

Sun Disk Management Overview

For x64 Sun Fire and Sun Blade
Series Servers



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Contents

Preface v

1. Disk Management Solutions 1

Disk Management Terms 2

Disk Management Solutions 3

Types of Disk Controllers 3

Identifying Your Server's Disk Controller 4

Identifying Your Disk Controller Using OS Commands 10

▼ Identifying Your Disk Controller in the Solaris Operating System 10

▼ Identifying Your Disk Controller in the Linux Operating System 11

▼ Identifying Your Disk Controller in the Windows Operating System
12

Upgrading HBA Firmware Using SIA 13

Using Compact Flash Cards, FMODs, and Solid State Drives 14

Considerations When Using RAID 14

For More Information 16

2. Disk Management Information Resources 17

Finding the Resources to Manage Your Disks 18

Preface

This document provides an overview of disk management for Oracle's x86/64 (Intel™ and AMD™) architecture Sun Fire™ Server and Sun Blade™ Server systems. Use this guide as a reference to help you find the information you need to manage your server's mass storage.

Related Documentation

For the most up-to-date information about your server, refer to its documentation set located on the web:

Documentation	Web Site
Server documentation	(http://docs.sun.com/app/docs/prod/server#hic)
Solaris Operating System Installation	(http://docs.sun.com/)
All Sun hardware documentation	(http://docs.sun.com/)

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Disk Management Solutions

This chapter contains overview information about various disk management hardware solutions for Sun x64 servers.

- “Disk Management Terms” on page 2
- “Disk Management Solutions” on page 3
 - “Types of Disk Controllers” on page 3
 - “Identifying Your Server’s Disk Controller” on page 4
 - “Identifying Your Disk Controller Using OS Commands” on page 10
- “Upgrading HBA Firmware Using SIA” on page 13
- “Using Compact Flash Cards, FMODs, and Solid State Drives” on page 14
- “Considerations When Using RAID” on page 14
- “For More Information” on page 16

Disk Management Terms

Terms used in this manual are described in the table below. You will also see these terms used in other Sun server documentation to describe disk management solutions.

TABLE 1-1 Disk Management Terms

Term	Description
FMOD	Flash Module. This is flash-based memory module that can be used like a disk for caching local data, or to act as a boot disk.
HBA	Host Bus Adapter. This can refer to an on-board chip (integrated circuit) or to a controller card that plugs into an accessory slot (PCI, PCIe, etc.). A disk storage HBA controls the transfer of data from the host (initiator) to a storage device (target).
Integrated disk controller	A disk controller that is integrated, or comes standard, with the system (on-board integrated circuit, mezzanine board, or preinstalled in an accessory slot from the factory)
PCIe EM	PCIe ExpressModule. An optional I/O interface card with a special form factor that plugs into a blade system chassis ExpressModule slot.
REM	RAID Expansion Module. Disk controller that is installed directly on a blade server module using a proprietary motherboard connector.
RAID	<p>Redundant Array of Independent Disks. Disks configured in a RAID can preserve your data in the event of a disk failure and continue to operate. Information can be mirrored (with two volumes containing the same information), or striped (where information is spread across many disks) in different ways. Disks in a RAID are combined into a single logical unit that can then be partitioned. There are two types of RAID:</p> <ul style="list-style-type: none">• Software RAID: Included in the operating system. Software RAID functions are handled by the server CPU and can be I/O intensive. To get the best performance, you want a system with available CPU resources to manage the RAID functions. This solution works well for data warehousing and video streaming.• Hardware RAID: Included in the HBA. Processor-intensive RAID operations are off-loaded from the server CPU to the RAID controller to enhance performance. Some solutions include a battery-backed write cache that can increase performance and reduce the risk of losing data. This solution works well for web servers and transaction databases. Disk controllers with “RAID” as part of their name provide hardware RAID. For information on RAID levels, see TABLE 1-3.

TABLE 1-1 Disk Management Terms (*Continued*)

Term	Description
SAS	Serially Attached SCSI. Disks that use this technology provide two physical links to each disk, allowing for path redundancy.
SATA	Serial Advanced Technology Attachment. Disks that use this technology are less expensive, but only provide one physical link to each drive.
SCSI	Small Computer Systems Interface. Command-based standard interface created for PCs. This architecture is the basis for SAS.
SSD	Solid State Drive. SSDs utilize flash technology and provide higher data rates, better reliability and use less power than traditional mechanical drives.

Disk Management Solutions

This section describes the different disk management solutions for the Sun x86/x64 servers. It includes the following sections:

- [“Types of Disk Controllers” on page 3](#)
- [“Identifying Your Server’s Disk Controller” on page 4](#)
- [“Identifying Your Disk Controller Using OS Commands” on page 10](#)

Types of Disk Controllers

Sun servers can come with a variety of disk management solutions (or disk controllers). These solutions are used to control either internal or external disks (in some cases, both). There are several types:

- On-board chip (also called integrated circuit) disk controller on the mother board, or mezzanine card (example: Integrated LSI SAS 1068E disk controller)
- Disk controller accessory card (PCI, PCIe, PCIx, etc.) that comes either as an integrated (or bundled) solution with the system, or as an orderable option (example: Sun StorageTek SAS RAID Internal HBA)
- Expansion Module disk controller that comes standard or can be purchased as an option and is installed in a blade server using a proprietary mother board connector (example: Sun Blade RAID 0/1 Expansion Module)
- PCI ExpressModule (EM) that is installed in the blade chassis (example: Sun StorageTek SAS RAID ExpressModule)

Identifying Your Server's Disk Controller

TABLE 1-2 describes where each disk controller is used, how each controller is configured, whether it includes disk management software, and how its firmware is maintained. Note that support for HBA firmware upgrades may also be available through the Sun Solaris, Linux, Windows Installation Assistant (see “Upgrading HBA Firmware Using SIA” on page 13).

TABLE 1-2 Disk Controller Support/Feature Matrix

Server	Disk Controller	RAID Support	Initial Config. Through:	OS Driver Support	GUI Disk Management Software	CLI Disk Management Tools	Firmware Upgrades Through:
V20z, V40z	On-board chip, LSI SCSI U320	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows			Server BIOS
X2100, X2100 M2, X2200 M2	On-board chip, NVIDIA NVRAID SATA controller	Hardware 0, 1	Server BIOS to enable, then HBA BIOS	Windows (optional hardware NVRAID), Solaris, Linux			Server BIOS
X2100 M2, X2200 M2	Optional StorageTek PCIe SAS 4-Port Internal HBA, SG-XPICIE4SAS3-Z, LSI SAS 1064E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	raidctl (Solaris), HBA utility (Linux, Windows)
X2250	On-board chip, Intel ESB2 SATA controller	Hardware 0, 1	Server BIOS	Windows (optional hardware RAID), Solaris, Linux	Matrix Storage Manager (Windows)		Server BIOS
X2270	On-board chip, Intel ICH10R SATA controller	Hardware 0, 1	Server BIOS	Windows (optional hardware RAID), Solaris, Linux	Matrix Storage Manager (Windows)		Server BIOS

TABLE 1-2 Disk Controller Support/Feature Matrix (*Continued*)

