



# Sun Fire™ X2100 Server User Guide

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Sun Microsystems, Inc.  
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# Preface

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The *Sun Fire X2100 Server User Guide* provides a detailed description of the hardware and software applications that support the Sun Fire X2100 Server. This book is intended for system administrators, network administrators, and service technicians who have an understanding of server hardware and software.

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## Before You Read This Book

- [Chapter 1](#)      Contains an overview of the Sun Fire X2100 Server.
- [Chapter 2](#)      Contains information about troubleshooting the server.
- [Chapter 3](#)      Contains information about diagnostics.
- [Chapter 4](#)      Contains information about removing and replacing components.
- [Appendix A](#)    Contains information on system specifications.
- [Appendix B](#)    Contains information on BIOS POST codes.
- [Appendix C](#)    Contains information on using the optional M3290 service processor.
- [Appendix D](#)    Contains information on setting up a PXE server to run the Supplemental CD.

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# Shell Prompts

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

---

# Typographic Conventions

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

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

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## Related Documentation

For a description of the document set for the Sun Fire X2100 server, see the product's documentation site at the following URL:

[http://www.sun.com/products-n-solutions/hardware/docs/Servers/Workgroup\\_Servers/x2100/index.html](http://www.sun.com/products-n-solutions/hardware/docs/Servers/Workgroup_Servers/x2100/index.html)

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

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Sun Function	URL
Documentation	<a href="http://www.sun.com/documentation/">http://www.sun.com/documentation/</a>
Updates, including firmware, drivers, and CD-ROM ISO images	<a href="http://www.sun.com/servers/entry/x2100/downloads.jsp">http://www.sun.com/servers/entry/x2100/downloads.jsp</a>
Technical support	<a href="http://www.sun.com/service/contacting">http://www.sun.com/service/contacting</a>
Training	<a href="http://www.sun.com/training/">http://www.sun.com/training/</a>
Solaris™ Operating System documentation	<a href="http://docs.sun.com">http://docs.sun.com</a>
Warranty	<a href="http://www.sun.com/service/support/warranty/index.html">http://www.sun.com/service/support/warranty/index.html</a>

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Please include the title and part number of your document with your feedback: *Sun Fire X2100 Server User Guide*, 819-3721-13.

# Introduction to the Sun Fire X2100 Server

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This chapter provides an overview of the Sun Fire™ X2100 Server, as well as power-on and power-off procedures and information about installing components.

The following sections are included in this chapter:

- [Section 1.1, “Features” on page 1-2](#)
- [Section 1.2, “Operating System and Software” on page 1-3](#)
- [Section 1.3, “Hardware System Overview” on page 1-5](#)
- [Section 1.4, “Powering the Server On and Off” on page 1-8](#)
- [Section 1.5, “Customer-Orderable Components” on page 1-10](#)

# 1.1 Features

TABLE 1-1 shows the system's key components.

**TABLE 1-1** Sun Fire X2100 Server Features

<b>Component</b>	<b>Description</b>
CPU	<ul style="list-style-type: none"><li>• One single- or dual-core AMD Operton processor</li><li>• Processor frequencies: 2.2 GHz and faster</li><li>• Up to 1 MB level 2 cache</li></ul>
Memory	<ul style="list-style-type: none"><li>• Four DIMM slots</li><li>• Each DIMM socket supports 512 MB, 1 GB, and 2 GB DDR1 400 SDRAM (3.05 cm max. height) modules</li><li>• Unbuffered ECC memory</li></ul>
Media storage	<ul style="list-style-type: none"><li>• Optional DVD-ROM</li></ul>
Hard disk drives	<ul style="list-style-type: none"><li>• Up to two SATA disk drives</li></ul>
Power supply	<ul style="list-style-type: none"><li>• 300W PSU</li></ul>
Network I/O	<ul style="list-style-type: none"><li>• Two 10/100/1000BASE-T Gigabit Ethernet ports</li></ul>
PCI I/O	<ul style="list-style-type: none"><li>• One PCI-Express x8 riser card supporting full-height, short length x1, x4 or x8 cards up to 25W</li></ul>
Other I/O	<ul style="list-style-type: none"><li>• Four USB 2.0 connectors on the rear panel and two on the front panel</li><li>• Onboard ATI Rage XL PCI graphics controller with 8 MB memory</li><li>• One serial RS232 port with DB9 connector</li></ul>
System management	<ul style="list-style-type: none"><li>• Optional IPMI 1.5 compliant service processor module</li></ul>

---

## 1.2 Operating System and Software

### 1.2.1 Operating System Software

#### 1.2.1.1 Preinstalled Software

Your Sun Fire X2100 Server has the Solaris™ 10 Operating System (OS) and Sun Java™ Enterprise System (Java ES) installed if the server has at least one hard drive.

For information on configuring the preinstalled Solaris 10 OS for the Sun Fire X2100 Server, refer to the *Sun Fire X2100 Server Getting Started Guide*, 819-3720.

For further information on the Solaris 10 OS, see the Solaris 10 OS documentation at:

<http://docs.sun.com>

#### 1.2.1.2 Supported Operating Systems

TABLE 1-2 shows the operating systems currently available for the Sun Fire X2100 Server:

**TABLE 1-2** Minimum Supported Operating Systems

Operating System	Minimum Version	32-bit	64-bit	Vendor Certified?
Solaris™ 10 Operating System with Sun Java™ Enterprise System	Solaris 10 1/06	yes	yes	yes
Red Hat Enterprise Linux 3	Update 6	yes	yes	yes
Red Hat Enterprise Linux 4	Update 2	yes	yes	yes
SUSE Linux Enterprise System 9	SP2 (single core) SP3 (dual core)	yes	yes	yes
SUSE Linux Enterprise System 10		no	yes	yes
Windows Server 2003 Standard/Enterprise Editions (32-bit and 64-bit)	SP1	yes	yes	yes

An updated list of supported operating systems is available at the following URL:

<http://www.sun.com/servers/entry/x2100/os.jsp>

Sun sells Red Hat Enterprise Linux versions 3 and 4, and SUSE Linux Enterprise System 9, at the following URL:

<http://www.sun.com/software/linux/index.html>

Instructions for installing these operating systems are available in the media sets that come with the operating system software.

After installing the operating system, refer to the *Sun Fire X2100 Server Getting Started Guide*, 819-3720, for further information on updates and drivers that need to be installed.

## 1.2.2 Supplemental CD Software

The Sun Fire X2100 Server Supplemental CD, included with the server, contains the following software:

- Supplemental drivers to support preinstalled or user-installed operating systems. See the *Sun Fire X2100 Server Getting Started Guide*, 819-3720, for information on installing these drivers.
- Eurosoft Pc-Check diagnostics software, which provides various diagnostics testing options for the Sun Fire X2100 Server. See [Chapter 3](#) for more information.

## 1.2.3 System Management

The M3290 Service Management Daughter Card (SMDC) is an optional service processor that you can install on your Sun Fire X2100 Server.

See [Appendix C](#) for additional information on system management using the SMDC and an IPMI v1.5 client.



## 1.3 Hardware System Overview

The following sections describe the hardware orientation and features of your Sun Fire X2100 Server.

### 1.3.1 Front and Rear Panels

FIGURE 1-1 illustrates the front panel of the Sun Fire X2100 Server.

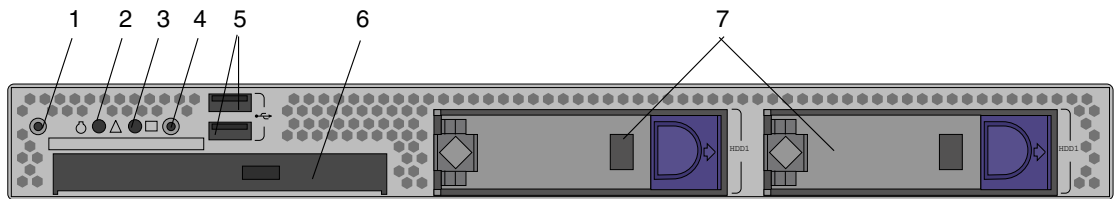


FIGURE 1-1 Front Panel

TABLE 1-3 Front Panel

Label	Button/LED/Port	Label	Button/LED/port
1	Locate LED	5	USB ports (2)
2	Status LED	6	DVD drive (optional)
3	Power LED	7	Hard disk drives (0, 1 or 2 optional)
4	Power button		

FIGURE 1-2 depicts the rear panel of the Sun Fire X2100 Server.

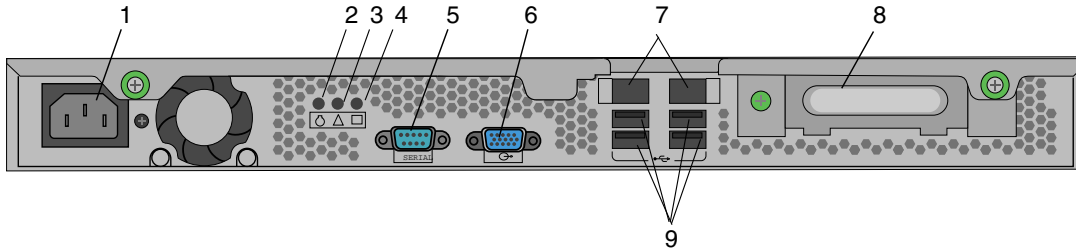


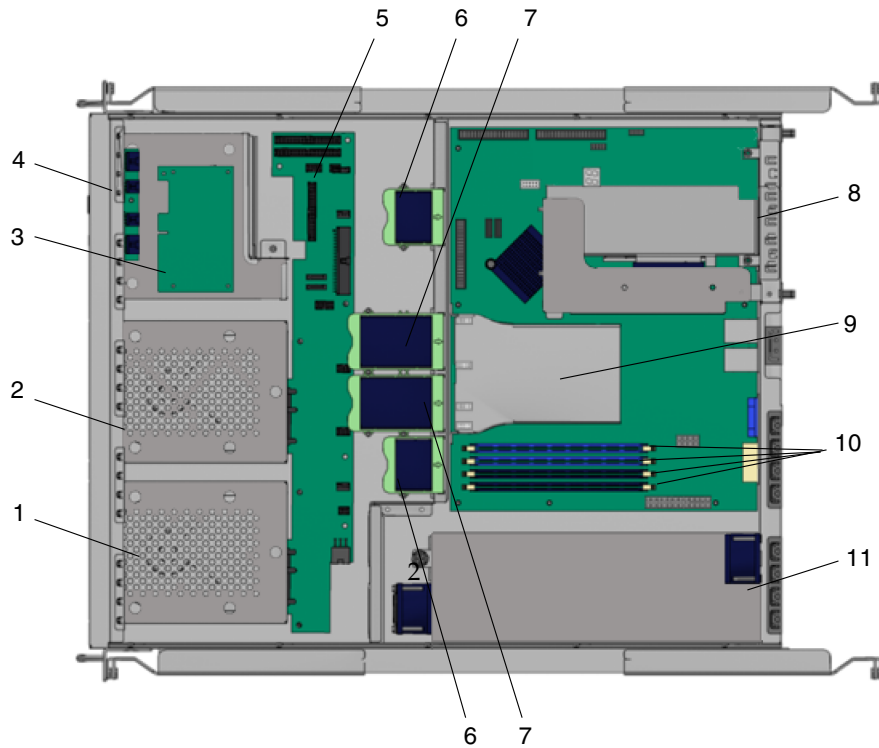
FIGURE 1-2 Rear Panel

TABLE 1-4 Rear Panel

Label	Connector/Slot	Label	Connector/Slot
1	Power connector	6	Onboard HD15 video connector
2	Locate LED	7	Ethernet connectors (2)
3	Status LED	8	PCI-Express x8 slot
4	Power LED	9	USB connectors (4)
5	Serial connector		

## 1.3.2 Internal Components

FIGURE 1-3 shows the locations of the components inside the Sun Fire X2100 Server.



**FIGURE 1-3** Sun Fire X2100 Server System Components

**TABLE 1-5** Sun Fire X2100 Server Internal Components

Label	Component	Label	Component
1	Hard drive 2	7	Dual fan modules (2)
2	Hard drive 1	8	PC-Express card and riser
3	Optional service processor	9	Air baffle
4	Optional DVD drive	10	DIMM slots (4)
5	SATA backplane	11	Power supply
6	Single fan modules (2)		

---

## 1.4 Powering the Server On and Off

### 1.4.1 Powering On the Server

After making sure that you have set up the system properly and connected all the required cables as shown in the *Sun Fire X2100 Server Getting Started Guide*, 819-3720, you can power on your system.

---

**Tip** – If you are installing optional internal components such as additional memory DIMMs, PCI cards, optical drives, or hard drives, install those components before you power on the server. See [Chapter 4](#) for removal and replacement procedures. If you are not installing optional components, you are ready to power on the server.

---

Follow these steps to power on the server:

1. **Turn on the power to the monitor and to all external devices.**
2. **Press and release the server Power button on the front panel** (see [FIGURE 1-1](#)).
3. **After several seconds, verify that the power LED next to the Power button is lit.**  
The power LED lights after the server begins the internal booting process ([FIGURE 1-1](#)).
4. **If you are powering on the server for the first time, you need to install the operating system after the system has finished booting.**

See [Section 1.2.1, “Operating System Software” on page 1-3](#) for more details.

If you need to change the system parameters in the BIOS, press the F2 key during the Power-on Self Test (POST) process to access the BIOS Setup Utility.



---

**Caution** – Be careful when making changes to the system BIOS, as certain changes can cause your system to malfunction.

---

## 1.4.2 Powering Off the Server

1. **Save your data and close any open applications.**
2. **Read all of the following power-off options before powering off the server:**
  - Power off the server by using the operating system shutdown command or menu option.  
In most cases, this option powers off the operating system, then turns off the power to the server.
  - If the server power is not turned off through the operating system command or this command is not available, press and release the Power button (location shown in [FIGURE 1-2](#)).  
This option initiates an orderly shutdown of the operating system and powers off the server.



---

**Caution** – Use one of the first two options whenever possible to avoid data loss.

---

- If the server power is not turned off with one of the first two options, press and hold the Power button for approximately 4 seconds.  
This option shuts down the power to the server but does *not* initiate an orderly shutdown of the system. This method could result in data loss.

If the preceding options fail to power off the server, see [Section , “Troubleshooting” on page 2-1](#) for more options.

After powering off the server, wait at least four seconds before powering on the server again.

## 1.4.3 Power Interruptions

If the power to the system is interrupted for less than ten seconds, do the following to ensure that the standby power is completely shut off:

1. **Unplug the AC power cord from the server.**
2. **Wait ten or more seconds.**
3. **Plug the power AC cord into the server.**
4. **Power on the server.**

---

## 1.5 Customer-Orderable Components

You can order additional components and replacement parts for the Sun Fire X2100 Server.

Contact your local Sun sales representative for more information. For the most up-to-date component information, see the components list on the following web site:

[http://sunsolve.sun.com/handbook\\_pub/Systems/](http://sunsolve.sun.com/handbook_pub/Systems/)

# Troubleshooting

---

This chapter contains information on troubleshooting procedures, power-on self-test (POST) codes and technical support contacts.

This chapter includes the following sections:

- [Section 2.1, “Troubleshooting Overview” on page 2-2](#)
- [Section 2.2, “Visual Inspection” on page 2-2](#)
- [Section 2.3, “Troubleshooting Procedures” on page 2-4](#)
- [Section 2.4, “Technical Assistance” on page 2-7](#)

---

## 2.1 Troubleshooting Overview

Before troubleshooting your specific server problem, answer the following questions:

- What events occurred prior to the failure?
- Was any hardware or software modified or installed?
- Was the server recently installed or moved?
- How long has the server exhibited symptoms?
- What is the duration or frequency of the problem?

After you have assessed the problem and noted your current configuration and environment, you can choose from several ways to troubleshoot your server:

- Visually inspect your system as described in [Section 2.2, “Visual Inspection” on page 2-2](#).
- View the troubleshooting procedures in [Section 2.3, “Troubleshooting Procedures” on page 2-4](#) to see if any of them solve the problem.
- If the BIOS halts without displaying an error message, see the Port 80 LED for BIOS POST messages. [Appendix B](#) lists the descriptions of the BIOS POST codes.
- Execute a diagnostics test as described in [Chapter 3](#).
- If you are not able to resolve the problem, contact Sun technical support. Support numbers are shown in [Section 2.4, “Technical Assistance” on page 2-7](#).

---

## 2.2 Visual Inspection

Improperly set controls and loose or improperly connected cables are common causes of problems with hardware components. When investigating a system problem, first check all the external switches, controls, and cable connections. See [Section 2.2.1, “Performing an External Visual Inspection” on page 2-3](#).

If this does not resolve your problem, then visually inspect the system’s interior hardware for problems such as a loose card, cable connector, or mounting screw. See [Section 2.2.2, “Performing an Internal Visual Inspection” on page 2-3](#).



## 2.2.1 Performing an External Visual Inspection

1. Turn off the system and any attached peripherals.
2. Verify that all power cables are properly connected to the system box, the monitor, and the peripherals.
3. Inspect connections to any attached devices, including network cables, keyboard, monitor, and mouse, as well as any devices attached to the serial port.

## 2.2.2 Performing an Internal Visual Inspection

1. Shut down the operating system, if necessary.
2. Disconnect the power cord from the back of the system box.
3. Turn off any attached peripherals.
4. Remove the server cover, using the procedures in [Section 4.2, “Installation Precautions”](#) on page 4-2.



---

**Caution** – Some components, such as the heatsink, can become extremely hot during system operations. Allow these components to cool before handling them.

---

5. Verify that the interior components are fully seated in their sockets or connectors and that the sockets are clean.
6. Verify that all cables inside the system are firmly attached to their respective connectors.
7. Replace the top cover.
8. Reconnect the power cord to the system box, the monitor and any attached peripherals.
9. Power on the system.

## 2.3 Troubleshooting Procedures

[TABLE 2-1](#) lists problems that might arise as you use your server. Possible solutions are listed for each problem. If the solutions listed here do not fix the problem, run the appropriate diagnostic test (see [Chapter 3](#)).

