



Sun Fire™ X4600 to Sun Fire X4600 M2 Server Migration

Sun Microsystems, Inc.
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Preface

This manual describes procedures for upgrading a Sun Fire X4600 to a Sun Fire X4600 M2.

Before You Read This Document

It is important that you review the safety guidelines in the *Sun Fire X4600 and Sun Fire X4600 M2 Servers Safety and Compliance Guide* (819-4348).

Related Documentation

For a description of the document set for the Sun Fire X4600/X4600 M2 Servers, see the *Where To Find* Documentation sheet or *Getting Started* manual that is packed with your system and also posted at the product's documentation site.

For the Sun Fire X4600 Server:

<http://docs.sun.com/app/docs/prod/sf.x4600>

For the Sun Fire X4600 M2 Server:

<http://docs.sun.com/app/docs/prod/sf.x4600m2>

Translated versions of some of these documents are available at the web site described above in French, Simplified Chinese, Traditional Chinese, Korean, and Japanese. English documentation is revised more frequently and might be more up-to-date than the translated documentation.

For all Sun software and hardware manuals, go to:

<http://docs.sun.com>

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Sun Fire X4600 to Sun Fire X4600 M2 Server Migration, part number 819-5040-11

Sun Fire X4600 to Sun Fire X4600 M2 Server Migration

This manual describes procedures for upgrading a Sun Fire X4600 server to a Sun Fire X4600 M2 server.

These two systems share a chassis and motherboard. They differ in firmware, which determines the CPU modules and DIMMS that they support:

- The Sun Fire X4600 server supports CPU modules that use AMD Opteron 800 series CPUs and DDR1 DIMMs.
- The Sun Fire X4600 M2 server supports CPU modules that use AMD Opteron 8000 series CPUs and DDR2 DIMMs.

No one set of system firmware supports both kinds of CPU modules. Two firmware update streams are maintained. Because the two firmware update streams support different hardware, the upgrade procedure is more complicated than for a typical firmware upgrade.

Note – If you plan to upgrade a Sun Fire X4600 system to use CPU modules with 4 or more cores, you must upgrade the system to be a Sun Fire X4600 M2, as described in this manual.

Upgrade Procedure

The upgrade procedure has four stages:

[“Planning and Preparation” on page 2](#)

[“Populating a Server With CPU Modules” on page 3](#)

[“Firmware: Planning and Downloading” on page 14](#)

[“Updating the Firmware” on page 22](#)

Note – You may need to reboot the system several times during the upgrade process. When you do this, the console may remain blank for an extended period. For a system with 8 CPU modules, the blank screen can last up to 5 minutes, though 1 to 2 minutes is more typical. This delay is shorter for systems with fewer CPU modules

Planning and Preparation

Note – Before proceeding, check the motherboard part number. If this is 501-7588-01, the system cannot be upgraded to an M2; contact Sun Service and request a replacement. Later revisions of the mother board (part number ending in -02 or higher) will work.

▼ To Plan and Prepare

1. Verify that the system is in working order. The host operating system should be able to boot and have access to all installed CPUs. Resolve any problems before proceeding.
2. Determine the new CPU modules that you will use and obtain them, along with any necessary memory DIMMs.

Note – You must use DDR2 DIMMs that Sun has certified for use with the new CPU modules; the DDR1 DIMMs in your existing modules cannot be used.

3. If you plan to use a different number of CPU modules than you currently have, consult the following for:
 - Correctly populating the chassis with CPU modules and determining whether you need filler cards for unused CPU module slots. See [“Populating a Server With CPU Modules” on page 3](#)
4. Determine how you will interact with the system while performing the firmware update. See [“Interacting with the System” on page 6](#) for specifics.

5. Plan the firmware update and download the necessary files. See [“Firmware: Planning and Downloading”](#) on page 14 for specifics.

Populating a Server With CPU Modules

Note – This section describes configurations with 2, 4, 6, and 8 CPU modules. The number of modules a system can actually support depends on the software and firmware versions. To identify the configurations supported by your system, see the Software Release Notes for the system software you have installed.

[“CPU Module Matching Requirements”](#) on page 3

[“Population Procedures”](#) on page 3

CPU Module Matching Requirements

The following CPU modules can be used together:

- Sun Fire X4600 M2 4-DIMM CPU module
- Sun Fire X4600 M2 8-DIMM CPU module

Except for the modules listed in this section, all CPU modules in a server must be identical. This means that each module must have the same Sun part number. If two modules are the same model but different part numbers, then their CPUs are different; mixing CPUs in a single server is not supported.

When different CPU modules are in the same system, the CPUs must be identical. This means that even though the part numbers for the CPU modules may be different, the part numbers for the CPUs on the modules must be the same.



Caution – Only the CPU modules listed in this section can be used together.

Population Procedures

The 8 CPU module slots are designated by letters A through H, as shown in [FIGURE 1](#). Looking from the front of the server, the CPU module slots are lettered from right to left.

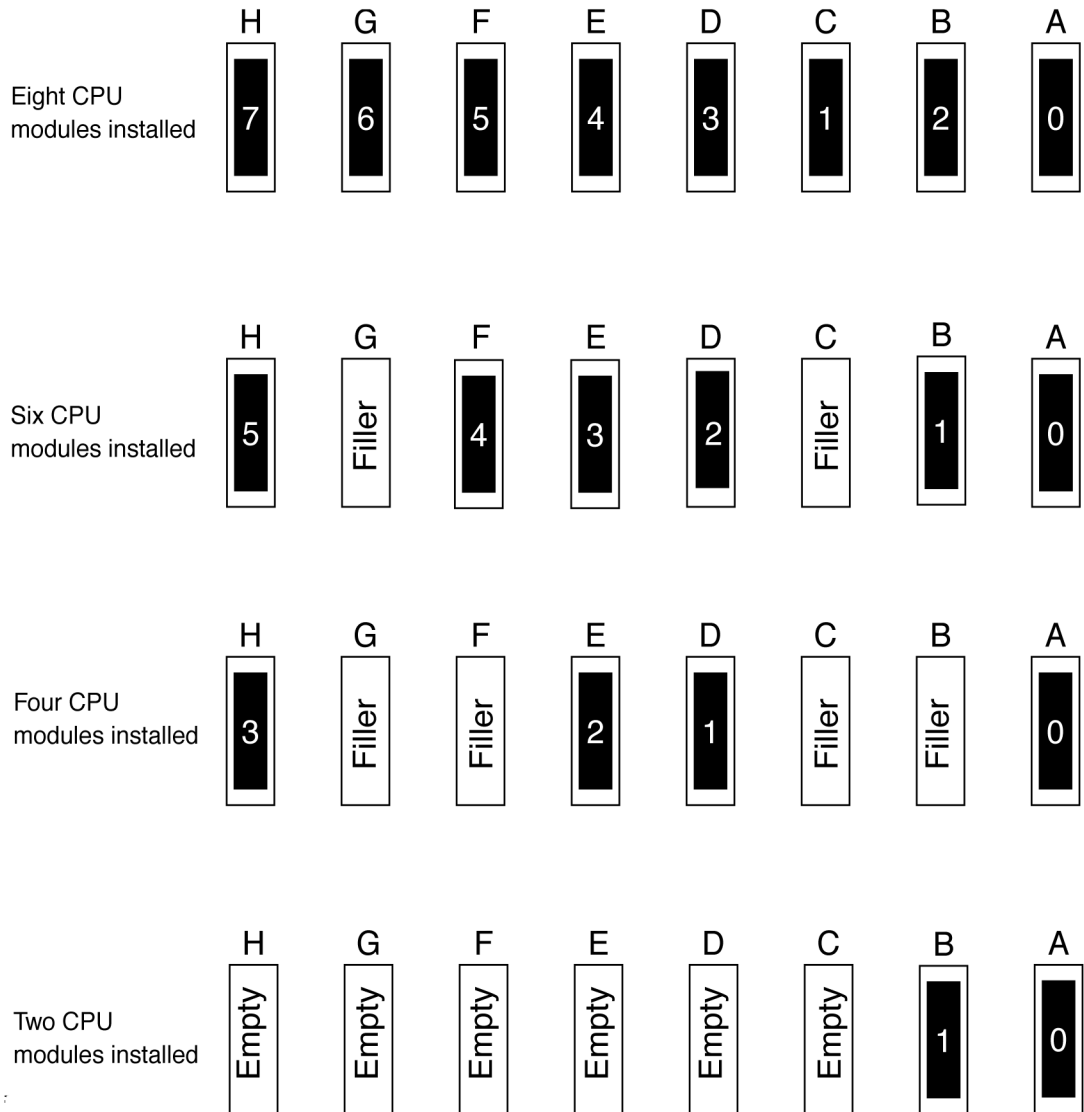
When a server contains fewer than 8 CPU modules, only specific slots can be used, as shown in [FIGURE 1](#). This figure also shows how the CPU module slot letters map to the numbers that identify actual CPU modules.

Note – In an eight-module configuration, the modules are not all in numerical order. Slot B contains module 2, and slot C contains module 1.

Note – In a two-module configuration, use of PCI slots 5, 6, and 7 is not supported.

Note – In six-module and four-module configurations, unused CPU slots must contain filler modules. In two-module configurations, unused CPU slots must be left empty.

