HP StorageWorks QLogic fibre channel host bus adapters for ProLiant and Integrity servers using Linux and VMware operating systems release notes
Description

These release notes contain driver, firmware, and other supplemental information for the QLogic 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.

Update recommendation

Routine

Prerequisites

Before you perform HBA updates, you must:

- Ensure that the system is running one of the operating system versions in “Operating systems” on page 4.
- 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 web site http://welcome.hp.com/country/us/en/support.html.

Product models

The following HBAs and Mezzanine Cards Support Linux on ProLiant servers:

- HP StorageWorks FC1242SR PCI Express HBA (product number AE312A)
- HP StorageWorks FC1243 PCI-X 2.0 4Gb HBA (product number AE369A)
- HP StorageWorks FCA2214 PCI-X HBA (product number 281541-B2)
- HP StorageWorks FCA2214 DC PCI-X HBA (product number 321835-B21)
- HP BL20p G2 FC p-class Mezzanine Adapter (product number 300874-B21)
- HP BL20p G3, G4 p-class FC Mezzanine Adapter (product number 361426-B21)
- HP BL30p/BL35p p-class Dual-Port FC Mezzanine Adapter (product number 354054-B21)
- HP BL25p/BL45p p-class G2 FC Mezzanine Adapter (product number 381881-B21)

The following HBAs and Mezzanine HBAs support Linux on BOTH ProLiant and Integrity Servers:

- HP StorageWorks FC1143 PCI-X 2.0 4Gb HBA (product number AB429A)
- HP StorageWorks FC1142SR PCI Express HBA (product number AE311A)
- HP QLogic QMH2462 4Gb FC HBA for HP c-Class BladeSystem (product number 403619-B21)

The following HBAs support Linux only on Integrity servers:

- HP PCIe dual-port 4Gb FC adapter (product number AD300A)
- HP PCI-X dual-port 4Gb FC adapter (product number AB379A)
- HP PCI-X dual-port 4Gb FC adapter (product number AB379B)
- HP Q2300 PCI-X 2GB FC HBA (product number A7538A)
- HP A6826A PCI-X Dual Port 2GB FC HBA (product number A6826A)
Devices supported

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

- Support the Linux operating systems described in Operating systems.
- Support the following storage arrays for Linux:
  - Modular Smart Array 1000
  - Modular Smart Array 1500
  - Enterprise Virtual Array 3000/5000 GL
  - Enterprise Virtual Array 4000/6000/8000 XL
  - XP12000, XP1024/128, XP10000

Linux operating systems

Linux on ProLiant

The following versions of Linux are supported on ProLiant servers.

Table 1 This table lists software support with the following 2.6 versions of x86 and x64 Linux: RHEL 4 – U4 and U5, RHEL 5, SLES 9 – SP2 and SP3, SLES 10 and SLES 10 SP1.

<table>
<thead>
<tr>
<th>HBAs</th>
<th>Driver</th>
<th>BIOS</th>
<th>Multi-boot image</th>
<th>SANsurfer Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC1242SR (AE312A)</td>
<td>8.01.07.25</td>
<td>1.26</td>
<td>1.64</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>FC11425R (AE311A)</td>
<td>8.01.07.25</td>
<td>1.26</td>
<td>1.64</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>QMH2462 c-Class Mezz</td>
<td>8.01.07.25</td>
<td>1.26</td>
<td>1.64</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>FC1243 (AE369A)</td>
<td>8.01.07.25</td>
<td>1.26</td>
<td>1.64</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>FC1143 (AB429A)</td>
<td>8.01.07.25</td>
<td>1.26</td>
<td>1.64</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>FCA2214</td>
<td>8.01.07.25</td>
<td>1.45</td>
<td>n/a</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>FCA2214DC</td>
<td>8.01.07.25</td>
<td>1.45</td>
<td>n/a</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>HP BL20p G3, G4 FC</td>
<td>8.01.07.25</td>
<td>1.45</td>
<td>n/a</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>HP BL25p/BL45p G2</td>
<td>8.01.07.25</td>
<td>1.48</td>
<td>n/a</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>HP BL30p/BL35p Dual-Port FC Mezz</td>
<td>8.01.07.25</td>
<td>1.45</td>
<td>n/a</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>HP BL20p G2 FC Mezz</td>
<td>8.01.07.25</td>
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</tr>
</tbody>
</table>

