

FCP Solaris® Attach Kit 2.0

Release Notes

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FCP Solaris® Attach Kit 2.0 overview

New features

This release provides support for the following features:

- ◆ New Emulex® LP10000 HBA
- ◆ New Emulex 6.01f driver, for LP10000 HBAs and existing LP9002 HBAs
- ◆ Firmware versions
 - ❖ 1.90a4 -for LP10000 HBAs
 - ❖ 3.92a2 for LP9002 HBAs
- ◆ VERITAS® Storage Foundation version 4.0, MP1 - providing VERITAS VxVM, DMP, VxFS and VCS components
- ◆ A new Array Support Library (ASL version 4.0)
- ◆ Enhanced switch support, including support for Cisco®, Brocade, McData and InRange switches
- ◆ Support for HBAnyware
- ◆ Support for Dynamic Reconfiguration (DR) with LP10000 on Solaris version 8 and Solaris version 9 platforms

HBA hardware and software kits

Network Appliance provides FCP Solaris Attach Kit 2.0 components in the following kits:

- ◆ *Fibre Channel HBA Kit* - provides HBA hardware and mounting brackets
- ◆ *FCP Solaris Attach Kit* - provides the FCP Solaris Attach Kit 2.0 software, documentation, and license agreement

Hardware kit contents

The Fibre Channel HBA kit contains the:

- ◆ Emulex LP10000 HBA with standard PCI bracket, single port
- ◆ One low-profile PCI mounting bracket
- ◆ Emulex product documentation
- ◆ Instructions for firmware upgrade

Software kit contents

The FCP Solaris Attach Kit contains the:

- ◆ Documentation Package, including the:

- ❖ *SAN Setup Overview*
- ❖ *FCP Solaris Attach Kit 2.0 Installation and Setup Guide*
- ❖ *Installing and Managing VERITAS Array Support Library 4.0 for NetApp Filers*
- ◆ Media Package, including the:
 - ❖ CD-ROM with ntap_solaris_fcp_2.0.tar.Z software and firmware package
 - ❖ CD-ROM with NetApp-provided VERITAS Array Support Library (ASL)
 - ❖ License agreement
 - ❖ *FCP Solaris Attach Kit 2.0 Release Notes* (these Release Notes)

System requirements

FCP Solaris Attach Attach Kit 2.0 requirements

The following table lists the most recent hardware and software components qualified with FCP Solaris Attach Kit 2.0.

Important: Network Appliance provides support for existing components and qualifies new ones on an on-going basis. For a current and complete list of new and supported HBAs, platforms, and applications, refer to http://now.netapp.com/NOW/knowledge/docs/san/fcp_iscsi_config/.

Component	Requirement
HBA	◆ Emulex LP10000 ❖ Firmware level: 1.90a4 ❖ Driver level: 6.01f ◆ Emulex LP9002L-F2 ❖ 3.90a7 (minimum) or 3.92a2 (strongly recommended) ❖ Driver level: 6.01f Note_____ If you are installing the FCP Solaris Attach Kit 2.0 with new or existing LP9002 HBA firmware, you should upgrade to 3.92a2. This firmware includes a variety of software fixes, and is also required to support Solaris Dynamic Reconfiguration features.
PCI slot for HBA	◆ One open 32-bit or 64-bit (recommended) PCI bus slot (either 3.3V or 5.0V signaling interface) ◆ PCI bus clock rate of 33 MHz, 66 MHz, (recommended) or 133MHz

