

HP ProLiant Storage Server SAN Connection and Management

application notes

Legal and notice information

© Copyright 2007 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Microsoft® and Windows® are U.S. registered trademarks of Microsoft Corporation.

About this document

These application notes describe methods and procedures for connecting HP storage servers to a storage area network (SAN) based on your type of Fibre Channel array.

For the latest version of this document, go to <http://www.hp.com/support/manuals>. Under the storage section, click **Disk Storage Systems**, then **NAS/Storage Servers**, and select a SAN-capable storage server model (for example, the DL380 G5). Links to the most current documentation available are displayed on the page.

Application notes topics

These application notes contain methods for connecting storage servers to the following arrays:

- [Modular Smart Array](#), page 3
- [Enterprise Virtual Array](#), page 5
- [Disk Array XP](#), page 8
- [Secure Path Manager \(optional\)](#), page 11
- [Expanding storage in a SAN environment](#), page 11

Intended audience

This document is intended for customers who are familiar with:

- HP storage servers running Windows® Storage Server 2003
- Fibre Channel configuration and management
- Types of storage arrays discussed in this document

Modular Smart Array

The procedure below describes how to connect your storage server to a Modular Smart Array (MSA).

1. Verify that the correct Fibre Channel (FC) host bus adapter (HBA) driver version, firmware, and boot BIOS are installed for Windows Storage Server 2003 R2. "Table 1" lists the recent driver/firmware boot BIOS for supported FC HBAs. Go to <http://www.hp.com/go/msa> to check for updates to these versions.

 **NOTE:**

Microsoft® Windows Storage Server 2003 R2 and Windows Server 2003 32-bit are identical for the purpose of this compatibility table.

Table 1 MSA 1000/1500 driver versions for supported FC HBAs

MSA 1000/1500	Driver SCSIPORT	Driver StorPort	Firmware	Boot BIOS
A7387A (LP1050DC) A7388A (LP1050)	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)
FC 1142SR (QLE2460) FC1242SR (QLE2464)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)
FC 1143 (QLA2460) FC1243 (QLA2462)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)
FC 2142SR (LPe1150) FC2242SR (LPe11002)	5-5.30a2	5-1.20a7	2.50a6	1.71a0 (5.02a1)
FC 2143 (LP1150) FC2243 (LP11002)	5-5.30a2	5-1.20a7	2.10a10	1.71a0 (5.02a1)
FCA 2214 (QLA2340) FCA2214DC (QLA2342)	9.1.3.11	9.1.3.16	N/A	1.45
FCA 2404 (LP9802) FCA2404DC (LP9802DC)	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)
LP 10000 LP10000DC	5-520a10	5-1.11x1	1.91a1	1.70a3
FCA 2408343073-B21	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)

If you update the HBA driver version, firmware, or boot BIOS, be sure to reboot the system after the update before you continue.

Contact HP Service and Support:

- To get the latest driver version, firmware, or boot BIOS for HBA drivers
- If your HBA PCI cards are not listed in “Table 1”

2. Verify that the firmware revision for the MSA array is installed.

MSA1000/1500 Active/Passive firmware revision:	5.20
MSA1000/1500 Active/Active firmware revision:	7.00

The firmware can be downloaded without cost from <http://www.hp.com/go/msa>. Otherwise, contact HP Service and Support to obtain the latest firmware for your storage array.

If you update the firmware, be sure to reboot the system after the update before you continue.

3. Install multipath software (SecurePath or HP MPIO DSM).

HP SecurePath version: 4.0c SP2-1

HP MPIO version: HP MPIO Basic DSM (Device Specific Module) for Windows for MSA 1000/1500 Active/Passive Disk Arrays version 1.40
HP MPIO Full Featured DSM for MSA (Active/Active) Disk Arrays version 1.00.01

If you have a NAS system unit configured for high availability, install Multipath Input/Output (MPIO) software. Currently, two software MPIOs are supported for these storage arrays: HP StorageWorks SecurePath and HP MPIO DSM.

To obtain HP StorageWorks SecurePath, go to <http://www.hp.com/go/SecurePath>. Do not install the AutoPath driver when prompted during the installation. Reboot the system after the software installation before you continue.

HP MPIO users can obtain the software from <http://h18006.www1.hp.com/products/sanworks/multipathoptions/index.html>.

 **IMPORTANT:**

Review the MPIO documentation (readme and installation instructions). Review important information concerning the HP MPIO DSM (prerequisites, system requirements, important notes, and considerations) before you begin the installation process.

