



# Sun StorageTek™ 6140 Array Release Notes

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Release 6.5.0

Sun Microsystems, Inc.  
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# Contents

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<b>1. Sun StorageTek 6140 Array Release Notes</b>	<b>1</b>
For Information About CAM	1
For Related Patch Information	2
What's In This Firmware Release	2
Sun StorageTek 6140 Array Features	3
6140 Array Ship Kit Contents	4
Management Software	4
Array Expansion Module Support	5
Licenses For Optional Premium Features	5
System Requirements	6
Disk Drives and Tray Capacity	6
Data Host Requirements	7
Multipathing Software	7
Supported Host Bus Adaptors (HBAs)	9
Supported Enterprise Software	15
Supported FC and Multilayer Switches	16
Installing Firmware	16
Upgrading Array Firmware	16
Troubleshooting Upgrade Failures	18

To Upgrade the Firmware on the Array	18
Updating the SSD Driver for the Solaris OS	18
To Update the SSD Driver for the Solaris 8 OS	19
To Update the SSD Driver for the Solaris 9 OS	19
Known Issues	20
Installation and Initial Configuration Issues	20
Hardware and Firmware Issues	20
Documentation Issues	22
Operational Information	24
Release Documentation	27
Service Contact Information	29
Third-Party Web Sites	29
<b>A. Disk Drive Insertion</b>	<b>31</b>
<b>B. Using DC Power</b>	<b>35</b>
DC Power Overview	35
Site Preparation for DC Power	37
Site Wiring and Power	37
DC Power Input	38
DC Power Connector Cables and Source Wires	39
Additional DC Specifications	39
Installation Notes for DC Power	39
Ship Kit Changes	40
DC Power LEDES	40
DC Power Caution When Link Rate Switching	40
Connecting Power Cables	41
Connecting the Cables	41
Turning Off the DC Power During an Emergency	42

Relocation Cautions 42

**C. Preparing the Two-Post Telco Rack 45**

Preparing the Telco Rack 46

Attaching the Rails to a Telco 2-Post Rack 46

Installing a Tray in a Telco 2-Post Rack 50



# Sun StorageTek 6140 Array Release Notes

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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:

- “What’s In This Firmware Release” on page 2
- “Sun StorageTek 6140 Array Features” on page 3
- “Licenses For Optional Premium Features” on page 5
- “System Requirements” on page 6
- “Installing Firmware” on page 16
- “Known Issues” on page 20
- “Release Documentation” on page 27
- “Service Contact Information” on page 29
- “Service Contact Information” on page 29
- “Third-Party Web Sites” on page 29

## 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](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~cam6.5?1=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.

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## What's In This Firmware Release

Array controller firmware version 07.60.xx.xx includes bug fixes and data host support for SUSE Linux Enterprise 11 platforms.

The firmware is provided with Sun StorageTek Common Array Manager (CAM) v. 6.5.0 or available for download at:

[http://www.sun.com/storage/management\\_software/resource\\_management/cam](http://www.sun.com/storage/management_software/resource_management/cam)

Click the "Get It" tab to download the latest CAM software.

For more information about bug fixes, see the *Sun StorageTek Common Array Manager Release Notes, 6.5.0*. See "[Installing Firmware](#)" on [page 16](#) for details about upgrade paths.



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# 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](#) compares the 2 Gbyte cache and 4 Gbyte cache array configurations.

**TABLE 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 25](#))
  - 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.

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

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Refer to “[Upgrading Firmware for Adding Expansion Trays](#)” in the Sun StorageTek Common Array Manager Release Notes, v. 6.5.0 (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 16.

TABLE 2 lists the supported expansion modules.

**TABLE 2** Supported Expansion Modules—6000 Series Arrays

Array Controller	Original Supported Expansion Modules	Supported Expansion Modules with Controller Firmware 06.19.25.10 (or higher)
Sun StorageTek 6140 Array	CSM200	CSM100, CSM200

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## Licenses For Optional Premium Features

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

See the *Sun StorageTek Common Array Manager Software Release Notes, v. 6.5.0* for more information about premium features that are available for the Sun StorageTek 6140 Array.

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# 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 6](#)
- [“Data Host Requirements” on page 7](#)

## Disk Drives and Tray Capacity

[TABLE 3](#) 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 3** 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” on page 7](#)
- [“Supported Host Bus Adaptors \(HBAs\)” on page 9](#)
- [“Supported Enterprise Software” on page 15](#)
- [“Supported FC and Multilayer Switches” on page 16](#)

## Multipathing Software

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

For Solaris™ Operating System (OS) 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 4](#) lists supported multipathing software by operating system.

**TABLE 4** Multipathing Software

OS	Multipathing Software	Minimum Version	Latest Version	Host Type Setting	Notes
Solaris 9 SPARC	STMS/MPxIO	SFK 4.4.13	SFK 4.4.14	Solaris with MPxIO	
Solaris 10	STMS/MPxIO	Update 6 or Update 5 with patch 140919-04 (SPARC), 140920-04 (x64/x86)	Kernel Jumbo Patch (KJP)	Solaris with MPxIO	
Solaris 9,10 with DMP	Symantec Veritas Dynamic Multi-Pathing (DMP)	5.0MP3	5.0MP3	Solaris with DMP	
Windows 2003 Non-clustered	MPIO	01.03.0302.0215	01.03.0302.0215 (MPIO)	Windows 2003 Non-clustered	
Windows MSCS Cluster	MPIO	01.03.0302.0215	01.03.0302.0215 (MPIO)	Windows Server 2003 Clustered	

**TABLE 4** Multipathing Software (Continued)

OS	Multipathing Software	Minimum Version	Latest Version	Host Type Setting	Notes
Windows 2003 Non-clustered with DMP	DMP	5.0MP3	5.1	Windows Server 2003 Non- clustered (with Veritas DMP)	Pending vendor qualification, see Symantec's HCL
Windows 2003 Clustered with DMP	DMP	5.0MP3	5.1	Windows Server 2003 clustered (with Veritas DMP)	Pending vendor qualification, see Symantec's HCL
Windows 2008	MPIO	01.03.0302.0215	01.03.0302.0215	Windows Server 2008	
AIX 6.1	Cambex DPF	6.1.0.63	6.1.0.63	AIX	
AIX 5.3, 6.1 with DMP	DMP	5.0	5.0MP3	AIX with DMP	Pending vendor qualification, see Symantec's HCL
Red Hat 4 SuSE 9/SuSE 10	RDAC/MPP	09.09.B02.0214	09.09.B02.0214	Linux	
Red Hat 5 SuSE 10 SP1 (and above)	RDAC/MPP	09.03.0C00.0042	09.09.0C02.0214	Linux	
Red Hat 5 (and above)	RDAC	09.03.0C00.0042	09.09.0C02.0214	Linux	
Red Hat SuSE with DMP	DMP	5.0MP3	5.0MP3	Linux with DMP	Pending vendor qualification, see Symantec's HCL
HPUX	Veritas DMP	5.0MP3	5.0MP3	HP-UX	Pending vendor qualification, see Symantec's HCL

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**Note** – Download the MPIO and RDAC multipathing drivers from the Sun Download Center <http://www.sun.com/download/index.jsp?tab=2>.

