Sun StorageTek™ 6140 Array Release Notes

Release 6.4.1

Sun Microsystems, Inc.
www.sun.com

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Contents

CHAPTER 1

Sun StorageTek 6140 Array Release Notes

This document contains important release information about the Sun StorageTek™ 6140 Array or information that was not available at the time the product documentation was published. Read this document so that you are aware of issues or requirements that can affect the installation and operation of the Sun StorageTek 6140 Array.

The release notes consist of the following sections:

For Information About CAM

See the Sun StorageTek Common Array Manager software product page at:

`http://www.sun.com/storage/management_software/resource_management/cam/index.xml`

For information about the management software for the 6140 array, see the CAM documentation at:

http://docs.sun.com/app/docs/prod/stortek.6140rohs~cam6.4?l=en#hic

For Related Patch Information

Look for the latest patches pertaining to your environment at:

http://sunsolve.sun.com/show.do?target=patchpage

1. **In the Search box in the masthead, enter 6140.**
2. **Filter Results By: Downloads > Patches.**

   A listing of available patches related to the array is listed.

About This Release

The following firmware versions are available for the Sun StorageTek 6140 Array. See "Installing Firmware" on page 19 for details about upgrade paths.

Firmware Version	Includes	For More Information
06.60.22.10	Bug fixes	• "Notable Updates/Fixes in This Release" on page 32
07.50.13.10	Bug fixes plus support for the following features: • Portable volume groups • RAID 6 • Virtual disks > 30 • >2 TB LUNs (varies with OS) • Expanded host regions from 16 to 32	• "Notable Updates/Fixes in This Release" on page 32 • See CAM online help and "Release Documentation" on page 30 for information about these new features.

Sun StorageTek 6140 Array Features

The Sun StorageTek 6140 Array is a 4-Gb Fibre Channel (FC) array that offers both direct attached and SAN attached storage. The Sun StorageTek 6140 Array features:

- Eight or four SFP host ports (four or two per controller)
- 1-Gb, 2-Gb, and 4-Gb host interface speed
- Dual redundant controllers
- FC and/or Serial Advanced Technology Attachment (SATA)-2 disk drives
- Available in a 2 Gbyte cache and a 4 Gbyte cache configuration
- Support for up to six expansion trays with one controller tray for the 4 Gbyte model or up to three expansion trays with one controller tray for the 2 Gbyte model
- Switched drive tray (contains an FC switch)
- 112 maximum drives (six expansion trays and one controller tray with up to 16 drives each) for the 4 Gbyte array and 64 maximum drives (three expansion trays and one controller tray with up to 16 drives each for 2 Gbyte array.
- AC or DC Power

The Sun StorageTek 6140 Array is available in a 2 Gbyte cache and a 4 Gbyte cache configuration. TABLE 1-1 compares the 2 Gbyte cache and 4 Gbyte cache array configurations.

TABLE 1-1 Comparison of 2 Gbyte Cache and 4 Gbyte Cache Array Configurations

	Sun StorageTek 6140 Array with 2Gbyte Cache	**Sun StorageTek 6140 Array with 4Gbyte Cache**
Total cache size per array	2 Gbyte	4 Gbyte
Number of host ports (4Gb/s) per array	4	8
Maximum number of drives supported	64	112
Maximum array configuration	1x4	1x7
Maximum raw capacity	64 Tbytes	112 Tbytes
Maximum storage domains supported	32	128

6140 Array Ship Kit Contents

The Sun StorageTek 6140 Array controller and expansion trays are shipped separately. The following is a list of the contents in the tray ship kits.

- Ship kit for the controller tray:
  - Two 5-meter Fibre Channel (FC) cables for connecting the redundant array of independent disks (RAID) controllers to your storage area network (SAN) or host
- One 6-meter RJ45-RJ45 cable for controller serial port
- Two RJ45-DB9 serial adapters (see "Cable Adapters" on page 28)
- PS2 6-pin DIN to RJ-45 serial cable for service access
  - Sun StorageTek Common Array Manager Software DVD
  - *Sun StorageTek Common Array Manager Software Installation Guide*
  - *Sun StorageTek 6140 Array Hardware Installation Guide*
  - *Sun StorageTek 6140 Array Poster*
  - *Accessing Documentation* card
- Ship kit for each expansion tray:
  - Two 2-meter optical FC cables and four SFPs
  - *Accessing Documentation* guide
- AC power cords (or the optional DC power option) are shipped separately with each tray.

Management Software

The Sun StorageTek Common Array Manager software provides you with an easy-to-use interface to configure, manage, and monitor Sun StorageTek storage systems, including the Sun StorageTek 6140 Array. You can also use the Common Array Manager software to diagnose problems, view events, and monitor the health of your array.

The Common Array Manager is described separately in the Sun StorageTek Common Array Manager documentation.

Array Expansion Module Support

Controller firmware 06.19.25.10 (and higher) allows tray mixing of Sun StorageTek 6540, 6140, and 6130 Array Controller Modules and the Sun StorageTek CSM100 and CSM200 Expansion Modules. After installing the firmware, the CSM100 expansion modules can be used with 6140 controllers.

Note – To add trays with data already on them, contact your service representative for assistance to avoid data loss.

Refer to "Upgrading Firmware for Adding Expansion Trays" in the Sun StorageTek Common Array Manager Release Notes, v.6.4.1 (or higher), for more information on the procedure to upgrade trays without data.

For information on upgrading to current firmware levels, see "Upgrading Array Firmware" on page 19.

TABLE 1-2 lists the supported expansion modules.

TABLE 1-2 Supported Expansion Modules - 6000 Series Arrays

Array Controller	Original Supported Expansion Modules	Supported Expansion Modules with Controller Firmware 06.19.25.10
Sun StorageTek 6140 Array	CSM200	CSM100, CSM200

Licenses For Optional Premium Features

For optional premium features, you must purchase licenses. When you order premium feature licenses, the licenses will be sent to you with instructions on how to activate the features.

The following licenses for premium features are available from Sun:

TABLE 1-3 Available Licenses for Premium Features

Premium Feature	6140 Array with 2Gbyte Cache	6140 Array with 4Gbyte Cache
2 Storage Domains	X	X
4 Storage Domains	X	X
8 Storage Domains	X	X

TABLE 1-3 Available Licenses for Premium Features

Premium Feature	6140 Array with 2Gbyte Cache	6140 Array with 4Gbyte Cache
16 Storage Domains	X	X
32 Storage Domains	X	X
64 Storage Domains		X
Data Snapshot	X	X
Data Volume Copy	X	X
Data Replicator	X	X
Combo Data Snapshot and 8 Domains	X	X
Combo Data Snapshot, Data Volume Copy, Data Replicator, and 64 Domains	X	X
Combo Data Snapshot, Data Volume Copy	X	X
Combo Data Snapshot, Data Volume Copy, and Data Replicator	X	X

System Requirements

The software and hardware products that have been tested and qualified to work with the Sun StorageTek 6140 Array are described in the following sections:

- "Disk Drives and Tray Capacity" on page 7
- "Data Host Requirements" on page 7

Disk Drives and Tray Capacity

TABLE 1-4 lists the size, speed, and tray capacity for the supported FC and Serial Advanced Technology Attachment (SATA) disk drives in the Sun StorageTek 6140 Array.

TABLE 1-4 Supported Disk Drives

Drive	Description
FC 73G15K	73-Gbyte 15,000-RPM FC drives (4 Gbits/sec); 1168 Gbytes per tray
FC 146G10K	146-Gbyte 10,000-RPM FC drives (2 Gbits/sec); 2044 Gbytes per tray
FC 146G15K	146-Gbyte 15,000-RPM FC drives (4 Gbits/sec); 2336 Gbytes per tray
FC 300G10K	300-Gbyte 10,000-RPM FC drives (2 Gbits/sec); 4800 Gbytes per tray
FC 300G15K	300-Gbyte 15,000-RPM FC drives (4 Gbits/sec): 4800 Gbytes per tray
FC400G10K	400-Gbyte 10,000-RPM FC drives (4Gbits/sec); 6400 Gbytes per tray
SATA 2, 500G7.2K	500-Gbyte 7,200-RPM SATA drives (3 Gbits/sec); 8000 Gbytes per tray
SATA 2, 750G7.2K	750-Gbyte 7,200-RPM SATA drives (3 Gbits/sec); 12000 Gbytes per tray
SATA2, 1T7.2K	1-Tbyte7, 200-RPM SATA drives (3Gbits/sec); 16000 Gbytes per tray

Data Host Requirements

This section describes supported data host software, HBAs, and switches.

Multipathing Software

You must install multipathing software on each data host that communicates with the Sun Storage 6140 Array.

For Solaris OS 8 and 9 data hosts, the multipathing software is part of the Sun StorageTek SAN Foundation Software (SFS). Solaris OS 10 includes the multipathing software. For data hosts running the Solaris OS, follow the instructions in the *Sun StorageTek 6140 Array Hardware Installation Guide* to download and install the software from the Sun Download Center.

TABLE 1-5 lists supported multipathing software by operating system.

TABLE 1-5 6140 Multipathing Software

OS	Multipathing Software	Minimum Version	Latest Version	Host Type Setting	Notes
Solaris 8/9	STMS/MPxIO	SFS 4.4.10	SFS 4.4.13 (Solaris 8) 4.4.15 (Solaris 9)	Solaris with MPxIO	
Solaris 10	STMS/MPxIO	Update 6 Update 5 with patch 137137-09 (Sparc), 137138-09 (x64)	Kernel Jumbo Patch (KJP)	Solaris with MPxIO	
Solaris 8, 9	RDAC	09.10.02.01	9.10.02.01	Solaris with MPxIO	
Solaris 8,9,10 with DMP	Symantec Veritas Dynamic Multi-Pathing (DMP)	5.0	5.0MP3	Solaris with DMP	ASL (Array Support Library) is also required
Windows 2000/2003 Non-clustered	MPIO	01.03.0302.0013	01.03.0302.0110	Windows 2000/2003 Non-clustered	
Windows MSCS Cluster	MPIO	01.03.0302.0013	01.03.0302.0110	Windows 2000/20003 Clustered	You must use MPIO for 7.10 and above
Windows 2000/2003 Non-clustered with DMP	DMP	5.0	5.1	Windows 2000/Server 2003 Non-clustered (with Veritas DMP)	Pending vendor qualification, see Symantec's HCL ASL (Array Support Library) is also required

TABLE 1-5 6140 Multipathing Software *(Continued)*

OS	Multipathing Software	Minimum Version	Latest Version	Host Type Setting	Notes
Windows 2003 Clustered with DMP	DMP	5.0	5.1	Windows Server 2003 clustered (with Veritas DMP)	Pending vendor qualification, see Symantec's HCL ASL (Array Support Library) is also required
Windows 2008	MPIO	01.03.0302.0013	01.03.0302.0013	Windows 2000/Server 2003	Array must be at firmware level 06.60 and above
AIX 5.2, 5.3	SUNdac Plugin	5.2.0.16	5.2.0.16	AIX	
AIX 5.3	SUNdac Plugin	5.3.0.16	5.3.0.16	AIX	
AIX 5.3, 6.1 with DMP	DMP	5.0	5.0MP3	AIX with DMP	Pending vendor qualification, see Symantec's HCL ASL (Array Support Library) is also required
Red Hat 4 SuSE 9/SuSE 10	RDAC/MPP	09.03.0B02.0013	09.03.0B02.0042	Linux	
Red Hat 5 SuSE 10 SP1	RDAC/MPP	09.03.0C02.0013	09.03.0C02.0042	Linux	
Red Hat SuSE with DMP	DMP	5.0MP3	5.0MP3	Linux with DMP	Pending vendor qualification, see Symantec's HCL ASL (Array Support Library) is also required
HPUX	Veritas DMP	5.0MP1	5.0MP1	HP-UX	Pending vendor qualification, see Symantec's HCL ASL (Array Support Library) is also required

Note – The multipathing driver for the IBM AIX platform is Veritas DMP, bundled in Veritas Volume Manager 3.x for the Sun StorageTek 6140 Array on AIX. Download the Array Support Library (ASL) from http://support.veritas.com/.

