



# Implementing Microsoft® Windows Server® 2008 R2 on HP ProLiant servers

integration note

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# Abstract

This integration note describes the level of support available for Microsoft® Windows Server® 2008 R2 on HP ProLiant servers. The purpose of this paper is to assist customers during installation of the Windows Server 2008 R2 operating system (OS) build.

This paper addresses several key topics:

- Supported configurations of ProLiant and Integrity servers
- Recommended system configuration and server platforms
- Supported software, storage options, and network adapters
- Procedures for new installations

## Introduction to Windows Server 2008 R2

Windows Server 2008 R2 focuses on the following technologies:

- Virtualization:
  - Microsoft Windows Server 2008 Hyper-V™ 2.0
  - Live Migration
  - Hot Add/Remove VM Storage
  - Microsoft Remote Desktop Services
- Management:
  - Power management
  - Microsoft Windows PowerShell 2.0
  - Active Directory Administrative Center
  - Microsoft Best Practices Analyzer
- Web:
  - Internet Information Services (IIS) 7.5
  - ASP.NET on Server Core
  - Web Management and Publishing
- Scalability and reliability:
  - Support for up to 256 Logical Processors
  - Reduced operating system overhead for graphical user interface
  - Improved performance for storage devices
- Better Together with Windows 7:
  - DirectAccess
  - BrancheCache
  - Enhanced Group Policies
  - Remote Desktop & App Connections

## Power Management Features

As the number of computers in a data center increases, power consumption becomes a key consideration. During the development of Windows Server 2008 R2, HP, and Microsoft worked together to ensure HP customers can take advantage of the Power Management features of the OS.

Windows Server 2008 R2 Power Management features including Collaborative Power Control and Power Metering and Budgeting.

### Collaborative Power Control

Windows Server 2008 R2 introduces support for a new processor performance state interface that enables OS and platform coordination of processor power management (PPM)

- The computer is in direct control of t- and p-states.
- The OS specifies processor performance requirements.
- Per-processor basis is used as a percentage of maximum frequency.
- The computer is responsible for delivering requested performance; however, in some cases, like a power budget condition, the platform can decrease performance.
- Interface is described through ACPI [www.acpica.org](http://www.acpica.org).

### Power Metering and Budgeting (PMB)

Windows Server 2008 R2 supports the Power Metering and Budgeting (PMB) infrastructure, which promotes computer energy efficiency by providing power consumption and management features:

- PMB provides additional options to configure power metering and budgeting.
- System manufacturers, IT professionals, and end users can use the PMB infrastructure to tune their systems so that they balance power and performance to meet their needs.
- Power metering monitors power consumption in the computer. This information is used to determine how the computer or components use power. Power metering also provides the current configuration of a power meter, such as metering capabilities and power consumption thresholds.
- Power budgeting is used to determine the power limit, or *budget*, that is supported by the computer system. Depending on the computer, this information might also allow an administrator to configure the system's power budget.

Table 1 lists the ProLiant servers that support Power Metering and Budgeting.

**Table 1.** ProLiant server platforms that support Power Metering and Budgeting

Server platform	ROM family	ROM date (minimum)
<b>ProLiant BL servers:</b>		
BL280c G6	I22	07/24/09
BL460c G6	I24	07/24/09
BL490c G6	I21	07/24/09
<b>ProLiant DL servers::</b>		
DL320 G6	W07	07/24/09
DL360 G6	P64	07/24/09
DL370 G6	P63	07/24/09

**Table 1.** ProLiant server platforms that support Power Metering and Budgeting

Server platform	ROM family	ROM date (minimum)
DL380 G6	P62	07/24/09
<b>ProLiant ML servers:</b>		
ML330 G6	W07	07/24/09
ML350 G6	D22	07/24/09
ML370 G6	P63	07/24/09

## Installation method

Windows Server 2008 R2 builds on the foundation of Windows Server 2008, expanding existing technology and adding new features that let organizations increase the reliability and flexibility of their server infrastructure. For additional information, review the Windows Server 2008 R2 Reviewers Guide <http://www.microsoft.com/windowsserver2008/en/us/r2.aspx>.

## Supported configurations

Windows Server 2008 R2 should load and run on any HP server listed in the “Recommended ProLiant server platforms” sections of this document (when the server meets the recommended hardware configuration established by Microsoft).