FIGURE 1 CPU Module Population rules and numbering



Interacting with the System

You have two options for interacting with the system:

- You can interact directly, using the serial management port, the system console, and the DVD drive. See [“Interacting Directly” on page 6](#).
- You can interact over the network, using any of the following features (see [“Interacting Over The Network” on page 7](#)):
 - the ILOM web interface
 - the ILOM command line interface (CLI), using an SSH connection
 - the remote console, which includes support for remote DVD drives or remote ISO images mounted as virtual drives

Interacting Directly

In order to interact directly with the system, you will need the following:

- A laptop or other computer system to interact with the ILOM CLI through the serial management port with the following features and accessories:
 - An RS232 serial port or a USB-to-RS232 adapter.
 - A RS232 cable. You can assemble this cable from an ethernet patch cable together with the serial adapter (530-3100) provided in the system’s accessory kit.
 - Terminal software for accessing the server over the serial connection. Set the connection options to 9600 bps, 8 data bits, 1 stop bit, no parity or flow control.
- A system running a TFTP server, to host the image files.
- A VGA monitor capable of 1024x768 resolution. To connect to the video connector on the system’s back panel.
- A USB keyboard. To connect to one of the USB connectors on the system’s front or back panel.
 - Optionally, a USB mouse. This is not needed for installing the firmware, but may be useful for interacting with the host operating system.
- A bootable CD or DVD to install the new LSI HBA BIOS. This is burned from an ISO image you will download. See [“Firmware: Planning and Downloading” on page 14](#).

Test this setup before proceeding. If the system is fully booted, you should be able to interact with the system using the monitor and keyboard. If any of the power connectors are live, the service processor should be active, and you will be use the ILOM command line, even if the system is powered down.

Note – Before you can use the ILOM command line, you must log in. The administrator user name is “root”, and the default password is “changeme”. If the current password is lost, you can reset it to the default; see [“Resetting SP and BIOS Passwords Using Jumper P20” on page 8](#)

Interacting Over The Network

If the service processor is connected to your network using the Net Management port on the back panel, you can interact with the ILOM and system console in several ways:

- The ILOM web GUI, which you can access by entering the service processor’s network address in the address bar of a web browser.
- The ILOM command line, which you can access by establishing an SSH connection to the service processor’s network address. If you plan to access the system from a Windows system, you will have to install communication software that supports SSH. (Free software that supports SSH includes PuTTY, Tera Term, and Cygwin with the OpenSSH option.) Most other operating systems include SSH software.
- The JavaRConsole application, which allows you to interact with the system console over the network. This application is run from ILOM web GUI.

Test these features before proceeding. You will need the network address of the service processor. If this is not available from your network administrator, obtain the service processor’s IP address by logging into the ILOM command line through the serial management port. (See [“Interacting Directly” on page 6.](#)) Once connected, enter this command:

```
show /SP/network/ipaddress
```

Note – Many of the following procedures require you to provide an ILOM user name and password. The administrator user name is “root”, and the default password is “changeme”. If the current password is lost, refer to the following for procedures to reset it.

Resetting SP and BIOS Passwords Using Jumper P20

This procedure describes how to reset the administration password (the root password) for the ILOM SP back to the default after it has been set once during initial setup.

▼ To Reset the Administration Password Back To the Default

Note – This procedure simultaneously removes any BIOS password that was set.

1. Shut down the server to standby power mode by using a pencil or other pointed object to press and release the recessed Power button on the front panel. See [“Powering Off the Server”](#) on page 10.
2. Disconnect the AC power cords from the server.



Caution – Before handling components, attach an ESD wrist strap to bare metal on the chassis. The system’s printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

3. If the server is in a rack, slide it far enough from the rack so that you can remove the main cover. If you cannot safely view and access the motherboard, remove the server from the rack.
4. Remove the main cover from the server. See [“To Remove the Main Cover”](#) on page 11
5. Install the shorting jumper across the P20 header pins.

See [FIGURE 2](#) for the P20 jumper location. The P20 jumper function is to clear the ILOM SP password.

6. Replace the server’s main cover.
7. Reconnect AC power cords to the server.

The server powers up to standby power mode, indicated when the Power/OK LED on the front panel is flashing.

8. Return the server to main power mode by using a pencil or other pointed object to press and release the recessed Power button on the front panel.

Note – You must allow the entire server, not just the SP, to reboot to main power mode to complete the password reset. This is because the state of the P20 jumper cannot be determined without the host CPU running. Wait until the end of POST, when you see the CMOS password cleared by jumper message, after which both the BIOS and SP passwords are reset.

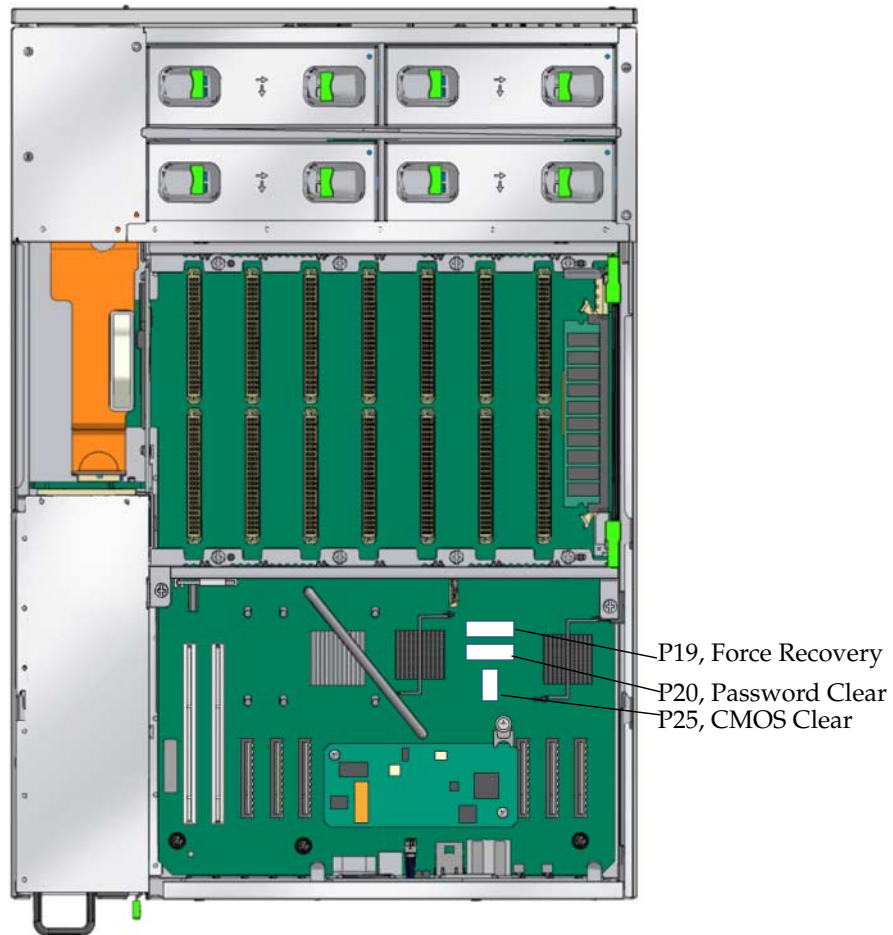
- The ILOM SP password is reset to the default, changeme.
 - The BIOS password is removed. If you had a BIOS password set, you are no longer prompted for one.
9. Log in to the ILOM web GUI using root as the user name and changeme as the password.

For login instructions, refer to the *Integrated Lights Out Manager Administration Guide*, 819-1160.

10. Change the default password to a password of your choice.
11. Repeat steps 1 through 8 to remove the P20 jumper. (Remove the jumper in step 5 rather than inserting it.)

Note – If you do not remove the P20 jumper, the ILOM SP and BIOS passwords will be reset every time you power-cycle the server.

FIGURE 2 Location of Jumpers on the Motherboard



Powering Off the Server

There are two methods for shutting down the server from main power mode to standby power mode.

- Graceful shutdown – Use a pencil or other pointed object to press and release the Power button on the front panel. This causes Advanced Configuration and Power Interface (ACPI) enabled operating systems to perform an orderly shutdown of the operating system.



Caution – Servers not running ACPI-enabled operating systems will shut down to standby power mode immediately.

- Emergency shutdown – Press and hold the Power button for four seconds to force main power off and enter standby power mode.

When main power is off, the Power/OK LED on the front panel begins flashing, indicating that the server is in standby power mode.



