HP StorageWorks Emulex Fibre Channel host bus adapters for ProLiant and Integrity servers using Linux, VMware and Citrix operating systems release notes
Description

These release notes contain driver, firmware, and other supplemental information for the Emulex Fibre Channel host bus adapters (HBAs) for ProLiant and Integrity servers using Linux and VMware operating systems. See Product models for a list of supported HBAs.

What's new?

• VMware 4.0 K/L U1 support

Prerequisites

Before you perform HBA updates, you must:

• Ensure that the system is running one of the operating system versions listed in “Operating systems” on page 5.
• See the HP server PCI slot specifications to determine if your server is compatible with these HBAs.
• If you are installing the Linux operating system for the first time, load the operating system and then download and install the supported Linux HBA driver from the HP website http://welcome.hp.com/country/us/en/support.html.

NOTE:

Starting with RHEL 5 U3, 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.

Product models

The following HBAs and mezzanine cards are supported on ProLiant servers running Linux:

• HP StorageWorks LPe1205–HP 8Gb FC Mezzanine Card HBA (product number 456972-B21)
• HP StorageWorks LPe12000 8Gb FC Single Channel HBA (product number AJ762A)
• HP StorageWorks LPe12002 8Gb FC Dual Channel HBA (product number AJ763A)
• HP StorageWorks LPe1105–HP 4Gb FC HBA for HP c-Class BladeSystem (product number 403621-B21)
• HP StorageWorks BL20p Fibre Channel Mezzanine Card HBA (product number 394757-B21)
• HP StorageWorks BL25/30/35/45p Fibre Channel Mezzanine Card HBA (product number 394588-B21)

NOTE:

The minimum system requirement for the LPe1205–HP HBA is the G6 c-Class family of servers.

The following HBAs are supported on ProLiant and Integrity servers running Linux:
• HP StorageWorks FC2143 (product number AD167A)
• HP StorageWorks FC2243 (product number AD168A)
• HP StorageWorks FC2142SR (product number A8002A)
• HP StorageWorks FC2242SR (product number A8003A)

Devices supported

The Emulex HBAs for Linux are supported on HP servers that:

• Support the Linux operating systems listed in “Operating systems” on page 5.
• Support the servers listed on the HP website http://www.hp.com/products1/serverconnectivity/support_matrices.html.
• Support the following storage arrays for Linux:
  • Modular Smart Array 1000
  • Modular Smart Array 1500
  • Modular Smart Array 2012fc/2212fc/2312fc/2324fc
  • Enterprise Virtual Array 3000/5000 GL
  • Enterprise Virtual Array 4000/6000/8000 XL
  • Enterprise Virtual Array 4400
  • Enterprise Virtual Array 4400 with embedded switch¹
  • Enterprise Virtual Array 4100/6100/8100
  • Enterprise Virtual Array 6400/8400²
  • XP1024/128, XP10000/12000, and XP20000/24000

**NOTE:**

Beginning with SLES 11, HP no longer supports the following arrays: MSA1000, MSA1500, EVA3000, EVA5000, XP128, and XP1024. Beginning with RHEL 5.3 and SLES 10 SP3, HP no longer supports the following arrays: MSA1000, MSA1500, EVA3000, and EVA5000. Beginning with RHEL 6.0, HP no longer supports the XP128 and XP1024.

For the latest supported array firmware, see the HP storage array website http://h18006.www1.hp.com/storage/arraysystems.html

**NOTE:**

For Modular Smart Arrays and Enterprise Virtual Array, active/passive storage arrays are supported in single-path mode only.

For the MSA2000 family of disk arrays only:

• The minimum required firmware is J200P24-01.

¹EVA 4400 with embedded switch is not currently supported with SLES 9 SP4.
²EVA 6400 and 8400 currently do not support boot from SAN.
• Creating virtual disks (vdisks) online or offline without volumes during the virtual disk creation process is not supported. You must create at least one volume during the virtual disk creation.
• MultiPulse is not supported. See the HP Device Mapper documentation for multipathing support.
• Boot from SAN is not currently supported.

Operating systems

Linux on ProLiant servers

The following table lists software support with the following 2.6 version of x86 and x64 Linux: RHEL 5 U4 (2.6.18-164).

