Abstract

This document contains driver, firmware, and other supplemental information for the QLogic Fibre Channel host bus adapters (HBAs) and converged network adapters (CNAs) for ProLiant and Integrity servers using Linux, Windows, VMware, or Citrix operating systems.
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**Product models**

This section lists the supported Fibre Channel HBAs and CNAs on HP ProLiant and Integrity servers.

### Supported CNA, HBA, and mezzanine product models

**Table 1 (page 3)** lists the CNA supported on ProLiant servers running Linux, Windows, VMware, or Citrix operating systems.

<table>
<thead>
<tr>
<th>Model</th>
<th>Microsoft Windows Server 2008</th>
<th>Microsoft Windows Server 2012</th>
<th>Linux</th>
<th>VMware</th>
<th>Citrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP StorageWorks CN1000Q Dual Port Converged Network Adapter (product number BS668A)</td>
<td>•</td>
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<tr>
<td>HP FlexFabric 10Gb 2P 526FLR-SFP+ Adapter (product number 629136–001)</td>
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<tr>
<td>HP 10GbE QLogic FCoE ALOM Gen8 (product number 562FLR)</td>
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</tbody>
</table>

**Legend:** • = supported; — = not supported

**NOTE:** CNAs are not supported on Integrity servers.

**Table 2 (page 3)** lists the HBAs and mezzanine cards supported on servers running Linux, Windows, VMware, or Citrix operating systems.

<table>
<thead>
<tr>
<th>Model</th>
<th>Microsoft Windows Server 2008</th>
<th>Microsoft Windows Server 2012</th>
<th>Linux</th>
<th>VMware</th>
<th>Citrix</th>
<th>Oracle Linux - UEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-Gb HBAs and mezzanine cards</td>
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<tr>
<td>HP SN1000Q 16-Gb 1P FC HBA (product number QW971A)</td>
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<tr>
<td>HP SN1000Q 16-Gb 2P FC HBA (product number QW972A)</td>
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<tr>
<td>HP QMH2672 16Gb FC HBA for BladeSystem c-Class</td>
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<tr>
<td>8-Gb HBAs and mezzanine cards</td>
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<tr>
<td>HP QMH2572 8Gb FC HBA for c-Class BladeSystem (product number 651281-B21)</td>
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<tr>
<td>HP StorageWorks QMH2562 8-Gb FC mezzanine card HBA (product number 451871-B21)</td>
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<tr>
<td>HP StorageWorks 81Q 8-Gb PCIe HBA (product number AK344A)</td>
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<tr>
<td>HP StorageWorks 82Q 8-Gb PCIe Dual Channel HBA (product number AJ764A)</td>
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<tr>
<td>HP PCIe 1-port 8-Gb Fibre Channel HBA (AH400A)</td>
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<tr>
<td>HP PCIe 2-port 8-Gb Fibre Channel HBA (AH401A)</td>
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<tr>
<td>4-Gb HBAs and mezzanine cards</td>
<td></td>
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</tr>
<tr>
<td>HP StorageWorks QMH2462 4-Gb FC HBA for HP c-Class BladeSystem (product number 403619-B21)</td>
<td>•</td>
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</tbody>
</table>
Table 2 Supported HBAs and mezzanine cards (continued)

<table>
<thead>
<tr>
<th>Model</th>
<th>Microsoft Windows Server 2008</th>
<th>Microsoft Windows Server 2012</th>
<th>Linux</th>
<th>VMware</th>
<th>Citrix</th>
<th>Oracle Linux - UEK</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP StorageWorks FC1142SR 4-Gb PCIe FC HBA (product number AE311A)</td>
<td>•</td>
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</tr>
<tr>
<td>HP StorageWorks FC1242SR 4-Gb PCIe dual-port FC HBA (product number AE312A)</td>
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<tr>
<td>HP PCIe 2-port 4-Gb PCIe (AD300A)</td>
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<td>3</td>
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<td>3</td>
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</tr>
<tr>
<td>HP StorageWorks FC1143 4-Gb PCI-X FC HBA (product number AB429A)</td>
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</tr>
<tr>
<td>HP StorageWorks FC1243 4-Gb PCI-X dual port FC HBA (product number AE369A)</td>
<td>•</td>
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</tr>
<tr>
<td>HP 2-port 4-Gb PCI-X (AB379B)</td>
<td>•</td>
<td>3</td>
<td>•</td>
<td>3</td>
<td>•</td>
<td>—</td>
</tr>
</tbody>
</table>

Legend: * = supported; — = not supported

1 The QMH2562 is supported with most G6 and later ProLiant blade servers with the exception of BL465G6 and BL495G6.
2 No IA64 support.
3 IA64 support only.