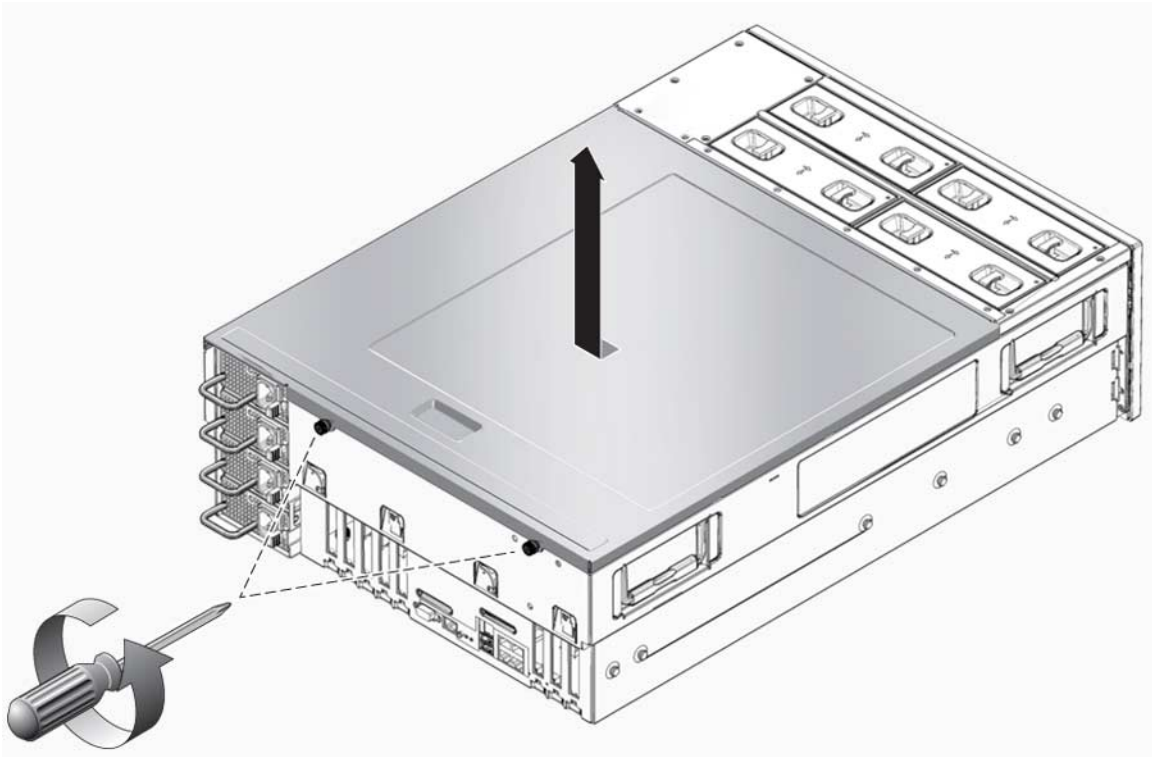
Caution – When you use the Power button to enter standby power mode, power is still directed to the GRASP board and power supply fans, indicated when the Power/OK LED is flashing. To completely power off the server, you must disconnect the AC power cords from the back panel of the server.

▼ To Remove the Main Cover

1. To remove the cover:
 - a. Loosen the two captive screws that secure the cover at the rear of the chassis.
 - b. Using the indent on the cover for leverage, slide the cover toward the rear of the chassis approximately 0.5 inches (12 mm.). See [FIGURE 3](#).
 - c. Grasp the cover by its edges and lift it straight up from the chassis.

Note – When you remove the cover, the intrusion switch that is on the motherboard automatically powers down the system to standby mode.

FIGURE 3 Removing the Main Cover



▼ To Replace the Cover

1. Set the cover on the chassis so that the tabs on the cover align with the notches in the chassis.
2. Slide the cover toward the server front about 0.5 inches (12 mm.), ensuring that the front lip on the cover slides into the groove on the chassis.
3. Tighten the two captive screws on the back of the cover by hand.

▼ Accessing the Web GUI

1. Enter the service processor's network address in a web browser address bar. You will be directed to the web GUI login screen, as shown in [FIGURE 4](#)

The remote console is accessed through the web GUI.

2. Choose the "Remote Control" tab, then the "Redirection" tab, and click on the "Launch Redirection" button. You will have to login separate to the JavaRConsole application, as shown in [FIGURE 5](#)
3. The ILOM command line is accessible over the network using SSH software. If you use the `ssh` command line client, you will probably need to specify the ILOM user name on the command line. For example:

```
ssh -l root 10.6.72.226
```

FIGURE 4 ILOM Login Screen

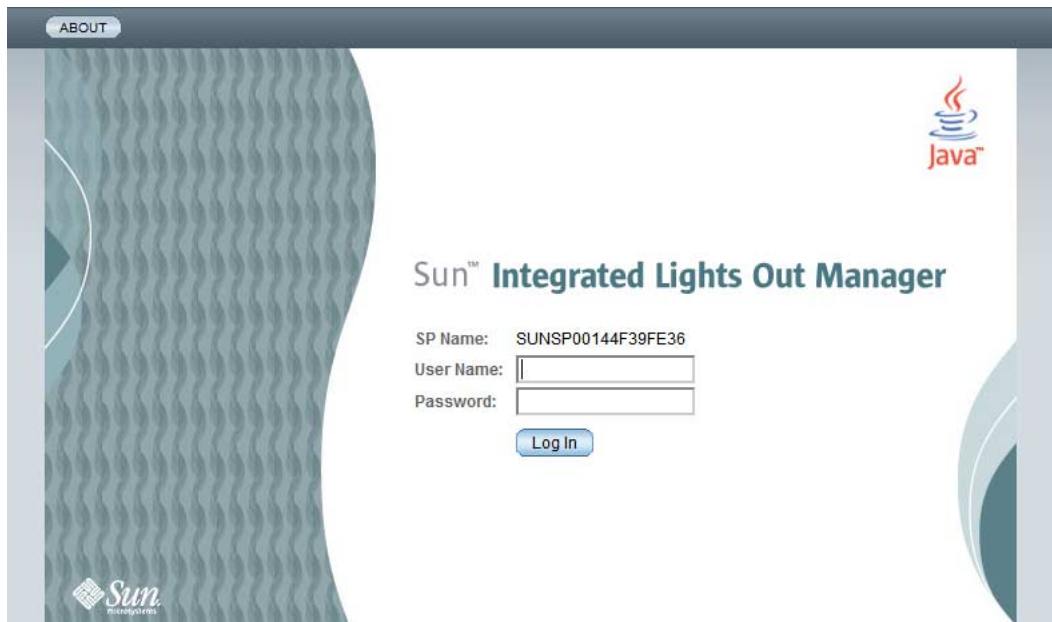
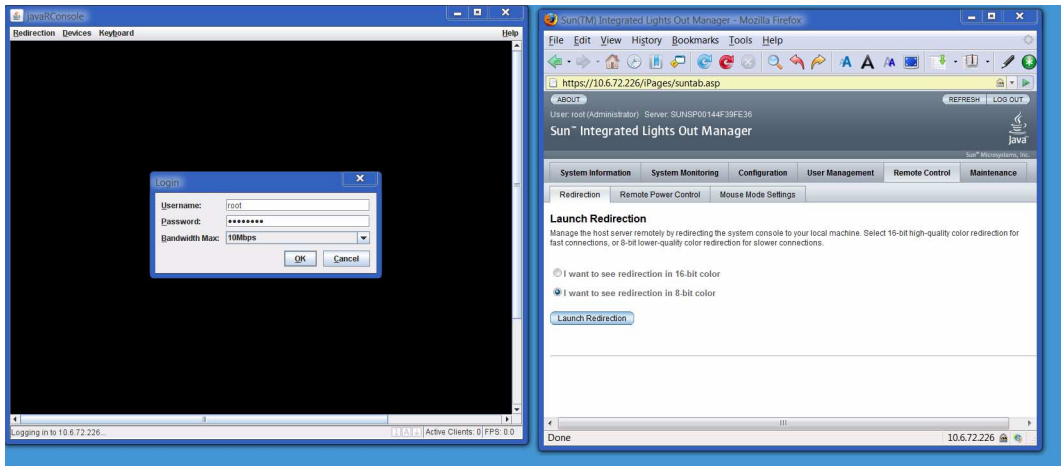


FIGURE 5 Login to Redirected System Console



Firmware: Planning and Downloading

[“To Upgrade the Firmware Images” on page 15](#)

[“To Replace the CPU Modules” on page 17](#)

[“To Replace a CPU Module or CPU Filler Board” on page 18](#)

Note – Before you proceed with the firmware upgrade see: [“To Replace the CPU Modules” on page 17](#)

Your first planning decision is to determine the firmware version you want on your upgraded system. In most cases, this should be the firmware in the latest software release.

Note – If you intend to use an earlier M2 firmware release, you should still temporarily install the latest M2 ILOM, and then downgrade to the release you want to use. Because you are moving between firmware release streams, the initial move to M2 ILOM is less likely to encounter problems if you start with the latest M2 ILOM.

The application used to flash a new ILOM image is the ILOM itself. For this process to work correctly, the ILOM doing the flash must be compatible with the ILOM being flashed. To avoid compatibility issues,

▼ To Upgrade the Firmware Images

1. If your current firmware is not the latest X4600 version available, use your current ILOM to flash the latest X4600 ILOM.
2. With the latest X4600 ILOM installed, use it to flash the latest X4600 M2 ILOM.
3. If your target firmware is not the latest version, downgrade your ILOM to the target.
4. Flash the LSI HBA BIOS from the same software release as the ILOM.

In each of steps 1 through 3, you will also be flashing a new system BIOS, since the two ILOM and BIOS are provided in a single image file.

Note – You must end the upgrade process with ILOM, system BIOS, and LSI HBA BIOS all from the same software release. Firmwares from different software releases may not have been tested together, and systems using them are not supported.

As you plan the BIOS, you will find a worksheet similar to the one in [TABLE 1](#) useful.

TABLE 1 Firmware Update Worksheet

	Software Release	ILOM	System BIOS
Current			
Latest X4600			LSI HBA BIOS
Latest X4600 M2			
Final			

Note – System BIOS and LSI HBA BIOS versions are not important for every step. During much of the upgrade process, only the service processor will be active; the rest of the system will be inactive.