Component	Requirement
Hardware platforms	Sun SPARC PCI-based systems Note The LP10000 HBA requires PCI slots providing 3.3V DC bus power. The Sun Ultra-2, Ultra-5, and Ultra-10 platforms do not provide the necessary voltages and are not supported.
Operating system and patch level	◆ Solaris 8—Qualified with MU7 and the patch cluster dated 01/25/05 ◆ Solaris 9—Qualified with MU4 and the patch cluster dated 01/25/05 You can obtain the Solaris patches from http://sunsolve.sun.com. Note For the latest operating system requirements, refer to http://now.netapp.com/NOW/knowledge/docs/san/fcp_iscsi_config/.
VERITAS application requirements	VERITAS Volume Manager (VxVM) 4.0 with MP1
Array Support Library (ASL)	VERITAS Array Support Library 4.0 for NetApp Filers Note FCP Solaris Attach Kit 2.0 software is backwardly compatible with VERITAS 3.5 software, but you must use ASL version 2.0 software. You cannot use VERITAS 3.5 with ASL version 4.0. For information about installing the ASL 4.0, see <i>Installing and Managing VERITAS® Array Support Library 4.0 for NetApp® Filers</i>. This document is included in the documentation package for the host attach kit.

Operational Issues

New bug searching capability

The Bugs Online Utility (<http://now.netapp.com/NOW/cgi-bin/bol>) provides enhanced FCP bugs searching criteria, including:

- ◆ *FCP General* - displays FCP and HBA bugs that are not associated with a specific host
- ◆ *FCP Solaris* - displays FCP and HBA bugs for Solaris platforms
- ◆ *FCP Windows* - displays FCP and HBA bugs for Windows platforms
- ◆ *FCP HPUNIX* - displays FCP and HBA bugs for HPUNIX platforms
- ◆ *FPC AIX* - displays FCP and HBA bugs for AIX platforms
- ◆ *FCP Linux* - displays FCP and HBA bugs for Linux platforms

The Bugs Online Utility is automatically set to display all FCP bugs. Use the New Bug Alerts Profiler, at the bottom of the page, to set bug searching criteria that match your requirements.

HBA driver compatibility

Use the recommended HBA driver version provided and supported by NetApp.

The recommended HBA driver distributed by NetApp is thoroughly tested with the storage appliance. The configuration settings and driver version are certified to work correctly with this product.

Drivers for the HBA that are obtained directly from Emulex are not supported.

lpfc.conf compatibility

The lpfc.conf file provided in this release replaces all previously installed versions of this file. You can not rename this file and save it when the installation is complete.

To insure a new lpfc.conf file is created, follow normal installation procedures by using the `uninstall` script to save the previous lpfc.conf file settings, and then using the `install` script to copy your settings to a new lpfc.conf file.

Supported hardware and software

For a current and complete list of new and existing HBAs, platforms, and applications, refer to http://now.netapp.com/NOW/knowledge/docs/san/fcp_iscsi_config/.

Upgrade Requirements for this attach kit and Data ONTAP 7.0

Components to upgrade

The following sections describe the components you must consider to upgrade your storage appliances to Data ONTAP™ 7.0 software and the FCP Solaris Attach Kit 2.0, and also provides a high level overview of the steps required.

Upgrading from the FCP Solaris 1.0 Attach Kit

To upgrade to Data ONTAP 7.0 from the FCP Solaris 1.0 Attach Kit:

Supported ONTAP Versions	ONTAP 7.0 Upgrade Overview
Data ONTAP 6.3	1. Upgrade to ONTAP 6.4.x. 2. If you are using VxVM 3.2, upgrade to: ❖ ASL 2.0, if not already installed. ❖ FCP Solaris 1.3 Attach Kit. If you are using VxVM 3.5, upgrade to: ❖ ASL 2.0 ❖ FCP Solaris Attach Kit 2.0 3. Upgrade to ONTAP 7.0 in standby mode. Refer to the <i>Data ONTAP 7.0 Upgrade Guide</i> at http://now.netapp.com/NOW/knowledge/docs/ontap/rel70rc/pdfs/ontap/upgrade.pdf for details.