**TABLE 2-1** Troubleshooting Procedures

Problem	Possible solution
Server does not power on when you press the front panel power button.	Keep notes on the following situations in case you need to call for service: <ul style="list-style-type: none"><li>• Is the power LED illuminated on the front of the system? (Ensure that the power cord is connected to the system and to a grounded power receptacle.)</li><li>• Does the wall outlet have power? Test by connecting another device.</li><li>• Does the system beep when it is powered on? (Ensure that the keyboard is connected).</li><li>• Test with another keyboard that you know is functional.</li><li>• Does the monitor sync within 5 minutes after power on? (The green LED on the monitor stops flashing and remains illuminated.)</li></ul>
Server powers on, but the monitor does not.	<ul style="list-style-type: none"><li>• Is the Power button for the monitor turned on?</li><li>• Is the monitor power cord connected to a wall outlet?</li><li>• Does the wall outlet have power? Test by connecting another device.</li></ul>
CD or DVD does not eject from the media tray when you press the Eject button.	<ul style="list-style-type: none"><li>• Move the mouse or press any key on the keyboard. The drive might be in the low-power mode.</li><li>• Use the utility software installed on your server to eject the CD.</li></ul>
Server does not power off when the front panel power button is pressed.	<ul style="list-style-type: none"><li>• Try all of the power-off options shown in <a href="#">Section 1.4.2, “Powering Off the Server” on page 1-9</a>.</li><li>• If the server still does not power off, disconnect the power cable from the rear of the chassis.</li></ul>
The network status LED does not turn on.	<ul style="list-style-type: none"><li>• Check the cabling and network equipment to make sure that all cables are correctly seated.</li><li>• Reinstall the network drivers.</li></ul>
An external device connected to a USB connector does not work.	<ul style="list-style-type: none"><li>• Reduce the number of external devices connected to a USB hub.</li><li>• Refer to the documentation that comes with the device.</li></ul>

**TABLE 2-1** Troubleshooting Procedures (Continued)

<b>Problem</b>	<b>Possible solution</b>
System cannot read the disk information.	Do the following: <ol style="list-style-type: none"><li>1. Turn off the server by pressing the Power button.</li><li>2. Check to make sure that the power and data cables are connected to the disk drive and that the pins in the cable and connector are not bent.</li><li>3. Turn on the server.</li></ol>
System cannot read the CD information.	Check the following: <ul style="list-style-type: none"><li>• Are you using the correct type of compact disc?</li><li>• Is the compact disc properly inserted into the drive?</li><li>• Is the compact disc clean and unscratched?</li><li>• Are the cables connected to the CD-RW/DVD-ROM drive?</li></ul>
Keyboard or mouse does not respond to action.	<ul style="list-style-type: none"><li>• Verify that the mouse and keyboard cables are connected to the on-board USB 2.0 connectors on the server.</li><li>• Verify that the server is powered on and that the front power LED is illuminated.</li></ul>
Server appears to be in low-power mode, but the Power button LED does not blink.	The power-indicator LED only blinks when all server components are in low-power mode. A tape drive might be connected to your server. Because tape drives do not enter low-power mode, the power-indicator LED does not blink.
Hung or frozen server: No response from mouse or keyboard or any application.	Try to access your system from a different server on the network. <ol style="list-style-type: none"><li>1. From a terminal window, type: <b>ping</b> <i>hostname</i></li><li>2. If no response, remotely log in from another system, using <b>telnet</b> or <b>rlogin</b>, and ping the system again.</li><li>3. Attempt to kill processes until the system responds.</li></ol> If the above procedures do not work: <ol style="list-style-type: none"><li>1. Press the Power button to power off the system.</li><li>2. Wait 20 to 30 seconds and power on the system.</li></ol> See <a href="#">Section 1.4.2, “Powering Off the Server”</a> on page 1-9 for more detailed information.

**TABLE 2-1** Troubleshooting Procedures (*Continued*)

<b>Problem</b>	<b>Possible solution</b>
No video is displayed on the monitor screen.	<p>Check the following:</p> <ul style="list-style-type: none"><li>• Is the cable connected to the video connector?</li><li>• Is the monitor power cord connected to the power outlet?</li><li>• Does the wall outlet have power? Test it by connecting another device.</li><li>• Is the video card seated correctly in its connector?</li><li>• Are the internal cables properly connected to the video card?</li><li>• Does the monitor work when connected to another system.</li><li>• If you have another monitor, does it work when connected to the original system?</li><li>• Verify that the BIOS settings are correct.</li></ul>
External device is not working.	<ul style="list-style-type: none"><li>• Check the documentation that came with the device to see if any device drivers must be installed.</li><li>• Ensure that the cables for the external device are firmly connected and that the pins in the cable and connector are not bent.</li><li>• Power off the system, reattach the external device, and power on the system.</li></ul>
Newly installed memory is not detected.	<ul style="list-style-type: none"><li>• Make sure that the memory is properly seated on the DIMM sockets.</li></ul> <p>For information removing and replacing DIMMs, see <a href="#">Section 4.5.9, “Dual Inline Memory Modules”</a> on page 4-30</p> <ul style="list-style-type: none"><li>• Move the memory to the other DIMM socket to determine whether the socket is defective.</li><li>• Make sure that you are using 512 MB or 1 GB DDR 400 SDRAM modules with 3.05 cm max. height.</li><li>• Make sure that the memory is installed in pairs.</li></ul>

---

## 2.4 Technical Assistance

If the troubleshooting procedures in this chapter fail to solve your problem, see [TABLE 2-2](#), which lists the Sun web sites and telephone numbers for additional technical support.

**TABLE 2-2** Sun Web Sites and Telephone Numbers

<b>Server Documents and Support Resources</b>	<b>URL or Telephone Number</b>
PDF files for all the current Sun Fire X2100 Server documents.	<a href="http://www.docs.sun.com/documentation/">http://www.docs.sun.com/documentation/</a>
Solaris and other software documents. This web site has full search capabilities.	<a href="http://docs.sun.com/documentation/">http://docs.sun.com/documentation/</a>
Discussion and troubleshooting forums.	<a href="http://supportforum.sun.com/">http://supportforum.sun.com/</a>
Support, diagnostic tools, and alerts for all Sun products.	<a href="http://www.sun.com/bigadmin/">http://www.sun.com/bigadmin/</a>
SunSolve <sup>SM</sup> web site. Contains links to software patches. Lists some system specifications, troubleshooting and maintenance information, and other tools.	<a href="http://www.sunsolve.sun.com/handbook_pub/">http://www.sunsolve.sun.com/handbook_pub/</a>
Service support phone numbers.	1-800-872-4786 (1-800-USA-4Sun) Select Option 1.
International telephone numbers for Sun support.	<a href="http://www.sun.com/service/contacting/solution.html">http://www.sun.com/service/contacting/solution.html</a>
Warranty and contract support contacts. Links to other service tools.	<a href="http://www.sun.com/service/online/">http://www.sun.com/service/online/</a>
Warranties for every Sun product.	<a href="http://www.sun.com/service/support/warranty">http://www.sun.com/service/support/warranty</a>



# Diagnostics

---

This chapter provides information on Pc-Check, the diagnostic utility that is packaged with your system. You can find Pc-Check on the Sun Fire X2100 Server Supplemental CDs. Diagnostic output is accessible on systems that are running supported Linux or Solaris operating systems. If you are having specific problems with your system, use the Pc-Check Diagnostics software to diagnose and resolve these issues.

The following sections are included in this chapter:

- [Section 3.1, “PC-Check Diagnostics Overview” on page 3-2](#)
- [Section 3.2, “System Information Menu” on page 3-3](#)
- [Section 3.3, “Advanced Diagnostics Tests” on page 3-4](#)
- [Section 3.4, “Immediate Burn-in Testing” on page 3-7](#)
- [Section 3.5, “Deferred Burn-in Testing” on page 3-9](#)
- [Section 3.6, “Create Diagnostic Partition” on page 3-10](#)
- [Section 3.7, “Show Results Summary” on page 3-16](#)
- [Section 3.8, “Print Results Report” on page 3-17](#)
- [Section 3.9, “About Pc-Check” on page 3-18](#)
- [Section 3.10, “Exit to DOS” on page 3-18](#)

---

## 3.1 PC-Check Diagnostics Overview

Sun Fire X2100 Server diagnostics are in the DOS-based Pc-Check utility. You can execute Pc-Check from the Sun Fire X2100 Server Supplemental CD only. Pc-Check detects and tests all motherboard components, ports, and slots.

If you encounter any hardware-related error messages (such as memory errors or hard disk errors) on your Sun Fire X2100 Server, run one of the following:

- **Advanced Diagnostics Test:** A specific hardware component test
- **Immediate Burn-in Test:** A Sun Fire X2100 Server diagnostic test script

The following steps show how to access these test options from the Sun Fire X2100 Server Supplemental CD.

### 1. Do one of the following, depending on which method you are using to access the Pc-Check Diagnostics software:

- *If your server has a DVD drive installed:* Insert the Sun Fire X2100 Server Supplemental CD into your DVD drive and reboot the system.
- *If you are running the Pc-Check software from a PXE server:* Follow the instructions in [Appendix C](#) to set up the PXE server.

The system boots to the Sun Fire X2100 Server Supplemental CD main menu.

### 2. Type 1 to run the Hardware Diagnostics Software.

The system information loads, and the Diagnostics main menu opens and the following menu options are displayed:

- System Information Menu
- Advanced Diagnostics Tests
- Immediate Burn-in Testing
- Deferred Burn-in Testing
- Create Diagnostic Partition
- Show Results Summary
- Print Results Report
- About PC-CHECK
- Exit to DOS

To run a specific hardware component test, select "Advanced Diagnostics Test".

To run one of the test scripts supplied by Sun, select "Immediate Burn-in Testing".

The following sections in this chapter describe the menu items and tests in detail.

You navigate by pressing the arrow keys located on keyboard to move to a menu selection, the Enter key to select a menu selection, and the ESC key to exit a menu. Navigation instructions are shown at the bottom of each screen.



---

## 3.2 System Information Menu

TABLE 3-1 describes each option in the System Information menu.

TABLE 3-1 System Information Menu Options

Option	Description
System Overview	Includes basic information about your system, motherboard, BIOS, processor, memory cache, drives, video, modem, network, buses, and ports.
Hardware ID Image Menu	Enables you to create a document showing information about your system, including comparisons between the updates and the newest versions of your system. XML is the default format; although, you can also choose a text format (.txt).
System Management Information	Provides information about the BIOS type, system, motherboard, enclosure, processors, memory modules, cache, slots, system event log, memory array, memory devices, memory device mapped addresses, and system boot.
PCI Bus Information	Includes details about specific devices from <code>pci-config</code> space within the system, similar to the System Management Information section.
IDE Bus Information	Shows the master/slave devices on the primary and secondary IDE controllers.
PCMCIA/CardBus Info	Not applicable to the Sun Fire X2100 Server.
Interrupt Vectors	Details and lists device interrupt vector information.
IRQ Information	Shows hardware interrupt assignments.
Device Drivers	Shows device drivers loaded under Open DOS.
APM Information	Tests the Advanced Power Management (APM) capabilities of the system. You can choose to change the power state, view the power status, indicate CPU usage, get a PM event, or change the interface mode.
I/O Port Browser	Shows the I/O port assignment for the hardware devices on the system.
Memory Browser	Enables you to view the mapped memory for the entire system.
Sector Browser	Reads sector information from the hard disks and DVD disks sector by sector.

**TABLE 3-1** System Information Menu Options *(Continued)*

Option	Description
CPU Frequency Monitor	Tests the processor speed.
CMOS RAM Utilities	Shows the CMOS settings of the system.
SCSI Utilities	Not applicable for the Sun Fire X2100 Server.
Text File Editor	Opens a file editor.
Start-Up Options	Enables you to set up options for diagnostics testing.

## 3.3 Advanced Diagnostics Tests

[TABLE 3-2](#) gives the name and a brief description of each option in the Advanced Diagnostics Tests menu.

**TABLE 3-2** Advanced Diagnostics Menu Options

Option	Description
Processor	Displays information about the processor, and includes a Processor Tests menu to test the processor on the system.
Memory	Displays information about the memory, and includes a Memory Tests menu to test the memory on the system. Also lists each type of memory in the system, such as system, cache, or video memory.
Motherboard	Displays information about the motherboard, and includes a Motherboard Tests menu to test the motherboard on the system.
Diskettes	Not applicable to Sun Fire X2100 Server.
Hard Disks	Displays information about the hard disk, and includes a Hard Disk Tests menu to test hard disks on the system. Refer to <a href="#">Section 3.3.1, "Hard Disk Testing" on page 3-6</a> , for more information about testing hard disks and script information.
CD-ROM/DVD	Includes a CD-ROM/DVD menu to test DVD devices on the system.
ATAPI Devices	Displays information about devices attached to the IDE controllers on the system other than a DVD or hard disks (for example, zip drives).

**TABLE 3-2** Advanced Diagnostics Menu Options (*Continued*)

<b>Option</b>	<b>Description</b>
Serial Ports	Displays information about the serial port, and includes a Serial Ports Tests menu to test serial ports on the system.
Parallel Ports	Not applicable for the Sun Fire X2100 Server.
Modems	Not applicable for the Sun Fire X2100 Server.
ATA	Displays the ATA test menu.
USB	Displays information about the USB devices on the system, and includes a USB Tests menu to test the USB.
FireWire	Not applicable for the Sun Fire X2100 Server.
Network	Performs network register controller tests.
Keyboard	Includes a Keyboard Test menu with options for performing different tests on the keyboard.
Mouse	Displays information about the mouse, and includes a menu to test the mouse on the system.
Joystick	Displays information about the joystick, and includes a menu to test the joystick.
Audio	Not applicable for the Sun Fire X2100 Server.
Video	Displays information about the video card. Initially, the monitor might flicker, but then it brings up a Video Test Options menu that enables you to perform various video tests.
Printers	Printers are not available for the Sun Fire X2100 Server.
Firmware - ACPI	Displays information about Advanced Configurable Power Interface (ACPI), and includes an ACPI Tests menu to test ACPI.

## 3.3.1 Hard Disk Testing

To test the hard disk:

1. **From the main menu, select Advanced Diagnostics Tests.**
2. **From the Advanced Diagnostics menu, select Hard Disks.**
3. **From the Select Drive menu, select the hard disk you are testing.**

The Hard Disk Diagnostics window opens, and displays the information for the hard disk you are testing and the Hard Disk Tests menu.

The Hard Disk Tests menu includes the following options:

- Select Drive
- Test Settings
- Read Test
- Read Verify Test
- Non-Destructive Write Test
- Destructive Write Test
- Mechanics Stress Test
- Internal Cache Test
- View Error Log
- Utilities Menu
- Exit

The Read Test, the Read Verify Test, the Non-Destructive Write Test, and the Destructive Write Test are options that pertain to the hard drive media.



---

**Caution** – Running the Destructive Write Test destroys any data that is on the disk.

---

The options that test the drive hardware, such as the head and internal cache are the Mechanics Stress Test and the Internal Cache Test.

In addition to choosing test options, you can also define several test parameters, by selecting Test Settings. Your options within Test Settings menu include the following:

- **Media Test Settings**

Set the test time duration, the percentage of the hard disk to test, and the sectors to be tested on the hard disk.

- **Device Test Settings**

Set the test time durations of the devices and the test level.

- **Number of Retries**

Set the number of times to retry testing a device before terminating the test.

- **Maximum Errors**

Set the number of errors allowed before terminating the test.

- **Check SMART First**

SMART stands for Smart Monitoring Analysis Reporting Test.

- **HPA Protection**

HPA stands for Host Protected Area.

- **Exit**

---

## 3.4 Immediate Burn-in Testing

The Immediate Burn-In Testing option enables you to run burn-in test scripts on your server. Three scripts have already been created for testing your system:

- `quick.tst` – This script performs a nondetailed test of all hardware components, including those components that require user input, as well as a more in-depth memory test. The user must interact with the Pc-Check software to progress through these interactive tests. The tests cannot be run unattended and do not contain any "timeout" facilities. The interactive tests will wait until the user provides the correct input.
- `noinput.tst` – This script is used as a first triage of any hardware related problems or issues. The script performs a nondetailed test of most hardware components, excluding those components that require user input (keyboard, mouse, sound, video). This test does not require user input.
- `full.tst` – This script performs the most detailed and comprehensive test on all hardware components, including those components that require user input. This script contains a more in-depth memory test than `quick.tst`, as well as external port tests (which may require loopback connectors). The user must interact with the test utility to progress through these interactive tests.

---

**Tip** – Each of these scripts tests the operating status of your entire system. If you want to test only a certain percentage of your system's hard drives, refer to [Section 3.3.1, "Hard Disk Testing" on page 3-6](#) to change the test options.

---

When you select the Immediate Burn-in Testing menu option, the Continuous Burn-in Testing window is displayed. The screen includes the list of options shown in [TABLE 3-3](#) for running the tests. When a `quick.tst`, `noinput.tst`, or `full.tst` script is loaded, the defaults indicated in the third column are automatically loaded.

**TABLE 3-3** Continuous Burn-in Testing Options

<b>Option</b>	<b>Default – General</b>	<b>Default Using quick.tst, noinput.tst, or full.tst Script</b>	<b>All Possible Choices</b>
Pass Control	Overall Time	Overall Passes	Individual Passes, Overall Passes, or Overall Time
Duration	01:00	1	Any number to designate the time duration of the test
Script File	N/A	quick.tst, noinput.tst, or full.tst	quick.tst, noinput.tst, or full.tst
Report File	None	None	User-defined
Journal File	None	D:\noinput.jrl, D:\quick.jrl, or D:\full.jrl	User-defined
Journal Options	Failed Tests	All Tests, Absent Devices, and Test Summary	Failed Tests, All Tests, Absent Devices, and Test Summary
Pause on Error	N	N	Y or N
Screen Display	Control Panel	Control Panel	Control Panel or Running Tests
POST Card	N	N	Y or N
Beep Codes	N	N	Y or N
Maximum Fails	Disabled	Disabled	1-9999

To load one of the scripts available to test the devices on your system, do the following:

- **From the main menu, select Immediate Burn-in Testing.**

The top portion of the window lists the options described in [TABLE 3-3](#), and the bottom portion of the window lists the following Burn-in menu options:

- **Load Burn-in Script**

Enter one of the following:

- **quick.tst**, **noinput.tst**, or **full.tst**
- If you have created and saved your own script, enter **d:\testname.tst**

Where *testname* is the name of the script that you have created.

- **Save Burn-in Script**

To save a burn-in script that you have created, enter **d:\testname.tst**

Where *testname* is the name of the script that you have created.

- **Change Options**

Opens the Burn-in Options menu, which enables you to modify the various options listed in [TABLE 3-3](#) for the currently loaded test script.

- **Select Tests**

Opens a listing of the tests available for your server configuration and the currently loaded test script.

- **Perform Burn-in Tests**

Starts to run the currently loaded burn-in test script.

---

## 3.5 Deferred Burn-in Testing

You can use the Deferred Burn-in Testing option to create and save your own scripts to run at a later time.

- **From the main menu, select Deferred Burn-in Testing.**

The top portion of the window lists the options described in [TABLE 3-3](#), and the bottom portion of the window lists the following Burn-in menu options:

- **Load Burn-in Script**

Enter one of the following:

- **quick.tst**, **noinput.tst**, or **full.tst**
- If you have created and saved your own script, enter **d:\testname.tst**

Where *testname* is the name that you have created.

- **Save Burn-in Script**

To save a burn-in script that you have created, enter `d:\testname.tst`

Where *testname* is the name of the script that you have created.

- **Change Options**

Opens the Burn-in Options menu, which enables you to modify the various options listed in [TABLE 3-3](#) for the currently loaded test script.

- **Select Tests**

Opens a listing of all of the possible types of tests available for you to run for the currently loaded test script.

---

## 3.6 Create Diagnostic Partition

The diagnostic partition is preinstalled on the Sun Fire X2100 Server. You need to reinstall the diagnostic partition only if you have reformatted your hard drive.

---

**Note** – Using the Erase Primary Boot Hard Disk utility on the Sun Fire X2100 Server Supplemental CD preserves the diagnostic partition.

---

The Create Diagnostic Partition option creates a diagnostic partition on the first bootable disk, usually the primary/master SATA device.

---

**Note** – If you are running the Pc-Check Diagnostics software from a PXE server, you do not need to follow the instructions in these procedures for inserting the Supplemental CD into the DVD tray.

