

# Sun Linux 5.0

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*User Guide*

**Sun Cobalt™**

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# Important Safeguards

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For your protection, please read all these instructions regarding your Sun Cobalt™ LX50 server and retain for future reference.

## 1. Safety Precautions

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Never push objects of any kind through openings in the equipment. Dangerous voltages may be present. Conductive foreign objects could produce a short circuit that could cause fire, electric shock or damage to your equipment.

## 2. Symbols

The following symbols may appear in this book:



**Caution:** There is a risk of personal injury and equipment damage. Follow the instructions.



**Warning:** Hazardous voltages are present. To reduce the risk of electric shock and danger to personal health, follow the instructions.

## 3. Power Source and Power Cords

Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.



**Warning:** Sun™ products are designed to work with single-phase power systems having a grounded neutral conductor. To reduce the risk of electric shock, do not plug Sun products into any other type of power system. Contact your facilities manager or a qualified electrician if you are not sure what type of power is supplied to your building.



**Warning:** Not all power cords have the same current ratings. Household extension cords do not have overload protection and are not meant for use with computer systems. Do not use household extension with your Sun products.



**Warning:** Your Sun product is shipped with a grounding type (three-wire) power cord. To reduce the risk of electric shock, always plug the cord into a grounded power outlet.



**Warning:** The power switch of this product functions as a standby type device only. The power cord serves as the primary disconnect device for the system. Be sure to plug the power cord into a grounded power outlet that is nearby the system and is readily accessible. Do not connect the power cord when the power supply has been removed from the system chassis.

## 4. Lithium Battery

The lithium battery on the system board provides power for the real-time clock and CMOS RAM. The battery has an estimated useful life expectancy of 5 to 10 years. If your system no longer keeps accurate time and date settings, it may be time to change the battery. Contact Sun Microsystems™, Inc. for service information.



**Warning:** Batteries may explode if mishandled or incorrectly replaced. Do not dispose of the battery in fire. Do not disassemble it or attempt to recharge it. Replace only with the same or equivalent type recommended by the equipment manufacturer. Dispose of used batteries according to manufacturer's instructions.

## 5. Electrical Shock

To reduce the risk of electrical shock, do not disassemble or tamper with the power supply assembly. Opening or removing the power supply may expose you to dangerous voltage or other risks. Incorrect reassembly can cause electric shock when this product is subsequently used.

## 6. Top Cover

You must remove the cover of your Sun server appliance to add cards, memory or internal storage devices. Be sure to replace the top cover before powering on your generic noun for Product.



**Caution:** Do not operate Sun products without the top cover in place. Failure to take this precaution may result in personal injury and system damage.

## 7. Modifications to equipment

Do not make mechanical or electrical modifications to the equipment. Sun Microsystems, Inc. is not responsible for regulatory compliance of a modified Sun product.

## 8. Ventilation

The fan openings on the Sun Cobalt LX50 server are provided for ventilation and reliable operation of the product, and to protect it from overheating. The openings must not be blocked or covered, and should be kept free of dust and debris. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your product

The Sun Cobalt LX50 server is designed to be a built-in installation, so adequate ventilation is required.

## 9. Placement of a Sun Product



**Caution:** Do not block or cover the openings of your Sun product. Never place a Sun product near a radiator or heat register. Failure to follow these guidelines can cause overheating and affect the reliability of your Sun product.



**Caution:** The workplace-dependent noise level defined in DIN 45 635 Part 1000 must be 70Db(A) or less.

## 10. SELV Compliance

Safety status of I/O connections comply to SELV requirements.

## 11. Regulations and Information

### FCC Class A Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

**Shielded Cables:** Connections between the workstation and peripherals must be made using shielded cables in order to maintain compliance with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted pair (UTP) cables.

**Modifications:** Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.



# Contents

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<b>Important Safeguards</b>	<b>iii</b>
<b>Figures</b>	<b>xi</b>
<b>Tables</b>	<b>xiii</b>
<b>Preface</b>	<b>xv</b>
<b>1 Introduction</b>	<b>1–1</b>
Differences With Other Linux™ Distributions .....	1–1
Required Equipment for Sun Linux Restoration .....	1–1
Conventions Used in this Document .....	1–2
Navigating Through the Setup Screens .....	1–2
Support and Reference Documentation .....	1–2
<b>2 Hardware and Connectors</b>	<b>2–1</b>
Connecting the Cables .....	2–3
Front-Panel Connectors .....	2–3
Front RJ-45 Serial 2 Connector .....	2–3
USB Connectors .....	2–5
Rear Panel Connectors .....	2–5
RJ-45 NIC 1 and NIC 2 Connectors .....	2–5
AC Power Connector .....	2–6
Rear Panel RJ-45 Serial 2 Connector .....	2–6
USB 3 and USB 4 Connectors .....	2–8
PS/2 Keyboard/Mouse Connector .....	2–8
SCSI Connector .....	2–8
Video Connector .....	2–9
Powering Up the Server for the First Time .....	2–9
Adding New Hardware .....	2–10
Adding a SCSI HDD .....	2–10
Adding a NIC Card .....	2–11
Configuring The Network with Kudzu .....	2–12

<b>3 Software Setup</b>	<b>3-1</b>
Initial Software Setup .....	3-1
LILO .....	3-1
Device Setup .....	3-1
Logging in and Creating a Password .....	3-2
Reconfiguring the Console .....	3-2
System Settings .....	3-3
Date/Time .....	3-3
System Services .....	3-3
Server Configuration .....	3-3
DNS Configuration .....	3-3
Apache Configuration .....	3-3
Firewall Configuration .....	3-3
X Configuration .....	3-4
Starting X .....	3-4
Setting Up Your X Windows Configuration .....	3-4
Configure Default Services .....	3-5
Sun™ Linux 5.0 Applications .....	3-6
Setting Up Sun Linux 5.0 Applications .....	3-6
Sun ONE Active Server Pages .....	3-7
Installing Sun ONE Active Server Pages .....	3-8
Important Notes About Linux Installations .....	3-13
Upgrading an Existing Installation .....	3-14
Uninstalling .....	3-15
Getting Started with Sun ONE Active Server Pages .....	3-16
Documentation .....	3-17
Sample ASP Applications .....	3-18
The 10-Step Tour .....	3-19
Diagnostics .....	3-19
Customer Support .....	3-20
Sun Grid Engine .....	3-20
Installation .....	3-20
Sun™ Streaming Server .....	3-21
Installing the RPM Package File .....	3-22
Starting Sun Streaming Server and Basic Server Operations .....	3-23
Administration of the Sun Streaming Server .....	3-23
Sun Streaming Server Error and Event Logs .....	3-29
Sun Streaming Server GUI Software .....	3-31
Access and Error Logs .....	3-32
JDK™/Tomcat .....	3-33
Installing the Java Developer Kit (JDK™) and Tomcat Java Server .....	3-33
Tomcat Server Documentation .....	3-35

Restoring Sun Linux From CD-ROM .....	3-36
Restore (Standard) .....	3-38
Restore (Custom) .....	3-40
Automatic Partitioning .....	3-41
New Partition Setup .....	3-43
Edit .....	3-45
Delete .....	3-45
Reset .....	3-45
Make RAID .....	3-45
Manually Partitioning (With Disk Druid) .....	3-46
Partitioning Using Fdisk .....	3-46
Linux Rescue Without Restore .....	3-47
Using a Remote Console (Monitor) Through a Serial Connection .....	3-48
Disabling Serial Console Redirection .....	3-49
Administration .....	3-50
Managing, Configuring and Validating Server Operation .....	3-50
Server Configuration and Management .....	3-50
Managing the System Event Log .....	3-51
Managing the Sensor Data Records .....	3-51
Managing the Field Replaceable Units .....	3-52
Managing Platform Events .....	3-52
Configuring Boot Devices .....	3-52
Configuring Security .....	3-53
Setting User Preferences .....	3-53
Server Validation Testing .....	3-53
Troubleshooting .....	3-54
Sun Linux Will Not Install from Local CD-ROM .....	3-54
Serial Console Doesn't Work .....	3-55
System Initialization Sequence Does Not Display on Remote Console (Serial Connected) .....	3-55
startx Does Not Start the X Windows System .....	3-55
Mouse/keyboard Do Not Work .....	3-55
Error Messages .....	3-55
ERROR: 84FF:System Event Log Full .....	3-55
System Reports That it Can't Detect a Modem .....	3-55



# Figures

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Front Panel (bezel removed) .....	2-3
Rear Panel .....	2-5
J6A2 Jumper Block Configured for DSR Signal (pin 7 connected to DSR) .....	2-7
J6A2 Jumper Block Configured for DCD Signal (pin 7 connected to DCD) .....	2-7
J6A2 Jumper Block Configured for DCD Signal (pin 7 connected to DCD) .....	2-8
Nautilus GUI .....	3-4
Tomcat Server Page .....	3-34
Boot Device Selection Menu .....	3-36
Sun Linux Splash Screen .....	3-37
About to Install Screen .....	3-38
Installing Packages Progress Screen .....	3-39
Disk Partitioning Setup Screen .....	3-40
Automatic Partitioning Screen .....	3-41
Partitioning Warning Dialog Box .....	3-42
Disk Setup Screen .....	3-42
New Partition Setup Screen .....	3-43
Partitioning Configuration Error Message .....	3-44
Partition Editing Screen .....	3-45
RAID Configuration Dialog Box .....	3-45
Rescue Installation Screen .....	3-47
Mount Completed Screen .....	3-47
Rescue Mode Error Screen .....	3-48
Service Partition Menu .....	3-51
System Utilities Menu .....	3-51
Multiboot Add-in Window .....	3-52
Security Main Window .....	3-53
Platform Confidence Test Window .....	3-54



# Tables

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Default Settings for the Sun Cobalt LX50 server .....	2-1
RJ-45 Connector Usage .....	2-3
Front RJ-45 Serial 2 Port Adapter Pinout .....	2-4
Back Serial 2 Port Adapter Pinout .....	2-7
Applications Loaded On Drive (some require decompression and setup) .....	3-6
Standards Supported by Sun Streaming Server .....	3-21
Sun Streaming Server Directory and File Locations .....	3-22
ismctl Basic Subcommands .....	3-24
ismctl Server Values Modification Subcommands .....	3-24
ismctl Subcommand Modifiers .....	3-25
Subcommand Modifier Keys .....	3-25
ismctl set Command Syntax .....	3-26
ismctl get Command Syntax .....	3-27
ismctl unset Command Syntax .....	3-28
Connection Log File Fields .....	3-29
Request Log File Fields .....	3-29
Session Log File Fields .....	3-30
Sun Streaming Server GUI Evaluation Software—Directories Created .....	3-31
SSS GUI Administration Functions .....	3-32
New Partition Configuration Selections .....	3-44
Considerations for Serial Console Use .....	3-50



# Preface

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This User Guide is for anyone who may need to install, set up and configure Sun Linux on the Sun Cobalt™ LX50 server, or perform a Linux™ rescue operation.

This guide consists of the following chapters:

**Chapter 1** — “Introduction” includes an overview of the Sun Cobalt LX50 server and of this guide.

**Chapter 2** — “Hardware and Connectors” explains the hardware and connectors on the the Sun Cobalt LX50 server.

**Chapter 3** — “Software Setup” describes the procedures for configuring Sun Linux on the Sun Cobalt LX50 server.

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# Introduction

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This document describes the restore process for Sun™ Linux 5.0 on the Sun Cobalt™ LX50 server, and also provides basic hardware and application setup procedures as a reference. The server comes complete with Sun Linux pre-installed from the factory, but you may want to re-install or re-configure portions, or perform an emergency restore in case of hard drive replacement. The procedures and information in this document will guide you through the re-install/restore process.

The Sun Linux distribution is very similar to conventional, standard Linux™ distributions. The various bundled applications, such as **KDE**, **Gnome**, **Apache**, and others are similar to other popular Linux distributions. The Sun Linux installer automates many functions such as partitioning for an automatic, standard installation, or you can choose to customize it yourself.

Otherwise, general Linux issues are the same as for standard, popular distributions. Linux issues such as access hierarchy are the same.

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## Differences With Other Linux™ Distributions

A fundamental difference between Sun Linux 5.0 and other Linux distributions is that Sun Linux 5.0 is configured to be specific to the Sun Cobalt LX50 server. Accordingly, the setup choices available during the installation process for other distributions are not necessary and are not present for Sun Linux restore. You can go in later and make changes, but the restore process is automatic (unless you decide to set up hard-drive partitions yourself) and default settings are used by the installer.

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## Required Equipment for Sun Linux Restoration

- Sun Cobalt LX50 server
- Sun Cobalt LX50 Server User Guide (for complete hardware information)
- Sun Linux restore CD ROMs
- VGA Monitor
- PS/2-type keyboard (mouse optional. 1:2 adaptor required if keyboard and mouse are used), or USB keyboard (mouse optional).



**Note:** USB support is enabled only after Linux has been loaded. If a keyboard is required prior to the OS and USB drivers being loaded, i.e., to alter BIOS options, then a PS/2 keyboard is required.

- RJ-45 to DB-9 adaptor for serial console connection to the Sun Cobalt LX50 server (optional)

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## Conventions Used in this Document

In this document, several conventions are used to indicate actions or designate item types:

- The use of left and right arrow brackets to indicate a key. For example, <ENTER> for the Enter key.
- Dashes are used to indicate a keyboard sequence, such as <CTRL>-<ALT>-<DELETE>
- File locations are shown using the forward slash, such as `/usr/local/zeus`
- Names of items listed on setup and install screens, either in list boxes or lists, are italicized, as in the *Manually partition with fdisk* item in the Disk Partitioning Setup screen.
- Filenames and application names are bolded, as in **boot.img** and **Apache**. Command line messages are also bolded.

---

## Navigating Through the Setup Screens

The setup screens and dialog boxes of this installation GUI have various combinations of command buttons, list boxes and option lists. You can use the arrow keys on the keyboard to change between items, then press <ENTER> to select, or click on them if you have installed a mouse. This document will assume you have installed a mouse, and will refer to the action as clicking to mean either method.

Many of the setup screens have “Back” and “Next” command buttons located in the lower right corner. Typically you make a selection somewhere on that screen, then click the “Next” button to proceed to the next screen. If you click on the “Back” button, you will return to the previous screen(s).

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## Support and Reference Documentation

Sun Linux is comparable to other standard releases of Linux. You can access a support and documentation data base for Sun Linux and other general Linux resources at the following URLs:

<a href="http://www.cobalt.com/support/">http://www.cobalt.com/support/</a>	Sun Resource Center
<a href="http://www.tldp.org/">http://www.tldp.org/</a>	The Linux Documentation Project website
<a href="http://linuxtoday.com/">http://linuxtoday.com/</a>	The Complete Linux Guide
<a href="http://www.linuxhq.com/">http://www.linuxhq.com/</a>	Linux Headquarters

A Web search will readily bring up many other online sources for Linux FAQs, tips, and help on working with Linux-based applications.

# Hardware and Connectors

This chapter explains the hardware and connectors on the the Sun Cobalt™ LX50 server.

To set up the Sun Cobalt LX50 server, use the following procedure:

- Add any extra hardware, such as NIC cards to the server (refer to the Sun Cobalt LX50 Server User Guide for more information on ports and cabling).
- Install the brackets or slide rails (for your particular rack mount).
- Connect a VGA monitor (back panel).
- Connect a PS/2 keyboard and mouse, or a USB keyboard and mouse.



**Note:** USB support is enabled only after Linux™ has been loaded. If a keyboard is required prior to the OS and USB drivers being loaded, i.e., to alter BIOS options, then a PS/2 keyboard is required.

The PS/2 mouse and keyboard use the back-panel PS/2 connector plus a 1:2 divider dongle. The USB keyboard and mouse plug into the two front-panel USB ports. Front-panel USB support is BIOS-enabled by default.

- Connect a serial cable to the serial (RJ-45) connector on the front panel or to the RJ-45 serial connector on the back panel.
- Connect a network cable to the RJ-45 NIC connector on the back panel.
- Set up X Options.

Table 1 lists the default configuration settings for the Sun Cobalt LX50 server.

**Table 1.** Default Settings for the Sun Cobalt LX50 server

Item	Default Setting
System Time:	Set to time server at factory
System Date:	Set to time server at factory
Floppy A:	1.44 MB
Hard Disk Pre-delay:	Disabled
Primary IDE Master:	CD-ROM (set to PIO Mode 4)
Primary IDE Slave:	Not Installed
<b>Processor settings</b>	
Processor Type:	Intel(R) Pentium(R) III
Processor Post Speed:	Current processor speed (1.20 GHz)
Processor Retest:	Disabled
Processor 1 CPUID:	Current processor

**Table 1.** Default Settings for the Sun Cobalt LX50 server (Continued)

Item	Default Setting
Processor 1 L2 Cache	Current processor
Processor 2 CPUID:	Current processor
Processor 2 L2 Cache:	Current processor
Language:	English
<b>PCI Configuration</b>	
USB Function	Disabled prior to OS loading.
Onboard NIC 1	Enabled
Onboard NIC 2	Enabled
Onboard SCSI	Enabled
Onboard Video	Enabled
PCI SLOT 1B ROM	Enabled
PCI SLOT 1C ROM	Enabled
<b>Peripheral Configuration</b>	
Serial Port1 Address	3F8
Serial Port1 IRQ	4
Serial Port2 Address	2F8
Serial Port2 IRQ	3
Diskette Controller	Enabled
Legacy USB Support	Disabled
Front Panel USB	Enabled
Serial Port1 Address	3F8
Serial Port1 IRQ	3
<b>Memory Configuration</b>	
Extended Memory Test	1 MByte
Bank #1	Reflects either installed or not installed depending on configuration
Bank #2	Reflects either installed or not installed depending on configuration
Bank #3	Reflects either installed or not installed depending on configuration
Memory Retest	Disabled

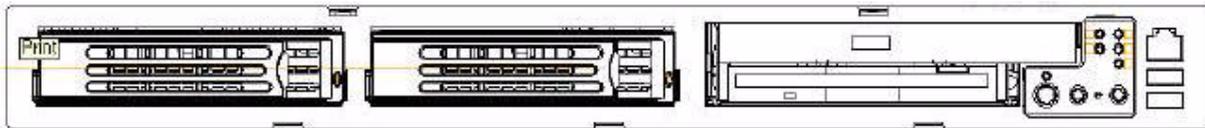
# Connecting the Cables

The Sun Cobalt LX50 server has a number of connectors. Some are on the front panel; others are located on the rear panel. This section summarizes the usage of each connector.