The firmware version numbers are documented in the *Software Release Notes* or *Product Notes* for the two products.

Begin by determining your system's current ILOM and system BIOS versions. The ILOM version is available from the web GUI in the System Information/Versions screen. You can also retrieve the version from the ILOM command line using the `version` command.

Note – Always include the build number when referring to an ILOM version. Different builds with the same version number are often available.

Use these two version strings to determine the software release version. In the following examples, we will assume that the initial ILOM is 1.0.2 Build 10708, and the initial BIOS is 0ABHA041. These are both part of Software 1.1 for the Sun Fire X4600.

Now you need the ILOM version for the latest X4600 release. For the purpose of the following examples, we will use Software 1.3a, which contains ILOM 2.0.2.1 build 23233.

Next, you need the version strings for the latest M2 release. For the purpose of the following examples, we will use Software 2.0, which contains ILOM 2.0.2.5 build 29771.

If you plan to use earlier versions of the M2 firmware, you will need the software release, ILOM version, system BIOS version, and LSI HBA BIOS version for your final setup. If you plan to use the latest M2 firmware, you need the latest system BIOS and LSI HBA BIOS version. For the purpose of the following examples, we will assume that no downgrade is needed, so that we only need the versions from Software 2.0. These are fw1.23.90-bios6.18.01.

Note – The version strings cited above are examples. Don't assume that Software 1.3a and Software 2.0 are the actual latest releases. Newer releases may have been made available since this manual was written. Always refer to the latest *Software Release Notes* and *Product Notes*.

If you fill out the firmware worksheet using the above examples, it should look something like [TABLE 2](#).

TABLE 2 Firmware Update Example

	Software Release	ILOM	System BIOS
Current	1.1	1.0.2 Build 10708	0ABHA041

TABLE 2 Firmware Update Example

Latest X4600	1.3a	2.0.2.1 Build 23233		
Latest X4600 M2	2.0	2.0.2.5 Build 29771	0ABIT087	LSI HBA BIOS
Final				fw1.23.90- bios6.18.01

Now that you know which software releases you'll need, you can download them from this web page:

<http://www.sun.com/servers/x64/x4600/downloads.jsp>

While working from the example worksheet in **TABLE 2**, the following files are needed:

- `ilom.X4600-2.0.2.1-r26075.ima` (ILOM and system BIOS for X4600 Software 1.3a),
- `ilom.X4600M2-2.0.2.5-r29771-bios87.ima` (ILOM and system BIOS for X4600 M2 Software 2.0),
- and `FW12390_B61801.iso` (bootable CD image for LSI HBA BIOS for X4600 M2 Software 2.0)

If you plan to flash the ILOM and system BIOS images from the ILOM command line, copy the image files to an TFTP server. If you plan to install the ILOM and system BIOS images from the web GUI, they need to be accessible from the same system that's running the web browser.

If you plan to use a physical disc to install the LSI HBA BIOS, you will need to burn the image you downloaded onto a disc. Otherwise, you can boot the system from the ISO image, using the remote console.

▼ To Replace the CPU Modules

Before proceeding with the firmware upgrade, replace the X4600 CPU modules with the X4600 M2 CPU modules. Follow these steps:

1. Perform a graceful shutdown of the host operating system.
2. Disconnect all cables from the back panel
3. Replace CPU modules as described in the following sections:

[“To Replace a CPU Module or CPU Filler Board” on page 18](#)

4. Reconnect *one* of the power cables; leave the other three disconnected.

Note – Using just one power cable supplies power to the Service Processor, but does not provide standby power to the CPU modules. (Normally, standby power is provided even when the system is powered down.) This prevents various problems that can occur when X4600 M2 CPU modules are used with X4600 ILOM firmware.

5. Make the data connections you will need for the upgrade process. Depending on how you plan to interact with the system, you might need:
 - A connection to the serial management port, which supports terminal access to the ILOM command line.
 - A network connection to the network management port, which supports access to the ILOM command line (via SSH), the web GUI, and the remote console.
 - A VGA monitor and USB keyboard, which support direct access to the system console.

▼ To Replace a CPU Module or CPU Filler Board

A CPU module includes the CPU (with heat sink) and DIMM slots on a removable board. The CPU modules are not redundant; failure of one CPU module will cause system failure.

Note – This component is a CRU and can be replaced by anyone.

Follow these steps to remove and replace a CPU module or CPU filler board.

1. Power off the server as described in [“Powering Off the Server”](#) on page 10.



Caution – The CPU module can be damaged if removed or inserted while standby power is on. Be sure to disable standby power by disconnecting all external power cables before proceeding.

- If the server is in a rack, slide it far enough from the rack so that you can remove the main cover.
- If you cannot safely view and access the component, remove the server from the rack.



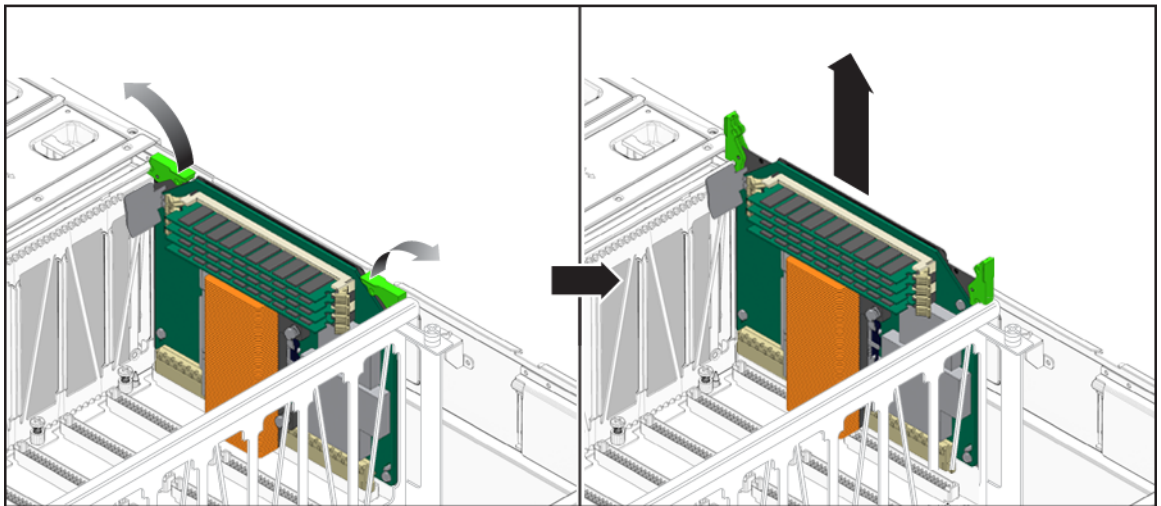
Caution – If the rack is not bolted to the floor make sure that any “anti tip over” rack features are employed. See your rack guide for information on extended feet at the bottom of the rack and anti-tip guide information.

2. Remove the main cover as described in [“To Remove the Main Cover”](#) on page 11.
3. Identify the CPU module or CPU filler board you are replacing.
4. Remove the CPU module or CPU filler board from the bay (see [FIGURE 6](#)):
 - a. Simultaneously rotate both plastic levers on the top corners of the module to an upright, 90-degree position.
 - b. Lift the module straight up to remove it from the metal edge-guides in the bay.



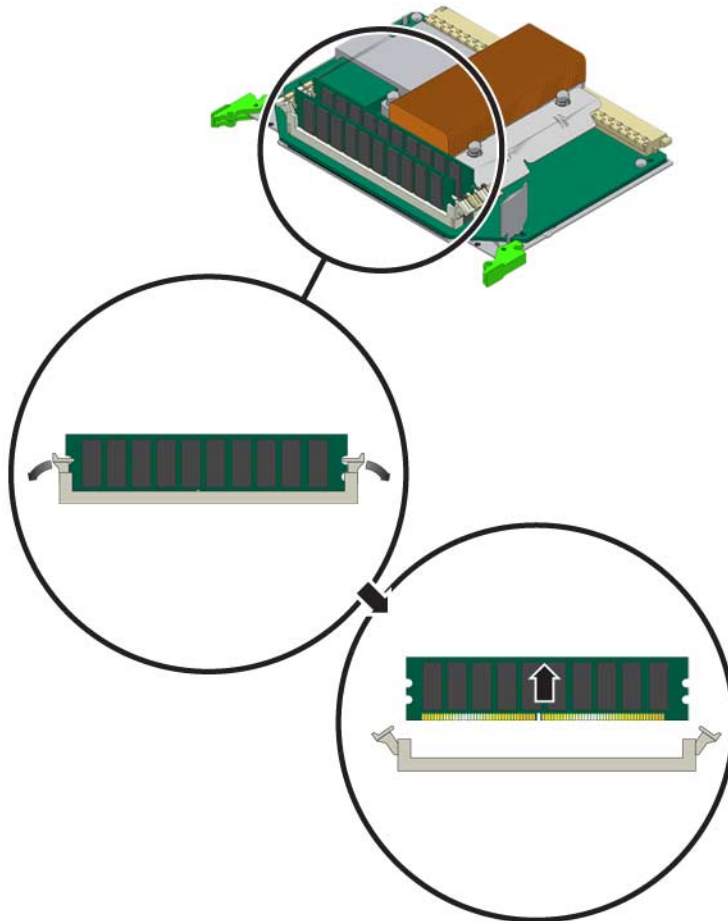
Caution – The pins that connect the CPU module to the motherboard are very fragile. When you remove the module, rotate both plastic levers at the top corners of the module simultaneously to avoid jamming the connector pins.