NOTE: Only Spyder cards (CN1000Q) sold since December, 2011 support iSCSI. For updating pre December 2011 Spyder cards to support iSCSI, a separate utility exists and can be used.

Devices supported

QLogic CNAs and HBAs are supported on HP servers that:

- For server support information, see the SPOCK website at [http://www.hp.com/products1/serverconnectivity/support_matrixes.html](http://www.hp.com/products1/serverconnectivity/support_matrixes.html). It is essential to sign up for an HP Passport to enable access.

For CN1000Q support information, see the server QuickSpecs at [www.hp.com/go/quickspecs](http://www.hp.com/go/quickspecs).

For storage array support, see the SPOCK website at [http://www.hp.com/storage/spock](http://www.hp.com/storage/spock). It is essential to sign up for an HP Passport to enable access.

Operating systems

This section describes how to obtain the latest information about supported operating systems and software.

For the latest information about supported CNA, HBA, and mezzanine cards listed by operating systems, see the HP SPOCK website at [http://h20272.www2.hp.com/Pages/spock2Html.aspx?htmlFile=hw_hbas.html&lang=en&cc=US&hppapid=hhpcf](http://h20272.www2.hp.com/Pages/spock2Html.aspx?htmlFile=hw_hbas.html&lang=en&cc=US&hppapid=hhpcf). It is essential to sign up for HP Passport to enable access. From the web page, click **HBAs, CNAs, Flex Fabric Adapters, & Server LOMs Support Matrix: Linux, Citrix, VMware, Windows**, and then select the operating system.

Linux support

This section describes CNA and HBA support for Linux.
Prerequisites

Before performing CNA or HBA updates:

- Ensure that the system is running one of the operating system versions listed in HBA Software Support Matrices, available at the SPOCK website: http://h20272.www2.hp.com/Pages/spock2Html.aspx?htmlFile=hw_hbas.html&lang=en&cc=US&hpappid=hppcf. It is essential to sign up for an HP Passport to enable access. From the web page, click HBAs, CNAs, Flex Fabric Adapters, & Server LOMs Support Matrix: Linux, Citrix, VMware, Windows, and then select the operating system.

- See the HP server PCI slot specifications to determine if the server is compatible with the CNA or HBA.

- If installing the Linux operating system for the first time, load the operating system before downloading and installing the supported Linux CNA or HBA driver from the HP website www.hp.com/go/support. For additional information, see the readme.txt file packaged with the kit.

**NOTE:** Starting with RHEL 5.3, SLES 10 SP3, and SLES 11, Fibre Channel HBAs and mezzanine cards are supported by Red Hat and Novell in-box drivers (included in the OS distribution), and multipath failover is handled by Device Mapper.

In-box drivers are not currently supported for QLogic CNAs. CNA multipath failover is handled by Device Mapper.

CNA installation instructions for Linux

For information on installing CNAs, see HP QLogic Converged Network Adapter Installation Guide:

2. Click Support & Troubleshooting.
3. Using the HP model number given in the guide, enter the CNA model number in the Enter a product name box, and then click Search.
4. Select the appropriate product.
5. On the Business Support Center page, select Manuals.

**IMPORTANT:**

If both CNAs and Fibre Channel HBAs are installed in the system, it is necessary to load and use the CNA drivers.

Driver updates

If downloading a qlinstall driver kit, the Linux qlinstall script must be used to update the Linux driver. HP does not support using rpm, the QConvergeConsole GUI, or the QConvergeConsole CLI for updating the Linux driver with the qlinstall kit.

Unresponsive script message

If using the Linux QConvergeConsole GUI to update firmware and see the message Warning: Unresponsive Script, select Don’t ask me again, and then click Continue. This is a common Firefox condition that indicates that a predetermined amount of time has been reached.

