



Dell™ PowerVault™ 660F Systems

# Direct Attach Administrator's Guide Version 5.01



# Notes, Notices, and Cautions

 **NOTE:** A NOTE indicates important information that helps you make better use of your computer.

 **NOTICE:** A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.**

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**August 2002 P/N 8R823 Rev. A00**

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This document describes how to update a server that is running a Microsoft® Windows® operating system and is directly attached to a Dell™ PowerVault™ 660F storage system. See the *Dell PowerVault Systems Storage Area Network (SAN) Version 5.01 Revision Compatibility Guide* for a complete list of component, software, and firmware versions that apply both to SAN version 5.01 and to servers directly attached to a PowerVault 660F storage system.

**Table 1-1. Windows Direct-Attach Update Path**

If You Currently Have This Product	Perform the Following Actions
Server attached directly to PowerVault 650F using <i>PowerVault Fibre Channel Update</i> CD version 1.0, 1.1, 2.0, or 3.0	Contact your Dell representative. Do not use the instructions in this document to update your direct-attach PowerVault 650F environment.
Server attached directly to PowerVault 660F using <i>PowerVault Fibre Channel Utilities</i> CD version 4.0, 4.05, or 4.06	Follow the instructions in this document to update your direct-attach environment to the SAN 5.01 release equivalent.
QLA2100x HBA installed in a direct-attached server	Replace this HBA with a QLA2200x HBA before you begin updating from Fibre Channel version 4.0 or later to version 5.01.

## Direct-Attach Update Roadmap

To update to Fibre Channel version 5.01 from version 4.0, 4.05, or 4.06, perform the following tasks:

- 1 Stop all I/O and disable the cluster service if you are using clusters.
- 2 Replace any QLA2100x HBAs with QLA2200x HBAs (QLA2100x HBAs are not supported with version 5.01).
- 3 Verify and update the HBA BIOS.
- 4 Update to HBA driver 8.00.09.23 or later.
- 5 Uninstall existing software (QLDirect, QLConfig, and Dell OpenManage™ Array Manager).
- 6 Update to QLDirect utility 8.01.0 3.
- 7 Install QMSJ 2.0.6 or later.
- 8 Install Array Manager 3.1.2 or later.
- 9 Update the PowerVault 660F system's SES firmware to version 1.9.5 or later.

- 10 Update the PowerVault 660F system's RAID controller firmware to version 7.82 or later.
- 11 Configure LUNs in QMSJ.
- 12 Resume operations.

## Stopping I/O

Before updating, stop all I/O to the storage system. If you are running Microsoft Cluster Server (MSCS) clusters, disable the cluster service on all cluster servers connected to the storage system.

## Replacing Unsupported HBAs

If your server uses QLA2100x HBAs, you must replace them with QLA2200x HBAs.

For more information about installing and configuring HBAs, see the HBA documentation and "Preparing New SAN Hardware" in the *Dell PowerVault Systems Storage Area Network (SAN) Version 5.01 Administrator's Guide*.

## Verifying and Updating the HBA BIOS

If you have not already verified the HBA BIOS version, you must do so now.

### Verifying the HBA BIOS

- 1 Restart the server and watch for the following HBA BIOS startup message:  
QLA2200 PCI Fibre Channel ROM BIOS Version x.xx.
- 2 Press <Alt> <Q>, and then press <Enter> with the first HBA selected.
- 3 Select **Configuration Settings** and press <Enter>.
- 4 Select **Host Adapter Settings** and press <Enter>.
- 5 Verify that the HBA is using BIOS version 1.76 or later.
- 6 Repeat this procedure for the second HBA.

If the BIOS is version 1.76 or later, see "Updating Windows HBA Drivers." If the BIOS version is earlier than 1.76, see "Flashing the HBA BIOS."

## Flashing the HBA BIOS

This section provides instructions for flashing the HBA BIOS in MS-DOS®. You must create a BIOS update diskette on a server or client running Windows. After the diskette is made, use it to flash the BIOS on your server running Windows.