FIGURE 6 Removing a CPU Module From a CPU Module Bay



5. If you are replacing a CPU filler board skip to Step 9.
6. Remove the DIMMs from the CPU module.
 - a. Rotate both DIMM slot ejectors outward as far as they will go. The DIMM is partially ejected from the socket. See [FIGURE 7](#).

FIGURE 7 Removing a DIMM



- b. Carefully lift the DIMM straight up to remove it from the socket.
 - c. Set the DIMMs on a clean ESD-safe surface until you are ready to install them to the new CPU module.
7. Unpack the new CPU module, and set it flat on its back surface on an ESD-safe mat.
 8. Install the DIMMs that you removed to the new CPU module.

Note – Use the DIMM population rules that are appropriate for the CPU module. See [“CPU Modules and Memory DIMMs”](#) on page 27.

- a. Ensure that the DIMM slot ejectors at each end of the slot are fully open (rotated outward) to accept the new DIMM.
 - b. Align the notch in the bottom edge of the DIMM with the key in the DIMM socket. See [FIGURE 7](#).
 - c. Press down evenly on both top corners of the DIMM until the ejectors snap over the cutouts in the left and right edges of the DIMM.
9. Install the new CPU module or CPU filler board.

Note – All CPU modules in the server must have identical part numbers. Mixing CPU speeds or mixing dual-core CPUs with single-core CPUs is not supported. Be sure to populate the CPU module slots according to the rules in [“Populating a Server With CPU Modules”](#) on page 3.



Caution – The CPU module can be damaged if removed or inserted while standby power is on. Disable standby power by disconnecting all external power cables before proceeding.

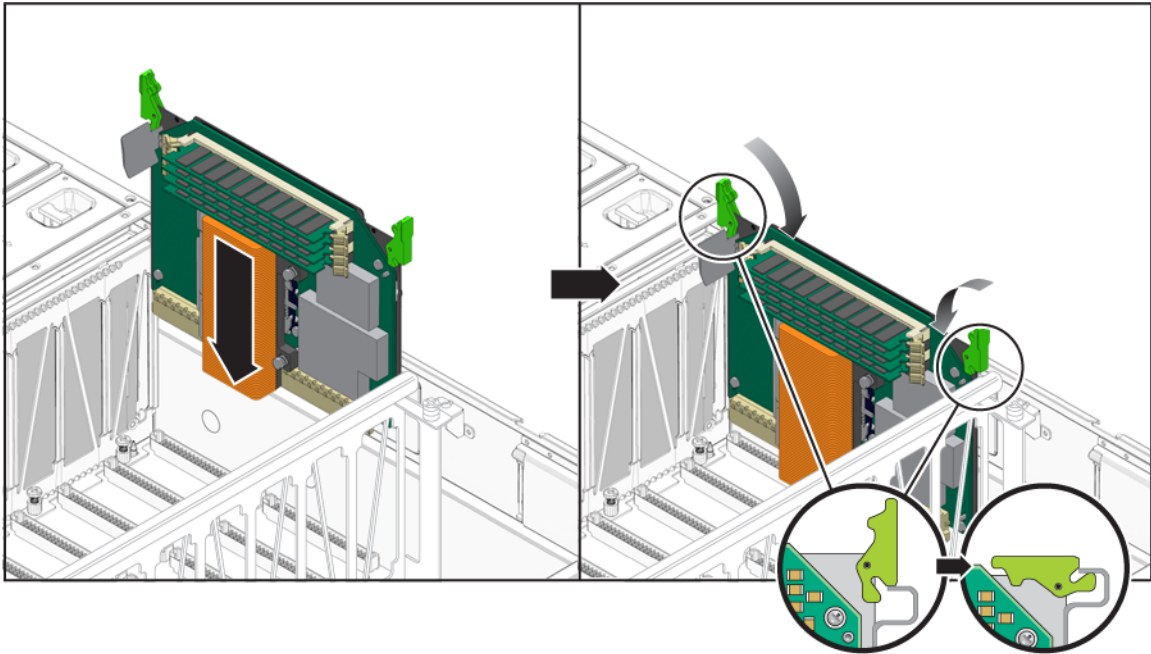
- a. Ensure that both plastic levers on the top corners of the module are in the fully open, vertical position.
- b. Align the module edges with the metal edge-guides in the CPU module bay.
- c. Lower the module until it touches the motherboard connector and the open plastic levers are in contact with the edges of the bay.
- d. Rotate both plastic levers downward simultaneously until they are flat against the top corners of the module.



Caution – The pins that connect the CPU module to the motherboard are very fragile. When you install the module, be very careful to align the module with the edge-guides in the bay and to rotate both plastic levers at the top corners of the module closed simultaneously to avoid jamming the connector pins.

10. Replace the main cover.

FIGURE 8 Installing a CPU Module



Updating the Firmware

[“To Update the ILOM and System BIOS” on page 23](#)

[“Cleanup Steps, Post ILOM Update” on page 24](#)

[“To Force the ILOM Update” on page 25](#)

There are two stages to the firmware update process:

1. Using the ILOM, upload and flash one or more ILOM image files. (These image files also contain a matched system BIOS, which is flashed at the same time.)
2. Using a bootable CD or CD image, flash the LSI HBA BIOS. This only needs to be done once, unless an error occurs.

▼ To Update the ILOM and System BIOS

Each of the `.ima` files you downloaded previously (see “[Firmware: Planning and Downloading](#)” on page 14) contains both an ILOM image and a system BIOS image. Each, in turn must be uploaded and flashed in the order they are listed on your worksheet. There are two ways to do this: from the ILOM command line, and by way of the web interface.

▼ To Update From the ILOM Command Line

Specify the `.ima` in the `load` command:

```
load -source tftp://server/filename.ima
```

Where *server* is the address of the TFTP server, and *filename.ima* is the name of the `.ima` file (possibly including a directory name).

▼ To Update From the Web Interface

Navigate to the Maintenance/Firmware Upgrade page, and click on “Enter Upgrade Mode”. You will be sent to a web page where you can upload and flash the new images.

Note – Both update procedures offer the option of preserving your current ILOM configuration. If you choose this option, and the update fails, try turning the option off. You can then restore your settings by hand.

The upload and flash processes take about 5 minutes. When they complete, the service processor is reset. If you are working remotely, you will have to re-establish your connection with the service processor:

- If you are using the web GUI, you will have to log in again. If you have trouble logging in, try restarting your web browser and clearing your browser cookies.
- If you are using an SSH client to access the command line, your connection will be lost. When you reconnect, the SSH client will warn you that identifying information of the remote system has changed, indicating a possible security failure; this warning can be safely ignored. Some ILOM clients will refuse to contact the ILOM until you delete the old identification data.

Note – If the update process reports completion, but then hangs, try removing all power from the system for 10 seconds. You may find it useful to monitor the output on the serial management port as the service processor reboots.

Note – If the ILOM update fails and you are unable to correct the problem, you can try the update without safeguards. See [“To Force the ILOM Update” on page 25.](#)

After it is reset, the service processor can take a few minutes to reboot. Once you reconnect, check the version via the web GUI or ILOM command line. If the version (including the build number) matches the version you just uploaded, then the update has succeed. You can then repeat the entire process with the next firmware set on your worksheet.

Cleanup Steps, Post ILOM Update

▼ To Perform the Cleanup Steps

1. Clear the system CMOS. You can do this by setting a jumper, as described in the [“Clearing CMOS Jumper P2” on page 25.](#)

Alternately, you can use `ipmitool` from a remote system:

```
ipmitool -U root -H spaddress chassis bootdef \  
none clear-cmos=yes
```

Where *spaddress* is the service processor’s network address.

2. Connect all four power cables, boot the system, and watch the boot process on the console.

Note – A CMOS checksum error will be reported. This message is caused by your clearing the CMOS in the previous step. It can be safely ignored.

Note – The first time it boots with the new firmware, the system may report only one CPU present. This error will correct itself the next time you boot the system.

3. When the prompt “Press F2 to run Setup (CTRL+E on Remote Keyboard)” appears, press one of those keys to bring up the BIOS setup screen.

Note – (If you used `ipmitool` to clear CMOS, then the BIOS setup screen will appear without your intervention.)

The BIOS screen appears.

4. In the BIOS setup screen perform the following steps:

- a. Verify that the BIOS version reported matches the last system BIOS version your worksheet.
 - b. Verify that the date and time are correct. If not, press F2 to correct them.
 - c. Press F9 to load the optimal default values.
 - d. Press F10 (if using the remote console, choose Keyboard/F10) to save and exit.
5. Allow the resulting boot to proceed uninterrupted. The correct number of CPU modules should be reported this time.
 6. Power the system down.

You are now ready to update the LSI HBA BIOS.

Forcing the ILOM Update

▼ To Force the ILOM Update

If your attempts to flash the ILOM keep producing an error, you can try “forcing” the update. This means that safeguards in the ILOM update process are disabled. This can only be done from the ILOM command line, using `load` with the `-f` option.

```
load -f -source tftp://server/filename.ima
```

Note – The `-f` option “forces” the ILOM to update itself without any safety checks. In particular, the ILOM does not verify that the image file is appropriate for the current platform. Do not use the `-f` option except to work around problems flashing an image. If you do use the `-f` option, make absolutely sure that the image file is correct for your hardware platform; the ILOM will not prevent you from flashing an image meant for a different platform.