Supported Host Bus Adaptors (HBAs)

TABLE 1-6, TABLE 1-7, TABLE 1-8, and TABLE 1-9 lists supported HBAs and other data host platform elements by operating system.

HBAs must be ordered separately from Sun or its respective manufacturers. Sun HBAs can be ordered from:

`/www.sun.com/storagetek/storage_networking/hba/`

You can download HBA drivers and other host software from the Sun Download Center, `http://www.sun.com/software/download/`.

Download operating system updates from the web site of the operating system company.

Note – You must install the multipathing software before you install any OS patches.

TABLE 1-6 Supported HBAs for Solaris Data Host Platforms

Operating System	Minimum OS Patches	Sun 2-Gbit HBAs	Sun 4-Gbit HBAs	Sun 8-Gb HBAs
Solaris 8	108974-49 or higher	SG-XPCI1FC-QL2 (6767A) SG-XPCI2FC-QF2 (6768A) SG-XPCI2FC-QF2-Z (6768A)	SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI2FC-EM4-Z SG-XPCI1FC-EM4-Z	N/A

TABLE 1-6 Supported HBAs for Solaris Data Host Platforms *(Continued)*

Operating System	Minimum OS Patches	Sun 2-Gbit HBAs	Sun 4-Gbit HBAs	Sun 8-Gb HBAs
Solaris 9	113277-44 or higher	SG-XPCI1FC-QL2 (6767A) SG-XPCI2FC-QF2-Z (6768A) SG-XPCI1FC-EM2 SG-XPCI2FC-EM2	SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI2FC-EM4-Z SG-XPCI1FC-EM4-Z	N/A
Solaris 10 SPARC	Update 6 or Update 5 with patch 137137-09	SG-XPCI1FC-QL2 (6767A) SG-XPCI2FC-QF2-Z (6768A) SG-XPCI1FC-EM2 SG-XPCI2FC-EM2	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4 SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI1FC-EM4 SG-XPCI2FC-EM4 SG-XPCIE2FCGBE-Q-Z SG-XPCIE2FCGBE-E-Z	SG-XPCIE1FC-QF8-Z SG-XPCIE2FC-QF8-Z SG-XPCIE1FC-EM8-Z SG-XPCIE2FC-EM8-Z
Solaris 10 x64/x86	Update 6 or Update 5 with patch 137138-09	SG-XPCI1FC-QL2 (6767A) SG-XPCI2FC-QF2-Z (6768A) SG-XPCI1FC-EM2 SG-XPCI2FC-EM2	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4 SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI1FC-EM4 SG-XPCI2FC-EM4 SG-XPCIE2FCGBE-Q-Z SG-XPCIE2FCGBE-E-Z	SG-XPCIE1FC-QF8-Z SG-XPCIE2FC-QF8-Z SG-XPCIE1FC-EM8-Z SG-XPCIE2FC-EM8-Z

TABLE 1-7 Supported HBAs for Microsoft Windows Data Host Platforms

Host OS / Servers	HBAs	Sun 2-Gb HBAs	Sun 4-Gb HBAs	Sun 8-Gb HBAs
Microsoft Windows 2008 Server 32-bit / x86 (IA32) 64-bit / x64 (AMD) EM64T IA64	QLogic QLE 256x QLogic QLE 246x QLogic QLA 246x QLogic QLA 234x QLogic QLA 2310F Emulex LPe12000/12002 Emulex Lpe11000/LPe11002/LPe1150 Emulex LP11000/LP11002/LP1150 Emulex LP9802/9802DC/982 Emulex LP952/LP9002/LP9002DC Emulex 10000/10000DC/LP1050	SG-XPCI1FC-EM2 SG-XPCI2FC-EM2 SG-XPCI1FC-QL2 SG-XPCI2FC-QF2-Z	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4 SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI1FC-EM4 SG-XPCI2FC-EM4 SG-XPCIE2FCGBE-Q-Z SG-XPCIE2FCGBE-E-Z	SG-XPCIE1FC-QF8-Z SG-XPCIE2FC-QF8-Z SG-XPCIE1FC-EM8-Z SG-XPCIE2FC-EM8-Z
Microsoft Windows 2003 32-bit with SP1 R2 / x86 (IA32)	QLogic QLE 256x QLogic QLE 246x QLogic QLA 246x QLogic QLA 234x QLogic QLA 2310F Emulex LPe12000/12002 Emulex Lpe11000/LPe11002/LPe1150 Emulex LP11000/LP11002/LP1150 Emulex LP9802/9802DC/982 Emulex LP952/LP9002/LP9002DC Emulex 10000/10000DC/LP1050	SG-XPCI1FC-EM2 SG-XPCI2FC-EM2 SG-XPCI1FC-QL2 SG-XPCI2FC-QF2-Z	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4 SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI1FC-EM4 SG-XPCI2FC-EM4 SG-XPCIE2FCGBE-Q-Z SG-XPCIE2FCGBE-E-Z	SG-XPCIE1FC-QF8-Z SG-XPCIE2FC-QF8-Z SG-XPCIE1FC-EM8-Z SG-XPCIE2FC-EM8-Z

TABLE 1-7 Supported HBAs for Microsoft Windows Data Host Platforms *(Continued)*

Host OS / Servers	HBAs	Sun 2-Gb HBAs	Sun 4-Gb HBAs	Sun 8-Gb HBAs
Microsoft Windows 2003 64-bit with SP1 R2 / x64 (AMD) EM64T IA64	QLogic QLE 256x QLogic QLE 246x QLogic QLA 246x QLogic QLA 234x QLogic QLA 2310F Emulex LPe12000/12002 Emulex Lpe11000/LPe11002/LPe1150 Emulex LP11000/LP11002/LP1150 Emulex LP9802/9802DC/982 Emulex LP952/LP9002/LP9002DC Emulex 10000/10000DC/LP1050	SG-XPCI1FC-EM2 SG-XPCI2FC-EM2 SG-XPCI1FC-QL2 SG-XPCI2FC-QF2-Z	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4 SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI1FC-EM4 SG-XPCI2FC-EM4 SG-XPCIE2FCGBE-Q-Z SG-XPCIE2FCGBE-E-Z	SG-XPCIE1FC-QF8-Z SG-XPCIE2FC-QF8-Z SG-XPCIE1FC-EM8-Z SG-XPCIE2FC-EM8-Z

TABLE 1-8 Supported HBAs for Linux Data Host Platforms

Host OS / Sun Servers	HBAs	Sun 2-Gb HBAs	Sun 4-Gb HBAs	Sun 8-Gb HBAs
Linux SuSE 10 SP2	QLogic QLE 256x QLogic QLE246x QLogic QLA 246x QLogic QLA 234x QLogic QLA 2310F Emulex LP982/LP9802/9802DC Emulex LP9002/LP9002DC/LP952 Emulex LP10000/10000DC/LP1050 Emulex LP11000/LP11002/LP1150 Emulex Lpe11000/LPe11002/LPe1150	SG-XPCI1FC-EM2 SG-XPCI2FC-EM2 SG-XPCI1FC-QL2 SG-XPCI2FC-QF2-Z	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4 SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI1FC-EM4 SG-XPCI2FC-EM4 SG-XPCIE2FCGBE-Q-Z SG-XPCIE2FCGBE-E-Z	SG-XPCIE1FC-QF8-Z SG-XPCIE2FC-QF8-Z SG-XPCIE1FC-EM8-Z SG-XPCIE2FC-EM8-Z

TABLE 1-8 Supported HBAs for Linux Data Host Platforms *(Continued)*

Host OS / Sun Servers	HBAs	Sun 2-Gb HBAs	Sun 4-Gb HBAs	Sun 8-Gb HBAs
Linux SuSE 9.0 - IA 32, 2.6 kernel / x64 EM64T x86 (IA32) IA64	QLogic QLE 256x QLogic QLE246x QLogic QLA 246x QLogic QLA 234x QLogic QLA 2310F Emulex LP982/LP9802/9802DC Emulex LP9002/LP9002DC/LP952 Emulex LP10000/10000DC/LP1050 Emulex LP11000/LP11002/LP1150 Emulex Lpe11000/LPe11002/LPe1150	SG-XPCI1FC-EM2 SG-XPCI2FC-EM2 SG-XPCI1FC-QL2 SG-XPCI2FC-QF2-Z	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4 SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI1FC-EM4 SG-XPCI2FC-EM4 SG-XPCIE2FCGBE-Q-Z SG-XPCIE2FCGBE-E-Z	SG-XPCIE1FC-QF8-Z SG-XPCIE2FC-QF8-Z SG-XPCIE1FC-EM8-Z SG-XPCIE2FC-EM8-Z
Linux SuSE 8.0*, 2.4 kernel / x64 EM64T x86 (IA32) IA64	QLogic QLE 256x QLogic QLE246x QLogic QLA 246x QLogic QLA 234x QLogic QLA 2310F Emulex LP982/LP9802/9802DC Emulex LP9002/LP9002DC/LP952 Emulex LP10000/10000DC/LP1050 Emulex LP11000/LP11002/LP1150 Emulex LPe11000/LPe11002/LPe1150	SG-XPCI1FC-EM2 SG-XPCI2FC-EM2 SG-XPCI1FC-QL2 SG-XPCI1FC-QF2 SG-XPCI2FC-QF2-Z	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4 SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI1FC-EM4 SG-XPCI2FC-EM4 SG-XPCIE2FCGBE-Q-Z	SG-XPCIE1FC-QF8-Z SG-XPCIE2FC-QF8-Z SG-XPCIE1FC-EM8 SG-XPCIE2FC-EM8

