Sun Microsystems

Sun Blade 6000 Disk Module Configuration Guide

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Contents

Planning

This chapter covers the things you must plan for before beginning your installation.

Note – Many references in this guide point to sections of the *Sun Blade 6000 Disk Module Administration Guide* (part number 820-4922), available online at (http://docs.sun.com/app/docs/coll/blade6000dskmod), which is referenced in this document as the *Disk Module Administration Guide*.

When you insert a Sun Blade 6000 Disk Module (also called a disk blade) and a Sun Blade 6000 SAS-NEM in a Sun Blade 6000 chassis, the chassis becomes an integrated system where all the blades interact with one another.

Whether you insert these components into an empty chassis or into a chassis where there are already server modules (also called server blades) in use, you must do some prerequisite planning.

Caution – For older X6220 server blades, verify that your host bus adapter hardware is at the correct revision level (see the system requirements listed in the *Disk Module Administration Guide*). If it is not, you must have Sun rework or replace the server blade before you can use it with a disk blade.

Plan for the following items:

- "Where to Put the Server Blades and Disk Blades" on page 2
- "Where to Install Your Operating System" on page 3
- "Upgrading Components" on page 4
- "Upgrading Operating Systems" on page 5
- "Things You Will Need" on page 5

Where to Put the Server Blades and Disk Blades

You can use any combination of the supported server blades (see "Supported Servers and Operating Systems" on page 8) in a single chassis.

The server blades and disk blades must be placed in the chassis in pairs. The pairs must be in slots 0+1, 2+3, 4+5, 6+7, or 8+9. No other combination of slots (such as 1+2) can be used.
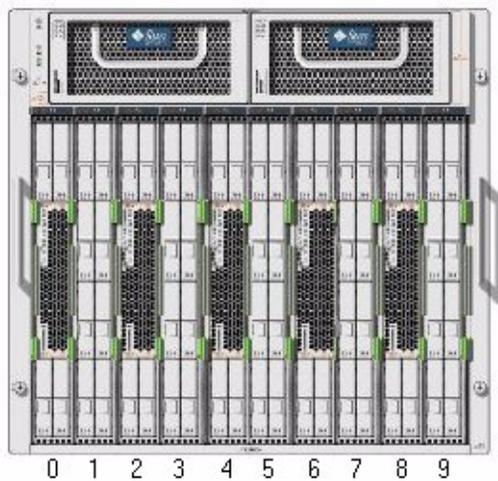
Sun recommends that you fill your chassis with disk blades from right to left, facing the front of the chassis. This means that the first disk blade added should go in slot 9, the next one should go in slot 7, and so forth.

The server blade that is paired with a disk blade goes in the slot to its left. For example, the server blade paired with the disk blade in slot 9 should be inserted in slot 8.

Example: Placing Server Blades and Disk Blades

Suppose you plan to use six server blades (four X6250 blades and two X6450 blades) and two disk blades in a chassis. You would put the blades in like this:

Slot	Contents
9	Disk blade
8	X6450 server blade
7	Disk blade
6	X6450 server blade
5	Filler panel. Slot is available for the *first* new disk blade that might be added in the future.
4	X6250 server blade
3	Filler panel. Slot is available for the *second* new disk blade that might be added in the future.
2	X6250 server blade
1	X6250 server blade. Could be replaced with the *third* new disk blade that might be added in the future.
0	X6250 server blade

Where to Install Your Operating System

For server blades that are paired with disk blades, your OS *must* be installed in one of the following ways:

■ On a single disk in your server blade.

■ In a RAID 1 volume with both disks in the server blade.

■ In a *hardware* RAID 1 (but not RAID 1E) volume with one disk in the server blade and one disk in the disk blade. (Not allowed for SPARC blades.)

■ In a *hardware* RAID volume of any type with all disks on the disk blade. (Not allowed for SPARC blades.)

Note – A hardware RAID volume is RAID volume that is created and managed at the firmware level of the server blade's host bus adapter. See the *Disk Module Administration Guide* for more information on configuring RAID.

The options are summarized in .