Clearing CMOS Jumper P2

You can use Jumper P25 to clear the server’s CMOS settings after a system hang. For example, if the server hangs because of incorrect settings and will not boot, use this jumper to invalidate the settings and reboot with defaults.

▼ To Clear a Server's CMOS Settings With Jumper P2

1. Shut down the server to standby power mode by using a pencil or other pointed object to press and release the recessed Power button on the front panel. See [“Powering Off the Server”](#) on page 10
2. Disconnect the AC power cords from the server.



Caution – Before handling components, attach an ESD wrist strap to bare metal on the chassis. The system's printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

3. If the server is in a rack, slide it far enough from the rack so that you can remove the main cover. If you cannot safely view and access the motherboard, remove the server from the rack.
4. Remove the main cover from the server. See [“To Remove the Main Cover”](#) on page 11
5. Install the shorting jumper across the P25 header pins.

See [FIGURE 2](#) for the P25 jumper location. The P25 jumper function is to tell the system to clear the current CMOS settings at system reboot.

6. Wait 10 seconds, then remove the shorting jumper.

This jumper removes battery power from the SouthBridge chipset where the CMOS settings are stored, thereby removing the CMOS settings.

7. Reinstall the main cover to the server.
8. Reconnect AC power cords to the server.

The server powers up to standby power mode, indicated when the Power/OK LED on the front panel is flashing.

Updating the LSI HBA BIOS

▼ To Update the LSI HBA BIOS

In order to update the LSI HBA BIOS, you must boot the system from a CD or CD image containing the update.

1. You can boot from a CD image via the remote console: choose Device/CD-ROM Image, and then select the `.iso` file you downloaded.

2. Once you've inserted the disc in the drive, or mounted the ISO image, reboot.

You will see a menu screen. Choose "1". The firmware update process begins and takes about 5 minutes.

Note – The upgrade script runs a number of programs, some of which issue instructions. These can be ignored. Do nothing until the script finishes, and the DOS prompt (A:>) appears.

Once the script has finished remove the CD from the drive or unselect the CD image from the remote console and reboot. When prompted "Press Ctrl-C to start LSI Configuration Utility" press that key. Verify that the LSI HBA BIOS version information matches that on the last line of your worksheet. Then exit the utility and reboot. The upgrade to an M2 system is complete.

CPU Modules and Memory DIMMs

"CPU Module Models" on page 27 describes the CPU module models and explains the rules for populating the module with memory DIMMs.

"Populating a Server With CPU Modules" on page 3 describes the rules for populating a server with CPU modules and explains how module slot letters map to numeric module IDs.

"Locating Faulty CPUs and DIMMs" on page 39 describes the CPU modules' built-in diagnostic features.

CPU Module Models

This section describes the various CPU module models. Some models are available in multiple part numbers. All part numbers within a given model share basic features such as the kind of CPU they support and the way they use memory DIMMs. Individual part numbers vary as to the specific CPU they support. For more information refer to the Sun System Handbook:

http://sunsolve.sun.com/handbook_pub/

Each CPU module model description indicates whether it can be used with the X4600 server or the X4600 M2 server. No CPU module model can be used with both systems.

The sections that document individual CPU modules are:

[“Sun Fire X4600 CPU Module” on page 28](#)

[“Sun Fire X4600 M2 4-DIMM CPU Module” on page 31](#)

[“Sun Fire X4600 M2 8-DIMM and 8-DIMM Split Plane CPU Modules” on page 33](#)

Sun Fire X4600 CPU Module

[“Physical Layout” on page 28](#)

[“DIMM Usage” on page 30](#)

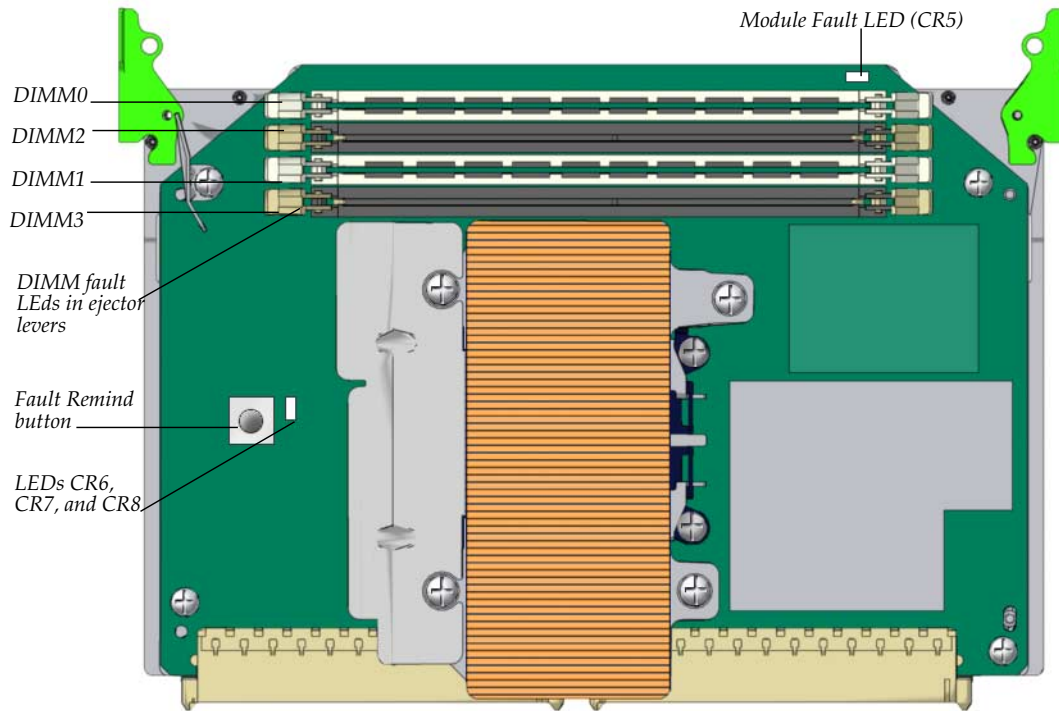
This module is only compatible with the Sun Fire X4600 server. It supports an AMD Opteron 800 series dual-core CPU and a maximum of 8 GB of DDR1 memory.

Physical Layout

Physical layout of the Sun Fire X4600 CPU Module is shown in

Note – This module does not number its DIMM slots consecutively. Also, DIMM pairs are not placed in adjacent slots.

FIGURE 9 Physical Layout of Sun Fire X4600 CPU Module



Pressing the Fault Remind button lights LEDs that indicate faulty CPU and DIMM. See [“Locating Faulty CPUs and DIMMs”](#) on page 39

LEDs are described in [TABLE 3](#)

TABLE 3 Sun Fire X4600 CPU Module LEDs

Led	Color and Meaning
CR5: Module Fault	Amber. Indicates faulty CPU or DIMM.
CR6: CPU Core VRM On	Amber. Indicates power available to CPU.
CR7: DDR Memory VRM On	Amber. Indicates power available to DIMM slots
CR8: Processor Failure	Amber. Indicates faulty CPU when Fault Remind button is pressed.
DIMM Ejector Lever LEDs	Amber. Indicate faulty DIMMs when Fault Remind button is pressed.

DIMM Usage

The Sun Fire X4600 CPU Module provides four DIMM slots (TABLE F-2), for a maximum of two pairs. Here are the specifications and population rules used with the DIMM slots:

- **Type:** DIMMs must be DDR1.
- **Speed:** Maximum speed is 200 MHz (DDR1-400).
- **Capacity:** 1-GB and 2-GB DIMMs are supported.
- **Matching:** DIMMs must be added in pairs, with both DIMMs in a pair having the same Sun part number.
- **Slot Usage:** Every module must have at least one matched pair of DIMMs. Populate pair 0 (the white slots) first.

TABLE 4 DIMM Slots in Sun Fire X4600 CPU Module

Slot	Color	Pair Number
DIMM0	White	0
DIMM0	Black	1
DIMM0	White	0
DIMM0	Black	1

Sun Fire X4600 M2 4-DIMM CPU Module

This module is only compatible with the Sun Fire X4600 M2 server. It supports an AMD Opteron 8000 series dual-core CPU and a maximum of 16 GB of DDR2 memory.