TABLE 1-8 Supported HBAs for Linux Data Host Platforms *(Continued)*

Host OS / Sun Servers	HBAs	Sun 2-Gb HBAs	Sun 4-Gb HBAs	Sun 8-Gb HBAs
Red Hat 5 Update 1, 2 RHEL 5u1 RHEL 5u2	QLogic QLE 256x QLogic QLE 246x QLogic QLA 246x QLogic QLA 234x QLogic QLA 2310F Emulex LP982/LP9802/9802DC Emulex LP9002/LP9002DC/LP952 Emulex LP10000/10000DC/LP1050 Emulex Lpe11000/LPe11002/LPe1150 Emulex Lpe12000/LPe12002	SG-XPCI1FC-EM2 SG-XPCI2FC-EM2 SG-XPCI1FC-QL2 SG-XPCI2FC-QF2-Z	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4 SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI1FC-EM4-Z SG-XPCI2FC-EM4-Z SG-XPCIE2FCGBE-Q-Z SG-XPCIE2FCGBE-E-Z	SG-XPCIE1FC-QF8-Z SG-XPCIE2FC-QF8-Z SG-XPCIE1FC-EM8-Z SG-XPCIE2FC-EM8-Z
Red Hat 4 Update 6 RHEL 4u6	QLogic QLE 256x QLogic QLE 246x QLogic QLA 246x QLogic QLA 234x QLogic QLA 2310F Emulex LP982/LP9802/9802DC Emulex LP9002/LP9002DC/LP952 Emulex LP10000/10000DC/LP1050 Emulex Lpe11000/LPe11002/LPe1150 Emulex Lpe12000/LPe12002	SG-XPCI1FC-EM2 SG-XPCI2FC-EM2 SG-XPCI1FC-QL2 SG-XPCI2FC-QF2-Z	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4 SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI1FC-EM4-Z SG-XPCI2FC-EM4-Z SG-XPCIE2FCGBE-Q-Z SG-XPCIE2FCGBE-E-Z	SG-XPCIE1FC-QF8-Z SG-XPCIE2FC-QF8-Z SG-XPCIE1FC-EM8-Z SG-XPCIE2FC-EM8-Z

TABLE 1-8 Supported HBAs for Linux Data Host Platforms *(Continued)*

Host OS / Sun Servers	HBAs	Sun 2-Gb HBAs	Sun 4-Gb HBAs	Sun 8-Gb HBAs
Red Hat Linux 4.0†, 2.6 kernel / x64 EM64T x86 (IA32) IA64	QLogic QLE 256x QLogic QLE 246x QLogic QLA 246x QLogic QLA 234x QLogic QLA 2310F Emulex LP982/LP9802/9802DC Emulex LP9002/LP9002DC/LP952 Emulex LP10000/10000DC/LP1050 Emulex Lpe11000/LPe11002/LPe1150 Emulex Lpe12000/LPe12002	SG-XPCI1FC-EM2 SG-XPCI2FC-EM2 SG-XPCI1FC-QL2 SG-XPCI2FC-QF2-Z	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4 SG-XPCI1FC-QF4 SG-XPCI2FC-QF4 SG-XPCI1FC-EM4-Z SG-XPCI2FC-EM4-Z SG-XPCIE2FCGBE-Q-Z SG-XPCIE2FCGBE-E-Z	SG-XPCIE1FC-QF8-Z SG-XPCIE2FC-QF8-Z SG-XPCIE1FC-EM8-Z SG-XPCIE2FC-EM8-Z
Red Hat Linux 3.0, 2.4 kernel / x64 EM64T x86 (IA32) IA64	QLogic QLA 246x QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F Emulex LP982/LP9802/9802DC Emulex LP9002/LP9002DC/LP952 Emulex LP10000/10000DC/LP1050 LSI 44929 LSI 40919	SG-XPCI1FC-EM2 SG-XPCI2FC-EM2	SG-XPCIE1FC-QF4 SG-XPCIE2FC-QF4 SG-XPCIE1FC-EM4 SG-XPCIE2FC-EM4	N/A

* Oracle Real Application Clusters (RAC), SteelEye LifeKeeper Server Clustering

† SteelEye LifeKeeper Server Clustering

TABLE 1-9 Other Supported Data Host Platforms

Host OS	Host Servers	HBAs
Novell NetWare 6.0 (SP5)	x86 (IA32)	QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F
Novell NetWare 6.5 (SP7)	x86 (IA32)	QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F QLogic QLA 246x
Novell NetWare 6.5 (SP3)	x86 (IA32)	QLogic QLA 2342 QLogic QLA 2340 QLogic QLA 2310F QLogic QLA 246x
IRIX 6.5.26, 6.5.27, 6.5.28, 6.5.29	MIPS	QLogic QLA 2310
HP-UX 11.31	HP RISC	HP A6795A HP A6826A HP A6684A HP A6685A HP A5158A HP AB378A HP AB379A HP AD300A HP AD355A

TABLE 1-9 Other Supported Data Host Platforms *(Continued)*

HP-UX B11.11	HP RISC	HP A6795A HP A6826A HP A6684A HP A6685A HP A5158A
HP-UX B.11.23	HP RISC IA64	HP A6795A HP A6826A HP A9784A HP AB378A HP AB379A HP AD300A HP AD355A
IBM AIX 5.2, 5.3, 6.1	Power	IBM 5716 IBM 5758 IBM 5759 IBM 6228 IBM 6239

Supported Enterprise Software

The enterprise software applications listed in TABLE 1-10 are compatible with the Solaris OS on the data host.

TABLE 1-10 Supported Enterprise Software

Software	Version
Legato NetWorker	7.3
Sun Cluster	3.0, 3.1
Sun StorEdge QFS software	4.0 minimum
Sun StorEdge SAM-FS software	4.0 minimum
Sun StorEdge Availability Suite	3.2 minimum
Sun StorEdge Enterprise Backup Software	7.3
Solstice DiskSuite	4.2.1 (in conjunction with the Solaris 8 OS)
Solaris Volume Manager	Embedded in the Solaris 9 and 10 OSs
Veritas Storage Foundation (VxVM/VxFS)	5.0

TABLE 1-10 Supported Enterprise Software *(Continued)*

Software	Version
Veritas Cluster Server (VCS)	5.0
Veritas NetBackup	6.0 or higher
Veritas Storage Foundation (VxVM/VxFS)	5.0

Supported FC and Multilayer Switches

The following FC fabric and multilayer switches are compatible for connecting data hosts and the Sun StorageTek 6140 Array:

- Sun StorEdge Network 2 Gb FC Switch - 8, 16, and 64
- Brocade SilkWorm 200E/300/4100/4900/5000/5100/5300/7500/48000/DCX
- Cisco 9124/9134/9216/9216i/9222i/9506/9509/9513
- McDATA 6140/i10K/QPM 4 Gb blade for 6140
- QLogic SANBox 5602/9000

Installing Firmware

The array installation procedures are described in the *Sun StorageTek 6140 Array Hardware Installation Guide* that came with your array. Host management software installation and upgrades are described in the *Sun StorageTek Common Array Manager Release Notes*. This section describes release-specific steps for firmware upgrades that you must perform:

- "Upgrading Array Firmware" on page 19
- "Updating the SSD Driver for the Solaris OS" on page 21

Upgrading Array Firmware

New firmware files are included in each release of the Sun StorageTek Common Array Management software, currently Release 6.4.1. When you install new management software from DVD or web download and perform the Upgrade Firmware function, the software will detect older firmware versions and upgrade to the new firmware versions required for this release. It is not necessary to uninstall the existing firmware.

If the software detects that there is no earlier version installed, it will perform a complete new installation. The software is available on the Sun StorageTek Common Array Manager DVD, or in the package you obtain from http://www.sun.com/storagetek/management_software/resource_management/cam/get_it.html

TABLE 1-11 lists the available fimrware upgrade paths.

TABLE 1-11 Firmware Upgrade Paths

Current Firmware Revision	Upgrade to Revision	Upgrade Type	Upgrade Performed Using
06.xx	06.60.22.10	Online	CAM (See "To Upgrade the Firmware on the Array" on page 21)
06.14 (or higher)	07.50.13.10 (or higher)	Offline and Online	Requires a two-step process: 1. Upgrade 6.14 (or higher) to 7.15.11.17* using Sun StorageTek 6000 Series Upgrade Utility (See *Sun StorageTek 6000 Series Array Firmware Upgrade Guide*) 2. Upgrade 7.15.11.17 to 7.50.13.10 (or higher) using CAM (See "To Upgrade the Firmware on the Array" on page 21)
07.xx	07.50.13.10 (or higher)	Online	CAM (See "To Upgrade the Firmware on the Array" on page 21)

* Limited function version of the firmware for initial step in the controller firmware upgrade process

Note – The transition from 06.xx to 07.15.11.17 firmware is an offline upgrade and is customer installable. The *Sun StorageTek 6000 Series Array Firmware Upgrade Guide* describes how to upgrade the 6140 array to the controller firmware version 7.15.11.17 (a limited function version of the firmware) using the special upgrade utility. Once your array is at firmware version 7.15.11.17, you *must* then upgrade to the latest firmware revision using CAM.

Troubleshooting Upgrade Failures

If you receive a failure message from the Upgrade Utility going from 7.15.11.17 to 7.50 or going from 7.50.08.10 to 7.50.13.10 and any higher firmware revision using CAM or SANtricity. follow these steps:

1. Review the event log for true errors.
2. Save the event log.
3. You might need to clear the event log to move forward.

Contact your technical support representative if you need assistance in the reviewing the event log.

Caution – If your array is at firmware version 07.xx, you cannot downgrade to 6.xx. If you must downgrade to 6.xx, contact Sun support.

To Upgrade the Firmware on the Array

Using CAM, this procedure downloads the firmware binary on the management host to the array and upgrades the firmware running in the array.

1. **Log in to the management host.**
2. **On the Java Web Console page, click Sun StorageTek Common Array Manager.**
3. **Go to the Storage System Summary page and select the arrays to be upgraded.**
4. **Click the Upgrade Firmware button.**
5. **Follow the prompts.**

Updating the SSD Driver for the Solaris OS

After installing software for the data hosts from the Sun StorageTek 6140 Host Installation Software CD, go to SunSolve (`http://www.sun.com/sunsolve`) and download the `SSD` driver for data hosts running the Solaris 8 or 9 OS.

