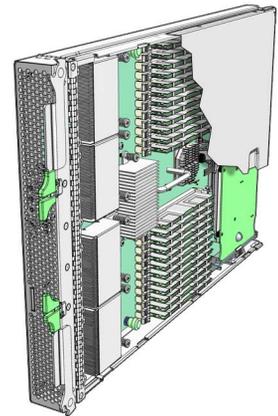


# Sun Blade™ X6450 Server Module Installation Guide

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Sun Microsystems, Inc.  
[www.sun.com](http://www.sun.com)

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# Preface

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This *Sun Blade X6450 Server Module Installation Guide* contains procedures for installing the server module in a chassis, and connecting to the service processor administrator account.

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## Using UNIX Commands

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

- Software documentation that you received with your system
- Solaris<sup>™</sup> Operating System (Solaris OS) documentation, which is at <http://docs.sun.com>

---

# Shell Prompts

Shell	Prompt
C shell	<i>machine-name%</i>
C shell superuser	<i>machine-name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

---

# Typographic Conventions

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

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

---

# Related Documentation

For a description of the document set, see the *Where to Find Documentation* sheet that is packed with your system and also posted at the product's documentation site. Go to the following URL, then navigate to your product.

<http://docs.sun.com/app/docs/prod/blade.x6450>

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

For all Sun hardware and software documentation, go to the following URL:

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## Documentation, Support, and Training

Sun Function	URL
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Support	<a href="http://www.sun.com/support/">http://www.sun.com/support/</a>
Training	<a href="http://www.sun.com/training/">http://www.sun.com/training/</a>

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## Product Updates

For product updates that you can download, please visit the following web site:

<http://www.sun.com/download/>

Find the Hardware Drivers section and click x64 Servers & Workstations. The Sun Blade™ X6450 Server Module site contains updates for firmware and drivers, as well as CD-ROM ISO images.

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Please include the title and part number of your document with your feedback:

*Sun Blade X6450 Server Module Installation Guide*, part number 820-3535-13

## Introduction

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This chapter contains the following topics:

- [“Terms and References Used in This Book” on page 1](#)
- [“Installation Overview” on page 2](#)
- [“Routine Power On and Power Off” on page 3](#)
- [“About Diskless Servers” on page 6](#)
- [“About the Boot Process” on page 11](#)
- [“RAID Configuration” on page 16](#)
- [“Installing an Operating System” on page 17](#)
- [“Directing Console Output” on page 18](#)
- [“Accessing BIOS Configuration Utilities and Selecting a Boot Device” on page 14](#)

---

## Terms and References Used in This Book

Note the following terms used in this book:

- The term *server module* refers to the Sun Blade X6450 server hardware.
- The term *chassis* refers to the Sun Blade 6000 modular system.
- The term *remote drive* refers to a disk drive that is located outside the server module, but is configured to serve as a local drive.
- The server module includes a *service processor (SP)*, which is IPMI-compatible software integrated into the motherboard. This can be one of several versions:
  - *Integrated Lights Out Manager (ILOM) 3.0* – Sun Blade X6450 server modules are currently shipped with an ILOM service processor.
  - *Integrated Lights Out Manager (ILOM) 2.0* – Some earlier X6420 server modules might be equipped with this version of the ILOM service processor.

- *Embedded Lights Out Manager* – Some earlier X6450 server modules might be equipped with this version of the service processor.

---

## Installation Overview

The following overview outlines the steps to install the server module. The actual procedures are in [Chapter 2](#).

Unpack the server module before proceeding.

1. Insert the server module into the chassis.

When you are done, the server module comes up to standby mode. See [“Inserting the Server Module” on page 19](#).

2. Access and configure the service processor. Using the service processor, you can:

- Access the system console remotely over the network.
- Access the service processor’s IP address and MAC address.
- Change the service processor’s IP address, and configure whether the service processor uses DHCP or static addressing. See [“Configuring the Service Processor’s Network Settings \(Optional\)” on page 28](#)

When you are done, you can access the service processor from the Ethernet. You can also set the service processor’s network settings, including its IP address at this time.

3. Configure any additional network hardware. See [“About Diskless Servers” on page 6](#) for more information.
4. Configure or select a boot device. See [“Accessing BIOS Configuration Utilities and Selecting a Boot Device” on page 14](#) for more information.
5. Install or configure your operating system.
  - To install a supported Solaris, Linux, or VMware operating system, see the *Sun Blade X6450 Server Module Operating System Installation Guide*.
  - To install a supported Windows operating system, see the *Sun Blade X6450 Server Module Windows Operating System Installation Guide*.

---

# Routine Power On and Power Off

This section describes how to apply standby power to the server module so you can operate the service processor. It also includes procedures for powering on and for shutting down the server module.

---

**Note** – You can also power on and power off the server module remotely using the service processor. Powering on is described in [“Accessing the System Console” on page 29](#). More complete instructions are provided in the corresponding service processor documentation.

---

## ▼ To Apply Standby Power

When standby power is applied, the service processor is powered on, and everything else is powered off.

If the chassis is powered on, standby power is automatically applied to the server module. No action is required.

## ▼ To Power On Main Power for All Server Components

### 1. Insert the server module into a powered chassis.

The server module comes up to standby power mode automatically.

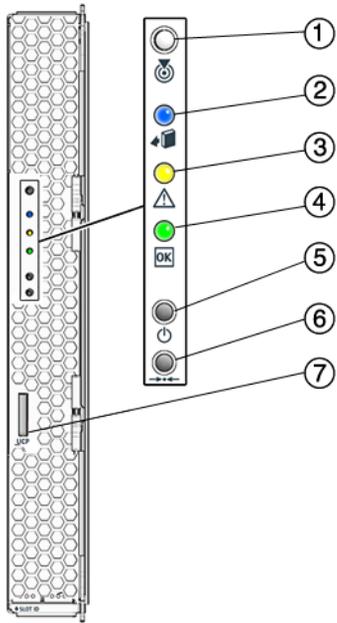
In standby power mode, the green OK LED on the front panel flashes. The blue OK to Remove LED remains ON with ILOM 2.0 and ELOM. It remains Off with ILOM 3.0.

See [FIGURE 1-1](#).

### 2. Use a non-conducting pointed object, such as a stylus, to press and release the recessed Power button on the server front panel.

When main power is applied to the full server, the green OK LED above the Power button lights and remains lit.

**FIGURE 1-1** Server Module Front Panel



**Figure Legend**

- 
- 1 White LED - Locate. Use it to identify the server module. When turned on, the locate LED blinks at .25Hz for 30 minutes.  
To turn it on or off, press it momentarily, or use the ILOM as described in:
    - ["To Control the Locate LED Using the ILOM Web Interface" on page 5](#) or
    - ["To Control the Locate LED Using the ILOM Command Line Interface \(CLI\)" on page 6.](#)
  - 2 Blue LED - Ready to remove. Use ILOM 3.0 commands to turn it On and Off.
  - 3 Amber LED - Service action required.
  - 4 Green LED - Power/OK. See ["LED Behavior" on page 21](#) for details.
  - 5 Power on button/standby.
  - 6 For service use only.
  - 7 UCP (universal connector port), used for dongle cable.
- 

## ▼ To Shut Down Main Power

To power off the server, use one of the following two methods:

- **Graceful shutdown.** Use a non-conducting pointed object, such as a stylus, 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. 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.