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**Note** – The multipathing driver for the IBM AIX platform is Veritas DMP, bundled in Veritas Storage Foundation 5.0 for Sun StorageTek 6140 Array. Download the Array Support Library (ASL) from <http://support.veritas.com/>.

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## Supported Host Bus Adaptors (HBAs)

[TABLE 5](#), [TABLE 6](#), and [TABLE 7](#) 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:

[http://www.sun.com/storagetek/storage\\_networking/hba/](http://www.sun.com/storagetek/storage_networking/hba/)

You can download HBA drivers and other host software from the Sun Download Center at:

<http://www.sun.com/software/download/>

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

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

**TABLE 5** 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 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 140919-04	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 140920-04	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 6** 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)	QLogic QLE 256x	SG-XPCI1FC-EM2	SG-XPCIE1FC-QF4	SG-XPCIE1FC-QF8-Z	
	QLogic QLE 246x	SG-XPCI2FC-EM2	SG-XPCIE2FC-QF4	SG-XPCIE2FC-QF8-Z	
	QLogic QLA 246x	SG-XPCI1FC-QL2	SG-XPCIE1FC-EM4	SG-XPCIE1FC-EM8-Z	
	QLogic QLA 234x	SG-XPCI2FC-QF2-Z	SG-XPCIE2FC-EM4	SG-XPCIE2FC-EM8-Z	
	QLogic QLA 2310F		SG-XPCI1FC-QF4		
	Emulex		SG-XPCI2FC-QF4		
	LPe12000/LPe12002/LPe1250		SG-XPCI1FC-EM4		
	Emulex		SG-XPCI2FC-EM4		
	Lpe11000/LPe11002/LPe1150		SG-XPCIE2FCGBE-Q-Z		
	Emulex		SG-XPCIE2FCGBE-E-Z		
64-bit / x64 (AMD) EM64T IA64	LP11000/LP11002/LP1150				
	Emulex LP9802/9802DC/982				
	Emulex LP952/LP9002/LP9002DC				
	Emulex 10000/10000DC/LP1050				
	Microsoft Windows 2003	QLogic QLE 256x	SG-XPCI1FC-EM2	SG-XPCIE1FC-QF4	SG-XPCIE1FC-QF8-Z
	32-bit with SP1 R2 / x86 (IA32)	QLogic QLE 246x	SG-XPCI2FC-EM2	SG-XPCIE2FC-QF4	SG-XPCIE2FC-QF8-Z
		QLogic QLA 246x	SG-XPCI1FC-QL2	SG-XPCIE1FC-EM4	SG-XPCIE1FC-EM8-Z
		QLogic QLA 234x	SG-XPCI2FC-QF2-Z	SG-XPCIE2FC-EM4	SG-XPCIE2FC-EM8-Z
		QLogic QLA 2310F		SG-XPCI1FC-QF4	
		Emulex		SG-XPCI2FC-QF4	
LPe12000/LPe12002/LPe1250			SG-XPCI1FC-EM4		
Emulex			SG-XPCI2FC-EM4		
Lpe11000/LPe11002/LPe1150			SG-XPCIE2FCGBE-Q-Z		
Emulex			SG-XPCIE2FCGBE-E-Z		
LP11000/LP11002/LP1150					
Emulex LP9802/9802DC/982					
Emulex LP952/LP9002/LP9002DC					
Emulex 10000/10000DC/LP1050					

**TABLE 6** 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	SG-XPCI1FC-EM2	SG-XPCIE1FC-QF4	SG-XPCIE1FC-QF8-Z
	QLogic QLE 246x	SG-XPCI2FC-EM2	SG-XPCIE2FC-QF4	SG-XPCIE2FC-QF8-Z
	QLogic QLA 246x	SG-XPCI1FC-QL2	SG-XPCIE1FC-EM4	SG-XPCIE1FC-EM8-Z
	QLogic QLA 234x	SG-XPCI2FC-QF2-Z	SG-XPCIE2FC-EM4	SG-XPCIE2FC-EM8-Z
	QLogic QLA 2310F		SG-XPCI1FC-QF4	
	Emulex		SG-XPCI2FC-QF4	
	LPe12000/LPe12002/ LPe1250		SG-XPCI1FC-EM4	
	Emulex		SG-XPCI2FC-EM4	
	Lpe11000/LPe11002/LPe1150		SG-XPCIE2FCGBE-Q-Z	
	Emulex		SG-XPCIE2FCGBE-E-Z	
	LP11000/LP11002/LP1150			
	Emulex LP9802/9802DC/982			
	Emulex			
	LP952/LP9002/LP9002DC			
	Emulex			
10000/10000DC/LP1050				

**TABLE 7** 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	QLogic QLE 256x	SG-XPCI1FC-EM2	SG-XPCIE1FC-QF4	SG-XPCIE1FC-QF8-Z
SuSE 10.2	QLogic QLE246x	SG-XPCI2FC-EM2	SG-XPCIE2FC-QF4	SG-XPCIE2FC-QF8-Z
SuSE 11	QLogic QLA 246x	SG-XPCI1FC-QL2	SG-XPCIE1FC-EM4	SG-XPCIE1FC-EM8-Z
	QLogic QLA 234x	SG-XPCI2FC-QF2-Z	SG-XPCIE2FC-EM4	SG-XPCIE2FC-EM8-Z
	QLogic QLA 2310F		SG-XPCI1FC-QF4	
	Emulex		SG-XPCI2FC-QF4	
	LP982/LP9802/9802DC		SG-XPCI1FC-EM4	
	Emulex		SG-XPCI2FC-EM4	
	LP9002/LP9002DC/LP952		SG-XPCIE2FCGBE-Q-Z	
	Emulex		SG-XPCIE2FCGBE-E-Z	
	LP10000/10000DC/LP1050			
	Emulex			
	LP11000/LP11002/LP1150			
	Emulex			
	Lpe11000/LPe11002/LPe1150			
	Lpe12000/LPe12002/ Lpe1250			