---

The following sections explain how to create and access the diagnostic partition on the Sun Fire X2100 Server:

- [Section 3.6.1, “Removing Existing Partitions From a Hard Disk”](#) on page 3-11
- [Section 3.6.2, “Adding a Diagnostic Partition to the First Bootable Disk”](#) on page 3-12
- [Section 3.6.3, “Creating a Log File on the Diagnostic Partition”](#) on page 3-12
- [Section 3.6.4, “Accessing the Diagnostic Partition on a Red Hat Linux System”](#) on page 3-13
- [Section 3.6.5, “Accessing the Diagnostic Partition on the Solaris 10 Operating System”](#) on page 3-14
- [Section 3.6.6, “Accessing the Diagnostic Partition on a Windows XP System”](#) on page 3-15



## 3.6.1 Removing Existing Partitions From a Hard Disk

The Create Diagnostic Partition option creates a diagnostic partition on a hard disk only if that hard disk is completely free of any partitions. You need to delete any existing partitions from a hard disk if you plan to use the hard disk to create a diagnostic partition on it.



---

**Caution** – Removing all hard disk partitions destroys all data on the disk.

---

There are two ways to remove existing partitions from the hard disk:

- Use the Erase Primary Boot Hard Disk utility (Option 3 on the Supplemental CD main menu).
- Use the following procedure:

1. Insert the Supplemental CD into the DVD tray.
2. Reboot the server.
3. From the Supplemental CD main menu, type 4 to exit to DOS.
4. Type `fdisk` at the command prompt and press the Enter key.
5. Type 4 to select an alternate fixed disk.

The second hard disk as seen from `fdisk` is the first bootable disk of the system. The first hard disk as seen from `fdisk` is the bootable Supplemental CD.



---

**Caution** – When performing the following tests, be careful not to delete any operating system partitions that you want to keep. Removing hard disk partitions destroys all data on the disk.

---

6. Type 2 to delete the DOS partition.
7. Type 1 or 2 depending on the type of partition you want to delete.
8. Type the number of the partition you want to delete.
9. Type Y to erase the data and the partition.
10. Repeat [Step 6](#) through [Step 9](#) until all partitions have been removed.
11. Press the Esc key to exit, and press any key to reboot the server.

## 3.6.2 Adding a Diagnostic Partition to the First Bootable Disk

Pc-Check can view only the first or second hard disk on the system from the boot loader. The software automatically installs the diagnostic partition on the first bootable disk. To add the diagnostic partition on the first bootable disk:

1. **Insert the Supplemental CD into the DVD tray.**
2. **Reboot the server.**
3. **At the Supplemental CD main menu, type 1 to run Hardware Diagnostics.**
4. **From the main menu, select Create Diagnostic Partition.**
  - If the first bootable disk is *not* clear of partitions, the software will be unable to create a hardware diagnostic partition. If this happens you must clear the partitions from the disk to complete this procedure. For information on clearing the partitions from the disk, see [Section 3.6.1, "Removing Existing Partitions From a Hard Disk" on page 3-11](#).
  - If the first bootable disk is clear of partitions, the Sun Microsystems Partitioning Utility window appears, and displays the following message:

```
Your primary hard disk is not partitioned. Would you like to partition
it now?
```

- Select Yes and press Enter.
- The following message displays:

```
Partitioning complete. Your machine will now be restarted.
```

5. **Press Enter to reboot your server.**

## 3.6.3 Creating a Log File on the Diagnostic Partition

All the scripts that are loadable with the hardware diagnostics software are predefined, with logging to the diagnostic partition enabled. The names of log files corresponds to the name of the script. For example, a script named `noinput.tst` creates a log file named `noinput.jrl`.

The following instructions show an example of how to create and access a log file on the diagnostic partition for the `noinput.tst` script:

1. Insert the Supplemental CD into the DVD tray.
2. Reboot the server.
3. From the Supplemental CD main menu, select 1 to run the Hardware Diagnostics software.
4. From the Hardware Diagnostics main menu, select Immediate Burn-In Testing.
5. Select Load Burn-in Script.
6. Type `noinput.tst` and press Enter.  
If you are using a test you have created yourself, you need to enter `d:\testname.tst` into the Load Burn-in Script field, where *testname* is the name of the test you have created.
7. Select Perform Burn-in Tests to run the script.
8. When the tests are complete, press the Esc key to exit the Display Results window.
9. Select Exit to DOS and press Enter.
10. At the DOS prompt, type the following:  

```
C:> d:
```
11. Type the following to list the contents of the diagnostic partition.  

```
D:> dir
```

  
The `noinput.jrl` log is displayed.

## 3.6.4 Accessing the Diagnostic Partition on a Red Hat Linux System

To access the diagnostic partition when you are running a Red Hat Linux operating system:

1. Remove the Supplemental CD from the DVD tray.
2. Reboot the server and start the Linux Red Hat operating system.
3. Become root (superuser).

4. Determine if your diagnostic partition has been configured to be mounted by typing the following command:

```
# ls /diagpart
```

- If this command fails to list the log files created by the hardware diagnostics software, then the operating system has never been configured to mount the diagnostic partition. Continue to [Step 5](#).
- If this command succeeds in listing the log files created by the hardware diagnostics software, then the operating system has already been configured to mount the diagnostic partition. All users have read access to this partition. Only the superuser has read/write access to this partition. You do not need to continue this procedure.

5. Insert the Supplemental CD into the DVD tray.
6. When the CD is mounted, open a terminal window.
7. Type the following command:

```
# cd mountpoint/drivers/linux/linux_version
```

Where *mountpoint* is the CD mountpoint and *linux\_version* is the version of Linux that you have installed. For example:

```
# cd /mnt/cdrom/drivers/linux/red_hat
```

8. Type the following to install the diagnostic partition:  

```
# ./install.sh
```
9. Press Enter.

The following lines appear if the diagnostic partition is mounted successfully:

```
Mounting Diagnostic Partition  
Installation Successful
```

10. Type the following command:

```
# ls /diagpart
```

The contents of the diagnostic partition are listed.

## 3.6.5 Accessing the Diagnostic Partition on the Solaris 10 Operating System

To access the diagnostic partition when you are running the Solaris 10 Operating System:

1. Remove the Supplemental CD from the DVD tray.
2. Reboot the machine and start the Solaris 10 Operating System.
3. Become root (superuser).
4. Type the following command to determine if your diagnostic partition has been configured to be mounted:  

```
# ls /diagpart
```

  - If this command fails to list the log files created by the hardware diagnostics software then the operating system has never been configured to mount the diagnostic partition. Continue to [Step 5](#).
  - If this command succeeds in listing the log files created by the hardware diagnostics software, then the operating system has already been configured to mount the diagnostic partition. All users have read access to this partition. Only the superuser has read/write access to this partition. You do not need to continue this procedure.
5. Insert the Supplemental CD into the DVD tray.
6. When the CD is mounted, open a terminal window.
7. Type the following:  

```
# cd /cdrom/cdrom0/drivers/sx86
```
8. Type the following to install the diagnostic partition:  

```
# ./install.sh
```
9. Press the Enter key.

The following lines appear if the diagnostic partition is mounted successfully:

```
Mounting Diagnostic Partition
Installing Successful
```

10. Type the following command to list the contents of the diagnostic partition:

```
# ls /diagpart
```

## 3.6.6 Accessing the Diagnostic Partition on a Windows XP System

The Windows XP operating system does not allow you to mount a diagnostic partition. There is no way to view or gain access to the diagnostic partition if you are running Windows XP on a Sun Fire X2100 Server.

The only way to retrieve the contents (log files) on the diagnostic partition is to attach a USB diskette drive to the Sun Fire X2100 Server and complete the following procedure:

1. **Connect the USB diskette drive to any USB port on the Sun Fire X2100 Server.**
2. **Insert the Supplemental CD into the DVD tray.**
3. **Reboot the server.**
4. **At the Supplemental CD main menu, type 3 to exit to DOS.**
5. **Type the following at the DOS command prompt:**

```
C:> d:
```

6. **Copy the log file to the diskette.**

For example, to copy a file named `noinput.jrl` to the diskette, type:

```
D:> copy d:\noinput.jrl a:\
```

The journal file is now saved to the diskette in the USB diskette drive.

---

## 3.7 Show Results Summary

The Show Results Summary lists the tests that were run and shows the results of those tests as: Pass, Fail, or N/A.

The following is a list of the options that are available with the Supplemental CD. If your own system does not have all of these options, they might not be listed the Show Results Summary.

### ■ Processor

This section displays the results of the following tests conducted on the processor: Core Processor Tests, AMD 64-Bit Core Tests, Math Co-Processor Tests – Pentium Class FDIV and Pentium Class FIST, MMX Operation, 3DNow! Operation, SSE Instruction Set, SSE2 Instruction Set, and MP Symmetry.

### ■ Motherboard

This section displays the results of the following tests conducted on the motherboard: DMA Controller Tests, System Timer Tests, Interrupt Test, Keyboard Controller Tests, PCI Bus Tests, and CMOS RAM/Clock Tests.

### ■ Memory, Cache Memory, and Video Memory

This section displays the results of the following tests conducted on the various types of memory: Inversion Test Tree, Progressive Inv. Test, Chaotic Addressing Test, and Block Rotation Test.

- **Input Device**

This section displays the results of the following tests conducted on the input device, or keyboard: Verify Device, Keyboard Repeat, and Keyboard LEDs.

- **Mouse**

This section displays the results of the following tests conducted on the mouse: Buttons, Ballistics, Text Mode Positioning, Text Mode Area Redefine, Graphics Mode Positions, Graphics Area Redefine, and Graphics Cursor Redefine.

- **Video**

This section displays the results of the following tests conducted on the video: Color Purity Test, True Color Test, Alignment Test, LCD Test, and Test Cord Test.

- **Multimedia**

This section displays the results of the following tests conducted on the multimedia components: Internal Speaker Test, FM Synthesizer Test, PCM Sample Test, CD/DVD Drive Read Test, CD/DVD Transfer (KB/Sec), CD/DVD Transfer Rating, CD/DVD Drive Seek Test, CD/DVD Seek Time (ms), CD/DVD Test Disk Read, and CD/DVD Tray Test.

- **ATAPI Devices**

This section displays the results of the following tests conducted on the ATAPI devices: Linear Read Test, Non-Destructive Write, and Random Read/Write Test.

- **Hard Disk**

This section displays the results of the following tests conducted on the hard disk: Read Test, Read Verify Test, Non-Destructive Write Test, Destructive Write Test, Mechanics Stress Test, and Internal Cache Test.

- **USB**

This section displays the results of the following tests conducted on the the USB: Controller Tests and Functional Tests.

- **Hardware ID**

This section displays the result of the compare test, which is used to determine the machine ID of the system. This test is not available for the Sun Fire X2100 Server.

---

## 3.8 Print Results Report

The Print Results Report option enables you to print results of the diagnosis of your system.

Ensure that your server is connected to a printer, and then enter the required information to print the results.

---

## 3.9 About Pc-Check

The About Pc-Check window includes general information about Pc-Check software, including resident and nonresident components, such as mouse devices.

---

## 3.10 Exit to DOS

You use the Exit to DOS option to Pc-Check and return to the DOS prompt.



# Maintaining the Sun Fire X2100 Server

---

This chapter describes how to add, replace and configure components in the Sun Fire X2100 Server server.

This chapter contains the following sections:

- [Section 4.1, “Tools and Supplies Needed” on page 4-1](#)
- [Section 4.2, “Installation Precautions” on page 4-2](#)
- [Section 4.3, “Powering Off the Server and Removing the Cover” on page 4-3](#)
- [Section 4.4, “Locations of Server Components” on page 4-5](#)
- [Section 4.5, “Customer-Replaceable-Unit Replacement Procedures” on page 4-6](#)

To determine and isolate a faulty component, refer to [Chapter 3](#).

---

## 4.1 Tools and Supplies Needed

You need the following tools and supplies for performing Sun Fire X2100 Server maintenance procedures.

- #2 Phillip screwdriver
- Antistatic wrist strap and mat
- Alcohol pads (for CPU replacement only)

---

## 4.2 Installation Precautions

Before removing the system's top cover, read the following sections. These sections contain important ESD precautions, along with preinstallation and postinstallation instructions.

### 4.2.1 ESD Precautions

Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a system component:

- Do not remove a component from its protective packaging until you are ready to install it.
- Wear a wrist strap and attach it to the system chassis ground, or to any metal part of the system, before handling components.
- Turn off the power button on the back of the chassis before removing or replacing any of the system components.

### 4.2.2 Preinstallation Instructions

Always perform the following steps before you install any component:

1. **Turn off the system and all of the peripherals connected to it.**



---

**Caution** – Failure to properly turn off the system before you start installing components can cause serious component damage.

---



---

**Caution** – Follow the ESD precautions described in [Section 4.2.1, “ESD Precautions” on page 4-2](#) when handling a system component.

---

2. **Open the server.**

See [Section 4.3, “Powering Off the Server and Removing the Cover” on page 4-3](#).

## 4.2.3 Postinstallation Instructions

Perform the following steps after installing a server component:

1. **Ensure that all of the components are installed as described in the step-by-step instructions.**

See [Section 4.5, “Customer-Replaceable-Unit Replacement Procedures”](#) on page 4-6.

2. **Install any PCI-Express (PCIe) cards or peripherals that you had previously removed.**

See [Section 4.5, “Customer-Replaceable-Unit Replacement Procedures”](#) on page 4-6.

3. **Install the cover.**

See [Section 4.3, “Powering Off the Server and Removing the Cover”](#) on page 4-3.

4. **Connect all external cables to the system.**

5. **Power on the system.**

See [Section 1.4.1, “Powering On the Server”](#) on page 1-8.



---

**Caution** – If the cover and hard disk drives have been removed, do not operate the server for more than ten minutes. Improper cooling airflow might damage the system components.

---

---

## 4.3 Powering Off the Server and Removing the Cover

1. **If the operating system (OS) is running, perform a shutdown of the OS, and then press and release the platform power button on the front panel.**
2. **Turn off all peripheral devices connected to the system.**
3. **Disconnect the AC power on the back panel of the server (see [FIGURE 1-2](#)).**
4. **Turn off the power to any attached peripherals.**
5. **Label and disconnect all peripheral cables and all telecommunication lines connected to I/O connectors or ports on the back panel of the system.**

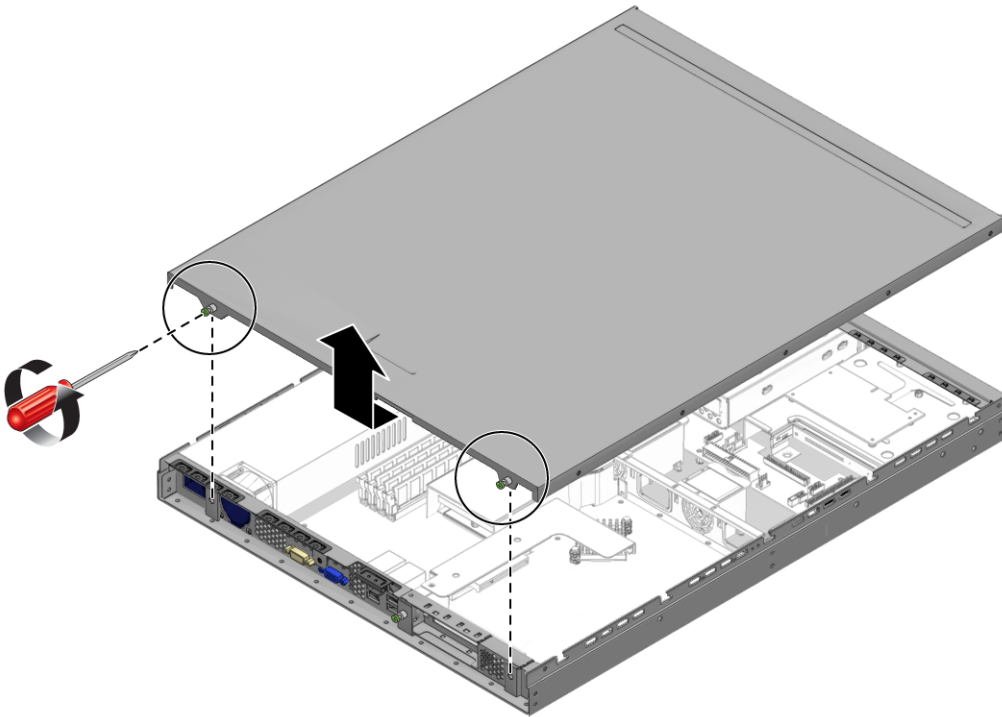


---

**Caution** – The printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

---

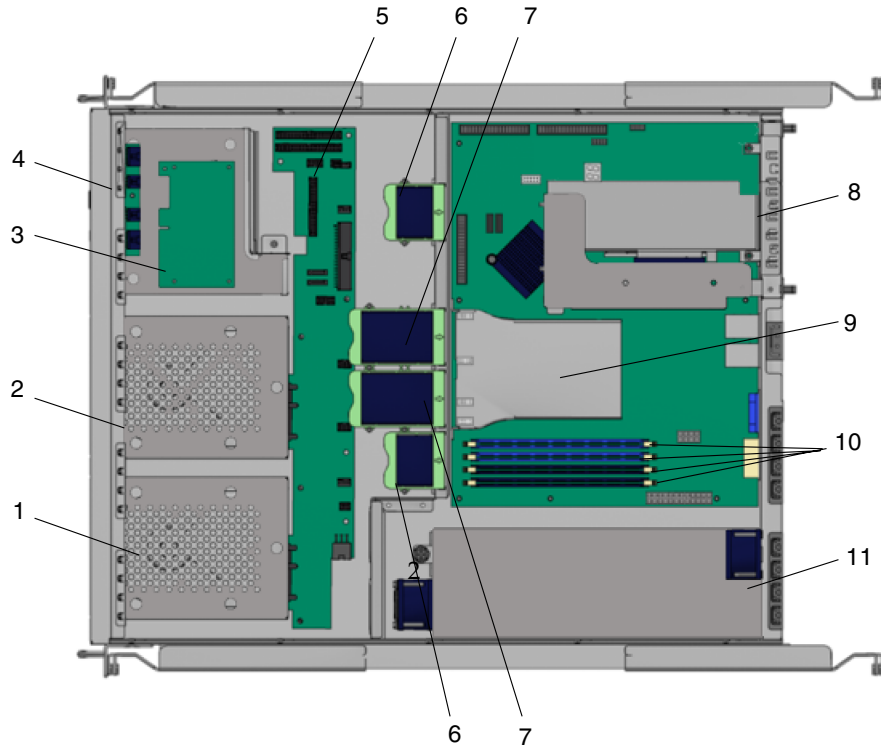
6. Before handling components, attach a wrist strap to a chassis ground (any unpainted metal surface).
7. Loosen the two captive screws securing the cover to the chassis (see [FIGURE 4-1](#)).
8. Pull the cover slightly toward the back of the server, and then straight up to remove it.
9. Lift the cover and remove it.



**FIGURE 4-1** Removing the Server Cover

## 4.4 Locations of Server Components

Refer to [FIGURE 4-2](#) to locate components before performing the remove and replace procedures.