The minimum supported 2.6 kernel versions are RHEL 4 U5 - (2.6.9-55.EL.smp), RHEL 5 – (2.6.18-8.1.8.el5), SLES 9 SP3 – (2.6.5-7.267-smp) and SLES 10 SP1 – (2.6.16.53-0.8).
Table 2 This table lists software support with the following 2.4 versions of x86 and x64 Linux: RHEL 3 – U8 and U9 and SLES 8 SP4.

<table>
<thead>
<tr>
<th>HBA</th>
<th>RHEL 3 Driver</th>
<th>SLES 8 Driver</th>
<th>BIOS</th>
<th>Multi-boot image</th>
<th>SANsurfer Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC1242SR (AE312A)</td>
<td>7.07.05.08</td>
<td>7.07.05.02</td>
<td>1.26</td>
<td>1.64</td>
<td>5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)</td>
</tr>
<tr>
<td>FC1142SR (AE311A)</td>
<td>7.07.05.08</td>
<td>7.07.05.02</td>
<td>1.26</td>
<td>1.64</td>
<td>5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)</td>
</tr>
<tr>
<td>QMH2462 c-Class Mezz</td>
<td>7.07.05.08</td>
<td>7.07.05.02</td>
<td>1.26</td>
<td>1.64</td>
<td>5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)</td>
</tr>
<tr>
<td>FC1243 (AE369A)</td>
<td>7.07.05.08</td>
<td>7.07.05.02</td>
<td>1.26</td>
<td>1.64</td>
<td>5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)</td>
</tr>
<tr>
<td>FC1143 (AB429A)</td>
<td>7.07.05.08</td>
<td>7.07.05.02</td>
<td>1.26</td>
<td>1.64</td>
<td>5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)</td>
</tr>
<tr>
<td>FCA2214</td>
<td>7.07.05.08</td>
<td>7.07.05.02</td>
<td>1.45</td>
<td>n/a</td>
<td>5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)</td>
</tr>
<tr>
<td>FCA2214DC</td>
<td>7.07.05.08</td>
<td>7.07.05.02</td>
<td>1.45</td>
<td>n/a</td>
<td>5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)</td>
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<tr>
<td>HP BL20p G3, G4 FC</td>
<td>7.07.05.08</td>
<td>7.07.05.02</td>
<td>1.45</td>
<td>n/a</td>
<td>5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)</td>
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<td>HP BL25p/BL45p G2</td>
<td>7.07.05.08</td>
<td>7.07.05.02</td>
<td>1.48</td>
<td>n/a</td>
<td>5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)</td>
</tr>
<tr>
<td>HP BL30p/BL35p Dual-Port FC Mezz</td>
<td>7.07.05.08</td>
<td>7.07.05.02</td>
<td>1.45</td>
<td>n/a</td>
<td>5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)</td>
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<tr>
<td>HP BL20p G2 FC Mezz</td>
<td>7.07.05.08</td>
<td>7.07.05.02</td>
<td>1.45</td>
<td>n/a</td>
<td>5.0.0b14 (.02 driver) 5.0.0b22 (.08 driver)</td>
</tr>
</tbody>
</table>
Linux on Integrity

The following versions of Linux are supported on Integrity servers:

**Table 3 This table lists software support with the following 2.6 versions of Itanium Linux: RHEL 4 – U4 and U5, RHEL 5, SLES 9 – SP2 and SP3, SLES 10 and SLES 10 SP1.**