## Front-Panel Connectors

To access the front-panel connectors when a front bezel is installed, grasp the bezel on the right side at the finger hole and gently pull it towards you, unhinging it at the left until it unsnaps from the chassis. Figure 1 shows the front of the server with the bezel removed.

**Figure 1.** Front Panel (bezel removed)



There are three connectors on the front panel:

- Front RJ-45 Serial 2 connector
- USB 1 connector
- USB 2 connector

## Front RJ-45 Serial 2 Connector

The Sun Cobalt LX50 server provides two common external RJ-45 serial ports, one located on the back of the system and the other located on the front panel.

The use of RJ-45 connectors for the serial interface is widely becoming a standard for use in the high-density server market. The intended usage model for the RJ-45 serial connector, on the back of the system, is for use as an interface to a serial port concentrator allowing for remote access to the server's Emergency Management Port (EMP). The serial connector on the front panel can be used as a direct connect to the EMP, allowing for PC-to-PC serial communications to diagnostics on a server mounted in a rack environment.

**Table 2.** RJ-45 Connector Usage

Mode	Front	Back
Modem	No	Yes
Serial Concentrator	No	Yes
PC to PC communication	Yes	Yes

Both serial connectors cannot be used at the same time. Logic on the server baseboard determines which connector is in use.

If the front serial port is in use, the rear panel is automatically disabled. When the front panel serial port connection is removed, the system automatically re-enables the rear serial port.

The front RJ-45 usage model is intended for PC-to-PC serial communication only. It shares common serial signals with the RJ-45 serial port, located on the back of the system. However, it will not support a modem as there is no RI signal. Instead it sets pin #5 to ground, causing logic on the baseboard to disable the rear serial port when a cable or adapter is plugged into it.

For a direct connect or PC-to-PC serial communication, either an 8-pin RJ45-to-DB9 adapter or a cable supporting both DB-9 and RJ-45 connectors will be necessary.

Table 3 provides a pinout for the front RJ45-to-DB9 adapter or cable.

**Table 3.** Front RJ-45 Serial 2 Port Adapter Pinout

Signal Name	RJ-45	DB-9
No connect	N/A	1
SIN	6	2
SOUT	3	3
DTR	2	4
GRND	4	5 <sup>a</sup>
DSR	7	6
RTS	1	7
CTS	8	8
RIN	5	5 <sup>a</sup>
No connect		9

a. The use of a modem on this port cannot be supported due to the lack of an RI signal.



**Note:** Sun Microsystems offers an accessory kit (order number **X5026A**) that you can purchase; the kit contains three RJ45-to-DB9 adapters that can be plugged into the front or rear EMP connectors.

The cables are:

- DSR Peripherals cable (for rear data set ready (DSR) peripherals)
- DCD Modem cable (for rear data carrier detect (DCD) modem)
- Front EMP cable (for front Emergency Management Port)

## USB Connectors

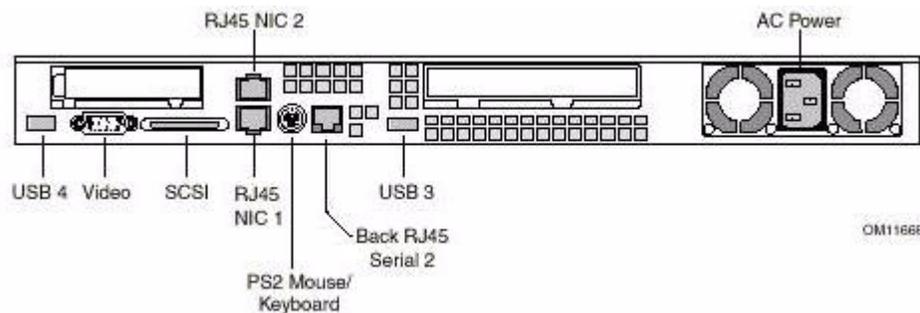
The USB 1 and USB 2 connectors provide USB functionality. All ports function with identical capabilities and with the same bandwidth. The industry-standard USB v1.1 specification defines the external connectors.

## Rear Panel Connectors

There are 9 connectors on the rear panel; see Figure 2.

- RJ-45 NIC 2 connector
- AC Power connector
- USB 3 connector
- Back RJ-45 Serial 2 connector (ttyS1)
- PS2 mouse/keyboard connector
- RJ-45 NIC 1 connector
- SCSI connector (SCSI version only)
- Video connector
- USB 4 connector

**Figure 2.** Rear Panel



## RJ-45 NIC 1 and NIC 2 Connectors

The server supports two 10BASE-T/100BASE-TX Network Interface Controllers (NICs). The NIC interfaces support the following features:

- Glueless 32-bit PCI, CardBus master interface (Direct Drive of Bus), compatible with *PCI local Bus Specification, Revision 2.2*.
- Integrated IEEE 802.3 10BASE-T and 100BASE-TX compatible PHY.
- IEEE 820.3u auto-negotiation support.
- Full-duplex support at both 10 Mbps and 100 Mbps operation.
- Both ports are PXE Boot capable
- Low power +3.3 V device (Wake-On-LAN support on both rear panel Ethernet ports).

The two NICs drive LEDs located on each network interface connector. The amber LED indicates a network connection when on, and transmit/receive activity when blinking. The green LED indicates 100-Mbps operation when lit, and 10-Mbps when off.

## AC Power Connector

This connector is where you plug in the AC power cord.



**Warning:** Do not attempt to modify or use the supplied AC power cord if it is not the exact type required.

The power supply cord is the main disconnect to AC power. The socket outlet must be installed near the equipment and readily accessible.

If the power cord supplied with the system is not compatible with the AC wall outlet in your region, use only one that meets the following criteria:

- The cord must be rated for the available AC voltage and have a current rating that is at least 125% of the current rating of the server.
- The plug on the power cord that plugs into the wall outlet must be a grounding-type male plug designed for use in your region. It must have certification marks showing certification by an agency acceptable in your region.
- The connector that plugs into the AC receptacle on the power supply must be an IEC 320, sheet C13, type female connector.
- In Europe, the cord must be less than 4.5 meters (14.76 feet) long, and it must be flexible <HAR> (harmonized) or VDE-certified cordage to comply with the chassis' safety certifications.

## Rear Panel RJ-45 Serial 2 Connector

The intended use for the RJ-45 serial port, located in the back of the system, is for remote EMP communication by connecting the port to a serial terminal concentrator. With an optional RJ45-to-DB9 adapter, the serial port can also be configured for use with a modem. The rear serial port is traditionally referred to as COM2 (DOS, Windows), or ttyS1 (Linux).

Serial terminal concentrators use one of two serial communication standards. Some terminal concentrators require a Data Carrier Detect (DCD) signal, while others require a DSR signal. The server baseboard can be configured to support either of these configurations by setting the appropriate jumper on the jumper block, located directly behind the RJ-45 serial connector on the baseboard.

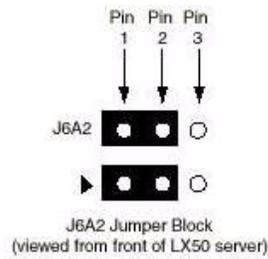
The back RJ-45 Serial 2 port can support any standard serial device. An RJ-45 connector was selected to allow for direct support for serial port concentrators, which typically use RJ-45 connectors and are widely used in the high-density server market to access the server management features of the server.

To give support for either of two serial configuration standards used by serial port concentrators, the J6A2 jumper block, located on the baseboard inside the server directly behind the rear RJ-45 serial port, must be jumpered appropriately according to which standard is desired.

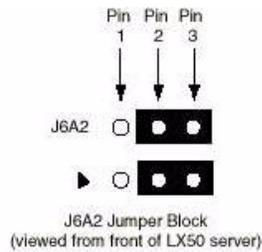


**Note:** By default, as configured in the factory, the server baseboard has the back RJ-45 serial port configured to support a DSR signal which is compatible with the Cisco standard.

For serial devices that require a DSR signal (default), the J6A2 jumper block must be configured as follows: the DSR jumper in position 1 and 2, and the DCD jumper in position 1 and 2. Pin 1, on the jumper, is denoted by an arrow directly next to the jumper block (seeFigure 3).

**Figure 3.** J6A2 Jumper Block Configured for DSR Signal (pin 7 connected to DSR)

For serial devices that require a DCD signal, the J6A2 jumper block must be configured as follows: The DCD jumper in position 2 and 3, and the DSR jumper in position 2 and 3. Pin 1, on the jumper, is denoted by an arrow directly next to the jumper block. The jumper block pinout for this configuration is shown in Figure 4.

**Figure 4.** J6A2 Jumper Block Configured for DCD Signal (pin 7 connected to DCD)

For those serial devices that require a DB-9 type of serial connector, an 8-pin RJ45-to-DB9 adapter must be used.

Table 4 provides the pinout required for the adapter to provide RS232 support.

**Table 4.** Back Serial 2 Port Adapter Pinout

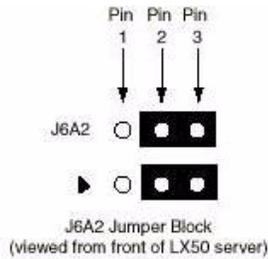
RJ-45	Signal	Abbr.	DB-9
1	Request to Send	RTS	7
2	Data Terminal Ready	DTR	4
3	Transmitted Data	TD	3
4	Signal Ground	SGND	5
5	Ring Indicator	RI	9
6	Received Data	RD	2
7	DCD or DSR	DCD/DSR	1 or 6 <sup>a</sup>
8	Clear To Send	CTS	8

a. The RJ45-to-DB9 adapter used should match both the signal requirements of the serial device and the external RJ-45 serial port. The external RJ-45 serial port provides all standard serial port signals, however having only 8 pins, Pin #7 can be manually configured to support either a DCD or DSR signal by setting the J6A2 jumper block appropriately.

For systems configured with both a front and back RJ-45 serial connectors, the adapters used for the back connector cannot be used with the front connector, as the pinout for both RJ-45 ports are different.

Usage Example: When using an external modem to access the server management features of the server baseboard, you must first set the J6A2 jumper to support a DCD signal and make or choose the appropriate RJ-45-to-DB9 adapter (see Figure 5).

**Figure 5.** J6A2 Jumper Block Configured for DCD Signal (pin 7 connected to DCD)



If you choose to develop your own RJ-45-to-DB9 adapter, see Table 4 for the appropriate pinout configuration.



**Note:**

- Only the back Serial 2 port has modem support
- Sun provides an accessory kit (order number X5026A) that can be purchased that contains all three RJ45-to-DB9 adapters:
  - DSR Peripherals cable (for rear data set ready (DSR) peripherals)
  - DCD Modem cable (for rear data carrier detect (DCD) modem)
  - Front EMP cable (for front Emergency Management Port)

## USB 3 and USB 4 Connectors

The USB 3 and USB 4 connectors provide USB functionality. All ports function with identical capabilities and with the same bandwidth. The industry-standard USB v1.1 specification defines the external connectors.

## PS/2 Keyboard/Mouse Connector

A single PS/2 port located on the back panel is provided to support a standard keyboard or mouse. A PS/2 Y-cable adapter is provided with the system to allow simultaneous use of the PS/2 keyboard and mouse.

## SCSI Connector

The Sun Cobalt LX50 server includes an onboard Adaptec dual channel Ultra-160 SCSI controller (AIC-7899W) capable of controlling up to three internally mounted SCSI drives and 15 external SCSI drives at rates up to 160 MB/s. The onboard SCSI controller is connected to a SCSI backplane board inside the server using a 68-pin SCSI cable. The SCSI backplane provides connections for up to three internally mounted SCA LVDS SCSI drives with standard 80-pin SCA connectors. Channel B is used exclusively by internal drives while channel A is used for

connecting to external SCSI devices by means of a rear panel high-density SCSI connector. The connector supports a standard high-density 68-pin connector. Use only shielded Ultra-160 LVDS rated cables for connection to external SCSI chassis



**Caution:** If for any reason you open the Server enclosure and access the hard drives or the CD/FDD module, never hot swap them. The system must be shut down and powered down before removing or replacing the HDDs or the CD/FDD module.

## Video Connector

The server board provides an ATI Rage XL PCI graphics accelerator, along with 8 MB of video SDRAM and support circuitry for an embedded SVGA video subsystem. The SVGA subsystem supports a variety of modes, up to 1600 x 1200 resolution in 8/16/24/32 bpp modes under 2D, and up to 1024 x 768 resolution in 8/16/24/32 bpp modes under 3D. It also supports both CRT and LCD monitors up to 100 Hz vertical refresh rate. All of these capabilities depend on software support.

The Sun Cobalt LX50 server provides a standard 15-pin VGA connector and supports disabling of the on-board video through the BIOS Setup menu or when a plug-in video card is installed in any of the PCI slots.

---

# Powering Up the Server for the First Time

Before turning your Sun Cobalt LX50 server on for the first time be sure that you have plugged in the following items:

1. Power cable.
2. VGA monitor.
3. Connect a PS/2 keyboard and mouse, or a USB keyboard and mouse. See the beginning of this chapter for details about keyboard and mouse connectivity.
4. An Ethernet cable attached to the RJ-45 Ethernet port [1] located in the back of machine. You may also plug a cable into the RJ-45 Ethernet port [2] at this time if it will be also be used. See Figure 2 on page 2-5 for the locations of these ports and refer to the section “RJ-45 NIC 1 and NIC 2 Connectors” on page 2-5. for more information about these connectors.

## Optional Items

- Serial Cable - Please refer to the sections in this document on setting up the serial console. The serial cable is plugged into the server rear panel next to the PS2 connector.
  - Additional Network cards
5. Turn on the monitor and power on your system. There may approximately a 15 second delay before something appears on the screen. The LILO: prompt (Linux Loader) will display after the system runs through its initial setup (see “LILO” on page 3-1 for more information about the Linux loader). Press <RETURN> on the keyboard to enable the default system, or use the <Tab> key to see other startup options. Pressing <ENTER> will allow the system to begin loading. If you are setting up via serial console, type in "linux-serial" so that the setup options get redirected to the serial console.

The system will run a utility called **kudzu** to set up your ethernet ports and initial network settings. If you don't respond to this utility within about 30 seconds, it will time out and continue loading your system without configuring your network. Should this happen, you can run **kudzu** from the command line after you have logged in and changed your password. Hit <ENTER> to continue at this screen.

---

## Adding New Hardware

### Adding a SCSI HDD

When adding a scsi disk, you must modify the LILO configuration file to change the sda -> sdx renumbering. This is done in boot=/dev/sda section of /etc/lilo.conf.



**Caution:** Once you have modified the LILO configuration file for an additional HDD, do not run LILO until the additional disk has been physically added to the server.

First make a note of how many hard disks are already installed, how many are to be added, and where you wish to add additional drives. SCSI drives can be added in two ways:

1. From the front panel area by removing the combo CD/floppy module.
2. From the rear through the use of a high-density SCSI connector.

If you add a SCSI drive to the rear, you will need to make some changes to your system before installation as Linux will renumber the drives in the front of the unit to follow the drives in the rear:

3. Edit /etc/fstab and change /dev/sda and /dev/sdb (if it exists) to accomodate adding the additional drives. here are some examples:
  - a) existing two drives (sda and sdb) -> added 3 drives. re-label sda to sdd and sdb to sde.
  - b) single drive -> added 1 drive. re-label sda to sdb.
4. Shut down the system and attach the additional storage.
5. Reboot.
6. Once the system starts booting, go to the Adaptec BIOS screen. Select Configure/View Host Adapter Settings, and then Boot Device Options. On this screen, verify that the Boot Channel option says "A" First. "A" is the external SCSI bus adapter which has its connector on the rear. This is the default configuration for the server. If your Adaptec BIOS is set to the factory default settings, you may skip this step.

## Adding a NIC Card

The Sun Cobalt LX50 server supports the following two Ethernet cards:

- Intel Pro/100 dual-10/100BaseT adapter
- Intel Pro/1000XT 10/100/1000BaseT adapter

To ensure proper functionality when installing these adapters, please note the following:

The dual-10/100BaseT adapter will re-order your Ethernet ports so that its ports will logically appear before the on-board Ethernet devices (i.e., eth0 becomes eth2 and eth1 becomes eth3). You will need to move your Ethernet cables to the dual-nic card to restore your network settings.

Kudzu will identify the Intel Gigabit adapter, but it will not configure it properly. The gigabit adapter will be installed as eth2, but kudzu will attempt to configure eth0 instead. To prevent this from happening, do not configure the networking setup of the gigabit adapter from within kudzu. Instead, do the following:

1. Copy `/etc/sysconfig/network-scripts/ifcfg-eth0` to `/etc/sysconfig/network-scripts/ifcfg-eth2`
2. Edit `ifcfg-eth2` and change the `DEVICE` to refer to eth2 instead of eth0.
3. Set up networking parameters to match your desired configuration:
4. `BOOTPROTO=dhcp` sets up the Ethernet device to use DHCP
5. Set up a static IP address by adding the following fields instead:

```
IPADDR=<ip address>
NETMASK=<netmask in the form of 255.255.0.0>
NETWORK=<network in the form of x.y.0.0>
BROADCAST=<broadcast address in the form of x.y.255.255>
BOOTPROTO=static
```

6. Specify `ONBOOT=yes` if you wish the network device to come up on boot.

## Configuring The Network with Kudzu

Hardware configuration files are stored in `/etc/sysconfig/hwconf`

1. The following information will be displayed:

The following network card has been added to your system:

```
Intel Corporation:82557 [Ethernet Pro 100]
```

You can now choose to:

1. Configure the device.
2. Ignore the device. If you chose this, then no configuration will be added, but you will not be prompted if the device is detected on subsequent reboots.
3. Do nothing. In this case, no configuration will be added, and the device will show up as new if it is detected on subsequent reboots. Go ahead and tab to highlight Configure, then press <ENTER> to continue.