Table 1 Software support for RHEL 5 U4 version 2.6.18-164 of x86 and x64 Linux

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>BIOS</th>
<th>Universal boot image</th>
<th>HBAAnyware</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPe12000 (AJ762A)</td>
<td>8.2.0.48.2p</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>LPe12002 (AJ763A)</td>
<td>8.2.0.48.2p</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>FC2143 (AD167A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>LPe1105-HP (403621-B21)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>3.03a9</td>
<td>6.03a7</td>
<td>4.1a36</td>
</tr>
<tr>
<td>LPe1205-HP (456972-B21)</td>
<td>8.2.0.48.2p</td>
<td>1.11a5</td>
<td>3.03a9</td>
<td>6.03a7</td>
<td>4.1a36</td>
</tr>
</tbody>
</table>

The following table lists software support with the following 2.6 version of x86 and x64 Linux: SLES 10 SP3 (2.6.16-60-0.54.5).

Table 2 Software support for SLES 10 SP3 version 2.6.16-60-0.54.5 of x86 and x64 Linux

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>BIOS</th>
<th>Universal boot image</th>
<th>HBAAnyware</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPe12000 (AJ762A)</td>
<td>8.2.0.48.2p</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>LPe12002 (AJ763A)</td>
<td>8.2.0.48.2p</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>FC2143 (AD167A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a36</td>
</tr>
<tr>
<td>LPe1105-HP (403621-B21)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>3.03a9</td>
<td>6.03a7</td>
<td>4.1a36</td>
</tr>
</tbody>
</table>
The following table lists software support with the following 2.6 version of x86 and x64 Linux: SLES 11 (2.6.27.19-5).

**Table 3 Software support for SLES 11 version 2.6.27.19-5 of x86 and x64 Linux**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>BIOS</th>
<th>Universal boot image</th>
<th>HBAAnyware</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPe1205-HP (456972-B21)</td>
<td>8.2.0.48.2p</td>
<td>1.11a5</td>
<td>3.03a9</td>
<td>6.03a7</td>
<td>4.1a36</td>
</tr>
</tbody>
</table>

The following table lists software support with the following 2.6 version of x86 and x64 Linux: RHEL 5 U3 (2.6.18.128).

**Table 4 Software support for RHEL 5 U3 version 2.6.18.128 of x86 and x64 Linux**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>BIOS</th>
<th>Universal Boot Image</th>
<th>HBAAnyware</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPe12000 (AJ762A)</td>
<td>8.2.8.14</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a33</td>
</tr>
<tr>
<td>LPe12002 (AJ763A)</td>
<td>8.2.8.14</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a33</td>
</tr>
<tr>
<td>FC2143 (AD167A)</td>
<td>8.2.8.14</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a33</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>8.2.8.14</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a33</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>8.2.8.14</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a33</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>8.2.8.14</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>4.1a33</td>
</tr>
<tr>
<td>LPe1105-HP (403621-B21)</td>
<td>8.2.8.14</td>
<td>2.72a2</td>
<td>3.03a9</td>
<td>6.03a7</td>
<td>4.1a33</td>
</tr>
<tr>
<td>LPe1205-HP (456972-B21)</td>
<td>8.2.8.14</td>
<td>1.11a5</td>
<td>3.03a9</td>
<td>6.03a7</td>
<td>4.0a31</td>
</tr>
</tbody>
</table>
The following table lists software support with the following 2.6 version of x86 and x64 Linux: RHEL 5 U2 (2.6.18–92), and SLES 10 SP2 (2.6.16.60–0.21).

