

# **Sun StorEdge 6120 Array System Manual Outline**

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This manual contains information about the Sun StorEdge 6120 Array product, including array administration roadmap, product overview, array configuration, administration tasks, enhancements to the array configurations, array monitoring, serviceability, and CLI commands descriptions.

The configuration information in this manual covers the Maserati Midrange 1 and Midrange 2 configurations only. Refer to xx manuals for information about the Midrange 3, Enterprise 1, and Enterprise 2 configurations.

# Sun StorEdge 6120 Array System Manual Outline

Topics in this manual are divided into the following parts:

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1	Array Components
2	Array Features
3	Administration Roadmap
4	Administration Tools
PART II	Configuration Options
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6	Host Connection Configurations
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9	Configuring Network Time Protocol
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PART IV	Configuration Enhancements
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PART VI	Serviceability
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## **PART I Overview**

This section provides an overview of the array, including its components, features, and architecture, as well as descriptions of the array features.

Additionally, it provides an overview of the sequence of steps for administering the array, as well as a set of tools and guidelines needed to administer and troubleshoot the array.

Chapters included in this section are

Chapter 1: Array Components

Chapter 2: Array Features

Chapter 3: Administration Roadmap

Chapter 4: Administration Tools

### 1.0 Array Components

Product Description

Array Components

- Disk Drive

- Array Controller Card

- Unit Interconnect Cards (UIC)

- Power and Cooling Unit

- Expansion Unit

- Battery

- Controller-Based Trays

- Controller-Less Trays (Expansion trays)

Features

Architecture

### 2.0 Array Features

Firmware Version 3.0 Features List

Firmware Version 3.0 Features Concepts

- Volume Slicing, Mapping, and Masking

- Auto Upgrade

- Split Loop Mode

- Fabric Point-to-Point Support

- Persistent Group Reservation

- Network Time Protocol

- Auto-Versioning

- Drive Depop

- Online Firmware Upgrade

# Sun StorEdge 6120 Array System Manual Outline

## 3.0 Administration Roadmap

Tasks Overview

### **Step 1: Install the Array.**

This step involves installing the Sun StorEdge 6120 Array, Version 3.0 Firmware. It also includes setting basic array configuration requirements.

See the *Sun StorEdge 6120 Array Installation Manual* for detailed information on how to connect the cables, the network, non-Solaris operating systems; and how to define volumes for the array.

### **Step 2: Learn about the array.**

See

Chapter 1: Array Components

Chapter 2: Array Features

### **Step 3: Study the roadmap and tools to administer the array.**

See

Chapter 3: Administration Roadmap

Chapter 4: Administration Tools

### **Step 4: Study supported configurations.**

See

Chapter 5: Array Configurations

Chapter 6: Host Connection Configuration Scenarios

### **Step 5: Perform software configurations.**

See

Chapter 7: Overview of Array Configuration Settings

Chapter 8: Configuring IP Address and Multipathing

Chapter 9: Configuring Network Time Protocol

Chapter 10: Configuring Fibre Channel

Chapter 11: Configuring Cache Modes

Chapter 12: Configuring RAID Levels

Chapter 13: Configuring Logical Volumes

Chapter 14: Configuring Volume Slicing, Mapping, Masking

### **Step 6: Enhance array configurations.**

See

Chapter 15: Expanding Array Configuration

Chapter 16: Adding Disk Space

Chapter 17: Adding Trays

## **Step 7: Administer the array.**

See

Chapter 18: Array Troubleshooting

Chapter 19: Monitoring the Array

Chapter 20: System Messages

Chapter 21: Error Messages

Chapter 22: Error Messages Description

## **Step 8: Service the array.**

See

Chapter 23: Servicing the Array

## **Step 9: Study reference materials.**

See

Chapter 24: CLI Commands

Chapter 25: Specifications

Chapter 26: Illustrated Parts

## 4.0 Administration Tools

Array-Based Administration Interface

- Displaying all CLI Commands

- Command Syntax

Host-Based Administration Tools

These are the software that are installed on the Solaris host but are accessible through multiple machines

- Storage Management Software—Administration software

  - Consists of both CLI and GUI commands.