To Update the SSD Driver for the Solaris 8 OS

Note – Patch `108974-49` or higher requires patch `108528-29` or higher. If needed, apply patch `108528-29` or higher first.

1. **Download the 108974-49 or higher patch from SunSolve.**

   Refer to the README file for more information on downloading patches.

2. **Unpack the patch:**

   ```
   unzip 108974-49.zip
   ```

3. **Read the README file:**

   ```
   108974-49/README.108974-49
   ```

4. **Apply the patch with the `patchadd` command:**

   ```
   patchadd 108974-49
   ```

5. **Reboot your system.**

   ```
   reboot -- -r
   ```

To Update the SSD Driver for the Solaris 9 OS

Note – Patch 113277-44 or higher requires patches 112233-02 and 112834-02, which are already included in most versions of the Solaris 9 OS. If they are needed, apply patches 112233-02 and 112834-02 first.

1. **Download the 113277-44 or higher patch from SunSolve.**

   Refer to the README file for more information on downloading patches.

2. **Unpack the patch:**

   ```
   unzip 113277-44.zip
   ```

3. **Read the README file:**

   ```
   113277-44/README.113277-44
   ```

4. **Apply the patch with the `patchadd` command.**

   ```
   patchadd 113277-44
   ```

5. **Reboot your system.**

```
reboot -- -r
```

Known Issues

The following sections provide information about known issues and bugs filed against this product release:

If a recommended workaround is available for a bug, it follows the bug description.

Installation and Initial Configuration Issues

This section describes known issues and bugs related to installing and initially configuring the Sun StorageTek 6140 Array.

Auto-Negotiation of Ethernet Switches Must be Set to On

Bug 6538927 - The Ethernet ports of the array auto-negotiate for standard 10 and 100 Mbits/second full duplex connectivity. The Ethernet switch that the array's management path connects with must have auto-negotiation turned on. If it is not set, the array will eventually lose visibility from the management host.

Hardware and Firmware Issues

This section describes general issues related to the Sun StorageTek 6140 Array hardware and firmware.

CSM200 Requirements

When you add a new CSM200 expansion tray to an existing array in a production or active environment, you must cable and add the trays while the RAID controller module is powered on.

Not following correct procedures could result in loss of customer data. Null Reference for a Removed Drive

Bug 6746324 – After performing a drive replacement for a virtual disk on an array running controller firmware version 07.xx.x.xx, the array returns a null reference for the removed drive.

Failed Drive Maintenance LED Remains Illuminated After Volume Deletion

Bug 6590564 – When a drive has failed and is part of a volume being deleted, it is possible for the failed drive's blue maintenance LED to illuminate and remain illuminated despite the drive no longer being assigned to a volume.

Workaround – A reboot of the controller will clear the maintenance LED.

Addition and Removal of Initiators From Zones in Fabric Are Not Dynamically Detected

Bug 6329784 - When an initiator is added or removed from a zone in a fabric, the configuration software does not dynamically detect the change. The WWNs of initiators newly added to the SAN are not displayed.

Workaround – If the WWN of a new initiator is not in the drop-down list on the New initiator page, try creating the initiator by manually entering the new WWN. This will force the page to refresh. When you create another new initiator, the WWN will be in the list.

Cannot Boot From System With a 6768A Direct Attached HBA

Bug 6358173 - The 6768A (QLogic 2342) 2-Gb dual-port adapter cannot be used in direct attach mode, and you cannot boot from it.

Workaround - To use 6768A in direct attach mode, move the jumpers from pins 2-3 to pins 1-2. To boot using this HBA, move the 6768A jumpers from pins 2-3 to pins 1-2 or put a switch between the host and array.

Errors From Expansion Tray 2A and 2B Ports

Bug 6417872 - When Small Form-factor Plugs (SFPs) are installed in ports 2A and 2B of an expansion tray, the front amber fault LED turns on and the IOM displays an H8 error.

Workaround - Do not install SFPs into these slots.

Documentation Issues

This section describes known issues and bugs related to the Sun StorageTek 6140 Array documentation.

With Release 5.0, the *Sun StorageTek 6140 Array Getting Started Guide* (Release 2.0) has been replaced by the *Sun StorageTek Common Array Manager Software Installation Guide* and the *Sun StorageTek 6140 Array Hardware Installation Guide*. Refer to the *Sun StorageTek Common Array Manager Software Installation Guide* for information about Sun StorageTek Common Array Manager software installation, firmware files, and logging into the browser interface and sscs CLI man pages.

Cable Changes in Installation Guide

The *Sun StorageTek 6140 Array Hardware Installation Guide* has not yet been updated for:

- The addition of one RJ45-DB9 adapter with null modem to the contents of the controller tray box.
- A change from copper cables to 2-meter optical FC cables and SFPs in the expansion module box.

The outdated copper cables are referenced in each configuration cabling section.Use the optical FC cables instead.

Revised Specifications

The following are revised specifications for the array and its documentation.

Controller Module (fully populated)

- Acoustics: 6.8 bels
- Heat Output:

  380 Watts (1297 BTU/Hr) using AC Power Source

  445 Watts (1519 BTU/Hr) using DC Power Source (NEBS)
- Altitude (storage) 100 ft (30.5 M) below sea level to 9,840 feet (3,000 meters)
- AC Power

  3.73 A Max Operating @ 115 VAC (90 to136 VAC Range), 50/60 Hz

  1.96 A Max Operating @ 230 VAC (180 to 264 VAC Range), 50/60 Hz

- DC Power

  15.8 A Max Operating @ 36 VDC (-36 to -72 VDC Range)
- Safety and Emissions

  EN 300 386 (NEBS)

CSM200 Expansion Module (fully populated)

- Acoustics: 6.8 bels
- Heat Output:

  410 Watts (1400 BTU/Hr) using AC Power Source

  445 Watts (1519 BTU/Hr) using DC Power Source (NEBS)
- Altitude (storage) 100 ft (30.5 M) below sea level to 9,840 feet (3,000 meters)
- AC Power

  4.21 A Max Operating @ 115 VAC (90 to136 VAC Range), 50/60 Hz

  2.16 A Max Operating @ 230 VAC (180 to 264 VAC Range), 50/60 Hz
- DC Power

  15.8 A Max Operating @ 36 VDC (-36 to -72 VDC Range)
- Safety and Emissions

  EN 300 386 (NEBS)

Operational Information

This section provides useful operational information not documented elsewhere.

Sharp Edges on Chassis

Caution – On both the controller and expansion trays, the rear of the chassis has very sharp edges.

Controller FRU Handle Can Be Hazardous

Caution – Be careful using the FRU handle on the controller tray. It can snap shut when pushed hard during reinsertion, pinning fingers between the tray and handle edges.

Replacing Failed Disk Drives From Another Array

If a volume failure on a Sun StorageTek 6140 Array results from failed disk drives, you must be careful when introducing replacement drives that were part of a volume in use by another Sun StorageTek 6140 Array.

Workaround - To avoid having the array incorrectly initiate a volume migration process with the newly introduced replacement drives, perform one of the following tasks:

- Verify that the volume on the Sun StorageTek 6140 Array with the failed disk drives has not been deleted. You should leave the volume in a failed state and not delete the volume.
- Verify that the disk drives being taken from the inactive Sun StorageTek 6140 Array are not part of an active volume. If the disk drives are part of an active virtual disk, delete all volumes residing on that virtual disk before removing the disk drives.

Controller Tray ID Numbering Is Unrestricted

Controller tray IDs can be set to any number between 0 and 99. Expansion trays use the values 0 to 79. Controller trays should use the values 80 to 99 (except 85) to avoid duplicate tray IDs.

If tray IDs are duplicated, the array will not be able to detect the drives on one of the two trays that have the same ID (which one is arbitrary). Do not use ID 85 for the controller tray, as this number is the default setting that indicates everything is operating as expected.

The Expansion Module Must Be Set to the Same Speed As the Controller

The controller and expansion modules must be set to the same speed. If the 2/4Gb switch is set to 2Gb on one and it is set to 4Gb on the other, the expansion module will appear inoperative with no indication of the cause.

The controller is set to 2Gb at the factory. An expansion module is set at the factory to whatever its disk drives are. You can tell what the speed of the disks on the tray are by removing one of the disks and examining the label. Next to the disk name on the label there is a number indicating the RPM and speed of the disk. For example, the number 15k.4 indicates the disk is 15,000 RPMs and 4Gb.

Cable Adapters

The array ships with two RJ-45 to miniDIN cables, a RJ45-DB9 adapter, and a RJ45-DB9 adapter with a null modem. The two adapters allow users to connect to the array from most Sun workstations, portable PCs, and terminal servers. If your ship kit does not include the RJ45-DB9 adapter with a null modem and you cannot connect with the RJ45-DB9 adapter, either supply your own adapter or contact Sun Service.

To connect from a portable PC without a serial port, you will need to purchase a USB to serial adapter, available from most computer stores.

When Performing an Array Import, Do Not Modify Management Objects

If you create management objects while an "import array" job is running, it might interfere with the import. Be sure that everyone who uses the destination array does not modify or create any objects (including volumes, initiators, mappings, and so on) while the import is in progress.

Using a Volume Before It Is Fully Initialized

When you create a volume and label it, you can start using the volume before it is fully initialized.

Controller Tray Battery Information

During bootup, the battery light might flash for an extended period. The battery charger performs a series of battery qualification tests before starting a battery charge cycle. This series of tests occurs at subsystem power-up. The tests are automatically reinitialized approximately every 25 hours by a timer.

Each controller tray contains a hot-pluggable lithium ion battery pack for cache backup in case of power loss. The on-board battery is capable of holding a 2-gigabyte cache for three days (72 hours). The service life of the battery pack is three years, at the end of which the battery pack must be replaced (it is field-replaceable).

Status Codes

The following is a list of the meanings of the status and diagnostic codes that may display on the numerical LEDs on the controller and expansion modules.

TABLE 1-12 Tray ID Display Status Codes

Value	Description
FF	IOM boot diagnostic executing
88	This IOM is being held in Reset by the other IOM
AA	IOM-A application is booting up
bb	IOM-B application is booting up
H1	SFP speed mismatch (2 Gbit/sec SFP installed when operating at 4 Gbit/sec)
H2	Invalid/incomplete configuration
H3	Maximum reboot attempts exceeded
H4	Cannot communicate with other IOM
H5	Midplane harness failure
H6	Firmware failure
H7	Current enclosure fibre channel rate different than rate switch
H8	SFP(s) present in currently unsupported slot (2A or 2B)

TABLE 1-13 Tray ID Display Diagnostic Codes

Value	Controller State	Description
L0	Suspended	Mismatched controller types
L1	Suspended	Missing interconnect canister
L2	Suspended	Persistent memory errors
L3	Suspended	Persistent hardware errors
L4	Suspended	Persistent data protection errors
L5	Suspended	ACS failure
L6	Suspended	Unsupported host card
L7	Suspended	Sub-model identifier not set or mismatched
L8	Suspended	Memory configuration error

TABLE 1-13 Tray ID Display Diagnostic Codes *(Continued)*

Value	Controller State	Description
L9	Suspended	Link speed mismatch
LA	Suspended	Reserved
Lb	Suspended	Host card configuration error
LC	Suspended	Persistent cache backup configuration error
Ld	Suspended	Mixed cache memory DIMMs
LE	Suspended	Uncertified cache memory DIMM Sizes
LF	Suspended	Lockdown with limited SYMbol support
LH	Suspended	Controller firmware mismatch

Release Documentation

Following is a list of documents related to the Sun StorageTek 6140 Array.