**Table 5 Software support for RHEL 5 U2 version 2.6.18-92 and SLES 10 SP2 version 2.6.16.60-0.21 of x86 and x64 Linux**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>BIOS</th>
<th>Universal boot image</th>
<th>MultiPulse</th>
<th>HBAAnyware</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPe12000 (AJ762A)</td>
<td>8.2.0.22_p4</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>LPe12002 (AJ763A)</td>
<td>8.2.0.22_p4</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>FC2143 (AD167A)</td>
<td>8.2.0.22_p4</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>8.2.0.22_p4</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>8.2.0.22_p4</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>8.2.0.22_p4</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>LPe1105 (403621-B21)</td>
<td>8.2.0.22_p4</td>
<td>2.72a2</td>
<td>3.03a9</td>
<td>6.03a7</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>LPe1205-HP (456972-B21)</td>
<td>8.2.0.22_p4</td>
<td>1.11a5</td>
<td>3.03a9</td>
<td>6.03a7</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>BL20p (394757-B21)</td>
<td>8.2.0.22_p4</td>
<td>1.91a5</td>
<td>1.71a0</td>
<td>n/a</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>B25/30/35/45p (394588-B21)</td>
<td>8.2.0.22_p4</td>
<td>1.91a5</td>
<td>1.71a0</td>
<td>n/a</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
</tbody>
</table>

^1 RHEL 5 U2 and SLES 10 SP2 support only

The following table lists software support with the following 2.6 versions of x86 and x86_64 Linux: RHEL 4 U7 and U8 versions 2.6 and SLES 9 SP4.

**Table 6 Software support for RHEL 4 U7 and U8 versions 2.6 and SLES 9 SP4 versions 2.6 of x86 and x64 Linux**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>BIOS</th>
<th>Universal boot image</th>
<th>MultiPulse</th>
<th>HBAAnyware</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPe12000 (AJ762A)</td>
<td>8.0.16.40_p3</td>
<td>1.00a9</td>
<td>2.01a2</td>
<td>5.03a0</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>LPe12002 (AJ763A)</td>
<td>8.0.16.40_p3</td>
<td>1.00a9</td>
<td>2.01a2</td>
<td>5.03a0</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
</tbody>
</table>
The following table lists software support with the following 2.4 kernel versions of x86 and x86_64 Linux: RHEL 3 U7 and U8.

**Table 7 Software support for RHEL 3 U7 and U8 2.4 kernel versions of x86 and x86_64 of Linux**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>BIOS</th>
<th>Universal Boot</th>
<th>MultiPulse</th>
<th>HBAAnywhere</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC2143 (AD167A)</td>
<td>8.0.16.40_p3</td>
<td>2.72a2</td>
<td>2.01a2</td>
<td>5.03a0</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>8.0.16.40_p3</td>
<td>2.72a2</td>
<td>2.01a2</td>
<td>5.03a0</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>8.0.16.40_p3</td>
<td>2.72a2</td>
<td>2.01a2</td>
<td>5.03a0</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>8.0.16.40_p3</td>
<td>2.72a2</td>
<td>2.01a2</td>
<td>5.03a0</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>LPe1105-HP (403621-B21)</td>
<td>8.0.16.40_p3</td>
<td>2.72a2</td>
<td>3.00a4</td>
<td>6.00a5</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>BL20p (394757-B21)</td>
<td>8.0.16.40_p3</td>
<td>1.91a5</td>
<td>1.71a0</td>
<td>n/a</td>
<td>2.2.44</td>
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</tr>
<tr>
<td>BL25/30/35/45p (394588-B21)</td>
<td>8.0.16.40_p3</td>
<td>1.91a5</td>
<td>1.71a0</td>
<td>n/a</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
</tbody>
</table>

**Linux on Integrity servers**

The following versions of Linux are supported on Integrity servers.
This table lists software support with the following 2.6 versions of Itanium Linux: SLES 11.

**Table 8 Software support for SLES 11 version 2.6 of Itanium Linux**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>EFI</th>
<th>Universal Boot Image</th>
<th>HBAAnyware</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC2143 (AD167A)</td>
<td>8.2.8.14</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.1.a33</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>8.2.8.14</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.1.a33</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>8.2.8.14</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.1.a33</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>8.2.8.14</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.1.a33</td>
</tr>
</tbody>
</table>

The following table lists software support with the following 2.6 versions of Itanium Linux: SLES 10 SP3 and RHEL 5 U4.

**Table 9 Software support for SLES 10 SP3 and RHEL 5 U4 version 2.6 of Itanium Linux**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>EFI</th>
<th>Universal Boot Image</th>
<th>HBAAnyware</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC2143 (AD167A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.1.a36</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.1.a36</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.1.a36</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>8.2.0.48.2p</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.1.a36</td>
</tr>
</tbody>
</table>

The following table lists software support with the following 2.6 versions of Itanium Linux: RHEL 5 U3.