4. Connect the appropriate fiber cables to the HBA cards.
5. Install SecurePath Manager (optional). If you use SecurePath, and want to install SecurePath Manager, see “[Secure Path Manager \(optional\)](#)” on page 11.

Enterprise Virtual Array

The procedure below describes how to connect your storage server to an Enterprise Virtual Array (EVA).

1. Verify that the correct FC HBA driver version, firmware, and boot BIOS are installed. “[Table 2](#)” and “[Table 3](#)” lists the recent driver, firmware, and boot BIOS for supported FC HBAs. Go to <http://www.hp.com/go/eva> to check for updates to these versions.

 **NOTE:**

Microsoft Windows Storage Server 2003 R2 and Windows Server 2003 32-bit are identical for the purpose of this compatibility table.

Table 2 EVA 3000/5000 driver versions for supported FC HBAs

EVA3000 EVA5000	Driver SCSI PORT	Driver StorPort	Firmware	Boot BIOS
A7387A (LP1050DC) A7388A (LP1050)	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)
FC1142SR (QLE2460) FC1242SR (QLE2462)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)
FC1143 (QLA2460) FC1243 (QLA2462)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)

EVA3000 EVA5000	Driver SCSI PORT	Driver StorPort	Firmware	Boot BIOS
FC2142SR (LPe1150) FC2242SR (LPe11002)	5-5.30a2	5-1.20a7	2.50a6	1.71a0 (5.02a1)
FC2143 (LP1150) FC2243 (LP11002)	5-5.30a2	5-1.20a7	2.10a10	1.71a0 (5.02a1)
FCA2214 (QLA2340) FCA2214DC (QLA2342)	9.1.3.11	9.1.3.16	N/A	1.45
FCA2404 (LP9802) FCA2404DC (LP9802DC)	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)
LP10000 LP10000DC	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)
FCA 2408343073-B21	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)

Table 3 EVA 4000/6000/8000 driver versions for supported FC HBAs

EVA 4000/6000/ 8000	Driver SCSI PORT	Driver StorPort	Firmware	Boot BIOS
A7387A (LP1050DC) A7388A (LP1050)	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)
FC1142SR (QLE2460) FC1242SR (QLE2462)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)
FC1143 (QLA2460) FC1243 (QLA2462)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)
FC2142SR (LPe1150) FC2242SR (LPe11002)	5-5.30a2	5-1.20a7	2.50a6	1.71a0 (5.02a1)
A7387A (LP1050DC) A7388A (LP1050)	5-5.30a2	5-1.20a7	2.10a10	1.71a0 (5.02a1)
FC1142SR (QLE2460) FC1242SR (QLE2462)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)

EVA 4000/6000/ 8000	Driver SCSI/PORT	Driver StorPort	Firmware	Boot BIOS
FC1143 (QLA2460) FC1243 (QLA2462)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)
FC2142SR (LPe1150) FC2242SR (LPe11002)	5-5.30a2	5-1.20a7	2.50a6	1.71a0 (5.02a1)
FCA 2408 343073-B21 (2Gbps, 32/64-bit PCI-X)	5-5.30a2	5-1.20a7	1.91a5	1.71a0

If you update the HBA driver version, firmware, or boot BIOS, be sure to reboot the system after the update before you continue.

Contact HP Service and Support:

- To get the latest driver version, firmware, or boot BIOS for HBA drivers
- If your HBA PCI cards are not listed in “[Table 2](#)” and “[Table 3](#)”

2. Verify that the firmware revision for the EVA array is installed.

EVA 3000/5000 firmware revision:	3.100 or 4.007
EVA 4000/6000/8000 firmware revision:	6.100

Contact HP Service and Support to obtain the latest firmware version for your storage array. If you update the firmware, be sure to reboot the system after the update before you continue.

3. Install multipath software (SecurePath or HP MPIO DSM).

HP SecurePath version:	4.0c SP2-1 (EVA 3000/5000 only)
HP MPIO version:	Basic DSM for Windows for EVA 3000/5000 for VCS 3.xxx v1.01 Full featured DSM for Windows for EVA 3000/5000 for VCS 4.xxx v2.00.01 Full featured DSM for Windows for EVA 4000/6000/8000 v2.01.00

Windows with EVA storage requires the installation of HP StorageWorks multipathing software on each host to achieve high-availability, multiple-path capability.