Upgrading from the FCP Solaris 1.1 Attach Kit To upgrade to Data ONTAP 7.0 from the FCP Solaris 1.1 Attach Kit:

Supported ONTAP Versions	ONTAP 7.0 Upgrade Overview
Data ONTAP 6.3 Data ONTAP 6.4	- Upgrade to ONTAP 6.4.x. - If you are using VxVM 3.2, upgrade to: ❖ ASL 2.0, if not already installed. ❖ FCP Solaris 1.3 Attach Kit. If you are using VxVM 3.5, upgrade to: ❖ ASL 2.0 ❖ FCP Solaris 2.0 Attach Kit - Upgrade to ONTAP 7.0 in standby mode. Refer to the <i>Data ONTAP 7.0 Upgrade Guide</i> at http://now.netapp.com/NOW/knowledge/docs/ontap/rel70rc/pdfs/ontap/upgrade.pdf for details.

Upgrading from the FCP Solaris 1.2 Attach Kit To upgrade to Data ONTAP 7.0 from the FCP Solaris 1.2 Attach Kit:

Supported ONTAP Versions	ONTAP 7.0 Upgrade Overview
Data ONTAP 6.4	- If you are using VxVM 3.2, upgrade to: ❖ ASL 2.0, if not already installed ❖ FCP Solaris 1.3 Attach Kit If you are using VxVM 3.5, upgrade to: ❖ ASL 2.0, if not already installed ❖ FCP Solaris Attach Kit 2.0 - Upgrade to ONTAP 7.0. Refer to the <i>Data ONTAP 7.0 Upgrade Guide</i> at http://now.netapp.com/NOW/knowledge/docs/ontap/rel70rc/pdfs/ontap/upgrade.pdf for details.

Upgrading from the Solaris 1.3 Attach Kit To upgrade to Data ONTAP 7.0 from the FCP Solaris 1.3 Attach Kit:

Supported ONTAP Versions	ONTAP 7.0 Upgrade Overview
Data ONTAP 6.4 Data ONTAP 6.5 Data ONTAP 7.0	- If you are using: - VxVM 3.2 with ASL 2.0 - do not upgrade the Solaris 1.3 attach kit. - VxVM 3.5 with ASL 2.0 - upgrade to the FCP Solaris Attach Kit 2.0. - VxVM 4.0 - upgrade to ASL 4.0 (recommended) and FCP Solaris Attach Kit 2.0. - Upgrade to ONTAP 7.0. Refer to the <i>Data ONTAP 7.0 Upgrade Guide</i> at http://now.netapp.com/NOW/knowledge/docs/ontap/rel70rc/pdfs/ontap/upgrade.pdf for details.

Upgrading from the Solaris 2.0 Attach Kit To upgrade to Data ONTAP 7.0 from the FCP Solaris Attach Kit 2.0:

Supported ONTAP Versions	ONTAP 7.0 Upgrade Overview
Data ONTAP 6.4 Data ONTAP 6.5 Data ONTAP 7.0	- If you are using VxVM 4.0 upgrade to ASL 4.0 (recommended) - Upgrade to ONTAP 7.0. Refer to the <i>Data ONTAP 7.0 Upgrade Guide</i> at http://now.netapp.com/NOW/knowledge/docs/ontap/rel70rc/pdfs/ontap/upgrade.pdf for details.

Upgrading to FCP Solaris Attach Kit 2.0

Introduction

This section provides a high-level overview of the upgrade procedure, and also includes information about:

- ◆ Reboot requirements
- ◆ System configuration requirements

Reboot requirements

The upgrade process requires you to reboot the host after you upgrade a host attach kit. This means you must plan to quiesce host I/O and take the host application offline before you begin the upgrade process.

Note

Upgrading the ASL does not require reboot.

Note about heterogeneous configurations

The procedures in this section apply to homogenous SAN configurations in which only Solaris hosts access LUNs on a NetApp storage appliance. This document does not include procedures for heterogeneous configurations in which you want to configure Solaris and either HP-UX® or AIX® hosts to access a cluster. HP-UX and AIX hosts do not have the same default target port settings as Solaris. If you have a heterogeneous configuration with Solaris and HP-UX or AIX hosts, contact your NetApp Professional Services representative for assistance.