**Table 10 Software support for RHEL 5 U3 version 2.6 of Itanium Linux**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>EFI</th>
<th>Universal boot image</th>
<th>HBAAnyware</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC2143 (AD167A)</td>
<td>8.2.0.33.3p</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.0a31</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>8.2.0.33.3p</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.0a31</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>8.2.0.33.3p</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.0a31</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>8.2.0.33.3p</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>4.0a31</td>
</tr>
</tbody>
</table>

The following table lists software support with the following 2.6 versions of Itanium Linux: SLES 10 SP2 and RHEL 5 U2.

**Table 11 Software support for SLES 10 SP2 version 2.6 and RHEL 5 U2, version 2.6 of Itanium Linux**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>EFI</th>
<th>Universal Boot Image</th>
<th>MultiPulse</th>
<th>HBAAnyware</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC2143 (AD167A)</td>
<td>8.2.0.22_p4</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>8.2.0.22_p4</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
</tbody>
</table>

HP StorageWorks Emulex Fibre Channel host bus adapters for ProLiant and Integrity servers using Linux, VMware and Citrix operating systems release notes
This table lists software support with the following 2.6 versions of Itanium Linux: RHEL 4 U7 and U8, SLES 9 SP3 and SP4.

Table 12 Software support for RHEL 4 U7 and U8 version 2.6 and SLES 9 and SP4 version 2.6 of Itanium Linux

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>EFI</th>
<th>Universal Boot Image</th>
<th>MultiPulse</th>
<th>HBAnyware</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC21425R (A8002A)</td>
<td>8.2.0.22_p4</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
<tr>
<td>FC22425R (A8003A)</td>
<td>8.2.0.22_p4</td>
<td>2.72a2</td>
<td>4.00a6</td>
<td>5.03a9</td>
<td>2.2.44</td>
<td>3.4a16</td>
</tr>
</tbody>
</table>

VMware

HP supports the use of Linux as a guest on VMware ESX versions 4.x and 3.x. When running VMware, Fibre Channel HBAs are supported by in-box drivers supplied with VMware ESX. Linux FC HBA drivers are not supported on the Virtual OS (VOS).

**NOTE:**
You do not need to install the Emulex driver because it is shipped with the ESX server.

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

The following table lists minimum software support with the following 2.6 version of x86 ESX server: 4.0.

Table 13 Software support for 4.0 version 2.6 of x86 ESX server

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>BIOS</th>
<th>Universal Boot</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPe12000 (AJ762A)</td>
<td>8.2.0.30.49</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>LPe12002 (AJ763A)</td>
<td>8.2.0.30.49</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>HBA</td>
<td>Driver</td>
<td>Firmware</td>
<td>BIOS</td>
<td>Universal Boot</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------</td>
<td>----------</td>
<td>------</td>
<td>----------------</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>8.2.0.30.49</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>8.2.0.30.49</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>8.2.0.30.49</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>FC2143 (AD167A)</td>
<td>8.2.0.30.49</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>LPe1105-HP (403621-B21)</td>
<td>8.2.0.30.49</td>
<td>2.72a2</td>
<td>3.03a7</td>
<td>6.00a7</td>
</tr>
<tr>
<td>LPe1205-HP (456972-B21)</td>
<td>8.2.0.30.49</td>
<td>1.11a5</td>
<td>3.03a9</td>
<td>6.03a7</td>
</tr>
</tbody>
</table>

The following table lists minimum software support for the x64 ESX server: 4.0 U1.

**Table 14 Software support for 4.0 U1 of x64 ESX server**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>BIOS</th>
<th>Universal Boot</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPe12000 (AJ762A)</td>
<td>8.2.0.30.52</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>LPe12002 (AJ763A)</td>
<td>8.2.0.30.52</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>8.2.0.30.52</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>8.2.0.30.52</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>8.2.0.30.52</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>FC2143 (AD167A)</td>
<td>8.2.0.30.52</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>LPe1105-HP (403621-B21)</td>
<td>8.2.0.30.52</td>
<td>2.72a2</td>
<td>3.03a7</td>
<td>6.00a7</td>
</tr>
<tr>
<td>LPe1205-HP (456972-B21)</td>
<td>8.2.0.30.52</td>
<td>1.11a5</td>
<td>3.03a9</td>
<td>6.03a7</td>
</tr>
</tbody>
</table>

The following table lists minimum software support with the following 2.4 versions of x86 ESX server: 3.5 U4.