Server	Disk Controller	RAID Support	Initial Config. Through:	OS Driver Support	GUI Disk Management Software	CLI Disk Management Tools	Firmware Upgrades Through:
X2270 M2	On-board chip, Intel ICH10R SATA controller	Hardware 0, 1, 5, 10	Server BIOS	Windows (optional hardware RAID), Solaris, Linux, OVM, ESX	Matrix Storage Manager (Windows)		Server BIOS
X4100, X4100 M2, X4200, X4200 M2	On-board chip, LSI SAS 1064E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	Server BIOS
X4140, X4240, X4440	On-board chip, NVIDIA MCP55 nForce SATA controller	Internal SATA mechanical hard disk drives are not supported.					
X4140, X4240, X4440	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	raidctl (Solaris), HBA utility (Linux, Windows)
X4140, X4240, X4440	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT -Z, Adaptec/Intel-based	Hardware 0, 1, 1E, 10, 5, 5EE, 50, 6, 60	HBA BIOS	Solaris, Linux, Windows, ESX	StorageTek RAID Manager	arcconf	GUI or CLI
X4150, X4250, X4450	On-board chip, Intel ESB2 SATA controller	Internal SATA mechanical hard disk drives are not supported.					
X4150, X4250, X4450	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	raidctl (Solaris), HBA utility (Linux, Windows)
X4150, X4250, X4450	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT -Z, Adaptec/Intel-based	Hardware 0, 1, 1E, 10, 5, 5EE, 50, 6, 60	HBA BIOS	Solaris, Linux, Windows, ESX	StorageTek RAID Manager	arcconf	GUI or CLI

TABLE 1-2 Disk Controller Support/Feature Matrix (*Continued*)

Server	Disk Controller	RAID Support	Initial Config. Through:	OS Driver Support	GUI Disk Management Software	CLI Disk Management Tools	Firmware Upgrades Through:
X4170	On-board chip, Intel ICH10 SATA controller	RAID is not supported in this configuration.					
X4170	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	raidctl (Solaris), HBA utility (Linux, Windows)
X4170	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT-Z, Adaptec/Intel-based	Hardware 0, 1, 1E, 10, 5, 5EE, 50, 6, 60	HBA BIOS	Solaris, Linux, Windows, ESX	StorageTek RAID Manager	arcconf	GUI or CLI
X4170 M2	On-board chip, Intel ICH10 SATA controller	RAID is not supported in this configuration.					
X4170 M2	Optional Sun Storage 6Gb/s SAS PCIe Internal HBA, SGX-SAS6-INT-Z, LSI Fusion-MPT IR SAS2	Hardware 0, 1, 10	HBA BIOS	Solaris, Linux, Windows, OVM, ESX	MegaRAID Storage Manager	sas2ircu	GUI or utility bundled with upgrade
X4170 M2	Optional Sun Storage 6Gb/s SAS PCIe RAID Internal HBA, SGX-SAS6-R-INT-Z, LSI MegaRAID SAS2	Hardware 0, 1, 5, 6, 10, 50, 60	HBA WebBIOS, pcli	Solaris, Linux, Windows, OVM, ESX	MegaRAID Storage Manager	megaCLI	GUI or CLI
X4270, X4275	On-board chip, Intel ICH10 SATA controller	Internal SATA/SAS hard disk and solid-state disk (SSD) drives are not supported with this controller.					
X4270, X4275	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	raidctl (Solaris), HBA utility (Linux, Windows)

TABLE 1-2 Disk Controller Support/Feature Matrix (*Continued*)

Server	Disk Controller	RAID Support	Initial Config. Through:	OS Driver Support	GUI Disk Management Software	CLI Disk Management Tools	Firmware Upgrades Through:
X4270, X4275	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT-Z, Adaptec/Intel-based	Hardware 0, 1, 1E, 10, 5, 5EE, 50, 6, 60	HBA BIOS	Solaris, Linux, Windows, ESX	StorageTek RAID Manager	arcconf	GUI or CLI
X4470	On-board chip, Intel ICH10 SATA controller	Internal SATA/SAS hard disk and solid-state disk (SSD) drives are not supported with this controller.					
X4470	Optional Sun Storage 6Gb/s SAS PCIe Internal HBA, SGX-SAS6-INT-Z, LSI Fusion-MPT IR SAS2	Hardware 0, 1, 10	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	sas2ircu	GUI or utility bundled with upgrade
X4470	Optional Sun Storage 6Gb/s SAS PCIe RAID Internal HBA, SGX-SAS6-R-INT-Z, LSI MegaRAID SAS2	Hardware 0, 1, 5, 6, 10, 50, 60	HBA WebBIOS, pcli	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	megaCLI	GUI or CLI
X4500	On-board chip, Marvell SATA G2 controller	Software (OS level)	Server BIOS	Solaris, Linux, Windows	DCM (Windows)	DCM (Linux, Windows), hd tool	Server BIOS
X4540	On-board chip, LSI SAS 1068E (SATA configurations only)	Software (OS level)	HBA BIOS	Solaris, Linux, Windows	DCM (Windows)	DCM (Linux, Windows), hd tool	Server BIOS
X4600, X4600 M2	On-board chip, LSI SAS 1064E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	Server BIOS
X4640	On-board chip, LSI SAS 1064E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	Server BIOS
X4800	On-board chip, Intel ICH10 SATA controller (CPU Module 0 only)	Internal SATA/SAS hard disk and solid-state disk (SSD) drives are not supported with this controller.					

TABLE 1-2 Disk Controller Support/Feature Matrix (Continued)

Server	Disk Controller	RAID Support	Initial Config. Through:	OS Driver Support	GUI Disk Management Software	CLI Disk Management Tools	Firmware Upgrades Through:
X4800	Optional Sun Storage 6Gb/s SAS REM RAID HBA, SGX-SAS6-R-REM-Z, LSI MegaRAID SAS2 (CPU Module 0 only)	Hardware 0, 1, 5, 6, 10, 50, 60	HBA WebBIOS, pcli	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	megaCLI	GUI or CLI
X6220	On-board chip, LSI SAS 1068E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	Server BIOS
X6240, X6440	On-board chip, LSI SAS 1068E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	Server BIOS
X6240, X6440	Optional Sun Blade RAID 0/1 Expansion Module, X4607A, LSI SAS 1068E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	raidctl (Solaris), HBA utility (Linux, Windows)
X6240, X6440	Optional Sun Blade RAID 5 Expansion Module, X4620A, Adaptec/Intel-based	Hardware 0, 1, 1E, 10, 5, 5EE, 50, 6, 60	HBA BIOS	Solaris, Linux, Windows, ESX	StorageTek RAID Manager	arconf	GUI or CLI
X6250, X6450	On-board chip, Intel ESB2 SATA controller	Software (OS level)	Server BIOS	Solaris, Linux, Windows			Server BIOS
X6250, X6450	Optional Sun Blade RAID 5 Expansion Module, X4620A, Adaptec/Intel-based	Hardware 0, 1, 1E, 10, 5, 5EE, 50, 6, 60	HBA BIOS	Solaris, Linux, Windows, ESX	StorageTek RAID Manager	arconf	GUI or CLI
X6450	Optional Sun Blade RAID 0/1 Expansion Module, X4607A, LSI SAS 1068E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	raidctl (Solaris), HBA utility (Linux, Windows)

TABLE 1-2 Disk Controller Support/Feature Matrix (*Continued*)