Documentation for this product is available online at
http://docs.sun.com/app/docs/prod/stortek.6140rohs#hic

You can also search for additional documentation at
http://www.sun.com/documentation

Application	Title	Part Number
Site planning information	*Sun StorageTek 6140 Array Site Preparation Guide*	819-5046
Regulatory and safety information	*Sun StorageTek 6140 Array Regulatory and Safety Compliance Manual*	819-5047
Installation and initial configuration instructions	*Sun StorageTek 6140 Hardware Installation Guide*	819-7497
Installation instructions and basic configuration information for the Sun StorageTek Common Array Manager	*Sun StorageTek Common Array Manager Software Installation Guide, v6.2.0* (or higher)	819-5747
Instructions for installing the Sun StorEdge Expansion cabinet	*Sun StorEdge Expansion Cabinet Installation and Service Manual*	805-3067

Application	Title	Part Number
Instructions for installing the Sun Rack 900/1000 cabinets	*Sun Rack Installation Guide*	816-6386
Instructions for installing the Sun Fire cabinet	*Sun Fire Cabinet Installation and Reference Manual*	806-2942
Solaris OS 8 and 9 multipathing software information	*SAN Foundation Software Release Notes*	819-5604-15
Multipath failover guide for Linux OS platforms	*Sun StorageTek RDAC Multipath Failover Driver Installation Guide For Linux OS*	820-4738
Multipath failover guide for Windows OS platforms	*Sun StorageTek MPIO Device Specific Module Installation Guide For Microsoft Windows OS*	820-4737
Release-specific information for the Sun StorageTek Common Array Manager	*Sun StorageTek Common Array Manager Release Notes, v. 6.4.1* (or higher)	820-7920
Upgrade controller firmware from 6.x to 7.x	*Sun StorageTek 6000 Series Array Firmware Upgrade Guide*	820-7197
Reference information for the Common Array Manager CLI	*Sun StorageTek Common Array Manager CLI Guide*	820-6662

Notable Updates/Fixes in This Release

TABLE 1-14 Array Firmware Updates/Fixes in This Release

CR ID	Description
2170590	False impending failure alerts. Related to PFA. Failure alerts are migrating to other drives
2172381 6799705	RVM deletion operation staying queued and causing loss-of-management.
6572039	SYMbol is returning 0 for FLX280 Ethernet port speed
6588535 6714375	750GB drives report check conditions and DDE's in MajorEventLog and makes MEL unusable
6593771	Shell command component of DDC data is not present
6612020	Controller B continues to reboot
6663985	Exception log corrupted when watchdog suspended and "I" issued
66765184	6540 reports Temperature Exceeded on a few trays if running firmware (07.10.25.10)
66803561	SYMbol is configuring the Java logger such that it interferes with management application logging
6680647	Large data replication block size causes controller reboot
6703791	SPM database corruption causes boot loop; Mapset numbers don't match between the two controllers
6719611	CSM200 drive tray has fault LED turned on even when the tray and the whole array is optimal
6734964	Array IP address not discovered when queried
6747153	Controller cache memory size displays 0
6754351	Controller reboot with out-of-band management
6755642	Snapshot status incorrect
6755990	Controllers enter reboot loop after data replication pairs are restored
6757957	Auto code sync feature can fail during controller replacement
6767241	After a controller reboot, loss of path redundancy might be reported on some internal drives
6768200	Controller reset during volume (vmware_vmfs_3) build
6790533	Controller reset due to Ancient IO

TABLE 1-14 Array Firmware Updates/Fixes in This Release

CR ID	Description
6792398	After upgrading to latest crystal firmware, customer encounters controller reboots when running full I/O load
6797173	6140/6540 report degraded path to drive(s) that isn't degraded
6799705	RVM deletion operation staying queued and causing loss-of-management
6804830	PANIC: sasDoTargetCmd: Cannot allocate mirror buffer on Controller B
6810115	RVM remained synchronized on odd volumes but was not synchronized on even volumes after cables were pulled
6810118	Data corruption when changing RVM mode from Asynchronous to Asynchronous with Consistency mode
6812994	DDC data not collecting traces in b.dq
6821655 6821654 6822129	(LBA) truncation issue on greater than 2TB volumes
6823965	Controller Panic with (iconMgr2): PANIC: Already freed memory block at 0x10a374a0
6824635	6140 controller panic reboot ?PANIC: StateChangeMgr::incGenerationNumberAlt?
697188	SATA drives may fail further to a 06/3f/01 during drive code update

Service Contact Information

If you need help installing or using this product, go to:

http://www.sun.com/service/contacting

Third-Party Web Sites

Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

APPENDIX **A**

Disk Drive Insertion

This appendix describes how to properly insert a disk drive into a controller or expansion tray.

Drives are inserted with the power on, unless specifically instructed not to by Sun technical support.

The correct way to insert a disk drive into the tray is as follows:

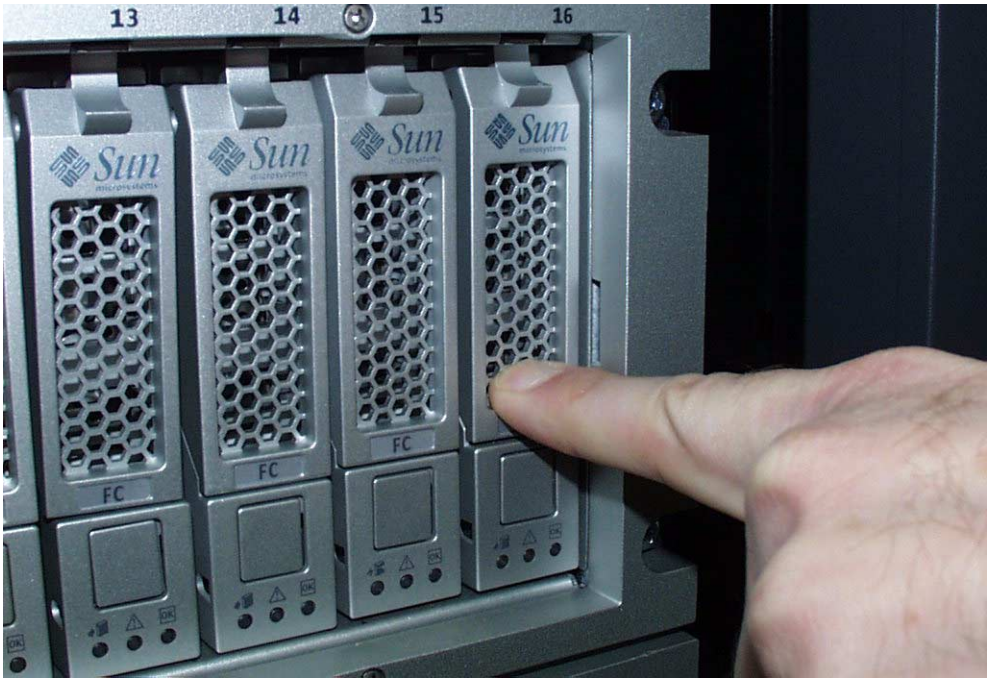
1. Lift the drive handle up to open it.
2. Push the disk drive into the chassis by slowly pushing against the drive housing until the drive handle engages with the chassis.
3. When the handle starts to move itself downwards, push the disk drive handle down. This will crank the disk drive the rest of the way into the chassis.

FIGURE A-1 shows a drive being inserted into the chassis the correct way.

FIGURE A-1 Inserting a Disk Drive

FIGURE A-2 Successfully Inserted Disk Drive

When the drive is completely installed, the drive and handle will be flush with the others, as shown in FIGURE A-2.



Caution – Do not insert a disk drive into a tray by pushing on its housing until it is all the way in. This can cause the handle to be stuck in the "up" position so it is unable to close.

FIGURE A-3 shows the wrong way to insert the drive.

FIGURE A-3 Incorrect Way to Insert Disk Drive

APPENDIX **B**

Using DC Power

This appendix describes using the DC Power Unit for the Sun StorageTek 6140 array in the following sections:

DC Power Overview

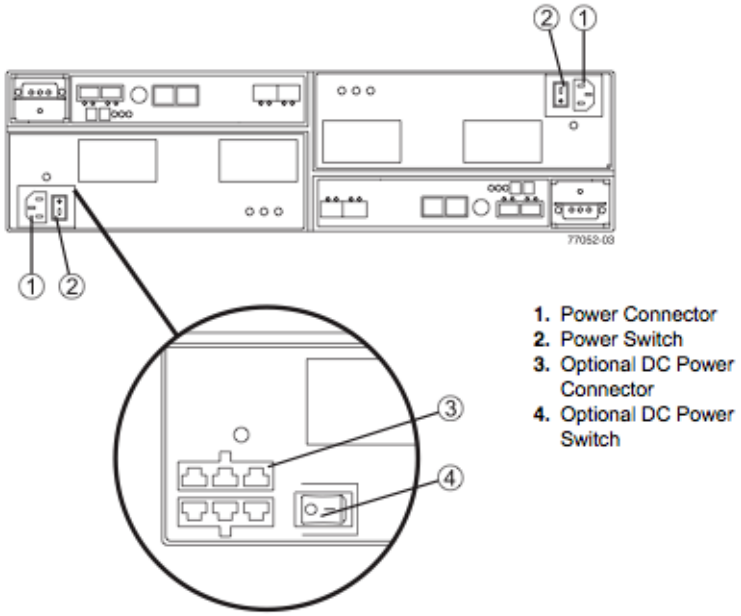
The Sun StorageTek 6140 array can be ordered with a DC power connection and connector cables.

Caution – A qualified service person is required to make the DC power connection per NEC and CEC guidelines. A two-pole 20-amp circuit breaker is required between the DC power source and the array module for over-current and short-circuit protection. Before turning off any power switches on a DC-powered module, you must disconnect the two-pole 20-amp circuit breaker.