**Table 15 Software support for 3.5 U4 version 2.4 of x86 ESX server**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver 1</th>
<th>Firmware</th>
<th>BIOS</th>
<th>Universal Boot</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPe12000 (AJ762A)</td>
<td>7.4.0.39</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>LPe12002 (AJ763A)</td>
<td>7.4.0.39</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>7.4.0.39</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>7.4.0.39</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>7.4.0.39</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
</tr>
</tbody>
</table>
The Emulex driver is shipped with the ESX server. The driver does not require installation.

**NOTE:**
ESX Server 3.5 U2 added support for AJ762A and AJ763A.

### Citrix

The following table lists minimum software support for Citrix V5.5.0 (15119).

HP supports the Citrix hypervisor. See the website: [http://www.hp.com/go/citrix](http://www.hp.com/go/citrix).

**Table 16 Software support for Citrix V5.5.0 (15119)**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>Firmware</th>
<th>BIOS</th>
<th>Universal Boot Image</th>
<th>HBAAnywhere</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPe12000 (AJ762A)</td>
<td>Inbox</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>Inbox–CLI</td>
</tr>
<tr>
<td>LPe12002 (AJ763A)</td>
<td>Inbox</td>
<td>1.11a5</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>Inbox–CLI</td>
</tr>
<tr>
<td>FC2143 (AD167A)</td>
<td>Inbox</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>Inbox–CLI</td>
</tr>
<tr>
<td>FC2243 (AD168A)</td>
<td>Inbox</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>Inbox–CLI</td>
</tr>
<tr>
<td>FC2142SR (A8002A)</td>
<td>Inbox</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>Inbox–CLI</td>
</tr>
<tr>
<td>FC2242SR (A8003A)</td>
<td>Inbox</td>
<td>2.72a2</td>
<td>2.02a2</td>
<td>5.03a9</td>
<td>Inbox–CLI</td>
</tr>
<tr>
<td>LPe1105-HP (403621-B21)</td>
<td>Inbox</td>
<td>2.72a2</td>
<td>3.03a9</td>
<td>6.03a7</td>
<td>Inbox–CLI</td>
</tr>
<tr>
<td>LPe1205-HP (456972-B21)</td>
<td>Inbox</td>
<td>1.11a5</td>
<td>3.03a9</td>
<td>6.03a7</td>
<td>Inbox–CLI</td>
</tr>
</tbody>
</table>

**Boot from SAN on VMware**

To perform a boot from SAN on VMware, see [HP StorageWorks Fibre Channel host bus adapters software guide for Linux](http://bizsupport2.austin.hp.com/bc/docs/support/SupportManual/c01672721/c01672721.pdf).
Installing the Linux device driver using the Red Hat in-box driver

For instructions on how to install Linux while using the in-box driver, go to the HP website http://www.hp.com, and then search for device mapper + boot + san.

If you require multiple-path redundancy, after installing the operating system, you must install the HP-supplied Device Mapper Multipath Kit. Go to the HP website http://www.hp.com/go/devicemapper.

You must also install the new HP Fibre Channel Enablement Kit (hp-fc-enablement), after installing the operating system.

HP Fibre Channel Enablement Kit

The HP Fibre Channel Enablement Kit provides additional libraries and configuration utilities to enable HP StorageWorks Fibre Channel storage arrays to work with Linux. The kit is not required to use the lpfc and qla2xxx kernel modules, but it provides configuration scripts to ensure that HP StorageWorks Fibre Channel arrays. The Fibre Channel Enablement kit also sets the correct lpfc and qla2xxx kernel module values used with Device Mapper multipathing.

**NOTE:**

If you are using any HP management applications, you will need the HBAAPI libraries that are included in the hp-fc-enablement RPM.