**TABLE 7** 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	QLogic QLE 256x	SG-XPCI1FC-EM2	SG-XPCIE1FC-QF4	SG-XPCIE1FC-QF8-Z
SuSE 9.0 - IA 32, 2.6 kernel / x64	QLogic QLE246x	SG-XPCI2FC-EM2	SG-XPCIE2FC-QF4	SG-XPCIE2FC-QF8-Z
	QLogic QLA 246x	SG-XPCI1FC-QL2	SG-XPCIE1FC-EM4	SG-XPCIE1FC-EM8-Z
	QLogic QLA 234x	SG-XPCI2FC-QF2-Z	SG-XPCIE2FC-EM4	SG-XPCIE2FC-EM8-Z
EM64T	QLogic QLA 2310F		SG-XPCI1FC-QF4	
x86 (IA32)	Emulex LP982/LP9802/9802DC		SG-XPCI2FC-QF4	
IA64	LP9002/LP9002DC/LP952		SG-XPCI1FC-EM4	
	Emulex LP10000/10000DC/LP1050		SG-XPCIE2FCGBE-Q-Z	
	Emulex LP11000/LP11002/LP1150		SG-XPCIE2FCGBE-E-Z	
	Emulex Lpe11000/LPe11002/LPe1150			
RHEL 5u2	QLogic QLE 256x	SG-XPCI1FC-EM2	SG-XPCIE1FC-QF4	SG-XPCIE1FC-QF8-Z
RHEL 5u3	QLogic QLE 246x	SG-XPCI2FC-EM2	SG-XPCIE2FC-QF4	SG-XPCIE2FC-QF8-Z
	QLogic QLA 246x	SG-XPCI1FC-QL2	SG-XPCIE1FC-EM4	SG-XPCIE1FC-EM8-Z
	QLogic QLA 234x	SG-XPCI2FC-QF2-Z	SG-XPCIE2FC-EM4	SG-XPCIE2FC-EM8-Z
	QLogic QLA 2310F		SG-XPCI1FC-QF4	
	Emulex LP982/LP9802/9802DC		SG-XPCI2FC-QF4	
	Emulex LP9002/LP9002DC/LP952		SG-XPCI1FC-EM4-Z	
	Emulex LP10000/10000DC/LP1050		SG-XPCIE2FCGBE-Q-Z	
	Emulex Lpe11000/LPe11002/LPe1150		SG-XPCIE2FCGBE-E-Z	
	Emulex Lpe12000/LPe12002/ LPe1250			

**TABLE 7** 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
RHEL 4u7	QLogic QLE 256x	SG-XPCI1FC-EM2	SG-XPCIE1FC-QF4	SG-XPCIE1FC-QF8-Z
RHEL 4.8	QLogic QLE 246x	SG-XPCI2FC-EM2	SG-XPCIE2FC-QF4	SG-XPCIE2FC-QF8-Z
	QLogic QLA 246x	SG-XPCI1FC-QL2	SG-XPCIE1FC-EM4	SG-XPCIE1FC-EM8-Z
	QLogic QLA 234x	SG-XPCI2FC-QF2-Z	SG-XPCIE2FC-EM4	SG-XPCIE2FC-EM8-Z
	QLogic QLA 2310F		SG-XPCI1FC-QF4	
	Emulex		SG-XPCI2FC-QF4	
	LP982/LP9802/9802DC		SG-XPCI1FC-EM4-Z	
	Emulex		SG-XPCI2FC-EM4-Z	
	LP9002/LP9002DC/LP952		SG-XPCIE2FCGBE-Q-Z	
	Emulex		SG-XPCIE2FCGBE-E-Z	
	LP10000/10000DC/LP1050			
	Emulex			
	Lpe11000/LPe11002/LPe1150			
	Emulex			
	Lpe12000/LPe12002/			
	Lpe1250			

**TABLE 8** Other Supported Data Host Platforms

Host OS	Host Servers	HBAs
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

**TABLE 8** Other Supported Data Host Platforms (Continued)

HP-UX 11.31	HP RISC IA64	HP A6795A
		HP A6826A
		HP A6684A
		HP A6685A
		HP AB378A
		HP AB379A
		HP AD300A
		HP AD355A
		AH400A (IA64)
		AH401A (IA64)
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 9](#) are compatible with the Solaris OS on the data host.

**TABLE 9** Supported Enterprise Software

Software	Version
Legato NetWorker	7.3
Sun Cluster	3.0, 3.1
Sun StorageTek QFS software	4.0 minimum
Sun StorageTek SAM-FS software	4.0 minimum
Sun StorageTek Availability Suite	3.2 minimum
Sun StorageTek Enterprise Backup Software	7.3

**TABLE 9** Supported Enterprise Software (Continued)

Software	Version
Solaris Volume Manager	Embedded in the Solaris 9 and 10 OSs
VERITAS Storage Foundation (VxVM/VxFS)	5.0
VERITAS Cluster Server (VCS)	5.0
VERITAS NetBackup	6.0 or higher

## Supported FC and Multilayer Switches

The following FC fabric and multilayer switches are compatible for connecting data hosts and 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 16](#)
- [“Updating the SSD Driver for the Solaris OS” on page 18](#)

## Upgrading Array Firmware

New firmware files are included in each release of the Sun StorageTek Common Array Management software, currently Release 6.5.0. 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/storageitek/management\\_software/resource\\_management/cam/get\\_it.html](http://www.sun.com/storageitek/management_software/resource_management/cam/get_it.html)

TABLE 10 lists the available firmware upgrade paths.