After you have shut down main power, it is OK to remove the server module from the chassis. You can use the ILOM 3.0 web interface or CLI to light the blue OK to Remove LED if necessary to inform onsite personnel that it is OK to remove it.



---

**Caution** – Do not remove the server module from the chassis while it is installing (flashing) firmware.

---

---

**Note** – To power off the server completely, you must remove it from the chassis, or disconnect the AC power cords from the back panel of the chassis.

---

---

**Note** – Pressing the Power button for four seconds or more always causes the subsystems in the server module (except for the service processor) to be powered off, even if the server module is already in the powered-off state.

If the server module is already in the powered-off state when the Power button is pressed for four seconds or more, power is briefly applied to the system, then it is turned off again.

---

## ▼ To Control the Locate LED Using the ILOM Web Interface

1. **Log in to the ILOM web interface.** See [“To Connect to the ILOM Web Interface” on page 25](#) for details.
2. **Navigate to System Monitoring -> Indicators.**
3. **Select the radio button next to the Locate LED**
4. **Select an action from the drop-down menu:**
  - Set LED To Fast Blink to turn the LED on.

- Turn LED Off to turn the LED off.

## ▼ To Control the Locate LED Using the ILOM Command Line Interface (CLI)

1. Log in to the ILOM CLI. See [“To Connect to the ILOM CLI” on page 27](#) for details.
2. Use the following commands:
  - `/SYS/LOCATE value=FastBlink` to turn the LED on.
  - `/SYS/LOCATE value=Off` to turn the LED off.

---

# Operating System Installation Options

The Sun Blade X6450 can be configured to install the operating system in a wide variety of locations.

This section describes some of the options available. They include:

- Installing the operating system on the compact flash, which shares characteristics with a hard drive, and which can support some operating systems. This option is described in [“Compact Flash Drive” on page 7](#).
- Installing the operating system on the SSD, or Solid State Disk device. See [“Solid State Disk Drive \(SSD\)” on page 7](#).
- Configure diskless network boot, which boots the server module from a boot image on another server. See the *Sun Blade X6450 Server Module Operating System Installation Guide* or your operating system documentation for more information.
- Installing the operating system on a remote drive, which might be in the chassis (connected through the SAS-NEM module to a Sun Blade 6000 Disk Module) or outside the chassis, in a storage device such as a SAN. See [“Connecting to SAS Devices” on page 8](#) and [“Connecting to Exterior Storage Devices Using a Fibre Channel Connection” on page 10](#)

The following sections describe methods of configuring remote drives:

- [“Connecting to SAS Devices” on page 8](#).
- [“Connecting to Exterior Storage Devices Using a Fibre Channel Connection” on page 10](#).

After you have configured one or more remote drives, you can proceed with the operating system installation. From the point of view of the operating system installation, when remote drives are installed and configured correctly, they operate the same as local drives. They should appear in the list when the operating system installation procedure queries for where to install the operating system.

If the operating system installation procedure requires you to select a boot device in the BIOS, see [“Accessing BIOS Configuration Utilities and Selecting a Boot Device” on page 14](#).

## Compact Flash Drive

The Sun Blade X6450 is equipped with a compact flash device that can support some operating systems. It is the only local option for installing an operating system.

The following operating systems support booting from compact flash:

- S10 U4 (64-bit) or later
- RHEL4.6 (32/64-bit) or later
- RHEL5.0 (64-bit) or later
- SLES9 Sp4 (64-bit)
- SLES10 Sp1 (64-bit) or later
- VMware ESX 3.0.2+
- Windows 2003 32-bit and 64-bit
- Windows 2008 32-bit and 64-bit

The compact flash drive supports a finite number of writes before its performance degrades. You can mitigate the limited number of writes by configuring it to redirect the log files (the `/var` and `/tmp` directories) to another location. See your operating system documentation for details.

## Solid State Disk Drive (SSD)

The SSD is a 32-gigabyte solid-state SATA drive that mounts on the motherboard.

---

**Note** – This feature requires a F540-7821-01 or newer motherboard, with 2.0 software installed. The motherboard part number appears on the motherboard, and can be read using the service processor.

---

When an SSD is present, it appears as a disk device which is controlled by the onboard SATA controller. You can install an operating system on it.

Note the following conditions:

- The SSD can be driven by the onboard SATA controller.
- A server module with an SSD cannot have a Sun Blade RAID 5 Expansion Module.
- A server module with an SSD can have a Sun Blade RAID 0/1 G2 RAID Expansion Module. However to drive the SSD, the Sun Blade RAID 0/1 G2 RAID Expansion Module must have FW1.26.91 and later.

For instructions to install an SSD, see the *Sun Blade X6450 Server Module Service Manual*.

## Connecting to SAS Devices

The SAS-NEM module, mounted in the back of the chassis, allows to the Sun Blade X6450 Server Module to connect to SAS devices inside the chassis and outside of the chassis. Each chassis can support one or two SAS-NEM modules.

These configurations require the Sun Blade X6450 Server Module to have either a REM or a FEM.

- *Inside the chassis*, the Sun Blade 6000 Disk Module provides eight SAS drives.

The Sun Blade 6000 Disk Module and the Sun Blade X6450 Server Module work in pairs, with the server module in an even-numbered slot, directly to the left of the disk module. Thus, the pairs can be in slots 0+1, 2+3, 4+5, 6+7, or 8+9.

In this configuration, the eight disks on the disk module are available to the server module, and appear in the boot list as local drives.

- *Outside the chassis*, the Sun Blade 6000 10GbE Multi-Fabric Network Express Module provides four 10 GbE SAS external ports as well as connections to the Sun Blade 6000 Disk Module.

For more information, see the *Sun Blade 6000 Disk Module Installation Guide* (820-1702), and the documentation for the corresponding SAS NEM module.

The following device requires software 3.0 or newer.

- Sun Blade 6000 10GbE Multi-Fabric Network Express Module

---

**Note** – The Sun Blade 6000 10GbE Multi-Fabric Network Express Module can run on a server module equipped with SW2.0.3, with CPLD V071 or newer; however to support hot plugging this component requires SW3.0.

---

The following devices require software 2.0 or newer.

- Sun Blade RAID 5 Expansion Module

- Sun Blade RAID 0/1 G2 Expansion Module
- Sun Blade 6000 Multi-Fabric Network Express Module

The following devices require a F540-7821-01 or newer motherboard, with 2.0 software installed. The motherboard part number appears on the motherboard, and can be read using the service processor.