---

Installing the HP Fibre Channel Enablement Kit

To install the HP Fibre Channel Enablement Kit:

1. Download the hp-fc-enablement-yyyy-mm-dd.tar.gz file for your operating system and copy it to the target server
2. Untar the enablement kit by executing the command to create the directory, hp-fc-enablement-yyyy-mm-dd:
   
   # tar zxvf hp-fc-enablement-yyyy-mm-dd.tar.gz
3. Browse to the directory hp-fc-enablement-yyyy-mm-dd.
4. Do one of the following to execute the install.sh script:
   - If you are not using Device Mapper multipathing, enter the following command:
     
     # ./install.sh -s
   - If you are using Device Mapper multipathing, enter the following command:
     
     # ./install.sh -m

The hp-fc-enablement and fibreutils RPMs are installed. To verify the installation, enter the following commands:

# rpm -q hp-fc-enablement
# rpm -q fibreutils
Uninstalling the HP Fibre Channel Enablement Kit

To uninstall the Fibre Channel Enablement Kit, untar the kit as mentioned in steps 1 through 3, and then execute the `install.sh` script with the `-u` option:

```
# ./install.sh -u
```

To manually uninstall the RPMs in the enablement kit, enter the following commands:

```
# rpm -e hp-fc-enablement
# rpm -e fibreutils
```

Installing the Linux device driver using the HP kit (prior to RHEL 5 U3)

HP does not support building the `lpfc` driver from source code. The driver versions for kernel-based distributions are as follows:

- Driver 7.x.x for the 2.4 kernel
- Driver 8.x.x.x for the 2.6 kernel

Installing the Linux device driver

1. Download the appropriate driver kit for your distribution where the driver kit file will be in the form of `hp-lpfc-yyyy-mm-dd.tar.gz`.
2. Copy the driver kit to the target system.
3. Uncompress and untar the driver kit by entering the following command:
   ```
   # tar zxvf hp-lpfc-yyyy-mm-dd.tar.gz.
   ```
4. Change the directory to `hp-lpfc-yyyy-mm-dd`.
5. Do one of the following:
   - Enter the following command to install the Linux device driver:
     ```
     # ./INSTALL
     ```
     The command syntax varies depending on your configuration. Use the `-h` option of the command to list all supported options. If a driver kit is already installed, you can enter the command without any options; the script uses the current configuration.
   - Enter the following command to install the Linux device driver for SLES 10 SP1 only:
     ```
     #./INSTALL -p
     ```
   - Include the `-m` option to force the installation to failover mode.
     ```
     #./INSTALL -mp
     ```
   - Use the `-s` option to force the installation to single-path mode:
     ```
     #./INSTALL -s
     ```
     The `INSTALL` script installs the appropriate driver RPM for your configuration, and the appropriate fibreutils RPM. When the script is finished, you will either reload the Emulex driver modules (`lpfc`, `lpfcdfc` and `lpfcmpl`) or reboot your server.

Loading the driver

To load the driver, enter the following commands:
# modprobe lpfc
# modprobe lpfcdfc

**NOTE:**
The command `modprobe lpfcdfc` is for RHEL 4 Ux and SLES 9SPx.

# modprobe lpfcmpl

**NOTE:**
The command `modprobe lpfcmpl` is for MultiPulse configuration only.

---

**Rebooting the server**

To reboot the server, enter the following command:

```
# reboot
```

If your boot device is a SAN attached device, you must reboot your server.

---

**Verifying the RPM driver version**

To verify what RPM driver version is installed, use the `RPM` command with the `-q` option.

```
# rpm -q hp-lpfc
# rpm -q hp-multipulse
```

For MultiPulse configuration only:

```
# rpm -q fibreutils
```

---

**Unloading the driver**

To unload the driver, enter the following command:

```
# modprobe -r lpfcmpl
```

**NOTE:**
The command `modprobe -r lpfcmpl` is for MultiPulse configuration only.

```
# modprobe -r lpfcdfc
```

**NOTE:**
The command `modprobe -r lpfcdfc` is for RHEL 4 Ux and SLES 9SPx.

```
# modprobe -r lpfc
```
Installing HBAnyware on Linux

To install HBAnyware on a Linux system:

1. Download the file HP_ElxApps-<Kernel Version>-<HBAnyware Version>-<Driver Version>.zip to the target system.
   
   **Example:**
   
   HP_ElxApps-26-3.2a16-8.1.10.11.zip

   **NOTE:**
   
   See Table 1 through 5 for HBAnyware and driver version information. kernel version: 26 for 2.6 kernels and kernel version 24 for 2.4 kernels.