<table>
<thead>
<tr>
<th>HBA</th>
<th>Driver</th>
<th>EFI</th>
<th>EFI utility</th>
<th>Multi-boot image</th>
<th>SANsurfer utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD300A</td>
<td>8.01.07.25</td>
<td>1.09</td>
<td>2.30</td>
<td>1.64</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>QMH2462 4Gb c-Class Mezz</td>
<td>8.01.07.25</td>
<td>1.09</td>
<td>2.30</td>
<td>1.64</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>AB379A</td>
<td>8.01.07.25</td>
<td>1.09</td>
<td>2.30</td>
<td>1.64</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>AB379B</td>
<td>8.01.07.25</td>
<td>1.09</td>
<td>2.30</td>
<td>1.64</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>AB429A</td>
<td>8.01.07.25</td>
<td>1.09</td>
<td>2.30</td>
<td>1.64</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>A6826A</td>
<td>8.01.07.25</td>
<td>1.49</td>
<td>2.07</td>
<td>n/a</td>
<td>5.0.0b32</td>
</tr>
<tr>
<td>A7538A</td>
<td>8.01.07.25</td>
<td>1.49</td>
<td>2.07</td>
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The minimum supported 2.6 kernel versions are RHEL 4 U5 - (2.6.9-55.EL.smp), RHEL 5 - (2.6.18-1.8.el5), SLES 9 SP3 - (2.6.5-7.267-smp) and SLES 10 SP1 - (2.6.16.53-0.8).

**Table 4 This table lists software support with the following 2.4 versions of Itanium Linux: RHEL 3 release U8 and U9.**

<table>
<thead>
<tr>
<th>HBA</th>
<th>RHEL 3 Driver</th>
<th>EFI</th>
<th>EFI utility</th>
<th>Multi-boot image</th>
<th>SANsurfer utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A6826A</td>
<td>7.07.05.08</td>
<td>1.49</td>
<td>2.07</td>
<td>n/a</td>
<td>5.0.0b22</td>
</tr>
<tr>
<td>A7538A</td>
<td>7.07.05.08</td>
<td>1.49</td>
<td>2.07</td>
<td>n/a</td>
<td>5.0.0b22</td>
</tr>
</tbody>
</table>

**Installing HP Supported QLogic driver**

HP does not currently support the driver that comes with the Linux kernel. Instead, you need to install an appropriate driver from the Fibre Channel HBA web site [http://h18006.www1.hp.com/storage/networking/index.html](http://h18006.www1.hp.com/storage/networking/index.html).

To obtain the HBA driver, download the appropriate driver kit for your operating system.

**Driver failover mode**

If you use the `INSTALL` command with no flags, the driver’s failover mode depends on whether a QLogic driver is already loaded in memory, (i.e. listed in the output of the `lsmod` command). Possible driver failover mode scenarios include:

- If an `hp_qla2x00src` driver RPM is already installed, then the new driver RPM will use the failover of the previous driver package.
- If there is no QLogic driver module (`qla2xxx module`) loaded, the driver will default to failover mode. This is also true if an inbox driver is loaded that does not list output in the `/proc/scsi/qla2xxx` directory.
- If there is a driver that is loaded in memory that lists the driver version in `/proc/scsi/qla2xxx` but no driver RPM has been installed, then the driver RPM will load the driver in the failover mode that the driver in memory is currently in.
Installation instructions

1. Download the appropriate driver kit for your distribution. The driver kit file will be in the format hp_qla2x00-yyyy-mm-dd.tar.gz.
2. Copy the driver kit to the target system.
3. Uncompress and untar the driver kit using the following command:
   
   ```
   # tar zxvf hp_qla2x00-yyyy-mm-dd.tar.gz
   ```
4. Change directory to the hp_qla2x00-yyyy-mm-dd directory.
5. Execute the INSTALL command.
   
   The INSTALL command syntax will vary depending on your configuration. If a previous driver kit is installed, you can invoke the INSTALL command without any arguments as the script will use the currently loaded configuration:
   
   ```
   # ./INSTALL
   ```
   
   To force the installation to failover mode, use the -f flag:
   
   ```
   # ./INSTALL -f
   ```
   
   To force the installation to single-path mode, use the -s flag:
   
   ```
   # ./INSTALL -s
   ```
   
   Use the -h option of the INSTALL script for a list of all supported arguments. The INSTALL script will install the appropriate driver RPM for your configuration, as well as the appropriate fibreutils RPM. Once the INSTALL script is finished, you will either have to reload the QLogic driver modules (qla2xxx, qla2300, qla2400, qla2xxx_conf) or reboot your server.
   
