Sun StorageTek™ 6540 Array Site Preparation Guide

Sun Microsystems, Inc.
www.sun.com

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Preface

The *Sun StorageTek 6540 Array Site Preparation Guide* describes facilities and system requirements for installing the Sun StorageTek™ 6540 Array. Follow the guidelines as outlined in this document when planning your installation.

Before You Read This Book

Before you begin to install the Sun StorageTek 6540 Array, you must have already read the regulatory and safety requirements described in this book:

- *Sun StorageTek 6540 Array Regulatory and Safety Compliance Manual*

How This Book Is Organized

Chapter 1 describes the requirements for preparing the customer site for installation of the Sun StorageTek 6540 Array.

Chapter 2 describes the physical, environmental, and electrical requirements for the cabinet in which the Sun StorageTek 6540 Array is installed.

Chapter 3 describes the physical, environmental, and electrical requirements for the Sun StorageTek 6540 Array.

Appendix A provides worksheets to help you gather the information you need to complete the installation.

Using UNIX Commands

This document might not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at

  http://docs.sun.com

Shell Prompts

Shell	Prompt
C shell	*machine-name*`%`
C shell superuser	*machine-name*`#`
Bourne shell and Korn shell	`$`
Bourne shell and Korn shell superuser	`#`

Typographic Conventions

Typeface*	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output.	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output.	`%` **`su`** `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

* The settings on your browser might differ from these settings.

Related Documentation

Title	Part Number
Sun StorageTek 6540 Array Regulatory and Safety Compliance Manual	819-6520-*nn*
Sun StorageTek 6540 Array Release Notes	819-6521-*nn*
Sun StorageTek 6540 Array Hardware Installation Guide	819-6461-*nn*
Sun StorEdge Expansion Cabinet Installation and Service Manual	805-3067-*nn*
Sun Rack Installation Guide	816-6386-*nn*
Sun Fire Cabinet Installation and Reference Manual	806-2942-*nn*

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Sun StorageTek 6540 Array Site Preparation Guide, part number 819-6524-11

CHAPTER 1

Planning for the Installation

This chapter describes the requirements for preparing the customer site for installation of the Sun StorageTek 6540 Array. It contains the following sections:

Customer Obligations

The customer is obliged to inform Sun Microsystems, Inc. of any and all ordinances and regulations that might affect the installation. The customer is responsible for meeting all government codes and regulations concerning facilities. The customer is also required to do the following:

- Comply with all local, national, and international codes covered in this specification. The subjects covered include fire and safety, building, and electrical codes.
- Document and inform Sun Microsystems, Inc. of any deviations from this specification.

Safety Information

Install the Sun StorageTek 6540 Array in accordance with the local safety codes and regulations at the facility site. Make sure that you read the safety precautions in the *Sun StorageTek 6540 Array Regulatory and Safety Compliance Manual*.

The following sections contain additional safety information for the local facility:

- "Handling Precautions" on page 2
- "Secure Installation Requirements" on page 2
- "Placement of a Sun Product" on page 3

Note – Do not make mechanical or electrical modifications to the equipment. Sun Microsystems, Inc. is not responsible for regulatory compliance of a modified Sun product.

Handling Precautions

Caution – A fully populated cabinet can weigh in excess of 1500 pounds (682 kg). Ensure that all surfaces this system will move over can withstand this load.

The cabinet is equipped with wheels so you can move it. Use enough personnel when moving the cabinet, especially on sloped loading docks and ramps, to gain access to a raised computer room floor. Move the cabinet slowly and deliberately, and make sure that the floor is free from foreign objects and cables that the cabinet could roll over.

Caution – To avoid injury, wear protective footwear when moving a system.

Secure Installation Requirements

To minimize personnel injury in the event of a seismic occurrence, you must securely fasten the cabinet to a rigid structure extending from the floor to the ceiling, or from the walls, of the room in which the cabinet is located.

Install the cabinet on a level surface. At each corner, on the base of the cabinet, are adjustable nonskid pads. Extend these pads when the cabinet is installed to prevent the cabinet from rolling. Do not use these pads to level the cabinet.