TABLE 1-1 Operating System Installation Options

Server	On a Single Disk in the Server Blade	In a RAID 1 Volume with Both Disks in the Server Blade	In a Hardware RAID 1 Volume With One Disk in the Server Blade and One Disk in the Disk Blade (RAID 1 only)	In a Hardware RAID Volume of Any Type With All Disks on the Disk Blade
X6220	Yes	Yes	Yes	Yes
X6240	Yes	Yes	Yes	Yes
X6250	Yes	Yes	Yes	Yes
X6270	Yes	Yes	Yes	Yes
X6440	Yes (Compact Flash Drive)	No	No	Yes
X6450	Yes (Compact Flash Drive)	No	No	Yes
T6300	Yes	Yes	No	No
T6320	Yes	Yes	No	No
T6340	Yes	Yes	No	No

Upgrading Components

Your chassis, and all of the server blades and host bus adapters in it, need to have the most current software and firmware versions.

Refer to the *Disk Module Administration Guide* for the following information:

- How to find out the current versions of the software and firmware on your components.
- Where to get software and firmware upgrade files.
- How to install software and firmware upgrades.

Note – After you have downloaded the software and firmware files and any tools needed to install them in advance, the upgrade procedure should be no more than 10-15 minutes per server blade.

Upgrading Operating Systems

You must be sure that the OS you choose for each of your server blades has been tested for use with disk blades. The list can be found in "Supported Servers and Operating Systems" on page 8.

Each OS must include the latest drivers. The *Disk Module Administration Guide* includes information on updating drivers.

Note – Installation of patches takes only 10-15 minutes unless rebooting is required. If you need to upgrade your Solaris OS to Solaris 10 5/08, the process can take hours.

Things You Will Need

In preparing for installation of your chassis with a mixture of server blades and disk blades, it is a good idea to download the things you need ahead of time.

Note – If you have purchased new server blades, some of the items in this list may come with the server blade.

This list includes the following (refer to the *Disk Module Administration Guide* for more details):

- The latest Integrated Lights Out Manager (ILOM) software for your chassis.
- The latest Sun Installation Assistant (SIA) software for each type of x64 server you are using. This is used to upgrade server and host bus adapter firmware.

Note – When you use SIA to upgrade firmware, you do not need to know the firmware version numbers. SIA provides the correct versions automatically.

- The latest Tools & Drivers CD (or ISO image) for any x64 servers you are using. You can download just the drivers that you need.
- The latest system firmware (SysFW) patches for any SPARC servers you are using.
- The Solaris 10 5/08 OS if it is not already installed on your SPARC servers.
- The Solaris 10 5/08 patches for any SPARC servers you use.
- Host bus adapter firmware for any SPARC servers you use.
- The `lsiutil` software.
- If you are using older 10GbE Multi-Fabric NEMs, the Sun Common Array Manager (CAM) software.

System Requirements

This chapter contains the following topics:

Latest System Requirements Are Online

If you do not see your server blade listed in this chapter, or if you think there might have been recent changes to the system requirements, drivers, or firmware for your server blade, you can find the latest version information in the *Sun Blade 6000 Disk Module Product Notes* (820-1809, found here:

(http://docs.sun.com/app/docs/coll/blade6000dskmod)

Alternatively, to find the most recent versions and download them, go to the Sun Blade 6000 disk module download site:

(http://www.sun.com/servers/blades/downloads.jsp#6000dm)

Supported Servers and Operating Systems

At the time of initial release, the Sun Blade 6000 Disk Module works with the combinations of server blades and operating systems shown in TABLE 2-1. For later combinations, look online (see "Latest System Requirements Are Online" on page 7).