Server	Disk Controller	RAID Support	Initial Config. Through:	OS Driver Support	GUI Disk Management Software	CLI Disk Management Tools	Firmware Upgrades Through:
X6450	Optional Emulex 4GB Fibre Channel ExpressModule, SG-PCIE2FC-EB4-Z	Based on SAN	HBA BIOS	Solaris, Linux, Windows	HBAnyware	emlxadm (Solaris), lputil (Linux, Windows)	HBA utility
X6450	Optional QLogic 4GB Fibre Channel ExpressModule, SG-PCIE2FC-QB4-Z	Based on SAN	HBA BIOS	Solaris, Linux, Windows, ESX	SANsurfer FC HBA Manager	scli	HBA utility
X6270	On-board chip, Intel ICH10 SATA controller	Software (OS level)	Server BIOS	Solaris, Linux, Windows, ESX			Server BIOS
X6270	Optional Sun Blade RAID 0/1 Expansion Module, X4607A, LSI SAS 1068E	Hardware 0, 1, 1E	HBA BIOS	Solaris, Linux, Windows, ESX	MegaRAID Storage Manager	raidctl (Solaris), cfggen (Windows)	raidctl (Solaris), HBA utility (Linux, Windows)
X6270	Optional Sun Blade RAID 5 Expansion Module, X4620A, Adaptec/Intel-based	Hardware 0, 1, 1E, 10, 5, 5EE, 50, 6, 60	HBA BIOS	Solaris, Linux, Windows, ESX	StorageTek RAID Manager	arconf	GUI or CLI
X6270 M2	On-board chip, Intel ICH10 SATA controller	Internal SATA/SAS hard disk and solid-state disk (SSD) drives are not supported with this controller.					
X6270 M2	Optional Sun Storage 6Gb/s SAS REM HBA, SGX-SAS6-REM-Z, LSI Fusion-MPT IR SAS2	Hardware 0, 1, 10	HBA BIOS	Solaris, Linux, Windows, OVM, ESX	MegaRAID Storage Manager	sas2ircu	GUI or utility bundled with upgrade
X6270 M2	Optional Sun Storage 6Gb/s SAS REM RAID HBA, SGX-SAS6-R-REM-Z, LSI MegaRAID SAS2	Hardware 0, 1, 5, 6, 10, 50, 60	HBA WebBIOS, pcli	Solaris, Linux, Windows, OVM, ESX	MegaRAID Storage Manager	megaCLI	GUI or CLI

TABLE 1-2 Disk Controller Support/Feature Matrix (*Continued*)

Server	Disk Controller	RAID Support	Initial Config. Through:	OS Driver Support	GUI Disk Management Software	CLI Disk Management Tools	Firmware Upgrades Through:
X6275	On-board chip, Intel ICH10 SATA controller (FMOD support)	N/A	Server BIOS	Solaris, Linux, Windows			Server BIOS
X6275	InfiniBand (IB) HCA chip, two 4x QDR (Quad Data Rate) IB ports (one per compute node)	Based on SAN	Server BIOS	Solaris, Linux, Windows			MFT (Mellanox Firmware Tools)
X6275 M2	On-board chip, Intel ICH10 SATA controller (FMOD support)	N/A	Server BIOS	Solaris, Linux, Windows	N/A	N/A	Server BIOS

Identifying Your Disk Controller Using OS Commands

If you are unsure as to which optional controller is in your server, you can use one of the operating system methods listed below to identify your installed disk controllers.

▼ Identifying Your Disk Controller in the Solaris Operating System

1. Open a terminal window and login as root.

```
# su -
```

2. Enter the following command:

```
# /usr/sbin/prtconf -D
```

An example of the output on a server with an LSI Fusion-MPT disk controller might look like:

```
System Configuration: Sun Microsystems i86pc
Memory size: 32768 Megabytes
System Peripherals (Software Nodes):
i86pc (driver name: rootnex)
scsi_vhci, instance #0 (driver name: scsi_vhci)
```

```
isa, instance #0 (driver name: isa)
  asy, instance #0 (driver name: asy)
  motherboard
pci, instance #0 (driver name: npe)
  pci10de,cb84
  pci10de,cb84
  pci10de,cb84
  pci10de,cb84, instance #0 (driver name: ohci)
  device, instance #0 (driver name: usb_mid)
  keyboard, instance #0 (driver name: hid)
  mouse, instance #1 (driver name: hid)
  pci10de,cb84, instance #0 (driver name: ehci)
  hub, instance #0 (driver name: hubd)
  pci10de,370, instance #0 (driver name: pci_pci)
  display, instance #0 (driver name: vgatext)
  pci10de,cb84, instance #0 (driver name: nge)
  pci10de,cb84, instance #1 (driver name: nge)
  pci10de,377, instance #0 (driver name: pcie_pci)
  pci1000,1000, instance #0 (driver name: mpt) <--LSI CONTROLLER
  sd, instance #0 (driver name: sd)
  sd, instance #1 (driver name: sd)
```

▼ Identifying Your Disk Controller in the Linux Operating System

1. Open a terminal window and login as root.

```
# su -
```

2. Enter the following command:

```
# lspci
```

An example of the output for a server that includes an NVIDIA SATA disk controller might look like:

```
00:00.0 RAM memory: nVidia Corporation MCP55 Memory Controller (rev a2)
00:01.0 ISA bridge: nVidia Corporation MCP55 LPC Bridge (rev a3)
00:01.1 SMBus: nVidia Corporation MCP55 SMBus (rev a3)
00:02.0 USB Controller: nVidia Corporation MCP55 USB Controller (rev a1)
00:02.1 USB Controller: nVidia Corporation MCP55 USB Controller (rev a2)
00:04.0 IDE interface: nVidia Corporation MCP55 IDE (rev a1)
00:05.0 IDE interface: nVidia Corporation MCP55 SATA Controller (rev a3) <-- NVIDIA CONTROLLER
```

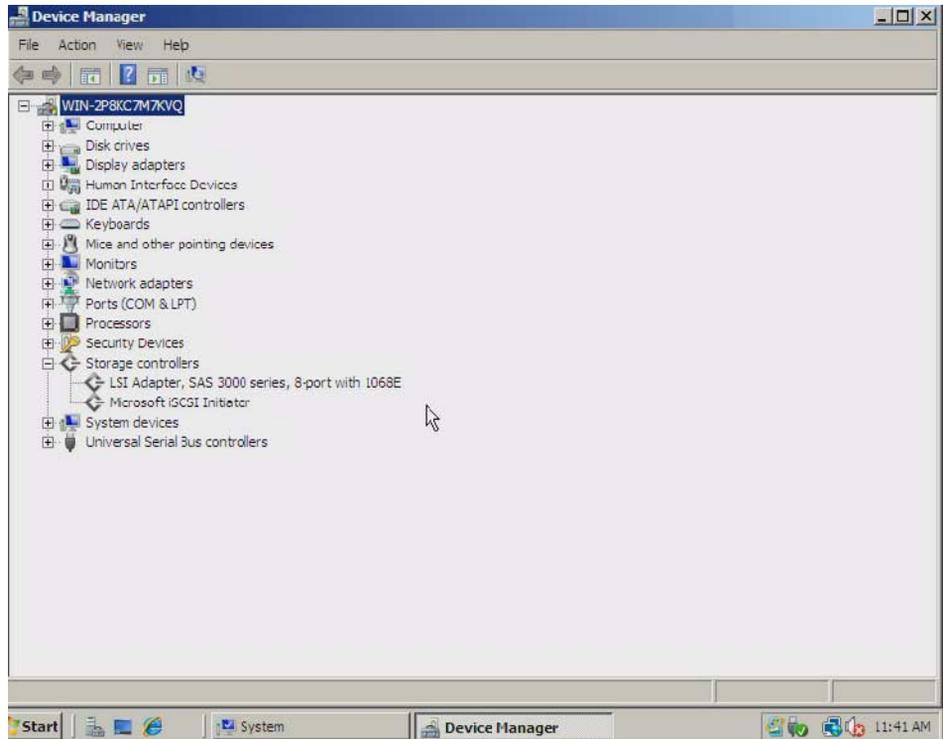
```
00:05.1 IDE interface: nVidia Corporation MCP55 SATA Controller  
(rev a3)  
00:06.0 PCI bridge: nVidia Corporation MCP55 PCI bridge (rev a2)  
00:06.1 Audio device: nVidia Corporation MCP55 High Definition  
Audio (rev a2)
```