Placement of a Sun Product

Allow enough room surrounding the cabinet for access to the cabinet and arrays for maintenance.

Caution – Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.

Air cools the system cabinets from front to back. Air enters at the front, circulates, and is expelled at the back of the cabinet. The front and back door clearances provide sufficient space for cooling. See Chapter 2 for specific clearance specifications.

Site Wiring and Power Requirements

The AC power distribution boxes in the cabinet use common industrial wiring. Consider the following information when preparing the cabinet installation site:

- **AC power source** – The AC power source must provide the correct voltage, current, and frequency specified on the module model and serial number label.
- **Earth ground** – Site wiring must include an earth ground connection to the AC power source.
- **Circuit overloading** – Power circuits and associated circuit breakers must provide sufficient power and overload protection. To prevent possible damage to the AC power distribution boxes and other components in the cabinet, use an external, independent power source that is isolated from large switching loads (such as air conditioning motors, elevator motors, and factory loads).
- **Module power distribution** – All units attached to the two power strips inside that cabinet must be auto-ranging between 180 and 264 VAC, 47-63 Hz.
- **Power interruptions** – The cabinet and modules will withstand the following applied voltage interruptions (with or without an integrated uninterruptible power supply [UPS]):
  - **Input transient** – 0V for 1 cycle with no interruption
  - **Duration** – 70 percent of nominal for 0.5 seconds and 0V for 5 seconds, recoverable with user intervention
- **Power failures** – If a total power failure occurs, when power is restored the modules within the cabinet automatically perform a power-up recovery.

CHAPTER 2

Cabinet Specifications

This chapter describes the physical, environmental, and electrical requirements for the Sun Rack 1000-38 cabinet.

The floor area at the installation site must provide enough stability to support the weight of the cabinet and installed trays, sufficient space for installation and servicing of the cabinet and components, and sufficient ventilation to provide a free flow of air to the cabinet.

To ensure safe and proper operation of the system, and ease of maintenance, make sure that all of these requirements are met before using the cabinet.

Dimension and Weight

TABLE 2-1 provides the physical dimensions of the Sun Rack 1000-38 cabinet.

TABLE 2-1 Sun Rack 1000-38 Cabinet Dimensions

Height	Width	Depth
74 in. (188 cm)	23.5 in. (59.7 cm)	39.4 in. (1000 mm)

A fully loaded Sun Rack 1000-38 cabinet has a maximum weight of 1625 pounds (737 kilograms). The total weight of your Sun Rack 1000-38 cabinet depends on the number and type of components installed in the cabinet. TABLE 2-2 lists the weight of an empty cabinet and the maximum weight of each component. Use these weights to estimate the total weight of your system, based on the number of components installed in the cabinet. Record the total weight in an easy-to-find place to reference when checking flooring load or elevator weight restrictions.

TABLE 2-2 Sun Rack 1000-38 Cabinet and Component Weights

Component	Quantity		Weight (each)		Total Weight (lbs or kg)
Cabinet (empty)	1	X	360 lbs (163.3 kg)	=	
Cabinet (with 2 power sequencers)	1	X	410 lbs (185.97 kg)	=	
Chassis, front cage, and midplane		X	36.1 lbs (16.4 kg)	=	
Controller tray		X	80.5 lbs (36.51 kg)	=	
Expansion tray (no drives)		X	4.15 lbs (1.88 kg)	=	
Front cage and midplane assembly		X	9.1 lbs (4.2 kg)	=	
Power supply		X	7.95 lbs (3.60 kg)	=	
Fibre Channel drives		X	1.65 lbs (0.75 kg)	=	
SATA II drives		X	2.29 lbs (1.04 kg)	=	
			Total Weight	=	

Environmental Requirements

This section describes the environmental conditions that are prerequisite to installing Sun Rack cabinets.

Temperature, Humidity, and Altitude

TABLE 2-3 lists operating and nonoperating temperature, relative humidity, and altitude ranges for the Sun Rack 1000-38 cabinet.