TABLE 2-1 Supported Servers, Firmware and Operating Systems

Server	SPARC/ x64	Minimum System Firmware and Patches	Linux	VMware	Windows	Solaris OS and Patches (in order of installation)
T6300	SPARC	SysFW: 6.6.5 + 136931-04 Disk Controller: 1.24.93.00, + 139418-01	N/A	N/A	N/A	S10 05/08: + 119254-64, + 125555-02, + 138866-02
T6320 (with RAID 0/1 REM)	SPARC	SysFW: 6.6.5 + 136931-04 Disk Controller: 1.24.93.00, + 138445-02	N/A	N/A	N/A	S10 10/08 S10 05/08: + 119254-64, + 125555-02, + 138866-02
T6320 (with RAID 0/1 G2 REM)	SPARC	SysFW: 7.1.6 + 136931-04 Disk Controller: + 139419-01	N/A	N/A	N/A	S10 10/08 S10 05/08: + 119254-64, + 125555-02, + 138866-02
T6340	SPARC	SysFW: 7.1.6.d Disk Controller: 1.24.94.00, + 139419-01	N/A	N/A	N/A	S10 10/08 S10 05/08: + 119254-64, + 125555-02, + 138866-02
X6220	x64	BIOS: 110 ILOM: 2.0.3.10, build 36968	RHEL 4.6 (32/64), RHEL 4.7 (32/64), RHEL 5.1 (64), SLES 10 SP1 (64)	ESX 3.0.3, ESX 3.5 U3	2003 R2 SP2 (32/64), 2008 Data Cntr. (32/64)	S10 10/08 S10 05/08: + 138880-01
X6240	x64	BIOS: 1.08 ILOM: 2.0.3.9, build 36997	RHEL 4.6 (32/64), RHEL 5.1 (64), SLES 9 SP4 (64), SLES 10 SP2 (64)	ESX 3.5 U2, ESXi 3.5 U2	2003 R2 SP2 (32/64), 2008 Data Cntr. (32/64)	S10 05/08: + 138880-01

TABLE 2-1   Supported Servers, Firmware and Operating Systems *(Continued)*

Server	SPARC/ x64	Minimum System Firmware and Patches	Linux	VMware	Windows	Solaris OS and Patches (in order of installation)
X6250	x64	BIOS: v11 ILOM: 2.0.3.6	RHEL 4.6 (32/64), RHEL 4.7 (32/64), RHEL 5.0 (64), RHEL 5.1 (64), RHEL 5.2 (64), RHEL 5.3 (64), SLES 9 SP3 (64), SLES 9 SP4 (64), SLES 10 SP1 (64), SLES 10 SP2 (64)	ESX 3.0.2 U1	2003 R2 SP2 (32/64), 2008 Data Cntr. (32/64)	S10 10/08 S10 05/08: + 138880-01
X6270	x64	Initial release supported	RHEL 4.6 (32/64) RHEL 4.7 (32/64), RHEL 5.1 (64), RHEL 5.2 (64), SLES 9 SP4 (64), SLES 10 SP1 (64), SLES 10 SP2 (64)	ESX 3.0.2 U1, ESX 3.5 U1, ESX 3.5 U2	2003 R2 SP2 (32/64), 2008 Data Cntr. (32/64)	S10 10/08 S10 05/08: + 138880-01
X6440	x64	Initial release supported	RHEL 4.6 (32/64), RHEL 5.1 (64), SLES 9 SP4 (64), SLES 10 SP2 (64)	ESX 3.5 U2, ESXi 3.5 U2	2003 R2 SP2 (32/64), 2008 Data Cntr. (32/64)	S10 05/08: + 138880-01
X6450	x64	BIOS: 3B16 ILOM: 2.0.3.6	RHEL 4.6 (32/64), RHEL 4.7 (32/64), RHEL 5 (64), RHEL 5.2 (64), SLES 9 SP4 (64), SLES 10 SP2 (64)	ESX 3.5, ESX 3.5 U2	2003 R2 SP2 (32/64), 2008 Data Cntr. (32/64)	S10 05/08: + 138880-01

Note – The patches listed for Solaris are *in addition to* the patches that are required for the server blade. The server blade has its own patch list. These are additional patches needed for use with disk blades.

RAID Controllers and Host Bus Adapters

At the time of initial release, the supported SAS RAID controllers are shown in TABLE 2-2. For later combinations, look online (see "Latest System Requirements Are Online" on page 7).