Firmware RPMs

The latest Linux firmware RPMs for SLES10 SP4, SLES11 SP2, and RHEL 6.3/6.2 are available at http://www.hp.com/go/support in the Drivers & Software section.

To install an RPM in an SLES10 or SLES11 configuration:

1. Save the original firmware files in /lib/firmware:
   
   ```
   # cd /
   # cp /lib/firmware/ql2400_fw.bin /lib/firmware/ql2400_fw.bin.orig
   # cp /lib/firmware/ql2500_fw.bin /lib/firmware/ql2500_fw.bin.orig
   ```
2. Use the following command to extract the firmware:

   ```
   # rpm -Uvh --force qlogic-firmware-x.yy.zz.noarch.rpm
   ```

3. Rebuild the ramdisk, and then reboot.

   ### An example of an installation follows:

   1. Save the original firmware files in `/lib/firmware`:

   ```
   # cd /
   # cp /lib/firmware/ql2400_fw.bin /lib/firmware/ql2400_fw.bin.orig
   # cp /lib/firmware/ql2500_fw.bin /lib/firmware/ql2500_fw.bin.orig
   ```

   2. Use the following commands to extract the firmware:

   ```
   # rpm -Uvh --force ql2400-firmware-x.yy.zz.noarch.rpm
   $ rpm -Uvh --force ql2500-firmware-x.yy.zz.noarch.rpm
   ```

3. Rebuild the ramdisk, and then reboot.

   ```
   # mkninitrd -i initrd.img -k kernelimage
   ```

**NOTE:** A SLES11 SP2 scheduler issue is observed in BFS configurations during heavy IO load. In BFS configuration, HP recommends to change the default scheduler Completely Fair Queuing (CFQ) to the other scheduler options such as noop or deadline. To change the scheduler, edit the boot loader configuration file `/boot/grub/menu.lst`.

   Add `elevator=deadline` or `elevator=noop` to the kernel entry and reboot the system. Check the elevator settings with the command `cat/sys/block/sdb/queue/scheduler`.

   ```
   /boot/grub/menu.lst
   ```

   **Example:**

   ```
   ### Don't change this comment – YaST2 identifier:
   Original name: linux###
   title SUSE Linux Enterprise Server 11 SP2 - 3.0.76-0.11
   root (hd0,0)
   kernel/vmlinuz-3.0.76.11-default root=/dev/disk/by-id/scsi-360002ac000000000000000200006036-part2 splash=silent
   crashkernel=256M-:128M showopts vga=0x314 elevator=deadline
   initrd/initrd-3.0.76-0.11-default
   ```

   **Example:**

   ```
   ### Don't change this comment – YaST2 identifier:
   Original name: linux###
   title SUSE Linux Enterprise Server 11 SP3 - 3.0.76-0.11
   root (hd0,0)
   kernel/vmlinuz-3.0.76.11-default root=/dev/disk/by-id/scsi-360002ac000000000000000200006036-part3 resume=/dev/disk/by-id/scsi-360002ac000000000000000200006036-part2 splash=silent crashkernel=256M-:128M showopts
   vga=0x314 elevator=deadline
   initrd/initrd-3.0.76-0.11-default
   ```

---

**Windows support**

This section describes CNA and HBA support for Windows.
Windows on ProLiant servers

CNAs and HBAs are supported on HP ProLiant servers with Enterprise, Standard, Storage Server, or Datacenter versions of the following:

- Microsoft Windows Server 2008 W32 – SP2
- Microsoft Windows Server 2008 x64 – SP2, R2
- Microsoft Windows Server 2012

Windows on HP Integrity servers

Fibre Channel HBAs are supported on Integrity servers with Enterprise, Standard, Storage Server, or Datacenter versions of the following:

- Microsoft Windows Server 2008, IA64 — SP2, R2

**NOTE:** CNAs are not supported on HP Integrity servers.

VMware support

HP supports the use of Windows and Linux as a guest operating system on VMware ESX versions 4.x and 5.x. When running VMware, HBAs are supported by the in-box drivers supplied with ESX, and CNAs are supported with certified drivers available from the VMware website [www.vmware.com](http://www.vmware.com). Windows and Linux Fibre Channel HBA drivers are not used on the virtual operating system.