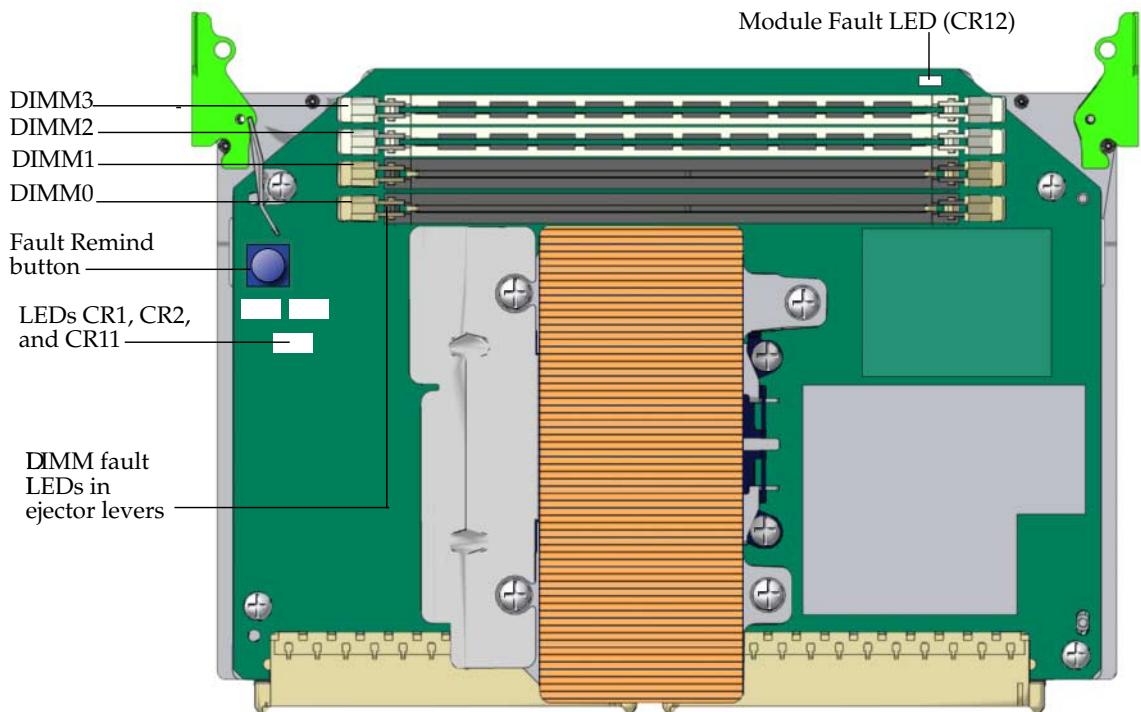
[“Physical Layout” on page 33](#)

[“DIMM Usage” on page 35](#)

Physical Layout

Physical layout of the Sun Fire X4600 M2 4-DIMM CPU module is shown in [FIGURE 10](#)

FIGURE 10 Physical Layout of Sun Fire X4600 M2 4-DIMM CPU Module X4600 M2 8-



Pressing the Fault Remind button lights LEDs that indicate faulty CPU and DIMM. See [“Locating Faulty CPUs and DIMMs” on page 39](#)

Note – This module can be used in the same system with Sun Fire X4600 M2 8-DIMM CPU modules, provided all CPUs are identical. For more information on CPU module matching requirements, see [“CPU Module Matching Requirements” on page 3](#)

LEDs are described in [TABLE 5](#).

TABLE 5 LEDs on Sun Fire X4600 M2 CPU 4-DIMM Module

LEDs	Color and Meaning
CR1: CPU Core VRM On	Amber. Indicates power available to CPU.
CR2: DDR Memory VRM On	Amber. Indicates power available to DIMM slots
CR11: Processor Failure	Amber. Indicates faulty CPU when Fault Remind button is pressed
DIMM Ejector Levers	Amber. Indicate faulty DIMMs when Fault Remind button is pressed.

DIMM Usage

The Sun Fire X4600 M2 4-DIMM CPU module provides four DIMM slots ([TABLE 6](#)), for a maximum of two pairs. Here are the specifications and population rules used with the DIMM slots:

- **Type:** DIMMs must be DDR2.
- **Speed:** Maximum speed is 333 MHz (DDR2-667).
- **Capacity:** 1-GB, 2-GB, and 4-GB DIMMs are supported.
- **Matching:** DIMMs must be added in pairs, with both DIMMs in a pair having the same Sun part number.
- **Slot Usage:** Every module must have at least one matched pair of DIMMs. Populate pair 1 (the white slots) first.

TABLE 6 DIMM Slots in Sun Fire X4600 CPU Module

Slot3	Color	Pair Number
DIMM3	White	1
DIMM2	White	1
DIMM1	Black	0
DIMM0	Black	0

Sun Fire X4600 M2 8-DIMM and 8-DIMM Split Plane CPU Modules

[“Physical Layout” on page 33](#)

[“DIMM Usage” on page 35](#)

These two modules have identical physical layout, and follow the same DIMM usage rules. They both are compatible with the Sun Fire X4600 M2 server only, and support a maximum of 32GB of DDR2 memory. They have important differences:

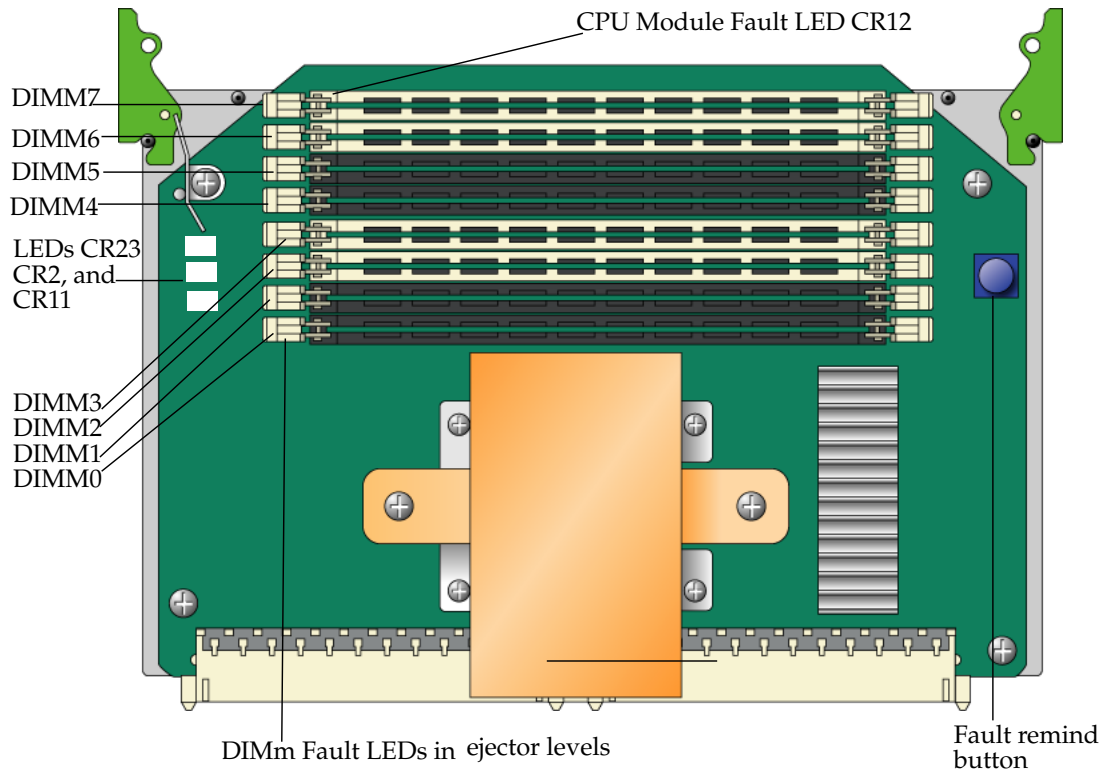
- The Sun Fire X4600 M2 8-DIMM CPU module supports a dual-core AMD Opteron 8000 series CPU. It can be used in the same system with Sun Fire X4600 M2 4-DIMM CPU modules, provided all CPUs are identical.
- The Sun Fire X4600 M2 8-DIMM Split Plane CPU module supports a quad-core AMD Opteron 8000 series CPU. When this model is used a system, all CPU modules must have the same Sun part number.

Note – For more information on CPU module matching requirements, see [“CPU Module Matching Requirements” on page 3](#)

Physical Layout

Physical layout of the Sun Fire X4600 M2 8-DIMM and 8-DIMM split plane CPU modules is shown in FIGURE F-Physical Layout of Sun Fire X4600 M2 8-DIMM and 8-DIMM Split Plane CPU module.

FIGURE 11 Physical Layout of Sun Fire X4600 M2 8-DIMM CPU Module and Sun Fire X4600 M2 8-DIMM Split Plane CPU Modules



Pressing the Fault Remind button lights LEDs that indicate faulty CPU and DIMM. See [“To Locate Faulty CPU’s and DIMMs” on page 39](#)

LEDs are described in TABLE F-3

TABLE 7 LEDs on Sun Fire X4600 M2 CPU 4-DIMM Module

LEDs	Color and Meaning
CR12: Module Fault	Amber. Indicates faulty CPU or DIMM
CR1: CPU Core VRM On	Amber. Indicates power available to CPU.

TABLE 7 LEDs on Sun Fire X4600 M2 CPU 4-DIMM Module

LEDs	Color and Meaning
CR2: DDR Memory VRM On	Amber. Indicates power available to DIMM slots.
CR23: Processor Failure	Amber. Indicates faulty CPU when Fault Remind button is pressed
DIMM Ejector Levers	Amber. Indicate faulty DIMMs when Fault Remind button is pressed

DIMM Usage

The Sun Fire X4600 M2 8-DIMM and 8-DIMM split plane CPU modules provides 8 DIMM slots (TABLE F-6), for a maximum of four pairs. Here are the specifications and population rules used with the DIMM slots:

- **Type:** DIMMs must be DDR2.
- **Speed**
 - **Eight-DIMM** with 2 or 4 DIMMs: Maximum speed is 333 MHz (DDR2-667).
 - **Eight-DIMM** with 6 or 8 DIMMs: Maximum speed is 266 MHz (DDR2-533).
 - **Eight-DIMM** split plane module: Maximum speed is 333 MHz (DDR2-667).
- **Capacity:** 1-GB, 2-GB, and 4-GB DIMMs are supported.
- **Matching:** DIMMs must be added in pairs, with both DIMMs in a pair having the same Sun part number.
- **Slot Usage:** Every module must have at least one matched pair of DIMMs. Populate pair 3 (the white slots farthest from the CPU) first, and work your way towards the CPU.