TABLE 2-2   RAID Controllers and Host Bus Adapters

Server	On-board RAID Controller Chip	RAID Expansion Module HBA	Minimum HBA Firmware Required	Minimum Disk Blade and SAS-NEM Firmware Required	Minimum HBA Firmware Required for SSD Support
T6300	LSI 1068E	Not supported	LSI: FW 1.24.93.0	5.02.10	LSI: FW 1.26.90.0
T6320	Not supported	• T6320 RAID 0/1 Expansion Module (LSI) • Sun Blade RAID 0/1 G2 Expansion Module (LSI)	• LSI: FW 1.24.93.0 • LSI: FW 1.24.94.0	5.02.10	• LSI: FW 1.26.90.0 • LSI: FW 1.26.90.0
T6340	Not supported	Sun Blade RAID 0/1 G2 Expansion Module (LSI)	LSI: FW 1.24.94.0	5.02.10	LSI: FW 1.26.90.0
X6220	LSI 1068E	Not supported	LSI: FW 1.24.93.00, BIOS 6.20.03	5.02.10	LSI: FW 1.26.90.00, BIOS 6.24.01
X6240	Not supported	• Sun Blade RAID 0/1 G2 Expansion Module (LSI) • Sun Blade RAID 5 Expansion Module (Intel/Adaptec)	• LSI: FW 1.24.94.00, BIOS 6.20.03, Fcode 1.00.49 • Adaptec: FW 5.2.0-15825, BIOS 5.2.0-15825, Fcode 5.2.0-15825	5.02.10	• LSI: FW 1.26.90.0, BIOS 6.24.01, Fcode 1.00.49 • Adaptec: No SSD support
X6250	Not supported	Sun Blade RAID 5 Expansion Module (Intel/Adaptec)	Adaptec: FW 5.2.0-15825, BIOS 5.2.0-15825, Fcode 5.2.0-15825	5.02.10	Adaptec: No SSD support

TABLE 2-2   RAID Controllers and Host Bus Adapters *(Continued)*

Server	On-board RAID Controller Chip	RAID Expansion Module HBA	Minimum HBA Firmware Required	Minimum Disk Blade and SAS-NEM Firmware Required	Minimum HBA Firmware Required for SSD Support
X6270	Not supported	• Sun Blade RAID 0/1 G2 Expansion Module (LSI) • Sun Blade RAID 5 Expansion Module (Intel/Adaptec)	• LSI: FW 1.24.94.00, BIOS 6.20.03, Fcode 1.00.49 • Adaptec: FW 5.2.0-15825, BIOS 5.2.0-15825, Fcode 5.2.0-15825	5.02.10	• LSI: FW 1.26.90.0, BIOS 6.24.01, Fcode 1.00.49 • Adaptec: No SSD support
X6440	Not supported	• Sun Blade RAID 0/1 G2 Expansion Module (LSI) • Sun Blade RAID 5 Expansion Module (Intel/Adaptec)	• LSI: FW 1.24.94.00, BIOS 6.20.03, Fcode 1.00.49 • Adaptec: FW 5.2.0-15825, BIOS 5.2.0-15825, Fcode 5.2.0-15825	5.02.10	• LSI: FW 1.26.90.0, BIOS 6.24.01, Fcode 1.00.49 • Adaptec: No SSD support
X6450	Not supported	• Sun Blade RAID 0/1 G2 Expansion Module (LSI) • Sun Blade RAID 5 Expansion Module (Intel/Adaptec)	• LSI: FW 1.24.94.00, BIOS 6.20.03, Fcode 1.00.49 • Adaptec: FW 5.2.0-15825, BIOS 5.2.0-15825, Fcode 5.2.0-15825	5.02.10	• LSI: FW 1.26.90.0, BIOS 6.24.01, Fcode 1.00.49 • Adaptec: No SSD support

For supported RAID controllers and HBAs, note the following

- The on-board LSI 1068E chip, the T6320 RAID 0/1 Expansion Module, and the Sun Blade RAID 0/1 G2 Expansion Module are functionally equivalent. The latter two are REMs that use the LSI 1068E chip. Each of the three can create two RAID volumes that are RAID 0, 1, or 1E. Documentation for these LSI host bus adapters can be found in the *Sun LSI 106x RAID User's Guide* (part number 820-4933).

- The Sun Blade RAID 5 Expansion Module is a REM with Intel circuitry and Adaptec firmware. It can create 24 RAID volumes that are RAID 0, 1, 1E, 10, 5, 5EE, 50, 6, or 60. See the *Sun Intel Adaptec BIOS RAID Utility User's Manual* (part number 820-4708) and the *Sun StorageTek RAID Manager Software User's Guide* (part number 820-1177).

- For servers using the on-board LSI 1068E chip, firmware upgrades for the chip are done when upgrading the server's system BIOS and ILOM firmware.

- Support for Solid State Drives (SSD) requires compatible firmware on both the HBA and the disk blade. For more on upgrading firmware, see "Drivers, Firmware and Software" on page 13.