2. Unzip the file on the target system.
   
   **Example:**
   
   # unzip HP_ElxApps-26-3.2a16-8.1.10.11.zip

3. Make the file executable under Linux.
   
   **Example:**
   
   # chmod +x HP_ElxApps-26-3.2a16-8.1.10.11.bin

4. Install the application.
   
   **Example:** #./HP_ElxApps-26-3.2a16-8.1.10.11.bin

5. Launch the application.
   
   **Example:** # HBAnyware or # /usr/sbin/hbanyware/hbanyware

   **NOTE:**
   
   See the HBAnyware online help for more information.

HBAnyware 3.4a16 has a known presentation issue with the 8.0.16.40 driver and the AJ762A and AJ763A HBAs. The link speed is not displayed. This will be corrected in a future release.

Important information

Restrictions

This section describes restrictions that apply to Linux and this release of the HBAs:

- SUSE 10 SP1 has a known issue related to boot hang and udev timeout. To correct the issue, use the ./INSTALL script with the -p option. See the section, “Installing the Linux device driver using the HP kit” on page 14 for more installation options.

- SLES 10 SP2 has an issue displaying 8 Gb HBA speed. You can correct the problem using kernel version 2.6.16.60-0.25.

- The Emulex MultiPulse 2.2.22 2.2.38, 2.2.39 and 2.2.44 drivers supports active/active storage arrays only.
• If using MultiPulse 2.1.x, you can have a maximum of four physical paths to a LUN. More than four paths can cause a failure.
• If using MultiPulse 2.2.x, you can have a maximum of eight physical paths to a LUN. More than eight paths can cause failure.
• Because the order in which a switch reports Fibre Channel ports to a name server can vary, the order in which LUNs are discovered can vary between system boots.

HP recommends that you use the udev utility to ensure that the name of a device does not change between system boots. For detailed information, available on the website http://www.kernel.org/pub/linux/utils/kernel/hotplug/udev.html.

• When using MultiPulse with SUSE Linux systems in boot from SAN configurations, HP recommends that you use the udev utility to ensure that your system boots successfully. For detailed information about this procedure, see "Using the udev utility with SUSE Linux systems" in the HP StorageWorks Booting Itanium Linux systems from a storage area network application notes, available on the website http://h18006.www1.hp.com/storage/saninfrastructure.html.

• Boot from SAN is not supported on the A8002A with RHEL 4 U3 and U4, IA64, or SLES 10 IA64.
• Boot from SAN is not supported on the AJ762A and AJ763A with RHEL 4 U5, SLES 9 SP3 and SLES 10 SP1.

• If you are installing the Linux operating system for the first time, load the operating system and then download and install the supported Linux HBA driver from the HP website http://welcome.hp.com/country/us/en/support.html.

• XP LUNs presented to Linux hosts must start with LUN 0.
• MultiPulse can coexist with multipathing products such as the Emulex failover driver and Secure Path. However, MultiPulse works only with Emulex-based HBAs; it will not configure multiple paths for other HBAs in the system.

• HP recommends that you implement zoning with HBA, as described in the HP StorageWorks SAN design reference guide, available on the website http://h18006.www1.hp.com/products/storageworks/san/documentation.html.

• A maximum of 10 targets are supported in a boot from SAN zone.

• On a sx2000 system with the default logging level, a call trace may appear in the /var/log/messages file during failover events.

• When running the scsi_info command on older XP arrays such as XP1024/128, you may see output similar to that shown in the following example. Ignore the error, and note that the XP array’s WWN is not all zeros.

The XP array returns inquiry data that differs slightly from that returned by EVA or MSA arrays.