Carefully review this document for the recommended system configuration and possible issues that might be encountered. Do not use this paper as the sole source of information. In addition to the websites mentioned throughout this paper, visit the Windows Server 2008 R2 support page: [www.microsoft.com/windowsserver2008/en/us/r2.aspx](http://www.microsoft.com/windowsserver2008/en/us/r2.aspx).

## Recommended system configuration

The recommended system configurations listed in this section are established by Microsoft for Windows Server 2008 R2 base OS installations.

Actual requirements vary based on specific system configuration and the applications and features that are installed. Refer to the following Microsoft website for any system requirement updates: [www.microsoft.com/windowsserver2008/en/us/r2.aspx](http://www.microsoft.com/windowsserver2008/en/us/r2.aspx).

Windows Server 2008 R2 is a 64-bit server product and supports the following processor families:

- Intel® Xeon® Processors with Intel Extended Memory 64 Technology (EM64T)
- Advanced Micro Devices, Inc. (AMD64) Opteron™ Series Processors
- Itanium-Based system editions for systems with Intel® Itanium® processors

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### NOTE

Windows Server 2008 R2 runs only on 64-bit processors; therefore, any 16-bit applications will not run.

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Processor performance is dependent upon the clock frequency in addition to the number of cores and the size of the processor cache.

**Table 2.** Recommended system configuration as established by Microsoft

Component	Requirement
Processor	<ul style="list-style-type: none"><li>• Minimum: 1.4 GHz</li><li>• Recommended: 2 GHz</li><li>• Supports up to 256 Logical Processors</li></ul>
RAM per processor	<ul style="list-style-type: none"><li>• Minimum: 512 MB</li><li>• Maximum:<ul style="list-style-type: none"><li>– 32 GB (Standard)</li><li>– 2 TB (Enterprise and Datacenter)</li></ul></li><li>• Recommended: 2 GB</li></ul>
Monitor	SVGA resolution (800x600) or higher
Optical storage	DVD-ROM drive
Peripherals	<ul style="list-style-type: none"><li>• Keyboard</li><li>• Microsoft Mouse or compatible pointing device</li></ul>
Available disk space*	<ul style="list-style-type: none"><li>• Minimum: 10 GB</li><li>• Recommended: 40 GB</li></ul>

\*Available disk space is the free disk space on the partition that will contain the system files. Additional space is required to copy the Windows Server 2008 R2 CD contents to the hard disk during installation. Computers with more than 16 GB of RAM will require more disk space for paging and dump files.

## Recommended ProLiant server platforms

Servers that support Windows Server 2008 R2 must meet new hardware requirements in order to qualify for the Microsoft Windows Logo Program. The Windows Logo Program helps customers identify compatible products that are designed for ease of use, better performance, and enhanced security. To qualify, the server must be able to support virtualization, PCI-e, and power management features.

Windows Server 2008 R2 does not support some HP servers that Windows Server 2008 supports. The following servers do not support virtualization technologies and do not include PCI-e in their standard configurations; therefore, they are not supported with Windows Server 2008 R2:

- HP ProLiant BL p-class servers
- HP ProLiant 300 series Generation 1 servers configured with an AMD processor
- HP ProLiant 500 series Generation 1 servers configured with an AMD processor
- HP ProLiant 300 series Generation 4 servers configured with an Intel processor

Table 3 lists the ProLiant servers, ROM versions, and ROM dates that support Windows Server 2008 R2. Refer to the following web resources to assist in determining the ROM version and family of the supported ProLiant server:

- Software and drivers: <http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp?lang=en&cc=us&taskId=135>.
- Windows on ProLiant support matrix: <http://h10018.www1.hp.com/wwsolutions/windows/index.html>.

**Table 3.** ProLiant server platforms that support Windows Server 2008 R2

Server platform	ROM family	ROM date (minimum)
<b>ProLiant BL servers:</b>		
BL2x220c G5	I19	05/12/09
BL260c G5	I20	07/10/09
BL280c G6	I22	07/24/09
BL460c	I15	08/21/07
BL460c G5	I23	05/12/09
BL460c G6	I24	07/24/09
BL465c	A13	07/27/09
BL465c G5	A13	07/27/09
BL465c G6	A13	05/27/09
BL480c	I14	07/10/09
BL490c G6	I21	07/24/09
BL495c G5	A14	07/27/09
BL495c G6	A14	05/07/09
BL680c G5	I17	05/10/09
BL685c	A08	07/20/09
BL685c G5	A08	07/20/09
BL685c G6	A17	07/29/09
<b>ProLiant DL servers:</b>		
DL120 G5	O22	07/22/09
DL160 G5	DL160G5	1/13/09
DL160 G6	O33	07/24/09
DL160se G6	O33	07/24/09
DL165 G5	O13	07/02/09
DL165 G6	2009.05.18	05/18/09
DL170h G6	O34	07/13/09