Supported Network Express Modules

The Sun Blade 6000 Disk Module requires, at minimum, a SAS-NEM in NEM slot 0 for communication with server blades. For dual paths to SAS disk drives, a SAS-NEM is also required in NEM slot 1. SAS-NEMs also include firmware, which may be upgraded using the Sun Common Array Manager, see "Drivers, Firmware and Software" on page 13. The following SAS-NEMs are supported for use with the disk blade:

- Sun Blade 6000 Multi-Fabric Network Express Module (abbreviated Multi-Fabric NEM)
- Sun Blade 6000 10GbE Multi-Fabric Network Express Module (abbreviated 10GbE Multi-Fabric NEM)
- Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module (abbreviated Virtualized 10GbE Multi-Fabric NEM)

Rules for Mixing NEMs

You can mix SAS-NEMs as follows:

- You can use two Multi-Fabric NEMs, two 10GbE Multi-Fabric NEMs, or two Virtualized 10GbE Multi-Fabric NEMs.
- You can mix a Multi-Fabric NEM and a 10GbE Multi-Fabric NEM. It does not matter which type is in slot NEM 0.
- You can not mix a Virtualized 10GbE Multi-Fabric NEM with any other type of NEM.
- You can use a plain NEM (one without SAS connectivity) in slot NEM 1, but not in slot NEM 0. However, **in this configuration you lose the redundant second path to SAS disks**.
- In all cases, a SAS-NEM must be in slot NEM 0.
- The expander firmware version on each of the SAS-NEMs and the disk blade module must be the same.

Special Server or OS Considerations

- If you are using two SAS-NEMs for redundant paths to SAS disks, an LSI controller, and you have disks that are not in hardware RAID volumes, you *must* enable multipathing at the OS level on all active server blades in the chassis. This ensures that the primary path to disks is not lost, which can cause an OS panic. Sun does not support dual paths to SAS disks if OS multipathing is not enabled.

- For all operating systems, if you put your boot disk on the disk blade, it must be in a hardware RAID volume.

- For SPARC blades, you must either put the OS on a single disk in your server blade or in a RAID 1 volume with both member disks in your server blade.

- For the Solaris OS, you must create RAID volumes before enabling `mpxio`. Once `mpxio` is enabled, you can no longer create RAID volumes or change RAID configurations.

- SUSE Linux can manage dual paths to disk drives at the OS level, *except for boot disks*. You should either create a RAID volume for your OS with the SAS host bus adapter firmware or put the OS on a disk or volume on your server. The disks on the server blades have only one path.

- RHEL 4 Linux can manage dual paths to disk drives at the OS level, *except for boot disks*. You should either create a RAID volume for your OS with the SAS host bus adapter firmware or put the OS on a disk or volume on your server. The disks on the server blades have only one path.

- RHEL 5.0, 5.1, and 5.2 can manage dual paths to disk drives either at the OS level (*including the boot disk*) or through the SAS host bus adapter firmware. Installation might require special boot parameters passed to the kernel for dual-path disks to be recognized correctly.

- Windows 2008 includes an `MPIO` utility and supports dual-pathing at the OS level. It can also handle multipathing through the SAS host bus adapter firmware.

- Windows 2003 does not include an `MPIO` utility at this time, although one is being developed, so dual paths are not supported at the OS level. However, Windows 2003 can manage dual-pathing through the SAS host bus adapter firmware, which means that RAID volumes need to be created by the adapter.

Drivers, Firmware and Software

This section lists the drivers, firmware and software you need for your installation. Refer to the *Sun Blade 6000 Disk Module Product Notes* (part number 820-1709) for the most current versions.

Minimum Operational Requirements

Every installation requires:

- ILOM 2.0.3.10, build number 36968 on the chassis CMM
- The latest expander firmware on the disk blade
- The latest expander firmware on the SAS-NEM (same version as the disk blade)

Every server must have:

- For x64 blades, the latest SP firmware and system BIOS
- For SPARC blades, the latest SysFW
- The latest LSI firmware if there is an on-board 1068E chip (X6220, T6300)
- The latest LSI REM firmware if a RAID 0/1 REM is supported
- The latest Adaptec REM firmware if the RAID 5 REM is supported
- The latest LSI `mpt` drivers for each OS version supported when using LSI 1068E chip or RAID 0/1 REM
- The latest Adaptec drivers for each supported OS when using the RAID 5 REM
- For servers running Windows, the Sun Blade 6000 Disk Module enclosure driver is required.
- Installations utilizing multipath, refer to the *Sun Blade 6000 Disk Module Administration Guide* (820-4922) for adding the multipath drivers to your operating system.