**FIGURE 4-2** Sun Fire X2100 Server System Components

**TABLE 4-1**

Label	Component	Label	Component
1	Hard drive 2	7	Dual fan modules (2)
2	Hard drive 1	8	PCI-Express card and riser
3	Optional service processor	9	Air baffle
4	Optional DVD drive	10	DIMM slots (4)
5	SATA backplane	11	Power supply
6	Single fan modules (2)		

---

## 4.5 Customer-Replaceable-Unit Replacement Procedures

The following components are customer-replaceable units (CRUs) and procedures:

- I/O board (see [Section 4.5.1, “I/O Board”](#) on page 4-7)
- SMDC (see [Section 4.5.2, “SMDC Service Processor”](#) on page 4-9)
- PCIe cards and risers (see [Section 4.5.3, “PCIe Card”](#) on page 4-12)
- SATA hard disk drives and carriers (see [Section 4.5.4, “SATA Hard Disk Drive and Carrier”](#) on page 4-15)
- SATA backplane (see [Section 4.5.5, “SATA Backplane”](#) on page 4-18)
- DVD drive (see [Section 4.5.6, “DVD Drive Assembly”](#) on page 4-22)
- Power supply (see [Section 4.5.7, “Power Supply”](#) on page 4-25)
- Fans (see [Section 4.5.8, “Cooling Fans”](#) on page 4-27)
- Memory DIMMs (see [Section 4.5.9, “Dual Inline Memory Modules”](#) on page 4-30)
- CMOS Data (see [Section 4.5.10, “CMOS Data”](#) on page 4-34)
- Battery (see [Section 4.5.11, “System Battery”](#) on page 4-36)
- Cable kit (see [Section 4.5.13, “Cables”](#) on page 4-46)

The following components should be replaced only by trained field service technicians:

- CPU (see [Section 4.5.12, “CPUs”](#) on page 4-39)
- Motherboard (see [Section 4.5.14, “Motherboard”](#) on page 4-49)

---

**Note** – Many of the illustrations in this section show multiple PCIe slots on the motherboard. The Sun Fire X2100 Server motherboard will only have a single PCI-Express slot.

---

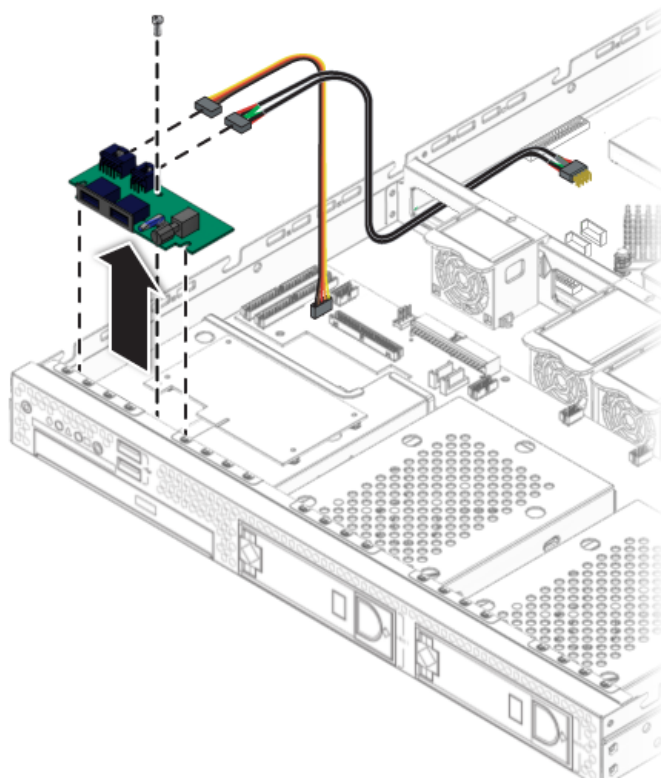
## 4.5.1 I/O Board

The following procedure describes how to remove and replace an IO board.

### 4.5.1.1 Removing an I/O Board

Follow these steps to remove the I/O board:

1. **Power off the server and any attached peripherals, and disconnect the power cord for the server. Refer to [Section 4.3, “Powering Off the Server and Removing the Cover”](#) on page 4-3.**
2. **Remove all cables connected to the I/O board.**
3. **Remove the screw securing the I/O board to the DVD cage.**



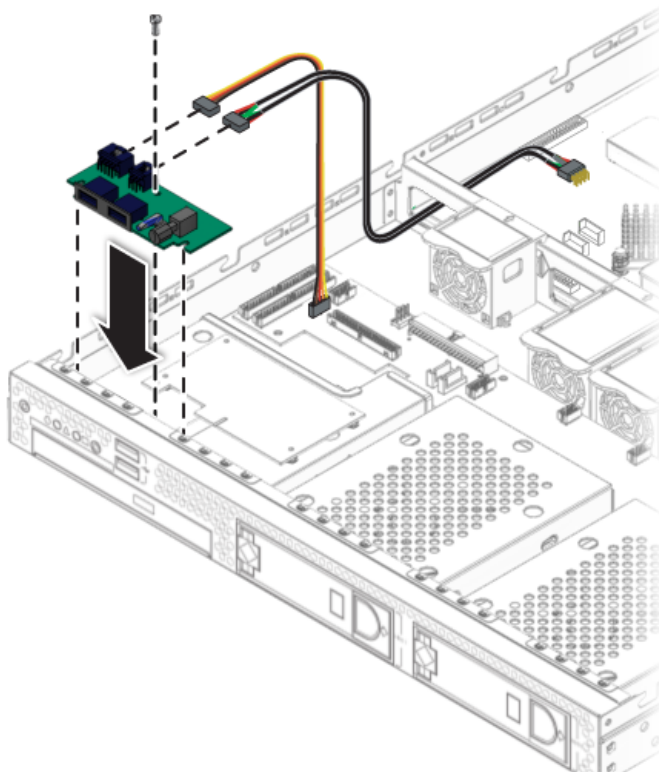
**FIGURE 4-3** Removing the I/O Board

4. Lift the I/O board away from the front panel to free it from the guideposts on the DVD cage.

### 4.5.1.2 Installing an I/O Board

Follow these steps to install the I/O board:

1. Position the I/O board on top of the DVD cage so that it fits into the I/O board guideposts.



**FIGURE 4-4** Installing the I/O Board

2. Fasten the screw to secure the I/O board to the drive cage.
3. Connect the cables.
4. Before installing the cover on the server, check the routing of all cables for obstructions.



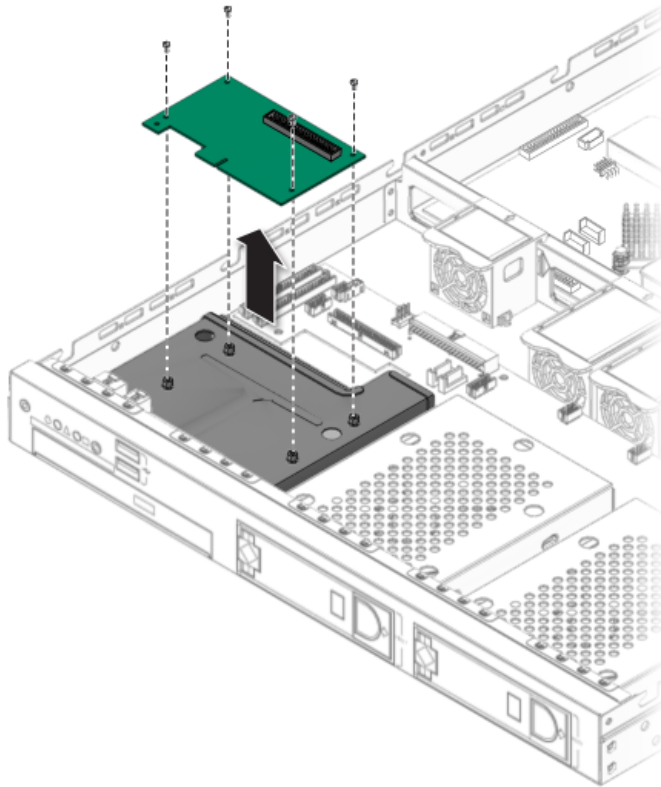
## 4.5.2 SMDC Service Processor

The following procedure describes how to remove and install the optional service processor (SP), the M3290 Service Management Daughter Card (SMDC). For more information on the SMDC and its setup, see [Appendix C](#).

### 4.5.2.1 Removing the SMDC

If you are installing an SMDC card for the first time, skip this section and go to [Section 4.5.2.2, “Installing the SMDC Card”](#) on page 4-10.

1. Unfasten the four screws securing the SP card to the DVD drive cage.



**FIGURE 4-5** Removing the SP Card

2. Disconnect the data cable from the SATA backplane.
3. Lift the SP card from the chassis.

## 4.5.2.2 Installing the SMDC Card

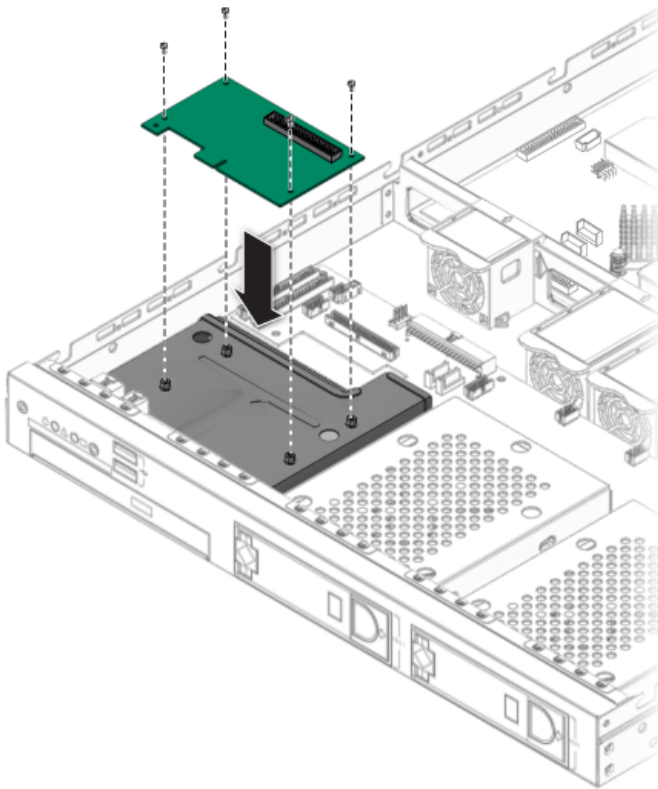
This procedure describes how to install the SMDC service processor.

---

**Note** – If you are installing the SMDC for the first time, you will need the *Sun Fire X2100 Server Supplemental CD* to complete the installation. Additionally, refer to [Appendix C](#) for more information and requirements related to installing and using the SMDC service processor.

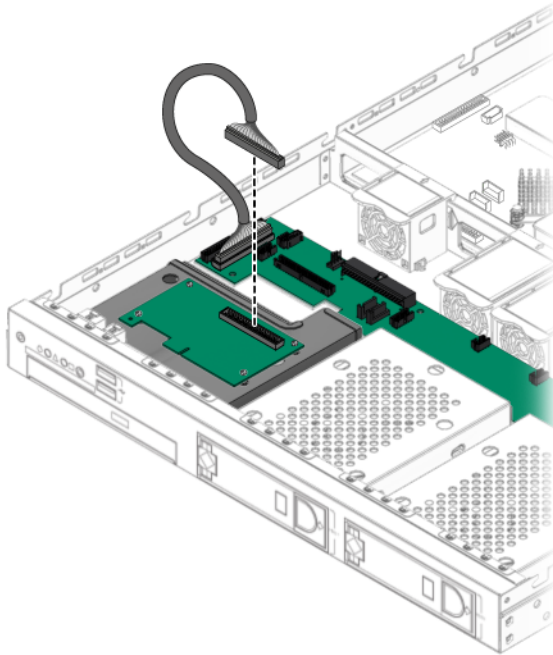
---

1. Position the SP card over the four holes on top of the DVD drive cage.
2. Secure the SP card to the DVD drive cage using the four screws.



**FIGURE 4-6** Installing the SP Card

3. Connect the data cable to the back of the SP card.



**FIGURE 4-7** Connecting the Cable to the SP Card

## Flashing the BIOS

After installing the optional SMDC service processor, you need to manually flash the BIOS to rebuild the dmi table. To manually flash the BIOS, do the following:

---

**Note** – For known issues and late-breaking information on BIOS, hardware, and software, see the latest release of *The Sun Fire X2100 Server Release Notes, 819-3722*, at the following URL: [http://www.sun.com/products-n-solutions/hardware/docs/Servers/x64\\_servers/x2100/index.html](http://www.sun.com/products-n-solutions/hardware/docs/Servers/x64_servers/x2100/index.html)

---

1. Boot the server with the Supplemental CD.
2. From the main menu, select option 4, Exit to DOS.
3. Type the following commands to flash the BIOS.

```
cd \flash\bios\latest  
awdflash.exe aqua1110.bin /py /sn /cc /cd
```

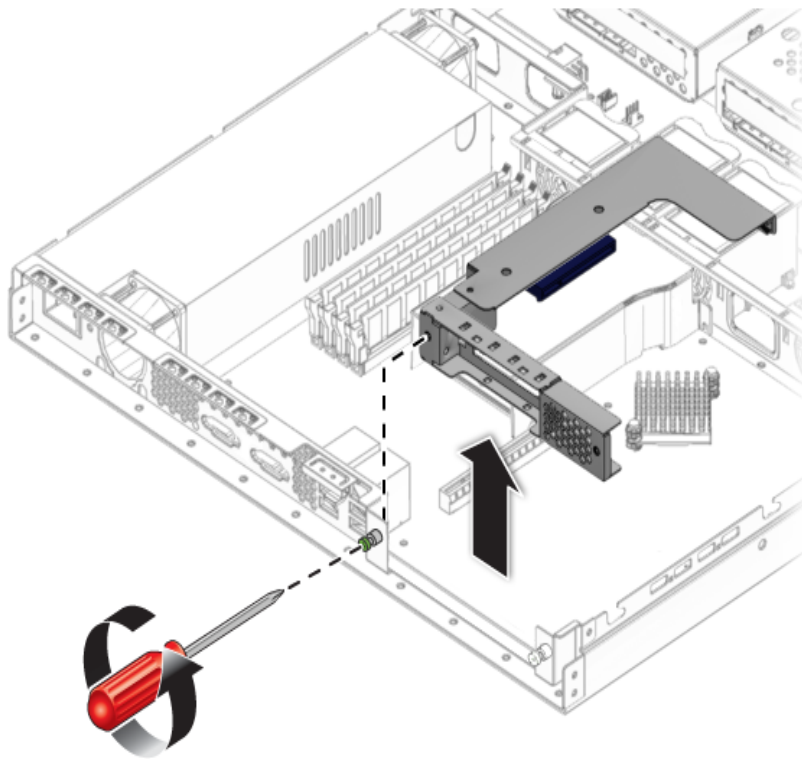
## 4.5.3 PCIe Card

The following procedure describes how to add or replace a PCIe card.

### 4.5.3.1 Removing the PCIe Card and Riser

Follow these steps to remove the PCIe card and riser:

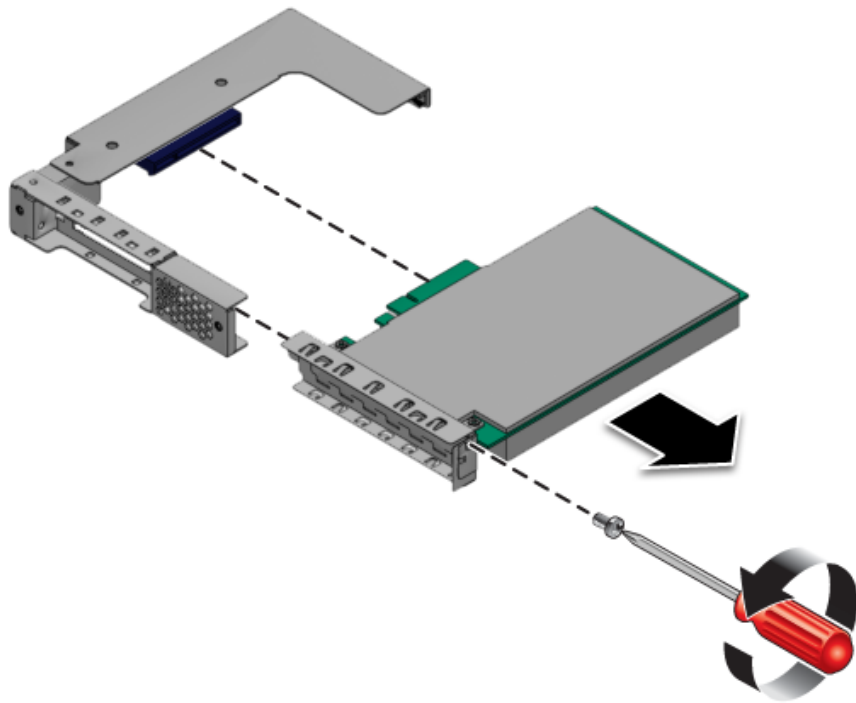
1. **Power off the system and remove the cover as described in [Section 4.3, “Powering Off the Server and Removing the Cover”](#) on page 4-3.**
2. **Loosen the captive screw holding the PCIe card riser assembly.**



**FIGURE 4-8** Removing the PCIe Card Riser Assembly

3. **Pull the assembly upward and out of the chassis.**

4. Unscrew the PCIe card and remove the card from the PCIe card riser assembly connector.

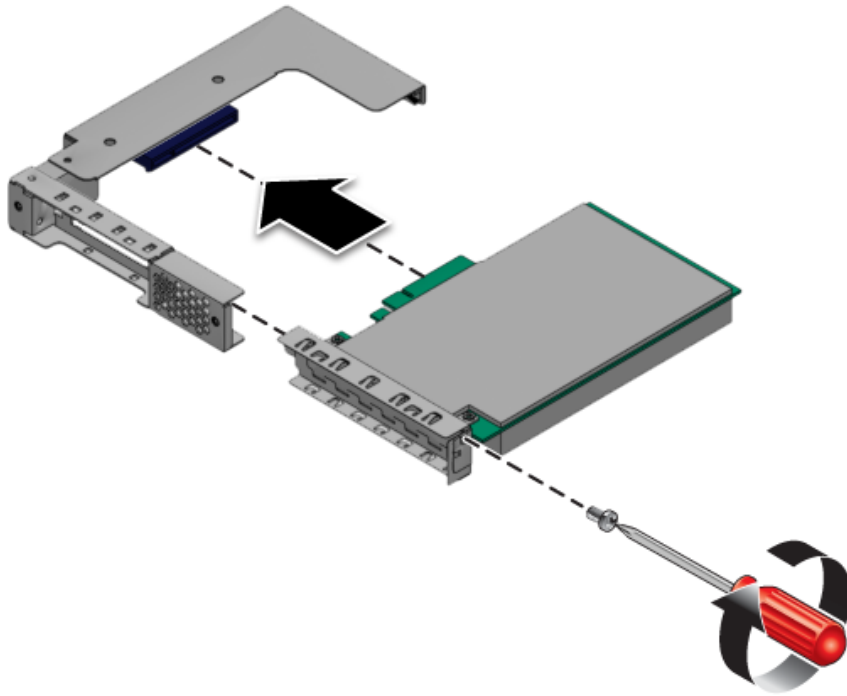


**FIGURE 4-9** Removing the PCIe Card

### 4.5.3.2 Installing the PCIe Card and Riser

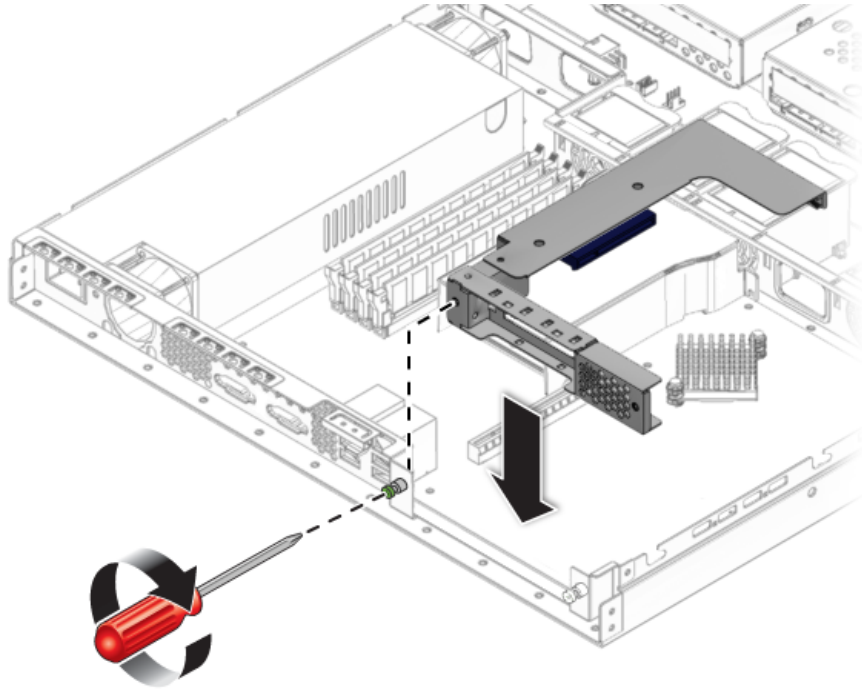
Follow these steps to install the PCIe card and riser:

1. Install the new PCIe card in the riser assembly and fasten the screw to secure it.



**FIGURE 4-10** Installing the PCIe Card

2. Install the riser and card in the connector on the motherboard.



**FIGURE 4-11** Installing the PCIe Card Riser Assembly

3. Tighten the captive screw to secure the riser card to the chassis.
4. Check the routing of all cables for obstructions, and then install the cover.