To ensure that the HBA/CNA is supported by HP and VMware, see VMware Compatibility Guide at: [http://www.vmware.com/resources/compatibility/search.php](http://www.vmware.com/resources/compatibility/search.php).

Boot from SAN on VMware


**NOTE:** Boot from SAN is supported on ESXi with QLogic CNAs using the latest HP ESXi customized images.

Installing the driver

You need not to install the QLogic driver for HBAs because it is shipped in-box with the ESX server.

**NOTE:** VMware ESX is not supported on the IA64 architecture.

Citrix support

HP supports the Citrix Hypervisor. For more information, see the HP Virtualization with Citrix website at [http://www.hp.com/go/citrix](http://www.hp.com/go/citrix).

Oracle Linux support


Management software

Use the QLogic QConvergeConsole application to manage CNAs and HBAs. QConvergeConsole supersedes QLogicSANsurfer software. However, SANsurfer can still be used to manage older HBAs.
For more information about software support, see the HP SPOCK website at http://h20272.www2.hp.com/Pages/spock2Html.aspx?htmlFile=hw_hbas.html&lang=en&cc=US&hpappid=hppcf. It is essential to sign up for an HP Passport to enable access. From the web page, click HBAs, CNAs, Flex Fabric Adapters, & Server LOMs Support Matrix: Linux, Citrix, VMware, Windows, and then select the operating system.

**NOTE:** If QCC GUI version fails to connect and displays an error message like “FC Get Host Info failed, see if agent is installed/running”, you might be running an unsupported browser. For more information about supported browser versions, see the QLogic QCC read me or QLogic QCC Release Notes.

### Important notes

This section describes restrictions and notes for QLogic adapters.

### General notes

The notes in this section apply to all operating systems.

### HP QLogic 8Gb and 16GB HBA Support for HP Proliant DL580 Gen8 Server

HP Qlogic 8Gb and 16Gb HBAs are supported on the HP Proliant DL580 Gen8 server with UEFI Boot, Legacy Boot, and Secure Boot.

**NOTE:** Secure Boot is supported only on Microsoft Windows Server 2012, Microsoft Windows Server 2012 R2, and SLES11 SP3.

### Adapter version requirement:

The HP QLogic 8Gb and 16Gb HBAs require the following minimum version components:

**81/82q 8Gb HBA**
- **BIOS:** 3.13/uEFI 6.28
- **MultiBoot Image:** 3.60.04

**SN1000Q 16Gb HBA**
- **BIOS:** 3.21/uEFI 6.25
- **FC FW:** 6.07.02
- **Flash Image:** 3.90.02

### Linux important notes

This section describes restrictions and notes for QLogic adapters installed on servers running Linux.

### Filesystem recommendation


For information on the differences between ext2 and ext3, see the operating system documentation.

### SLES11 ReiserFS issue

ReiserFS file systems can exhibit unexpected behavior under heavy loads. For up-to-date recommendations, see the Novell website http://support.novell.com/.
Presenting LUNs to a Linux host

When presenting XP LUNs to a Linux host:

- The LUNs must start with a LUN 0.
- The LUNs must be presented across all paths that are connected or configured from the XP storage array.
- If LUN 0 is not present, SANsurfer displays the XP array as offline.

Dynamic target addition not supported for XP arrays

Dynamic target addition is defined as adding a new Fibre Channel target (such as adding a new storage array) to a SAN, presenting that new target to a Fibre Channel host bus adapter, and then prompting the operating system to do an online scan (such as using the hp_rescan utility that comes with fibreutils). This functionality is not supported with XP arrays. If a new Fibre Channel XP target is added to a host server, it is necessary to reboot that host server.

For 81Q and 82Q only

HP Simple SAN Connection Manager (SSCM) is supported on the Windows based management server and connects to the qlremote agent on the Linux server.

Windows important notes

This section describes restrictions and notes for QLogic adapters installed on servers running Windows.