**Table 3.** ProLiant server platforms that support Windows Server 2008 R2

<b>Server platform</b>	<b>ROM family</b>	<b>ROM date (minimum)</b>
DL180 G5	DL180G5	03/13/09
DL180 G6	O20	07/23/09
DL320 G5p*	W05	07/10/09
DL320 G6	W07	07/24/09
DL360 G5	P58	07/10/09
DL360 G6	P64	07/24/09
DL365 G5	A10	07/17/09
DL370 G6	P63	07/24/09
DL380 G5	P56	07/10/09
DL380 G6	P62	07/24/09
DL385 G2	A09	07/10/09
DL385 G5	A09	07/10/09
DL385 G5p	A22	07/10/09
DL580 G5	P61	05/09/09
DL585 G2	A07	07/27/09
DL585 G5	A07	07/27/09
DL785 G5	A15	08/14/09
DL785 G6	A15	08/14/09
<b>ProLiant ML servers:</b>		
ML110 G5	O15	07/13/09
ML115 G5	O18	07/06/09
ML150 G5	O17	07/06/09
ML150 G6	O21	07/06/09
ML310 G5*	W05	07/10/09
ML310G5p	W08	07/10/09
ML330 G6	W07	07/24/09

**Table 3.** ProLiant server platforms that support Windows Server 2008 R2

Server platform	ROM family	ROM date (minimum)
ML350 G5	D21	07/10/09
ML350 G6	D22	07/24/09
ML370 G5	P57	07/10/09
ML370 G6	P63	07/24/09
SL160z G6	O33	07/24/09
SL170z G6	O34	07/13/09
ZL2x170z G6	O34	07/13/09

\*Not supported with Windows Server 2008 Hyper-V

## Supported components for ProLiant servers

### Software drivers

ProLiant Support Pack (PSP) 8.30 for Windows Server 2008 R2 is available at at <ftp://ftp.hp.com/pub/softlib2/software1/supportpack-windows/p91519871/v53187/psp-8.30.w2k8R2.x64.exe>. See the "Installing the ProLiant Support Pack" section of this paper for installation instructions.

### Storage Area Network components

For Storage Area Network (SAN) supported configuration information for storage arrays, host bus adapters, switches, and other SAN components, visit the Single Point Of Connectivity Knowledge website (SPOCK): [www.hp.com/storage/spock](http://www.hp.com/storage/spock). This site also contains application notes, white papers, and other storage-related documents.

For information on HP StorageWorks Enterprise Backup Solutions (EBS), visit [www.hp.com/go/ebs](http://www.hp.com/go/ebs).

For information on HP Backup Compatibility, visit [www.hp.com/go/connect](http://www.hp.com/go/connect).



## Storage options

Table 4 lists supported ProLiant storage options needed to interface with Windows Server 2008 R2.

Drivers that are available on the Windows Server 2008 R2 media may not be available on PSP 8.30. Check the HP website for the latest release drivers ([www.hp.com](http://www.hp.com)).

**Table 4. Supported ProLiant storage controller options**

Option	Driver	Location		
		Web Download	Windows Media	PSP 8.30
<b>Management drivers:</b>				
SAS/SATA Notification Service	CISSESRV.EXE	✓		✓
StorageWorks Fibre Channel Array Notification Driver for Windows 2000/Server 2003	CPQFCAC.SYS			
6-Port SATA RAID Controller	AAC.SYS	✓		
Internal 4/8 Port SAS HBA	LSI_SAS.SYS		✓	
<b>Smart Array:</b>				
E200	HPSAMD.SYS (basic)		✓	
E200i				
E500	HPCISS2.SYS (full featured)	✓		✓
P212				
P400				
P400i				
P410				
P410i				
P411				
P600				
P700m				
P800				
<b>Host Bus Adapters</b>				
HP 8 Internal Port SAS HBA with RAID				
SC44Ge				
SC11Xe				
SC08Ge				
<b>Broadcom Serial ATA Controller Driver:</b>				
HT1000	BCHTSW64.SYS	✓		
<b>Fibre Channel Host Bus Adapters:</b>				