TABLE 8 Sun Fire X4600 M2 8-DIMM and 8-DIMM split plane CPU Module DIMM Slots

Slot	Color	Pair Number
DIMM7	White	3
DIMM6	White	3
DIMM5	Black	2
DIMM4	Black	2
DIMM3	White	1

TABLE 8 Sun Fire X4600 M2 8-DIMM and 8-DIMM split plane CPU Module DIMM Slots

Slot	Color	Pair Number
DIMM2	White	1
DIMM1	Black	0
DIMM0	Black	0

Populating a Server With CPU Modules

Note – This section describes configurations with 2, 4, 6, and 8 CPU modules. The number of modules a system can actually support depends on the software and firmware versions. To identify the configurations supported by your system, see the Software Release Notes for the system software you have installed.

CPU Module Matching Requirements

The following CPU modules can be used together:

- Sun Fire X4600 M2 4-DIMM CPU module
- Sun Fire X4600 M2 8-DIMM CPU module

Except for the modules listed in this section, all CPU modules in a server must be identical. This means that each module must have the same Sun part number. If two modules are the same model but different part numbers, then their CPUs are different; mixing CPUs in a single server is not supported.

When different CPU modules are in the same system, the CPUs must be identical. This means that even though the part numbers for the CPU modules may be different, the part numbers for the CPUs on the modules must be the same.

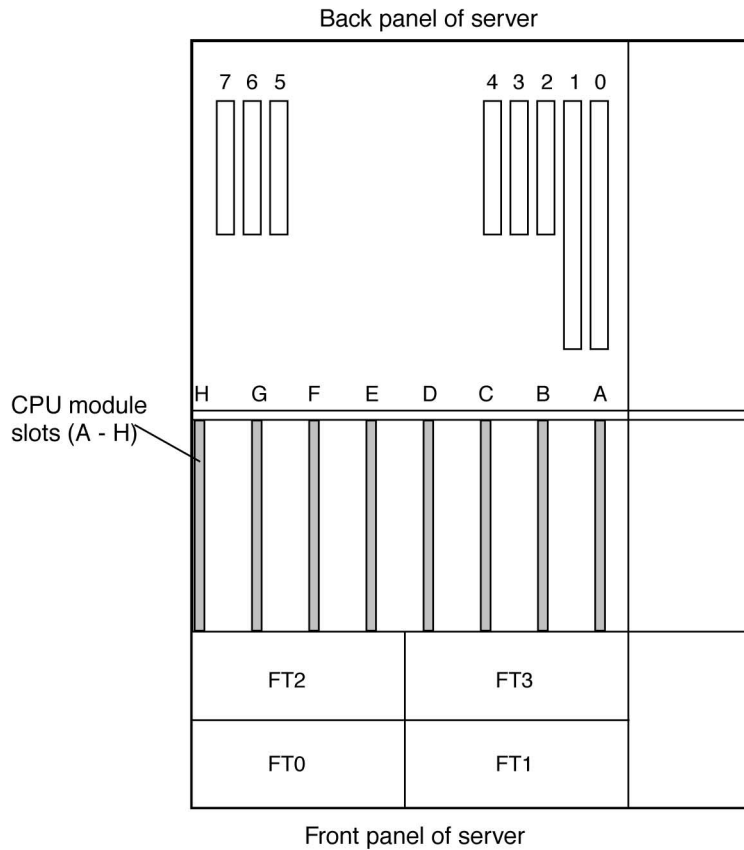


Caution – Only the CPU modules listed in this section can used together.

Population Procedures

The 8 CPU module slots are designated by letters A through H, as shown in FIGURE F-4. Looking from the front of the server, the CPU module slots are lettered from right to left.

FIGURE 12 Sun Fire X4600/X4600 M2 CPU Module Slots

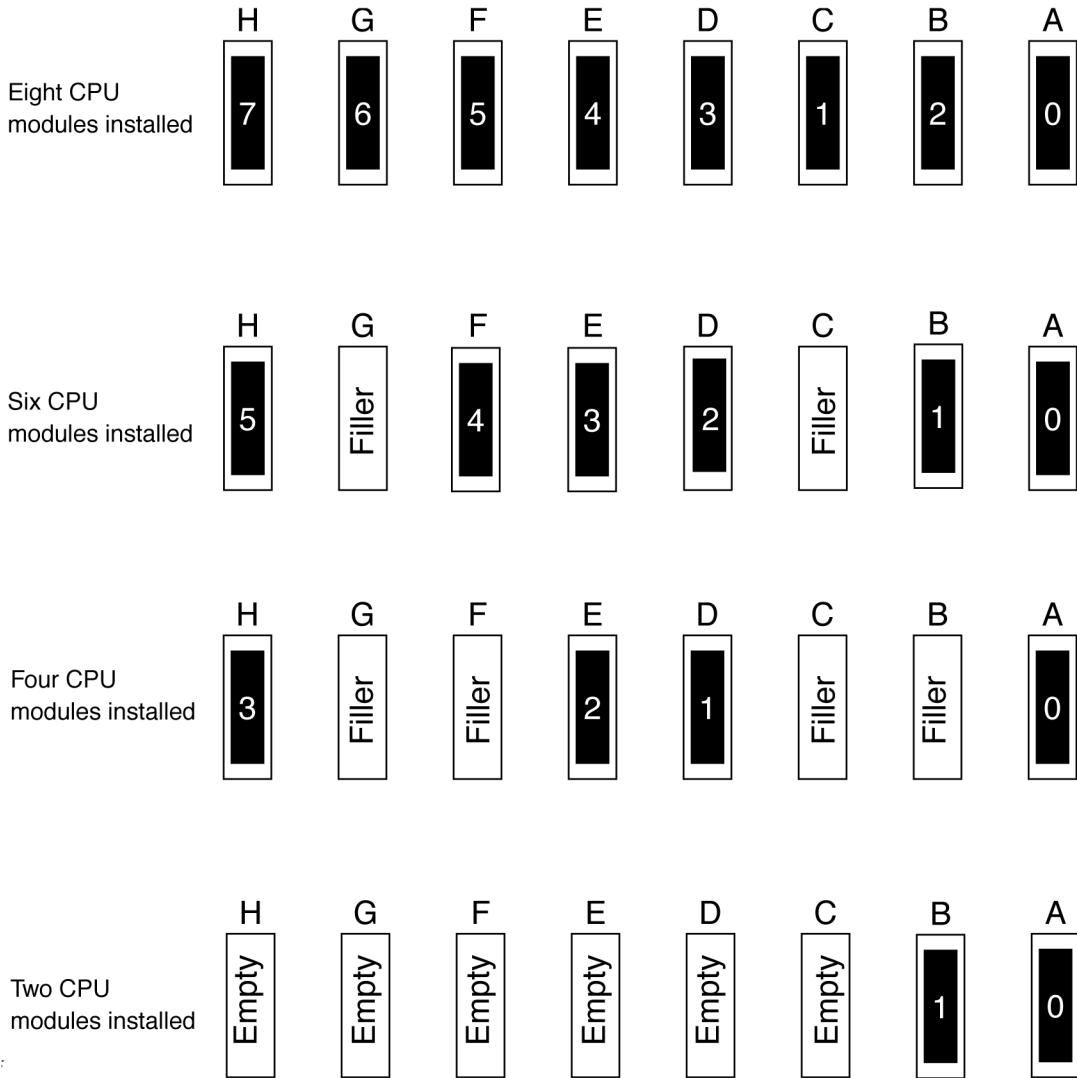


When a server contains fewer than 8 CPU modules, only specific slots can be used, as shown in FIGURE F-5. This figure also shows how the CPU module slot letters map to the numbers that identify actual CPU modules.

Note – In an eight-module configuration, the modules are not all in numerical order. Slot B contains module 2, and slot C contains module 1.

Note – In a two-module configuration, use of PCI slots 5, 6, and 7 is not supported.

FIGURE 13 CPU Module Population Rules and Numbering



Note – In six-module and four-module configurations, unused CPU slots must contain filler modules. In two-module configurations, unused CPU slots must be left empty.

Locating Faulty CPUs and DIMMs

▼ To Locate Faulty CPU's and DIMMs

Every CPU module supports the following diagnostic procedure.

1. Make sure that the system is powered down, but that power cables are still connected to the PSU. This ensures that standby power is flowing to the CPU modules
2. Locate the CPU module with a lit amber LED visible at its top edge. The LED indicates that the module has faulty CPU or DIMM.
3. Remove standby power by disconnecting all power cables from the PSU.



Caution – Removing or inserting a CPU module while standby power is available can damage the module.

4. Remove the CPU module you previously identified from its slot in the CPU module bay. See [““To Replace a CPU Module or CPU Filler Board” on page 18.](#)
5. Press the module's fault remind button. If a DIMM is faulty, an amber LED is lit in one of the DIMM's slot handles. If the CPU is faulty, a CPU fault LED is lit. These LEDs are powered by an on-board capacity and can remain lit about a minute.

To identify the fault remind button and the CPU fault LED, refer to the individual module descriptions in “CPU Module Models” on page F-1.