TABLE 2-3 Cabinet Temperature, Humidity, and Altitude

Specification	Operating	Nonoperating
Temperature	41˚F to 95˚F (5˚C to 35˚C)	-40˚F to 150.8˚F (-40˚C to -66˚C)
Relative humidity (RH)	20% to 80% noncondensing	5% to 95% noncondensing
Altitude	0 to 9,840 feet (0 to 3 km)	0 to 39,370 feet (0 to 12 km)

If you plan to operate a system at an altitude between 3280 ft. to 10,000 ft. (1000 m to 3048 m) above sea level, lower the environmental temperature 3.3˚F (1.7˚C) for every 3280 ft. (1000 m) above sea level.

TABLE 2-4 lists the acceptable temperatures in which the 6540 controller tray is designed to operate.

TABLE 2-4 Controller Tray Temperature

Range	Temperature	Maximum Rate of Change per Hour
Operating	32˚F to 104˚F (0˚C to 40˚C)	18˚F (10˚C)
Storage	14˚F to 149˚F (-10˚C to 65˚C)	27˚F (15˚C)
Transit	-40˚F to 149˚F (-40˚C to 65˚C)	36˚F (20˚C)

lists the acceptable humidity ranges in which the 6540 controller tray is designed to operate.

Measure	Maximum Rate of Change per Hour
Operating range	20% to 80%
Storage range	10% to 93%
Transit range	5% to 95%
Maximum dew point	79˚F (26˚C)
Maximum gradient	10% per hour

TABLE 2-5 Controller Tray Relative Humidity (RH), Noncondensing

Airflow and Heat Dissipation

Cabinet airflow is from front to back. Allow at least 30 inches (76.2 cm) in front of the cabinet, and at least 24 (60.96 cm) inches behind the cabinet, for service clearance, proper ventilation, and heat dissipation.

Power Requirements

The AC power sources must provide the correct voltage, current, and frequency specified on the component model and serial number label. The cabinet can run within the limits shown in TABLE 2-6.

TABLE 2-6 Cabinet AC Power Requirements

Parameter	Requirements
Nominal voltages	200 to 240 VAC
Operating voltage	180 to 264 VAC
Frequency range	47 to 63 Hz
Current	Four 20 Amp circuits are required for the 6540 cabinet to insure full redundancy. (UL allows the planned use of only 16A from each of those 20A circuits.)

TABLE 2-6 Cabinet AC Power Requirements *(Continued)*

Parameter	Requirements
AC power plug	NEMA L6-20P (North American) IEC 309 16A 3-Position (International)
AC power receptacle	NEMA L6-20R (North American) IEC 309 16A 3-Position (International)
Power cords required	4

All components in the cabinet should operate on only two of the 20A circuits (16A loaded each), but in this case no AC redundancy would be in place (power only A0/A1 or B0/B1).

With all four 20A circuits powered (A0, A1, B0, B1), the cabinet will draw a maximum total of 32A from the four circuits. If the system were to draw more than that 32A, then full AC redundancy cannot be present.

The Sun Rack 1000-38 cabinet power distribution systems work at 180-264VAC only. Internal components will never be operated below 180V (200V nominal) when in this cabinet.

CHAPTER 3

Sun StorageTek 6540 Array Specifications

This chapter describes the physical, environmental, and electrical requirements for the Sun StorageTek 6540 Array. It contains the following sections:

Dimension and Weight Specifications

The floor space at the installation site must be strong enough to support the combined weight of the cabinet, controller trays, expansion trays, and associated equipment. The site also requires sufficient space for installation, operation, and servicing the arrays and sufficient ventilation to provide a free flow of air to the unit.

The total weight of an expansion tray depends on the number of drives installed.

TABLE 3-1 provides the physical dimensions and weight of the array trays.

TABLE 3-1 Tray Dimensions and Weight

Height	Width	Depth	Weight (Fully Populated)
Controller tray			
6.87 in.	17.5 in.	24 in.	80.5 lbs
17.45 cm	44.45 cm	60.96 cm	36.51 kg

TABLE 3-1 Tray Dimensions and Weight

Height	Width	Depth	Weight (Fully Populated)
Expansion tray			
5.25 in.	17.5 in.	24 in.	95 lbs
13.335 cm	44.45 cm	60.96 cm	43 kg

Environmental Requirements

This section describes the environmental conditions that are prerequisite to installing the unit, and heat conditions that are generated by normal operation of the unit.