- Sun Dual 10GbE Fabric Expansion Module

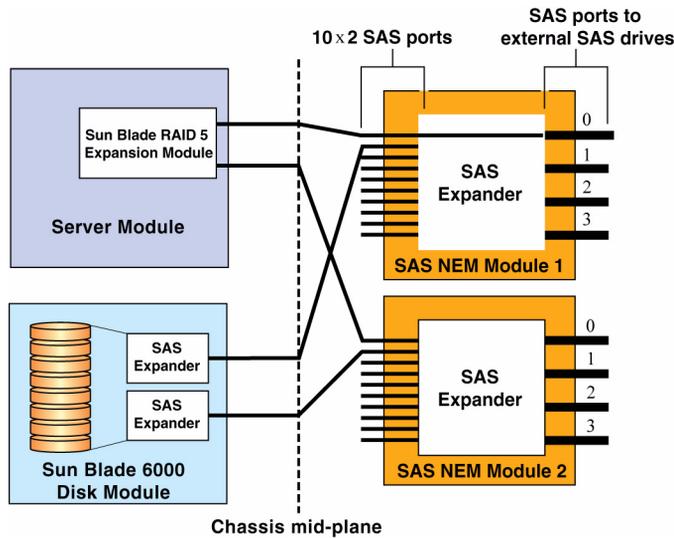
The combinations, and the configurations they support appear in [TABLE 1-1](#).

**TABLE 1-1** SAS Connection Summary

REM	SAS-NEM Module	Supported Connections
Sun Blade RAID 5 Expansion Module, or Sun Blade RAID 0/1 G2 Expansion Module	NEM	None
Sun Blade RAID 5 Expansion Module, or Sun Blade RAID 0/1 G2 Expansion Module	Sun Blade 6000 Multi-Fabric Network Express Module	Sun Blade 6000 Disk Module External SAS connectors
Sun Blade RAID 5 Expansion Module, or Sun Blade RAID 0/1 G2 Expansion Module	Sun Blade 6000 10GbE Multi-Fabric Network Express Module <b>Note</b> - This SAS-NEM also supports the 10GbE Ethernet connectors. See <a href="#">“External Connector to the 10 GbE Ethernet Connections”</a> on page 10.	Sun Blade 6000 Disk Module External SAS connectors

[FIGURE 1-2](#) shows a Sun Blade X6450 server module in slot 0 and a Sun Blade 6000 Disk Module in slot 1, with a pair of Sun Blade 6000 10GbE Multi-Fabric Network Express Modules.

**FIGURE 1-2** Connections to a SAS NEM Module



## Internal Connection to a Sun Blade 6000 Disk Module

Inside the chassis, the Sun Blade 6000 Disk Module provides eight SAS drives.

The Sun Blade 6000 Disk Module and the Sun Blade X6450 Server Module work in pairs, with the server module in an even-numbered slot, directly to the left of the disk module. Thus, the pairs can be in slots 0+1, 2+3, 4+5, 6+7, or 8+9.

In this configuration, the eight disks on the disk module are available to the server module, and appear in the boot list as local drives.

## External Connect to the 10 GbE Ethernet Connections

In addition to the four external SAS connectors, the Sun Blade 6000 10GbE Multi-Fabric Network Express Module provides ten 10GbE ports. To use the 10GbE ports, you must have a Sun Blade 6000 10GbE Multi-Fabric Network Express Module installed.

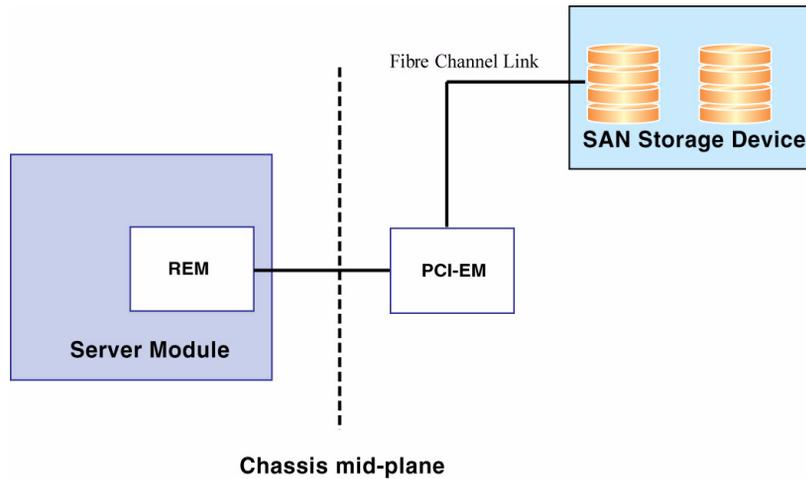
For more information, see the *Sun Blade 6000 Disk Module Installation Guide*, and the documentation for the SAS NEM module.

# Connecting to Exterior Storage Devices Using a Fibre Channel Connection

The Sun Blade X6450 supports connections to an external SAN over a fibre channel link provided by a PCIe ExpressModule card in the corresponding PCIe ExpressModule slot. The PCIe ExpressModule card provides a fibre channel connection to the external SAN.

FIGURE 1-3 shows the configuration.

FIGURE 1-3 PCIe ExpressModule with Fibre Channel and SAN



The chassis supports two PCIe ExpressModule slots for each server slot. They are numbered  $N-0$  and  $N-1$ , where  $N$  is the server slot number. The numbering is described in the chassis documentation.

See the documentation provided with the PCIe ExpressModule card for more details.

To configure a boot device on the SAN device, see [“Accessing BIOS Configuration Utilities and Selecting a Boot Device”](#) on page 14.

---

## About the Boot Process

This section provides an overview of the boot process.

When you start your server module, it offers two chances to select the way it boots:

- BIOS – Allows you to select a hardware device to boot from, and to configure other aspects of system operation
- Bootloader– After the BIOS exits, the bootloader offers a selection of configured operating systems

## BIOS and BIOS Configuration Utilities

When you power on your server module, it completes its self-test and then displays a series of messages that offer a chance to access and configure the BIOS.

- If you do nothing, the server module boots from the default device.
- If you enter a keystroke, the server module does one of the following:
  - F2 – Enters BIOS configuration mode. This allows you to configure a wide range of BIOS options, including the default boot device. When you are done, the system re-boots using the settings you configured.  
*See the [Sun Blade X6450 Server Service Manual](#) for details.*
  - F8 – Displays a list of configured hardware boot options, and continues booting from the selected device.
  - F12 – Boots from the network (netboot). See [“To Load an OS Over the Network \(Netboot\)” on page 16](#).
  - BIOS Configuration Utilities – Many option cards have BIOS configuration utilities that can also be used to configure such things as disk volumes and RAID arrays.

---

**Note** – Many configurations require you to configure your option card(s) with their respective BIOS configuration utilities before installing your operating system. See [“Accessing BIOS Configuration Utilities and Selecting a Boot Device” on page 14](#) for additional instructions.

---

## Bootloader

When the BIOS Power-On Self Test (POST) is finished, an operating system boots.

Most operating systems start by opening a bootloader. Like the BIOS, a bootloader offers a menu of boot selections, and if you do nothing, it boots the default selection. However, unlike the BIOS, the bootloader offers a choice of installed operating systems, not a selection of bootable hardware devices.

After you make a selection or accept the default, the bootloader boots the indicated selection.

Bootloaders are commonly used for two types of selections:

- **Booting different operating systems.** For example, if you have installed the Solaris and Linux operating systems on different drives, or on partitions of the same drive, you can use the bootloader to select between them.
- **Booting the same operating system with different parameters.** For example, with the Solaris OS, you can configure one selection to display console output on the serial port, and the other to display console output on the VGA output.