To obtain HP StorageWorks SecurePath, go to <http://www.hp.com/go/SecurePath>. Do not install the AutoPath driver when prompted during the installation. Reboot the system after the software installation before you continue.

HP MPIO users can obtain the software from <http://h18006.www1.hp.com/products/sanworks/multipathoptions/index.html>.

 **IMPORTANT:**

Review the MPIO documentation (readme and installation instructions). Review important information concerning the HP MPIO DSM (prerequisites, system requirements, important notes, and considerations) before you begin the installation process.

4. Connect the appropriate fiber cables to the HBA cards.
5. Install SecurePath Manager (optional). If you use SecurePath, and want to install SecurePath Manager, see “[Secure Path Manager \(optional\)](#)” on page 11.

Disk Array XP

The procedure below describes how to connect your storage server to an XP array.

1. Verify that the correct FC HBA driver version, firmware, and boot BIOS are installed. “[Table 4](#)” and “[Table 5](#)” lists the recent driver, firmware, and boot BIOS for supported FC HBAs. Go to <http://www.hp.com> to check for updates to these versions.

 **NOTE:**

Microsoft Windows Storage Server 2003 R2 and Windows Server 2003 32-bit are identical for the purpose of this compatibility table.

Table 4 Disk Array XP 10000 and XP 12000 driver versions for supported FC HBAs

XP10000 XP12000	Driver SCSI PORT	Driver StorPort	Firmware	BootBIOS
A7387A (LP1050DC) A7388A (LP1050)	9.1.0.13	9.1.0.18	N/A	1.45
FC1142SR (QLE2460) FC1242SR (QLE2462)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)
FC1143 (QLA2460) FC1243 (QLA2462)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)
FC2142SR (LPe1150) FC2242SR (LPe11002)	5-5.30a2	5-1.20a7	2.50a6	1.71a0 (5.02a1)
FC2143 (LP1150) FC2243 (LP11002)	5-5.30a2	5-1.20a7	2.10a10	1.71a0 (5.02a1)
FCA2214 (QLA2340) FCA2214DC (QLA2342)	9.1.3.13	9.1.3.168	N/A	1.45
FCA2404 (LP9802) FCA2404DC (LP9802DC)	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)
LP10000 LP10000DC	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)
FCA 2408343073-B21	5-5.30a2	5-1.20a7	1.91a5	1.71a0

Table 5 Disk Array XP128 and XP 1024 driver versions for supported FC HBAs

XP128 XP1024	Driver SCSI PORT	Driver StorPort	Firmware	BootBIOS
A7387A (LP1050DC) A7388A (LP1050)	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)
FC1142SR (QLE2460) FC1242SR (QLE2462)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)
FC1143 (QLA2460) FC1243 (QLA2462)	9.1.3.11	9.1.3.16	N/A	1.16 (1.41)
FC2142SR (LPe1150) FC2242SR (LPe11002)	5-5.30a2	5-1.20a7	2.50a6	1.71a0 (5.02a1)

XP128 XP1024	Driver SCSI PORT	Driver StorPort	Firmware	BootBIOS
FC2143 (LP1150) FC2243 (LP11002)	5-5.30a2	5-1.20a7	2.10a 10	1.71a0 (5.02a1)
FCA2214 (QLA2340) FCA2214DC (QLA2342)	9.1.3.11	9.1.3.16	N/A	1.45
FCA2404 (LP9802) FCA2404DC (LP9802DC)	5-5.20a10	5-1.11x1	1.91a1	1.71a3
LP10000 LP10000DC	5-5.30a2	5-120a7	1.91a5	1.71a0 (5.02a1)
FCA 2408 34073-B21	5-5.30a2	5-1.20a7	1.91a5	1.71a0 (5.02a1)

If you update the HBA driver version, firmware, or boot BIOS, be sure to reboot the system after the update before you continue.

Contact HP Service and Support:

- To get the latest driver version, firmware, or boot BIOS for HBA drivers
- If your HBA PCI cards are not listed in “Table 4” and “Table 5”

2. Verify that the firmware revision for the XP array is installed.

XP 128/1024 firmware revision: 21.14.30.00/00

XP 10000/12000 firmware revision: 50.09.07.00/00

Contact HP Service and Support to obtain the latest firmware version for your storage array.

If you update the firmware, be sure to reboot the system after the update before you continue.

3. Install multipath software (SecurePath or HP MPIO DSM).

HP SecurePath version: 4.0C SP1 and 4.0C SP2-1

HP MPIO version: Full featured DSM for Windows XP v2.00.01

Windows with XP storage requires the installation of HP StorageWorks multipathing software on each host to achieve high-availability, multiple-path capability.