Caution – Electrical grounding hazard – This equipment is designed to permit the connection of the D.C. supply circuit to the earthing conductor at the equipment.

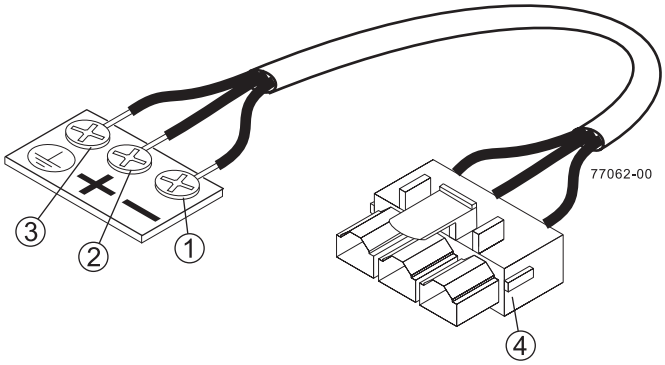
FIGURE B-1 shows the DC Power Connectors and DC Power Switch.

FIGURE B-1 DC Power Connectors and DC Power Switch.



Caution – Risk of electrical shock – This unit has more than one power source. To remove all power from the unit, all DC MAINS must be disconnected by removing all power connectors (item 4 in Appendix FIGURE B-2) from the power supplies.

FIGURE B-2 DC Power Connector Cable and Source Wires



1. Supply (Negative), Brown Wire, –48 VDC
2. Return (Positive), Blue Wire
3. Ground, Green/Yellow Wire
4. DC Power Connector

Site Preparation for DC Power

This section updates the Sun StorageTek 6140 Array Site Preparation Guide with information regarding site power and wiring, power requirements (–48 VDC), and power cord routing instructions for the Sun StorageTek 6140 array:

- "Site Wiring and Power" on page 41
- "DC Power Input" on page 42
- "DC Power Connector Cables and Source Wires" on page 43

Site Wiring and Power

The Sun StorageTek 6140 array uses wide-ranging, redundant power supplies that automatically accommodate voltages to the AC power source or the optional –48-VDC power source.

The power supplies meet standard voltage requirements for both North American (USA and Canada) operation and worldwide (except USA and Canada) operation. The power supplies use standard industrial wiring with line-to-neutral or line-to-line power connections.

Note – Power for the optional –48-VDC power configuration is supplied by a centralized DC power plant instead of the AC power source in the cabinet. Refer to the associated manufacturer's documentation for specific DC power source requirements.

Consider the following information when preparing the array's installation site:

- Protective ground – Site wiring must include a protective ground connection to the AC power source or the optional –48-VDC power source.

Note – Protective ground is also known as safety ground or chassis ground.

- Circuit overloading

  Power circuits and associated circuit breakers must provide sufficient power and overload protection. To prevent possible damage to the array, isolate their power source from large switching loads (such as air- conditioning motors, elevator motors, and factory loads).
- Interruptions:
  - Input transient – 50 percent of the nominal voltage
  - Duration – One-half cycle
  - Frequency – Once every 10 seconds
- Power failures – If a total power failure occurs, the array automatically performs a power-on recovery sequence without operator intervention after power is restored.

DC Power Input

The DC power source must provide the correct voltage, current, and frequency specified on the array nameplate label and the serial number label.

The DC power limits within which the Sun StorageTek 6140 array can run without interruption include the following:

- Nominal voltage
  - Low range: –36 VDC
  - High range: –72 VDC
- Operating current: 15.8 A maximum

DC Power Connector Cables and Source Wires

The Sun StorageTek 6140 array is shipped with –48-VDC power connector cables if the DC power option is ordered. The power connector cable plugs into the DC power connector on the back of the array (Figure 6-3 on page 6-3). The three source wires on the other end of the power connector cable connect the array to centralized DC power plant equipment, typically through a bus bar above the cabinet. A qualified service person is required to make this DC power connection. FIGURE B-2 shows the DC connector cable and the source wires.

Two (or optionally, four) DC power connector cables are provided with each array. There are two DC power connectors on the back of each array's two DC power supplies if additional redundancy is required.

Note – It is not mandatory that the second DC power connection on the array's DC power supplies be connected. The second DC power connection is provided for additional redundancy only and may be connected to a second DC power bus.

Additional DC Specifications

The following are specifications for DC power for a fully populated controller or expansion module:

Heat Output: 445 Watts (1519 BTU/Hr) using DC Power Source (NEBS)

Safety and Emissions: EN 300 386 (NEBS)

Installation Notes for DC Power

The sections that follow update the Sun StorageTek 6140 Array Hardware Installation Guide for DC power.

Ship Kit Changes

If the DC power option is ordered, two DC power connector cables are provided with each controller tray for connection to centralized DC power plant equipment.

Two additional DC power connector cables should be ordered if additional redundancy is required.

Caution – A qualified service person is required to make the DC power connection per NEC and CEC guidelines. A two-pole 20-amp circuit breaker is required between the DC power source and the array module for over-current and short-circuit protection. Before turning off any power switches on a DC-powered module, you must disconnect the two-pole 20-amp circuit breaker.

DC Power LEDS

The following table lists the LEDs for DC power.

TABLE B-1 Lights on the Array Module

Light	Symbol	Location (CRUs)	Function
DC Power (Optional)	DC ⎓	Power-fan **Note -** Light is directly above or below DC power switch and DC power connector	Indicates the power supply is receiving DC input power
Direct Current (DC) Enabled	DC ⎓	Power-fan	Indicates the power supply is outputting DC power

DC Power Caution When Link Rate Switching

Caution – Change the Link Rate switch only when there is no power applied to the controller tray. The link rate setting is read only at power-on. Before turning off any power switches on a DC-powered tray, you must disconnect the two-pole 20-amp circuit breaker.

Connecting Power Cables

To use the DC power option (–48-VDC) to power the array module, review the following points.

- Ensure that you use a separate power source for each optional DC power connector on the array module. Connecting to independent power sources maintains power redundancy.
- It is not mandatory that the second DC power connection on each of the array module's DC power-fan CRUs be connected. The second DC power connection is for additional redundancy only and may be connected to a second DC power bus.

Caution – A qualified service person is required to make the DC power connection per NEC and CEC guidelines. A two-pole 20-amp circuit breaker is required between the DC power source and the array module for over-current and short-circuit protection. Before turning off any power switches on a DC-powered module, you must disconnect the two-pole 20-amp circuit breaker.

Caution – Ensure that you do not turn on power to the array module or the connected drive modules until this guide instructs you to do so. For the proper procedure for turning on the power, see "'Connecting Power Cables" on page 45."

Caution – Electrical grounding hazard – This equipment is designed to permit the connection of the D.C. supply circuit to the earthing conductor at the equipment.

▼ Connecting the Cables

1. **Disconnect the two-pole 20-amp DC circuit breaker for the storage array.**
2. **Ensure that all DC power switches on the DC-powered array module and all DC power switches on any connected, DC-powered drive modules are turned off.**
3. **Connect the DC power connector cable to the DC power connector on the back of the array module.**

Caution – The three source wires on the DC power connector cable (–48 VDC) connect the array module to centralized DC power plant equipment, typically through a bus bar located above the cabinet.

Note – It is not mandatory that the second DC power connection on each of the array module's DC power-fan CRUs be connected. The second DC power connection is for additional redundancy only and may be connected to a second DC power bus.

4. **A qualified service person is required to make the DC power connection per NEC and CEC guidelines. A two-pole 20-amp circuit breaker is required between the DC power source and DC-powered modules for over-current and short-circuit protection. Connect the DC power source wires on the other end of the DC power connector cable to the centralized DC power plant equipment as follows (see** "DC Power Connector Cable and Source Wires" on page 41**).**

   a. **Connect the brown –48-VDC supply wire to the negative terminal.**

   b. **Connect the blue return wire to the positive terminal.**

   c. **Connect the green/yellow ground wire to the ground terminal.**

5. **If applicable, connect a DC power cable to each DC-powered drive module in the storage array.**

Turning Off the DC Power During an Emergency

Caution – Potential loss of data – An emergency shutdown of the storage array might not allow the server to complete its I/O to the storage array.

Note – Trays in storage arrays can be connected to either the standard AC power supply or the optional DC power supply (–48 VDC).

Note – Before turning off the power switches on a DC-powered tray you must disconnect the two-pole 20-amp circuit breaker.

Relocation Cautions

Use the following guidelines when relocating trays or drives from one storage array to another.

Caution – Potential data loss – Moving a array or array components that are configured as part of a volume group can result in data loss. To prevent data loss, always consult a Customer Support representative before relocating configured drives, controller trays or expansion trays.

Note – Trays in arrays can be connected to the DC power supply (–48 VDC). Before turning off any power switches on a DC-powered tray, you must disconnect the two-pole 20-amp circuit breaker.

Do not move controller trays or expansion trays that are part of a volume group configuration. If you must move array components, contact a Customer Support representative for procedures. A Customer Support representative might direct you to complete several tasks prior to undertaking the relocation. These tasks might include:

- Creating, saving, and printing an array profile of each storage array that is affected by the relocation of a drive or tray.
- Performing a complete backup of all data on the drives that you intend to move.
- Verifying that the volume group and each of its associated volumes on the affected array have an Optimal status.
- Determining the location and status of any global hot spares associated with the affected storage array.

APPENDIX **C**

Preparing the Two-Post Telco Rack

Use the procedures in this chapter to install trays in a standard Telco rack. (You can use the existing universal rack kit and procedures to install the Sun StorageTek 6140 array in a four-post Telco rack.) The number of trays you need to install depends on your overall storage requirements. You can install a maximum of eight, one controller tray and up to seven expansion trays, in a third-party Telco rack.

This chapter describes the process of installing Sun StorageTek 6140 trays. It contains the following sections:

The installation procedures in this chapter require the following items:

- #2 Phillips screwdriver
- #3 Phillips screwdriver
- Flathead screwdriver
- Antistatic protection

Caution – Electrostatic discharge can damage sensitive components. Touching the array or its components without using a proper ground might damage the equipment. To avoid damage, use proper antistatic protection before handling any components.

Preparing the Telco Rack

Install the rack as described in the installation instructions provided by the manufacturer.

Note – Sun Microsystems makes no warranties or guaranties as to fit, form, or function of the Sun StorageTek 6140 array installed in third-party racks or cabinets. It is the customer's responsibility to ensure that the rack or cabinet can house the Sun StorageTek 6140 array in all conditions that may exist. All racks and cabinets must comply with local building and construction codes.

Populating a rack with trays starting from the bottom and moving up distributes the weight correctly in the cabinet.

Attaching the Rails to a Telco 2-Post Rack

This procedure describes how to attach the rackmount rail kit to a Telco 2-post frame. You can use rack rails with a depth of 3-to-6 inches.