You will see a brief message about the system configuring the card. You will then be asked if you would like to set up networking for this adapter. Use the <TAB> key to highlight **Yes** and press <RETURN>. If you are on a network with a DHCP server, you can just press the spacebar to check that box, and the system will fill in the other values for you after querying your DHCP server. You can also setup your static values here if you know what they are. Use the <TAB> key to move from field to field on this screen.

### Example Network Settings

[ ] Use dynamic IP configuration (BOOTP/DHCP)

```
IP address:          192.168.100.100
Netmask:             255.255.255.0
Default gateway (IP): 192.168.100.1
Primary nameserver:  192.168.100.2
```

Use the <TAB> key to highlight **Ok** and press <RETURN> once you have entered the correct values. You will then see that the system has detected a second Ethernet port and will prompt you if you want set this up. Go ahead and set this as described in Sep1 above.

4. The final step is to configure networking for this port as was done in Step 2 above.



**Important:** If you configure this port to DHCP and you reboot the system without an Ethernet cable plugged in, the system will hang temporarily. Skip setting up networking for this port if you will not be using it right now. You can go into the UI and set this up later if necessary.

If you have installed additional network cards you will be asked to configure those too.

The system will now continue loading and eventually display the login prompt.

# Software Setup

---

This chapter describes the procedures for configuring Sun™ Linux on the Sun Cobalt™ LX50 server.

---

## Initial Software Setup

Sun Linux is loaded on the hard drive of the Sun Cobalt LX50 server from the factory. All packages included with your system are available without any additional media loading. However, in some cases, the devices or software packages require some combination of installation or configuration.

The following sections of this manual will guide you through these steps.

The BIOS options of the Sun Cobalt LX50 server are listed at the start of Chapter 1.

### LILLO

LILLO (Linux™ Loader) is configured by default to start automatically. When the server boots, the LILLO boot loader will present you with a prompt that will allow you to select different kernel boot options. When LILLO first executes, it prompts you with:

```
LILLO:
```

This prompt is output to both the display and the serial port console (if used).

Regardless of the kernel selected, both the display and the serial port receive the kernel boot messages. However, initialization scripts and some other output are directed to the primary console only. Once the system is fully initialized, both the serial and display operate as separate login terminals in all configurations.

You may enter the <TAB> key to see a list of choices, or enter one of the choices below.

- **linux.** Boot the default Sun Linux kernel. If no string is entered at the LILLO: prompt, after five seconds this option is selected. This kernel is a full-featured SMP kernel configuration. The primary console is the display and keyboard.
- **linux-serial** This boots the same kernel and configuration, but the serial port is the primary console, and so has all relevant output.
- **linux-up.** This is the same as the 'linux' option, except that a different kernel which does not support SMP is booted. This may be useful if multi-processor hardware, or SMP kernel or driver issues are a concern.
- **linux-up-serial.** The same as linux-up, except with the serial port as the primary console device.

### Device Setup

During the first boot of the Server, or first reboot after an OS Restore operation, some devices will need to be set up. During the initialization scripts, Sun Linux runs the Kudzu program for this operation.

Kudzu will ask about each device, in turn, that is present on the system and is not yet configured.

At a minimum, it will ask about configuring the Ethernet devices. It will present eth0 and then eth1, asking for each:

```
* Would you like to configure this network adapter?
```

If you say yes, it will create a configuration file for the adapter in the `/etc/sysconfig/network-scripts/` directory. For Ethernet adapter 0, it creates `ifcfg-eth0`, and for adapter 1 `ifcfg-eth1`. The contents will be derived from the questions Kudzu asks next:

```
[ ] Use dynamic IP configuration (BOOTP/DHCP)
```

```
IP address: _____
```

```
Netmask: _____
```

```
Default gateway (IP): _____
```

```
Primary nameserver: _____
```

Get the information from your network administrator, type it in, and hit [OK]. This will save the configuration you specify.

## Logging in and Creating a Password

The first time you start up the Sun Cobalt LX50 server, or after a restore of Sun Linux, you will have to log in and then immediately change the password. The initial login is **root**, the initial password is **admin**.

Upon initial login, the following message is displayed:

```
You are required to change your password immediately (root enforced). Changing password for root. (current) UNIX password:
```

Type in **admin** again; at the prompt, type in your new password and enter. If it is accepted, you will be prompted to enter it a second time. You will then be logged in at the root level:

```
[root@localhost root]#
```

## Reconfiguring the Console

A textmode system setup utility can be used for basic setup for the following items by typing “setup” as root from the command line. This is handy since you can be remotely telnetted in to run this or also via serial console, although the features are somewhat limited. The following item can be configured by using this setup utility:

- Authentication configuration
- Firewall configuration
- Keyboard configuration
- Mouse configuration
- Network configuration (first port only so use UI if you need to configure more ports)
- Printer configuration
- System services (sets which services start automatically - on NEXT boot)
- Sound card configuration (no sound card included on system)
- Timezone configuration (use the UI utility if you need more setup)

Lets go into the UI to see where we can setup these things there by typing “startx”. The default desktop environment is the Gnome desktop. A Start Here window should automatically open with all your basic system setup utilities. These utilities are fairly self-explanatory. If you do not see the Start Here window, double-click the Start Here icon on the desktop.

## System Settings

This section describes the system settings that can be configured.

### Date/Time

From the Start Here window click System Settings and then click Date/Time Properties to configure system date and time. Click Apply once you have set all the proper info here. Don't forget to also set up your timezone.

### System Services

From the Start Here window click System Settings and then click Service Configuration to setup the services you wish to start when the system starts. If you make a lot of changes as to what you want to start its easiest to just reboot once you have things setup the way you want.

Some services can be started through the interface by hitting the start button if it highlights when you enable a service. Click save when you are done here.



*Note:* Enabling a service does not automatically start it.

## Server Configuration

This section describes the server configuration settings.

### DNS Configuration

From the Start Here window, click Server Configuration and then click DNS Configure to configure your system's DNS.

### Apache Configuration

From the Start Here window, click Server Configuration and then click Apache Configuration to configure your Apache Web server. Sun Linux 5.0 comes with Apache 1.3.22 installed.

You can also navigate the system via the system menus. Click on the foot icon on the lower left part of the screen to get access the system menus.

### Firewall Configuration

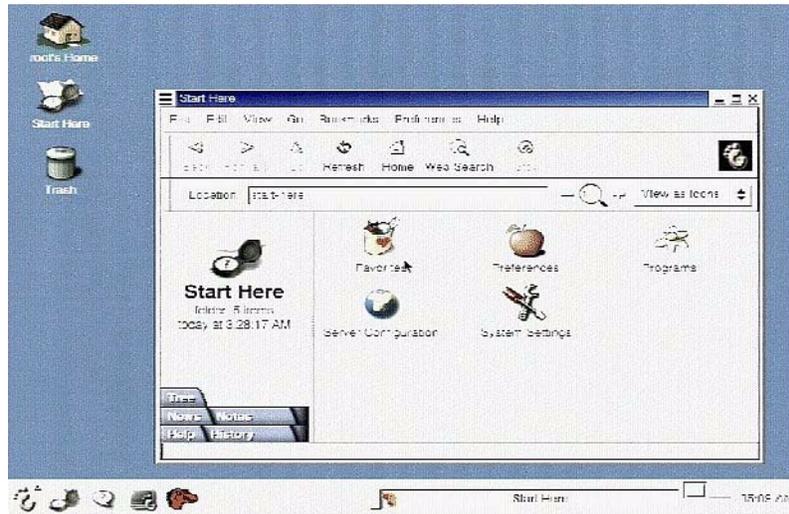
Click Foot->Programs->System->firewall-config to configure your firewall.

## X Configuration

### Starting X

After you have logged in at the root level, type **startx** at the prompt Gnome and the Nautilus GUI will be loaded (Figure 6). Additionally, you can enable X to start by default by either setting up X (see below) or editing the default run level in `/etc/inittab` to be 5.

Figure 6. Nautilus GUI



### Setting Up Your X Windows Configuration

Your system comes pre-configured to run at 800x600 16bpp with a ps/2 mouse. If you wish to modify these settings, you will need to run the setup program. .



**Note:** If you wish to reconfigure your X Windows configuration, you must do it from the command line.

1. From the command line, as root, type “setup” and to display the Text Mode Setup Utility.
2. Select X configuration to begin the video configuration process. The Welcome screen will be displayed. Press <ENTER> to continue once you have carefully read the information.
3. The system will probe for a video card and display the results. Use <TAB> to highlight Ok and press <ENTER> to continue.
4. Select a monitor from the list that matches your monitor, then press <TAB> to highlight Ok and press <ENTER> to continue. If your monitor is not in this list you may need to select Custom and define your monitor's characteristics manually. You will need to refer to your monitor's manual for that information.
5. Select how much memory the video board has from the list. Select 8MB and then use <TAB> to highlight Ok. Press <RETURN> to continue.
6. Select *No Clockchip Setting* (recommended) then press <TAB> to highlight Ok and press <ENTER>.
7. Use the <TAB> and <SPACEBAR> keys to select the video mode(s) you need. Use <TAB> to highlight OK and press <ENTER> once you have finished selecting. The Sun Cobalt LX50 server is capable of 24bpp with a resolution of 1600x1200, although monitor may not be capable of using these settings.

8. A window will now display to inform you that the system will now test your configuration. Press <ENTER> to begin the test or use <TAB> to Skip and then press <RETURN> return if you don't want to run the test. It is strongly recommended that you do run the test.
9. If you can see the Sun Linux image on this screen ,you can click Yes if it look satisfactory. You can click No to go back and make any changes. This screen will also timeout after 10 seconds and let you go back and try new settings. There may also instances when it cannot even get to the video mode, in which case an error message will then be displayed. If this happens, press <ENTER> to go back and try again.
10. You can now choose if you want the system to automatically start in graphic mode when the system boots. Click Yes or No.
11. A message is now displayed telling you that the new configuration has been saved and the location where it was saved to.
12. Click OK and X has now been set up.
13. Use <Tab> to Quit, and press <RETURN> to exit the Text Mode Utility.

## Configure Default Services

The Sun Cobalt LX50 server ships with a few default services enabled that allow the system to function right out of the box. Each of the enabled services is listed below with information concerning general configuration to these services.

### INETD

Inetd is a service that allows for dynamically starting services rather than having them running in a daemon mode. For example, instead of having an ftp server listening on port 21 all the time for connections, inetd (when properly configured) will listen on port 21 and start up the ftp server for the connection. Sun Linux uses a version of inetd called xinetd, which is a more configurable version of inetd. A sample configuration file for the ftp service would look like this:

```
service ftp
{
    socket_type      = stream
    port            = 21
    wait            = no
    user            = root
    server          = /usr/sbin/in.ftpd
    server_args     = -l -a
    disable        = no
}
```

This file should reside in /etc/xinetd.d. When xinetd is started, it will read all the files in that directory and make the appropriate connection available. When you make changes to these files, you must restart xinetd by running '/etc/init.d/xinetd restart'.

### PORTMAP

Portmap is a server that tells Remote Procedure Call (RPC) programs what port number they are listening and what RPC calls the server can process. It must be running in order to make RPC calls. When a client wishes to make an RPC call to a given program number, it will first contact portmap on the server machine to determine the port number where RPC packets should be sent.

Portmap must be started before any RPC servers are invoked

## SSHD

Sshd is the secure shell daemon program that allows for interactive shell sessions over an encrypted channel. Programs like telnet and ftp use clear text to communicate making your sessions susceptible to being snooped by other users allowing them obtain sensitive information. The ssh daemon on the LX50 supports both ssh protocol 1 and 2 for compatibility with most ssh client software.

## SENDMAIL

Sendmail is a mail transfer agent. It sends a message to one or more recipients through the network connection. Sendmail also delivers mail to the users on the local system. Sendmail does not provide services such as pop3 or imap, only the ability transfer mail from one server to another. It can be configured by many different methods, the most popular being m4. The m4 configuration file for sendmail is located in `/usr/share/sendmail-cf/ostype/linux.m4`. By reading `/usr/share/doc/sendmail/README.cf`, you get a good overview of how to configure sendmail via m4.



**Note:** Sendmail is set up by default to allow local access only. You will need to reconfigure it to remove this restriction if you wish to use your system as a mail server.

## Sun™ Linux 5.0 Applications

In addition to the Linux OS and its associated applications, Sun Linux 5.0 has some additional functions that are loaded onto the server hard drive by the Restore process. Table 5 lists them. They are discussed in more detail in following sections.

**Table 5.** Applications Loaded On Drive (some require decompression and setup)

Package	Version
Sun Grid Engine	5.2.3.1
Sun Open Network Environment (Sun ONE) Active Server Pages	3.6.2
Sun Streaming Server including UI	1.0
MySQL*	3.23.41
Wu-FTP*	2.6.1
Apache Web Server*	1.3.22
Java 2 Standard Edition SDK	1.4
Tomcat	3.2.1

## Setting Up Sun Linux 5.0 Applications

These applications are installed into the root directory, in the path `/opt/SunApps/`. Some are installed as tar files, and others in RPM format. You must either untar them and install, or install via rpm then set them up for use.

## Sun ONE Active Server Pages



**Note:** This software was formerly known as Chili!Soft Active Server Pages (ASP). The version on the Sun Cobalt LX50 server is Chili!Soft ASP v3.6.2.

This section provides system requirements, installation instructions, and basic information about getting started with Sun Open Net Environment (Sun ONE) Active Server Pages.

Detailed information about configuring, managing, and using Sun ONE Active Server Pages can be found in the product documentation for Sun ONE Active Server Pages. Application notes and the latest information about this release is also provided in the Sun ONE Active Server Pages README file. You should review the README file before proceeding with your installation. The README file can be found in the same directory as this QuickStart Guide. The README file can also be found on the Sun ONE Active Server Pages Web site at:

<http://www.chilisoft.com/caspdoc>

ODBC drivers are installed automatically by the Sun ONE Active Server Pages setup program. Following installation, you must configure the drivers for the data sources being used. For more information, see “Configuring a Database” in “Chapter 3: Managing Sun Chili!Soft ASP” in the product documentation. For information about accessing the product documentation, see “Documentation” on page 3-17 of this guide.



**Note:** To provide remote database connectivity with Microsoft Access and Microsoft SQL Server 6.5 databases, Sun ONE Active Server Pages includes the client portion of the DataDirect SequeLink 4.51a software.

On the Windows machine that contains your database, you also must download and install the server portion of this software from Sun Microsystems.

For more information, see “Configuring SequeLink” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Configuring a Database”).

### Java™ Runtime Environment

Sun ONE Active Server Pages includes the Java™ runtime environment (JRE) 1.3.1 for Sun Chili!Beans. While JREs 1.2.x and 1.3.x are supported, and the Java 2 runtime environment can also be used, the use of JRE 1.3.1 is strongly recommended. Chili!Beans enables you to use Java class files as components called from VBScript or JScript. To use Chili!Beans, a Java runtime environment must be installed on the machine, and Chili!Beans must be enabled from the Administration Console. For more information, see “Chili!Beans Component Reference” in “Chapter 5: Developer’s Reference” in the product documentation.

### Microsoft FrontPage 2002 Server Extensions

Sun ONE Active Server Pages enables you to run active server pages generated by Microsoft FrontPage. Microsoft FrontPage Server Extensions provide services to the Web server that work in conjunction with Sun ONE Active Server Pages to provide FrontPage functionality to computers not running Microsoft Windows NT or Windows 2000 and Internet Information Services (IIS). FrontPage Server Extensions are no longer installed with Sun ONE Active Server Pages; you must obtain them from Microsoft.

For more information, see “Enabling FrontPage Publishing” in “Chapter 3: Managing Sun Chili!Soft ASP” in the product documentation.

## Installing Sun ONE Active Server Pages

The setup program takes you through the steps required to install Sun ONE Active Server Pages on Sun Linux 5.0. As you perform the installation, you have many options to accept default configuration settings or to specify your own. The setup program installs the following components on the target server:

1. Sun ONE Active Server Pages server
2. Sun ONE Active Server Pages Administration Console
3. Sun Chili!Beans support (the use of Chili!Beans is optional). Sun ONE Active Server Pages includes Java runtime environment 1.3.1. The use of this specific JRE version is not required, but is strongly recommended.
4. Sun SpicePack components
5. Apache Web Server 1.3.19 DSO (“bundled” with Sun ONE Active Server Pages)



**Note:** If you are upgrading an existing installation of Sun ONE Active Server Pages for Linux, follow the instructions in “Upgrading an Existing Installation” on page 3-14 of this guide.

### First Steps

Before you begin your installation, make sure you meet the following requirements:

- You are logged in as root.
- You have 60 MB of hard disk space available to extract the installation files.
- You know which language you want Sun ONE Active Server Pages to support (English - US, Japanese Shift-JIS, and so on). You can change the language after installation using the Sun ONE Active Server Pages Administration Console, as described in “Configuring International Support” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Managing the ASP Server”).



**Note:** One standard configuration of the Sun Cobalt LX50 server has 256MB of memory installed. Sun ONE Active Server Pages requires 256 MB of memory space for itself.

This software will run on a server with only 256 MB of memory, but it is not recommended.

If you choose to customize settings for the Sun ONE Active Server Pages Administration Console, you must specify a username and password for accessing the console. Be sure to specify a password that you can remember, or else plan to store the password in a secure location. If you forget your password you can run the `admtool` utility and set a new one, as described in “Configuring Usernames and Passwords” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Using the Administration Console”). If you do not choose the customize settings option, the username is set as ‘admin’ and the password as ‘root’. To protect the security of your server, you should run the `admtool` and change these settings as soon as possible following installation.

To use Chili!Beans, a Java runtime environment (JRE) must be installed on the machine, and Chili!Beans must be enabled from the Administration Console. During installation, Sun ONE Active Server Pages installs JRE 1.3.1, unless you choose to install another supported version (1.2.x or 1.3.x). Note that while you have the option to install a different JRE, and the Java 2 runtime environment can also be used, the use of JRE 1.3.1 is strongly recommended. Chili!Beans enables you to access Java objects and classes from an ASP script. For more information, see “Chili!Beans Component Reference” in “Chapter 5: Developer’s Reference” in the product documentation.