- 1 Insert the *Dell PowerVault Fibre Channel Utilities* CD into the CD drive.
- 2 Insert a blank, formatted diskette into the diskette drive.
- 3 Click **QLogic QLA2200 PCI Fibre Channel Adapter**, and then click **Flash Update Utility for QLA2200** to open the `Qlogic\ql2200_bios` directory on the *Utilities* CD.
- 4 Double-click the `qlflash.exe` file to create a bootable BIOS update diskette.
- 5 Restart the server in MS-DOS from the diskette in the diskette drive.
- 6 Type the following command, and then press <Enter>:

```
CD FLASH
```

- 7 Type the following command, and then press <Enter> to update the flash BIOS and NVRAM:

```
flasutil /f /l
```

- 8 Wait about 3 minutes while the program updates the BIOS on each HBA in the server.
- 9 Type the following command, and then press <Enter> to set the NVRAM as the BIOS default:

```
flasutil /u
```

This process takes about 2 minutes to complete.


- 10 Remove the diskette from the diskette drive and restart the server.

# Updating Windows HBA Drivers

This section explains how to update the HBA driver software on a server running Windows.

## Updating the HBA Driver in Windows NT®

The drivers for the Windows NT operating system are located on the *Utilities* CD. You can download the latest versions of the drivers from the Dell Support website at [support.dell.com](http://support.dell.com).

 **NOTE:** If an earlier version of the HBA driver is installed, you must remove that version before installing the new driver. You can remove the installed driver by clicking **SCSI Adapters** in the Control Panel and following the prompts.

To update the HBA driver in Windows NT, perform the following steps:

- 1 Insert the *Utilities* CD into the CD drive.
- 2 Click the **Start** button, point to **Settings**→**Control Panel**, and then click **SCSI Adapters**.  
The **SCSI Adapters** window appears.
- 3 Click the **Drivers** tab.  
A list of all installed HBAs appears.
- 4 Click **Add**.
- 5 Click **Have Disk**.  
The cursor appears in the field designating the drive location.
- 6 Type `Qlogic\ql2200\windows nt\NT` or browse to the driver files on the *Utilities* CD, and then click **OK**.
- 7 Select the appropriate PCI Fibre Channel adapter in the list of available drivers, and then click **OK**.  
The HBA appears in the list of installed adapters after you reboot.
- 8 Click **OK**.
- 9 Reboot the server when prompted.  
You do not need to install the driver more than once, even on a server with two HBAs installed.

- 10 Double-click **SCSI Adapters** in the Control Panel to verify that both of the HBAs installed in the server are recognized and listed.

You can also expand the entry for each controller to view a list of attached devices.

## Updating HBA Drivers in Windows 2000

- 1 Insert the *Utilities* CD into the CD drive.
- 2 Right-click **My Computer**, click **Properties**, and then click the **Hardware** tab.
- 3 Click **Device Manager**.

The **Device Manager** window appears.

- 4 Double-click **SCSI and RAID Controllers** for the listed HBAs or **Unknown Devices** for other HBAs.
- 5 Double-click **QLogic QLA2200 PCI Fibre Channel Adapter** for the HBA whose driver you want to install.
- 6 In the **HBA Adapter Properties** window, click the **Driver** tab, and then click **Update Driver**.

The **Upgrade Device Driver Wizard** window appears.

- 7 Click **Next**.



**NOTICE:** Do not use the default **Search for a suitable driver for my device** to perform this installation. If you accept this default, the driver installation appears to be successful, but it fails to install the specified driver. Instead, you must select **Display a list of the known drivers for this device so that I can choose a specific driver** as described in step 8.

- 8 Select **Display a list of the known drivers for this device so that I can choose a specific driver**, and then click **Next**.
- 9 Click **Have Disk**.

The **Install from Disk** window appears and asks for the path to the driver location.

- 10 Type `Qlogic\ql2200\windows 2000\W2K` or browse to the driver files on the *Utilities* CD.
- 11 Open the corresponding **OEMSETUP.INF** file, and then click **OK**.
- 12 Select the appropriate PCI Fibre Channel adapter in the list of available drivers, and then click **Next**.
- 13 Click **Next** to perform the installation.