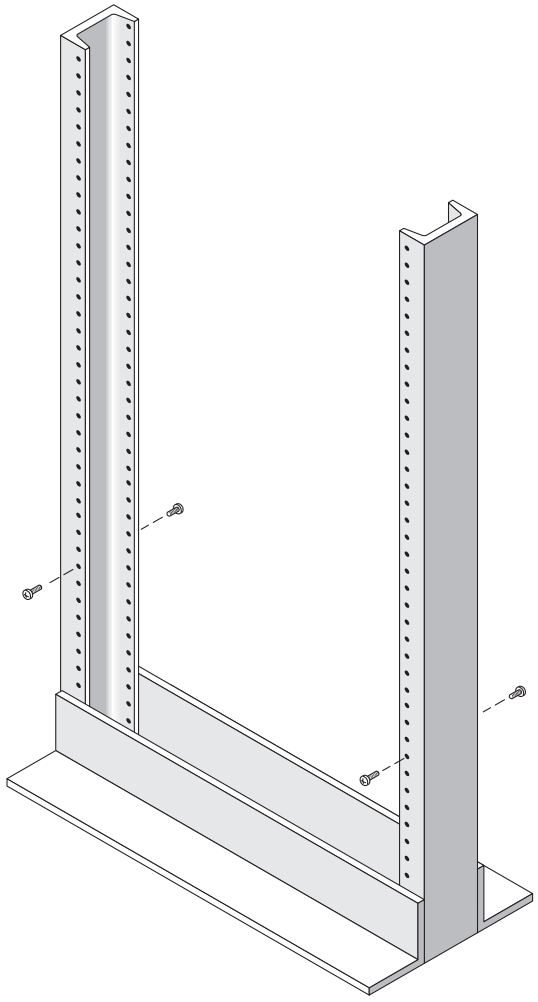
You will mount each tray with its horizontal center aligned with the frame of the Telco 2-post rack.

1. **Loosely adjust the rail length to accommodate the length of the array.**

1. **Insert four (12-24 or 10-32) screws (one in each post side) in the front and back mounting holes of the right and left posts (**FIGURE C-1**). Do not tighten at this time.**

   Use the lowest available mounting hole at the bottom of each post that can be aligned with the top mount slot on the rail. The mount slot allows the rail to hang over the screw. Make sure that all four screws are aligned and mounted at the same height.

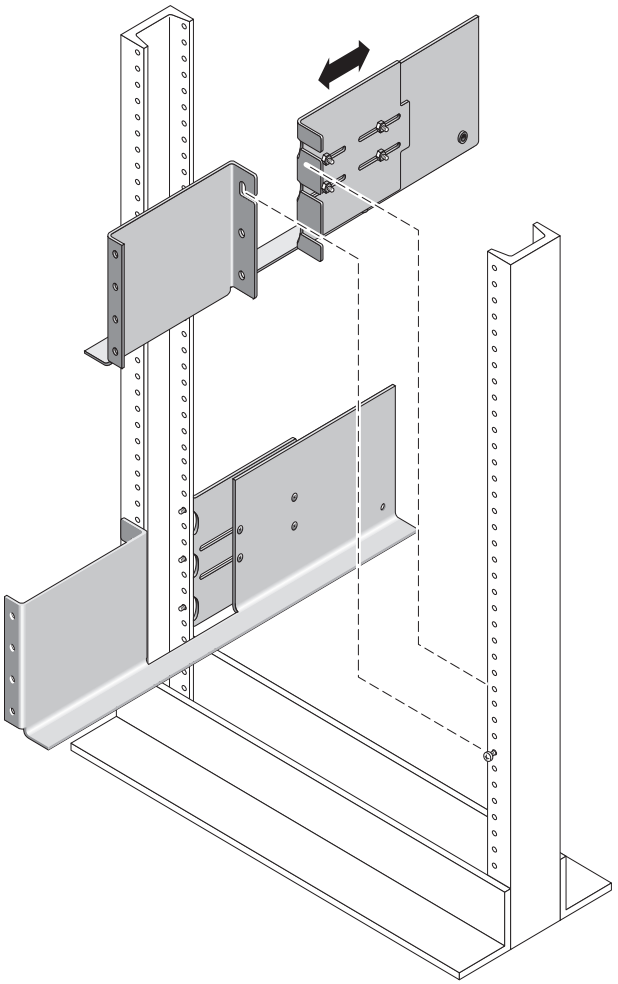
FIGURE C-1 Inserting Screws in the Front and Back Mounting Holes



2. **Align the open slot of the left mounting rail over the front and back screws of the left post, and press the rail down until it is seated over the screws (FIGURE C-2). Repeat for the right rail.**

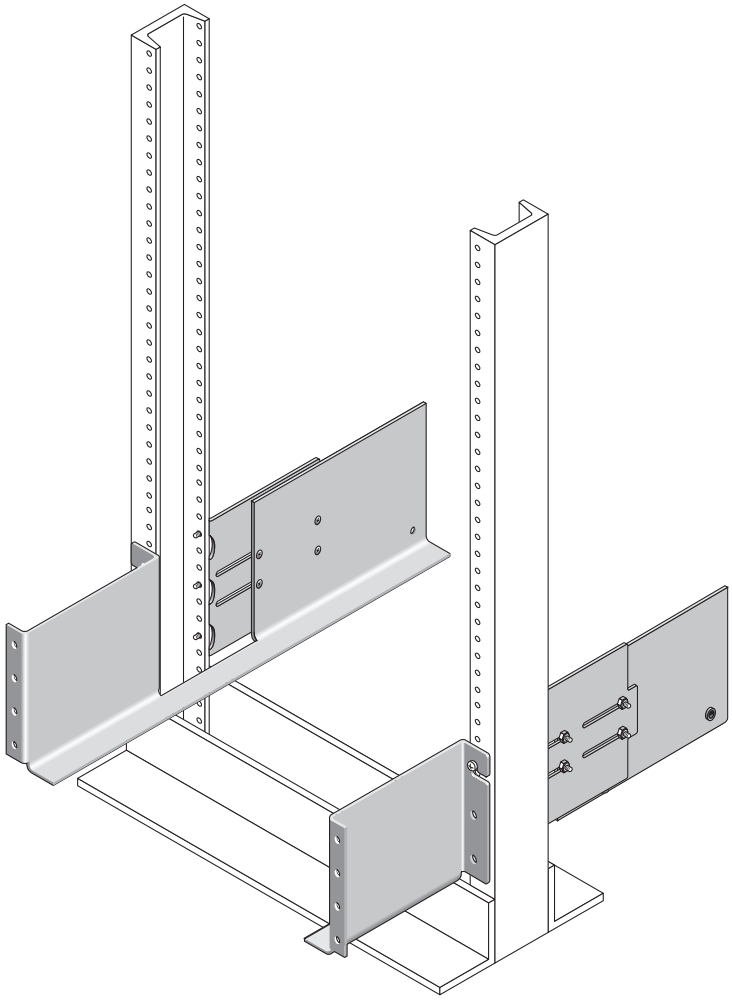
FIGURE C-2 Seating the Mounting Rails Over the Front and Back Screws

FIGURE C-3 Inserting Screws in the Lower Mounting Holes

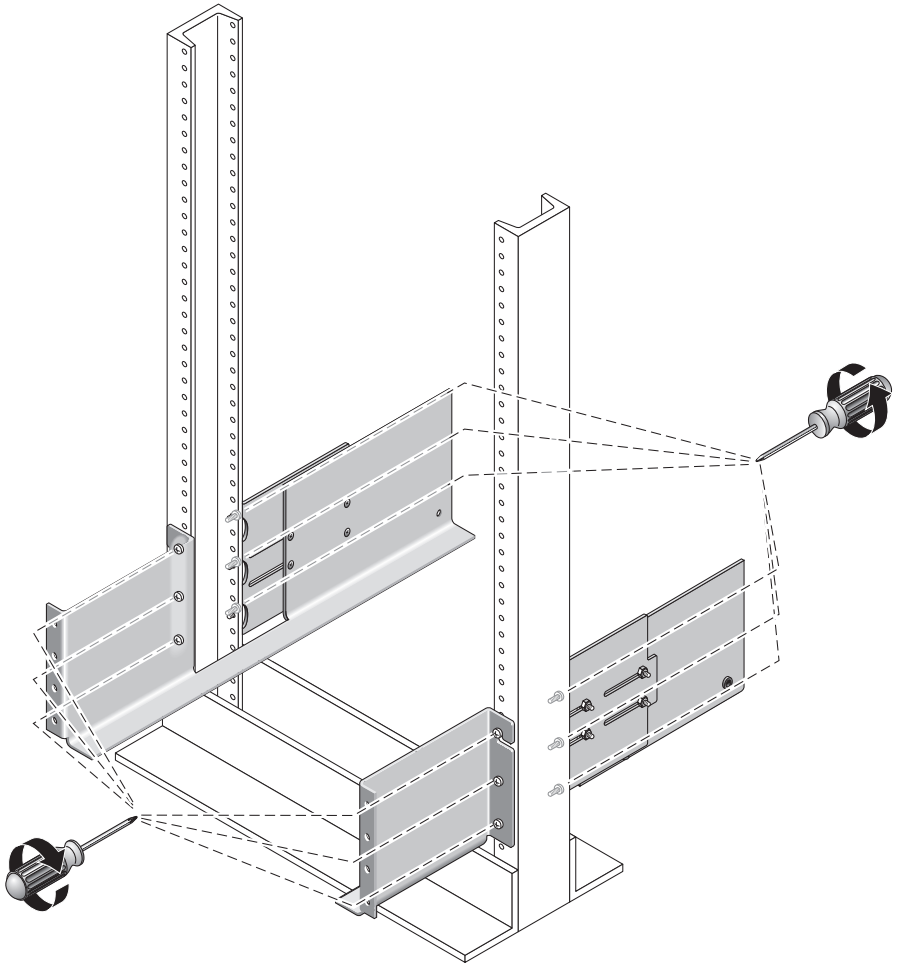


3. **Insert eight more (12-24 or 10-32) screws (two in each post side) in the lower mounting holes at the front and back of the left and right rails (**FIGURE C-3**).**

FIGURE C-4 Securing Each Rail to its Post



4. **Using the #3 Phillips screwdriver, tighten all twelve screws (three on each side of a post) at the front and back of both mounting rails to secure each rail to its post (**FIGURE C-3**).**