If you are upgrading from a previous version of Sun ONE Active Server Pages, you must install Sun ONE Active Server Pages into the same directory as your previous installation.

## Installation Procedure

1. The installation files are located in `/opt/SunApps.ChiliSoft`. Use the following command to extract the tar file:

```
#> tar -xvf chiliasp-3.6.21-BigBear.1047b.tar
```

This step creates the following files in the temporary directory, which you can delete after completing the installation:

- A QuickStart Guide with installation instructions .
  - A README file containing the latest product information
  - The `install.sh` installation script \* A package/EULA file containing the End-User License Agreement (EULA)
  - A package directory containing files required to install Sun ONE Active Server Pages
2. Run the `install.sh` script by using the script located in the `/opt/SunApps/chilisoft/` directory.
 

```
#> ./install.sh
```
  3. Review the EULA that displays.
    - Enter 'yes' if you agree with its conditions. You must type the entire word, 'yes'.
    - Enter 'no' if you do not agree. If you enter 'no', the Sun ONE Active Server Pages setup program quits the installation.
  4. On the next screen, choose an installation directory:
    - Press <ENTER> to accept the default Sun ONE Active Server Pages installation directory (`/opt/casp`).
    - Enter the absolute path name of a different installation directory. Make note of this location so you can easily find the Sun ONE Active Server Pages files at a later time.



**Note:** To upgrade from the previous version of Sun ONE Active Server Pages, you must specify the installation directory of your existing installation.

5. If the setup program detects a previous installation of Sun ONE Active Server Pages in the specified directory, you will be prompted to uninstall the previous version.
  - Enter 'n' (no) to change the installation directory or cancel the installation.
  - Enter 'y' (yes) to uninstall the previous installation. You will then be prompted to proceed.

At this confirmation prompt, enter 'n' to cancel the installation, or 'y' to uninstall the previous version. If you enter 'y', the previous version will be uninstalled by the installer.

Once that process is finished, press <ENTER> to continue.



**Note:** At the end of the Sun ONE Active Server Pages installation process, you will be prompted to import your settings.

6. Sun ONE Active Server Pages includes a ready-to-run Apache 1.3.19 Web server configured with support for Microsoft FrontPage 2002 Server Extensions (the extensions themselves are not installed) and EAPI (Extended API). If you have not yet configured a Web server, you have the option to install this preconfigured Apache Web server. It is recommended, but not required, that you use preinstalled version 1.3.22.
  - Enter 'y' (yes) to install the preconfigured ("bundled") Apache 1.3.19 Web server; proceed to the next step.
  - Enter 'n' (no) if you do not want to install the preconfigured Apache Web server; proceed to Step 8.



**Note:** It is recommended that you use the Apache Web server that is already installed.

7. The Apache Web server has many settings that you can choose and configure. Select one of the configuration options for the preconfigured Apache 1.3.19 Web server:
  - Enter '1' ('Default configuration') to direct Sun ONE Active Server Pages to automatically configure all settings for you.
  - Enter '2' ('Specify only the Web server listen port') to specify only the port number that the Apache Web server will listen on, and then specify the port.
  - Enter '3' ('Customize the configuration') to specify the configuration of many different settings, and then respond to the prompts.



**Note:** All Apache configuration settings can be changed manually after installation by editing the Apache configuration file.

8. On the next screen, choose a language:
  - Press <ENTER> to accept the default language (English - US), or
  - Enter the number of a language shown in the list.
9. On the next screen, enable or disable Chili!Beans support as desired.
  - Select 'Use the bundled 1.3.1 JRE' to enable Chili!Beans support and install JRE 1.3.1 (this is the recommended JRE), and then respond to the prompts.
  - Select 'Specify the path to an existing JRE' to specify the path to an existing JRE (JRE versions 1.2.x and 1.3.x are supported), or type 'none' to return to the previous screen, and then respond to the prompts.
  - Select 'Disable Java support' to disable Chili!Beans support, and then respond to the prompts.
  - Select 'Keep your current settings'.

10. The next screen provides options for choosing the Web server to configure with Sun ONE Active Server Pages.
- If you want the setup program to search your system and generate a list of installed Web servers from which to choose, enter the number of the desired search option (1, 2, or 3).  
If you select one of these search options, skip to Step 13.
  - If you want to skip this search and provide information about the Web server, enter '4' ('Don't search'). The installer will not search for the Web server, and instead takes you to Step 11.



**Note:** If you chose to install the preconfigured ("bundled") Apache 1.3.19 Web server in Step 6, go to Step 13.

On the next screen, enter the number of the type of Web server to configure: '1' for Apache, or '2' for iPlanet, and go to Step 12.

To cancel the user-specified Web server configuration, enter '4'. If you choose this option, the setup program returns you to the previous screen. From this screen you can choose another option, as described in Step 13.

11. At the prompts, enter the path of your Web server.
- If you do not know the correct path, type 'none' to cancel (this takes you to Step 13).
  - If you selected Apache in Step 11, you will be prompted for the Web server binary.
- After all information has been added correctly, the installer takes you to Step 13. There you will be able to select the Web server that was just added.

12. On the next screen, enter the number of the Web server you want the setup program to configure to run with Sun ONE Active Server Pages (if you selected option 1, 2, or 3 in Step 10) and go to Step 14.

To provide information about the Web server to configure, enter the number for the option, 'Specify the Web server'. If you choose this option, follow the instructions in Step 11.

To perform another search for installed Web servers, enter the number for the option, 'Attempt to auto-detect more Web servers'. If you choose this option, follow the instructions in Step 10.

If you do not want to configure a Web server during installation, enter the number for the option, 'Do not configure a Web server', and then go to Step 16. If you choose this option, the first time you open the Sun ONE Active Server Pages Administration Console, you will be prompted to configure the ASP Server and a Web server.

13. On the next screen, verify the information that the setup program displays about your Web server. If the information is incorrect, the Sun ONE Active Server Pages installation could fail. If the installation does fail, you can run the installation script again. If you do this, it is recommended that you first run the uninstall script, as described in section 3.5 of this guide.
- If the information on the screen is correct, enter 'y' (yes) and go to Step 15.
  - If the information is incorrect, enter 'n' (no). The setup program returns you to the previous screen (Step 13).

14. On the next screen, choose a configuration option for the ASP Server:

- Enter '1' to choose a default configuration, and go to Step 16.
- Enter '2' to choose a custom configuration, and enter the following information at the prompts:
  - 'Enable samples on this Web server?' Enter 'y' (yes) if you want the setup program to install and configure the Sun ONE Active Server Pages samples on your Web server, or enter 'n' (no).
  - 'Enable documentation on this Web server?' Enter 'y' (yes) if you want the setup program to enable the Sun ONE Active Server Pages documentation on your Web server, or enter 'n' (no).  
If you enter 'n', the documentation will be available from the Administration Console, but not from the Sun ONE Active Server Pages Start Page.
  - 'Start the ASP Server on system boot?' Enter 'y' (yes) if you want the setup program to start Sun ONE Active Server Pages automatically each time you start the computer, or enter 'n' (no).
  - 'Would you like this [Web server] restarted?' Enter 'y' (yes) if you want the setup program to automatically restart the Web server after completing Sun ONE Active Server Pages installation, or enter 'n' (no).
- Enter '3' to choose another Web server to configure for Sun ONE Active Server Pages, and follow the instructions in Step 10.

15. On the next screen, select a configuration option for the Administration Console.

When you choose 'Default configuration', the setup program configures the console using default settings. With this option, it specifies the username as 'admin' and the password as 'root'. To protect the security of your server, it is strongly recommended that you change these settings as soon as possible. For information about doing this, see "Configuring Usernames and Passwords" in the product documentation ("Chapter 3: Managing Sun Chili!Soft ASP" => "Using the Administration Console").

If you choose 'Custom configuration', enter the following information at the prompts:

- 'Administration Console port number': Enter the number of the port on which the Web server should listen for requests for the Administration Console, or press 'Enter' to accept the default.
- 'Automatically start the Administration Console on system startup': Enter 'y' (yes) if you want the Sun ONE Active Server Pages Administration Console to start automatically each time you start the computer, or enter 'n' (no).
- 'Type the username': Enter the administrator username.
- 'New password': Enter the administrator password, which is required to access the Administration Console. Be sure to make note of this password, because you cannot access the Administration Console without providing it.
- 'Confirm password': Reenter the password.

16. The next screen provides summary information about your Administration Console configuration. Be sure to make note of this information or else print this screen for future reference.

When finished, press 'Enter' to complete the installation.

17. If you are upgrading from the previous version for Linux, and the setup program was able to export the settings from your previous installation, you will be prompted to import these settings into your new installation.
- Enter 'y' (yes) to import your settings.
  - Enter 'n' (no) if you do not want to import your settings.

The setup program then completes the installation and writes a summary file to:

```
[C-ASP_INSTALL_DIR]/logs/install_summary
```

where [C-ASP\_INSTALL\_DIR] is the directory in which you installed Sun ONE Active Server Pages (/opt/casp by default). Be sure to print the information contained in the install\_summary file for future reference.

Before running your installation of Sun ONE Active Server Pages, see “Important Notes About Linux Installations” on page 3-13 of this guide. If you are upgrading from a previous version of Sun ONE Active Server Pages for Linux, see “Getting Started with Sun ONE Active Server Pages” on page 3-16 of this guide.

## Important Notes About Linux Installations

Before running your installation of Sun ONE Active Server Pages, review the following information:

If you chose the default configuration for the Administration Console, the setup program configured the username as 'admin' and the password as 'root'. To protect the security of your server, it is strongly recommended that you change the username and password as soon as possible. For more information, see “Configuring Usernames and Passwords” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Using the Administration Console”).

You use the Administration Console to start and stop the Sun ONE Active Server Pages server and to change configuration settings. You can access the Administration Console by typing the following URL in your Web browser address bar:

```
http://[HOSTNAME]:[PORT]
```

where [HOSTNAME] is the valid DNS name or IP address of the Apache Web server running the Sun ONE Active Server Pages Administration Console, and [PORT] is the port on which the Administration Console is configured to run (5100 by default). The URL for accessing the Administration Console is provided in the following file:

```
[C-ASP_INSTALL_DIR]/logs/install_summary
```

where [C-ASP\_INSTALL\_DIR] is the directory in which you installed Sun ONE Active Server Pages (/opt/casp by default).

If you did not configure a Web server to run with Sun ONE Active Server Pages during installation, the first time you open the Administration Console you will be prompted to install a Web server.

The Sun ONE Active Server Pages setup program makes certain changes to the configuration files for the associated Web server. For more information, see “Changes to Web Server Configuration Files” in the product documentation (“Chapter 2: Installing and Configuring Sun Chili!Soft ASP” => “Installing and Uninstalling Sun Chili!Soft ASP”).

You can change some of the options that were configured during installation, such as the Web server with which Sun ONE Active Server Pages is configured to run, and the status of Java support (enabled or disabled). For more information, see “Changing Installation Options after Installation” in the product documentation (“Chapter 2: Installing and Configuring Sun Chili!Soft ASP” => “Installing and Uninstalling Sun Chili!Soft ASP”). \* To use Chili!Beans, a Java runtime environment must be installed on the machine, and Chili!Beans must be enabled from the Administration Console (JRE 1.3.1 is included with Sun ONE Active Server Pages and is the recommended version). If you did not install a Java runtime environment during the installation of Sun ONE Active Server Pages, you can do so by following the instructions in “Enabling Java Support” in the product documentation (“Chapter 2: Installing and Configuring Sun Chili!Soft ASP” => “Installing and Uninstalling Sun Chili!Soft ASP” => “Changing Installation Options after Installation”).

After you have installed Sun ONE Active Server Pages, use the diagnostic applications to verify that your installation is working correctly. You can access the diagnostics from the following URL:

`http://[HOSTNAME]/caspsamp/diagnostics.htm`

where [HOSTNAME] is the hostname of the Web server configured to run with Sun ONE Active Server Pages.

Important summary information about the installation is located in the following file:

`[C-ASP_INSTALL_DIR]/logs/install_summary`

where [C-ASP\_INSTALL\_DIR] is the directory in which you installed Sun ONE Active Server Pages (/opt/casp by default). Be sure to print this information for future reference.

Certain Sun ONE Active Server Pages settings have important implications for the security of the Sun ONE Active Server Pages server. To ensure that the settings are appropriately configured for your specific environment, see “Securing the Server” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Managing the ASP Server”).

## Upgrading an Existing Installation

Sun ONE Active Server Pages 3.6.2 automatically upgrades many of your settings from an existing installation. To perform an upgrade from Sun ONE Active Server Pages 3.6 to Sun ONE Active Server Pages 3.6.2, follow the instructions in sections 3.1 and 3.2 in this guide. In addition, review the information listed below and take any necessary steps.

The Sun ONE Active Server Pages 3.6.2 setup program preserves the settings from your Sun ONE Active Server Pages 3.6 installation, and then imports those settings into your new Sun ONE Active Server Pages 3.6.2 installation. The settings imported from your existing installation will override the settings that you configure during installation, with the exception of Sun ONE support. During installation, you must configure Sun ONE support and select the option for the bundled JRE 1.3.1 (or specify a path to a different JRE). While JREs 1.2.x and 1.3.x are supported, and the Java 2 runtime environment can also be used, the use of JRE 1.3.1 is strongly recommended. Java support must be configured, even if it was enabled in the installation you are upgrading.



**Note:** SpicePack settings and Sybase DSNs are not migrated when upgrading to Sun ONE Active Server Pages 3.6.2.

The new installation will completely overwrite your existing installation. If there are any files in your current Sun ONE Active Server Pages installation directory that you want to preserve, copy them to another location. Otherwise, they will be lost.

If necessary, upgrade your Web server to meet the requirements listed in “Adding New Hardware” on page 2-10 of this guide.

Back up your existing installation prior to beginning the upgrade.

Do not upgrade a mission-critical production server. Performing the upgrade and taking the additional configuration steps required might keep your server offline for an unacceptably long period of time. If possible, you should mirror the production server to a non-production server, perform the upgrade, and then test and debug the upgraded server before deploying it in your production environment.

When the setup program has completed the installation, do the following:

Verify that any system DSNs defined for your previous installation are working correctly. For more information, see “Testing a DSN” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Configuring a Database” => “Configuring Data Source Names”). If system DSNs are not functioning you can create or edit them as needed, as described in the same section in the product documentation. You can find the configuration information for the system DSNs that were defined for your previous installation in the following file:

```
[C-ASP_INSTALL_DIR]/casp/INSTALL/settings.import
```

where [C-ASP\_INSTALL\_DIR] is the path name of the Sun ONE Active Server Pages installation directory.

## Uninstalling

You uninstall Sun ONE Active Server Pages by running the script named ‘uninstall’ located in the Sun ONE Active Server Pages installation directory. When you run the uninstall program, you can delete all of the directories and files contained in the Sun ONE Active Server Pages installation directory. Before you run the uninstall program, make copies of any files contained under this directory that you do not want to lose.



**Note:** To perform this procedure, you must be logged in as root on the computer running Sun ONE Active Server Pages.

### To uninstall Sun ONE Active Server Pages

1. From the Sun ONE Active Server Pages installation directory (/opt/casp by default), type the following command:

```
#> ./uninstall
```

2. Choose the number of the desired uninstall method.
  - Choose ‘1. Uninstall the entire product’ to remove all Sun ONE Active Server Pages components and all files and directories under the installation directory. If you choose this option, go to Step 5.
  - Choose ‘2. Perform a stage-based uninstall’ to select which components to uninstall. If you choose this option, go to Step 3.
  - Choose ‘3. Cancel the uninstall’ to stop the uninstall without removing any files.
3. If you chose option ‘2. Perform a stage-based uninstall’, you are prompted to select the components to uninstall. At the prompts, enter the number of the component(s) to remove.
4. Uninstall the Web server-Sun ONE Active Server Pages association, responding to the prompts as desired.
5. Delete the directories and files in the Sun ONE Active Server Pages installation directory.

Before deletion you are prompted to stop the uninstall and make backup copies of any files. To perform this action, enter ‘y’ (yes). To continue the uninstall and delete the directories and files, enter ‘n’ (no).

## Getting Started with Sun ONE Active Server Pages

The resources described in this section will help you get started with Sun ONE Active Server Pages.

Your primary resource is the product documentation for the Sun ONE Active Server Pages software (see “Documentation” on page 3-17).

There are two versions of this documentation: one in HTML format that includes dynamic index and search functionality, and one in Adobe PDF format. To view and print the PDF version, Adobe Acrobat Reader must be installed. To obtain a free copy of Acrobat Reader, go to:

<http://www.adobe.com/products/acrobat/readstep2.html>

In addition to the product documentation, the following resources will help you learn more about Sun ONE Active Server Pages:

- Sample ASP applications demonstrate the basics of building Sun ONE Active Server Pages applications (see “Sample ASP Applications” on page 3-18).
- The 10-Step Tour provides a basic introduction to Sun ONE Active Server Pages technology (see “The 10-Step Tour” on page 3-19).
- Diagnostic applications verify that the features of your ASP environment are working correctly (see “Diagnostics” on page 3-19).



**Note:** To use ASP functionality in the diagnostics, the 10-Step Tour, and the sample applications, ‘Allow session state’ must be set to ‘yes’ on the ‘Server Settings’ page in the Administration Console. For more information about this setting, see “Enabling Session State” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Managing the ASP Server”).

You can access these resources from the Sun ONE Active Server Pages Start Page at:

[http://\[HOSTNAME\]/caspsamp](http://[HOSTNAME]/caspsamp)

where [HOSTNAME] is the hostname of your Web server.

## Documentation

The Sun ONE Active Server Pages product documentation includes information about installing, configuring, and using Sun ONE Active Server Pages for Linux. It introduces the basics of building Sun ONE Active Server Pages applications, and provides reference information about using scripting languages, connecting to databases, and developing and using components. The product documentation is structured so you can easily find the information you need. The contents of each chapter are described below.

*“Introduction: About this Documentation”*: Provides an overview of the Sun ONE Active Server Pages product documentation and other Sun ONE Active Server Pages resources.

*“Chapter 1: About Sun Chili!Soft ASP”*: Describes what’s new in this release. Also provides an introduction to ASP technology, and describes the *Sun Chili!Soft implementation of ASP*.