▼ Identifying Your Disk Controller in the Windows Operating System

1. **Click Start, and then click Control Panel.**
2. **Double-click the System icon, and then do one of the following:**
 - If your OS is Windows Server 2003, select the Hardware tab, and then click Device Manager.
 - If your OS is Windows Server 2008, click Device Manager.
3. **Scroll down the list of hardware types, and then do one of the following:**
 - If your OS is Windows Server 2003, double-click “SCSI and RAID Host Bus Adapter”.
 - If your OS is Windows Server 2008, double-click “Storage Controller”.

An example showing an LSI 1068E on-board chip can be seen in [FIGURE 1-1](#).

FIGURE 1-1 Example of Device Manager Listing



Upgrading HBA Firmware Using SIA

For most x86/x64 servers, the Sun Installation Assistant (SIA) provides, among other things, operating system deployment and a means for upgrading system firmware and BIOS code. The program also supports HBA firmware upgrades on a variety of optional HBA cards. Support for HBA firmware upgrades is server-dependant and not available for all server models.

For more on SIA, including supported servers, go to:
(<http://www.sun.com/systemmanagement/sia.jsp>)

Using Compact Flash Cards, FMods, and Solid State Drives

Some servers support the use of compact flash cards, flash modules (FMods), or Solid State Drives (SSD) as storage options. Check your server's installation guide to see if these devices are supported.

Compact flash cards use their own special controlling circuitry which is integrated on the server's mother board, configurable through the server BIOS as an IDE drive, and is presented to the operating system as storage device. These cards act like flash cards in a camera, are small, and can be formatted like a disk. If you want to put a bootable operating system on it, check your server's operating system installation instructions to see which operating systems are supported and how best to optimize its performance and longevity.

Flash modules (FMods) use a mini-DIMM format and have their own special controlling circuitry which is integrated on the server's mother board, configurable through the server BIOS as a SATA drive, and is presented to the operating system as storage device. These modules combine speed, efficient power usage, and greater longevity than flash cards for high IO operations, including data caching. If you want to put a bootable operating system on it, check your server's operating system installation instructions to see which operating systems are supported and how best to optimize its performance.

Solid State Drives (SSD) are available on some servers as options. SSDs utilize flash technology and provide higher data rates, better reliability and use less power than mechanical drives. SSDs are configured, formatted and managed just like a SATA hard disk, using the server's integrated SATA disk controller. Rules for mixing SSD drives with other types of drives (SATA or SAS hard disk drives) varies from server to server. Check the documentation for your server for specific rules on installing and using SSDs.

Considerations When Using RAID

Depending on your disk controller, there are several possibilities and levels of support for using RAID. An important consideration during the initial setup of your system is whether you intend to include your boot disk as part of a RAID.

When using hardware RAID, if you intend to include your boot disk in an array, you must configure it using the HBA BIOS configuration program before installing your operating system. Other disks that you plan to include in the array can be added later, using the disk controller's OS-level application software.

Note – If you have an Adaptec-based RAID disk controller, any disk drives that you do not intend to include in an array must be configured as single-disk volumes using the RAID controller's BIOS configuration utility before the operating system will see them.

The following table includes general information on how to select the appropriate RAID level for the logical drives on your storage space, based on the number of available disk drives and your requirements for performance and reliability. The RAID levels supported by each HBAs varies. Consult your HBA documentation for supported RAID levels.

Note – Disk drive usage, read performance, and write performance depend on the number of drives in the logical drive and the design of the HBA. In general, the more drives, the better the performance.

TABLE 1-3 Selecting the Best RAID Level

RAID Level	Redundancy	Disk Drive Usage	Read/Write Performance	Built-in Hot Spare	Minimum Disk Drives	Application
0	No	100%	High/High	No	2	High-end systems, data logging, rendering in real-time, applications that use transitory data
1	Yes (single disk failure)	50%	Medium/Medium	No	2	Operating systems, transactional database
1E	Yes (single disk failure)	50%	Medium/Medium	No	3	Operating systems, transactional databases
10	Yes (single disk failure per sub-array)	50%	Medium/Medium	No	4	High performance databases, application servers
5	Yes (single disk failure)	67-94%	High/Low	No	3	Data warehousing, web serving, archiving
5EE	Yes (single disk failure)	50-88%	High/Low	Yes	4	Data warehousing, web serving, archiving

TABLE 1-3 Selecting the Best RAID Level (*Continued*)

RAID Level	Redundancy	Disk Drive Usage	Read/Write Performance	Built-in Hot Spare	Minimum Disk Drives	Application
50	Yes (single disk failure per sub-array)	67-94%	High/Low	No	6	Large databases, file servers, application servers
6	Yes (up to double disk failure)	50-88%	Medium/Low	No	4	Data archive/backup-to-disk, high availability solutions, servers requiring large capacity
60	Yes (up to double disk failure per sub-array)	50-88%	Medium/Low	No	8	Data archive/backup-to-disk, high availability solutions, servers requiring large capacity

For More Information

For information about obtaining documentation and software, proceed to the next chapter.

Disk Management Information Resources

This chapter describes where to find information on managing your server disks. It contains the following section:

- [“Finding the Resources to Manage Your Disks”](#) on page 18

Finding the Resources to Manage Your Disks

The table below lists the various disk controller solutions and where you can find information about installation, configuration and management.