Where to Get Drivers and Firmware

You can download the firmware and drivers from:

(http://www.sun.com/servers/blades/downloads.jsp#6000dm)

Other Software Required

Common Array Manager (CAM)

Support for Sun Blade 6000 Disk Modules and Sun Blade 6000 supported SAS-NEMs is available beginning with CAM version 6.1.2.8. Use CAM to upgrade the firmware on the disk module and SAS-NEMs. To obtain the latest CAM software and firmware, go to the Sun software download site:

(http://www.sun.com/servers/blades/downloads.jsp#6000dm)

lsiutil

The lsiutil application is used for service-related procedures, and version 1.60 or later should be installed on every server. To obtain the latest lsiutil software, go to the Sun software download site:

(http://www.sun.com/servers/blades/downloads.jsp#6000dm)

Optional Software

MegaRAID Storage Manager (MSM)

This software is used create and manage hardware RAID volumes on LSI host bus adapters. Version 2.63 is required for use with disk blades and SAS-NEMs.

MSM runs on Windows and Linux platforms only. To download it, go to

(http://www.sun.com/servers/blades/downloads.jsp#6000dm)

and navigate to the latest downloads for your server blade.

The Solaris utility raidctl performs many of the same functions as MSM on all platforms, including SPARC.

The MegaRAID Storage Manager and `raidctl` are both documented in the *Sun LSI 106x RAID User's Guide* (820-4933).

Sun StorageTek RAID Manager

This software is used to create and manage hardware RAID volumes on Adaptec host bus adapters. Version 17530 is required for use with disk blades and SAS-NEMs.

The Sun StorageTek RAID Manager runs on Windows, Linux, and the Solaris OS on all platforms, including SPARC. To download it, go to

(http://www.sun.com/servers/blades/downloads.jsp#6000dm)

and navigate to the latest downloads for your server blade.

The Sun StorageTek RAID Manager is documented in the *Sun StorageTek RAID Manager Software User's Guide* (820-1177).

Getting Started Checklist

This chapter provides a checklist of the steps you need to do to make a chassis with a mixture of server blades and disk blades work. It assumes that you have carefully reviewed Chapter 1 and have planned your installation.

The checklist is broken down into five steps:

Caution – It is important that you follow the steps in order.

Note – Performing all of the required steps for a multi-server and disk blade installation can take a number of hours. Be sure to plan for enough server downtime to complete the entire installation process.

Getting Started Checklist

Steps 1 through 3 must be performed before you install any disk blades.

▼ Step 1: Loading Your Chassis

1. **If necessary, upgrade the Integrated Lights Out Management System (ILOM) software on the CMM of your Sun Blade 6000 chassis to the minimum supported version (2.0.3.10, build number 36968). For more information on performing this procedure, see the** *Disk Module Administration Guide.*

2. **If your chassis includes SAS-NEMs of any kind, remove them at this time.**

Note – You can leave a plain NEM, one without SAS connectivity, in slot NEM 1.

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3. **Arrange or rearrange all the server blades that you intend to use in the chassis, whether or not they are to be paired with disk blades, according to the configuration outlined in** "Where to Put the Server Blades and Disk Blades" on page 2**.**

Caution – Do *not* insert the disk blades yet.

▼ Step 2: Installing or Upgrading Your Operating Systems

Note – You might need a NEM of some sort for network access when installing your OS. Unless it is a NEM without SAS connectivity in slot NEM 1, remove it after your OS is installed.

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1. **If necessary, upgrade your Solaris network installation images to Solaris 10 5/08 with all the correct patches for use with disk blades. See** "Supported Servers and Operating Systems" on page 8**.**

2. **Install the Solaris 10 5/08 OS with patches on all your SPARC blades.**

   If you have a SPARC blade with the OS already on it, upgrade the OS to Solaris 10 5/08 and add the required patches (see "Supported Servers and Operating Systems" on page 8).

3. **Install a supported OS on all your x64 server blades. See** "Supported Servers and Operating Systems" on page 8**.**

Note – If you plan to install your x64 OS in a hardware RAID volume on the disk blade, postpone this step until prompted later in the installation process.