TABLE 10 Firmware Upgrade Paths

Current Firmware Revision	Upgrade to Revision	Upgrade Type	Upgrade Performed Using
06.xx	06.60.22.10	Online	CAM (See <a href="#">“To Upgrade the Firmware on the Array” on page 18</a> )
06.14 (or higher)	07.60.xx.xx (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 <i>Sun StorageTek 6000 Series Array Firmware Upgrade Guide</i> ) 2. Upgrade 7.15.11.17 to 7.50.13.10 (or higher) using CAM (See <a href="#">“To Upgrade the Firmware on the Array” on page 18</a> )
07.xx	07.60.xx.xx (or higher)	Online	CAM (See <a href="#">“To Upgrade the Firmware on the Array” on page 18</a> )

\* 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:

- [“Installation and Initial Configuration Issues”](#) on page 20
- [“Hardware and Firmware Issues”](#) on page 20
- [“Documentation Issues”](#) on page 22
- [“Operational Information”](#) on page 24

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 Mb/s/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.

## *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.

## *Installation Documentation Correction Regarding Sun Cluster Support*

**Bug 6417872**—The note on page 77 of the *Sun StorageTek 6140 Array Hardware Installation Guide*, p/n 817-7497, incorrectly states the configuration in Figure 3-4 is not supported for use in a Sun Cluster environment.

**Correction**—Change the text of the note to read:

---

**Note** – The configuration in FIGURE 3-4 is supported for use in a Sun Cluster environment.

---

## *Reset Battery Age Procedure Omitted from Guide*

Bug 6887119—The *Sun Storage 6000 Series Hardware Upgrade Guide*, p/n 820-7003-10, is missing a step for resetting the battery age.

**Correction**—After installing the new controller tray and reconnecting the cables, use the Service Advisor Battery Replacement procedure to reset the battery age.

## *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 to 136 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 to 136 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*



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**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 11** Tray ID Display Status Codes

<b>Value</b>	<b>Description</b>
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 12** Tray ID Display Diagnostic Codes

<b>Value</b>	<b>Controller State</b>	<b>Description</b>
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
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>

<b>Application</b>	<b>Title</b>	<b>Part Number</b>
Site planning information	<i>Sun StorageTek 6140 Array Site Preparation Guide</i>	819-5046
Regulatory and safety information	<i>Sun StorageTek 6140 Array Regulatory and Safety Compliance Manual</i>	819-5047
Installation and initial configuration instructions	<i>Sun StorageTek 6140 Hardware Installation Guide</i>	819-7497
Installation instructions and basic configuration information for the Sun StorageTek Common Array Manager	<i>Sun StorageTek Common Array Manager Software Installation Guide</i>	820-7921
Instructions for installing the Sun StorEdge Expansion cabinet	<i>Sun StorEdge Expansion Cabinet Installation and Service Manual</i>	805-3067
Instructions for installing the Sun Rack 900/1000 cabinets	<i>Sun Rack Installation Guide</i>	816-6386
Instructions for installing the Sun Fire cabinet	<i>Sun Fire Cabinet Installation and Reference Manual</i>	806-2942
Solaris OS 8 and 9 multipathing software information	<i>SAN Foundation Software Release Notes</i>	819-5604-15
Multipath failover guide for Linux OS platforms	<i>Sun StorageTek RDAC Multipath Failover Driver Installation Guide For Linux OS</i>	820-4738
Multipath failover guide for Windows OS platforms	<i>Sun StorageTek MPIO Device Specific Module Installation Guide For Microsoft Windows OS</i>	820-4737
Release-specific information for the Sun StorageTek Common Array Manager	<i>Sun StorageTek Common Array Manager Release Notes, v. 6.5.0</i>	821-0126
Upgrade controller firmware from 6.x to 7.x	<i>Sun StorageTek 6000 Series Array Firmware Upgrade Guide</i>	820-7197
Reference information for the Common Array Manager CLI	<i>Sun StorageTek Common Array Manager CLI Guide</i>	821-0132

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## Service Contact Information

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

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

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## 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.



## 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.

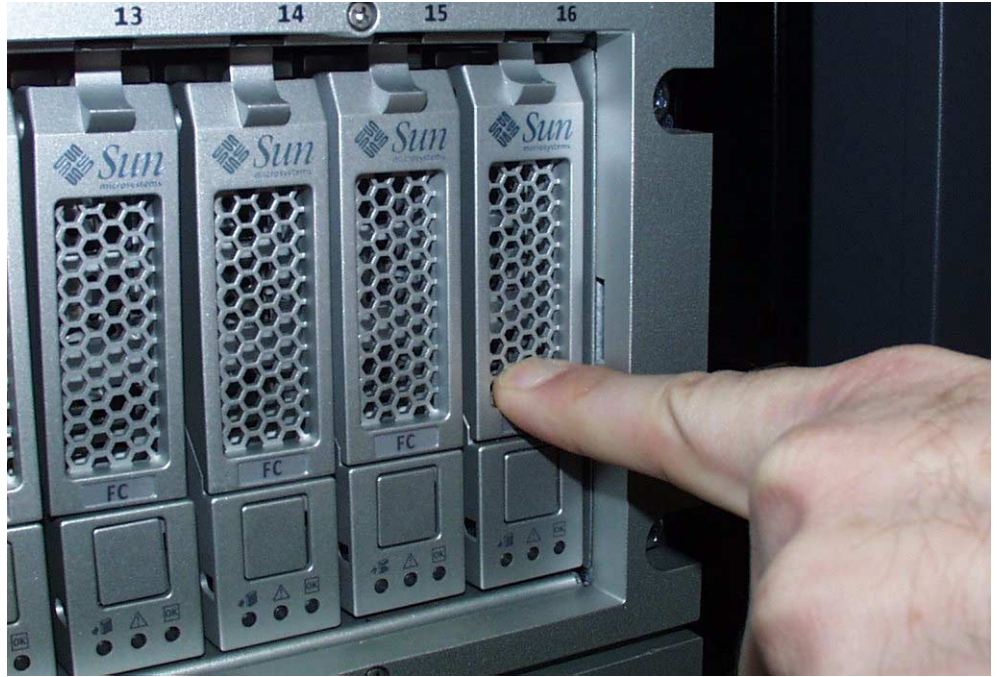
**FIGURE A-1** shows a drive being inserted into the chassis the correct way.