TABLE 3-2 lists the environmental conditions in which the module is designed to operate.

TABLE 3-2 Operating Environmental Conditions

Condition	Range
Temperature	32° F to 104° F (0° C to 40° C)
Relative humidity	20% to 80% noncondensing
Altitude*	100 feet (30.5 meters) below sea level to 10,000 feet (3,048 meters) above sea level
Shock	25 G at 3.75 ms triangular
Vibration	0.25 G, 5 to 150 Hz sinusoidal
Heat output	
Controller Tray	235 watts avgerage (804 BTU/Hr)
Expansion Tray	444 watts average (1517 BTU/Hr)

*If you plan to operate a system at an altitude between 3280 feet to 10,000 feet (1000 meters to 3048 meters) above sea level, lower the environmental temperature 3.3° F (1.7 °C) for every 3280 feet (1000 meters) above sea level.

TABLE 3-3 lists the nonoperating environmental conditions of the tray.

TABLE 3-3 Nonoperating Environmental Conditions

Condition	Range
Temperature (storage)	14° F to 149° F (-10° C to 65° C)
Temperature (transit)	-40° F to 149° F (-40° C to 65° C)
Humidity (storage)	10% to 93%
Humidity (transit)	5% to 95%
Altitude	100 feet (30.5 meters) below sea level to 40,000 feet (12,000 meters) above sea level
Shock	40 G, 3.75 ms up to 65 G, 3.75 ms triangular 20 G, 8 ms square or trapezoidal
Vibration	5 G, 5 to 150 Hz sinusoidal

Electrical Requirements

This section provides information regarding site power and wiring, module AC power requirements, and power cord routing instructions.

Site Wiring and Power

The tray uses wide-ranging redundant power supplies that automatically accommodate voltages to the AC power source. The power supplies operate within the range of 90 VAC to 264 VAC, at a minimum frequency of 50 Hz and a maximum frequency of 60 Hz. The power supplies meet standard voltage requirements for both domestic (inside USA) and international (outside USA) operation. They use standard industrial wiring with line-to-neutral or line-to-line power connections.

Power Input

The AC power sources must provide the correct voltage, current, and frequency specified on the tray model and serial number label. The tray can run without interruption within the limits shown in TABLE 3-4.

TABLE 3-4 Tray AC Power Requirements

Condition	Specification
AC power (Controller tray)	2.65A maximum operating @ 240 VAC (180 to 264 VAC, 50/60Hz) 5.53A maximum operating @ 115VAC (90 to 136 VAC 50/60HZ)
AC power (Expansion tray)	1.97A maximum operating @ 240VAC (180 to 264 VAC, 50/60Hz) 4.11A maximum operating @ 115VAC (90 to 136 VAC 50/60HZ)

The Sun Rack cabinet power distribution systems only work at 180 to 264VAC. Internal components will never be operated below 180V (200V nominal) when in this cabinet.

Power Cords and Receptacles

Power cords must be ordered separately so that are appropriate for use in a typical outlet in the destination country.

The power cords connect the power supplies in a tray to an independent external power source, such as those provided in the supported Sun cabinet, a wall receptacle, or uninterruptible power supply (UPS).

APPENDIX **A**

Configuration Worksheets

Use the worksheets in this appendix to help you collect the information you need to perform the installation. TABLE A-1 lists the information you need to collect to configure the array.

TABLE A-1 Sun StorageTek 6540 Array Configuration Worksheet

Controller A MAC address:	
Controller B MAC address:	
Controller A IP address:	
Controller B IP address:	
Management host IP address:	
Network mask:	
Name server domain name:	
IP address of the domain name server (DNS):	
Gateway IP address:	
Email notification address:	

TABLE A-2 lists the information you need to collect for each data host connected to the Sun StorageTek 6540 array.

TABLE A-2 Sun StorageTek 6540 Array Data Host Information

Host name:	
Vendor:	
Model:	
Operating system:	
Patch/Service pack:	
Number of HBAs:	
HBA World Wide Name (WWN):	
HBA model:	
HBA driver:	