---

**Note** – This is the currently supported method of switching the console output between the serial management port and the VGA port.

---

After the bootloader exits, the server module continues to boot from the selection you have made.

The bootloader you see depends on the type of operating system booted by the BIOS:

- The Solaris and Linux operating systems use the Grand Unified Bootloader (GRUB).
- The Windows operating system uses a proprietary bootloader.

For example, in a system with the Solaris operating system and the Windows operating system, if the BIOS boots the device containing the Solaris operating system, the GRUB bootloader appears. However, the GRUB can be configured to include a selection that boots a Windows operating system.

---

**Note** – Bootloaders are highly configurable. The choices are determined by local configuration. See your network administrator for additional information.

---

## GRUB

When the GRUB bootloader opens, it displays a menu of selections.

- To make a selection, use the arrow keys to highlight your selection, then press the Enter key.
- To accept the default selection, do nothing. GRUB will time out and boot the default.

## Windows Bootloader

The Windows bootloader performs the same basic function as GRUB. For more details, see your Windows operating system documentation.

---

# Accessing BIOS Configuration Utilities and Selecting a Boot Device

Because the Sun Blade X6450 is a diskless server, it most likely requires an option card to connect to its hard drives. In most cases, the option card must be configured using the BIOS configuration utility before you can install an operating system.

- If your operating system installation procedure offers a selection of bootable devices, the procedures in this section might be unnecessary. See your operating system installation documentation for details.
- If your server module includes a REM or a PCIe ExpressModule, and you plan to use RAID, you need to configure the server module using the corresponding BIOS configuration utility.
- If your server module includes a Sun Blade RAID 5 Expansion Module, you must initialize your hard drives before installing the operating system.
- If your server module is connected to a Sun Blade 6000 Disk Module over a NEM SAS connector, the eight hard drives will appear to be local drives. See [“Connecting to SAS Devices” on page 8](#).
- If your server includes an SSD, it will appear as a disk drive that can be selected as the boot device.

TABLE 1-2 lists some of the option cards and the keystrokes that access the corresponding BIOS configuration utility.

**TABLE 1-2** BIOS Configuration Utilities

Option Card	Keystroke	Documentation for BIOS Utility
QLogic PCIe ExpressModule	Ctrl-Q	See the documentation that came with your PCIe ExpressModule.
Emulex PCIe ExpressModule	Ctrl-E	See the documentation that came with your PCIe ExpressModule.
Sun Blade RAID 5 Expansion Module	Ctrl-A	<i>The Sun Intel Adaptec BIOS RAID Utility User's Manual.</i>
Sun Blade 0/1 G2 RAID Expansion Module	Ctrl-C	<i>Sun LSI 106x RAID User's Guide.</i>

The following sections provide details for accessing BIOS configuration utilities.

## ▼ To Configure Netboot or Compact Flash Boot in the BIOS

1. **Power on the server module.**
2. **Press F2 to access the BIOS.**
3. **Navigate to the Boot page.**
4. **Select the Boot Device Priority option.**
5. **Select a boot device from the menu.**  
Promote it to the top of the list by pressing + or - until it is at the top of the list.
6. **Save your changes.**

## ▼ To Configure the QLogic Fibre Channel in the BIOS

1. **Power on the server module.**
2. **Use Ctrl-Q to open the QLogic BIOS configuration utility.**
3. **Navigate to the Boot Device page.**  
The page displays a list of all bootable HDDs.
4. **Enable the PCIe ExpressModule as a boot device.**  
See the documentation for your PCIe ExpressModule for details.  
When you boot the system, the BIOS lists drives connected to the PCIe ExpressModule and allow you to select them as the boot drive.
5. **(Optional) Configure volumes and RAID arrays as required.**  
See the documentation for your PCIe ExpressModule for details.
6. **Save your changes.**

## ▼ To Configure the Emulex Fibre Channel PCIe ExpressModule in the BIOS

1. **Power on the server module.**
2. **Use Ctrl-E to open the Emulex BIOS configuration utility.**
3. **Navigate to the Boot Device page.**  
The page displays a list of all bootable HDDs.

**4. Enable the PCIe ExpressModule as a boot device.**

See the documentation for your PCIe ExpressModule for details.

When you boot the system, the BIOS will list drives connected to the PCIe ExpressModule and allow you to select them as the boot drive.

**5. (Optional) Configure volumes and RAID arrays as required.**

See the documentation for your PCIe ExpressModule for details.

**6. Save your changes.**

## ▼ To Load an OS Over the Network (Netboot)

Selecting F12 during POST causes the server module to boot from the network, using a process called netboot.

When the netboot environment is properly configured, and the server module comes up, it broadcasts its IP address to the network, which responds by installing an operating system for it.

See your operating system documentation for information about netbooting.

---

# RAID Configuration

RAID configuration requires an (optional) RAID Expansion Module (REM).



---

**Caution** – If you are going to include your boot drive in a RAID array, you must configure it before installing the operating system. Use one of the BIOS configuration utilities described in [“BIOS and BIOS Configuration Utilities”](#) on page 11.

---

- The Sun Blade RAID 5 Expansion Module, supports RAID levels 0, 1, 1E, 10, 5, or 6 with global or dedicated hot spares.

See [“To Configure the Sun Blade RAID 5 Expansion Module”](#) on page 17.

- The Sun Blade RAID 0/1 G2 Expansion Module supports RAID 1 (two mirrored disks with an optional hot spare) or RAID 1E (three or more mirrored disks with one or two hot spares).
  - See [“To Configure the Sun Blade 0/1 RAID Expansion Module”](#) on page 17 to use the BIOS configuration utility.
  - See the *Sun LSI 106x RAID User’s Guide* for additional details, and for instructions to configure RAID after the operating system is installed.

## ▼ To Configure the Sun Blade RAID 5 Expansion Module

1. Power on the server module.
2. Use Ctrl-A to open the configuration utility.
3. Use the utility to create a volume for each disk or each RAID that you want the server's BIOS (and OS if installed) to see.

The BIOS utility can create up to 20 volumes. Each volume can contain a single disk or a RAID (RAID levels 0, 1, 1E, 10, 5, or 6) with global or dedicated hot spares.

Each volume created by the BIOS Utility will be seen by the server's BIOS as a single disk drive.

For additional information, see: the *Sun Intel Adaptec RAID User's Guide*.

## ▼ To Configure the Sun Blade 0/1 RAID Expansion Module

1. Power on the server module.
2. Use Ctrl-C to open the configuration utility.
3. Follow the on-screen instructions to create a mirrored RAID.

You can choose between RAID 1 (two mirrored disks with an optional hot spare) or RAID 1E (three or more mirrored disks with one or two hot spares).

4. Exit the LSI RAID configuration utility.
5. You can install your OS on this RAID volume.

See the *Sun LSI 106x RAID User's Guide* for additional configuration information.

---

# Installing an Operating System

After you have installed your server, you can install an operating system and drivers. Your server module supports the Solaris, Linux, VMware, or Windows operating systems.

- For details about installing a supported VMware, Linux, or Solaris operating system, refer to the *Sun Blade X6450 Server Module Operating System Installation Guide* (820-3536).