**Table 4. Supported ProLiant storage controller options**

Option	Driver	Location		
		Web Download	Windows Media	PSP 8.30
Qlogic:				
FC1142SR / FC1242SR FC1143 / FC1243 QMH2462 c-Class mezz QMH2562 c-Class mezz	QL2300.SYS		✓	
Emulex:				
81E PCI-e 82E PCI-e FC2143 / FC2243 FC2142SR / FC2242SR Lpe1105 c-Class mezz Lpe1205 c-Class mezz	ELXSTOR.SYS		✓	
StorageWorks:				
DAT Autoloader 72*6 DAT Autoloader 72*10	HPDAT.SYS HPDATCHG.SYS		✓	

**NOTE:** Some devices have firmware upgrades available through variations of the Options ROMPaq. The latest version of each Options ROMPaq is available on the software and drivers website:  
<http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp?lang=en&cc=us&taskId=135>.

## Network interface controllers

Table 5 lists supported ProLiant network interface controllers (NICs) supported by Windows Server 2008 R2.

Drivers that are available on the Windows Server 2008 R2 media may not be available PSP 8.30. Certain drivers, noted in the "Download" column, will be added to the next release of the PSP. Currently, these drivers are available through web download from the server product page at <http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp?lang=en&cc=us&taskId=135>.

**Table 5.** Supported ProLiant network interface controller options

Gigabit NIC	Driver	Location		
		Download	Windows Media	PSP 8.30
NC1020 NC105T NC107T NC150T NC320t NC320m NC324m NC325m NC326m NC7761 NC7771 NC7781 NC7782	B57nd60a.SYS		✓	✓
NC6170 NC7170 NC310F NC340T	N1g6032e.SYS	✓	✓	✓
NC110T NC360m NC360T NC364T NC364m	e1e6232e.SYS		✓	✓
NC112t NC362i	e1q62x64.SYS		✓	✓
NC370T/F/i NC371i NC373T/F/M/i NC374M NC380T NC382i/T	BXVBDA.SYS		✓	✓

**Table 5.** Supported ProLiant network interface controller options

Gigabit NIC	Driver	Location		
		Download	Windows Media	PSP 8.30
NC522 NC524	hpnd6x64.SYS			✓

## Windows Server 2008 R2 installation on ProLiant servers

You can deploy Windows Server 2008 R2 manually or through assisted path installation options. Use the steps below to complete a manual install of Windows Server 2008 R2.

### Pre-installation tasks

To prepare for installation, ensure that the following tasks are completed:

- Select a server from the recommended system platform table (Table 3).
- If necessary, select additional storage options from the ProLiant storage options table (Table 4).
- If necessary, select any additional NICs from the ProLiant Gigabit Ethernet NIC table (Table 5).
- Go to [www.hp.com/go/bizsupport](http://www.hp.com/go/bizsupport) to obtain the supported ROM for Windows Server 2008 R2 installations for the server.
- Use the ROM-Based Setup Utility (RBSU) to set date/time and configure the boot controller order (if necessary).
- Use the Array Configuration Utility to configure the RAID settings for the server.
- Update iLO 2 firmware to Version 1.79 (or later).

### Installation procedure

To install Windows Server 2008 R2, complete the following steps:

1. Make sure that the server has a DVD drive (either native to the system or attached).

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#### **NOTE**

A license key may be required to use iLO virtual media with HP ProLiant ML or DL servers.

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2. Insert the Windows Server 2008 R2 media into the DVD drive and boot the server to the DVD to begin the installation.
3. Follow the on-screen instructions to complete the installation.

# Installing Windows Server 2008 R2 on ProLiant 300, 500, and 700

Install Windows Server 2008 R2 on ProLiant 300, 500, and 700 series servers using the SmartStart Assisted Path Installation.

## Installing Windows Server 2008 R2 from an attached DVD drive

To install Windows Server 2008 R2 using the Windows Server 2008 R2 media and an attached DVD drive, complete the following steps:

1. Insert the HP Smart Start 8.30 (or later) 64-bit DVD-ROM in the DVD drive.
2. Power On the server and proceed through the Operating System Selection wizard.
3. Select **DVD-ROM Media** for the **Operating System Source Type**.
4. Select **Flat files (default format)** for the **Operating System Source Format**.
5. Follow the prompts and complete the installation.