*“Chapter 2: Installing and Configuring Sun Chili!Soft ASP”*: Tells you how to install Sun ONE Active Server Pages on your server, and describes changes the setup program makes to your Web server configuration files. Also provides instructions for performing basic server-configuration tasks and enabling users to publish ASP applications to the Web server.

*“Chapter 3: Managing Sun Chili!Soft ASP”*: Provides information about administering Sun ONE Active Server Pages, including changing ASP Server configuration settings, configuring security, optimizing server performance, and troubleshooting server problems.

*“Chapter 4: Building a Sun Chili!Soft ASP Application”*: Introduces the basics of developing ASP applications: creating an ASP page, adding scripts and server-side includes, and defining the application on the server. Also discusses extending ASP applications by using objects and components, and connecting to databases. This chapter concludes with information about publishing a Sun ONE Active Server Pages application.

*“Chapter 5: Developer’s Reference”*: Provides reference information about using built-in ASP components, additional “off-the-shelf” ASP components, and custom components. Also provides a scripting reference for VBScript and JScript, and reference information about using ActiveX Data Objects (ADO), Sun Chili!Beans, and Sun SpicePack components.

*“Appendix A: Error Messages”*: Explains error messages you might encounter when using Sun ONE Active Server Pages.

*“Appendix B: Troubleshooting”*: Provides troubleshooting tips for problems you might encounter when running Sun ONE Active Server Pages.

*“Appendix C: Glossary”*: Contains a glossary of terms you might encounter when administering Sun ONE Active Server Pages and developing ASP applications.

You can access the product documentation in a number of ways:

- Following installation, you can access the product documentation from the Administration Console by clicking the ‘documentation’ link in the left navigation pane.
- The Sun ONE Active Server Pages setup program gives you the option to enable the product documentation on your Web server. If you choose this option, when your Web server is running, you can also access the HTML version of the documentation at:

`http://[HOSTNAME]/caspdoc/`

where [HOSTNAME] is the hostname of your Web server.

- From the first page of the HTML documentation, you can click a link to open the version in PDF format. To access the PDF version directly, use the following URL:

`http://[HOSTNAME]/caspdoc/pdf/chilisoft_asp_docs.pdf`

where [HOSTNAME] is the hostname of your Web server.

- You can access the product documentation from the Sun ONE Active Server Pages Web site at:

`http://www.chilisoft.com/caspdoc/`

- When your Web server is running, you can access the product documentation from the Sun ONE Active Server Pages Start Page at:

`http://[HOSTNAME]/caspsamp/`

where [HOSTNAME] is the hostname of your Web server.

## Sample ASP Applications

The Sun ONE Active Server Pages setup program gives you the option to enable the sample applications on the computer running Sun ONE Active Server Pages. The sample applications demonstrate the basics of building Sun ONE Active Server Pages applications.



**Note:** To use the sample applications, ‘Allow session state’ must be set to ‘yes’ on the ‘Server Settings’ page in the Administration Console. For more information about this setting, see “Enabling Session State” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Managing the ASP Server”).

You can access and view samples in a number of ways:

- When your Web server is running, you can access the samples from the Sun ONE Active Server Pages Start Page, at:

`http://[HOSTNAME]/caspsamp/`

where [HOSTNAME] is the hostname of your Web server.

- You can access the samples from the Sun ONE Active Server Pages Web site at:

`http://www.chilisoft.com/caspsamp/`

- You can view a list of installed sample ASP applications on the ‘ASP Applications’ page of the Sun Chili!Soft Administration Console, as described in “Adding an ASP Application” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Managing the ASP Server” => “Configuring ASP Applications”). The sample applications are located in your file system at:

`/caspsamp=" [C-ASP_INSTALL_DIR] /caspsamp"`

where /caspsamp is the directory alias (virtual directory) for the caspsamp sample application, and [C-ASP\_INSTALL DIR] is the path name of the Sun ONE Active Server Pages installation directory.

## The 10-Step Tour

If you are new to Sun ONE Active Server Pages technology, we recommend that you take our 10-Step Tour, which provides a basic introduction to Sun ONE Active Server Pages.



**Note:** To use Active Server Pages functionality in the 10-Step Tour, ‘Allow session state’ must be set to ‘yes’ on the ‘Server Settings’ page in the Administration Console.

For more information about this setting, see “Enabling Session State” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Managing the ASP Server”).

When Sun ONE Active Server Pages is installed and your Web server is running, you can access the tour from the Sun ONE Active Server Pages Start Page at:

`http://[HOSTNAME]/caspsamp/`

where [HOSTNAME] is the hostname of your Web server.

## Diagnostics

Diagnostics allow you to verify that various features of your Sun ONE Active Server Pages environment are working correctly. The diagnostic applications listed below are installed with Sun ONE Active Server Pages.



**Note:** To use the diagnostics, ‘Allow session state’ must be set to ‘yes’ on the ‘Server Settings’ page in the Administration Console. For more information about this setting, see “Enabling Session State” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Managing the ASP Server”).

- HELLO: Tests the functionality of ASP and VBScript by using a simple “Hello World” script.
- SERVER: Tests the ASP Server-to-Web server connection by retrieving the standard Web server variables.
- JSCRIPT: Tests the functionality of JScript.
- COMPONENTS: Tests the functionality of additional components installed with Sun ONE Active Server Pages.
- ADO: Accesses ActiveX Data Objects (ADO) from VBScript. It connects to a sample database by using ODBC (Open Database Connectivity) to test the functionality of ADO and the dBASE ODBC driver. I



**Note:** JSADO: Performs the same test as the ADO test, but accesses ADO from JScript rather than VBScript.

- SQLEXECUTE: Uses ADO to execute an SQL statement and display the results. To use this application, you must first create a system DSN for your database on the ASP Server, as described in “Adding a DSN” in the product documentation (“Chapter 3: Managing Sun Chili!Soft ASP” => “Configuring a Database” => “Configuring Data Source Names (DSNs)”).

When your Web server is running, you can access the diagnostic applications from the Sun ONE Active Server Pages Start Page at:

`http://[HOSTNAME]/caspsamp/`

where [HOSTNAME] is the hostname of your Web server.

## Customer Support

Use one of the following methods to contact Sun Customer Support:

- Web form: <http://www.chilisoft.com/support/chili.eval.asp>
- Support Forum: <http://www.chilisoft.com/forum/>

Following the installation of Sun ONE Active Server Pages, you can also contact Customer Support from the Sun ONE Active Server Pages Administration Console. Click the ‘customer support’ link in the left navigation pane, and then click the ‘Submit a question’ tab.

## Sun Grid Engine

The Sun Cobalt LX50 server comes with Sun Grid Engine 5.2.3 software loaded on the server. Sun Grid Engine software helps enable technical Sun Grid Computing, and provides a resource rich environment designed to maximize the available power of the local network to increase productivity, improve product quality, reduce the time to market and increase ROI. Sun Grid Engine software supports one of the most complete and scalable hardware, software and services models for Grid Computing.

For more information on the Sun Grid Engine, see:

<http://www.sun.com/software/gridware/>

The documentation for the Sun Grid Engine is available at:

[http://www.sun.com/products-n-solutions/hardware/docs/Software/Sun\\_Grid\\_Engine/index.htmlid](http://www.sun.com/products-n-solutions/hardware/docs/Software/Sun_Grid_Engine/index.htmlid)

For more information about becoming certified on the Sun Grid Engine software, see:

<http://m1.eng.sun.com/software/gridware/certification/>

For more information on the Open-source Grid Engine Project, see:

<http://gridengine.sunsource.net/>

## Installation

Change to the `/opt/SunApps/grid` directory and extract the tarred files:

```
# cd /opt/SunApps/grid
# tar -zxvf sge-5_2_3_1-bin-glinux[1].tar.gz
# tar -zxvf sge-5_2_3_1-common[1].tar.gz
# tar -zxvf sge-5_2_3_1-doc[1].tar.gz
```

These commands expand everything needed to continue with the installation.

Then follow the instructions in the Sun Grid Engine pdf manual, located in the `/opt/SunApps/grid/doc` directory file named `SGE523Man_US.pdf`. The Sun Grid Engine Manual contains a Quick Start Guide, Installation and Administration Guide, User’s Guide and Reference Guide Manual.

## Sun™ Streaming Server

For more information on the Sun™ Streaming Server, see:

<http://www.sun.com/wireless/streaming>

The Sun Streaming Server is a high-performance, open-standards-based multimedia streaming server. Designed to be deployed as part of a scalable, cost-effective streaming-media environment, Sun Streaming Server adheres to the ISMA 1.0 specification allowing it to be out-of-the box compatible with other products, such as clients, encoders and caches that adhere to the ISMA 1.0 specification.

Sun Streaming Server provides a simple, flexible and reliable platform for deploying value-added streaming services in a network environment. It is built on top of standard Internet protocols such as RTSP, RTP/RTCP, HTTP, SDP, the ISO MPEG-4 standard, and other *de facto* open standards, such as ELF and the Apple QuickTime file format. Using the open standards listed in Table 6, Sun Streaming Server can deliver stored and live ISO MPEG-4 or Apple QuickTime content to open-standards-based clients.

Table 6 lists the default settings for the Sun Cobalt LX50 server.

**Table 6.** Standards Supported by Sun Streaming Server

Standard	Description
3GPP TS 26.234 V4.0.0	3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Transparent end-to-end packet switched streaming service; Protocols and codecs
3GPP TS 26.233 V4.0.0	3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Transparent end-to-end packet switched streaming service; General Description
RFC 1945	Hypertext Transfer Protocol – HTTP/1.0
RFC 2616	Hypertext Transfer Protocol – HTTP/1.1
RFC 1889	RTP: Real-Time Transport Protocol; RTCP: Real-Time Control Protocol
RFC 2326	RTSP: Real Time Streaming Protocol
RFC 2327	SDP: Session Description Protocol
ISO/IEC-14496	MPEG-4 graphics and video compression algorithm standard, based on MPEG-1, MPEG-2, and Apple QuickTime technology.
ELF	Extended Log File Format
ISMA 1.0	The Internet Streaming Media Alliance (ISMA) has developed and published ISMA 1.0, an implementation specification designed to accelerate existing IETF and MPEG standards for streaming over the Internet.

## Installing the RPM Package File

The Sun Streaming Server software consists of the `ism-2.0RC1-1.i386.rpm` package located in the `/opt/SunApps/ism` directory.

Complete the following steps to install the Sun Streaming Server RPM package file:

1. At the command prompt, log in to the Sun Cobalt LX50 server as 'root'.

```
login: root
Password: your_password
```

2. Change to the `/opt/SunApps/ism` directory:

```
# cd /opt/SunApps/ism/
```

3. Use the `rpm -Uvh ism-2.0RC1-1.i386.rpm` command to install SSS on the system:

```
# rpm -Uvh ism-2.0RC1-1.i386.rpm
Preparing... ##### [100%]
warning: group admin does not exist - using root
warning: group admin does not exist - using root
warning: group admin does not exist - using root
1:ism ##### [100%]
```

If you receive the above results installation of the Sun Streaming Server is complete.

Table 7 lists the Sun Streaming Server directory and the file locations.

**Table 7.** Sun Streaming Server Directory and File Locations

Directory	Description
<code>/opt/ism</code>	Main server install directory. The installation files are stored here.
<code>/opt/ism/movies</code>	Default content root directory. Media content files are stored here by default and sample movie files ( <code>sample.mov</code> and <code>sample.mp4</code> ).
<code>/opt/ism/lib</code>	<code>ism-qt-plugin.so.1</code> , server daemon ( <code>ismd2</code> ), and <code>ismcf utility.rnel 2.4.9-3</code>
<code>/opt/ism/sbin</code>	<code>ismctl</code> (server administration tool)
<code>/opt/ism/etc</code>	Directory contains the <code>ism.cf</code> (configuration file) and <code>ism.cf.default</code> (install time default configuration file)
<code>/opt/ism/man</code>	The directory for the <code>ismctl</code> man page.
<code>/var/log/ismd</code>	Contains connection, request and session log files.
<code>/etc/init.d</code>	Contains the <code>start/stop/restart ism</code> script file.

## Starting Sun Streaming Server and Basic Server Operations

There are two methods for starting the Sun Streaming Server.

- Reboot the Sun Cobalt LX50 server and Sun Streaming Server starts up automatically in Linux. Run levels 2, 3, and 5 from the `/etc/rc.d/init.d/ism` script.

- You can also use the following command to manually start the Sun Streaming Server:

```
# /opt/ism/sbin/ismctl start
```

As superuser, type the following commands to start, stop, restart or check the server status:

```
# /opt/ism/sbin/ismctl [start|stop|restart|status]
```

### Verifying the Installation

To verify that the installation is correct, follow the steps below:

1. Start the server using the command listed in “Starting Sun Streaming Server and Basic Server Operations”.
2. Bring up a client application.

An example of a client application is QuickTime Player version 4.0 or higher. If QuickTime Player is used, it must be configured to use RTP/UDP as the transport protocol.

3. Open the following URL:

```
rtsp://<hostname>or<IP_address>:554/sample.mov
```

where `<hostname>` is the fully qualified domain name (FQDN) or the IP address of the machine on which SSS is installed and the default installation port.

If you are able to view the sample movie file, the Sun Streaming Server has been installed successfully.

If you cannot view the movie, look in the `/var/log/messages` files and `grep` for `ism` daemon to see if there are error messages.

```
# cat /var/log/messages | grep ism
```

## Administration of the Sun Streaming Server

This section describes the `ismctl` tool, which allows administration, tuning, and configuration of the Sun Streaming Server. `ismctl` is a command-line utility that uses subcommands to perform operations on the server or on configuration data used by the server. The functionality includes setting and retrieving configuration parameters, starting, stopping, restarting the server, and so on.

- The `start`, `stop`, `restart`, and `status` subcommands perform a specific, predefined task on the server to control its operation or to report its running status.
- The `get`, `set`, and `unset` subcommands operate on keys and values, allowing the user to access and modify configuration information. Modifiers are allowed with the `get`, `set`, and `unset` subcommands so that additional values or relationships can be represented.

### Command Interface

This section briefly describes the `ismctl` command syntax:

```
ismctl <subcommand> [modifier] [key] [value]
```

The `ismctl -h` command prints the usage message and a brief listing of all supported subcommands.

Detailed descriptions of the options, subcommands, modifiers and keys are given in Table 8, Table 9, Table 10, and Table 11.

## Basic Sun Streaming Server Subcommands

Table 8 shows the basic Sun Streaming Server commands for starting, stopping, and restarting the server, along with checking the status and version.

**Table 8.** ismctl Basic Subcommands

Subcommand	Description
start	Starts the server. The running process daemon can be looked up using the <code>ps -ef   grep ism</code> command.
stop	Stops the Sun Streaming Server server.
restart	Restarts the Sun Streaming Server server. Running RTSP sessions will be terminated.
status	Returns the current state of the server and any resources needed to use by logging to <code>/var/log/messages</code> file.
version	Returns the version of the Sun Streaming Server server.

## Modify Server Values

The subcommands listed in Table 9 along with descriptions modify Sun Streaming Server values.

The modifiers and keys for these `ismctl` subcommands are shown in Table 10 and Table 11, respectively.

In Table 12 through Table 14, each `ismctl` subcommand usage is shown and described.

**Table 9.** ismctl Server Values Modification Subcommands

Subcommand	Description
set [modifier] <key> <value>	Sets the value of the given key. Some values do not take effect until the server has been restarted.
get [modifier] <key>	Prints the value of the specified key to <code>stdout</code> .
unset [modifier] <key>	Sets the value of the key to the default value as listed in the <code>/opt/ism/etc/ism.cf.default</code> file. If the value did not exist by default, it removes the value.
help [subcommand   key]	If no subcommand or key is specified, the output is the same as <code>ismctl -h</code> . If a subcommand or key is specified, then more details are provided for.



**Note:** `get` and `unset` can take the special key `all`. When `all` is used, the given subcommand applies to all relevant keys. If used in conjunction with a modifier, the relevant keys are a subset of the available keys.

## Modifiers

Table 10 lists the modifiers for the subcommands shown in Table 9.

Table 11 lists the subcommand modifier keys.

The `-i` modifier applies only to the `set` and `unset` subcommands, while the `-e` and `-v` modifiers apply only to certain keys.

**Table 10.** ismctl Subcommand Modifiers

Modifier	Purpose
<code>-i &lt;set or unset&gt; &lt;key&gt;</code>	Forces <code>ismctl</code> command to indicate whether server restart is necessary for the set value to take effect. <code>ismctl</code> prints a message to <code>stdout</code> indicating whether a server restart is necessary or not.
<code>-e &lt;extension&gt;</code>	Allows an extension to be specified for or associated with the given MIME type. An example is: <code>ismctl set -e mov mimetype video/quicktime</code> .  The <code>-e</code> can be set to <code>-e all</code> so that the command applies to the <code>.mov</code> , <code>.qt</code> , <code>.mp4</code> , and <code>.sdp</code> .
<code>-v &lt;domain&gt;</code>	Allows a specific domain to be associated with its own content root. An example is: <code>ismctl set. -v domain.com /opt/domain.com/movies</code> .  The <code>-v</code> can be set to <code>-v all</code> so that the given command applies to all domains.

**Table 11.** Subcommand Modifier Keys

Key	Meaning
<code>user</code>	Sets the user Sun Streaming Server runs as. If an incorrect value is specified, the default user, <code>daemon</code> , is used. If the user is changed, make sure that log file <code>/var/log/ismd</code> directory is writable by the configured user.
<code>rtspport</code>	Port <code>ism</code> listens for RTSP requests. Any unused TCP port is valid. The server does not start if an invalid port is used. Default is 554.
<code>sesslimit</code>	Maximum number of concurrent sessions. Default is 2000.
<code>connlimit</code>	Maximum number of concurrent client connections. Default is 2000.
<code>cliconnlimit</code>	Maximum number of concurrent connections from a single client IP address. Default is 100.
<code>mimetype</code>	Maps an extension to a MIME type. The extension (specified with <code>-e</code> ) should not include the leading dot and are not case sensitive. QuickTime files must have type <code>video/quicktime</code> . SDP files must have type <code>application/sdp</code> . MPEG-4 files must have type <code>application/mpeg4</code> . The default MIME type mappings are:  <pre> movvideo/quicktime qtvideo/quicktime mp4application/mpeg4 sdpapplication/sdp </pre>
<code>contentroot</code>	Maps a hostname in the requesting URL to the content path. Enables each “virtual” domain (specified with the <code>-v</code> ) to have a separate path for content.  The default is <code>/opt/ism/movies</code> . The value applies to all domains.  Note that “partial hostnames” are not matched. For example, ‘ <code>my_domain</code> ’ is not matched to ‘ <code>www.my_domain.com</code> ’.