- For details about installing a supported Windows operating system, refer to the *Sun Blade X6450 Server Module Windows Operating System Installation Guide* (820-3537).
- For additional OS considerations specific to your server module, also refer to the *Sun Blade X6450 Server Module Product Notes* (820-3538).

---

## Directing Console Output

The server module always sends console I/O to the VGA port.

By default, it sends service processor I/O to the serial port.

The External Serial Port control in the BIOS allows you to modify the behavior of the serial port connection.

- If you set it to BMC (the default), the server module sends ILOM output to the serial port.
- If you set it to System, the server module sends console output to the serial port.

These settings only affect the connections on the dongle cable.

---

**Note** – You can also view console output using the service processor, as described in [“Accessing the System Console”](#) on page 29.

---

# Installing and Configuring the Server Module

---

This chapter provides instructions for installing and configuring the server module. It contains the following sections:

- “Inserting the Server Module” on page 19
- “Accessing and Configuring the ILOM Service Processor” on page 22
- “Accessing the System Console” on page 29
- “Dongle Cable Connections” on page 33

---

## Inserting the Server Module



---

**Caution** – Before handling components, attach an electrostatic discharge (ESD) wrist strap to bare metal on the chassis. Both the front and back of the chassis have grounded locations. The system’s printed circuit boards contain components that are extremely sensitive to static electricity.

---

### ▼ To Insert the Server Module

1. **Locate the desired slot in the chassis.**
2. **Remove the filler panel.**  
Pull the lever out and eject the filler panel.  
Do not discard the filler panel.



---

**Caution** – Do not operate the system with empty slots. Always insert a filler panel into an empty slot to reduce the possibility of module shutdown.

---

**3. Position the server module vertically so that the ejectors are on the right.**

The following illustrations show the server module being inserted into the Sun Blade 6000 modular system; your chassis might differ. See box 1 in [FIGURE 2-1](#) [1].

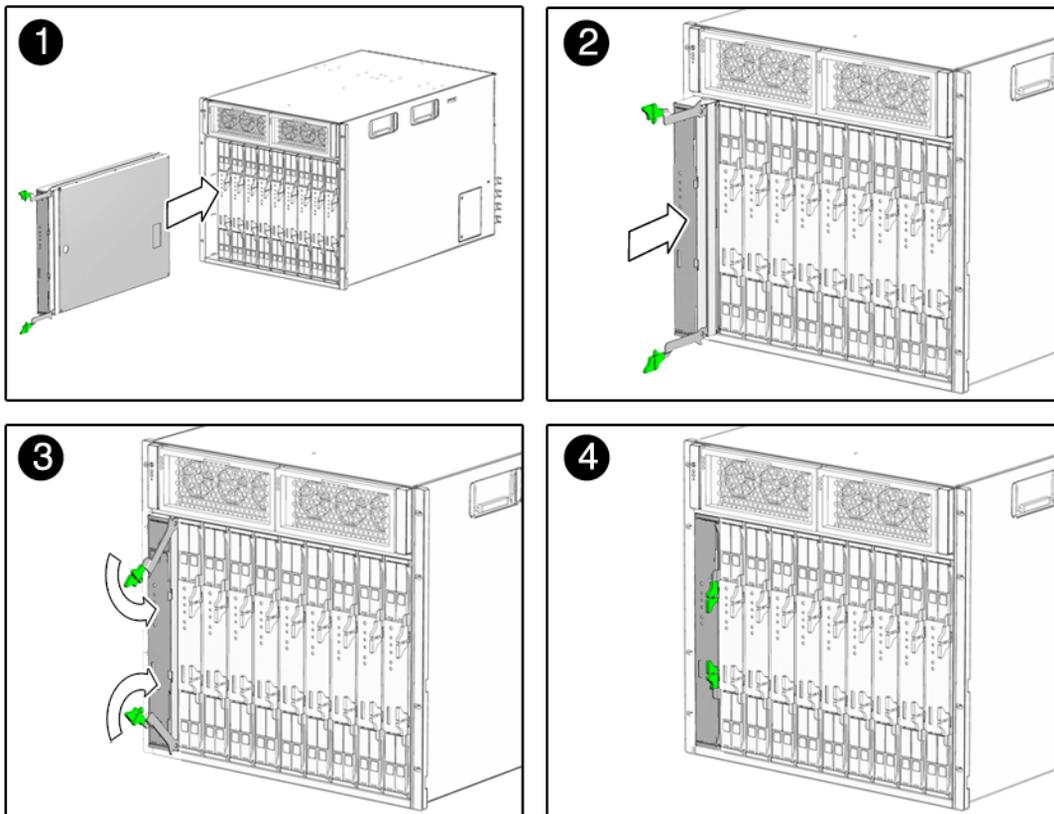


---

**Caution** – The server module is heavy. Use two hands to insert it into, or remove it from, the chassis. If you remove a server module from the chassis, be prepared to support the weight when it clears the chassis.

---

**FIGURE 2-1** Inserting the Server Module Into the Chassis



**4. Push the server module into the slot until the server module stops.**

See [FIGURE 2-1](#) [2].

## 5. Rotate the ejectors down until they snap into place.

The server module is now flush with the chassis, and the ejectors are locked. See boxes 3 and 4 in [FIGURE 2-1](#) [3,4].

If the chassis is powered on, the server module comes up to standby power. The green OK LED on the front panel flashes. With ILOM 2.0, the blue OK to Remove LED remains on. See [FIGURE 1-1](#).

## LED Behavior

When the server module is inserted in the chassis, the LEDs blink in a specific sequence.

### *LED Behavior for ELOM and ILOM 2.0*

When you apply power to the server module, the blue, amber, and green status LEDs blink three times, at one second intervals (.5 sec On, .5 sec Off).

The green LED blinks at one-second intervals until the SP starts IPMI services.

When the IPMI services are running:

- If the system main power is on, the green LED stays On and the blue OK to Remove LED stays Off.
- If the system is in standby power mode, the green LED blinks and the blue OK to Remove LED stays On.

### *LED Behavior For ILOM 3.0*

When you apply power to the server module, the blue, amber, green status, and white Locate LEDs blink three times, at one second intervals (.5 sec On, .5 sec Off).

After the three blinks, the green LED goes to fast blink while the ILOM performs power calculations (.125 sec On, .125 sec Off).

When the system is ready to turn on, the green LED stays ON for 3 seconds. You can now press the Power button to power on the host.

Until you press the power button, the green LED switches to standby blink (.1 sec On, 2.9 sec Off).

After you press the power button, the green LED slow blinks while the host powers up and BIOS runs (.5 sec On, .5 sec Off).

When the OS starts to boot, the green LED stays On.

If the ILOM has calculated that the server module is exceeding its power budget, the green LED stays Off instead.

---

## Accessing and Configuring the ILOM Service Processor

The server module includes a service processor (SP) integrated into the motherboard.

This section provides instructions for:

- Displaying the SP's IP address. See [“To Display the Service Processor's IP Address”](#) on page 24.
- Accessing the SP. See [“To Connect to the ILOM Web Interface”](#) on page 25 and [“To Connect to the ILOM CLI”](#) on page 27.
- Configuring the SP's network settings. See [“To Configure the Service Processor's Network Configuration:”](#) on page 28.