   The commands to reload the driver are:
   
   ```
   # /opt/hp/src/hp_qla2x00src/unload.sh
   # modprobe qla2xxx_conf
   # modprobe qla2xxx
   # modprobe qla2300
   # modprobe qla2400
   ```
   
   The command to reboot the server is:
   
   ```
   # reboot
   ```

⚠️ **CAUTION:**

If your boot device is a SAN attached device you will have to reboot your server.

To verify which RPM versions are installed, use the `rpm` command with the `-q` option.

For example:

```
# rpm -q hp_qla2x00src
# rpm -q fibreutils
```
VMWare

HP fully supports the use of Windows and Linux as a guest OS on VMware ESX versions 2.5.x and 3.x. When running VMware, fibre channel HBAs are supported by embedded drivers supplied with ESX. Windows and Linux FC HBA drivers are not used. To insure that your HBA is fully supported by HP and VMware, please refer to the appropriate VMware I/O Compatibility Guide for the version of VMware you are using at http://www.vmware.com/pdf/vi3_io_guide.pdf for v3.x or http://www.vmware.com/pdf/esx_SAN_guide.pdf.

Languages

American English

Important information

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/configured from the XP storage array.

Driver auto-compilation supported

What is auto-compilation?

Auto-compilation is the ability to have the QLogic fibre channel HBA driver automatically compile itself when a new kernel is loaded. The advantage of having the QLogic FC HBA driver compile itself automatically is that an administrator will not have to manually invoke the driver compile scripts, so that the new kernel is running the HP-approved FC HBA driver for QLogic.

How does auto-compilation work?

Auto-compilation is achieved by adding a trigger script to the kernel-source and kernel-devel RPMs in both Red Hat and Novell Linux distributions. What a trigger script does is when either the kernel-source or kernel-devel RPMs are either installed or upgraded, a small script will run and see if the QLogic FC HBA driver needs to be compiled for the new kernel. This script is actually located in /opt/hp/src/hp_qla2x00src/smart_compile.

What happens is this script is initially run when the hp_qla2x00src RPM is installed to take an inventory of kernels that have already been installed on the server. When the trigger script runs, it calls the smart compile script to compile the currently installed HP QLogic FC HBA driver for all the kernels that it does not have in its repository.

Once smart_compile is finished compiling the driver for all the newly installed kernels, it updates it inventory of kernels so that it contains the new kernels it just compiled the driver for. Thus, if smart_compile is run again it won’t compile the drivers that it has already compiled the kernel for again.
**Example 1. Auto-compilation example**

An example of what would happen during an auto-compile is below:

1. User enables auto-compilation as specified in the section How to enable auto-compilation, page_.
2. User installs the actual kernel binary RPM.
3. User installs the kernel development RPM (either kernel-source or kernel-devel).
4. Trigger script is run. If auto-compilation has been enabled, then smart_compile is run.
5. Auto-compilation script (smart_compile) compiles the QLogic FC HBA driver for the newly installed kernel
   The HP supported QLogic FC HBA driver will then load on next reboot.

**How to enable auto-compilation**

Auto-compilation of the QLogic driver is turned off by default. To enable auto-compilation, perform the following steps:

1. Change directory to /opt/hp/src/hp_q1a2x00src.
2. Run the following command.

   ```
   # ./set_parm -a
   ```

   The script should then output that auto-compilation has been set to yes. If the output says that it has been set to no, simply rerun the set_parm -a command again as the -a switch simply toggles this functionality on and off.