**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](#).



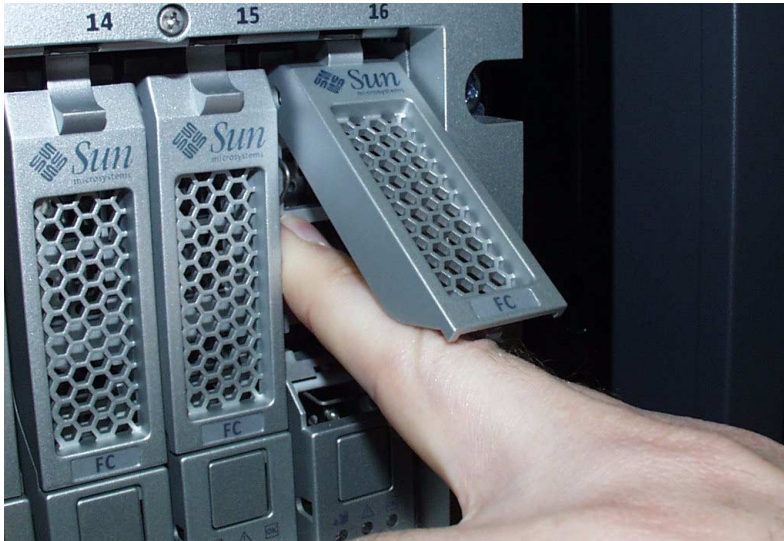
---

**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





## Using DC Power

---

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

- “DC Power Overview” on page 35
- “Site Preparation for DC Power” on page 37
  - “Site Wiring and Power” on page 37
  - “DC Power Input” on page 38
  - “DC Power Connector Cables and Source Wires” on page 39
- “Installation Notes for DC Power” on page 39
  - “Ship Kit Changes” on page 40
  - “DC Power LEDS” on page 40
  - “DC Power Caution When Link Rate Switching” on page 40
  - “Connecting Power Cables” on page 41
  - “Turning Off the DC Power During an Emergency” on page 42
  - “Relocation Cautions” on page 42

---

## 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.

---

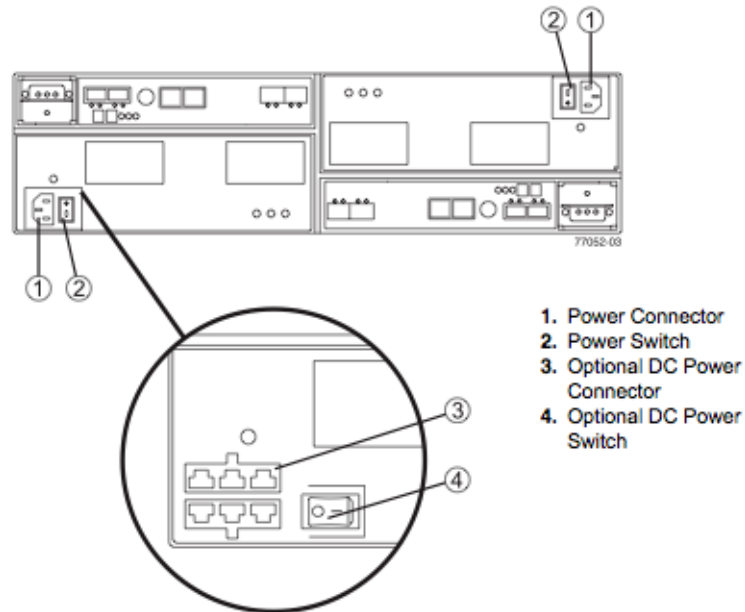
---

**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.

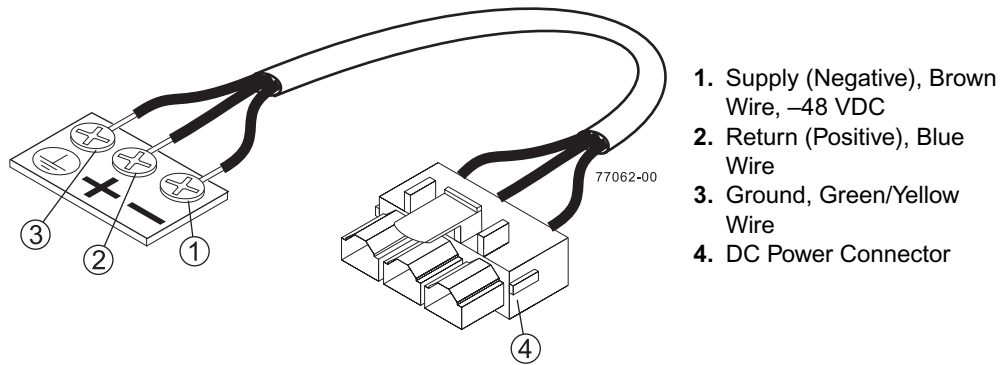


---

**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



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## 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 37](#)
- [“DC Power Input” on page 38](#)
- [“DC Power Connector Cables and Source Wires” on page 39](#)

## 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.

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**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.

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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.

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

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- 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.

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**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.

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## 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)

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## Installation Notes for DC Power

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

- [“Ship Kit Changes” on page 40](#)
- [“DC Power LEDs” on page 40](#)
- [“DC Power Caution When Link Rate Switching” on page 40](#)
- [“Connecting Power Cables” on page 41](#)
- [“Turning Off the DC Power During an Emergency” on page 42](#)
- [“DC Power Caution When Link Rate Switching” on page 40](#)
- [“Relocation Cautions” on page 42](#)

## 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.

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**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.

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## 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)	$\underline{\underline{DC}}$	Power-fan <b>Note</b> - 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	$\underline{\underline{DC}}$	Power-fan	Indicates the power supply is outputting DC power

## DC Power Caution When Link Rate Switching

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**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.

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# 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.

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**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.

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**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 41.](#)”

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**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.

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## 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.

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**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.

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**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.

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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 37).**
  - 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

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**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.

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

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

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## Relocation Cautions

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



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**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.

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**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.

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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.



## Preparing the Two-Post Telco Rack

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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:

- [“Preparing the Telco Rack” on page 46](#)
- [“Attaching the Rails to a Telco 2-Post Rack” on page 46](#)
- [“Installing a Tray in a Telco 2-Post Rack” on page 50](#)

The installation procedures in this chapter require the following items:

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



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**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.

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## Preparing the Telco Rack

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

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**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.

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

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## 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.