- For Linux, install the latest drivers (see "Supported Servers and Operating Systems" on page 8).

- For Windows, install the latest drivers *and* the Windows Enclosure Device Driver for Sun Blade 6000 Disk Modules (see "Supported Servers and Operating Systems" on page 8)

- For the Solaris OS, you do not need to install anything other than the correct patches, as mentioned above (see "Supported Servers and Operating Systems" on page 8).

▼ Step 3: Upgrading Your Existing Server Blades

This *can* be done with an OS already on the server blade, but it does not require an installed OS.

Note – Verify that any new components you have are at the latest revision level. See the *Disk Module Administration Guide* and skip this section if the revision levels are current.

You need to make sure that your server blades and host bus adapters all have the minimum supported firmware and software. If they do not, they need to be upgraded.

Note – You must ensure that all server blades and their host bus adapters meet the minimum firmware requirements whether or not you intend to pair them with a disk blade.

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1. **Upgrade the system firmware on *all* the server blades you are using in your chassis.**

    a. **For x64 blades (X6220, X6240, X6250, etc.), you can use the latest version of the Sun Installation Assistant (SIA) to upgrade the server's system BIOS and ILOM SP firmware (see** "Supported Servers and Operating Systems" on page 8**). An installed OS is not required.**

    b. **For SPARC blades, go to** (http://www.sun.com/servers/blades/downloads.jsp#6000dm) **to get the patches to upgrade the SysFW.**

    The patch download page includes instructions.

    - T6300 -- SysFW 6.6.5 (patch number 136931-04)

    - T6320 -- with RAID 0/1 G2 REM, SysFW 7.1.6 (patch number 136933-07)

    - T6320 -- with RAID 0/1 REM, SysFW 6.6.5 (patch number 136931-04)

- T6340 -- SysFW 7.1.6.d (new server blade, patch not yet released at the publication of this document)

2. **Upgrade the host bus adapter firmware on *all* the server blades you are using in your chassis.**

   a. **For x64 systems (X6220, X6240, X6250, X6450, etc.), you can use the latest version of the Sun Installation Assistant (SIA) to upgrade the HBA firmware (see** "Supported Servers and Operating Systems" on page 8**). An installed OS is not required.**

   b. **For SPARC blades, go to** (http://www.sun.com/servers/blades/downloads.jsp#6000dm) **to get the patches to upgrade the HBA firmware.**

   The patch download page includes instructions.

   - T6300 -- version 1.24.93.00 (patch number 139418-01)
   - T6320 with older RAID 0/1 REM -- version 1.24.93.00 (patch number 138445-02)
   - T6320 with newer RAID 0/1 G2 REM -- version 1.24.94.00 (patch number 139419-01)
   - T6340 with newer RAID 0/1 G2 REM -- version 1.24.94.00 (patch number 139419-01)

▼ Step 4: Installing Your SAS-NEMs and Disk Blades

⚠ **Caution –** If you have already been using a 10GbE Multi-Fabric NEM, you must upgrade its firmware before proceeding. If this is the case, leave the installation process in this chapter at this point and finish your installation by following the instructions in Appendix A.

1. **Power off all of your server blades.**

2. **Install one or two SAS-NEMs in your chassis. The SAS-NEMs power on automatically when inserted. Their green OK LED should turn on.**

   If you install only one SAS-NEM, it must go in slot NEM 0 (the lower slot). If you use only one SAS-NEM, you can insert a plain NEM (without SAS connectivity) in slot NEM 1.

   To provide redundancy by dual-path access to SAS disks on the disk blade, you must install two SAS-NEMs.

Note – Verify that the NEMs are installed correctly by referring to the appropriate NEM documentation.

3. Insert all the disk blades you intend to use with server blades. Facing the front of the chassis, insert the disk blade in an odd-numbered slot to the right of the server blade it is paired with.

Put the first, second, third, fourth, and fifth disk blade in slot 9, 7, 5, 3, and 1 (see "Where to Put the Server Blades and Disk Blades" on page 2).

Note – The disk blades power on automatically when inserted. Verify that the green OK LED on each disk blade lights up.

4. Insert disks into the disk blade if you have not already done so.

5. Power on all your server blades.

6. If you have planned to install your x64 server's OS in a hardware RAID volume on your disk blade, do so now. See the *Disk Module Administration Guide* for instructions for setting up hardware RAID volumes.