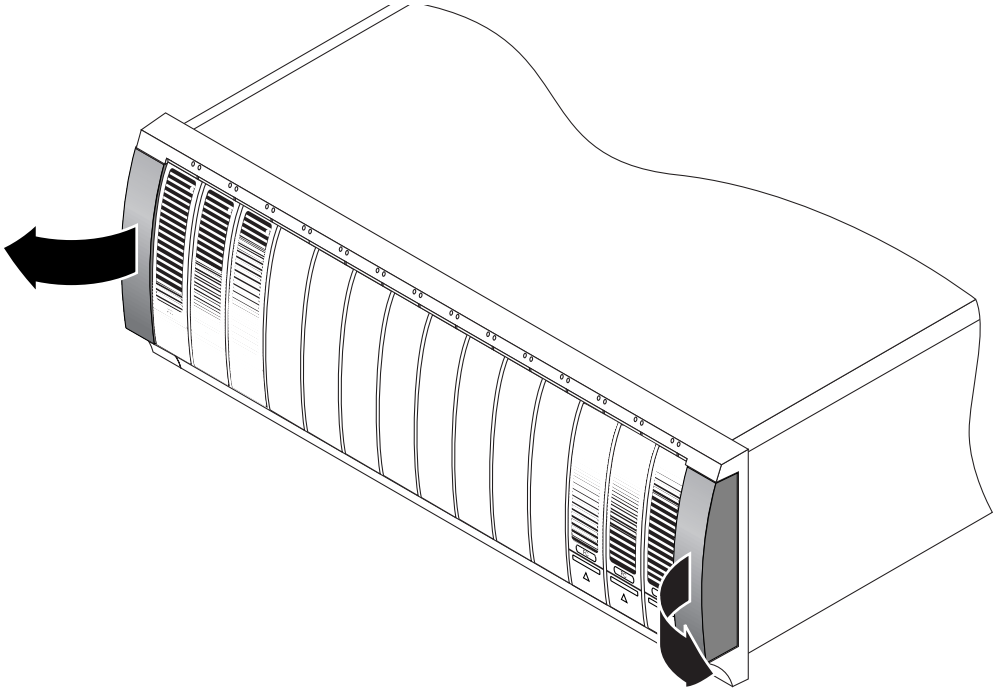


Installing a Tray in a Telco 2-Post Rack

When installing a tray in a Telco 2-post rack, follow these instructions:

1. **Unsnap and remove the left and right end caps on the tray to permit access to the screw mounting holes (**FIGURE C-5**).**

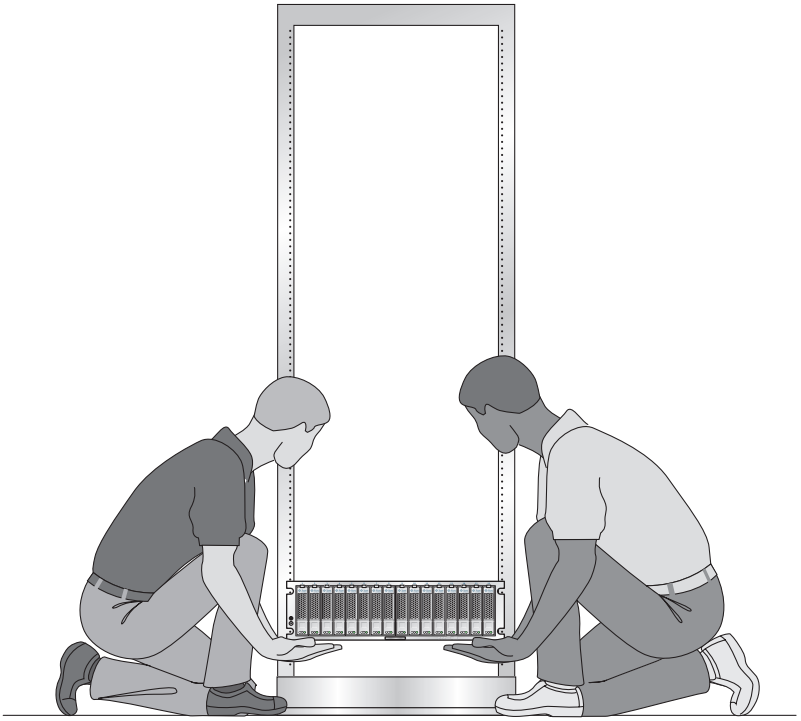
FIGURE C-5 Removing the End Caps on the Tray



2. **Using two people, one at each side of the tray, carefully lift and rest the tray on the bottom ledge of the left and right rails (**FIGURE C-6**).**

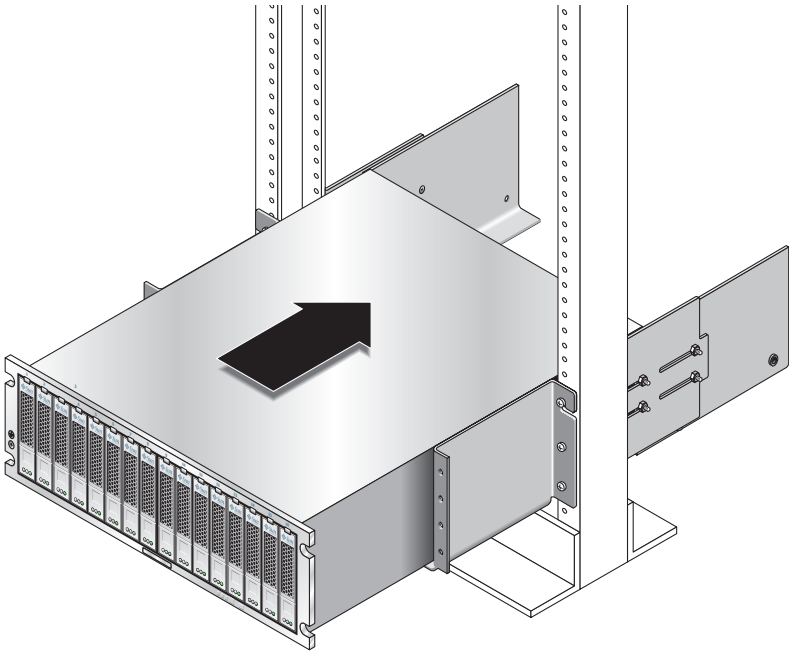
Caution – Use care to avoid injury. An tray can weigh up to 95 pounds (45 kg).

FIGURE C-6 Positioning the Tray in the Rack



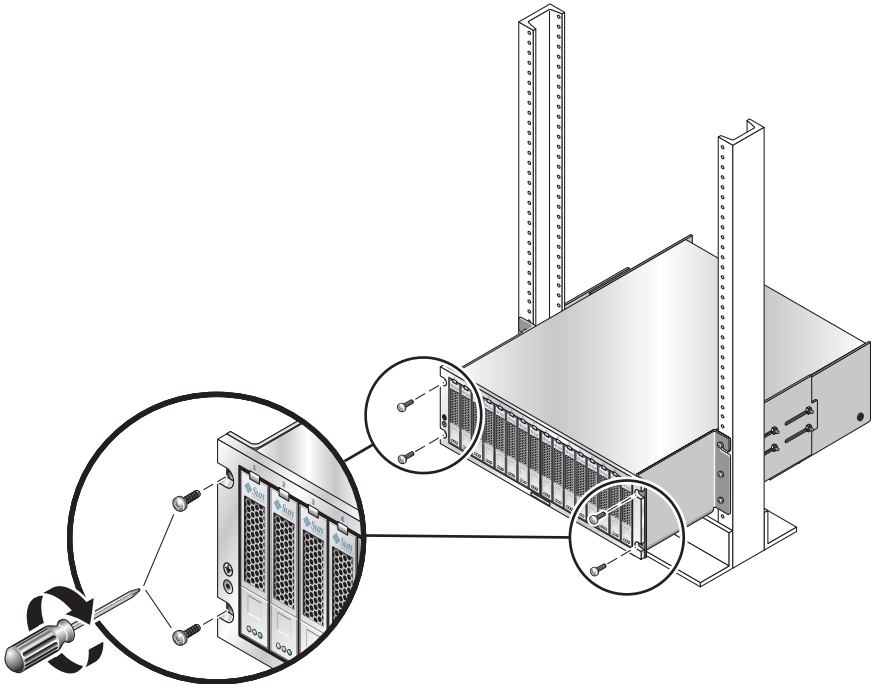
3. **Carefully slide the tray onto the mounting rails until the front bezel of the tray contacts the rail flange on each side (**FIGURE C-7**).**

FIGURE C-7 Sliding the Tray Into the Rack



4. **Use the #2 Phillips screwdriver to insert and tighten four 10-32 x 1/2 screws, washers, and nuts (two each per side) to secure the tray to the front of the rack (**FIGURE C-8**).**

FIGURE C-8 Securing the Tray to the Front of the Rack



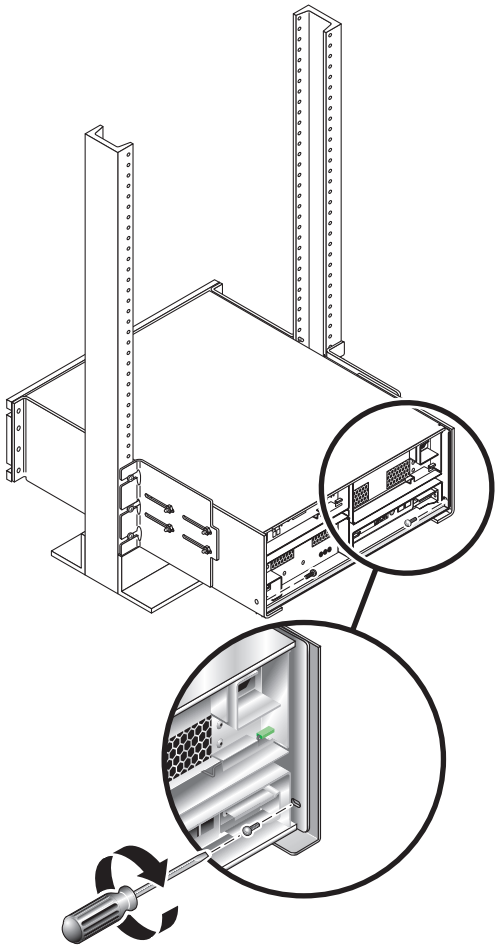
5. **Replace the left and right end caps to hide the front mounting screws.**

   The end caps snap onto the front bezel of the tray.

6. **At the back of the tray, make a final adjustment to the rail lengths to align the back mounting points (**FIGURE C-9**) on the rail and array.**

7. **At the back of the tray, use the flathead screwdriver to install and tighten two 6-32 flat-head screws (one per side) through the back mounting points (**FIGURE C-9**).**

FIGURE C-9 Securing the Tray to the Back of the Rack



8. **Tighten the four10-32 locknuts (two on each rail) on each rail extension to secure the rail length.**

FIGURE C-10 Tightening the Locknuts on the Rail Extension.