To obtain HP StorageWorks SecurePath, go to <http://www.hp.com/go/SecurePath>. Reboot the system after the software installation before you continue.

HP MPIO users can obtain the software from <http://h18006.www1.hp.com/products/sanworks/multipathoptions/index.html>.

 **IMPORTANT:**

Review the MPIO documentation (readme and installation instructions). Review important information concerning the HP MPIO DSM (prerequisites, system requirements, important notes, and considerations) before you begin the installation process. For all XP storage arrays, you must install MPIO software. Currently, two software MPIOs are supported for these storage arrays: HP StorageWorks SecurePath and HP MPIO DSM.

4. Connect the appropriate fiber cables to the HBA cards.

5. Install SecurePath Manager (optional). If you use SecurePath, and want to install SecurePath Manager, see “[Secure Path Manager \(optional\)](#)” on page 11.

SecurePath Manager (optional)

SecurePath Manager provides web-based management capability for cross-platform SecurePath configurations. This application displays a graphical representation of multiple path configurations, indicating the status of a user-defined set of hosts, storage systems, and paths. SecurePath Manager runs on web-based clients that support Sun Java™ 2 Runtime Environment (JRE) version 1.3.1 or later.

To obtain HP StorageWorks SecurePath, go to <http://www.hp.com/go/SecurePath>.

IMPORTANT:

Currently, HP NAS only supports SecurePath Manager version 4.0C or later. If you have older versions, contact HP Service and Support and upgrade, if you want to use SecurePath Manager on your NAS system. HP Insight Manager must be installed for administrators to use SecurePath Manager.

SecurePath Manager can be accessed on web-based clients that have Sun JRE version 1.3.1 or later installed.

Expanding storage in a SAN environment

Expansion is the process of adding physical disks to an array that has already been configured. The logical drives (or volumes) that exist in the array before the expansion takes place are unchanged, because only the amount of free space in the array changes. The expansion process is entirely independent of the operating system.

NOTE:

See your storage array user documentation for further details about expanding storage on the array.

Expanding storage on Modular Smart Arrays

The Array Configuration Utility (ACU) enables online capacity expansion of the array and logical drive for specific MSA storage arrays, such as the MSA1000 and MSA1500.

Expanding the array

Expanding an existing LUN is accomplished using the storage array configuration software applicable to the storage array in use. In the case of the Smart Array controller, this is accomplished using the Array Configuration Utility (“[Figure 1](#)”). LUN expansion may occur in disk arrays where space is available. If insufficient space is available, additional physical disks may be added to the array dynamically.

IMPORTANT:

An array expansion or logical-drive extension takes about 15 minutes per gigabyte, or considerably longer if the controller does not have a battery-backed cache. While this process is occurring, no other expansion or extension can occur simultaneously on the same controller.