ProLiant servers running Windows notes

HBA restrictions for ProLiant servers running Windows are as follows:

- SANsurfer restrictions:
  - HBA port cannot be disabled using Windows Device Manager when the SANsurfer agent is running. To disable the HBA port, stop the SANsurfer agent in the services window or uninstall SANsurfer first.
  - The EVA firmware version displayed in SANsurfer might be incorrect. When an EVA is configured in Windows host mode, the standard Inquiry data returns a constant EVA firmware version number. Obtain the correct EVA firmware version using HP P6000 Command View or HP Command View EVA.
  - The HBA VPD data displayed in SANsurfer can be incorrect in an IA64 EFI or IA64 Windows environment. If this occurs, update a QLogic multiboot package with SANsurfer in a Windows IA64 operating system. Repeat this step a second time.
- On a Windows server, SCSIport and STORport miniport drivers can be used for HBAs from different vendors. However, on that server, all HBAs from a single vendor must operate exclusively with either all SCSIport miniport drivers or all STORport miniport drivers.

Booting from a SAN installation with QMH2462 on Microsoft Windows 2008 SP2

Booting from a SAN installation of Microsoft Windows 2008 SP2 using the QLogic QMH2462 Mezzanine Card may not succeed if attempting to perform the O/S deployment by using driver files obtained from the HP QLogic driver Smart Component. A blue screen might be observed along with a message stating “The system has halted.”

To boot from a SAN installation of Microsoft Windows 2008 SP2 with the QLogic QMH2462, perform the initial O/S installation using the Windows in-box driver (included with the O/S), and then update to the latest HP supported driver after rebooting.
STORport miniport driver installation

If running Secure Path for Windows, upgrade to Secure Path 4.0c SP2 or later for Windows before upgrading to the STORport miniport driver from an earlier version. STORport drivers are not supported with earlier versions of Secure Path. The latest STORport QFE must be installed before installing the Multipath software.

STORport miniport driver installation restriction for Windows Server 2008 IA64

If running Microsoft Windows Server 2008 for Itanium-based systems on an rx2660, rx3600, rx6600, rx7640, rx8640 or Superdome sx2000 with an AH400A or AH401A 8-GB Fibre Channel HBA, the following steps must be completed:

- If using the AH400A/AH401A as a data controller, verify the Engineering Date Code (EDC) on the controller before performing an installation on an Integrity server running Windows. The EDC is on the part-number label located on the back side of the controller. If the EDC version is earlier than A-4832, run the ASPM/MSI-X Vector Update Utility, and then install Microsoft QFE 957018. If the EDC version is A-4832 or later, only Microsoft QFE 957018 needs to be installed.

  - To run the ASPM/MSI-X Vector Update Utility:
    2. Install the controller and boot to the EFI shell.
    3. Run the set_msi_vect.nsh tool at the EFI shell. When prompted, select Option #1 (Load preload table with 32 MSI-x vectors + ASPM fix).

  - To install Microsoft QFE 957018:
    • After the flash is complete, boot the operating system, and then install the update described in Microsoft Knowledge Base article 957018.

- NOTE: For more information, see to the Microsoft Knowledge Base article 957018, available at http://support.microsoft.com/kb/957018. This update is also available on HP Smart Update media in the OS Updates section on QFEs for WS2008 tab.

  - If using the AH400A/AH401A as a boot controller:
    1. Run the ASPM/MSI-X Vector Update Utility before installing the operating system to change the supported MSI-X vectors to 2 when installing to, and booting from, the AH400A/AH401A.
2. Install Microsoft QFE 957018.
   - To run the ASPM/MSI-X Vector Update Utility:
     2. Install the controller and boot to the EFI shell.
     3. Run the set_msi_vect.nsh tool at the EFI shell. When prompted, select **Option #2** (Load preload table with 2 MSI-x vectors + ASPM fix).
   - To install Microsoft QFE 957018:
     1. After the flash is complete, boot the operating system, and then install the update described in Microsoft Knowledge Base article 957018.
     
     **NOTE:** For more information, refer to the Microsoft Knowledge Base article 957018 available at http://support.microsoft.com/kb/957018. This update can also be found on HP Smart Update media, in OS Updates section on QFEs for WS2008 tab.
     
     2. After installing the QFE set the number of supported MSI-X vectors can be set back to 32 by running the update utility at the EFI shell and selecting Option #1 (Load preload table with 32 MSI-x vectors + ASPM fix).