Upgrading SAN components

There is a specific order for upgrading the components, which is described in the procedure below. You must follow this order to ensure that you do not change available I/O paths between the host and storage appliance.

To upgrade Data ONTAP and SAN Solaris hosts, complete the following steps.

Step	Action
1	Quiesce host I/O or take the host application offline.
2	◆ If you are currently running Data ONTAP 6.3.x or 6.4, upgrade to Data ONTAP 6.4.x (minimum 6.4.2). For detailed procedures for single filers or clusters, see the <i>Data ONTAP 6.4 Upgrade Guide</i>. ◆ If you are currently running Data ONTAP 6.4.2 or later, proceed to step 3.
3	Upgrade your filer cluster to Data ONTAP 7.0. For detailed procedures for single filers or clusters, see the <i>Data ONTAP 7.0 Upgrade Guide</i> .
4	Uninstall the previous version of the FCP Solaris Attach Kit. For detailed procedures, see the <i>FCP Solaris Attach Kit 2.0 Installation and Setup Guide</i> .

Step	Action
5	Take one of the following actions: ◆ If you have a version of VxVM previous to 4.0, refer to “Upgrading to FCP Solaris Attach Kit 2.0” on page 9 ◆ If you have VxVM 4.0 with ASL 2.0, upgrade to ASL 4.0: 1. Obtain the ASL 4.0 software from the CD-ROM included with your FCP Solaris Attach Kit 2.0, or by downloading it from the VERITAS software site or the NetApp NOW site. 2. Remove the previous version of the ASL by entering the following command on the Solaris host console: <pre>pkgrm NTAPas1</pre> 3. Install the ASL 4.0 package. For detailed installation procedures, see <i>Installing and Managing VERITAS Array Support Library 4.0 for NetApp Filers</i>. You can obtain this document from the following places: ❖ ASL 4.0 CD-ROM (PDF format) ❖ FCP Solaris Attach Kit 2.0 in the Solaris documentation package (print format) Note— If you are installing only the latest ASL, run <code>vxdctl enable</code> and then restart the host application.
6	Install the FCP Solaris Attach Kit 2.0. For detailed procedures, see the <i>FCP Solaris Attach Kit 2.0 Installation and Setup Guide</i>.
7	Reboot the Solaris host by entering the following command: <pre>reboot -- -r</pre>

Step	Action
8	If you did not install additional target HBAs in the filer before the upgrade, the upgrade procedure is complete. You installed additional target HBAs in the filer and now have up to four target HBAs, you must persistently bind the World Wide Port Names (WWPNs) of the filer's target ports to target IDs on the host. You run the NetApp-provided <code>create_binding.pl</code> script to automatically create persistent bindings. For detailed procedures, see Chapter 4 "Creating Persistent Bindings" in the <i>FCP Solaris Attach Kit 2.0 Installation and Setup Guide</i>.

Limitations and known problems

About this section

This section lists limitations and known problems of the FCP Solaris Attach Kit 2.0 at the time of this release. For the most up-to-date list of limitations and known problems, see the NetApp NOW Web site.

Accessing information about bug fixes

From time to time, problems with the FCP Solaris Attach Kit 2.0 are listed in an online system called Bugs Online. For a list of fixed bugs, access Bugs Online by completing the following steps.

Step	Action
1	Use a Web browser to go to http://now.netapp.com .
2	Click Service & Support.
3	Click Bugs Online. ◆ If you know the Bug ID, enter the BUG ID in the Quick Search text box and click Go. ◆ If you do not have a BUG ID and want to view a list of bugs, in the Advanced Search box, choose FCP Solaris and FCP General from the Bug Types menu and click Go. The Search Results page displays a list of SAN bugs and FCP Solaris bugs, including FCP Solaris Attach Kit 2.0 bugs.