## 4.5.4 SATA Hard Disk Drive and Carrier

The following procedure describes how to remove and replace a SATA hard disk drive (HDD) and carrier.

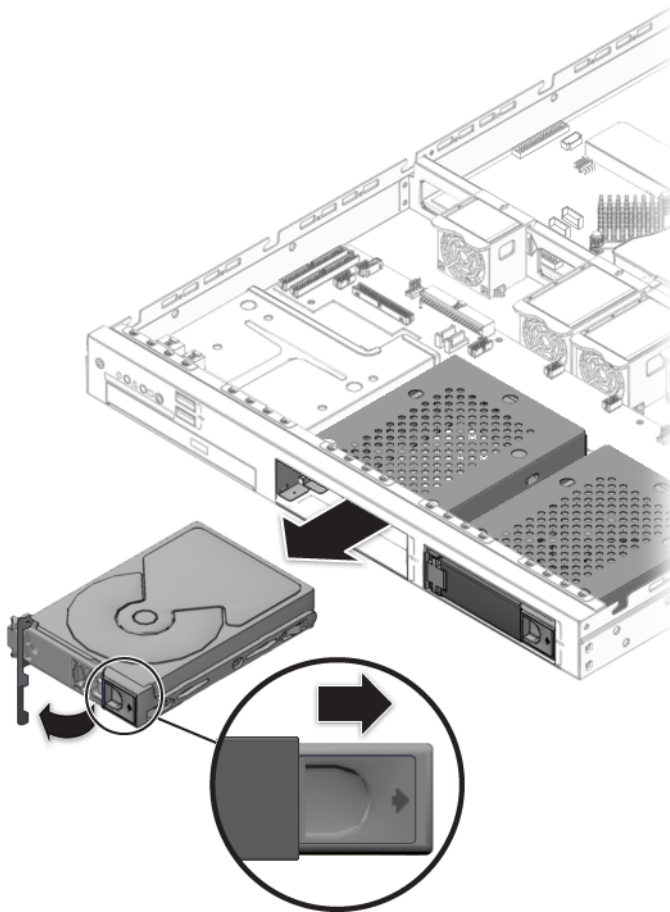
## 4.5.4.1 Removing an HDD and Carrier

Follow these steps to remove the HDD and carrier:

1. If you are *not* using an integrated-mirroring configuration, you must power off the server before removing an HDD; it is not necessary to remove the cover. Power off the system as described in [Section 4.3, "Powering Off the Server and Removing the Cover"](#) on page 4-3.

If you are using an IM configuration, start with [Step 2](#).

2. Squeeze the release latch and carefully swing the arm to the left as far as it will go.



**FIGURE 4-12** Removing a Hard Disk Drive



3. Grasp the carrier bezel with both hands and carefully pull the carrier out of the drive bay.

---

**Note** – Avoid using the arm to remove the carrier.

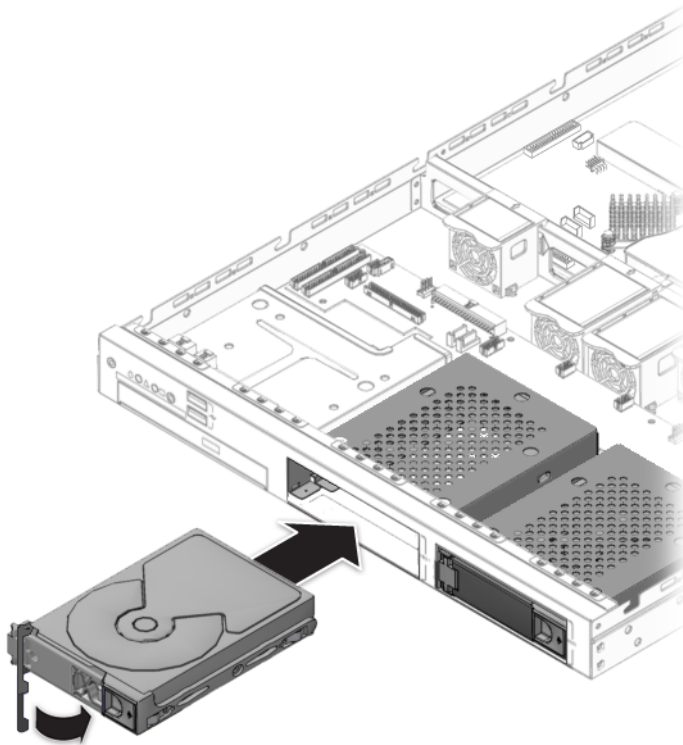
---

4. Reinsert the HDD and carrier into the server as described in [Section 4.5.4.2, “Installing an HDD and Carrier”](#) on page 4-17.

## 4.5.4.2 Installing an HDD and Carrier

Follow these steps to install the HDD and carrier:

1. Squeeze the release latch and carefully swing the arm to the left as far as it will go.



**FIGURE 4-13** Installing the Hard Disk Drive

2. Grasping the body of the drive in both hands, carefully guide the connector end of the carrier into the drive bay, sliding the carrier into the bay until the arm engages and partially closes itself.
3. Push the arm forward and latch it to lock the carrier in place.

## 4.5.5 SATA Backplane

The following procedure describes how to replace the SATA backplane.

### 4.5.5.1 Removing the SATA Backplane

Follow these steps to remove the SATA backplane:

1. **Power off the system and remove the cover as described in [Section 4.3, “Powering Off the Server and Removing the Cover”](#) on page 4-3.**
2. **Remove all hard disk drive (HDD) carriers:**
  - a. Squeeze the release latch and swing the arm to the left as far as it will go.
  - b. Grasp the carrier bezel with both hands and carefully pull the carrier out of the drive bay (see [FIGURE 4-12](#)).

---

**Note** – Avoid using the arm to remove the carrier.

---

3. **Disconnect the power, SATA, fan, and DVD and IDE cables from the SATA backplane (see [FIGURE 4-38](#)).**



---

**Caution** – The small flat cables are extremely fragile. Use care when disconnecting and connecting these cables.

---

4. Unfasten the eight screws that secure the backplane to the chassis.

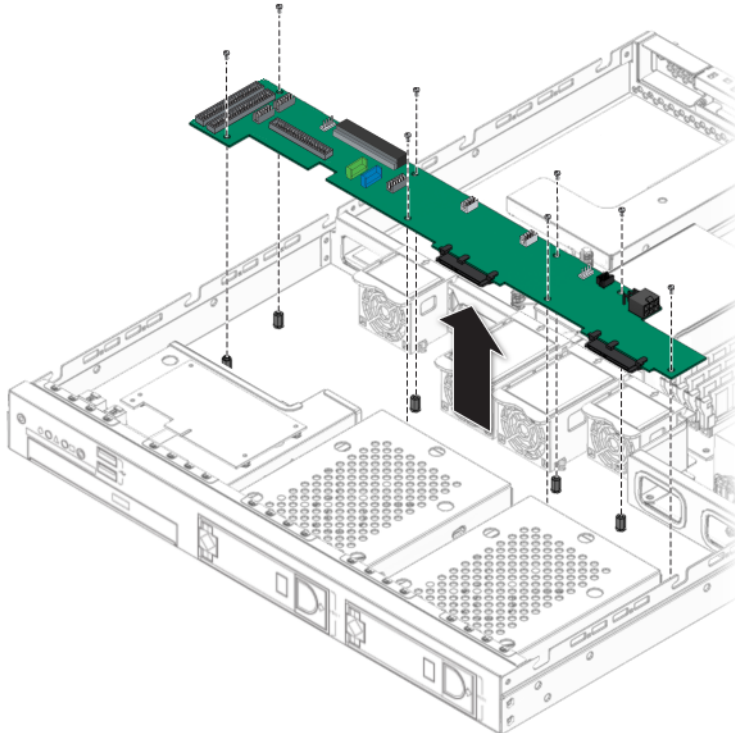


FIGURE 4-14 Removing the SATA Backplane

5. Lift the SATA backplane out of the chassis (see [FIGURE 4-14](#)).



---

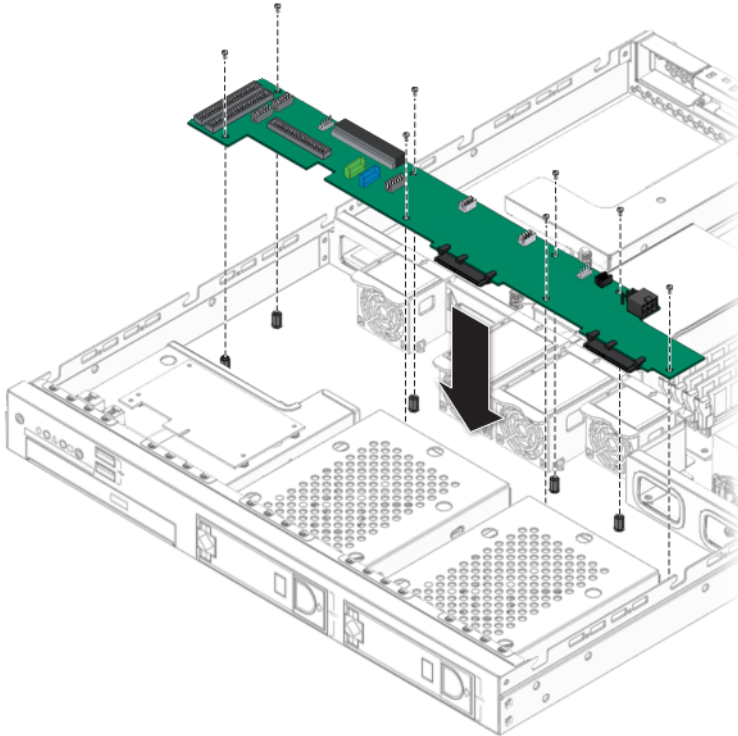
**Caution** – Ensure that the fan wires are not pinched when you install the backplane.

---

## 4.5.5.2 Installing the SATA Backplane

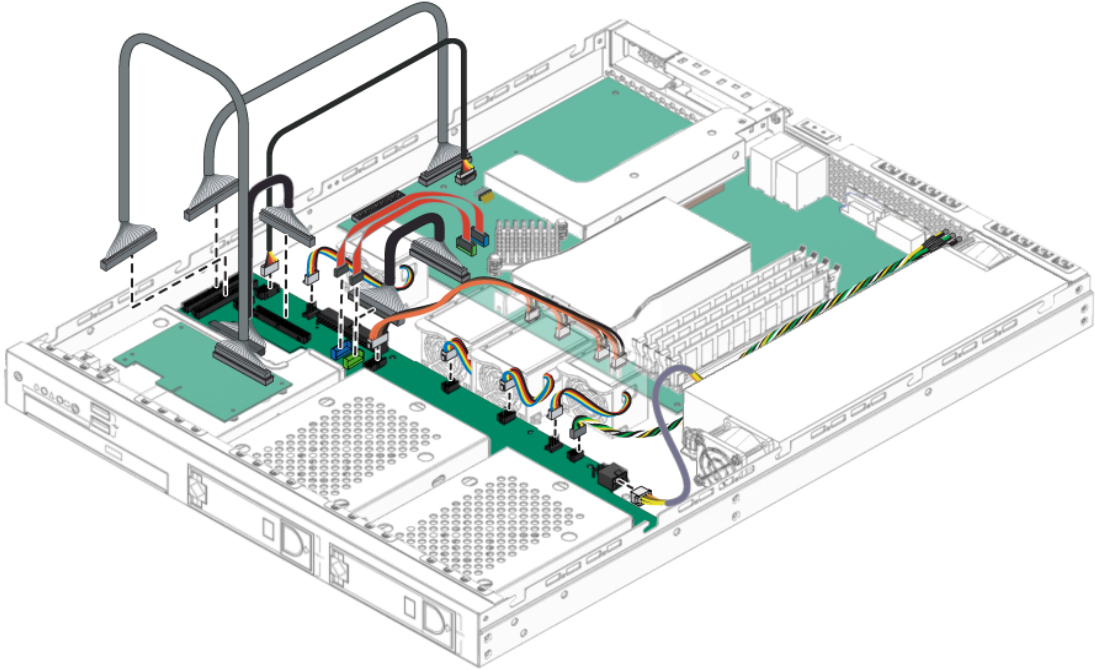
Follow these steps to install the SATA backplane:

1. Place the new SATA backplane in the chassis.



**FIGURE 4-15** Installing the SATA Backplane

2. Fasten the screws that secure the backplane to the chassis.
3. Reconnect the power, SATA, fan, and DVD and IDE cables to the SATA backplane.



**FIGURE 4-16** Server Internal Cable Routing

- 4. Check the routing of all cables for obstructions, and then install the cover.**
- 5. Install the hard drives.** (See [Section 4.5.4, “SATA Hard Disk Drive and Carrier”](#) on [page 4-15](#)).

## 4.5.6 DVD Drive Assembly

The following procedure describes how to replace the DVD drive assembly. If you are not replacing a DVD drive, go straight to [Section 4.5.6.2, “Installing the DVD Drive Assembly”](#) on page 4-23.

### 4.5.6.1 Removing the DVD Drive Assembly

Follow these steps to remove the DVD drive assembly:

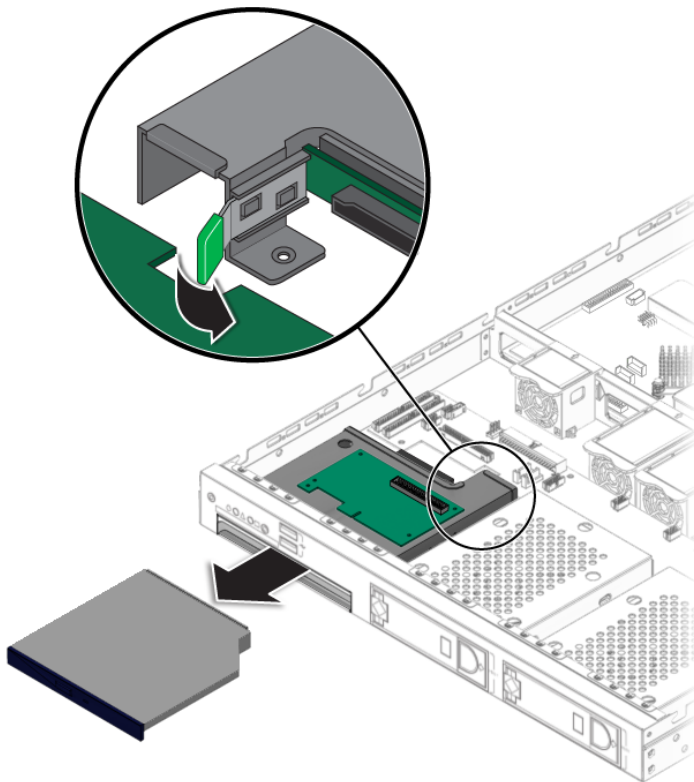
1. **Power off the system and remove the cover as described in [Section 4.3, “Powering Off the Server and Removing the Cover”](#)** on page 4-3.
2. **Unfasten the drive ribbon cable from the SATA backplane.**



---

**Caution** – Use care. The small flat cables are extremely fragile.

---



**FIGURE 4-17** Removing the DVD Drive Assembly

3. Pull the latch on the back of the DVD drive case away from the drive bay, until the DVD drive springs forward out of the chassis.
4. Pull the DVD drive out the front of the chassis.



---

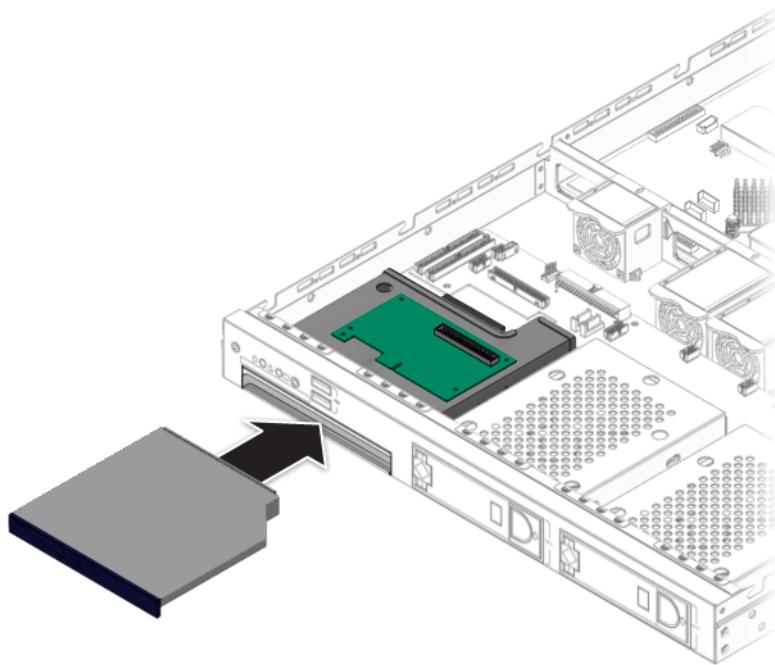
**Caution** – Move the assembly by grasping it by its sides. Do not push on the DVD-ROM tray.