- 14 If the **Digital Signature Not Found** window appears, click **Yes** to continue the installation.  
The **System Properties** window appears.
- 15 Click **Finish**.
- 16 Click **Close**.
- 17 Click **No** and repeat steps 2 through 16 for the second HBA installed in the server.
- 18 Restart the server after updating the second HBA driver.
- 19 Open the **Device Manager** and verify that both of the HBAs appear in the **SCSI and RAID Controllers** list.

## Uninstalling Existing Storage Software

Before you begin updating each server, uninstall the following programs:

- **QLDirect**
- **QLConfig** — If you still use **QLConfig** version 1.23 (only available early in the *Dell PowerVault Fibre Channel* CD 3.0 release time frame), you must export environment variables from the registry before uninstalling **QLConfig**. For instructions, see the *SAN 5.01* readme located on the *Fibre Channel Utilities* CD, version 5.01.
- **Array Manager**


To uninstall the software, perform the following steps:

- 1 Click the **Start** button, point to **Settings**, click **Control Panel**, and then click **Add/Remove Programs**.
- 2 Select the program name in the list and click **Change/Remove** or **Remove**, depending on your version of Windows.
- 3 Accept the defaults for the remaining dialog boxes as they appear.
- 4 Repeat steps 2 and 3 for the remaining programs.
- 5 Restart the server after you finish uninstalling the last program.



# Installing Array Manager

You must use Array Manager version 3.1.2 or later.

 **NOTE:** You should have already uninstalled the previous version of Array Manager, as described in "Uninstalling Existing Storage Software."

To install Array Manager, perform the following steps:

- 1 Insert the *Dell OpenManage Array Manager 3.1.2* CD into the CD drive.  
If the CD does not start automatically, locate and double-click the Array Manager Setup.exe program on the CD.

- 2 Click **Next** in the **Dell OpenManage Array Manager Setup** window.

- 3 Click **Yes** to accept the License Agreement.

- 4 Select the appropriate setup type, and then click **Next**.

In Windows 2000, a message appears explaining that Array Manager replaces Windows Disk Manager.

- 5 Click **OK**.

- 6 Read the warning message and click **OK** if the message about first-time Array Manager installations appears.


The **Dell OpenManage Array Manager Setup** window appears, which shows the required components and their status.

- 7 Click **Next**.

- 8 Select where you want to install Array Manager, and then click **Next**.

A message appears stating that Array Manager has detected that this server can be connected to Fibre Channel storage. The message also asks if you want this server to manage any PowerVault 660F storage systems that it detects.

- 9 Click **Yes** to manage the PowerVault 660F storage system with this server.

 **NOTE:** You should have only one server that manages a PowerVault 660F running Array Manager at any time. At the message that asks about managing PowerVault 660F systems, click **Yes**.

A message appears asking you to confirm that the server is directly connected to the PowerVault 660F.

- 10 Click **Yes**.

- 11 Select **Yes I want to restart my computer**, and click **Finish** to reboot the server now.

# Updating the SES Firmware

If you are updating from:

- *Fibre Channel Utilities* CD 4.05 or earlier, perform the steps in this section.
- *Fibre Channel Utilities* CD 4.06, see "Updating the RAID Controller Firmware" later in this document.

You must update the SES firmware on each LS module in the PowerVault 660F and all attached PowerVault 224F enclosures. If you replace an LS module or add a PowerVault 224F to an existing subsystem, all LS modules must have firmware version 1.9.5 or later.