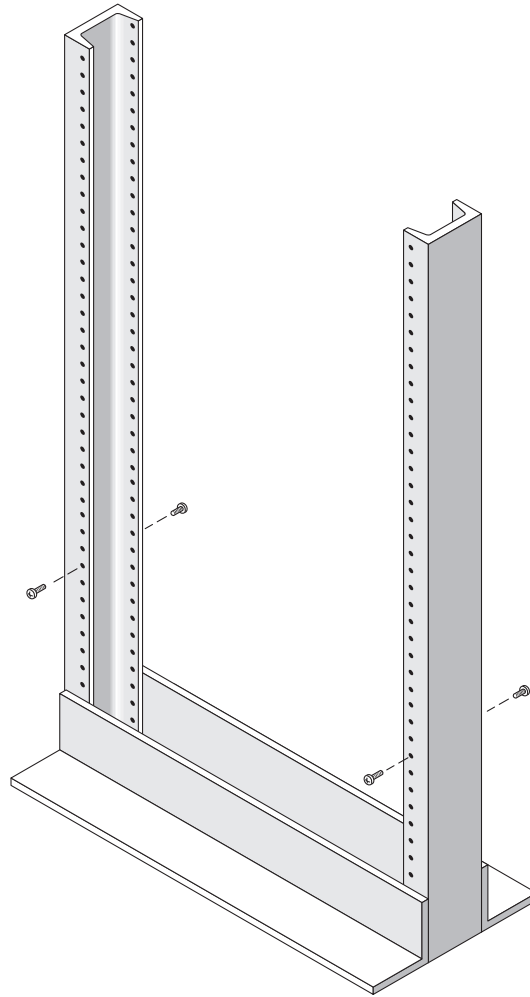
You will mount each tray with its horizontal center aligned with the frame of the Telco 2-post rack.

1. Loosely adjust the rail length to accommodate the length of the array.
2. 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.

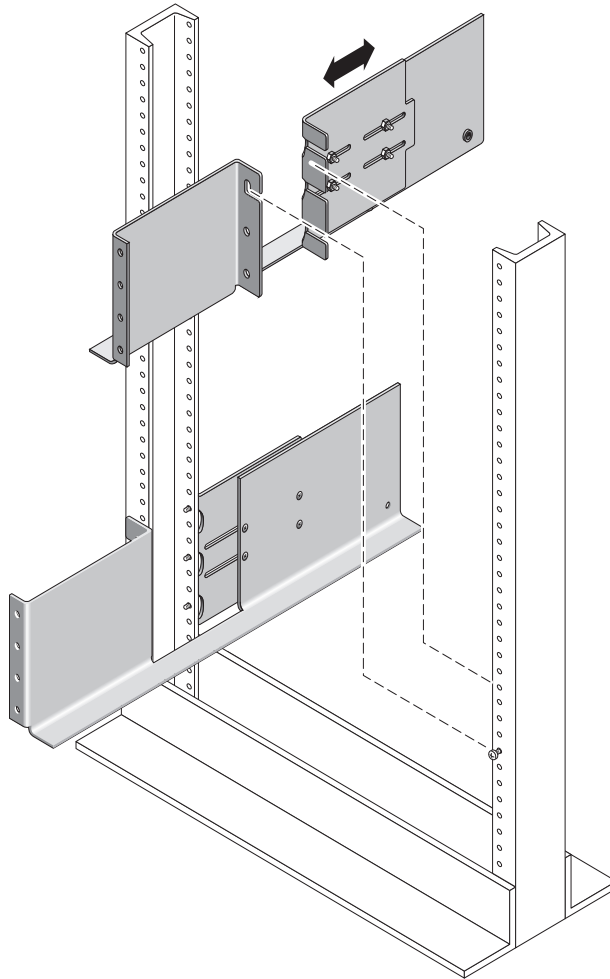
**FIGURE C-1** Inserting Screws in the Front and Back Mounting Holes

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



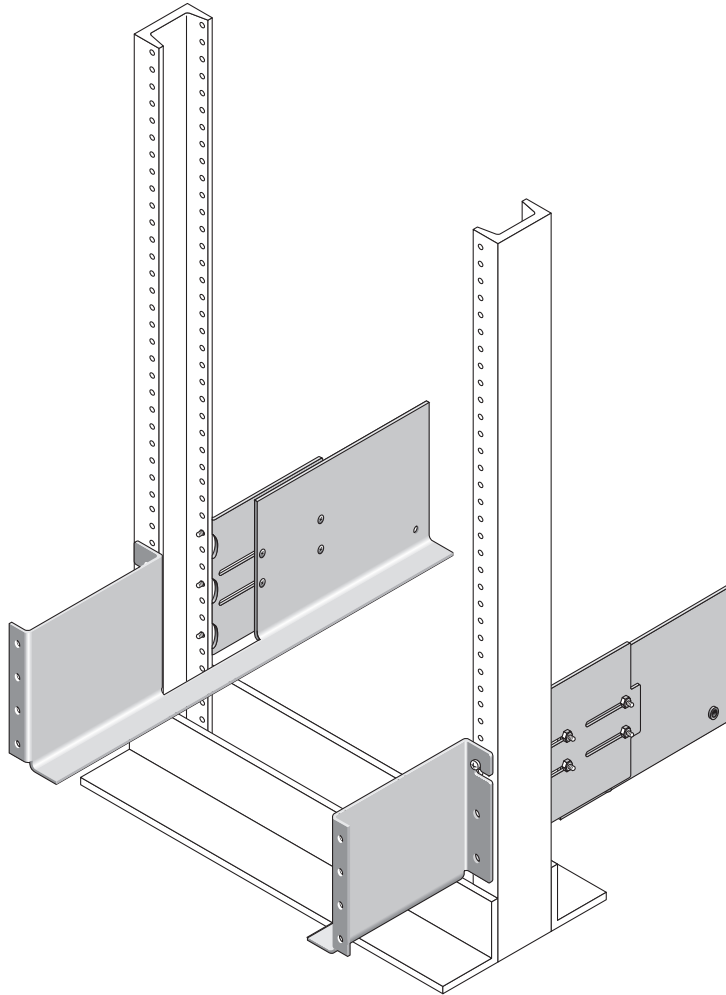
3. Align the open slot of the left mounting rail over the front and back screws of the left post, and press the rail down until it is seated over the screws (FIGURE C-2). Repeat for the right rail.