## Installing Windows Server 2008 R2 from a Windows Server 2008 R2 image

To install Windows Server 2008 R2 using a Windows Server 2008 R2 image that can be access over the network from the server receiving the installation or on a USB key, complete the following steps:

1. Mount the Smart Start 8.30 64-bit DVD image using HP Integrated Lights Out (iLO) virtual media.
2. Insert the USB key containing the OS image (an .ISO file).
3. Power On the server.
4. Select the operating system source type as follows:
  - If the Windows Server 2008 R2 image located on the network, select **Network File Share** for the **Operating System Source Type**.
  - Or –
  - If the Windows Server 2008 R2 image is located on an attached USB key, select **USB Key** for the **Operating System Source Type**.
5. Select **CD/DVD File (.ISO format)** for the **Operating System Source Format**.
6. Input the Product Set Up Information.
7. Complete the SmartStart configuration wizards by setting the WBEM/SNMP information and ProLiant Support Pack Installation Configuration to fit your requirements.
8. Complete the installation and allow SmartStart to reboot.

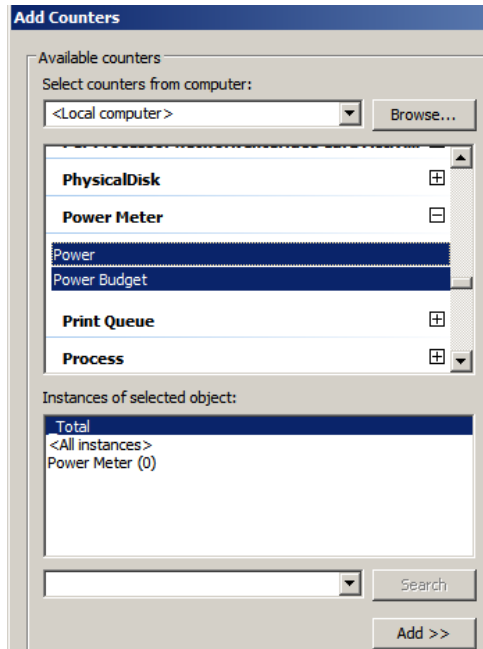
## Enabling Windows Server 2008 R2 Power Management Capabilities on HP ProLiant Servers

1. Ensure that you are using a platform listed in Table 1.
2. Download and install latest ROM.
3. Download and install iLO 1.79 firmware from:  
<http://h20000.www2.hp.com/bizsupport/TechSupport/SoftwareDescription.jsp?lang=en&cc=us&prodTypeId=15351&prodSeriesId=3884319&prodNameId=3884320&swEnvOID=4024&swLq=13&mode=2&taskId=135&swItem=MTX-a1da14d36f5549919ef8991c4d>.

#### 4. Install Windows Server 2008 R2.

After enabling the power management capabilities on the server, the **Power Meter** object and associated **Power** and **Power Budget** counters appear in Windows Performance Monitor as shown in Figure 1.

**Figure 1.** Power Meter counters



## Installing the ProLiant Support Pack

### Getting PSP updates

ProLiant Support Pack 8.30 for Windows Server 2008 R2 is available at <ftp://ftp.hp.com/pub/softlib2/software1/supportpack-windows/p91519871/v53187/psp-8.30.w2k8R2.x64.exe>.

#### **IMPORTANT**

The PSP does not apply to ProLiant 100 series servers.

### Installing the PSP

After downloading the PSP self-extracting executable, complete the following steps:

1. Go to the directory where the PSP executable is saved.
2. Double-click the executable and extract the PSP to a desired location.
3. Go to the directory where the extracted PSP is located.
4. Double-click setup.exe to start the PSP deployment.

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**NOTE**

All PSP files must reside in the same directory as the setup.exe file.

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5. As the PSP deployment starts, it performs an inventory of the available updates and checks the local system to see what hardware and software is installed.
6. After the inventory and discovery processes finish, the “Select Installation Hosts” screen appears. Select either the local host or one (or more) remote hosts for PSP deployment.
7. After selecting the host(s), the “Select bundle filter” screen displays the PSP bundle information. Select the bundle and the appropriate filter options. For remote deployments, additional screens allow you to update information on a per-host basis.
8. After selecting the bundle for all hosts being updated, open the “Select Items to be Installed” screen to complete the following tasks:
  - a. Select the components to be installed.
  - b. If necessary, configure the components.