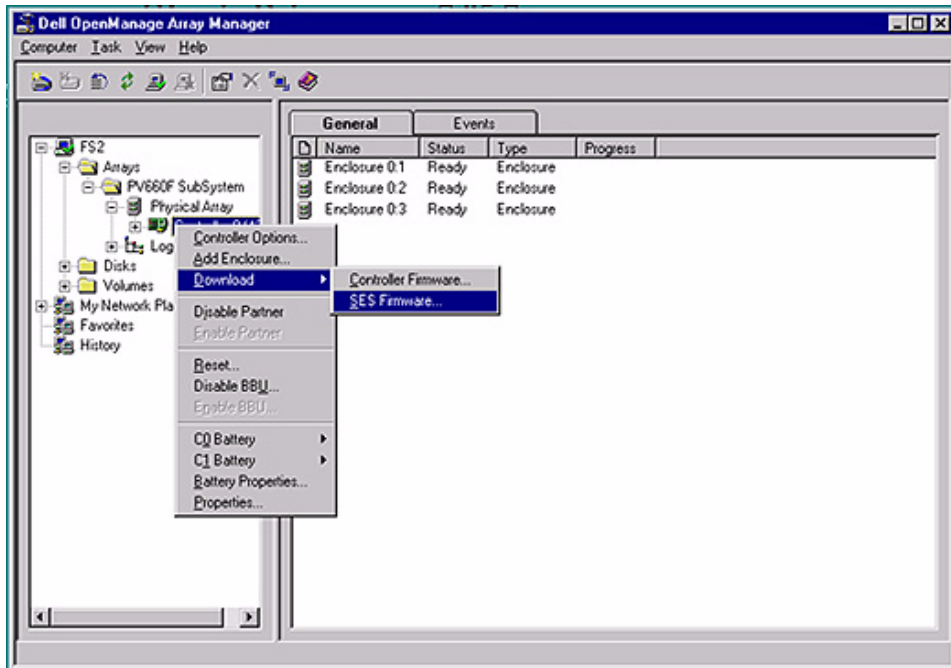
If all LS modules do not have the same firmware version, Array Manager might report most components in the system as failed. For example, the power supply, fans, temperature sensors, and voltage sensors might appear as failed. Also, some versions of Array Manager might show the LS module itself as failed. Any time that firmware versions are mixed, the shelf fault LED lights.



**NOTE:** Perform the following procedure only once to update the firmware on all PowerVault 224F systems that are attached to PowerVault 660F systems. This procedure takes about 8 to 9 minutes for each LS module in the storage array.

To update the LS module's SES firmware, perform the following steps:

- 1 Insert the *Utilities* CD.
- 2 Start Array Manager on the host system by clicking the **Start** button, pointing to **Programs**→**Dell OpenManage Applications**→**Array Manager**, and then clicking **Array Manager Console**.
- 3 Update the SES firmware on your PowerVault 660F subsystem:
  - a Click **Arrays**→**PV660F SubSystem**→**Physical Array**.
  - b Right-click **Controller 0**, and then select **Download**→**SES Firmware** (see Figure 1-1).


**Figure 1-1. Controller Menu**


- c Click **Next** in the **Welcome to SES Download** window.
  - d Select all of the enclosure boxes that require an update to SES version 1.95, and then click **Next**.
  - e Click **Browse**.
  - f Navigate to `PV66XF-224F\firmware\Enclosure_SES195.bin`, click **Open**, and then click **Next**.
  - g Click **Finish**, and then click **OK**.  
While the firmware update progresses, information displayed on the screen does not refresh.
  - h Click **OK** when the firmware update is complete.
- 4 Right-click the **PV660F SubSystem** folder in the **Dell OpenManage Array Manager** window, and select **Rescan** (see Figure 1-2) to update the properties information.
  - 5 Open the controller in the list and right-click the enclosure.

- 6 Select **Properties**, and then verify that it displays **Status Ready** and LS module SES firmware version 1.9.5 or later.