---

### 4.5.6.2 Installing the DVD Drive Assembly

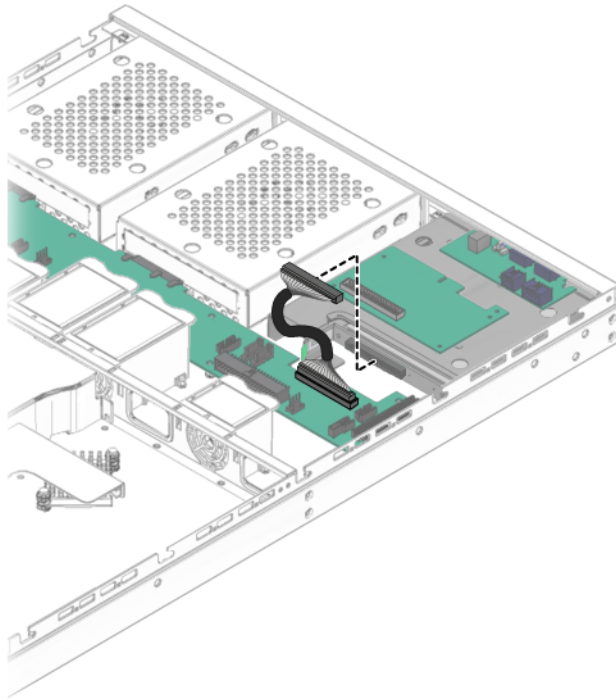
Follow these steps to install the DVD drive assembly:

1. (If necessary) remove the filler panel in front of the DVD drive slot on the front panel.
2. Position the DVD drive in front of the DVD drive slot on the front panel.
3. Push the DVD drive into the drive slot until the drive clicks into place.



**FIGURE 4-18** Installing the DVD Drive Assembly

4. Install the DVD drive cable.



**FIGURE 4-19** Installing the DVD Drive Cable

- 5. Check the routing of all cables for obstructions, and then install the cover.**



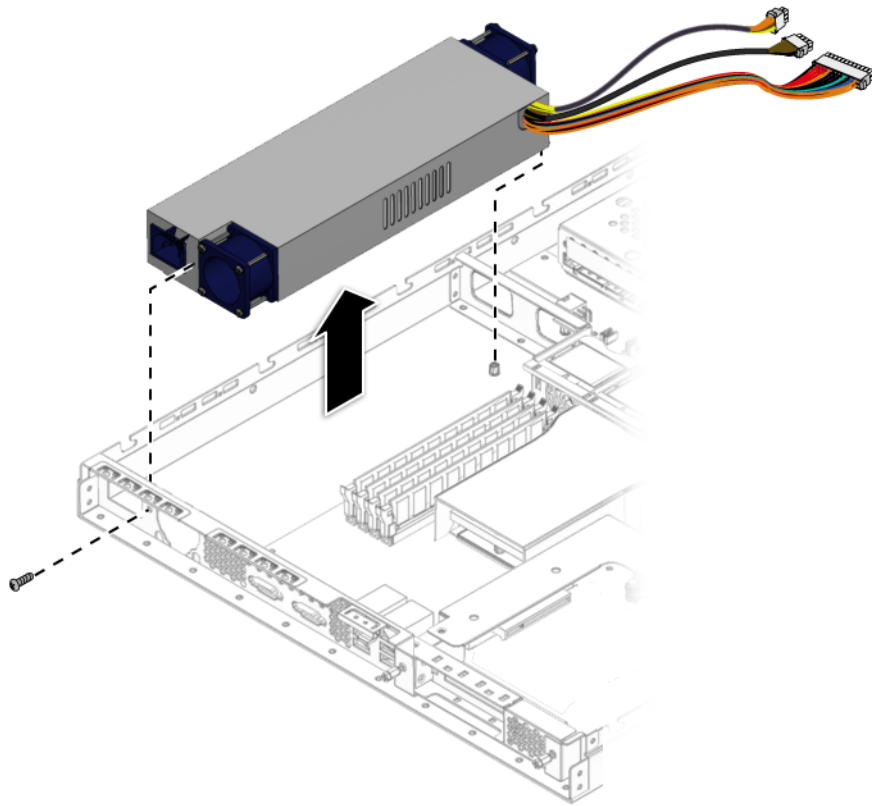
## 4.5.7 Power Supply

The following procedure describes how to replace the power supply.

### 4.5.7.1 Removing a Power Supply

Follow these steps to remove the power supply:

1. **Power off the system and remove the cover as described in [Section 4.3, “Powering Off the Server and Removing the Cover”](#) on page 4-3.**
2. **Disconnect the three power-supply cables from the motherboard (see [FIGURE 4-20](#)).**
3. **Unfasten the screw securing the power supply to the chassis and the screw securing the power supply to the back panel.**



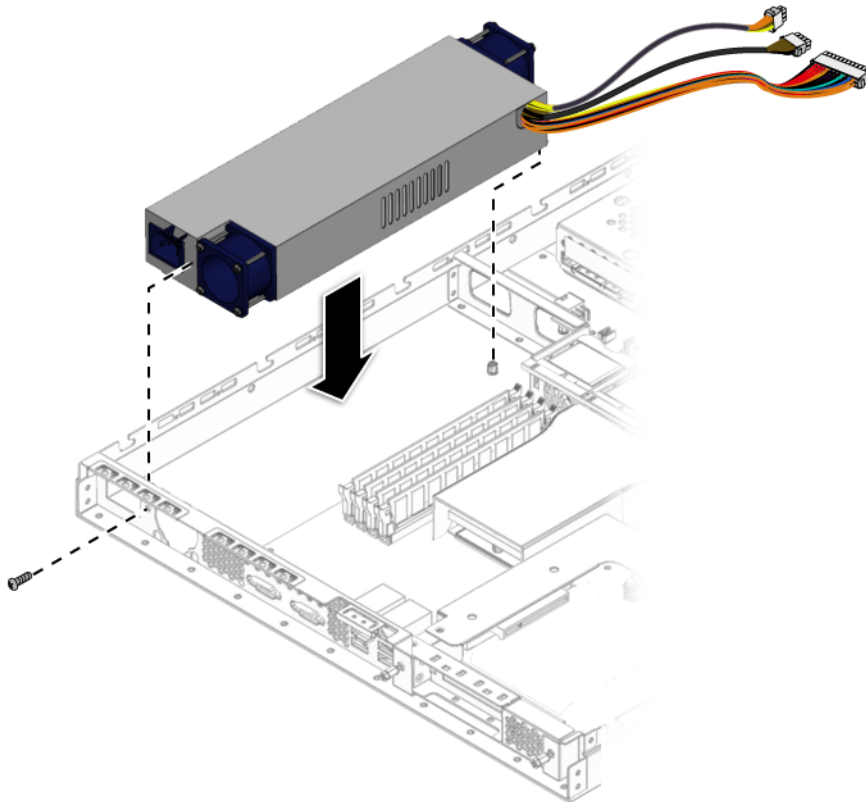
**FIGURE 4-20** Removing the Power Supply

4. Lift the power supply out of the chassis.

## 4.5.7.2 Installing a Power Supply

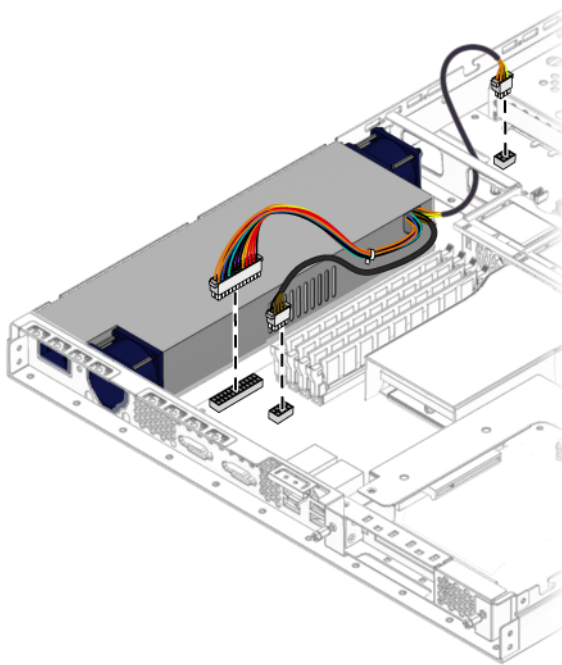
Follow these steps to install the power supply:

1. Position the power supply over the chassis power-supply cage.
2. Insert the power supply into the chassis.
3. Fasten the power supply to the chassis and backplane with screws.



**FIGURE 4-21** Installing the Power Supply

4. Connect two of the power supply cables to the motherboard and one cable to the SATA backplane.



**FIGURE 4-22** Connecting the Power Supply Cables

5. Check the routing of all cables for obstructions, and then install the cover.

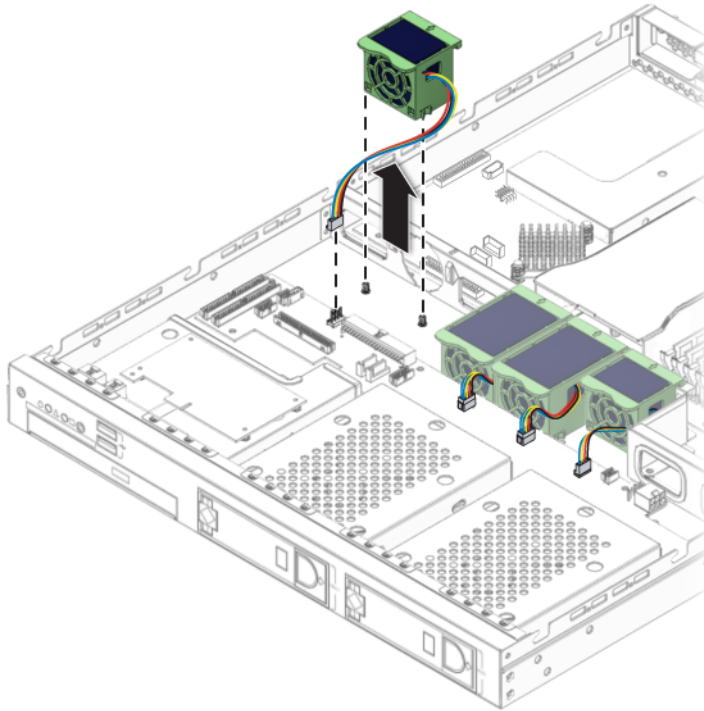
## 4.5.8 Cooling Fans

The following procedures describes how to replace a system fan module.

### 4.5.8.1 Removing the Fans

Follow these steps to remove a system fan module:

1. **Power off the system and remove the cover as described in [Section 4.3, “Powering Off the Server and Removing the Cover”](#) on page 4-3.**
2. **Identify the fan(s) to be replaced.**
3. **Push the fan module forward in the direction of the arrows and simultaneously pull the fan upward.**



**FIGURE 4-23** Removing a Fan Module

4. Unplug the fan's power connector from the SATA backplane (see [FIGURE 4-23](#)).

---

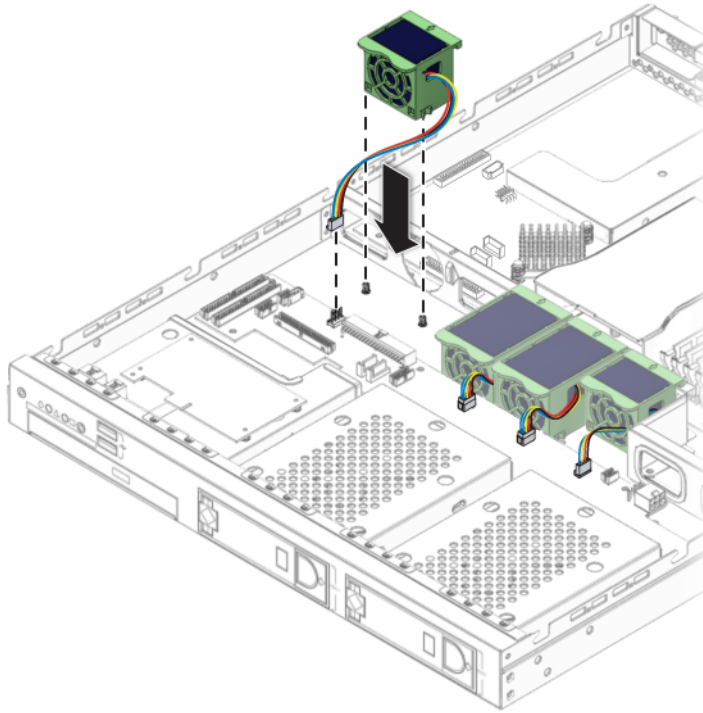
**Note** – Note exactly which motherboard connector to which the fan was connected. If you connect a fan to an incorrect connector, the SP cannot correctly identify a fan failure.

---

## 4.5.8.2 Installing the Fans

Follow these steps to install a system fan module:

1. Position the fan so that the arrow on top of the fan casing is facing the middle chassis divider.
2. Place the fan in the chassis so that it fits over the small guideposts.



**FIGURE 4-24** Installing a Fan Module

3. Gently push the fan down to secure it to the chassis.
4. Connect the fan connector to the appropriate connector on the SATA backplane.
5. Check the routing of all cables for obstructions, and then install the cover.

## 4.5.9 Dual Inline Memory Modules

This section contains the DIMM population rules for configuring the memory in your Sun Fire X2100 Server:

[“DIMM Population Rules” on page 30](#)

This section also contains the following procedures:

- [“Detecting Faulty DIMMs” on page 31](#)
- [“Removing a DIMM” on page 31](#)
- [“Installing a DIMM” on page 33](#)

### 4.5.9.1 DIMM Population Rules

The following rules apply when configuring memory in your Sun Fire X2100 Server.

- The Sun Fire X2100 Server contains four DIMM slots, numbered DIMM1, DIMM2, DIMM3, and DIMM4. DIMM1 is the slot closest to the CPU.
- The four slots are divided into two banks, Bank0 and Bank1. Bank0 is comprised of DIMM slots 1 and 2, and Bank1 is comprised of DIMM slots 3 and 4.
- The DIMM slots are color-coded. The Bank0 slots are blue, and The Bank1 slots are black.
- When configuring the memory slots, populate the blue slots first, before populating the black slots.
- The system supports 1, 2, or 4 DIMM configurations.
- When configuring for 2 or 4 DIMMs, the DIMMs must be installed as matched pairs. The two DIMMs in a bank must be identical (same size, type, and manufacturer).

Supported DIMM size and type:

- Supported DIMM sizes are: 512 MB, 1 GB, and 2 GB.
- Supported DIMM type is: DDR1/400 Unbuffered ECC (128 bit plus ECC databus).

Minimum and Maximum Memory Configurations:

- The minimum memory configuration is 512 MB, one 512 MB DIMM in slot1.
- The maximum memory configuration is 8 GB, four 2 GB DIMMs, one 2 GB DIMM in each slot.

## 4.5.9.2 Detecting Faulty DIMMs

Use the following procedure to determine which DIMM modules are not functioning properly:

1. **Boot the machine with the supplemental CD in the disk drive.**
2. **Run the PC-Check diagnostic tool that comes with the supplemental CD.**
3. **Select option 1, Hardware Diagnostic Tests.**
4. **Select Advanced Diagnostic Tests; then select Memory.**  
This shows all the system memory.
5. **Ensure that all the memory tests are selected by selecting test set in the memory test menu.**  
All tests should be highlighted in yellow, with a dot to the left of each.
6. **Exit the screen by pressing the Esc key.**
7. **Select test system memory.**  
This begins testing all the memory in the system. If a DIMM module is faulty, PC-Check indicates which one failed and highlights it in red.
8. **Make a note of any failed DIMM modules.**
9. **Shut down the machine and disconnect the AC power from the back.**
10. **To remove the faulty module and replace it with a new one, continue to [Section 4.5.9.3, “Removing a DIMM” on page 4-31.](#)**

## 4.5.9.3 Removing a DIMM

This procedure describes how to remove dual inline memory modules (DIMMs).



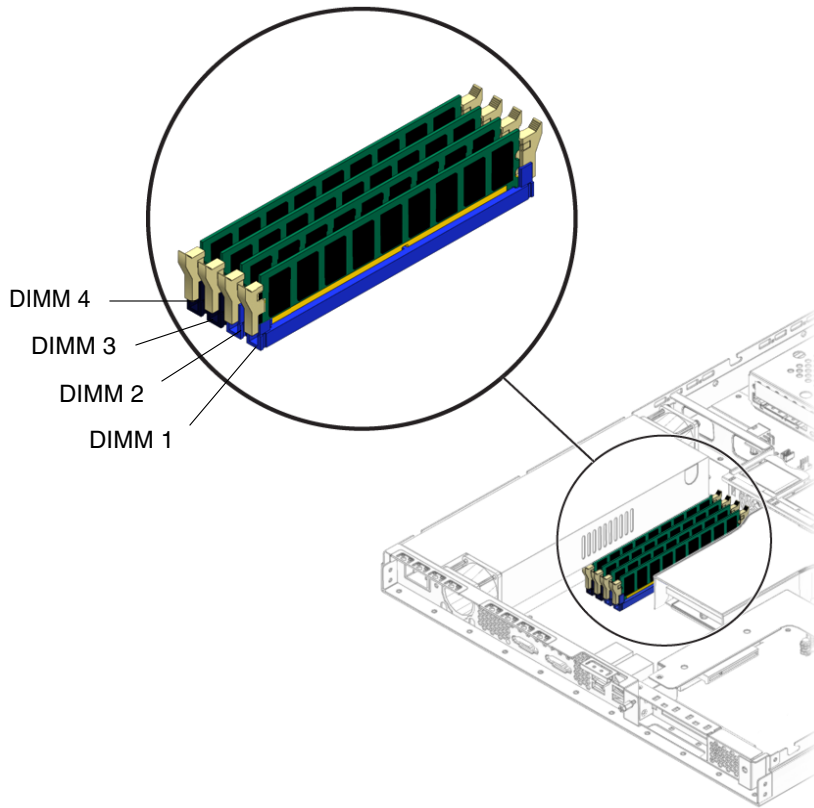
---

**Caution** – DIMMs and other components within your Sun Ultra 40 Workstation are extremely sensitive to electrostatic discharge (ESD). *ESD can damage DIMMs and other components beyond repair.* Use proper ESD grounding techniques when handling DIMMs and other components. Wear an antistatic wrist strap and use an antistatic mat.

---

Follow these steps to remove a DIMM:

1. **Power off the system and remove the cover as described in [Section 4.3, “Powering Off the Server and Removing the Cover” on page 4-3.](#)**
2. **Locate the DIMM slot containing the DIMM that you would like to remove.**



**FIGURE 4-25** DIMM Slot Locations

3. Release the DIMM by simultaneously pressing down on the retaining/ejector levers located at both ends of the DIMM slot (see [FIGURE 4-26](#)).

This action lifts the DIMM from its slot.



---

**Caution** – Do not remove the DIMM from the DIMM slot at an angle. This can damage the DIMM, the edge connector, or the slot. Always handle DIMMs along the outside edges. Do not handle DIMMs along the gold edge. Do not touch DIMM contacts, components or other metal parts.