Note – Successful creation of a hardware RAID volume verifies correct operation of that particular disk blade.

▼ Step 5: Saving the Configuration of Your LSI Host Bus Adapters for Server Blades Running the Solaris OS

If you need to replace a failed LSI host bus adapter on a server blade that is running the Solaris OS, the replacement is quick and simple if you have saved a file with the adapter's configuration. Use this procedure (which is documented in greater detail in the *Disk Module Administration Guide*), which does not require powering off or rebooting:

1. Install the `lsiutil` application on *all* the server blades in your chassis that are running the Solaris OS and have LSI host bus adapters.

2. Create a persistent mappings snapshot file for *every* one of these server blades.

3. Archive the persistent mappings snapshots (which you need if you must replace an LSI host bus adapter) to a safe external location.

> **Note –** If you are using Adaptec host bus adapters, it is not necessary to save a snapshot of your adapter's configuration.

Where to Go From Here

At some point after your chassis is set up, you should install the Sun Common Array Manager (CAM) to manage the disk blade. CAM can monitor your disk blades and SAS-NEMs. It can also upgrade the expander firmware on your disk blades and SAS-NEMs. CAM is the only mechanism for making such upgrades. For more information on CAM, see the *Disk Module Administration Guide*.

Finishing Installation With Existing 10GbE NEMs

If you have been using Sun Blade 6000 10GbE Multi-Fabric NEMs, you must upgrade the firmware on them to the minimum supported level. The Sun Common Array Manager (CAM) software does this. The CAM steps in this appendix are described in greater detail in the *Disk Module Administration Guide*.

CAM sees SAS-NEMs indirectly through disk blades. Therefore, to use CAM to upgrade the firmware on SAS-NEMs, you must have at least one disk blade in your chassis.

Use CAM to Upgrade NEM Firmware

▼ To Upgrade Your 10GbE NEM Firmware

1. **Insert your 10GbE Multi-Fabric NEMs.**

2. **Insert one disk blade in slot 9.**

3. **Install the CAM software on a single server on your network that you intend to use for management.**

4. **Register the disk blade in your chassis with CAM. Check to see if the disk blade expander firmware is current.**

   If the SAS-NEM firmware is not current, CAM reports that the *disk blade* firmware is not current. The SAS-NEM firmware and the disk blade firmware are upgraded at the same time and to the same revision.

5. Use CAM to upgrade the expander firmware on the disk blade.

Choosing to upgrade the disk blade automatically upgrades the SAS-NEMs in the chassis.

Note – When the SAS-NEM expander firmware is upgraded, you can continue with your installation. Proceed with the instructions below. Do not return to the previous chapter.

▼ To Install Your Disk Blades

1. Power off all of your server blades.

2. Insert all the disk blades you intend to use with server blades. Facing the front of the chassis, insert the disk blade in an odd-numbered slot to the right of the server blade it is paired with.

Put the first, second, third, fourth, and fifth disk blades in slots 9, 7, 5, 3, and 1 (see "Where to Put the Server Blades and Disk Blades" on page 2).

Note – The disk blades power on automatically when inserted. Verify that the green OK LED on each disk blade lights up.

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3. Insert disks into the disk blade if you have not already done so.

4. Power on all your server blades.

5. If you plan to install your x64 server's OS in a hardware RAID volume on your disk blade, do so now. See the *Disk Module Administration Guide* for instructions on setting up hardware RAID volumes.

Note – Successful creation of a hardware RAID volume verifies correct operation of that particular disk blade.

▼ To Save the Configuration of Your LSI Host Bus Adapters for Servers Running the Solaris OS

If you need to replace a failed LSI host bus adapter on a server blade that is running the Solaris OS, the replacement is quick and simple if you have saved a file with the adapter's configuration. Use this procedure (described in greater detail in the *Disk Module Administration Guide*), which does not require powering off or rebooting:

1. **Install the** `lsiutil` **application on** *all* **the server blades in your chassis that are running the Solaris OS and have LSI host bus adapters.**

2. **Create a persistent mappings snapshot file for** *every* **one of these server blades.**

3. **Archive the persistent mappings snapshots to a safe external location.**

Note – If you are using Adaptec host bus adapters, which use a different target ID scheme, it is not necessary to save a snapshot of your adapter's configuration.