the command to complete successfully.

**To disable a device driver**

1. At a command prompt, type the following, where *service\_name* is the name of the service you obtained in the previous procedure:

**Sc delete** <*service\_name*>

## Configure Hyper-V Server 2008 R2 for Remote Management


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Before you can manage Hyper-V Server 2008 R2 from a remote computer, you must configure it by following the steps below.

▶ **To configure Hyper-V Server 2008 R2 for remote management**

1. If it is not already running, start the Server Configuration tool by typing **Sconfig.cmd** in a command prompt and pressing ENTER.
2. If the account you have used to log on to the computer is already in the Domain Administrators group, skip to the next step. If the account you have used to log on to the computer is not in the Domain Administrators group, add the account to the Administrators group by typing **3** and pressing ENTER.
3. Type the domain name and user name and press ENTER.  
For example, type: **domain\domain user**.
4. Click **OK**.
5. In the Server Configuration tool, configure remote management by typing **4** and pressing ENTER.
6. Select any of the following remote management methods. These options are not exclusive—you can enable any or all of them by repeating this step. For remote management, you should enable all of them.

Allow MMC Remote Management	<ol style="list-style-type: none"><li>a. Type <b>1</b> to enable MMC Remote Management.</li><li>b. A message appears that says: "Enabling MMC firewall exceptions and Virtual Disk Service."</li><li>c. When the process is complete, the following message appears:</li></ol>
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	"Remote Management allowed for all Windows Firewall profiles." Click <b>OK</b> .
Enable Windows PowerShell	<ol style="list-style-type: none"> <li>a. Type <b>2</b> to enable Windows PowerShell.</li> <li>b. When the process is complete, the following message appears: "You must restart the computer to complete the Windows PowerShell installation. Restart now?" Click <b>Yes</b>.</li> </ol>
Allow Server Manager Remote Management	 <b>Note</b> You must enable Windows PowerShell and restart the computer before you can enable Server Manager Remote Management. <ol style="list-style-type: none"> <li>a. Type <b>3</b> to allow the computer to be managed by using Remote Server Manager.</li> <li>b. When the process is complete, the following message appears: "Remote Server Management enabled." Click <b>OK</b>.</li> </ol>

7. You may need to restart the computer to activate the option.
8. If the computer running Hyper-V Server is in a workgroup, see the [Hyper-V Server home page](http://go.microsoft.com/fwlink/?LinkId=158001) for more information (http://go.microsoft.com/fwlink/?LinkId=158001).

## Manage Hyper-V Server 2008 R2 Remotely

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After configuring the computer running Hyper-V Server 2008 R2 for remote management, you can remotely manage Hyper-V Server through any of the following methods:

- Use Hyper-V Manager in a Full installation of Windows Server 2008 R2.
- Use Hyper-V Manager in Windows 7 using Remote Server Administration Tools.
- Use Microsoft System Center Virtual Machine Manager 2008 R2.

Choose the option that is right for you, and then follow the steps that correspond with your choice.



#### Notes

- The Hyper-V Manager Microsoft Management Console (MMC) snap-in is automatically installed when the Hyper-V role is enabled on Full installations of Windows Server 2008 R2.
- If you will be using a computer with a 32-bit operating system to remotely manage a computer running Hyper-V Server that has failover clustering enabled, you must enable 32-bit support for failover clustering on the computer running Hyper-V Server. You can do this with the following command: **dism /online /enable-feature /featurename: FailoverCluster-Core-WOW64**

#### ▶ To manage from a Windows Server 2008 R2 computer

1. On the remote computer you will be managing Hyper-V Server from, enable the Hyper-V Manager MMC snap-in: On the **Start** menu, click **Server Manager**.
2. Right-click **Features**, and then click **Add Features**.
3. Under **Remote Server Administration Tools**, click **Role Administration Tools**, click **Hyper-V Tools**, and then click **Next**.
4. Click **Install**.
5. After the computer restarts, click the **Start** menu, click **Administrative Tools**, and then click **Hyper-V Manager**.
6. On the left side of the MMC window, click **Hyper-V Manager**.
7. From the **Actions** menu, click **Connect to Server**, select **Another Computer**, and then enter the name or IP address of the server that you want to connect to.

#### ▶ To manage from Windows 7

1. On the remote computer you will be managing Hyper-V Server 2008 R2 from, download and install the Hyper-V Manager MMC snap-in from [Remote Server Administration Tools](http://go.microsoft.com/fwlink/?LinkID=130862) (<http://go.microsoft.com/fwlink/?LinkID=130862>).
2. After the computer restarts, click the **Start** menu, click **Administrative Tools**, and then click **Hyper-V Manager**.
3. On the left side of the MMC window, click **Hyper-V Manager**.
4. From the **Actions** menu, click **Connect to Server**, select **Another Computer**, and then enter the name or IP address of the server that you want to connect to.

To manage Hyper-V Server remotely from Microsoft System Center Virtual Machine Manager, see the [Virtual Machine Manager content](http://go.microsoft.com/fwlink/?LinkID=129168) (http://go.microsoft.com/fwlink/?LinkID=129168).

## Configure Virtual Networks

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You can configure one or more virtual networks for virtual machines to access network resources. Configure virtual networks as follows.

### ► To configure virtual networks

1. Go to any computer that you have previously set up for remote management of Hyper-V Server.
2. Start the Hyper-V Manager MMC snap-in.
3. From the **Actions** menu, click **Connect to Server**, select **Another Computer**, and then enter the name or IP address of the server that you want to connect to.
4. In the **Actions** menu, click **Virtual Network Manager**.
5. Under **Create virtual network**, select **External**, and then click **Add**.
6. Type a name for the new virtual network (such as *Corpnet*), and then click **OK**.



### Note

When you create a virtual network remotely, Hyper-V Server creates the new virtual switch and binds it to the TCP/IP stack of the physical network. If the server running Hyper-V Server is configured with only one physical network adapter, this may result in a loss of network connection. When you create the external virtual switch, ensure that you select the **Allow management operating system to share this network adapter** check box in Step 5 in this procedure to avoid this situation. A drop of the network connection is normal during the creation of the virtual switch on the physical adapter.

## Configure and Manage Failover Clustering

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You can configure and manage failover clustering and live migration.

### ► To configure and manage failover clustering

1. In the Server Configuration tool (Sconfig.cmd), use option **11** to enable failover clustering.
2. On the remote computer that you will be managing a failover cluster from, download and install [Remote Server Administration Tools](http://go.microsoft.com/fwlink/?LinkID=130862) (http://go.microsoft.com/fwlink/?LinkID=130862).
3. After the computer restarts, click **Start**, click **Administrative Tools**, and then click **Failover Cluster Manager**. You can then use the manager to create and manage failover clusters.

**Note**

You can mix Hyper-V Server 2008 R2 nodes with nodes running Server Core installations of Windows Server 2008 R2. That is, a cluster can contain nodes of both kinds.

## Additional References

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- [Microsoft Hyper-V Server Web site](http://go.microsoft.com/fwlink/?LinkID=129170)  
(<http://go.microsoft.com/fwlink/?LinkID=129170>)
- [Microsoft System Center Virtual Machine Manager Web site](http://go.microsoft.com/fwlink/?LinkID=129168)  
(<http://go.microsoft.com/fwlink/?LinkID=129168>)