TABLE 2-1 Disk Controller Configuration and Maintenance

Server	Disk Controller	Resources
V20z	On-board chip, LSI SCSI U320 (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot): <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba)• Obtaining drivers and firmware: (http://www.sun.com/servers/entry/v20z/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/v20z-v40z)• Upgrading firmware: <i>Sun Fire V20z and V40z Servers SP and BIOS Readme</i> (http://docs.sun.com/app/docs/coll/v20z-v40z)
V40z	On-board chip, LSI SCSI U320 (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot): <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba)• Obtaining drivers and firmware: (http://www.sun.com/servers/entry/v40z/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/v20z-v40z)• Upgrading firmware: <i>Sun Fire V20z and V40z Servers SP and BIOS Readme</i> (http://docs.sun.com/app/docs/coll/v20z-v40z)
X2100	On-board chip, NVIDIA NVRAID SATA controller	<ul style="list-style-type: none">• BIOS configuration (F10 during boot): <i>Sun Fire X2100 Server User Guide</i> (http://docs.sun.com/app/docs/coll/x2100)• Obtaining drivers and firmware: (http://www.sun.com/servers/entry/x2100/downloads.jsp)• Installing an OS and drivers: <i>Sun Fire X2100 Server Getting Started Guide</i> (http://docs.sun.com/app/docs/coll/x2100)• Upgrading firmware: <i>Sun Fire X2100 Server User Guide</i> (http://docs.sun.com/app/docs/coll/x2100)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X2100 M2	On-board chip, NVIDIA NVRAID SATA controller (hardware RAID support for Windows only)	<ul style="list-style-type: none"> • BIOS NVRAID configuration (F10 during boot, after system BIOS setup utility is configured for RAID): <i>Sun Fire X2100 M2 Server Operating System Installation Guide</i> (http://docs.sun.com/app/docs/coll/x2100m2) • Obtaining drivers and firmware: (http://www.sun.com/servers/entry/x2100/downloads.jsp) • Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x2100m2) • Upgrading firmware: <i>Sun Fire X2100 M2 Server Service Manual</i> (http://docs.sun.com/app/docs/coll/x2100m2)
X2100 M2	Optional StorageTek PCIe SAS 4-Port Internal HBA, SG-XPCIE4SAS3-Z, LSI SAS 1064E (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+C during boot), how to use CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba) • Obtaining drivers: (http://www.sun.com/servers/x64/x2100/downloads.jsp), or LSI support (http://www.lsi.com/support/sun) • Installing an OS and drivers: <i>Sun Fire X2100 M2 Server Operating System Installation Guide</i> (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x2100m2)
X2200 M2	On-board chip, NVIDIA NVRAID SATA controller (hardware RAID support for Windows only)	<ul style="list-style-type: none"> • BIOS NVRAID configuration (F10 during boot, after system BIOS setup utility is configured for RAID): <i>Sun Fire X2200 M2 Server Operating System Installation Guide</i> (http://docs.sun.com/app/docs/coll/x2200m2) • Obtaining drivers and firmware: (http://www.sun.com/servers/x64/x2200/downloads.jsp) • Installing an OS and drivers: <i>Sun Fire X2200 M2 Server Operating System Installation Guide</i> (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x2200m2) • Upgrading firmware: <i>Sun Fire X2200 M2 Server Service Manual</i> (http://docs.sun.com/app/docs/coll/x2200m2)
X2200 M2	Optional StorageTek PCIe SAS 4-Port Internal HBA, SG-XPCIE4SAS3-Z, LSI SAS 1064E (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+C during boot), how to use CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba) • Obtaining drivers: (http://www.sun.com/servers/x64/x2200/downloads.jsp), or LSI support (http://www.lsi.com/support/sun) • Installing an OS and drivers: <i>Sun Fire X2200 M2 Server Operating System Installation Guide</i> (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x2200m2)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X2250	On-board chip, Intel ESB2 SATA controller (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl-I during boot, after system BIOS setup utility is configured for RAID), using Intel Matrix Storage Manager: <i>Sun Fire X2250 Server Operating System Installation Guide</i> (http://docs.sun.com/app/docs/coll/x2250)• Obtaining drivers and firmware: (http://www.sun.com/servers/x64/x2250/downloads.jsp)• Installing an OS and drivers: <i>Sun Fire X2250 Server Operating Systems Installation Guide</i> (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x2250) or• Upgrading firmware: <i>Sun Fire X2250 Server Service Manual</i> (http://docs.sun.com/app/docs/coll/x2250)
X2270	On-board chip, Intel ICH10 SATA controller (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl-I during boot, after system BIOS setup utility is configured for RAID), using Intel Matrix Storage Manager: <i>Sun Fire X2270 Server Windows Operating System Installation Guide</i> (http://docs.sun.com/app/docs/prod/sf.x2270)• Obtaining drivers and firmware: (http://www.sun.com/servers/x64/x2270/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/prod/sf.x2270)• Upgrading firmware: <i>Sun Fire X2270 Server Service Manual</i> (http://docs.sun.com/app/docs/prod/sf.x2270)
X2270 M2	On-board chip, Intel ICH10 SATA controller (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl-I during boot, after system BIOS setup utility is configured for RAID), using Intel Matrix Storage Manager: <i>Sun Fire X2270 M2 Server Installation Guide for Windows Operating System</i> (http://docs.sun.com/app/docs/prod/sf.x2270m2)• Obtaining drivers and firmware: (http://www.sun.com/servers/x64/x2270m2/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, and Virtual Machine software) (http://docs.sun.com/app/docs/prod/sf.x2270m2)• Upgrading firmware: <i>Sun Fire X2270 M2 Server Service Manual</i> (http://docs.sun.com/app/docs/prod/sf.x2270m2)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4100	On-board chip, LSI SAS 1064E (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba) • Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/entry/x4100/downloads.jsp) • Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4100) • Upgrading firmware: <i>Sun Fire X4100/X4200 Server Software Release Notes</i> (http://docs.sun.com/app/docs/coll/x4100)
X4100 M2	On-board chip, LSI SAS 1064E (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba) • Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/entry/x4100/downloads.jsp) • Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4100m2) • Upgrading firmware: <i>Sun Fire X4100 M2/X4200 M2 Server Software Release Notes</i> (http://docs.sun.com/app/docs/coll/x4200m2)
X4140	On-board chip, NVIDIA MCP55 nForce SATA controller	<ul style="list-style-type: none"> • Internal SATA hard disk drives are not supported.
X4140	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba-lsi) • Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4140/downloads.jsp), or LSI support (http://www.lsi.com/support/sun) • Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4140) • Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4140	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT-Z, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+A during boot): <i>Sun StorageTek SAS RAID HBA Installation Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4140/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4140)• How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)• Upgrading firmware: <i>Sun StorageTek RAID Manager User's Guide</i> or <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)
X4150	On-board chip, Intel ESB2 SATA controller	<ul style="list-style-type: none">• Internal SATA mechanical hard disk drives are not supported.
X4150	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba-lsi)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4150/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: <i>Sun Fire X4150 Server Operating System Installation Guide</i> (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x4150)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4150	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT-Z, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+A during boot): <i>Sun StorageTek SAS RAID HBA Installation Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4150/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm)• Installing an OS and drivers: <i>Sun Fire X4150 Server Operating System Installation Guide</i> (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x4150)• How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)• Upgrading firmware: <i>Sun StorageTek RAID Manager User's Guide</i> or <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)
X4170	On-board chip, Intel ICH10 SATA controller	<ul style="list-style-type: none">• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4170/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, VMware ESX) (http://docs.sun.com/app/docs/coll/x4170)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4170	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba-lsi)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4170/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, VMware ESX) (http://docs.sun.com/app/docs/coll/x4170)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)
X4170	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT-Z, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+A during boot): <i>Sun StorageTek SAS RAID HBA Installation Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4170/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, VMware ESX) (http://docs.sun.com/app/docs/coll/x4170)• How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)• Upgrading firmware: <i>Sun StorageTek RAID Manager User's Guide</i> or <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4170 M2	On-board chip, Intel ICH10 SATA controller	<ul style="list-style-type: none">• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4170m2/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, and Virtual Machine software) (http://docs.sun.com/app/docs/coll/x4170m2)
X4170 M2	Optional Sun Storage 6Gb/s SAS PCIe Internal HBA, SGX-SAS6-INT-Z, LSI Fusion-MPT IR SAS2 (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot): <i>Sun Storage 6Gb/s SAS HBA Installation Guide</i> (http://www.lsi.com/support/sun)• How to use MegaRAID Storage Manager (MSM): <i>LSI MegaRAID SAS Software User's Guide</i> (http://www.lsi.com/support/sun)• How to use sas2ircu CLI: <i>LSI SAS2 Integrated RAID Solution User's Guide</i> (http://www.lsi.com/support/sun)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4170m2/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, and Virtual Machine software) (http://docs.sun.com/app/docs/coll/x4170m2)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)
X4170 M2	Optional Sun Storage RAID 6Gb/s SAS PCIe Internal HBA, SGX-SAS6-R-INT-Z, LSI MegaRAID SAS2 (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (during boot, Ctrl+H for WebBIOS or Ctrl+Y for pcli): <i>Sun Storage RAID 6Gb/s SAS HBA Installation Guide</i> (http://www.lsi.com/support/sun)• How to use MegaRAID Storage Manager (MSM) and megaCLI: <i>LSI MegaRAID SAS Software User's Guide</i> (http://www.lsi.com/support/sun)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4170m2/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, and Virtual Machine software) (http://docs.sun.com/app/docs/coll/x4170m2)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4200	On-board chip, LSI SAS 1064E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba)• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/entry/x4100/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4100m2)• Upgrading firmware: <i>Sun Fire X4100/X4200 Server Software Release Notes</i> (http://docs.sun.com/app/docs/coll/x4100)