  - Manages LUN masking and storage pools.

  - Implements SNIA (Storage Networking Industry Association) storage profile in CIM (Common Information Model).

- StorADE—diagnostic and fault management software

- PatchPro—firmware upgrade and installation software

FRU Identifiers

## **PART II Configuration Options**

This section provides guidelines for configuring the array, different types of supported configurations, and different configuration scenarios for connecting the array to a host.

Chapters included in this section are

Chapter 5: Array Configurations

Chapter 6: Host Connection Configuration Scenarios

### 5.0 Array Configurations

#### Configurations Guidelines

This chapter provides information on the Sun StorEdge 6120 array supported configurations. It includes guidelines for connecting single-controller arrays and dual-controller HA arrays to hubs, switches, single hosts, and multi-initiator configurations, as well as the software applications and the array settings required for the configurations.

Although this chapter provides examples of some base configurations, it does not detail connections for every possible option, as there are many available. The level of detail in this chapter should provide enough information for someone who has a working knowledge of the array to be able to set up the type of configuration for their business applications.

#### Supported Configurations

##### Midrange 1 Configuration

This is a single-controller array with expansion unit(s) to provide additional capacity.

Midrange 1 supports three types of configurations for the array:

- \* Sun StorEdge 6120 Array with Single Controller, Single Tray
- \* Sun StorEdge 6120 Array with Single Controller, Two Trays
- \* Sun StorEdge 6120 Array with Single Controller, Three Trays

##### Midrange 2 Configuration

This is a dual-controller high availability (HA) array with expansion unit(s) to provide additional capacity.

Midrange 2 configuration supports three types of configurations for the HA array:

- \* Sun StorEdge 6120 High Availability Array with Two Controllers, Two Trays
- \* Sun StorEdge 6120 High Availability Array with Two Controllers, Four Trays
- \* Sun StorEdge 6120 Array, with Two Controllers, Six Trays, HA Configuration

#### Configuration Restrictions

- \* Midrange 1 Configuration Restrictions
- \* Midrange 2 Configuration Restrictions

#### Configuration Recommendations

##### Sun Cluster Support

## 6.0 Host Connection Configurations

### Direct Host Connection

- Host Multi-Pathing Management Software

- Single Host to 1 Array with 2 Controller, 2 Tray

- Single Host to 1 HA Array with 2 Controllers, 2 Trays

- Single Host to 2 HA Array with 4 Controllers, 4Trays

- Single Host to 4 HA Array with 8 Controllers, 8 Trays

### Switch Host Connection

- Dual Hosts to 2 Switches and to 1 HA Array with 2 Controllers, 2 Trays

- Dual Hosts to 2 Switches and to 4 HA Arrays with 8 Controllers, 8 Trays

### Hub Host Connection

- Single Host to 2 Hubs and to 4 Arrays with 4 Controllers, 4 Trays

- Single Host to 2 Hubs and to 4 HA Arrays with 8 Controllers, 8 Trays

- Dual Hosts to 2 Hubs and to 4 Arrays with 4 Controllers, 4 Trays

- Dual Hosts With 2 Hubs and 8 Controller Units

- Dual Hosts to 2 Hubs and to 2 HA Arrays with 4 Controllers, 4 Trays

- Dual Hosts to 2 Hubs and to 4 HA Arrays with 8 Controllers, 8 Trays

## **PART III: Software Configuration**

This section covers a sequence of steps that the user needs to take to configure the array. Each chapter associated with a specific task is coupled with a companion chapter where the concept of that particular task is explained.

See PART IV Configuration Enhancements for further enhancing your array.