Transport error messages in system logs

You might have a large number of transport error messages in system logs when a filer running Data ONTAP 6.5 is in a takeover state and the FCP failover mode (cfmode) is set to partner. Depending on how your disks are configured and the number of I/Os, you might fill up your log space partition or exceed your log boundary limits.

I/O does not restart after failover (137526)

Symptom: I/O does not restart on a host with VxVM 4.0 that is connected to an FAS270c filer that is taken over by its partner.

What to do: Follow the steps below to update VxVM on the host system with MP1 software. MP1 software is required for host systems using VxVM 4.0.

Step	Action
1	Connect to http://seer.support.veritas.com/docs/269487.htm .
2	Download the ss_cfs.4.0MP1.sol.tar_269487.gz file. Follow instructions in the Read this First file, located on the VERITAS site.
3	Go to the directory on the host system that contains patches.
4	Enter <code>/etc/init.d/isisd stop</code> to stop VEA.
5	Install the MP1 patch by entering <code>./installvp</code> .
6	Enter <code>/etc/init.d/isisd start</code> to start VEA.
7	Enter <code>/etc/init.d/isisd status</code> to ensure that VEA is started.

Brocade 3900 and 12000 switches

Symptom: In configurations with Brocade 3900 or 12000 switches, a multipath Solaris host might lose access to the LUNs on the filer during a reboot or a cluster takeover. The host console shows I/O errors and the filer log shows up to a 60-second delay between FCP startup and the target HBA's Link Up messages.

Note

This problem is rare. It affects only Brocade 3900 and 12000 switches running Brocade firmware version 4.0.2c.

Explanation: When a reboot or takeover occurs, the filer reloads firmware to the target HBAs. During the reload, the filer is not sending Fibre Channel messages to the switch. The switch sets a 60-second timeout and the filer cannot log back into the switch until this timeout expires. This delay exceeds the default 120 second no-device timeout on the host, and the host sends I/O errors to the application while waiting for the filer to come back up.

What to do: You can prevent losing access to the LUNs by increasing the HBA driver's no-device timeout to 180 seconds for each host attached to the Brocade switch.

To increase the no-device timeout, complete the following steps.

Step	Action
1	With a text editor, open the lpfc.conf file in the /kernel/drv directory on the host.
2	Change the nodev-tmo=120 setting to nodev-tmo=180. Result: The timeout is set to 180 seconds.
3	Reboot the host.

I/O fails after a takeover

Symptom: After a cluster takeover, I/O fails during the giveback and the host application console shows I/O errors. This problem occurs when the filer has four target HBAs and its cfmode setting is mixed.

Explanation: When a giveback occurs, the filer reloads firmware to the target HBAs. Because there are four target HBAs, and each physical port has three virtual ports in the mixed cfmode setting, there is a delay until all ports are available. This delay exceeds the default 120 second no-device timeout on the host, and the host sends I/O errors to the application while waiting for the target ports to come back up.

What to do: Increase the HBA's no-device timeout by completing the following steps on each host attached to the cluster.

Step	Action
1	With a text editor, open the lpfc.conf file in the /kernel/drv directory on the host.
2	Change the nodev-tmo=120 setting to nodev-tmo=180. Result: The timeout is set to 180 seconds.
3	Reboot the host.

Solaris PANIC performing vxddm enable cmlr commands

Symptom: A Solaris system with VERITAS Volume Manager 3.5 and MP1 patches might display the following panic when you run vxddm enable cmlr commands:

panic: BAD TRAP: type=31 rp=2a1004d6f50 addr=0 mmu_fsr=0 occurred in module "vxdmp" due to a NULL pointer dereference

Note

This problem is rare.

What to do: This issue is reported in the VERITAS Knowledge Base as incident 119864 and will be fixed in a follow-on Maintenance Pack release. Contact VERITAS Technical Support for more information about this Maintenance Pack release.

**Bug reference ID:
70725 (filer-related)**

Symptom: The filer has two different target IDs on the same host HBA.