X4200 M2	On-board chip, LSI SAS 1064E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba)• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/entry/x4100/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4200m2)• Upgrading firmware: <i>Sun Fire X4100 M2/X4200 M2 Server Software Release Notes</i> (http://docs.sun.com/app/docs/coll/x4200m2)
X4240	On-board chip, NVIDIA MCP55 nForce SATA controller	<ul style="list-style-type: none">• Internal SATA hard disk drives are not supported.
X4240	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba-lsi)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4240/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4140)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4240	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT-Z, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+A during boot): <i>Sun StorageTek SAS RAID HBA Installation Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba) • Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4240/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm) • Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4140) • How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba) • Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic) • Upgrading firmware: <i>Sun StorageTek RAID Manager User's Guide</i> or <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)
X4250	On-board chip, Intel ESB2 SATA controller	<ul style="list-style-type: none"> • Internal SATA mechanical hard disk drives are not supported.
X4250	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba-lsi) • Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4250/downloads.jsp), or LSI support (http://www.lsi.com/support/sun) • Installing an OS and drivers: <i>Sun Fire X4250 Server Operating System Installation Guide</i> (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x4250) • Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4250	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT-Z, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+A during boot): <i>Sun StorageTek SAS RAID HBA Installation Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4250/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm)• Installing an OS and drivers: <i>Sun Fire X4250 Server Operating System Installation Guide</i> (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x4250)• How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)• Upgrading firmware: <i>Sun StorageTek RAID Manager User's Guide</i> or <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)
X4270	On-board chip, Intel ICH10 SATA controller	Internal SATA/SAS hard disk and solid-state disk (SSD) drives are not supported with this controller.
X4270	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba-lsi)• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4270/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, VMware ESX) (http://docs.sun.com/app/docs/coll/x4270)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4270	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT-Z, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+A during boot): <i>Sun StorageTek SAS RAID HBA Installation Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba) • Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4270/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm) • Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, VMware ESX) (http://docs.sun.com/app/docs/coll/x4270) • How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba) • Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic) • Upgrading firmware: <i>Sun StorageTek RAID Manager User's Guide</i> or <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)
X4275	On-board chip, Intel ICH10 SATA controller	Internal SATA/SAS hard disk and solid-state disk (SSD) drives are not supported with this controller.
X4275	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba-lsi) • Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4275/downloads.jsp), or LSI support (http://www.lsi.com/support/sun) • Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware ESX) (http://docs.sun.com/app/docs/coll/x4275) • Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4275	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT-Z, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+A during boot): <i>Sun StorageTek SAS RAID HBA Installation Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4275/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware ESX) (http://docs.sun.com/app/docs/coll/x4275)• How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)• Upgrading firmware: <i>Sun StorageTek RAID Manager User's Guide</i> or <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)
X4440	On-board chip, NVIDIA MCP55 nForce SATA controller	<ul style="list-style-type: none">• Internal SATA hard disk drives are not supported.
X4440	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba-lsi)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4440/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4140)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4440	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT-Z, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+A during boot): <i>Sun StorageTek SAS RAID HBA Installation Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba) • Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4440/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm) • Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4140) • How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba) • Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic) • Upgrading firmware: <i>Sun StorageTek RAID Manager User's Guide</i> or <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)
X4450	On-board chip, Intel ESB2 SATA controller	<ul style="list-style-type: none"> • Internal SATA mechanical hard disk drives are not supported.
X4450	Optional StorageTek PCIe SAS 8-Port Internal HBA, SG-XPCIE8SAS-I-Z, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba-lsi) • Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4450/downloads.jsp), or LSI support (http://www.lsi.com/support/sun) • Installing an OS and drivers: <i>Sun Fire X4450 Server Operating System Installation Guide</i> (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x4450) • Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4450	Optional StorageTek SAS RAID 8-Port Internal HBA, SG-XPCIESAS-R-INT-Z, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+A during boot): <i>Sun StorageTek SAS RAID HBA Installation Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4450/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm)• Installing an OS and drivers: <i>Sun Fire X4450 Server Operating System Installation Guide</i> (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x4450)• How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)• Upgrading firmware: <i>Sun StorageTek RAID Manager User's Guide</i> or <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/sf-hba)
X4470	On-board chip, Intel ICH10 SATA controller	<ul style="list-style-type: none">• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4470/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Linux, Windows) (http://docs.sun.com/app/docs/coll/x4470)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4470	Optional Sun Storage 6Gb/s SAS PCIe Internal HBA, SGX-SAS6-INT-Z, LSI Fusion-MPT IR SAS2 (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot): <i>Sun Storage 6Gb/s SAS HBA Installation Guide</i> (http://www.lsi.com/support/sun)• How to use MegaRAID Storage Manager (MSM): <i>LSI MegaRAID SAS Software User's Guide</i> (http://www.lsi.com/support/sun)• How to use sas2ircu CLI: <i>LSI SAS2 Integrated RAID Solution User's Guide</i> (http://www.lsi.com/support/sun)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4470/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Linux, Windows) (http://docs.sun.com/app/docs/coll/x4470)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)
X4470	Optional Sun Storage RAID 6Gb/s SAS PCIe Internal HBA, SGX-SAS6-R-INT-Z, LSI MegaRAID SAS2 (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (during boot, Ctrl+H for WebBIOS or Ctrl+Y for pcli): <i>Sun Storage RAID 6Gb/s SAS HBA Installation Guide</i> (http://www.lsi.com/support/sun)• How to use MegaRAID Storage Manager (MSM) and megaCLI: <i>LSI MegaRAID SAS Software User's Guide</i> (http://www.lsi.com/support/sun)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/x64/x4470/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Linux, Windows) (http://docs.sun.com/app/docs/coll/x4470)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4500	On-board chip, Marvell SATA G2 controller (non-RAID)	<ul style="list-style-type: none">• Configuration (post-OS installation) using Disk Control and Monitoring (DCM): <i>Sun Fire X4500/X4540 Servers Windows Installation Guide</i> (http://docs.sun.com/app/docs/coll/x4500), or for Linux and Solaris, <i>Sun Fire X4500 Server Operating System Installation Guide</i> (http://docs.sun.com/app/docs/coll/x4500)• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4500/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x4500)• Upgrading firmware: <i>Sun Fire X4500/X4540 Server Integrated Lights Out Manager (ILOM) Supplement</i> (http://docs.sun.com/app/docs/coll/x4500)
X4540	On-board chip, LSI SAS 1068E (non-RAID, SATA configurations only)	<ul style="list-style-type: none">• Configuration (post-OS installation) using Disk Control and Monitoring (DCM): <i>Sun Fire X4500/X4540 Servers Windows Installation Guide</i> (http://docs.sun.com/app/docs/coll/x4540) or for Linux and Solaris, <i>Sun Fire X4540 Server Operating System Installation Guide</i> (http://docs.sun.com/app/docs/coll/x4540)• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4540/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows) (http://docs.sun.com/app/docs/coll/x4540)• Upgrading firmware: <i>Sun Fire X4500/X4540 Server Integrated Lights Out Manager (ILOM) Supplement</i> (http://docs.sun.com/app/docs/coll/x4540)
X4600	On-board chip, LSI SAS 1064E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba)• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4600/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4600)• Upgrading firmware: <i>Sun Fire X4600 Server Software Release Notes</i> (http://docs.sun.com/app/docs/coll/x4600)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4600 M2	On-board chip, LSI SAS 1064E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba)• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4600/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/x4600m2)• Upgrading firmware: <i>Sun Fire X4600 M2 Server Software Release Notes</i> (http://docs.sun.com/app/docs/coll/x4600m2)
X4640	On-board chip, LSI SAS 1064E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba)• Obtaining drivers, management software, and firmware: (http://www.sun.com/servers/x64/x4640/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/prod/sf.x4640)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)• Upgrading firmware: <i>Sun Fire X4640 Server ILOM Supplement</i> (http://docs.sun.com/app/docs/prod/sf.x4640)
X4800	On-board chip, Intel ICH10 SATA controller	Internal SATA/SAS hard disk and solid-state disk (SSD) drives are not supported with this controller.