**Table 11.** Subcommand Modifier Keys (Continued)

Key	Meaning
contentprofile	A tuning parameter for optimizing the server for the type of content that is going to be streamed. The primary values are low, medium, high, and mixed, as follows:  low (< 64 Kbps) medium (< 500 Kbps) high (> 500 Kbps) mixed (all bit rates mixed together)  The default value is mixed.
disks	The number of disks used for storing content. Used for optimizing the Sun Streaming Server to the machine. Default is 1. Set to the number of hard disks attached to the machine
all	A special keyword supported in the <code>ismctl get</code> and <code>ismctl unset</code> subcommands to indicate that the subcommand should apply to all relevant keys.  If <code>all</code> is used in conjunction with a modifier, the relevant keys are a subset of the available keys. For example, <code>ismctl get -v www.sun.com all</code> , returns the values for all the keys for the domain <code>www.sun.com</code> that have been modified by the <code>-v</code> modifier.

### Subcommand Syntax

Table 12 lists the `ismctl set` command usage. The following sections show the syntax for each of the subcommands. The general syntax of the `set` subcommand is:

```
ismctl set [modifier] <key> <value>
```

**Table 12.** `ismctl set` Command Syntax

Command syntax for <code>ismctl set...</code>	Sets the...
<code>user &lt;user&gt;</code>	User that the server runs as
<code>rtspport &lt;port&gt;</code>	Port the server listens to.
<code>sesslimit &lt;limit&gt;</code>	Maximum limit of concurrent sessions.
<code>connlimit &lt;limit&gt;</code>	Maximum limit of concurrent connections.
<code>cliconnlimit &lt;limit&gt;</code>	Maximum limit of concurrent connections per client.
<code>-e &lt;extension&gt; mimetype &lt;type&gt;</code>	File <extension> to a given MIME type.
<code>contentroot &lt;path&gt;</code>	Global content root path for the server.
<code>-v &lt;domain&gt; contentroot &lt;path&gt;</code>	Content root for <domain> to <path>.
<code>contentprofile &lt;profile&gt;</code>	Content profile to <profile>.
<code>disks &lt;n&gt;</code>	Number of disks to <n>.

## Get Subcommand

Table 13 lists the `ismctl get` command usage. The general syntax of the `get` subcommand is:

```
ismctl get [modifier] <key>
```

**Table 13.** `ismctl get` Command Syntax

Command Syntax for <code>ismctl get ...</code>	Returns the ...
<code>user</code>	Current user server run as <code>rtspport</code> Port which the server listen to
<code>sesslimit</code>	Maximum limit of concurrent sessions.
<code>cliconnlimit</code>	Maximum limit of concurrent connections per client.
<code>connlimit</code>	Maximum limit of concurrent connections.
<code>-e &lt;extension&gt; mimetype</code>	MIME type mapped to the given extension
<code>contentroot</code>	Content root of the server
<code>-v &lt;domain&gt; contentroot</code>	Content root of the virtual host
<code>contentprofile</code>	Content profile of the server
<code>disks</code>	Disk count of the server
<code>all</code>	Values of all the <code>ismctl</code> configured parameters .

## Unset Subcommand

Table 14 lists the `ismctl unset` command usage. The general syntax of the `unset` subcommand is:

```
ismctl unset [modifier] <key>-v <doma
```

**Table 14.** `ismctl unset` Command Syntax

Command Syntax for <code>ismctl unset -i ...</code>	Sets...
<code>user</code>	User the server runs to default value ( <code>daemon</code> ).
<code>rtspport</code>	RTSP listen port to the default value (554).
<code>sesslimit</code>	Maximum limit of sessions to the default value (2000).
<code>connlimit</code>	Maximum limit of connections to the default value (2000).
<code>cliconnlimit</code>	Maximum limit of connections per client to the default value.
<code>-e &lt;extension&gt; mimetype</code>	Unmaps <code>&lt;extension&gt;</code> from its MIME type. Sets it to the default value, if <code>&lt;extension&gt;</code> is the default extension.
<code>contentroot</code>	Top level content root to the default installed path: <code>/opt/ism/movies</code>
<code>-v &lt;domain&gt; contentroot</code>	No default values set, removes the virtual host for <code>&lt;domain&gt;</code>
<code>contentprofile</code>	Contentprofile to the default value <code>mixed</code>
<code>disks</code>	Disk count to the default value 1
<code>all</code>	All keys to default values and erases modified keyword items added after the default settings.

## Server and Client Interaction Logs

The Sun Streaming Server maintains transactional log files that reflect the interaction between the server and clients. These log files store information regarding connections, requests, and sessions handled by the server. Transactional log files are created in the `/var/log/ismd` directory in Extended Log File Format (ELF).

The log files cycle after the size limit of 512 kB is reached. At any one time, a maximum of five log files of each type exists. For example, when the `session.log` file reaches its size limit, the file is renamed `session.log.0`, and a new `session.log` file is created. If there is a `session.log.4` when `session.log` becomes full, `session.log` is renamed to `session.log.0`, `session.log.0` is renamed `session.log.1`, and so on until `session.log.3` is renamed `session.log.4`. The old `session.log.4` is deleted.

## Sun Streaming Server Error and Event Logs

Sun Streaming Server logs error messages to the `/var/log/messages` file. These error messages reflect any problems the server is experiencing. In addition, events such as starting the server and loading plug-ins are logged.

### Connection Log File

The connection log records all the connections and disconnections that have been made to or from the server. The log includes date, time, IP address received from the client, connect or disconnect events and protocol.

Table 15 lists the fields in the `connection.log` file.

**Table 15.** Connection Log File Fields

Field	Description
date	Date connection was made.
time	Time connection was made.
cs-ip	IP address sent from the client to server.
event	Either a CONNECT or a DISCONNECT.
protocol	Protocol used to communicate with the server (for example, RTSP).

### Request Log Files

The request log records the date and time of each request, the different RTSP requests (“GET,” “DESCRIBE,” “SETUP,” “PLAY,” and “PAUSE”) made to the server. It also includes the Uniform Resource Identifier (URI) from the client and the RTSP status code sent from the server to the client.

Table 16 lists the fields in the `request.log` file.

**Table 16.** Request Log File Fields

Field	Description
date	Date request was made.
time	Time request was made.
cs-method	RTSP method requested by the client (for example, GET, DESCRIBE, PLAY, PAUSE, and so on).
cs-uri	The URI sent from client to server specifying the URI of the stream received by the client.
cs (range)	The RTSP range header sent from the client to the server. This value indicates the specific time range of the stream that should be played.
cs (user-agent)	RTSP User-Agent header sent by the client to the server. This is dependent on the client, often includes the version and name of the client application being streamed to.
c-ip	The IP address of the client.
sc-status	RTSP status code sent from the server to the client. See RFC2326 for more information.
sc (session)	The RTSP session identifier. A series of random letters and numbers that identify the session.
sc (transport)	The RTSP Transport header sent from the server to the client. Specifies the transport, client and server ports, whether multicast or unicast should be used, and so on.

## Session Log Files

The session log contains information about each streaming session, the file that was streamed, the total number of packets sent, the number of packets lost, the protocol used, the average bandwidth, and so on.

Table 17 lists the fields in the `session.log` file.

**Table 17.** Session Log File Fields

Field	Description
date	Date of the session.
time	Time of day the session occurred.
protocol	Protocol used to communicate with the server (typically RTSP).
transport	The lower-level transport being used (for example, UDP or TCP).
avgbandwidth	Average bandwidth in bits per second, calculated based on the session length and the number of bytes streamed.
cs (user-agent)	RTSP User-Agent header sent by the client to the server. This is dependent on the client, often includes the version and name of the client application being streamed to.
cs-uri-stem	Specifies the URI of the stream that the client is receiving.
c-ip	IP address sent from the client to the server.
c-jitter	Jitter value that the client sends.  Jitter, according to RFC 1889 is “An estimate of the statistical variance of the RTP data packet interarrival time, measured in timestamp units.”
cs (user-agent)	RTSP User-Agent header sent by the client to the server. This is dependent on the client, often includes the version and name of the client application being streamed to.
c-pkts-lost-net	Total number of packets lost.
c-pkts-received	Total number of packets received by the client.
c-starttime	Start time of the session sent by the client.
sc-bytes	Number of bytes sent from the server to the client.
c-pkts-lost-net	Total number of packets lost.
s-pkts-sent	Number of packets the server sent.
s-pkts-lost-net	Number of packets lost due to network errors or a lack of network capacity on the server.
s-pkts-lost-drop	Number of packets the server dropped (usually due to CPU limits).
s-pkts-lost-skip	Number of packets the server skipped (usually due to disk limits).
x-duration	The length of the entire RTP session in seconds.

## Sun Streaming Server GUI Software

In the `/opt/SunApps/ism` directory, there is a `stream_ui-2.0-RC1.1.i386.rpm` package that contains an evaluation copy of the Sun Streaming Server graphical user interface (GUI). The `stream_ui-2.0-RC1.1.i386.rpm` package installs the Sun Streaming Server GUI front-end for some of the `ismctl` command/subcommands combinations.

### Installing the Evaluation Software

To install the Sun Streaming Server GUI software package:

1. In the console change to `/opt/SunApps/ism`.

```
# rpm -Uvh stream_ui-2.0-Eval.i386.rpm
```

The following messages appear:

```
Preparing...##### [100%]
1:stream_ui ##### [100%]
Stopping ISM Server
stopping server...
Adding streamui user to the system
Changing ownership of /opt/ism/movies directory
Changing ownership of /opt/stream directory
Changing ownership of /etc/init.d/streamui_httpd
Adding streamui to /etc/sudoers file
Adding Symbolic link in apache directory
Starting ISM Server
server starting...
Starting StreamUI Server
```

Table 18 lists the directories and files created during the rpm installation.

**Table 18.** Sun Streaming Server GUI Evaluation Software—Directories Created

Directories in <code>/opt/stream</code>	Contents
apache	Apache Web server program for the SSS GUI software, keeping the software independent from the system Web server.
pass streampass	File holding the user name and encrypted password combination for logging into the Sun Streaming Server GUI.
php	php files for configuring the Sun Streaming Server server.
web	Web page rendering files for the Sun Streaming Server GUI.

## Starting and Stopping the Sun Streaming Server GUI

The evaluation Sun Streaming Server administration GUI is designed to be modular and uses its own Apache Web server program installed with the package. Starting, stopping, and restarting the SSS administration is done with the command:

```
/etc/rc.d/init.d/streamui_httpd [start|stop|restart]
```

## Sun Streaming Server GUI Administration

Access the Sun Streaming Server GUI from a Web browser using port 10002 and the URL, for example:

```
http://www.<hostname>or<IP_address>:10002/.
```

This brings up the login screen and login using the default username *admin*, with the password *demo*.



**Note:** For security reasons, it is recommended that you change the default password *demo* after logging into the Sun Streaming Server GUI for the first time.

The Sun Streaming Server GUI Administration screen will be displayed.

Table 19 lists the administration functions available through the Sun Streaming Server GUI.

**Table 19.** SSS GUI Administration Functions

Menu Item	Administration Function
Manage Files	Upload and rename movie files Create directories View available disk space
RTSP Port	Change the Sun Streaming Server port (default 554)
Client Control	Change Maximum Connections Change Maximum Client Connections
MIME Types	Change the MIME type program associations
Start/Stop Server	Start, Stop and Restart the Sun Streaming Server
Password	Change the admin password
Logout	Logout of the Sun Streaming Server GUI administration

## Access and Error Logs

The Sun Streaming Server GUI uses the standard Apache Web server *access\_log* and *error\_log* files for logging Web server access and errors located in the */opt/stream/apache/logs* directory.

## JDK™/Tomcat

### Installing the Java Developer Kit (JDK™) and Tomcat Java Server

This version 1.4 of the Java 2 SDK, on the Sun Cobalt LX50 server is supported on x86-compatible platforms running the Linux kernel v2.2.12 and glibc v2.1.2-11 or later. It requires a minimum of 32 MB RAM, 16-bit color mode with KDE or the Gnome desktop in conjunction with displays set to local hosts.

To install the Java 2 SDK, version 1.4:

1. Log in as root, change to the `/opt/SunApps/jdk` directory.
2. Run the `rpm` command to install the Java 2 SDK packages:

```
# cd /opt/SunApps/jdk
# rpm -ivh j2sdk-1_4_0-fcs-linux-i386.rpm
```

The following messages appear:

```
Preparing...##### [100%]
1:j2sdk##### [100%]
```

The Java 2 SDK packages are now installed into `/usr/java/j2sdk1.4.0`.

To install and configure the Tomcat server for Java version 1.4:

1. Change to the `/opt/SunApps/tomcat` directory and list the rpms. Run the `rpm` command:

```
# cd /opt/SunApps/tomcat
# ls -al
ant-1.4.1-4.noarch.rpm
ant-javadoc-1.4.1-4.noarch.rpm
ant-manual-1.4.1-4.noarch.rpm
ant-optional-1.4.1-4.noarch.rpm
...p<<
```

2. Install the tomcat rpms using the `rpm -ivh *.rpm` command:

```
# rpm -ivh *.rpm
```

The following messages appear:

```
Preparing...##### [100%]
1:regex##### [ 6%]
2:xerces-j##### [ 12%]
3:servletapi4##### [ 18%]
4:tomcat4##### [ 25%]
....
```

3. Change to the `/etc/tomcat4/conf` directory, open the `tomcat4.conf` file for editing, and modify the `JAVA_HOME` variable to point to the JDK™1.4 directory (`/usr/java/j2sdk1.4.0`), save and exit the file:

```
# cd /etc/tomcat4/conf
# vi tomcat4.conf
:%s#/opt/IBMJava2-13/bin/java#/usr/java/j2sdk1.4.0#g
qw
```

To start and verify installation of the Java 2 SDK and the Tomcat server:

1. Start the Tomcat server:

```
# tomcat4 start
Using CATALINA_BASE: /var/tomcat4
Using CATALINA_HOME: /var/tomcat4
Using CATALINA_TMPDIR: /var/tomcat4/temp
Using JAVA_HOME: /usr/java/j2sdk1.4.0
```

Take note of the CATALINA\_BASE:, CATALINA\_HOME:, CATALINA\_TMPDIR:, and JAVA\_HOME: directories listed. These directories are important to remember when navigating the Tomcat server.

2. Open a Web browser and type: `http://<localhost>:8180/` where `<localhost>` is your system name.

The Tomcat server page appears; see Figure 7.

Figure 7. Tomcat Server Page



3. To verify the proper installation of the Java 1.4 SDK and Tomcat Java Server click Servlets Examples, located in the left hand side of the browser. Execute the examples to make sure they function properly.

### Tomcat Log Files

The Tomcat server log files for logging, debugging, and error messages are located in the `/var/tomcat4/logs` directory. The log file formats can be configure by modifying the logger elements in `/var/tomcat4/conf/server.xml`.

For more information on log files see the Tomcat Server Configuration Reference Guide, which is part of the installed documentation described in “Tomcat Server Documentation” or see the Apache Tomcat documentation reference in the “Additional Resources”.

## Tomcat Server Documentation

Along with the installation of the Tomcat server is the documentation located in the `/var/tomcat/webapps/tomcat-docs` directory. To access the documentation, click the Tomcat Documentation link located in the left-hand side of the browser shown in Figure 7.

### Getting Started Documentation

The following documents will assist you in downloading and installing Tomcat 4, and building a distribution from the source code.

- *Introduction* - A brief, high level, overview of Tomcat.
- *README.txt* - Describes the contents and directory structure of a Tomcat 4 binary distribution.
- *RUNNING.txt* - Documents the steps necessary to download, install, start and stop a Tomcat 4 server.
- *BUILDING.txt* - Details the steps necessary to download Tomcat 4 source code (and the other packages that it depends on), and build a binary distribution from those sources.

### Administrators Documentation

The Administrator documents are aimed at System Administrators who are responsible for installing, configuring, and operating a Tomcat 4 server and include:

- *Server Configuration Reference* - Reference manual that documents all available elements and attributes that may be placed into a Tomcat 4 `conf/server.xml` file.
- *Class Loader HOW-TO* - Information about class loading in Tomcat 4, including where to place your application classes so that they are visible.
- *JNDI Resources HOW-TO* - Configuring standard and custom resources in the JNDI naming context that is provided to each Web application.
- *Manager App HOW-TO* - Operating the Manager Web app to deploy, undeploy, and redeploy applications while Tomcat is running.
- *Proxy Support HOW-TO* - Configuring Tomcat 4 to run behind a proxy server (or a Web server functioning as a proxy server).
- *Realm Configuration HOW-TO* - Description of how to configure Realms (databases of users, passwords, and their associated roles) for use in Web applications that utilize Container Managed Security.
- *Security Manager HOW-TO* - Configuring and using a Java Security Manager to support fine-grained control over the behavior of your Web applications.
- *SSL Configuration HOW-TO* - Installing and configuring SSL support so that your Tomcat will serve requests using the https protocol.

### Application Developers Documentation

The following documents are aimed at Application Developers who are constructing Web applications or Web services that will run on Tomcat.

- *Application Developer's Guide* - An introduction to the concepts of a Web application as defined in the Servlet 2.3 Specification. Covers basic organization of your Web application source tree, the structure of a Web application archive, and an introduction to the Web application deployment descriptor (`/WEB-INF/web.xml`).
- *Servlet/JSP Javadocs* - The Servlet 2.3 and JSP 1.2 API Javadocs.

## Catalina Developers

The following documents are for Java developers who wish to contribute to the development of the Catalina servlet container portion of Tomcat itself, or to better understand its internal architecture and operation.