---

4. Remove the DIMM from the DIMM slot.



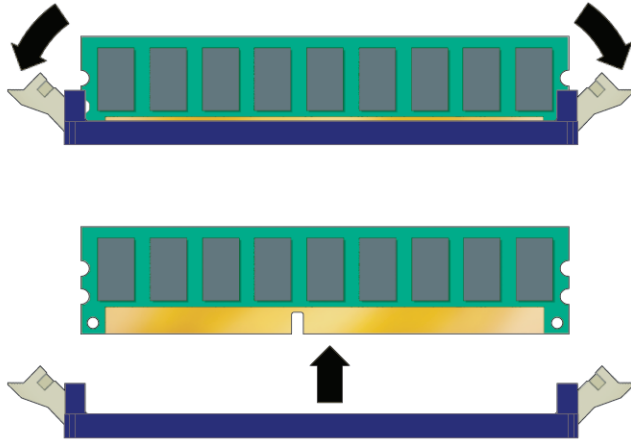


FIGURE 4-26 Removing a DIMM

#### 4.5.9.4 Installing a DIMM

Follow these steps to install a DIMM:

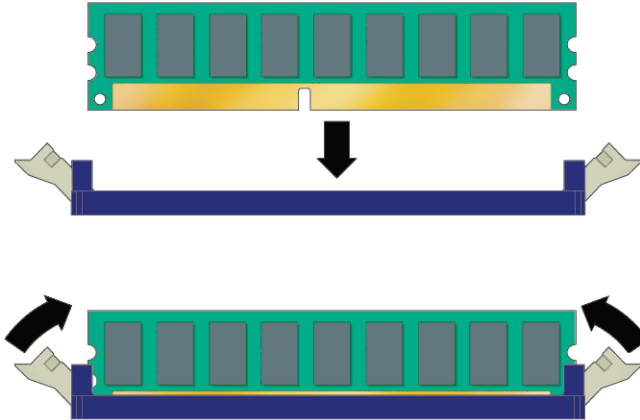


---

**Caution** – DIMMs and other components within your Sun Ultra 40 Workstation are extremely sensitive to electrostatic discharge (ESD). *ESD can damage DIMMs and other components beyond repair.* Use proper ESD grounding techniques when handling DIMMs and other components. Wear an antistatic wrist strap and use an antistatic mat.

---

1. Refer to “[DIMM Population Rules](#)” on page 30 before installing DIMMs.
2. Ensure that the DIMM socket ejector levers are open (rotated outward) to allow the new module to be inserted. See [FIGURE 4-26](#).
3. Align the DIMM’s edge connector with the alignment key and insert the memory module into the connector.



**FIGURE 4-27** Installing a DIMM

4. **Using both thumbs, press the DIMM straight down into the DIMM slot until both ejector levers click, locking the DIMM in the DIMM slot.**
  - The DIMM must be inserted evenly in the DIMM slot until it locks into place.
  - The DIMM is seated when you hear a click and the DIMM ejector levers are in the vertical position.
5. **Check the routing of all cables for obstructions, and then install the cover.**

## 4.5.10 CMOS Data

CMOS is a type of chip on the motherboard that stores system-specific data, such as, the date and time, and the user and supervisor passwords. The data stored on the CMOS chip is maintained by the system battery. If the system battery fails, or if it is removed, the CMOS system-specific data will be cleared and default values used instead.

Sometimes it is necessary to clear or reset the CMOS, for example, while troubleshooting, or to reset the passwords. The CMOS chip can be cleared by:

- Using the Clear CMOS jumper
- Removing and Installing the System Battery

## 4.5.10.1 Clearing CMOS Using the Clear CMOS Jumper

This procedure describes how to clear the CMOS using the Clear CMOS jumper (JP2):



---

**Caution** – Clearing the CMOS causes the server to revert to the factory default BIOS settings, regardless of how the server boot options have been set up using the System Setup Utility or the BIOS setup.

---

---

**Note** – The Clear CMOS Jumper function is disabled in BIOS version 1.1.5 (and higher). To clear the CMOS see, [Section 4.5.10.2, “Clearing the CMOS by Removing the System Battery”](#) on page 4-35.

---

1. **Power off the system and remove the cover as described in [Section 4.3, “Powering Off the Server and Removing the Cover”](#) on page 4-3.**
2. **Locate the Clear CMOS jumper (JP2). JP2 is located next to cable connector J33 on the motherboard, see [Section FIGURE 4-37, “Motherboard Cable Connection”](#) on page 4-47 for the location of connector J33.**

---

**Note** – JP2 is a three position jumper. The default/normal position has the jumper cap over pin 1 and pin 2.

---

3. **Remove the jumper cap from pins 1 and 2, and place it on pins 2 and 3.**
4. **Wait 15-20 seconds and then remove the jumper cap from pins 2 and 3, and return it to the default/normal position.**  
The CMOS is cleared.
5. **Install the cover and power on the server.**

## 4.5.10.2 Clearing the CMOS by Removing the System Battery

You can clear the CMOS by removing the system battery for 15-20 seconds. Use the following procedures to remove and install the system battery and clear the CMOS:

1. **Remove the system battery (see [Section 4.5.11.1, “Removing the System Battery”](#) on page 4-36).**  
To clear the CMOS wait 15-20 seconds before installing the battery.
2. **Install the battery (see [Section 4.5.11.2, “Installing the System Battery”](#) on page 4-38).**

## 4.5.11 System Battery

The system battery is a common CR2032 calculator battery.

You might need to replace the system battery if you know it is weak, if the BIOS loses its CMOS settings, or if the time-of-day clock loses time.



---

**Caution** – Removing the battery causes the server to revert to the factory default BIOS settings, regardless of how the server boot options have been set up using the System Setup Utility or the BIOS setup.

---



---

**Caution** – Do not attempt to open or service batteries. The battery contains lithium and can explode if not properly used, handled, or disposed of.

---

### 4.5.11.1 Removing the System Battery

Follow these steps to remove a system battery:

1. **Power off the system and remove the cover as described in [Section 4.3, “Powering Off the Server and Removing the Cover”](#) on page 4-3.**

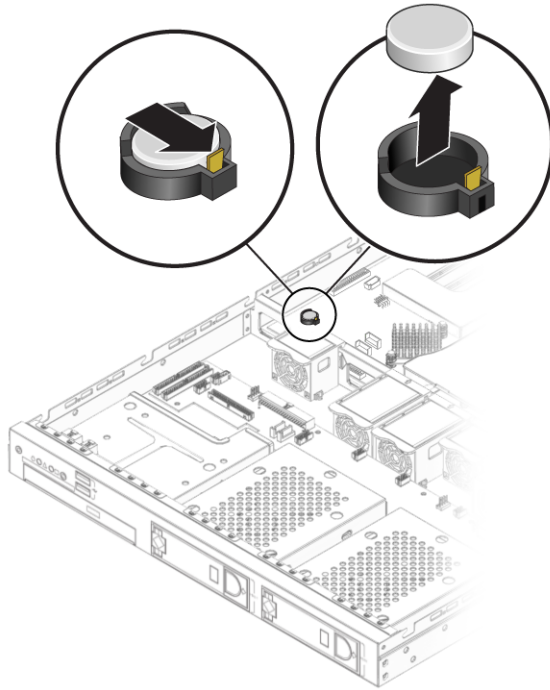


---

**Caution** – Components within your Sun Ultra 40 Workstation are extremely sensitive to electrostatic discharge (ESD). *ESD can damage these components beyond repair.* Use proper ESD grounding techniques when handling components within your Sun Ultra 40 Workstation. Wear an antistatic wrist strap and use an antistatic mat.

---

2. **Remove the system battery by sliding it back and prying it from the holder (see [FIGURE 4-28](#) for the location).**



**FIGURE 4-28** Removing the System Battery



---

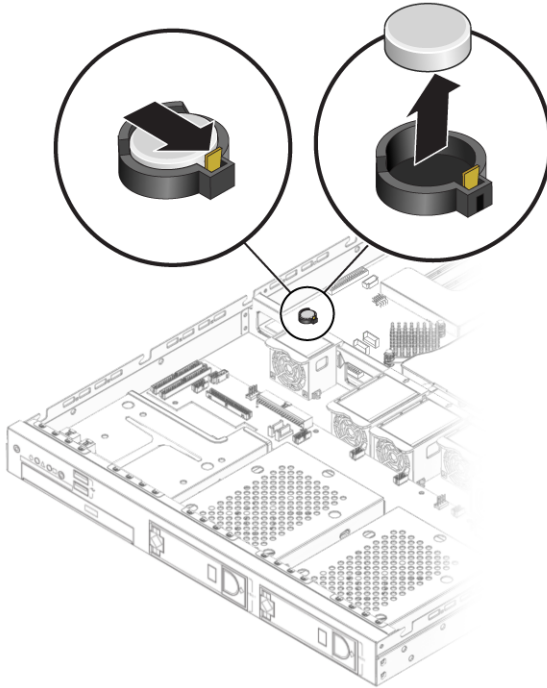
**Caution** – Do not dispose of the battery with regular waste. Discard used batteries according to the manufacturer’s instructions or contact your local waste-disposal agency for the location of the nearest battery deposit site.

---

## 4.5.11.2 Installing the System Battery

Follow these steps to install a system battery:

1. Install the system battery into the holder with the side labeled “+” facing up.



**FIGURE 4-29** Installing the System Battery

---

**Note** – Replace the battery only with the identical model.

---

2. Check the routing of all cables for obstructions, and then install the cover.

## 4.5.12 CPUs

The following procedure describes how to replace a CPU. The Sun Fire X2100 Server supports both single- and dual-CPU configurations.

---

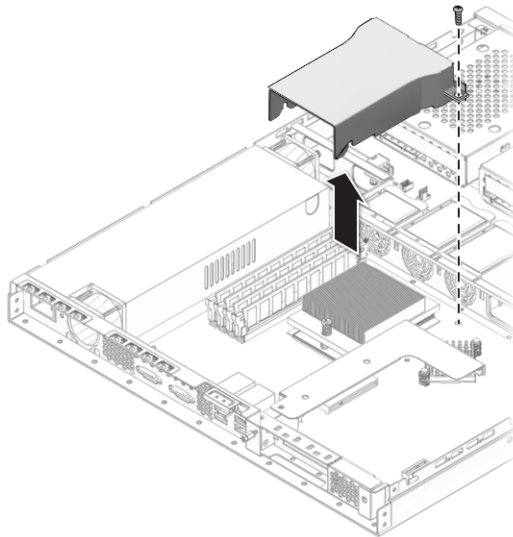
**Note** – The CPU is not a Customer Replaceable Unit (CRU) and should be replaced only by trained field service technicians.

---

### 4.5.12.1 Removing a Heatsink and CPU

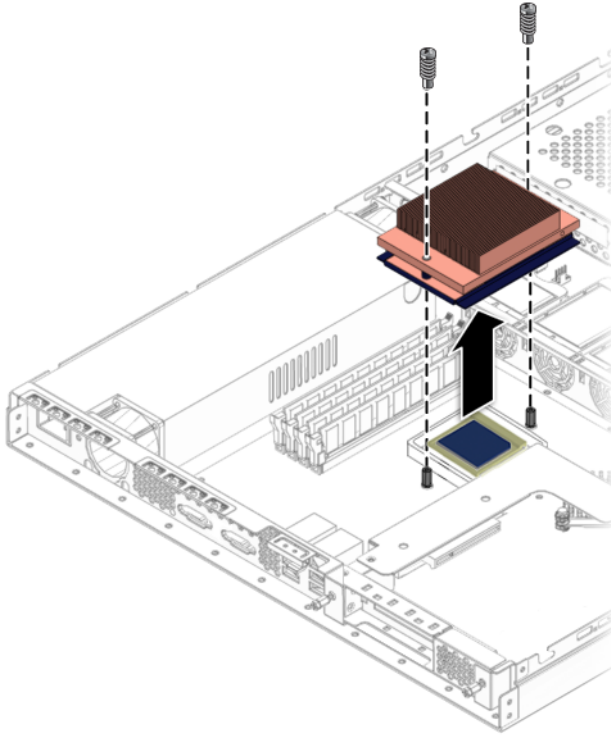
Follow these steps to remove a heatsink and CPU:

1. **Power off the system and remove the cover as described in [Section 4.3, “Powering Off the Server and Removing the Cover”](#) on page 4-3.**
2. **Remove the air baffle.**
  - a. **Remove the screw attaching the air baffle to the motherboard.**
  - a. **Lift the baffle straight up, just far enough to clear the guide screws on the side of the heatsink.**
  - b. **Pull the baffle straight back to disengage it from the chassis.**



**FIGURE 4-30** Removing the Air Baffle

3. **Unfasten the two screws securing the heatsink to the board (see [FIGURE 4-31](#)).**



**FIGURE 4-31** Removing the Heatsink



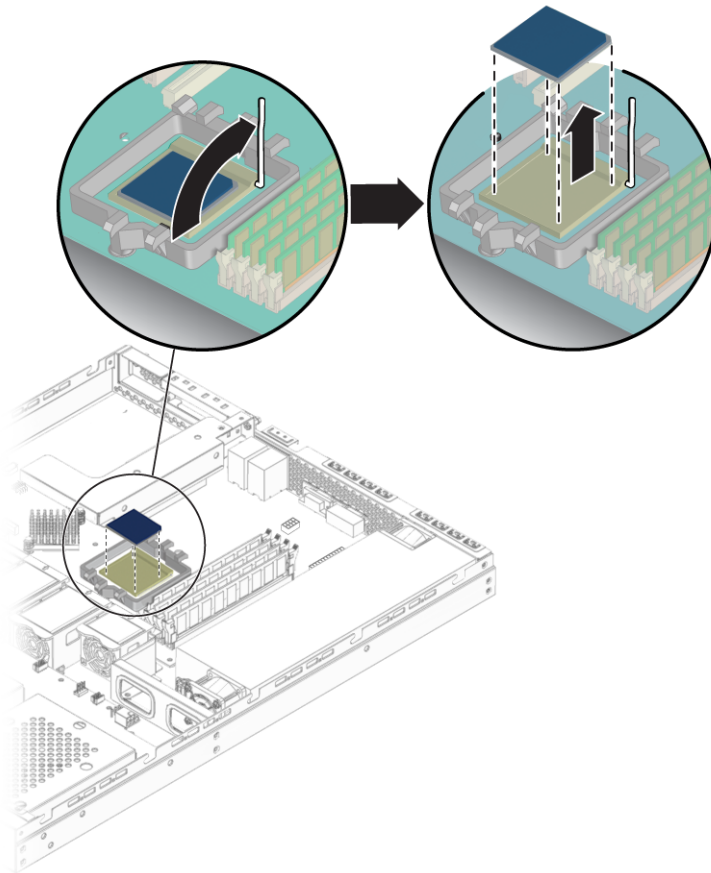
---

**Caution** – The heatsink can become extremely hot. Be sure it has had sufficient time to cool before handling.

---

4. Twist the heatsink slightly to the right or left to break the seal with the thermal grease.
5. Lift the heatsink away from the CPU.
6. Place the heatsink upside-down on a flat surface to prevent the thermal grease from contaminating other components.
7. Pull the socket release lever up to the fully open, perpendicular position.





**FIGURE 4-32** Removing the CPU

8. Lift the CPU out of the socket, leaving the release lever in the open position.



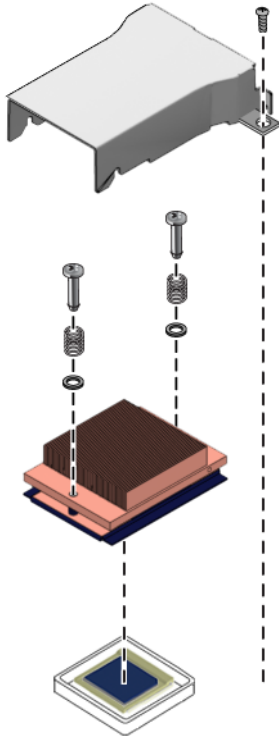
---

**Caution** – Ensure that the thermal grease from the heatsink does not come into contact with the CPU socket or pins.

---

## 4.5.12.2 Installing a CPU and Heatsink

The following illustration shows the order of hardware installation for the CPU and heatsink:



**FIGURE 4-33** Hardware Order for CPU and Heatsink Installation

Follow these steps to install a CPU and heatsink:

1. **Unpack the new CPU.**

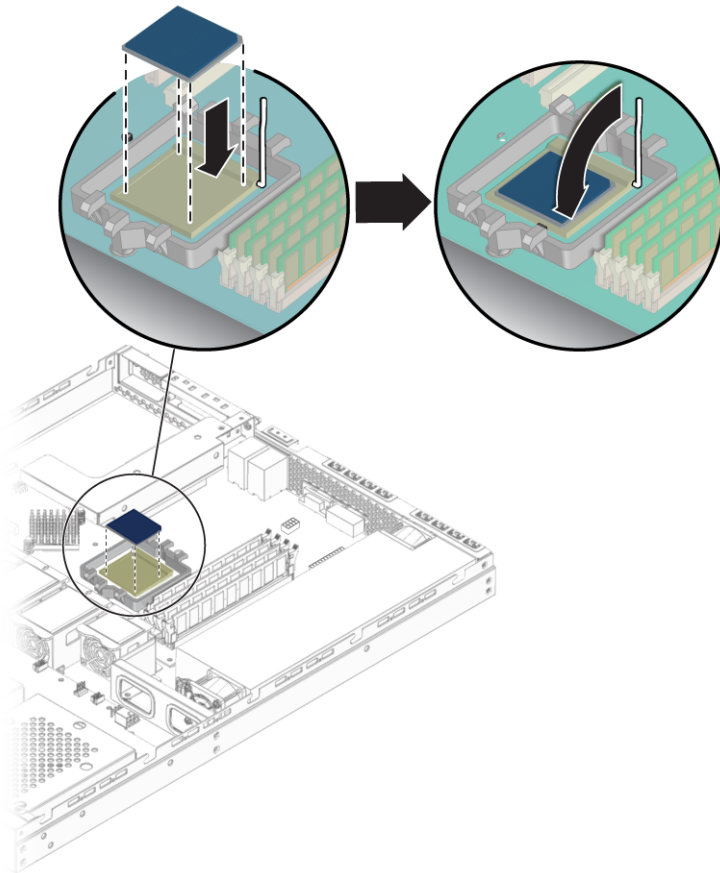


---

**Caution** – Observe the appropriate ESD precautions.

---

2. **Ensure that the socket release lever is in the fully open, perpendicular position** (see [FIGURE 4-34](#)).
3. **Align the small triangle, on the corner of the CPU, with the triangle on the corner of the socket.**



**FIGURE 4-34** Installing the CPU

**4. Insert the CPU into the socket.**



---

**Caution** – If the CPU is correctly aligned, then you should be able to easily insert the CPU into the socket. If you feel more than minimal resistance, stop and recheck the alignment. Forcing a misaligned CPU into the socket can cause permanent damage.

---

- 5. When the CPU is fully seated in the socket, push the socket release lever down until it snaps into place, securing the CPU in the socket.**
- 6. Use the syringe to apply approximately 0.1 ml of thermal grease in a circular pattern to the top of the CPU.**

7. Gently distribute the thermal grease and remove any excess so that only an extremely thin, uniform layer remains. If any voids or crevices appear that could lead to air pockets, reapply the grease until you achieve a thin but compact consistency.
8. Use an alcohol pad to remove all thermal grease from the bottom of the heatsink.
9. Inspect the heatsink for dust and lint. Clean if necessary.
10. Ensure that the foam strip under the heatsink area is intact and has not been removed, loosened, or damaged. This foam strip is critical to proper air flow.
11. Carefully position the heatsink on the CPU, aligning it with the mounting posts to reduce movement after it makes initial contact with the layer of thermal grease.