---

**NOTE**

The **Configure Now** link is not present when running Microsoft Windows Server 2008 with the Server Core option.

To configure components to be deployed on this OS configuration

1. Access the system as a remote host using HP Smart Update Manager running on a system with a supported Windows OS.
  2. Configure the components before deployment.
- 
- c. Review failed dependencies before installation.
    - d. Review the revision history of the components.
  9. After selecting the components, click **Install** to proceed with the installation. Once the installation completes, the Installation Results screen appears. If the PSP installs successfully, the process is complete.
  10. If one (or more) component(s) did not install successfully, complete the following steps:
    - a. Exit HP Smart Update Manager.
    - b. Make corrections to the environment.
    - c. Restart the application to ensure changes have taken affect.

# Installing Windows Server 2008 R2 on ProLiant 100 series servers

Windows Server 2008 R2 is not supported through the 100 Series Easy Setup CD at this time. As future ProLiant 100 series products are launched, R2 support will be added.

Use the manual installation procedures to configure ProLiant 100 series servers.

## Pre-installation tasks

To prepare for installation, ensure that the following tasks are completed:

- Select a server from the recommended system platform table (Table 3).
- If necessary, select additional storage options from the ProLiant storage options table (Table 4).
- If necessary, select any additional NICs from the ProLiant Gigabit Ethernet NIC table (Table 5).
- Go to [www.hp.com/go/bizsupport](http://www.hp.com/go/bizsupport) to obtain the supported ROM for Windows Server 2008 R2 installations for the server.
- Use the ROM-Based Setup Utility (RBSU) to set date/time and configure the boot controller order (if necessary).
- Use the Array Configuration Utility to configure the RAID settings for the server.
- Update iLO 2 firmware to Version 1.79 (or later).

## Installation procedure

To install Windows Server 2008 R2, complete the following steps:

1. Make sure that the server has a DVD drive (either native to the system or attached).

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### NOTE

A license key may be required to use iLO virtual media with HP ProLiant ML or DL servers.

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2. Place the Windows Server 2008 R2 media into the DVD drive and boot the server to the DVD to begin the installation.
3. Follow the on-screen instructions to complete the installation.



## Appendix A: known issues and workarounds

Table A-1 lists the known issues with ProLiant servers with Windows Server 2008 R2.

**Table A-1.** Known issues on ProLiant servers (x64):

Issue	Details
<b>Issue 1</b>	“Generic Host Process” error message is observed when running Windows Server 2003 R2 SP2 (64-bit) as a Hyper-V 2.0 guest.
Description	The “Generic Host Process is Win32 Services encountered a problem and needs to close” error message may appear when trying to run Windows Server 2003 R2 SP2 (64-bit) as a guest OS within Hyper-V 2.0.
Solution	HP and Microsoft are working together to determine a solution in a future release.
<b>Issue 2</b>	After enabling the Hyper-V 2.0 server role on a ProLiant DL785 G5 server, a black screen is observed upon reboot of the system.
Description	A black screen may occur after the enablement and reboot of a Hyper-V 2.0 installation on a ProLiant DL785 G5 server.
Solution	Apply the A15 system ROM, dated 8/14 or later to the ProLiant DL785 G5 server.
<b>Issue 3</b>	After enabling the Hyper-V 2.0 server role a blue screen appears upon reboot.
Description	A blue screen may appear upon reboot of the server after enabling Hyper-V 2.0. This issue may occur on any server hardware.
Solution	Microsoft will release a hotfix to address this issue. Contact your Microsoft representative to obtain the hotfix.

## For more information

For additional information, refer to the resources listed below.

Source	Hyperlink
HP Windows Server 2008 R2 Home Page	<a href="http://www.hp.com/go/ws2008r2">www.hp.com/go/ws2008r2</a>
HP and Microsoft Frontline Partnership website	<a href="http://www.hp.com/go/microsoft">www.hp.com/go/microsoft</a>
Microsoft website	<a href="http://www.microsoft.com">www.microsoft.com</a>
Windows Server 2008 R2 Home page	<a href="http://www.microsoft.com/windowsserver2008/en/us/r2.aspx">http://www.microsoft.com/windowsserver2008/en/us/r2.aspx</a>

## Call to action

Send comments about this paper to: [TechCom@HP.com](mailto:TechCom@HP.com).

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