## Service Processor Overview

The SP's built-in system management software enables you to monitor and manage the components installed in your chassis and server modules. Using the SP, you can configure network information, view and edit hardware configurations, monitor vital system information, and manage user accounts.

The chassis has its own service processor, called a Chassis Monitoring Module Integrated Lights Out Manager (CMM ILOM). In addition to providing chassis management functions, it provides an Ethernet connection to the server module's SP. This allows you to view and configure the server module's network information using the CMM ILOM.

The following sections assume that:

- The chassis is powered up
- The CMM ILOM is connected to the network and is working correctly
- The installer has Ethernet access to the same subnet as the CMM ILOM

If these conditions are not present, see the documentation for your service processor, as listed in [“Service Processor Versions”](#) on page 23.

# Service Processor Versions

Your server module might be equipped with one of several versions of the SP:

- ILOM 3.0 – This is the newest version of the service processor software. It is described in this section.

For additional documentation, see the ILOM 3.0 documentation collection.

- ILOM 2.0 – This version of the service processor software is also described in this section.

For additional documentation, see the ILOM 2.0 documentation collection.

- ELOM – Older systems might be equipped with an ELOM.

For additional documentation, see the ELOM documentation collection.

While there are fundamental differences between ILOM 2.0 and ILOM 3.0, they do not affect the procedures in this section; all of these procedures can be used for both. Any minor differences are noted where they occur.

The ILOM provides both a command line interface (CLI), and a web interface. This section provides procedures for using both of these interfaces.

## Upgrading or Migrating the Service Processor

You can migrate your SP from ELOM to ILOM 2.0, and you can upgrade ILOM 2.0 to ILOM 3.0.

### ELOM to ILOM 2.0

- See the *ELOM-to-ILOM Migration User's Guide*.

### ELOM to ILOM 3.0

- Migrate to ILOM 2.0 as described in the *ELOM-to-ILOM Migration User's Guide*.
- Upgrade to ILOM 3.0 as described in the *Sun Integrated Lights Out Manager 3.0 Supplement for Sun Blade X6450 Server Module*.



---

**Caution** – When you migrate from ELOM to ILOM 2.0, use SW2.0.3 or newer. Do not migrate from ELOM to a version of ILOM from an earlier software release.

---

## Displaying the Service Processor's IP Address

Use the following procedure to display the ILOM's network configuration, including the IP address of the ILOM SP, using the CMM ILOM.

This procedure also verifies that the ILOM is working correctly and that you can access it through the CMM ILOM.

## ▼ To Display the Service Processor's IP Address

---

**Note** – This procedure can be used for ELOM as well as ILOM 2.0 and ILOM 3.0.

---

1. Log in to the CMM ILOM CLI.

2. Type the command:

```
show /CH/BLn/SP/network
```

where *n* is the server module number or chassis slot ID.

The CMM ILOM displays information about the server module, including its IP address and MAC address. For example:

```
-> show /CH/BL0/SP/network
/CH/BL0/SP/network
Targets:
Properties:
  type = Network Configuration
  commitpending = (Cannot show property)
  ipaddress = IPaddress
  ipdiscovery = dhcp
  ipgateway = IPgateway
  ipnetmask = 255.255.252.0
  macaddress = Macaddress
  pendingipaddress = IPaddress
  pendingipdiscovery = dhcp
  pendingipgateway = IPgateway
  pendingipnetmask = 255.255.252.0
Commands:
  cd
  set
  show
->
```

## Connecting to the ILOM

This section describes how to connect to the ILOM's CLI and web interface.

## ▼ To Connect to the ILOM Web Interface

---

**Note** – To improve response times, disable the browser proxy server (if used).

---

If you do not know the ILOM's IP address, find it as described in [“Displaying the Service Processor's IP Address” on page 24](#) .

Follow these steps to log in to the ILOM web interface:

1. **To log in to the web interface, type the ILOM's IP address into your web browser.**

The web interface Login page appears.

---

**Note** – [FIGURE 2-2](#) and [FIGURE 2-3](#) show the Login page and Version page for ILOM 3.0. For ILOM 2.0, the procedures are the same but the pages might look slightly different.

---

**FIGURE 2-2** Login Page for ILOM 3.0



## 2. Type your user name and password.

The default user is **root**, and the default password is **changeme**, all in lowercase characters.

---

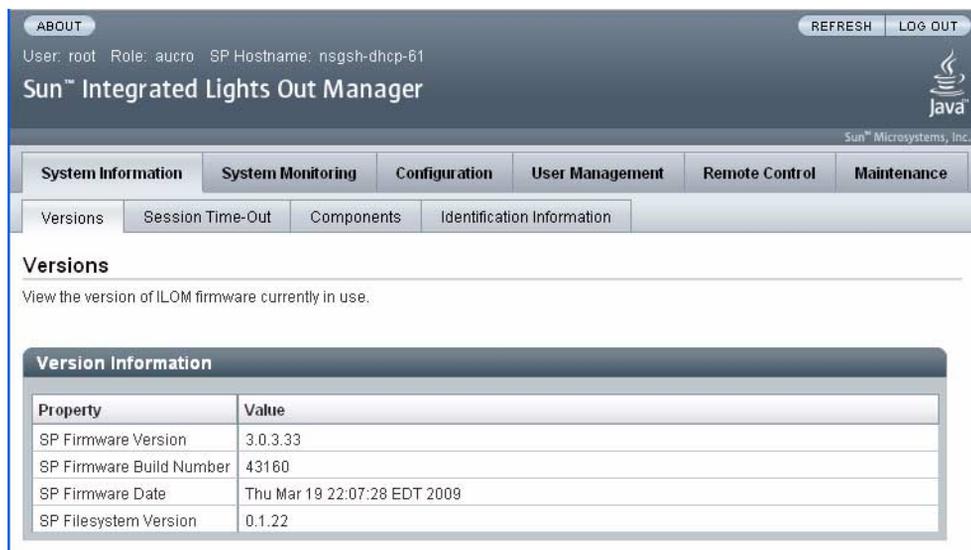
**Note** – After you log in to the SP using the default user name and password, you should change the the root account password (changeme). See the corresponding SP documentation collection for details.

---

## 3. Click Log In.

The web interface Versions page appears.

**FIGURE 2-3** Versions Page for ILOM 3.0



The screenshot shows the Sun Integrated Lights Out Manager (ILOM) web interface. At the top, there is a navigation bar with 'ABOUT', 'REFRESH', and 'LOG OUT' buttons. Below this, the user information is displayed: 'User: root Role: aacro SP Hostname: nsgsh-dhcp-61'. The main title is 'Sun™ Integrated Lights Out Manager' with the Sun logo and 'Java' branding. A secondary navigation bar contains tabs for 'System Information', 'System Monitoring', 'Configuration', 'User Management', 'Remote Control', and 'Maintenance'. Underneath, a sub-navigation bar has 'Versions', 'Session Time-Out', 'Components', and 'Identification Information' tabs. The 'Versions' tab is active, showing the heading 'Versions' and the instruction 'View the version of ILOM firmware currently in use.'. Below this is a 'Version Information' table with the following data:

Property	Value
SP Firmware Version	3.0.3.33
SP Firmware Build Number	43160
SP Firmware Date	Thu Mar 19 22:07:28 EDT 2009
SP Filesystem Version	0.1.22

## ▼ To Connect to the ILOM CLI

You can access the ILOM CLI remotely through a Secure Shell (SSH) or serial connection. Secure Shell connections are enabled by default.