Chapters in this sections are

Chapter 7: Overview of Array Configuration Settings

Chapter 8: Configuring IP Address and Multipathing

Chapter 9: Configuring Network Time Protocol

Chapter 10: Configuring Fibre Channel

Chapter 11: Configuring Cache Modes

Chapter 12: Configuring RAID Levels

Chapter 13: Configuring Logical Volumes

Chapter 14: Configuring Volume Slicing, Mapping, Masking

### 7.0 Overview of Array Configuration Settings

Configuration Roadmap

Step 1: Configuring IP Address and Multipathing

Step 2: Configuring Network Time Protocol

Step 3: Configuring Fibre Channel

Step 4: Configuring Cache Modes

Step 5: Configuring RAID Levels

Step 6: Configuring Logical Volumes

Step 7: Configuring Volume Slicing, Mapping, Masking

### 8.0 Configuring IP Address and Multipathing

> To Set the IP Address

> To Enable Partner Group Multipathing

### 9.0 Configuring Network Time Protocol

Network Time Protocol Concept

> To Change the Topology Firmware Mode

> Specifying the Network Time Server

### 10.0 Configuring Fibre Channel

Fibre Channel Concept

> To Setting Fibre Channel Topology

> To Determine Topology Firmware Mode

> To Change Topology Firmware Mode



## 11.0 Configuring Cache Modes

### Cache Modes Concepts

- Defining Performance and Redundancy

- Defining Data Block Size

- Enabling Mirrored Cache

### Setting Cache Modes

- > To Set Cache Block Size

- > Set Cache Mode

- > To Select Data Block Size

- > To Enable Mirrored Cache

- > To Specify Cache Allocation

- > To Set Cache Read-Ahead Threshold

## 12.0 Configuring RAID Levels

### RAID Levels Concepts

- Defining RAID 0

- Defining RAID 1

- Defining RAID 5

### Setting RAID Levels

- > To Determine a RAID Level

- > To Determine a Hot-Spare

- > To Determine Redundancy

## 13.0 Configuring Logical Volumes

### Logical Volumes Concepts

- Defining Logical Volumes Guidelines

- Defining Number of Logical Volumes

- Volumes Reconfiguration Limitations

- Administering Logical Volume

  - Deleting a Logical Volume

  - Creating a Logical Volume

  - Labeling a Volume

### Setting Logical Volumes

- > To Create and Labeling a Logical Volume

- > To Set LUN Reconstruction Rate

- > To Set Volume Verification

- > To Set the LUN Reconstruction Rate

## 14.0 Configuring Volume Slicing, Mapping, Masking

### Volume Slicing, Mapping, Masking Concepts

- Configuration Limitations

- Slicing Limitations

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### Configuration Consideration

#### Setting Volume Slicing, Mapping, Masking

##### > To Specify Volume Slicing

- Enabling Volume Slicing, Mapping, and Masking Operations

- Reconfiguring a Volume by Adding Slices After Volume Slicing Has Been Enabled

- Creating a Volume Slice

- Removing a Volume Slice

##### > To Specify LUN Mapping

- Displaying the LUN Map

- Adding an Entry to the LUN Map

- Removing an Entry From the LUN Map

##### > To Specify LUN Masking

- Finding the Default LUN Permissions and System-Assigned WWNs

- Setting a Specific LUN Permission

- Viewing All Registered WWNs

##### > To Set LUN Permission with Host Multipathing

- Changing the Default LUN Permissions

- Defining a Host WWN Group

- Setting the Permissions of a LUN for All Members of a Group

- Removing the Registered Status of a WWN

- Removing a WWN From a Specific Group

- Removing All WWNs From a Specific Group

## **PART IV Configuration Enhancement**

This section describes different ways of enhancing the configuration of the array by adding controller units, expansion units, as well as additional disk arrays and trays.

Chapters included in this section are

Chapter 15: Expanding Array Configuration

Chapter 16: Adding Disk Space

Chapter 17: Adding Trays

### **15.0 Expanding Array Configuration**

This chapter covers upgrading configurations by way of adding controller units and expansion units.

### **16.0 Adding Disk Space**

This chapter contains instructions to add additional disk drives to obtain more storage area.

### **17.0 Adding Trays**

This chapter covers the procedures to add trays to the array.