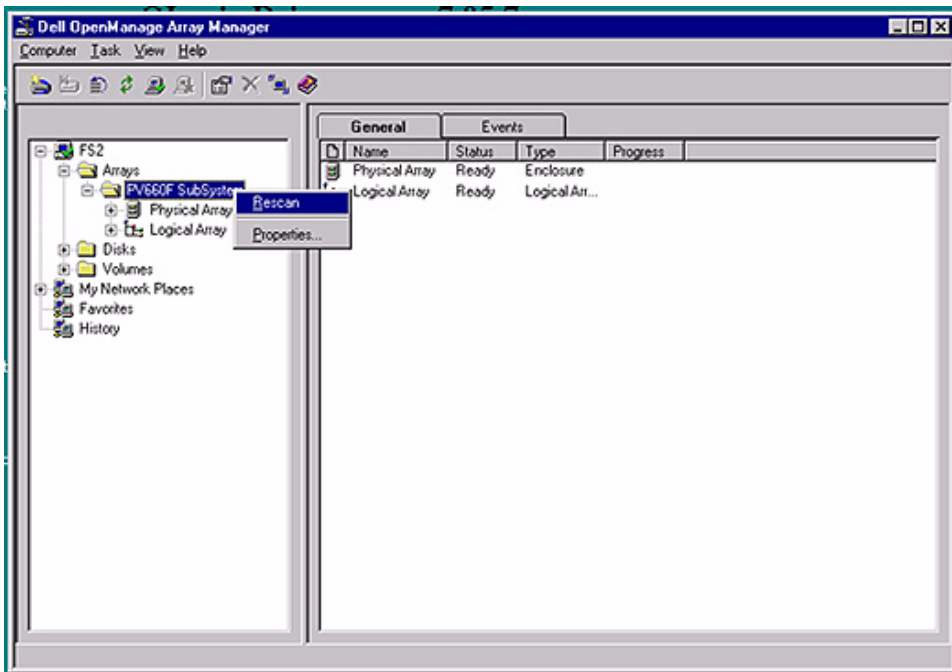
If the status is **Ready** and the **Revision** displays 1.95 or later, the procedure completed successfully.

If the status is **LS Module firmware version mismatch** or **Status Failed**, you must repeat the firmware update for this enclosure.

 **NOTE:** If the firmware update does not complete successfully, repeat the procedure until it does. This is a software-timing issue, not a hardware problem.

 **NOTE:** After updating to SES firmware version 1.9.5 or later, some systems might display **PV\_INVALID** in the product ID field of Array Manager. This display of the product ID is incorrect and does not interfere with proper operation of the unit.

**Figure 1-2. PowerVault 660F SubSystem Menu**



## Updating the RAID Controller Firmware

- 1 Insert the *Utilities* CD in the CD drive of the server with SAN management software.
- 2 Click **PowerVault 660 and 224 Fibre Channel Storage**, and then click **Dell PowerVault 660F Controller Firmware**.
- 3 Click **Before you begin the upgrade** and follow the instructions for the upgrade.
- 4 Start Array Manager by clicking the **Start** button, pointing to **Programs**→ **Dell OpenManage Applications**→ **Array Manager**, and then clicking **Array Manager Console**.
- 5 Click **Arrays**→ **PV660F SubSystem**→ **Physical Array** and note the firmware version.
- 6 Right-click **Controller 0**, and then click **Download**→ **Controller Firmware**.
- 7 Click **OK**.
- 8 Click **Browse**, select the firmware you downloaded to your host system, and then click **Open**.
- 9 Click **Apply** in the **Download Controller Firmware** window.
- 10 If you are upgrading from version 7.51, go to step 12. If you are upgrading from version 7.76, continue to the next step.
- 11 If you have firmware version 7.76, perform the following steps:
  - a Wait for the controller to finish resetting.
  - b Verify that the Controller Ready light (the lower middle LED) is green.
  - c Restart the server that accesses the PowerVault 660F.
  - d Click **Arrays**, **PV660F SubSystem**, and **Physical Array** to verify the firmware version in the controller list at the right.

The PowerVault 660F should remain configured in **QMSJ**, so you do not need to set the hidden and visible device paths.
- 12 If you have firmware version 7.51, perform the following steps:
  - a When a message appears stating what is required to complete the upgrade, click **Yes** after reviewing the steps.
  - b Wait for the controller firmware update to finish when the hourglass pointer disappears.
  - c Turn the storage system off, turn it back on, and then wait until the Controller Ready lights are solid green on both controllers.

- d Repeat step c.