- *Functional Specifications* - Requirements specifications for features of the Catalina servlet container portion of Tomcat 4.
- *Javadocs* - Javadoc API documentation for the Catalina servlet container portion of Tomcat 4.

## Jasper Developers

The following documents are for Java developers who wish to contribute to the development of the Jasper JSP container portion of Tomcat itself, or to better understand its internal architecture and operation.

- *Javadocs* - Javadoc API documentation for the Jasper JSP container portion of Tomcat 4.

---

# Restoring Sun Linux From CD-ROM

Sun Linux is restored locally from the CD-ROM drive on the Sun Cobalt LX50 server. Consult the server hardware manual before installation to familiarize yourself with the hardware capability, and with the location and types of connections such as USB, Ethernet, serial and VGA output as necessary.

Turn on power to the Sun Cobalt LX50 server. As the system is booting, press the <ESC> key. After a short delay while the BIOS searches for SCSI devices, the boot device selection menu (Figure 8) will be displayed. In the boot device selection menu, select the CD-ROM, with the Sun Linux OS Restore CD disc 1 in the CD-ROM drive.



**Note:** To restore Sun Linux 5.0, you must have the CD-ROM set and restore locally using the server's CD-ROM drive. You also must connect a VGA monitor to the server, plus a PS/2 or USB keyboard, at a minimum.

**Figure 8.** Boot Device Selection Menu



If the CD-ROM does not appear as a selection, it might not be set up in the BIOS or there may be a problem with the ROM/FDD module. . Refer to the “Troubleshooting” section of this document for more information, or if you experience difficulty. You can access BIOS setup during startup if necessary.

After the BIOS bootstrap sequence finishes, you will see a command line “boot” prompt displayed along with the message:

- To re-install press the <ENTER> key (default after 10 seconds).
  - For rescue mode, type: linux rescue <ENTER>
- boot :

You then have the choice of restoring Sun Linux, or going to Linux Rescue mode.

- If you choose to restore, the start sequence continues with several screens of system checks. The Sun Linux installer will start; it takes about 45 seconds to go through its startup process.
- If you choose `linux rescue`, refer to “Linux Rescue Without Restore” on page 3-47 of this document for more information.



**Warning:** An automatic or rescue re-install will cause previous partitions and configurations to be overwritten. If this is not what you want to do, be sure to select, when presented, the option to save some partitions.

The Sun Linux splash screen is displayed (Figure 9).

**Figure 9.** Sun Linux Splash Screen



After about 20 seconds, the **About to Install** screen is displayed; see Figure 10.

**Figure 10.** About to Install Screen



This screen offers you two choices:

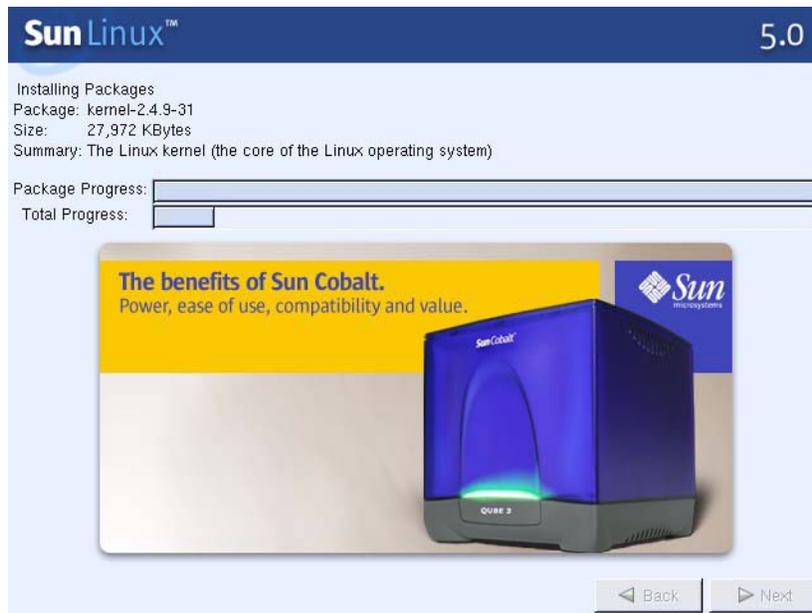
- an automatic restore, where all data on the server hard drive will be overwritten and a fresh standard disk partitioning and OS restore will occur
- a custom partition/restore (SAVE some disk partitions). The custom install allows you to save disk partitions that contain data you want to keep.

Click on the command button you want to start the process. The Sun Installer will be invoked; skip the next section (“Rescue”) and proceed to “Restore (Standard)” or “Restore (Custom)”.

## Restore (Standard)

The screen displays the Installing Packages screen (see Figure 11) and then begins formatting the hard drives. This process takes about three minutes; during which time it will appear that nothing is happening if two drives are installed in the server.

The “Package Progress” status bar then begins changing to track the progress of the install for each package, as well as the total installation. The names of the installed files and packages are displayed in the top left corner of the install screen as they are being installed. The file or package size, and a brief description or summary of the contents is also displayed.

**Figure 11.** Installing Packages Progress Screen

You will be prompted for CD number two; simply change to CD number 2 and the re-install continues automatically, and so on with number 3. The entire process takes about 30 minutes.

As soon as all packages and files are installed, the system configuration will be completed in about one more minute.

You should see the following final output displayed:

```

unmounting filesystems...
  /mnt/runtime done
disabling /dev/loop0
  /proc/bus/usb done
  /proc done
  /dev/pts done
  /mnt/sysimage/boot done
  /mnt/sysimage/dev/pts done
  /mnt/sysimage/diag done
  /mnt/sysimage/home done
  /mnt/sysimage/proc/bus/usb done
  /mnt/sysimage/proc done
  /mnt/sysimage/var done
  /mnt/sysimage done
  /mnt/source done
ejecting /tmp/cdrom...
System halted.  You may now power-down.
```

The above messages indicate a successful OS restore. Now power-down the server.

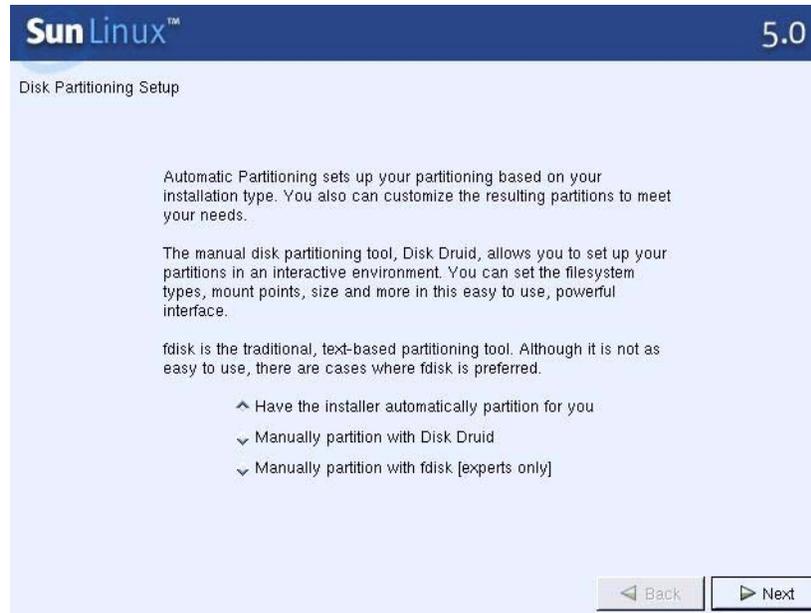
The default restore/re-install configures LILO to run automatically upon power-up, so that LILO will run the next time the server is booted and thereafter. Upon the first boot after a restore, Kudzu will run and report devices that are not already configured as “new”, then give you the option to configure. Otherwise, startup will continue. When complete, the Localhost Login prompt will be displayed on the command line.

See “Logging in and Creating a Password” on page 3-2 for login and password setting information.

## Restore (Custom)

If you choose the “SAVE some disk partitions” command button in the Install screen, the Disk Partitioning Setup screen (Figure 12) will be displayed next.

Figure 12. Disk Partitioning Setup Screen



You have three options on this screen:

- Have the installer automatically partition (highly recommended)



**Caution:** Do not select this choice if you have existing extra partitions on the hard drive(s) of the Sun Cobalt LX50 server, and you want to save them. Choosing this option causes the installer to repartition the hard drive(s), destroying all existing data.

If you want to save some partitions, choose the next option (manual partitioning).

- Manual partition using the Disk Druid utility (next best choice)
- Manual partition using fdisk (for experts only)

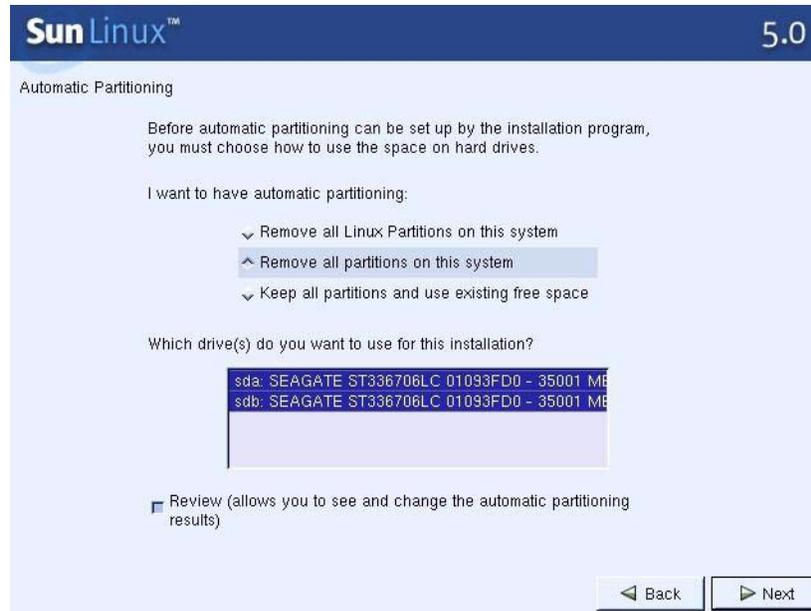
Use the keyboard arrows to highlight an item and then press <ENTER>, or use the mouse and click on a choice to select it. An item is selected when the arrow on the left is turned upward and it is surrounded by a border.

Once you have made the choice, click on the “Next” command button in the lower right of the screen. The next screen displayed depends on the choice you made.

## Automatic Partitioning

If you have selected installer automatic partitioning (recommended method), the Automatic Partitioning screen is displayed (Figure 13).

**Figure 13.** Automatic Partitioning Screen



Using this screen, you can:

- Remove all Linux partitions on the selected drive. Non-Linux partitions will not be affected.
- Remove ALL partitions (destroys ALL data on drive).
- Leave the existing partitioning alone and create additional partitions in free space.

You can also select the drive(s) to partition by clicking on it in the list box. Once you have made your selections, click on the “Next” button to proceed.



**Note:** It is recommended that you check the box (lower portion of window) to enable the Review; this allows you to view and change the automatic partitioning results.

If you selected the first or second option listed above, a warning dialog box (see Figure 14) is displayed.

**Figure 14.** Partitioning Warning Dialog Box



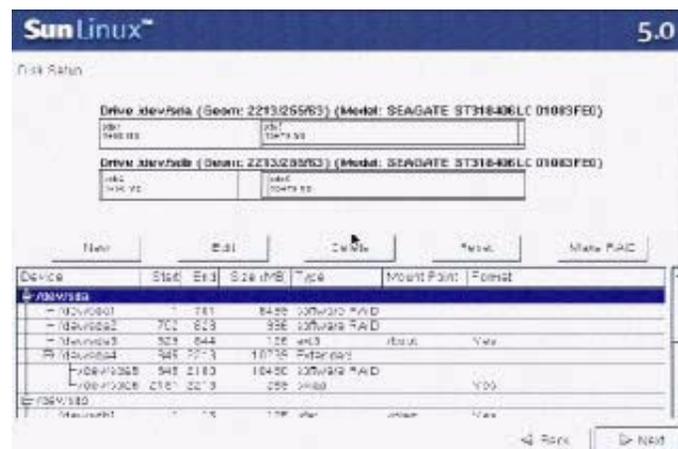
Click the “Yes” button to proceed. The Installing Packages screen (see Figure 11 on page 3-39) is displayed, and the re-install of the packages proceeds in the same manner as described earlier in this document (see “Restore (Standard)” on page 3-38).

If you chose to remove all partitions, after the warning dialog box, the Disk Setup screen see (Figure 15 on page 3-42) is displayed, showing the new configuration that the installer recommends. The Sun Linux 5.0 installer must create partitions for the following:

Mount Point	Minimum Size
/boot	128 MB
/diag	128 MB
/swap	5.5 GB
/var	1.0 GB
/home	1 MB (expands to fill free space on the disk)

You must choose to create this filesystem, unlike other Linux distributions.

**Figure 15.** Disk Setup Screen



This screen contains graphical and tabular displays of information for hard drives installed in the Sun Cobalt LX50 server. Each installed drive is graphically shown in the top part of the screen with partitions shown by vertical lines or marked with text. Those partitions correspond to entries in the table in the bottom half of the screen. If you click on one of the areas in the graphic, the corresponding table entry is highlighted; the reverse is also true.

By selecting areas, and then clicking on the various command buttons located across the middle of the screen, you can configure new partitions, edit existing ones, remove them, reset them to their original state (the state they were in before you began making changes in this screen) or designate them as RAID.

You can use the <Tab> key to select the command buttons, or the partitions listed in the bottom half of the screen and shown graphically in the top half of the screen. Continue pressing the <Tab> key until the partition you wish to select is highlighted. Hit <ENTER>, then tab through the command buttons in the middle of the screen. Note that their borders will be selected when highlighted, until you have selected the action you want (Edit, Delete).

When an item is selected, it is highlighted with a border, or the color of the shading changes slightly. Once an item is selected, press <ENTER>. If you have installed a mouse, you can also just click on an item to select it.

When you select one of the disk lines displayed in the lower half of the screen, the corresponding entry in the graphical displays at the top of the screen is also highlighted. You can use the Up/Down keyboard arrow keys to navigate through the entries in the table until the one you want is highlighted (and active). If you are using a mouse, just click on the menu item or item you wish to select and modify.

## New Partition Setup

Once you have selected a disk area, click on the **New** button to display the screen shown in Figure 16.



### Note:

1. If you create additional partitions, it is recommended that you use the fixed-size option for the additional partitions.
2. Do not perform partition setup unless you are very familiar with and understand all of the issues involved.

**Figure 16.** New Partition Setup Screen

This screen contains a number of list boxes and other selections for configuring the partition. Table 20 describes these selections.

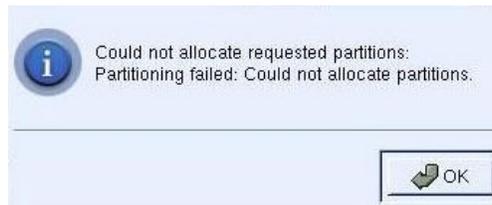
**Table 20.** New Partition Configuration Selections

Item	Description
Mount Point	Selects where in the Linux file system the partition will be mounted
Filesystem Type	Allows you to designate it as vfat, software RAID, ext, or swap
Allowable Drives	Lists installed drives that can be partitioned
Size (MB)	Enables you to choose the size of this partition
Additional Size Options	Provides more choices for partition size and use
Force to be a primary partition	Checkbox, enabled when it appears as a larger-sized box
Check for bad blocks.	Checkbox, enabled when it appears as a larger-sized box. Invokes a function that prevents data from being written to bad blocks by scanning the hard drive and mapping out bad blocks (this will take some time).

Once your selections have been made, click **OK** to save them and close the screen, or **Cancel** to exit without saving.

If you have made selections that are errors, the screen does not let you save the changes; instead, an error dialog box is displayed. An example is shown in Figure 17.

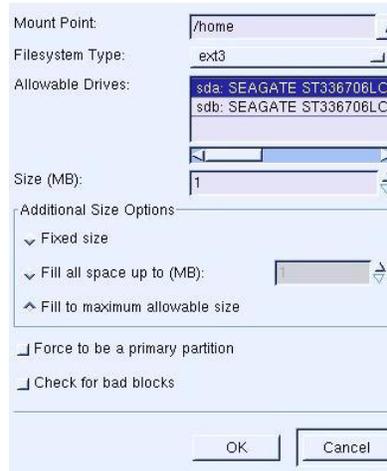
**Figure 17.** Partitioning Configuration Error Message



## Edit

Clicking the **Edit** button, with a disk area selected, displays a dialog box (see Figure 18) with selections for modifying the selected partition.

**Figure 18.** Partition Editing Screen



In this screen you can change the Mount Point, or change the type of file system (RAID, vfat, ext, or swap).

Click **OK** to save and exit.

## Delete

Clicking on a defined partition in the table, or disk graphic, and then clicking on the **Delete** command button removes the partition completely and makes the space available to other partitions.

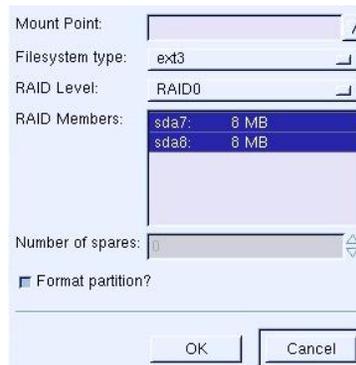
## Reset

Clicking the **Reset** command button resets the partition configuration of the entire disk drive to its original state (what the setup was before you began modifying it). This is a valuable tool to use in case you have modified partitions but encounter errors, or simply change your mind.

## Make RAID

Selecting a disk area and then clicking on the **RAID** command button displays the RAID Configuration dialog box (see Figure 19).

**Figure 19.** RAID Configuration Dialog Box



Use the selections in this box to set up this RAID partition. RAID 1 is the default setting for a two-drive Sun Cobalt LX50 server. Obviously, the server must have two hard drives installed in order to use RAID.

The last choice to make from the Automatic Partitioning screen (Figure 13 on page 3-41) is “Keep all partitions and use existing free space”. Select this option and then click the **Next** button.

## Manually Partitioning (With Disk Druid)

Disk Druid is a graphical partitioning configuration utility.