[root@coco /]# scsi_info /dev/sdal SCSI_ID="4,0,8,0":VENDOR="HP":MODEL="OPEN-E":FW_REV="5005":WWN="0000000000000":LUN="52353030203030-313035930203030"
[root@coco /]# scsi_info /dev/sdam SCSI_ID="4,0,8,1":VENDOR="HP":MODEL="OPEN-E":FW_REV="5005":WWN="0000000000000":LUN="52353030203030-313035930203030"
[root@coco /]# scsi_info /dev/sdan SCSI_ID="4,0,9,0":VENDOR="HP":MODEL="OPEN-E":FW_REV="2114":WWN="03000000002018e9":LUN="5234353120303030-333031303203030"
[root@coco /]# scsi_info /dev/sdao SCSI_ID="4,0,9,1":VENDOR="HP":MODEL="OPEN-E"
RHEL 5 U3 and SLES 10 SP3 do not support active/passive arrays.

Installing PSP 7.91/92 causes fibreutils to downgrade. Re-install fibreutils rpm from the downloaded kit.

Example:
```
# rpm -fvh fibreutils.<version>.linux.<arch>.rpm
```

When an EVA4400 with embedded switch is configured in a heterogeneous SAN, HP recommends that you use a text editor to edit the HBA configuration file /etc/modprobe.conf.

```
options lpfcmpl mpl_hbeat_tmo_busy=0
```

Save the file, and then run the make_initrd script.
```
# /opt/hp/hp-lpfc/make_initrd
```

Reboot your server with the correct initrd.

EVA4400 with embedded switch is not currently supported with SLES 9 SP4.

Dynamic LUN addition and removal are supported. However, the ability to dynamically add a new LUN (or a LUN that has been previously removed) using the LUN number of a previously removed LUN is not supported. Dynamic target addition, which is defined as adding a new Fibre Channel target (such as adding a new storage array) to a SAN, is also not supported. The ability to present the new target to a Fibre Channel host bus adapter, and then prompt the operating system to do an online scan (such as using the hp_rescan utility that comes with fibreutils) is not supported with the Emulex failover driver (MultiPulse). If you add a new Fibre Channel target to a host server, you must reboot that server.

VMware ESX 3.x.x is not supported on the IA64 architecture.

Emulex HBA driver 7.4.0.39 is needed to support QLogic switch firmware 8.0.2.2.0.

**FC2142SR and FC2242SR HBAs for Linux on ProLiant systems**

HP ProLiant DL380 (G4) servers must have System ROMPaq Firmware 4.05 P51-08/16/2005 or later to be compatible with the FC2142SR and FC2242SR. Failure to use this ROMPaq version can cause the HBAs to hang during the power-on self-test (POST). For detailed information, see [http://h18004.www1.hp.com/support/files/server/us/download/23728.html](http://h18004.www1.hp.com/support/files/server/us/download/23728.html).

**Compatibility and interoperability**

- The HBAs support the servers and switches described in “Devices supported” on page 4, and the operating systems described in “Operating systems” on page 5.

**Determining the HBA driver and firmware versions**

This section describes how to determine the HBA driver and firmware versions.

**2.4 kernels**

To view driver and firmware information:
1. Go to the `/proc/scsi/lpfc` directory to view a list of SCSI HBAs. A numbered file (such as 0 or 1) represents each HBA on the system.

2. Open the file to view the version information.

**2.6 kernels**

To view driver and firmware information:

1. Go to the `/sys/class/scsi_host` directory to view a list of SCSI HBAs. A numbered file (such as `host0` or `host1`) represents each HBA on the system.

2. Review the following files for version information:
   - `lpfc_drvr_version` contains driver information.
   - `fwrev` contains firmware information.

**SLES 11 Reiserfs**

HP and Novell are evaluating a report that Reiserfs filesystems display unexpected behavior under heavy load. Other filesystems such as `xfs` and `ext3` are not affected by this behavior. HP recommends that you use either the `XFS` or `ext3` filesystem. This is a high priority issue that is in the process of being resolved. Once a resolution is found, a maintenance update will be available on the website [http://support.novell.com/](http://support.novell.com/).

**Filesystem recommendation**


**Languages**

American English

**Effective date**

November 2009