Example: There are two filers with one LUN each mapped to a single Solaris client, as follows:

```
Filer (iop-3) - Target 3
Filer (iop-4) - Target 4
```

After the LUNs are exported, Target 0 for Filer (iop-3) is displayed. This is not the case for (iop-4). The `sanlun lun show` command reports the following output:

```
filer: lun-pathname device filename adapter lun size lun state
iop-f3: /vol/vol1/lun0 /dev/rdisk/c3t0d0s2 lpfc0 1024.0m (1073741312) GOOD
iop-f3: /vol/vol1/lun0 /dev/rdisk/c3t3d0s2 lpfc0 1024.0m (1073741312) GOOD
iop-f4: /vol/vol1/lun0 /dev/rdisk/c3t4d0s2 lpfc0 1024.0m (1073741312) GOOD
```

Explanation: This behavior occurs when multiple target ports with the same World Wide Node Name (WWNN) are visible to the same HBA on the Solaris host and you do not have multipathing software. The host has more than one active connection to a single filer. For example, you connected the A ports of two different HBAs on a single filer in a cluster to a switch, or you connected both ports of a single HBA on an unclustered filer to a switch.

Because multiple target ports are associated with one WWNN, a host HBA can use a different target port for the path to the LUN each time you reboot the host.

What to do: To ensure that a host HBA uses the same target ID to access a LUN, you must zone ports on the switch so that only one filer port is visible to each host HBA.

Obtaining the latest versions of HBA software

What you need

The FCP Solaris Attach Kit 2.0 media CD-ROM contains the latest HBA driver and firmware at time of shipment, and is available after you install the FCP Solaris Attach Kit. However, there might be later versions of both the driver and firmware released after the media kit was shipped. Therefore, you should check the NetApp NOW support Web site for the latest updates.

Obtaining the software from NOW

To download the software from the NOW site, complete the following steps.

Step	Action
1	Use a Web browser to log in to the NOW site at http://now.netapp.com . ◆ Type your user name and password. ◆ From the Select Start Page list box, click Service and Support. ◆ Click the Login button.
2	Click Download Software.
3	In the FCP Solaris Attach Kit 2.0 product row of the Software Download table, select Solaris in the Select Platform list box.
4	Click Go!
5	Follow the prompts to reach the Software Download page.
6	Download the <code>ntap_solaris_fcp_2_0.tar.Z</code> software file to a local directory, for example, the <code>/tmp</code> directory.
7	For instructions about extracting and installing this file, see the <i>FCP Solaris Attach Kit 2.0 Installation and Setup Guide</i> .

Obtaining additional NetApp SAN information

Where to go for host and filer information

The following table describes documents on NetApp's NOW Web site with the most current information about host and filer system requirements, supported configurations, and cabling instructions.

If you need information about...	See the following NetApp product documentation...
The latest supported configurations	◆ <i>FCP/iSCSI Configuration Guide</i> at http://now.netapp.com/NOW/knowledge/docs/san/fcp_iscsi_config/ ◆ <i>System Configuration Guide</i> at http://now.netapp.com
Configuring the storage appliance	◆ <i>Best Practices for Reliability: New System Installation</i> at http://now.netapp.com ◆ <i>Data ONTAP Software Setup Guide</i>
Installing and configuring the HBA in your Solaris host	◆ <i>FCP Solaris Attach Kit 2.0 Installation and Setup Guide</i>
Installing ASL 4.0	<i>Installing and Managing VERITAS Array Support Library 4.0 for NetApp Filers</i>
Managing SAN storage on the storage appliance	◆ <i>Data ONTAP Command Reference</i> ◆ <i>Data ONTAP Block Access Management Guide for FCP</i> ◆ <i>Data ONTAP Release Notes</i> ◆ <i>FilerView® Online Help</i> ◆ <i>Best Practices for Reliability: Maintenance</i> at http://now.netapp.com
Verifying compatibility of storage appliances with environmental requirements	<i>Site Requirements Guide</i>