Diagnostics to determine HBA/transceiver status for QLogic 8-Gb HBAs

To determine the status of transceivers that are installed in 8-Gb HBAs, view the SANsurfer FC HBA Manager, **Diagnostics page → Transceiver Details**. The Transceiver Details page contains two nested pages:

- **General**—Shows an overview of the status data and inventory data from the optical transceiver device.
- **Details**—Shows detailed digital diagnostic data from the optical transceiver device (per SFF-8472 Specification for Diagnostic Monitoring Interface for Optical Xcvrs, Revision 9.3 August 1, 2002).

The following identifying information appears above the nested pages:

- **Hostname**—The name or IP address of the host connected to the adapter.
- **HBA Model**—Specifies the model number for the adapter (any ISP2422/2432 based adapter).
- **HBA Port**—Indicates the adapter port number.
- **Node Name**—Indicates the worldwide adapter node name.

**NOTE:** The read/write buffer test must be run without the loopback connector on a device (disk or tape) that supports the SCSI read buffer and SCSI write buffer commands. The Transceiver Details page is available only for 4-Gb or greater adapter devices. The transceiver details function is not available if using in-box drivers with Red Hat 5.0 or SLES 10.0.

**HP Smart Component notes**

The following HP Smart Component messages might appear during driver installation:

- When using the HP Smart Component to install drivers, the following message might appear: The application failed to initialize because the windows station is shutting down.
It is safe to ignore this message and continue with the reboot procedure.

- When using the HP Smart Component to install drivers, windows might display the following message:
  
  There was a problem installing this hardware. This device is not working properly because Windows cannot load the drivers required for this device. (Code 31)

  Uninstall and then reinstall the device.

  Click Finish. You need not reply to Microsoft. Continue with the reboot procedure.

Microsoft Windows 2008 multipath notes

On a server running any variant of Microsoft Windows 2008, a STOP message (blue screen) might occur during discovery of multiple paths on QLogic HBAs using an in-box driver. To avoid a STOP error, it is necessary to update the driver before adding additional paths to storage and enabling multipathing functionality.

Use the following procedure:
1. Install the Microsoft Windows 2008 operating software.
2. Update the QLogic driver to Version 9.1.7.17 or later.
3. Reboot the system.
4. Install the MPIO software.
5. Reboot the system.
6. Configure the new paths.

**NOTE:** After installing Microsoft Windows 2008, the servers must be updated with the latest supported HP drivers by running either the current version of HPSUM or Proliant Support Pack.

Secure Path 4.0c SP1 notes

With Secure Path 4.0c SP1, during a rolling driver upgrade, a STOP (blue-screen) error may occur under any of the following conditions:

- The server boots from a SAN.
- All HBAs access their LUNs in a single-path configuration.
- The HBA is directly connected in a single path to its own MSA controller.

If the STOP error occurs, reboot the server and view the driver version to verify that the upgrade is complete on all HBAs. Upgrading to Secure Path 4.0c SP2 corrects this problem.

**NOTE:** Secure Path is not supported on Microsoft Windows Server 2008 and with 8-Gb HBAs and mezzanine cards.

Miscellaneous notes

- On HP ProLiant PCI-Gen2-capable servers, there is a negotiation issue between PCI Gen2-capable HP QLogic 8-Gb mezzanine card, 8-Gb stand-up HBAs, and the server if the ROM-Based Setup Utility (RBSU) PCI Express Generation 2.0 Support value is set
to AUTO. This setting prevents these products from running at PCI-Gen2 speeds automatically, resulting in the servers running at Gen1 functionality.

To enable Gen2 functionality, set the PCI Express Generation 2.0 Support to GEN2 value setting in the RBSU. This setting forces the server to run in PCI-Gen2 mode.

- A c-Class Virtual Connect environment requires vc-fc module firmware version 1.32 to enable crash dumps to be written to the boot from SAN LUN.
- An issue with Brocade Access Gateway mode and Brocade switch firmware 6.2.0d prevents the writing of crash dumps to disk.

**VMware important notes**

- VMware is not supported on the IA64 architecture.

**Citrix important notes**

- Citrix is not supported on the IA64 architecture.

**Effective date**

April 2014