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X4800	Optional Sun Storage RAID 6Gb/s SAS RAID REM HBA, SGX-SAS6-R-REM-Z, LSI MegaRAID SAS2 (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (during boot, Ctrl+H for WebBIOS or Ctrl+Y for pcli): <i>Sun Storage RAID 6Gb/s SAS HBA Installation Guide</i> (http://www.lsi.com/support/sun)• How to use MegaRAID Storage Manager (MSM) and megaCLI: <i>LSI MegaRAID SAS Software User's Guide</i> (http://www.lsi.com/support/sun)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/blades/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, Oracle VM) (http://docs.sun.com/app/docs/prod/sf.x4800)• Assisted installation of a supported OS, RAID configuration or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)
X6220	On-board chip, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/blades/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/blade-x6220)• Upgrading firmware: <i>Sun Blade X6220 Server Module Software Release Notes</i> (http://docs.sun.com/app/docs/coll/blade-x6220)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X6240	On-board chip, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/blades/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/prod/blade.x6240)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)• Upgrading firmware: refer to the <i>Sun Integrated Lights Out Manager User's Guide</i> for your installed version of ILOM (http://docs.sun.com/app/docs/prod/blade.x6240)
X6240	Optional Sun Blade RAID 0/1 Expansion Module, X4607A, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl-lsi)• Obtaining drivers and management software: from Sun (http://www.sun.com/servers/blades/downloads.jsp), or from LSI support (compatible with X4601A-Z) (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/prod/blade.x6240)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X6240	Optional Sun Blade RAID 5 Expansion Module, X4620A, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+A during boot): <i>Sun Intel/Adaptec BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/blades/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/prod/blade.x6240)• How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)
X6250	On-board chip, Intel ESB2 SATA controller (for SATA-only configurations)	<ul style="list-style-type: none">• Configuration (system BIOS setup utility): <i>Sun Blade X6250 Server Module Service Manual</i> (http://docs.sun.com/app/docs/coll/blade-x6250)• Obtaining drivers and firmware: (http://www.sun.com/servers/blades/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/blade-x6250)• Upgrading firmware: <i>Sun Blade X6250 Service Manual</i> (http://docs.sun.com/app/docs/coll/blade-x6250)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X6250	Optional Sun Blade RAID 5 Expansion Module, X4620A, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+A during boot): <i>Sun Intel/Adaptec BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/blades/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/blade-x6250)• How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl)• Upgrading firmware: <i>Sun Blade X6250 Server Module Service Manual</i> (http://docs.sun.com/app/docs/prod/blade-x6250)
X6270	On-board chip, Intel ICH10 SATA controller (for SATA-only configurations)	<ul style="list-style-type: none">• Configuration (system BIOS setup utility): <i>Sun Blade X6270 Server Module Service Manual</i> (http://docs.sun.com/app/docs/prod/blade.x6270)• Obtaining drivers and firmware: (http://www.sun.com/servers/blades/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/prod/blade.x6270)• Upgrading firmware: refer to the <i>Sun Integrated Lights Out Manager User's Guide</i> for your installed version of ILOM (http://docs.sun.com/app/docs/prod/blade.x6270)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X6270	Optional Sun Blade RAID 0/1 Expansion Module, X4607A, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl-lsi)• Obtaining drivers and management software: from Sun (http://www.sun.com/servers/blades/downloads.jsp), or from LSI support (compatible with X4601A-Z) (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/prod/blade.x6270)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)
X6270	Optional Sun Blade RAID 5 Expansion Module, X4620A, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+A during boot): <i>Sun Intel/Adaptec BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/blades/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/prod/blade.x6270)• How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)
X6270 M2	On-board chip, Intel ICH10 SATA controller	Internal SATA/SAS hard disk and solid-state disk (SSD) drives are not supported with this controller.