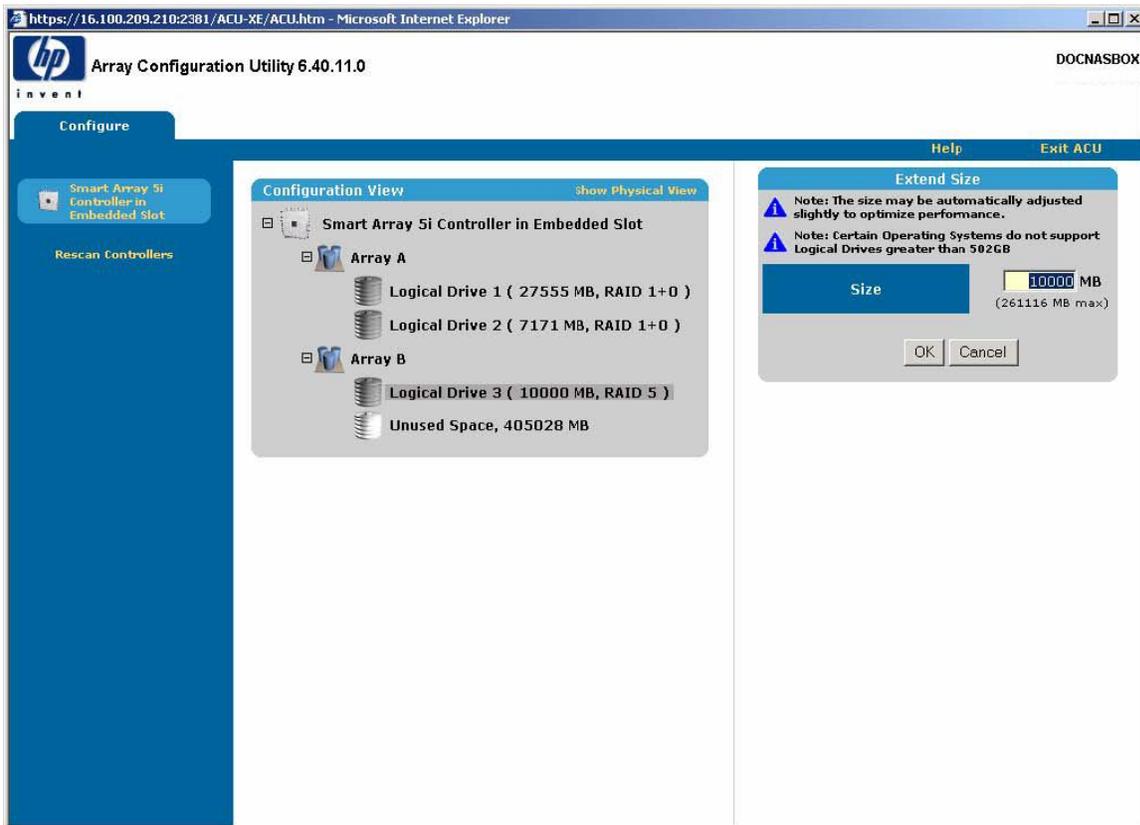


Figure 1 Expanding a LUN (Smart Array only)



NOTE:

The Expand Array task is listed only if there is an unassigned physical drive on the controller. The unassigned drive must also have a capacity no less than that of a drive in an existing array. If these conditions are not fulfilled, install at least one suitable drive on the controller, and then click **Refresh**.

There are two scenarios to adding storage for array expansion (Smart Array storage only):

- Add an unassigned physical disk to the array.
- Add a new disk to the appropriate storage device.

For more information, use the ACU online help or the Expand Array procedures in the *HP Array Configuration Utility User Guide* that can be downloaded from <http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00294139/c00294139.pdf>

Expanding the logical drive

This option in the ACU increases the storage capacity of a logical drive by adding unused space on an array to the logical drive on the same array. The unused space is obtained either by expanding an array, or by deleting another logical drive on the same array.

There are two scenarios to adding storage for logical drive expansion (Smart Array storage only):

- Extend an existing storage LUN where space is available in the array.
- Extend an existing storage LUN where space is not available in the array (Smart Array only).

For more information, use the ACU online help or the Expand Logical Drive procedures in the *HP Array Configuration Utility User Guide* that can be downloaded from <http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00294139/c00294139.pdf>

Expanding storage for Enterprise Virtual Arrays (single node environment)

The act of presenting a virtual disk makes it available for use by a host. You can present a virtual disk to a host during or after virtual disk creation. The virtual disk must be completely created before the host presentation can occur. If you choose host presentation during virtual disk creation, the management agent cannot complete any other task until that virtual disk is created and presented. Therefore, HP recommends that you wait until a virtual disk is created before presenting it to a host.

To extend a virtual disk (single-node environment):

1. Using an HP StorageWorks Storage Management Appliance (SMA), or Command View EVA hosted on a server, create or extend the virtual disk presented to the storage server.
2. On the storage server, open Device Manager, right-click the EVA LUN, and scan for hardware changes.
3. Open a command prompt and run `DiskPart.exe`.
4. List the current volumes of the system (List Volumes).
5. Select the volume to be extended (select volume X)
6. Extend the volume (extend [size=n], where size is optional).
7. Extend a LUN for EVA storage arrays (clustered environment).

To extend a LUN on an EVA storage array in a cluster:

1. Review requirements and procedures from the storage array hardware provider for expanding or extending storage.
2. Ensure that Microsoft Windows Server 2003 SP1 is installed.
3. Run Command View EVA on the storage server to increase the size of the presented EVA LUN.
4. Run Microsoft `DiskPart.exe` to add the additional space to the volume.

For additional information associated with extending a LUN in a cluster, see the following Microsoft Knowledge Base articles:

- How to extend the partition of a cluster shared disk
<http://support.microsoft.com/default.aspx?scid=kb;en-us;304736>
- How to replace a disk that is on a Windows 2000 or a Windows 2003 Server cluster
<http://support.microsoft.com/kb/305793>