**FIGURE C-3** Inserting Screws in the Lower Mounting Holes

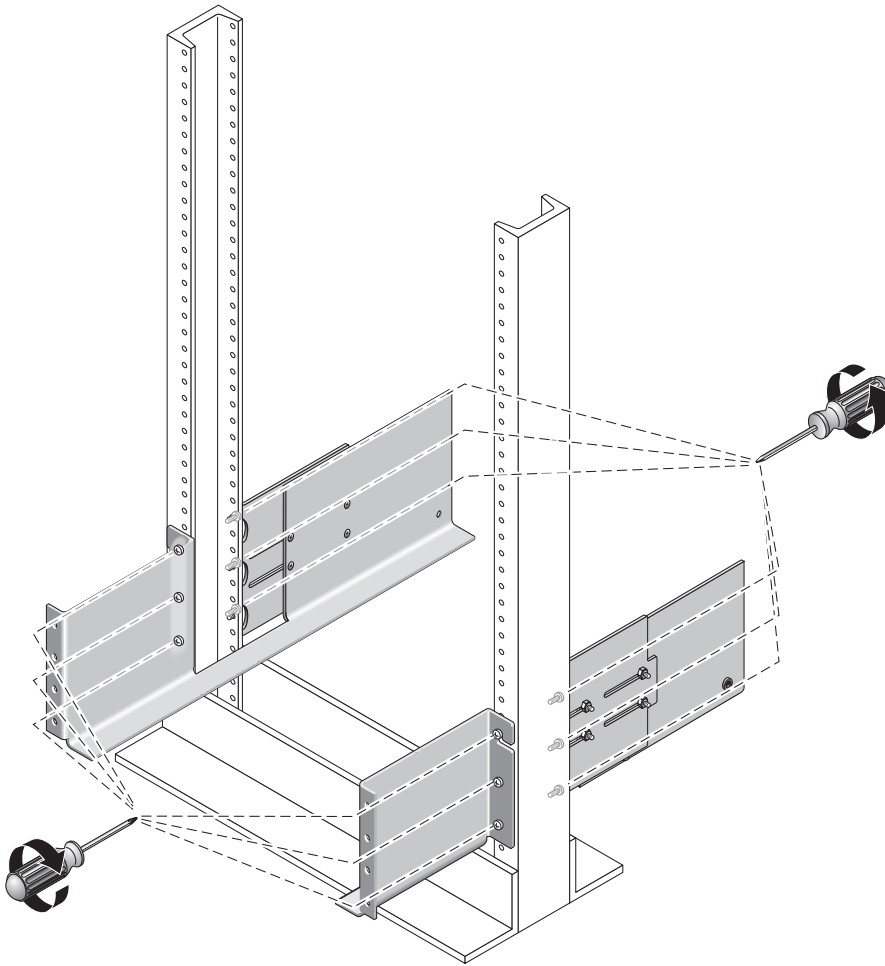


4. Insert eight more (12-24 or 10-32) screws (two in each post side) in the lower mounting holes at the front and back of the left and right rails (FIGURE C-3).

**FIGURE C-4** Securing Each Rail to its Post



5. 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-4).



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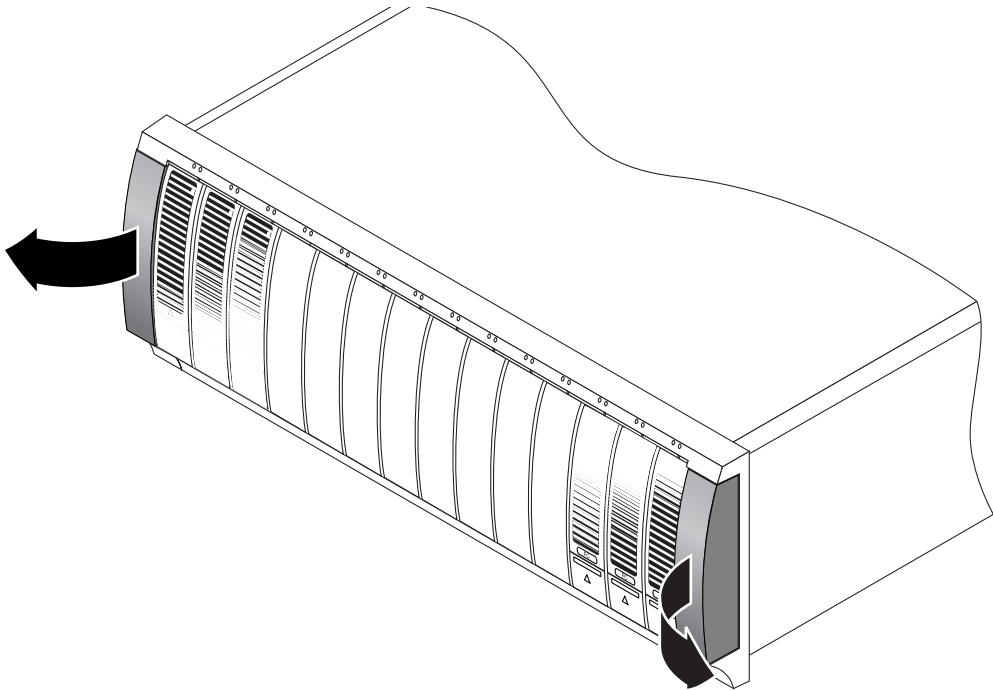
## Installing a Tray in a Telco 2-Post Rack

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).

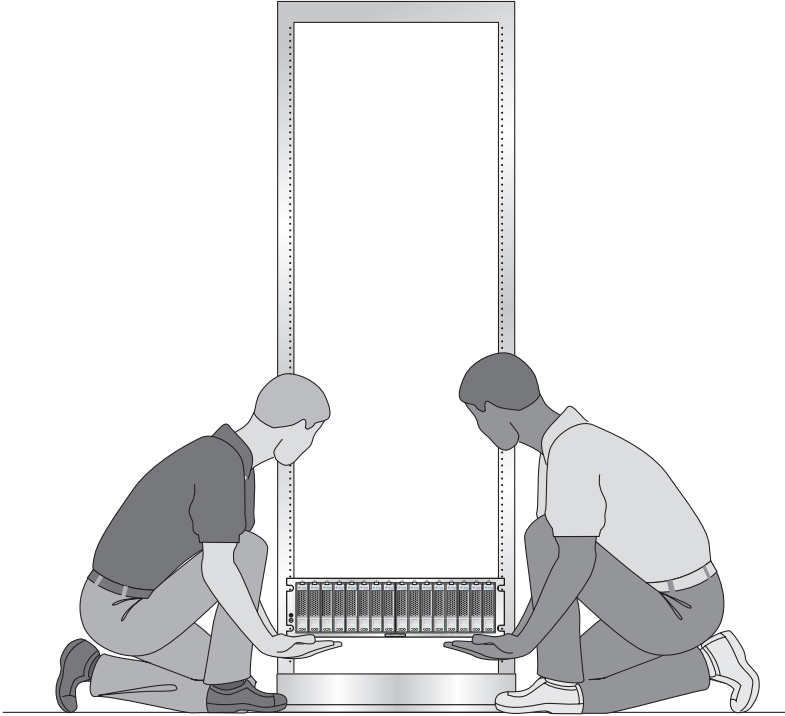


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**Caution** – Use care to avoid injury. An tray can weigh up to 95 pounds (45 kg).