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X6270 M2	Optional Sun Storage 6Gb/s SAS REM HBA, SGX-SAS6-REM-Z, LSI Fusion-MPT IR SAS2 (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot): <i>Sun Storage 6Gb/s SAS HBA Installation Guide</i> (http://www.lsi.com/support/sun)• How to use MegaRAID Storage Manager (MSM): <i>LSI MegaRAID SAS Software User's Guide</i> (http://www.lsi.com/support/sun)• How to use sas2ircu CLI: <i>LSI SAS2 Integrated RAID Solution User's Guide</i> (http://www.lsi.com/support/sun)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/blades/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, Oracle VM, VMware ESX) (http://docs.sun.com/app/docs/prod/blade.x6270m2)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)
X6270 M2	Optional Sun Storage RAID 6Gb/s SAS RAID REM HBA, SGX-SAS6-R-REM-Z, LSI MegaRAID SAS2 (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (during boot, Ctrl+H for WebBIOS or Ctrl+Y for pcli): <i>Sun Storage RAID 6Gb/s SAS HBA Installation Guide</i> (http://www.lsi.com/support/sun)• How to use MegaRAID Storage Manager (MSM) and megaCLI: <i>LSI MegaRAID SAS Software User's Guide</i> (http://www.lsi.com/support/sun)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/blades/downloads.jsp), or LSI support (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, Oracle VM, VMware ESX) (http://docs.sun.com/app/docs/prod/blade.x6270m2)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X6275	On-board chip, Intel ICH10 SATA controller (FMOD support)	<ul style="list-style-type: none">• Configuration (system BIOS setup utility): <i>Sun Blade X6275 Server Module Service Manual</i> (http://docs.sun.com/app/docs/prod/blade.x6275)• Obtaining drivers and firmware: (http://www.sun.com/servers/blades/downloads.jsp)• Installing an OS and drivers: <i>Sun Blade X6275 Server Module Linux Operating System Installation Guide</i> (http://docs.sun.com/app/docs/prod/blade.x6275)• Upgrading firmware: <i>Sun Blade X6275 Server Module ILOM Supplement</i> (http://docs.sun.com/app/docs/prod/blade.x6275)
X6275	InfiniBand (IB) HCA chip, two 4x QDR (Quad Data Rate) IB ports (one per compute node)	<ul style="list-style-type: none">• Configuration (system BIOS setup utility): <i>Sun Blade X6275 Server Module Service Manual</i> (http://docs.sun.com/app/docs/prod/blade.x6275)• Obtaining drivers and firmware: (http://www.sun.com/servers/blades/downloads.jsp)• Installing an OS and drivers: <i>Sun Blade X6275 Server Module Linux Operating System Installation Guide</i> (http://docs.sun.com/app/docs/prod/blade.x6275)• Using the OFED stack (including upgrading firmware): <i>Mellanox OFED Stack for Linux User's Manual</i> at: (http://www.mellanox.com/related-docs/prod_software/Mellanox_OFED_Linux_user_manual_1_40_1.pdf)
X6275 M2	On-board chip, Intel ICH10 SATA controller (FMOD support)	<ul style="list-style-type: none">• Configuration (system BIOS setup utility): <i>Sun Blade X6275 M2 Server Module Service Manual</i> (http://docs.sun.com/app/docs/prod/blade.x6275m2)• Obtaining drivers and firmware: (http://www.oracle.com/goto/blades)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Oracle Solaris, Linux, Windows, Oracle VM) (http://docs.sun.com/app/docs/prod/blade.x6275m2)• Upgrading firmware: <i>Oracle Integrated Lights Out Manager (ILOM) 3.0 Supplement for the Sun Blade X6275 M2 Server Module</i> at (http://docs.sun.com/app/docs/prod/blade.x6275m2)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X6440	On-board chip, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/sflsihba)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/blades/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/prod/blade.x6440)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)• Upgrading firmware: refer to the <i>Sun Integrated Lights Out Manager User's Guide</i> for your installed version of ILOM (http://docs.sun.com/app/docs/prod/blade.x6440)
X6440	Optional Sun Blade RAID 0/1 Expansion Module, X4607A, LSI SAS 1068E (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+C during boot), how to use MegaRAID Storage Manager (MSM) and CLI: <i>Sun LSI 106x BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl-lsi)• Obtaining drivers and management software: from Sun (http://www.sun.com/servers/blades/downloads.jsp), or from LSI support (compatible with X4601A-Z) (http://www.lsi.com/support/sun)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/prod/blade.x6440)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X6440	Optional Sun Blade RAID 5 Expansion Module, X4620A, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+A during boot): <i>Sun Intel/Adaptec BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl)• Obtaining drivers, firmware and management software: (http://www.sun.com/servers/blades/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/prod/blade.x6440)• How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl)• Assisted installation of a supported OS or upgrading firmware using Sun Installation Assistant: (http://www.sun.com/systemmanagement/sia.jsp) for instructions on using, see <i>Sun Installation Assistant User's Guide</i> for your version of SIA (http://docs.sun.com/app/docs/prod/install.x64svr#hic)
X6450	On-board chip, Intel ESB2 SATA controller (for SATA-only configurations)	<ul style="list-style-type: none">• Configuration (system BIOS setup utility): <i>Sun Blade X6450 Server Module Service Manual</i> (http://docs.sun.com/app/docs/coll/blade-x6450)• Obtaining drivers and firmware: (http://www.sun.com/servers/blades/downloads.jsp)• Installing an OS and drivers: See the appropriate OS installation guide for your server (Solaris, Linux, Windows, VMware) (http://docs.sun.com/app/docs/coll/blade-x6450)• Upgrading firmware: <i>Sun Blade X6450 Service Manual</i> (http://docs.sun.com/app/docs/coll/blade-x6450)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X6450	Optional Emulex 4GB Fibre Channel ExpressModule, SG-PCIE2FC-EB4-Z (SAN support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+E during boot): <i>Emulex Boot Code User Manual for Sun-branded Fibre Channel Adapters</i> (http://www.emulex.com/sun/support/em-e11000.jsp) • Obtaining drivers, firmware and management software: (http://www.emulex.com/sun/support/em-e11000.jsp) • Installing drivers: <i>Emulex FCA Utilities User Manual</i> (Solaris), or <i>Emulex Drivers and Utilities for Linux User Manual</i>, or <i>Emulex Autopilot Installer Quick Installation Manual</i> (Windows) (http://www.emulex.com/sun/support/em-e11000.jsp) • Using the management software and CLI: <i>Emulex HBAAnyware User Manual</i> (http://www.emulex.com/sun/support/em-e11000.jsp) • Upgrading firmware: <i>Emulex Firmware Update Manual</i> (http://www.emulex.com/sun/support/em-e11000.jsp)
X6450	Optional Sun Blade RAID 5 Expansion Module, X4620A, Adaptec/Intel-based (hardware RAID support)	<ul style="list-style-type: none"> • BIOS RAID configuration (Ctrl+A during boot): <i>Sun Intel/Adaptec BIOS RAID User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl) • Obtaining drivers, firmware and management software: (http://www.sun.com/servers/blades/downloads.jsp), or Intel support (http://support.intel.com/support/motherboards/server/sunraid/index.htm) • Installing an OS and drivers: <i>Sun Blade X6450 Server Module Operating System Installation Guide</i> (Solaris, Linux, VMware) (http://docs.sun.com/app/docs/coll/blade-x6450), or <i>Sun Blade X6450 Server Module Windows Operating System Installation Guide</i> (http://docs.sun.com/app/docs/coll/blade-x6450) • How to use the management software StorageTek RAID Manager and CLI: <i>Sun StorageTek RAID Manager User's Guide</i> and <i>Uniform Command-Line Interface User's Guide</i> (http://docs.sun.com/app/docs/coll/dsk-cntrl) • Upgrading firmware: <i>Sun Blade X6450 Service Manual</i> (http://docs.sun.com/app/docs/coll/blade-x6450)

TABLE 2-1 Disk Controller Configuration and Maintenance (*Continued*)

Server	Disk Controller	Resources
X6450	Optional QLogic 4 GB Fibre Channel ExpressModule, SG-PCIE2FC-QB4-Z (SAN support)	<ul style="list-style-type: none">• BIOS RAID configuration (Ctrl+Q during boot): <i>Sun StorageTek Enterprise Class 4Gb FC PCI-E ExpressModule HBA User's Guide</i> (http://docs.sun.com/app/docs/prod/4gb.dpem.hba#hic)• Obtaining drivers, firmware and management software: (http://support.qlogic.com/support/default_sun_page.asp)• Installing an OS and drivers: See the Readme file and Release Notes on the download page for your OS version (Solaris, Linux, Windows) (http://support.qlogic.com/support/default_sun_page.asp)• Using the management software and CLI: <i>SANsurfer FC HBA Manager GUI Online Help</i>, and <i>FC HBA CLI Application User's Guide</i> (http://support.qlogic.com/support/default_sun_page.asp)• Upgrading firmware (for QLx246x HBAs): <i>Multi-boot Image for 4Gb FC HBAs Readme</i> (http://support.qlogic.com/support/default_sun_page.asp)