Select this option in the Disk Setup screen (Figure 15 on page 3-42) to go right to the Disk Setup screen (Figure 16 on page 3-43). This screen has the same function, and is used the same way, as discussed in previous sections. Disk Druid is used for partitioning by the Sun Linux 5.0 installer to perform automatic partitioning, or you can use it manually.

In order to create a partition manually, you must create the following partitions::

```
/ partition
/var partition
/home partition
swap partition
```



**Note:** Do not format any existing partitions that you want to save

## Partitioning Using Fdisk

Selecting the *Manually partition with fdisk* item in the Disk Partitioning Setup screen (Figure 12) brings up another screen that allows you to select the drive on which `fdisk` will operate (if you have more than one drive installed) by clicking on a command button. Doing so then displays a window containing a command line for the `fdisk` utility. `fdisk` runs from this command line in much the same way as it does from a DOS command line, with all of the typical menu items.

Enter <q> to quit when finished.



**Note:** Partitioning using `fdisk` is not recommended. It is a much less user-friendly tool and is more difficult to use in this environment, with the installer, than Disk Druid.

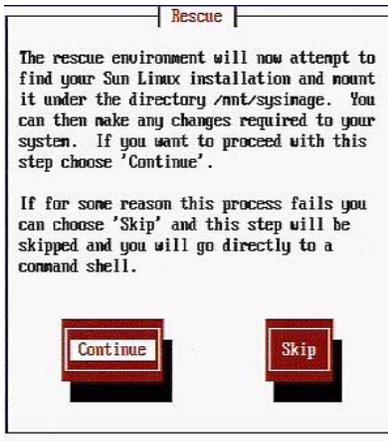
## Linux Rescue Without Restore

If you typed `linux rescue` and entered it at the `boot :` prompt the Sun Linux Installer will run and the Rescue screen (see Figure 20) will be displayed after the installer starts.



**Note:** Sun Linux 5.0 does not support the use of additional driver disks during the restore process. Such disks can only be used after Sun Linux is booted from the hard disk of the Sun Cobalt LX50 server.

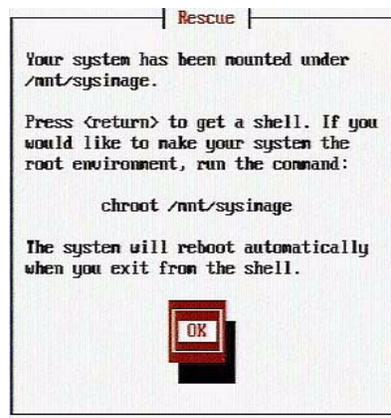
**Figure 20.** Rescue Installation Screen



The Rescue screen gives you the choice of attempting to make changes to your system installation through the `sysimage` file, or going to a command shell.

If you choose `Continue`, the Installer will mount the Linux image so that it can load at next reboot. If this operation is successful, the screen shown in Figure 21 will be displayed.

**Figure 21.** Mount Completed Screen



If the operation is unsuccessful, the screen shown in Figure 22 will be displayed. Press <ENTER> to exit the screen and go to the shell (command line prompt). You can then manually attempt to solve the problem.

**Figure 22.** Rescue Mode Error Screen



You can press <ENTER> and go to the shell, or power-down and perform a Restore operation. If you intend to use automatic restore and let the Installer handle all partitioning and setup for you, that might be the easiest way to proceed at this point.

If you had chosen the **Skip** command button in the Rescue Installation screen (Figure 20), and the system is located and a system image (sysimage) is created, you will go right to the shell and the prompt shown below will be displayed. You can perform any necessary operations at this time:

```
When finished please exit from the shell and your system will reboot.  
sh-2.05#
```

When you are finished, type **exit** at the prompt and <RETURN> to exit the shell. When the message **System Halted. You may now-power down** is displayed, power down the Server. Upon power up the system will boot and run LILO.

## Using a Remote Console (Monitor) Through a Serial Connection

You can connect a remote console, for example a laptop PC, through a serial port to the LX50 server. Using a remote terminal emulation application, such as Hyperterminal, you can implement Linux rescue, or view log information output from the server over the serial port during the restore process.

You will need the RJ45-to-DB9 adaptor. You will also need a serial cable. The serial port on the front panel of the Server is accessible through the RJ-45 connector located at the top right corner of the panel, or you can connect to the RJ-45 serial connector on the back panel (see Chapter 2 of this document for a diagram of the rear panel connections). When a device is plugged into the front panel, the rear port is automatically disabled. Connect to an available serial port on the PC, then start a terminal communications utility program, such as Hyperterminal, to make a serial connection and display the console output. Table 21 lists settings and other considerations for serial console use.

The Serial Console Redirection is enabled by default. To change the default Serial Console settings in BIOS do the following steps:

1. During the initial boot up sequence press key <F2>
2. In the BIOS Setup Utility menu, use the arrow keys and select the Server option
3. Select Console Redirection option from the Server menu, and hit enter
4. From the Console Redirection menu the following settings can be changed:
  - Enable/Disable the Serial Console Redirection;
  - Serial Port: COM2 IRQ3 by default
  - Baud Rate: 9600 by default
  - Flow Control: No Flow Control

5. Select F10 / Yes
6. The machine will reboot with the new settings. If you modify the baud rate setting, you will need to make changes to the following files from within Linux:

`/etc/inittab`

- change the 9600 in the following line to match your baud rate:

```
7:12345:respawn:/sbin/mgetty -s 9600 -r -b ttyS1
```

`/etc/lilo.conf`

- change occurrences of 9600 with the baud rate specified in the bios

6. Run the LILO command at the command prompt
7. Reboot

## Disabling Serial Console Redirection

You may wish to disable the serial console redirection if you want to attach a device (e.g., modem) to the serial port.

1. Complete the first part of the previous section and select Disable for Serial Console.
2. Redirection.
  - reboot the machine after the BIOS settings was saved
  - on the command prompt log in as root
  - edit the `/etc/inittab` file
    - comment out the following line by putting the '#' character in front of it:

```
# 7:12345:respawn:/sbin/mgetty -s 9600 -r -b ttyS1
```
    - save the changes and exit your editor
3. Edit the `/etc/lilo.conf` file.
  - modify the line that reads "default=linux" to "default=linux-serial"
  - save the changes and exit your editor
4. Run the lilo command on the command prompt.
5. Reboot.

**Table 21.** Considerations for Serial Console Use

Item	Comments
Remote Terminal Settings	Set the Terminal emulation for ANSI emulation, 9600 BAUD, 8 - N- 1. No flow control.
Linux Rescue or Restore (log view) Command Line Ebttries	To use the serial console in Linux Rescue mode, let the server boot from the CD-ROM with the Sun Linux Restore CD #1 in the CD-ROM drive. Enter, at the boot prompt, the following information:  boot: linux rescue console=ttyS1,9600  To use the serial connection to view log information during the Restore process, enter:
Making Server BIOS Setup Changes	When using Minicom or Kermit, keyboard function key F10 does not save BIOS changes and exit, as it should.  In Hyperterminal, F10 also does not save and exit.
Server Power-down While Using Linux Serial Mode	If you use the LILO option for Linux serial, you must have an active RS-232 connection made to the server. If you do not, the server will not power down until an active connection is made.
Closing Serial Port Session	From the perspective of the server, the serial session will not close automatically if the RS-232 cable is unplugged. Therefore, you must close the connection in your terminal problem when finished to avoid leaving the session active and the server port open.

---

## Administration

### Managing, Configuring and Validating Server Operation

The built-in service partition on the hard disk of the Sun Cobalt LX50 server allows you to perform server management, configuration and validation testing. To bring up the service partition, reboot and press the <F4> function key when the first BIOS screen appears.

Any configuration changes (CPU, memory, hard disk, add in PCI cards, and so forth) causes the Sun Cobalt LX50 server to revert to its factory-default state, regardless of how the server boot options have been set up using System Setup Utility (SSU) or the BIOS setup.

### Server Configuration and Management

This section provides an overview as to what options and settings are available from the service partiton, using SSU and SCB2.

SSU allows you to manage the following:

- System Event Log (SEL)
- System Data Records (SDR)
- Field Replaceable Units (FRU)
- Platform Events

SSU allows you to configure the following:

- User Preferences
- Boot devices
- Security

Server configuration and management is done from the service partition. You can access the service partition by pressing <F4> during startup. After a short delay, the Service Partition Menu will be displayed. Use arrow keys and <ENTER> to choose the Create Diskettes or System Utilities functions. Use the <ESC> key to back out of menus or selections.

**Figure 23.** Service Partition Menu



**Figure 24.** System Utilities Menu



Choose the “Quit to DOS” menu item. Then:

1. When the service partition DOS prompt (C:) appears, change directories to SSU:

```
cd SSU
```

2. Enter one of the following commands at the prompt:

```
C:\SSU SSU (graphics mode, easiest to use if you have a mouse connected), or
```

```
C:\SSU /t (text mode, suitable for HyperTerminal, for example)
```

## Managing the System Event Log

The server maintains a system event log in non-volatile memory. The log can be viewed and cleared using the SSU. To manage the log, double-click the SEL Manager menu item on the Available Tasks pane of the main SSU window. The System Event Log appears, and you can use the menu bar at the top of the log window to save the log, open a log, clear the log, reload the log, and sort the log.

## Managing the Sensor Data Records

The Sensor Data Record (SDR) Manager allows you to view the current sensor data for the system, save the SDR data to a file, and view SDR information previously saved to a file. The SDR data is saved in standard SDR format. To manage the SDR data, double-click the SDR Manager menu item on the Available Tasks pane of the main SSU window. The SDR Manager main window appears, and you can use the menu bar at the top of the window to manage SDR data.

## Managing the Field Replaceable Units

The Field Replaceable Unit (FRU) Manager allows you to view the FRU information stored in the Sun Cobalt LX50 server. The FRU records contain information about the system components, such as manufacturer's name, product name, part number, version number and asset tags. This information may prove useful when troubleshooting faults in the server.

To manage the FRUs, double-click the FRU Manager menu item on the Available Tasks pane of the main SSU window. The FRU Manager main window appears, and you can use the menu bar at the top of the log window to manage FRU information.



**Note:** Only two fields can be changed. These are accessed from the service partition menu system. You can change the system serial number from the chassis and asset tracking number. Both of these are customer-optional fields that are left blank when the system is shipped from the factory

## Managing Platform Events

The Platform Event Manager (PEM) allows you to configure and manage Platform Event Paging (PEP), BMC-LAN Configuration, and the Emergency Management Port (EMP).

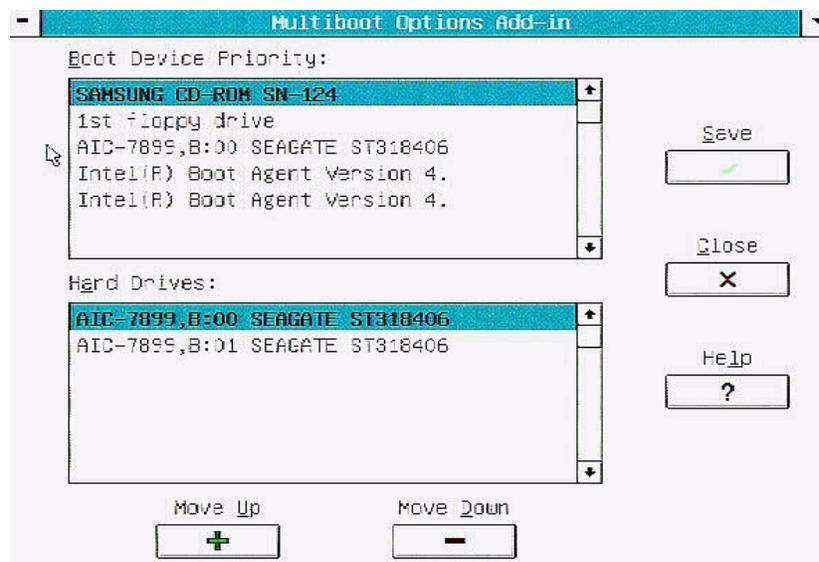
To use PEM, double-click the Platform Event Manager menu item on the Available Tasks pane of the main SSU window. The Platform Event Manager main window appears. You can click on the buttons in this window to perform platform management.

## Configuring Boot Devices

The Multiboot Add-in (MBA) feature of the SSU allows you to select the boot order for all bootable peripheral devices. To select the boot device priority, double-click the MBA Boot Devices menu item in the Available Tasks pane of the SSU main window. The Multiboot Options Add-in window appears (see Figure 25).

To change boot priorities, select a boot device and use the Move Down and Move Up buttons move the device boot priority.

Figure 25. Multiboot Add-in Window

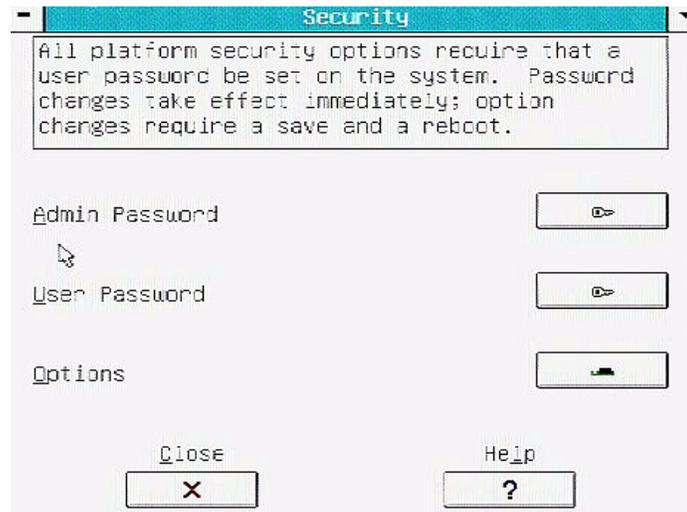


## Configuring Security

The Password Authorization feature of the SSU allow you to set BIOS passwords and other security options. To configure server security, double-click the PWA Security menu item in the Available Tasks pane of the SSU main window. The main Security window appears (see Figure 26).

Use the **Admin Password**, **User Password** and **Options** buttons to configure the security options.

**Figure 26.** Security Main Window



## Setting User Preferences

The following user preferences may be set from the main SSU window:

- Color (foreground and background)
- Mode (expert, intermediate, novice)
- Language
- Status Bar Display

## Server Validation Testing

Server Validation testing is also performed from the service partition. Follow the directions listed in the Server Configuration and Management section of this document to access the service partition. To perform server validation testing, follow these steps:

1. When the service partition DOS prompt (C:) appears, change directories to SCB2TEST:

```
cd SCB2TEST
```

2. Enter the following command at the prompt:

```
C:\SCB2TEST> RUNTEST
```

The Sun Cobalt LX50 server BYO Platform Confidence Test main menu appears, as shown in Figure 27. You can use this menu to perform various platform tests.

Figure 27. Platform Confidence Test Window



---

## Troubleshooting

This section covers basic troubleshooting information.

### Sun Linux Will Not Install from Local CD-ROM

Three things must occur in order to install from the CD-ROMs:

1. The system BIOS must detect the installed CD-ROM drive.
2. The BIOS must be setup to boot from the CD-ROM drive.
3. A valid bootable CD-ROM must be installed in the drive.

If you power up the server and then press <F2> at the bootup screen, the server enters BIOS setup mode. Navigate to the BOOT screen, then to the boot priority list. Select either the 1st or 2nd order in the list. You should then be able to select the CD-ROM drive. If you cannot get the CD-ROM selection to display, something is wrong with the hardware. If the floppy/CD-ROM module has power, then check the data connector.

Once the BIOS detects the presence of the CD-ROM drive, select it as either the 1st or 2nd boot device. It is suggested that you select Removable Device (floppy drive) as the first boot priority, in case you need to boot from a floppy later. Make the CD-ROM the 2nd order device, then the hard drive 3rd.

After you verify the BIOS is correctly setup, make sure the installed CD-ROM is the correct one. It should have the **boot.img**, **bootnet.img**, or **pcmcia.img** (and other) image files in the images directory. If it is the correct disk but will not boot and install, the disk may be damaged.

## Serial Console Doesn't Work

1. Check if the cable is plugged in.
2. Check if the Serial Console is Disabled.
3. Check if the Baud Rate for your tool is set up also to 9600 (or whatever you have the serial console set up as).
4. Reboot the system if you unplugged the Serial Console cable while you have the Serial Console connection open, because the port session does not disconnect when the serial cable is removed.

## System Initialization Sequence Does Not Display on Remote Console (Serial Connected)

Make sure that you either have Linux-serial set up as a default LILO setting, or that you have entered it in at the LILO boot prompt.

## startx Does Not Start the X Windows System

X Windows may not start correctly if your keyboard, mouse, or monitor aren't correctly recognized. Rerun the setup utility to make sure that X Windows is configured properly. If you are using a USB mouse, make sure that it was plugged in when you started up your system. Otherwise, you will need to reboot it to get it to recognize it correctly.

## Mouse/keyboard Do Not Work

Check to see if your mouse and keyboard are plugged in. If you need to use both PS/2 keyboard and mouse at the same time, use the PS/2 splitter.



**Note:** Legacy USB support is not enabled by the BIOS. As a result, USB keyboards and mice will not be recognized until after the Linux operating environment has loaded. In particular, selecting different options in LILO will not work with a USB keyboard.

You may have trouble with your keyboard if the keyboard has different keymap setting. Run 'setup' to reconfigure your keyboard. Similarly, you can run 'setup' to reconfigure your mouse if your settings have changed.

## Error Messages

### ERROR: 84FF: System Event Log Full

This is simply a notification during bootup that the BIOS Event Log file on the Sun Cobalt LX50 server is full and should be cleared. The log has a 400-message size limit.

If the Event Log is not read periodically and cleared, it will eventually fill. You can proceed with the install and ignore this by pressing the <F1> key. The event log can be accessed and read from BIOS setup, or using the System Setup Utility (SSU). See the Server Configuration and Management section of this chapter for more information on SSU.

You can also configure the event log to clear upon bootup. At startup, press <F2> to enter BIOS setup. Navigate to the Server tab, then to the Event Log Configuration item. Select the Clear All Event Logs item and press <ENTER>. Select YES and press <ENTER> again. Exit BIOS setup while saving the changes.

### System Reports That it Can't Detect a Modem

You probably still have serial redirection enabled. Disable it before attaching a modem.