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## **PART V Administering**

This section provides a comprehensive set of tools to troubleshoot and to monitor the activities of the array, including tools and error messages.

Chapters included in this section are

Chapter 18: Troubleshooting

Chapter 19: Monitoring

Chapter 20: System Messages

Chapter 21: Error Messages

Chapter 22: Error Messages Descriptions

### 18.0 Troubleshooting

ofdg Notice

Analyzing the Problem

StorADE

Host-Generated Messages

Telnet Session

Array LEDs

Disk Drive LEDs

Power and Cooling Unit LEDs

Interconnect Card LEDs

Controller Card LEDs

Channel Connection Failures

FRU Failures

### 19.0 Monitoring

Monitoring Tools

Sun StorEdge Component Manger

SNMP Notification

syslog Error Messages

Checking Status of Array Components

Determining Failover

Checking the Drive Status

Checking the Hot-Spare

Checking Data Parity

Checking the Battery

Displaying the FRU Information

Checking the FRU Status

### 20.0 System Messages

Setting up System Log in Messages

Transferring Array Files to the Management Host

- Editing the Array /etc/syslog.conf File
- Editing the Array /etc/hosts File
- Transferring Files Back to the Array
- Editing the Management Host /etc./syslog.conf File
- Setting up SNMP Notification Messages
  - Transferring the Array Files to the Management Host
  - Editing the Array /etc/syslog.conf File
  - Editing the Array /etc/hosts File
  - Transferring Files Back to the Array

### 21.0 Error Messages

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  - FRU Identifiers
  - Error Message Listing
  - Warning Message Listing
- Reset Log Types
- Command-Line Error Messages
  - RAID Errors and Other Common Errors
    - Categories of RAID Errors
    - Investigating RAID Errors
  - Port Errors
  - Interconnect Card and Other FRU Errors
  - Other Errors
- Examples
  - Error Messages
    - FRU Level Errors
  - Warning Messages
    - Cache Parity Error
    - Software Assertion or Panic
    - Unrecoverable Drive Error
    - Recoverable Drive Error
- Notice

### 22.0 Error Messages Descriptions

- Message Syntax
- Miscellaneous Abbreviations
- Interpreting the Array /syslog Messages
- Reset Log Message Types
- ~~Boot Messages~~
- Task List
- Internal Array AL\_PA/LID/LOOP Map

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SCSI Virtual Disk Driver (SVD) Error Definitions

Stripe Type Messages

SCSI Command Set

Arbitrated Loop Physical Addresses (AL\_PA) and Loop IDs

Sense Key Explanations

**PART VI Serviseability**

This section provides guidelines and instructions for servicing the array.

Chapter included in this section is

Chapter 23: Servicing the Array

**23.0 Servicing the Array**

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    Analyzing Host-Generated Messages

    Using Array CLI Commands

    Using the Graphical-User-Interface (Gotham)

    Interpreting Array LEDs

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    Cabinet Mounted

    Tower Mounted

Removing and Replacing Components

    Disk Driver

    Power and Cooling Unit

    UPS Battery

    Interconnect Card

    Controller Card

    Chassis and Midplane

## **PART VII Array Reference Materials**

This section contains reference materials, including the complete list of the CLI commands along with their descriptions and syntaxes and array messages, along with product specifications and illustrated parts.

Chapters included in this section are

Chapter 24: CLI Commands

Chapter 25: Specifications

Chapter 26: Illustrated Parts

### 24.0 CLI Commands

Complete List of CLI Commands

FRU Identifiers

Code Conventions

General Commands

    General Command Descriptions

Volume slicing, Mapping, and Masking Commands

    Volume Slicing Command Descriptions

    LUN Mapping Command Descriptions

    LUN Masking Commands Descriptions

Fibre Channel Topology Command

Network Time Protocol Commands

### 25.0 Specifications

Power Specifications

Environmental Specifications

Mechanical Specifications

Cable Specifications

### 26.0 Illustrated Parts (5 pages)

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