It might take two storage system restarts to propagate worldwide names (WWNs) to the controller.



**NOTE:** Before this upgrade, the PowerVault 660F WWN was defined by the primary RAID controller in slot 0 (zero). Hereafter, it is defined by the storage system's backplane.

- e Start **QMSJ** on the server by clicking the **Start** button, pointing to **Programs**→**QLogic Management Suite**, and then clicking **QMSJ**.

The **Connect to Host** dialog box appears.

- f Select **Local Host** or type the IP address or host name of the server, and then click **Connect**.

- g Click the **Configure** button.

The **Fibre Channel Configuration** window appears. The storage device you just flashed is unconfigured, as indicated by the red **X** icons beside each adapter.

- h Right-click each adapter in the **Adapter 0** and **Adapter 1** columns and select whether the adapter is **Visible** or **Hidden**.

The new device displays the WWN format of `xx:xx:00:B0:D0:xx:xx:xx` or `xx:xx:00:06:5b:xx:xx:xx`.

- i Click **Apply/Save**.

The **Security Check** dialog box appears.

- j Enter your password, and then click **OK**.

Until you change the password, the default is `config`.

A message appears stating that the configuration changes have been saved. You must restart the server for the changes to become effective.

- k Click **Yes** to restart the server.

## Updating From QLConfig to QMSJ

When updating to version 5.01, you will notice a distinct difference between QLConfig and QMSJ in how the failover paths are configured. In QLConfig, you configure a primary path and failover path to each PowerVault 660F. This enabled target-level failover. QMSJ accommodates LUN-level failover with the PowerVault 660F by defining preferred and alternate paths for each LUN. This a substantial improvement because the LUNs can now be load balanced between the two adapters in the server.

## Configuring LUNs in QMSJ

You need to configure the preferred and alternate paths between the HBAs and LUNs and then load balance all LUNs.

To configure LUNs, perform the following steps:

- 1 Start **QMSJ** by clicking the **Start** button, pointing to **Programs**→ **QLogic Management Suite**, and then clicking **QMSJ**.

- 2 Connect to the host system.

- 3 Click the **Configure** button.

An invalid LUN configuration message appears.

- 4 Click **OK**.

The **Fibre Channel Configuration** window appears.

- 5 Select a device node name, select **Device**, and then click **Auto Configure**.

A message appears asking if you also want to configure LUNs.

- 6 Click **Yes**.

The automatic configuration sets one adapter to **Preferred** and the other to **Alternate** (see Figure 1-3).

**Figure 1-3. LUN Configuration for Device Node Name Window**



- 7 Click **Apply/Save** to save the automatic configuration.

The **Security Check** dialog box appears.

- 8 Enter your password (the default is `config`), and then click **OK**.


A message appears stating that the configuration has been saved and the changes are effective immediately.

- 9 Click **OK**.

- 10 Click **Configure**, select the device node name that you just auto configured, select **Device**, and then click **Configure LUN(s)**.

- 11 Select **Tools**→**Load Balance**→**All LUNs**.

- 12 Click **OK**.

 **NOTE:** After configuring LUNs, you can view them in the HBA tree.

- 13 Click **Apply/Save** to save the automatic configuration.

The **Security Check** dialog box appears.

- 14 Enter your password (the default is `config`), and then click **OK**.

A message appears stating that the configuration has been saved and the changes are effective immediately.

- 15 Click **OK** and restart the server.

- 16 Repeat this procedure for all Windows NT and Windows 2000 servers to which you assigned LUNs.

- 17 Exit QMSJ.

## Resuming Operations

To restart Cluster Services, perform the following steps:

- 1 Click the **Start** button, point to **Settings**→**Control Panel**, and then click **Services**.
- 2 Select **Cluster Services**, and then select **Automatic**.
- 3 Click **Start** to start the service.

To resume operations, perform the following steps:

- 1 Reboot the server and restart Array Manager.
- 2 Confirm that you can see all disks and volumes on the PowerVault 660F, that alert icons or events did not appear, and that all the applications are online.