If you do not know the ILOM's IP address, find it as described in [“Displaying the Service Processor's IP Address” on page 24](#).

The following procedure shows an example using an SSH client on a UNIX system. Use an appropriate SSH client for your operating system. The default user name is root and default password is changeme.

Follow these steps to log in to ILOM using the default enabled SSH connection:

**1. To log on to the ILOM, type:**

```
$ ssh root@ipaddress
```

where *ipaddress* is the ILOM's IP address.

**2. Type the password when prompted. The default is `changeme`:**

```
Password: changeme
```

---

**Note** – After you log in to ILOM using the default user name and password, you should change the the ILOM root account password (`changeme`). See the *Sun Integrated Lights Out Manager 2.0 User's Guide* or the ILOM 3.0 documentation collection for details.

---

**3. To log out, type:**

```
-> exit
```

## Configuring the Service Processor's Network Settings (Optional)

The CMM ILOM allows you to change the server module network information, including the IP address, and DHCP settings.

### ▼ To Configure the Service Processor's Network Configuration:

**1. Log in to the CMM ILOM.**

See the ILOM documentation for your chassis for details.

**2. Navigate to `/CH/BLn/SP/network`.**

Where *n* is 0 through 9 for server modules 0 through 9 respectively.

---

**Note** – You can also change these settings using the ILOM 2.0 or ILOM 3.0 instead of the CMM ILOM. Navigate to `/SP/network` instead of `/CH/BLn/SP/network`. Once there, the commands are identical.

---

**3. Type the following commands:**

- To specify a static Ethernet configuration, type:

```
set pendingipaddress=xxx.xxx.xx.xx
set pendingipnetmask=yyy.yyy.yyy.y
set pendingipgateway=zzz.zzz.zz.zzz
set pendingipdiscovery=static
set commitpending=true
```

where *xxx.xxx.xx.xx*, *yyy.yyy.yyy.y* and *zzz.zzz.zz.zzz* are the IP address, netmask, and gateway for your SP and network configuration.

- To specify a dynamic Ethernet configuration, type:

```
set pendingipdiscovery=dhcp
set commitpending=true
```

---

**Note** – Typing `set commitpending=true` commits your changes.

---

## Accessing the System Console

This section describes how to connect to the system console.

Choose one of the following ways to access the system console:

- Directly, using the dongle
- Using the ILOM CLI
- Using the ILOM web interface and an RKVM session

After you can view the system console, refer to the documentation for your operating system. See the *Sun Blade X6450 Server Module Operating System Installation Guide*, or the *Sun Blade X6450 Server Module Windows Operating System Installation Guide*.

### ▼ To Access the System Console Directly

1. **Connect a keyboard, monitor, and mouse to the dongle cable on the server module front panel.** See [“Dongle Cable Connections”](#) on page 33.
2. **To power the server on or off, use a stylus as described in** [“Routine Power On and Power Off”](#) on page 3.

## ▼ To Access the System Console Using the ILOM CLI

1. Connect and log in to the ILOM as described in [“Connecting to the ILOM” on page 25](#).

The ILOM prompt appears.

2. To power on the system, type the command:

```
-> start /SYS
```

---

**Note** – You can also power the system on or off using a stylus, as described in [“Routine Power On and Power Off” on page 3](#).

---

3. To start the system console, type:

```
-> start /SP/console
```

4. To exit the system console, press Esc-Shift-9.

5. To stop the system, type:

```
-> stop /SYS
```

## ▼ To Access the System Console Using the ILOM Web Interface

---

**Note** – This procedure shows screens from ILOM 2.0. In ILOM 3.0, the procedures work the same, but the screens might have slight differences.

---

1. Log on to the web interface as described in [“To Connect to the ILOM Web Interface” on page 25](#).

The Versions screen appears.

**FIGURE 2-4** ILOM 2.0 Versions Screen



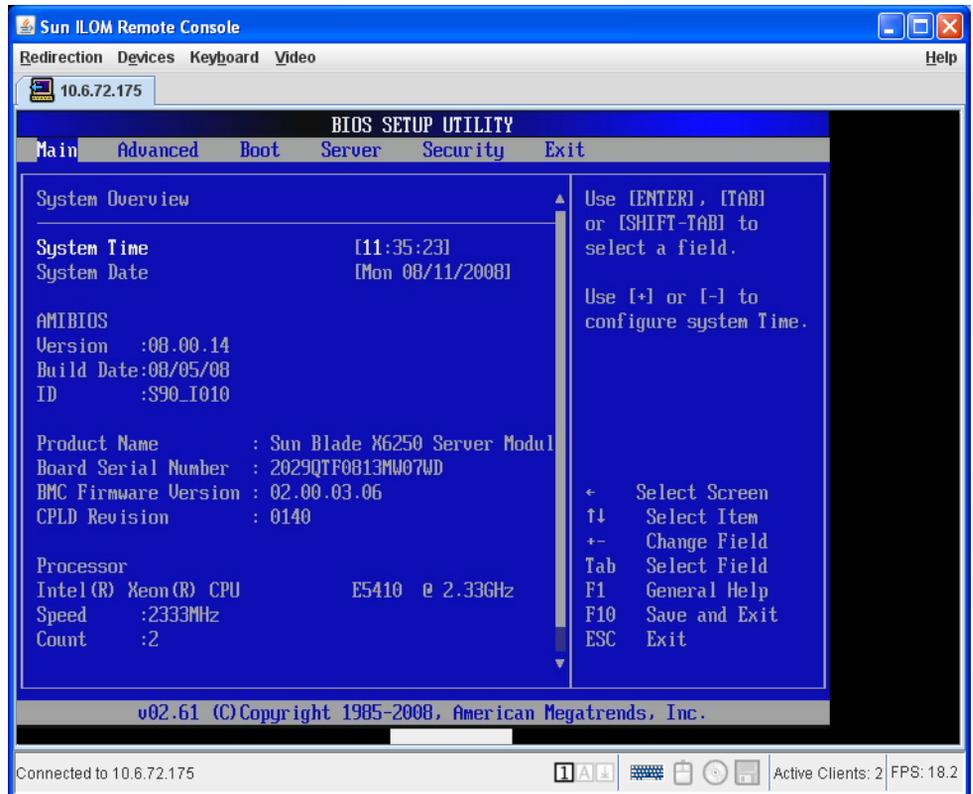
2. Click on the **Remote Control** tab.  
The Remote Control screen appears.

**FIGURE 2-5** ILOM 2.0 Remote Control Screen



3. Click the **Launch Redirection** tab.  
After some messages, the console appears.
  - The contents of the redirection screen depends on the state of the server module. [FIGURE 2-6](#) shows the console with an open BIOS session.
  - If a login prompt appears, you can log in to the console.