**How to disable auto-compilation**

1. Change directory to /opt/hp/src/hp_q1a2x00src.
2. Run the following command.

   ```
   # ./set_parm -a
   ```

   The script should then output that auto-compilation has been set to no. If the output says that it has been set to yes, simply rerun the set_parm -a command again as the -a switch simply toggles this functionality on and off.

**NOTE:**

When installing new kernels, in order for auto-compilation to work correctly, you must install the kernel rpm first, followed by the kernel development environment for the same kernel (kernel-source for SLES and kernel-devel for RHEL). Failure to do this will mean that the driver will not get compiled for the new kernel.
NOTE:
In order for auto-compile to work in RHEL 4, you must install the Kernel RPMs in the following order (perform steps 2 and 3 if required).
1. kernel-<version>.<arch>.rpm
2. kernel-smp/largesmp/hugemem-<version>.<arch>.rpm
3. kernel-smp/largesmp/hugemem-devel-<version>.<arch>.rpm
4. kernel-devel-<version>.<arch>.rpm

About warning messages
During the Kernel upgrade process, the following messages can be ignored.

RHEL 4 All Updates
WARNING: No module qla2xxx_conf found for kernel 2.6.9-55.0.9.EL, continuing anyway

SLES 10 All SPs
WARNING: /lib/modules/2.6.18-8.1.8.el5/kernel/drivers/scsi/qla2xxx/qla2300.ko needs unknown symbol qla2x00_remove_one
WARNING: /lib/modules/2.6.18-8.1.8.el5/kernel/drivers/scsi/qla2xxx/qla2300.ko needs unknown symbol qla2x00_probe_one
WARNING: /lib/modules/2.6.18-8.1.8.el5/kernel/drivers/scsi/qla2xxx/qla2400.ko needs unknown symbol qla2x00_remove_one
WARNING: /lib/modules/2.6.18-8.1.8.el5/kernel/drivers/scsi/qla2xxx/qla2400.ko needs unknown symbol qla2x00_probe_one

x86_64 SANsurfer benign messages
While the x86_64 SANsurfer RPM is installing, the following message may appear:
Command.run(): process completed before monitors could start.
This message can safely be ignored. SANsurfer will still install and run correctly.

Dynamic target addition not supported
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 fibreutil). This functionality is not supported with the QLogic failover driver. If you add a new fibre channel target to a host server, you must reboot that host server.

scsi_info command on older XP arrays
When running the scsi_info command on older XP arrays (such as the 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="0000000000000000":LUN="5235303020303030-
3130353930203030"
SANsurfer limitations

- As a safety mechanism, the SANsurfer application does not retain any updates when the user abruptly quits using the Close/Exit button. Users must click on the Save button for any changes or edits made to the HBA.
- Under certain conditions, some LUNs may not appear under the target in the left hand pane. Should this occur, refer to the LUNs displayed in the right hand pane. The O/S has visibility to all of the LUNs. The anomaly is the lack of LUNs being displayed under the target. This behavior is benign and may be ignored.

Enabling extended error logging on 2GB cards

The Enable Extended Error Logging feature on 2GB cards sets the bit in the /sys/module/qla2xxx/parameters but does not clear it when disabled.

LUN Numbering Requirement

When presenting LUNs from a specific storage array to a server, each LUN number must be unique. Specifically, all LUN numbers from a specific storage array to a specific server must be unique. This LUN numbering requirement includes presenting LUN’s from the same storage array, but to different sets of HBA ports in the same server. Also, the LUN numbers must be consistent across all HBA ports for the same physical LUN.

Controller Targets Require Data LUNs

After configuring a controller target, you must present at least one data LUN to the server (controller LUNs cannot be presented alone, without a data LUN).

XP load balancing

Automatic dynamic load balancing is not supported on HP XP arrays.

Compatibility and interoperability

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

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

Using SANsurfer

To determine version information on Linux systems:

1. Open SANsurfer.
2. Click an HBA in the left pane to select it.
3. Click the Information tab in the right pane to view the HBA’s version information.

Using the Linux more command

To determine version information on Linux systems enter the following more command:

```
more /proc/scsi/qla2xxx/*
```