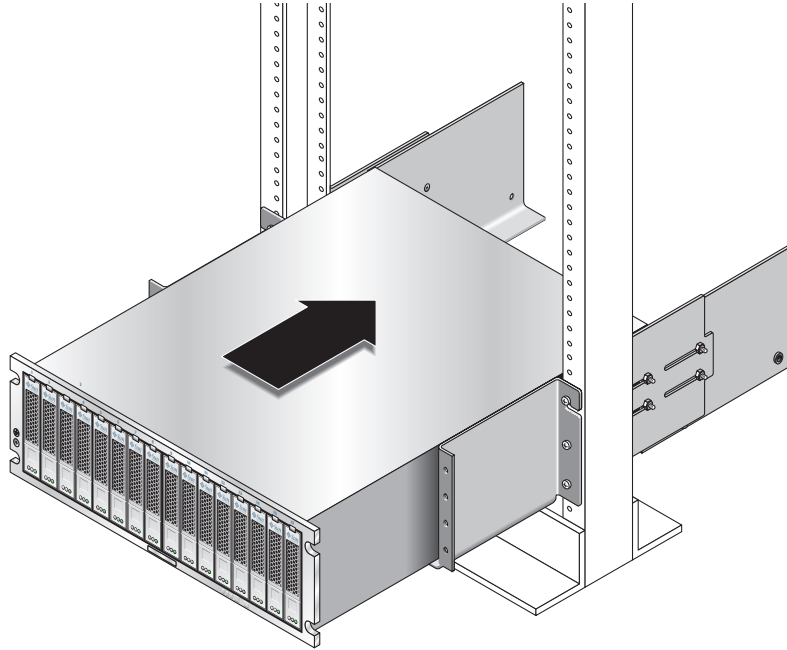
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**FIGURE C-6** Positioning the Tray in the Rack



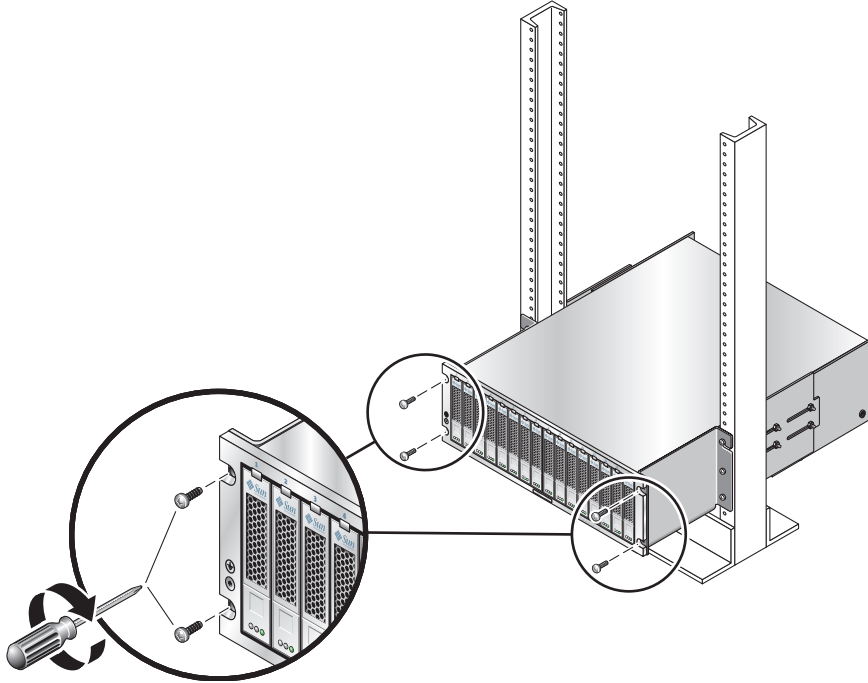
3. Carefully slide the tray onto the mounting rails until the front bezel of the tray contacts the rail flange on each side (FIGURE C-7).

**FIGURE C-7** Sliding the Tray Into the Rack



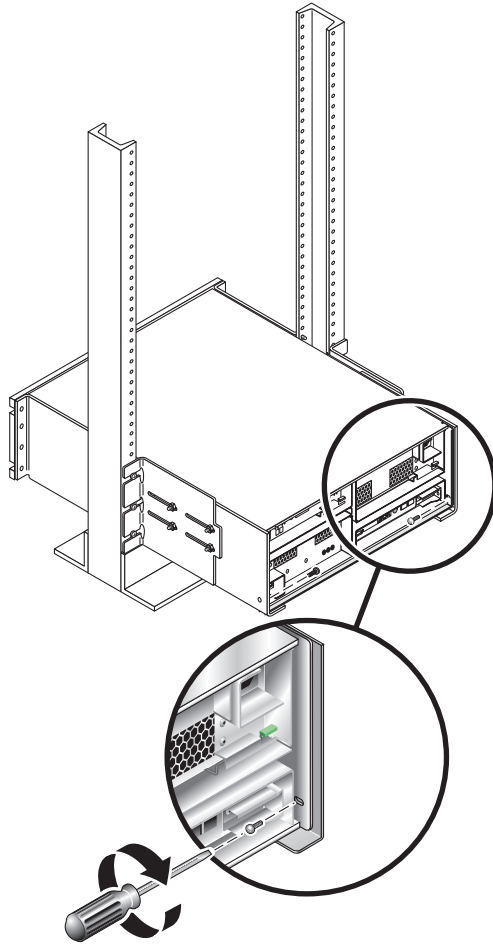
4. Use the #2 Phillips screwdriver to insert and tighten four 10-32 x 1/2 screws, washers, and nuts (two each per side) to secure the tray to the front of the rack (FIGURE C-8).

**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 four 10-32 locknuts (two on each rail) on each rail extension to secure the rail length.

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