**FIGURE 2-6** Redirection Screen Displaying BIOS Session



For more details see:

- For ILOM 2.0 – *The Sun Integrated Lights Out Manager 3.0 User's Guide*
- For ILOM 3.0 – *The Sun Integrated Lights Out Manager (ILOM) 3.0 Web Interface Procedures Guide*

# Dongle Cable Connections

The dongle cable, which is shipped with your chassis, allows you to connect directly to the front of your server module, as shown in [FIGURE 2-7](#).

---

**Note** – The dongle cable has either three or four connectors. [FIGURE 2-7](#) shows a dongle with four connectors. The three-connector dongle does not have the DB9 serial console connector (1).

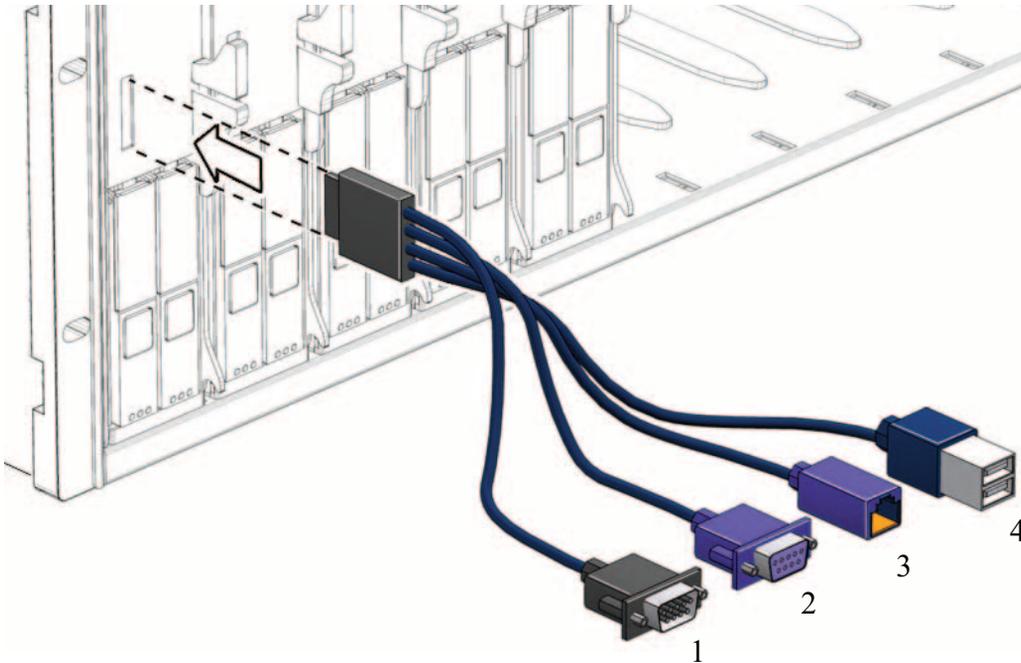
---

To connect to the system console:

- Connect a keyboard and mouse to the USB connector.
- Connect a monitor to the VGA connector.

The dongle cable is designed for occasional service use. For routine operation, use the ILOM.

**FIGURE 2-7** Dongle Cable Connections



**TABLE 2-1** Dongle Cable Connectors

---

- 1 DB9 serial console to server module service processor.  
Note: this connector is not present on a three-connector dongle.
  - 2 VGA video connector.
  - 3 RJ-45 connector.
    - On a three-connector dongle, this connector provides serial access to the service processor.
    - On a four-connector dongle, this connector is unused.
  - 4 Dual USB connectors.
- 



---

**Caution** – To avoid physical damage to the dongle cable and the connector, disconnect the dongle when it is not being used.

---



# Installation Worksheet

---

Use the worksheet in [TABLE A-1](#) to gather the information that you need to configure the Solaris OS. You need to collect only the information that applies to your application of the system.

**TABLE A-1** Installation Worksheet

Information for Installation		Description or Example	Your Answers: Defaults (*)
Language		Choose from the list of available languages.	English*
Locale		Choose your geographic region from the list of available locales.	
Terminal		Choose the type of terminal that you are using from the list of available terminal types.	
Network connection		Is the system connected to a network?	<ul style="list-style-type: none"> <li>• Networked</li> <li>• Non-networked*</li> </ul>
DHCP		Can the system use Dynamic Host Configuration Protocol (DHCP) to configure its network interfaces?	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No*</li> </ul>
If you are not using DHCP, note the network address:	IP address	If you are not using DHCP, supply the IP address for the system. Example: 129.200.9.1	
	Subnet	If you are not using DHCP, is the system part of a subnet? If yes, what is the netmask of the subnet? Example: 255.255.0.0	255.255.0.0*
	IPv6	Do you want to enable IPv6 on this machine?	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No*</li> </ul>
Host name		A host name that you choose for the system.	
Kerberos		Do you want to configure Kerberos security on this machine? If yes, gather this information:	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No*</li> </ul>
		Default Realm:	
		Administration Server:	
		First KDC:	
		(Optional) Additional KDCs:	

**TABLE A-1** Installation Worksheet (*Continued*)

Information for Installation	Description or Example	Your Answers: Defaults (*)
Name service	Name service	If applicable, which name service should this system use?
		<ul style="list-style-type: none"> <li>• NIS+</li> <li>• NIS</li> <li>• DNS</li> <li>• LDAP</li> <li>• None*</li> </ul>
	Domain name	Provide the name of the domain in which the system resides.
	NIS+ and NIS	Do you want to specify a name server, or let the installation program find one?
		<ul style="list-style-type: none"> <li>• Specify One</li> <li>• Find One*</li> </ul>
	DNS	Provide IP addresses for the DNS server. You must enter at least one IP address, but you can enter up to three addresses.
		You can also enter a list of domains to search when a DNS query is made.
		Search Domain:
		Search Domain:
		Search Domain:
	LDAP	Provide the following information about your LDAP profile:
		Profile name:
		Profile server:
		If you specify a proxy credential level in your LDAP profile, gather the following information:
		Proxy-Bind Distinguished Name:
		Proxy-Bind Password:

**TABLE A-1** Installation Worksheet (*Continued*)

Information for Installation	Description or Example	Your Answers: Defaults (*)
Default route	<p>Do you want to specify a default route IP address, or let the installation program find one?</p> <p>The default route provides a bridge that forwards traffic between two physical networks. An IP address is a unique number that identifies each host on a network.</p> <p>You have the following choices:</p> <ul style="list-style-type: none"><li>• You can specify the IP address. An <code>/etc/defaultrouter</code> file is created with the specified IP address. When the system is rebooted, the specified IP address becomes the default route.</li><li>• You can let the installation program detect an IP address. However, the system must be on a subnet that has a router that advertises itself by using the Internet Control Message Protocol (ICMP) router discovery protocol. If you are using the command-line interface, the software detects an IP address when the system is booted.</li><li>• You can choose None if you do not have a router or do not want the software to detect an IP address at this time. The software automatically tries to detect an IP address on reboot.</li></ul>	<ul style="list-style-type: none"><li>• Specify One</li><li>• Detect One</li><li>• None*</li></ul>
Time zone	How do you want to specify your default time zone?	<ul style="list-style-type: none"><li>• Geographic region*</li><li>• Offset from GMT</li><li>• Time zone file</li></ul>
Root password	Choose a root password for the system.	

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