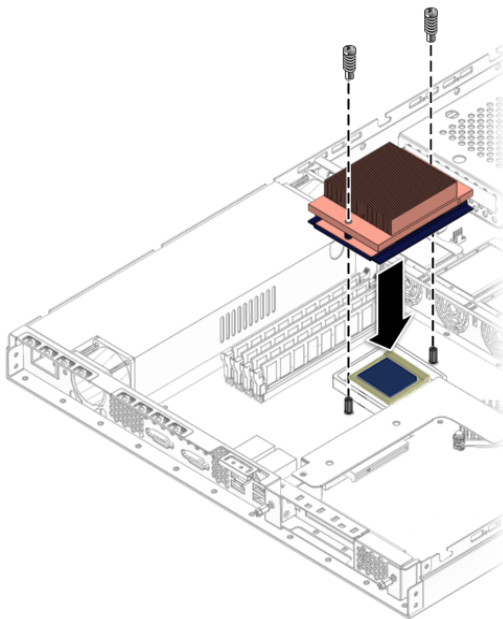


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**Caution** – If the heatsink is moved too much during its installation, the layer of thermal grease may become uneven, leading to component damage.

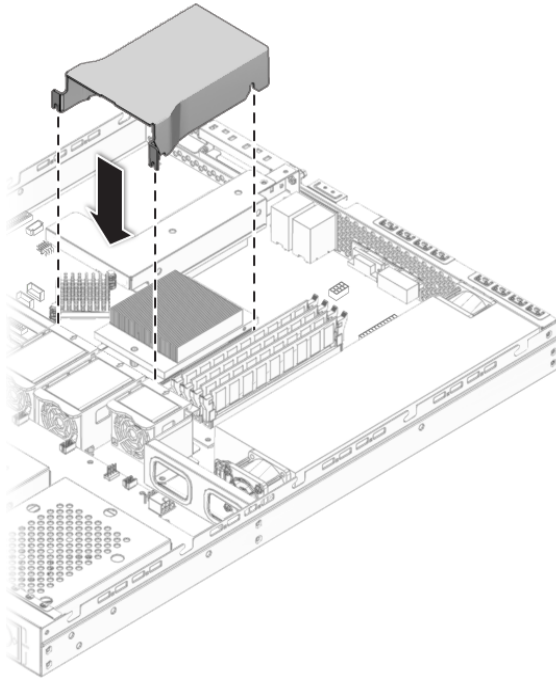
---

12. If necessary, install the spring onto each of the two heatsink screws, followed by the washer, before fastening the screws to the heatsink.  
See [FIGURE 4-33](#) for the correct order of hardware installation.
13. Fasten the two screws attaching the heatsink to the motherboard. See [FIGURE 4-35](#).



**FIGURE 4-35** Installing the Heatsink

14. Install the air baffle.
  - a. Position the air baffle over the heatsink.
  - b. Push the front of the air baffle forward to engage it with the positioning posts near the center chassis divider.
  - c. Push the back of the baffle straight down to secure it to the screws on the side of the heatsink.
15. Attach the screw to the tab on the side of the air baffle, as shown in [FIGURE 4-36](#).



**FIGURE 4-36** Installing the Air Baffle

16. Install the cover.

## 4.5.13 Cables

The following system cables have a connector at each end, and therefore can be removed or installed by the customer. Cables for DVD or SP cards are included with the component kits. All other cables are permanently attached to a system component at one end and must be removed or replaced along with the component.

See [FIGURE 4-37](#) and [FIGURE 4-38](#) for the locations of connectors. You can also refer to the cabling diagram on the service label attached to the cover of the system.

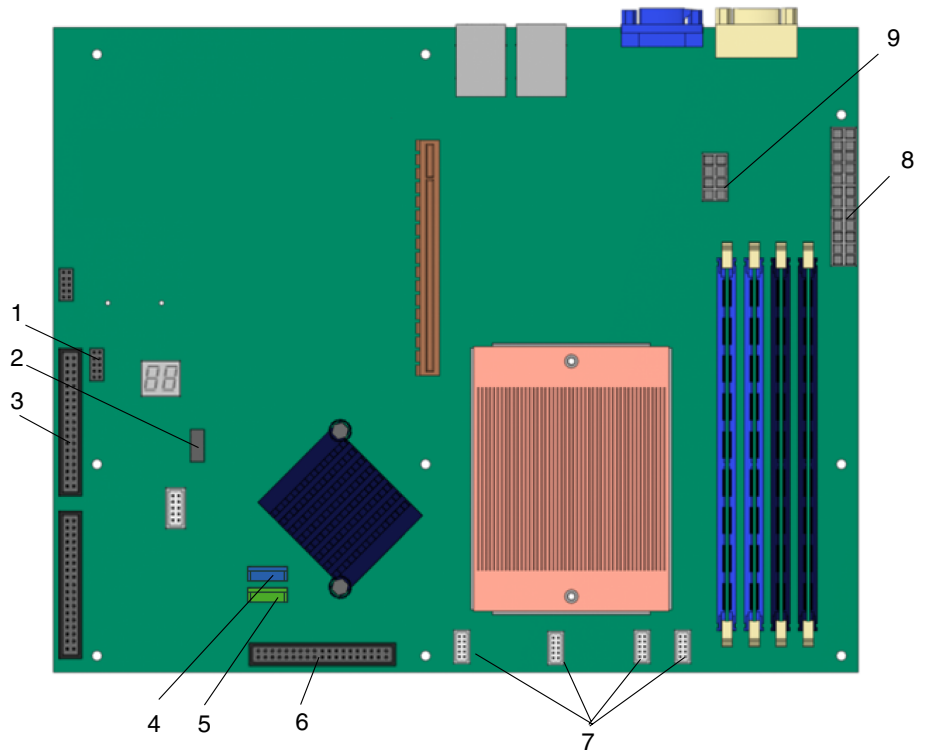
**TABLE 4-2** Sun Fire X2100 Server Cable Kit

Cable	Part Number
LED cable	422743500001
USB cable	422743500002
DVD cable	422743500004
SATA 1 cable -blue	422743500006
SATA 2 cable -green	422743500005
IPMI cable 1	422743500007
Power cable	422743500009
Front cable	422743500010
Fan cable	422743500011

Each cable connector on the motherboard is labeled to help you identify the cable to which it should be connected.

To remove and install system cables:

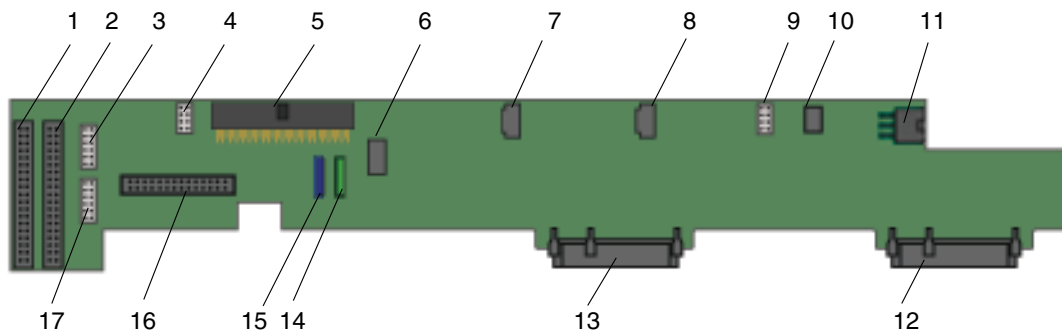
- 1. Press the power button to turn off the system power, and power-off all of the peripherals connected to the server.**
- 2. Remove the top cover of the server.**
- 3. Replace any cables that need to be replaced. (See [FIGURE 4-37](#) or [FIGURE 4-38](#)).**
- 4. Ensure that all cable routing is correct, and that all of the cable connectors are properly seated, before installing the left-side access panel. See [FIGURE 4-39](#).**



**FIGURE 4-37** Motherboard Cable Connection

**TABLE 4-3** Motherboard Cable Connections

Label	Motherboard connector	Component/board connection	Cable
1	J45	SATA backplane J20	422743500010
2	J 34	Front I/O Board J1	422743500002
3	J46 (SMBC)	SATA backplane J16	422743500007
4	SATA1	SATA backplane SATA1	422743500006
5	SATA 2	SATA backplane SATA2	422743500005
6	J33	SATA backplane J10	422743500004
7	Fan plugs 1, 2, 3, CPU	SATA backplane J8	422743500011
8	PW1	Power supply P1	Power supply P1
9	PW2	Power supply P3	Power supply P3

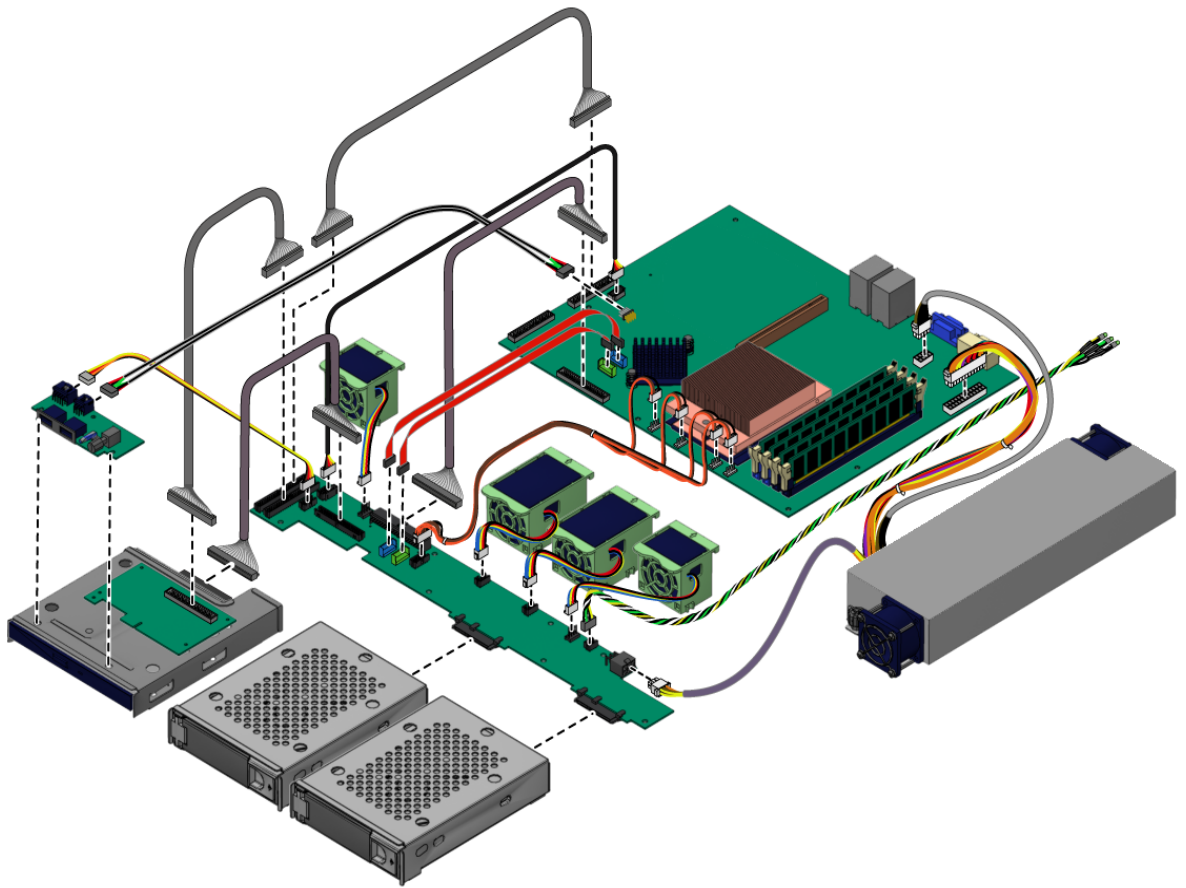


**FIGURE 4-38** SATA Backplane Cable Connections

**TABLE 4-4** SATA Backplane Cable Connections

Label	SATA Backplane Connector	Component/Board Connector	Cable	Notes
1	J16	Motherboard J46 (SMBC)	422743500007	
2	J17 (SMBC)	Service processor (SP)	422743500008	Cable packaged with SP.
3	J20	Motherboard J45	422743500010	
4	J9	Fan 4	Fan 4	
5	J10	Motherboard J33	422743500004	
6	J8	Motherboard fan plugs 1, 2, 3, CPU	422743500011	
7	J6	Fan 3	Fan 3	
8	J5	Fan 2	Fan 2	
9	J7	Fan 1	Fan 1	
10	J18	Rear service indicators	422743500001	
11	J15	Power supply P2	Power supply P2	
12	HDD 2 connector	HDD 2	N/A	
13	HDD 1 connector	HDD 1	N/A	
14	SATA 2 (green)	Motherboard SATA 2	422743500005	
15	SATA 1 (blue)	Motherboard SATA 1	422743500006	
16	J11	DVD	422743500003	Cable packaged with DVD.
17	J21	Front I/O board J3	422743500009	





**FIGURE 4-39** Server Internal Cable Routing

## 4.5.14 Motherboard

The following sections describe how to remove and install the Sun Fire X2100 Server system motherboard.

---

**Note** – The motherboard is not a CRU and should be replaced only by trained field service technicians.

---

## 4.5.14.1 Removing the Motherboard

Follow these steps to remove the motherboard:

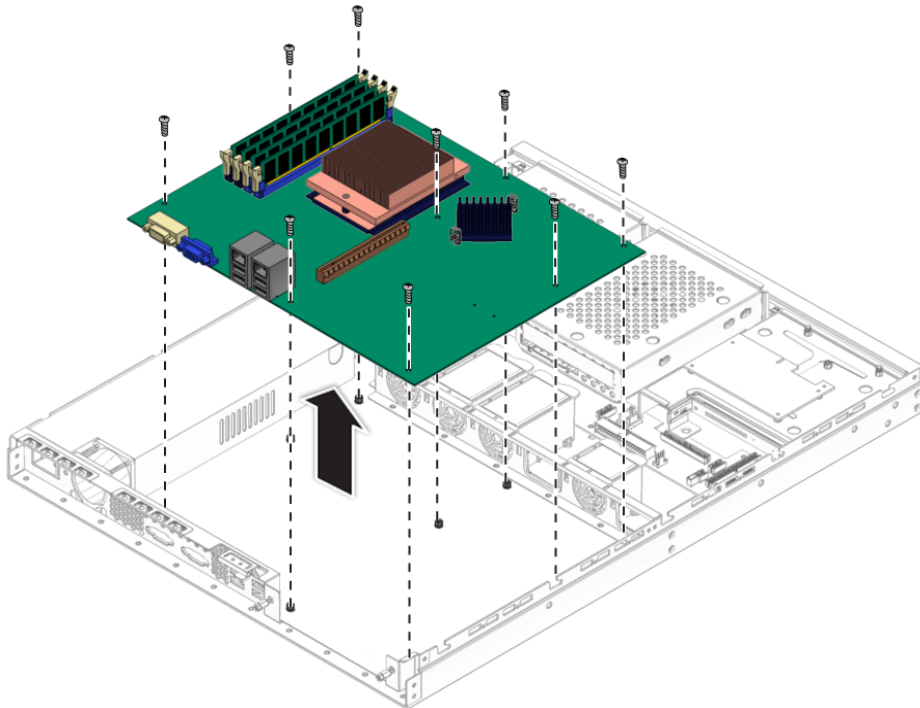
1. **Power off the system and remove the cover as described in Section 4.3, “Powering Off the Server and Removing the Cover” on page 4-3.**
2. **Remove the PCIe card riser installed on the motherboard (see Section 4.5.3, “PCIe Card” on page 4-12) and the air baffle (see Section 4.5.12, “CPUs” on page 4-39).**
3. **Disconnect all cables attached to the motherboard.**

---

**Note** – Do not remove the four screws that secure the CPU heatsink assembly to the motherboard.

---

4. **Remove the nine Phillips screws that fasten the motherboard to the chassis.**



**FIGURE 4-40** Removing the Motherboard

5. **Pull the motherboard away from the chassis.**

Refer to the following sections for information on removing and replacing the CPU and memory:

- [Section 4.5.12, “CPUs” on page 4-39](#)
- [Section 4.5.9, “Dual Inline Memory Modules” on page 4-30](#)

## 4.5.14.2 Installing the Motherboard

Follow these steps to install a motherboard:

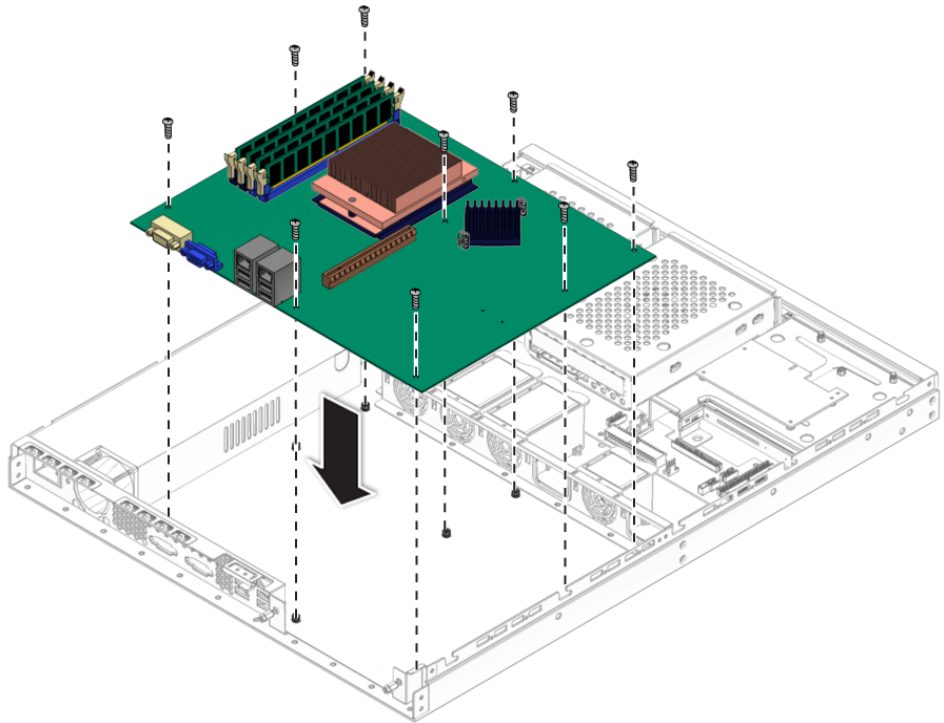


---

**Caution** – Observe proper ESD precautions when handling the new motherboard.

---

1. Center the motherboard on the chassis so that the screw holes in the motherboard align with the screw holes on the chassis.
2. Secure the nine Phillips screws that fasten the motherboard to the chassis. Torque screws to 8- to 9-inch pounds.



**FIGURE 4-41** Installing the Motherboard

**3. Install the CPU or DIMMs as necessary.**

Refer to the following sections for information on removing and replacing the CPU and memory:

- [Section 4.5.12, “CPUs” on page 4-39](#)
- [Section 4.5.9, “Dual Inline Memory Modules” on page 4-30](#)

**4. Install any PCIe or graphics cards.**

See [Section 4.5.3, “PCIe Card” on page 4-12](#).

**5. Connect all internal system cables.**

See [Section 4.5.13, “Cables” on page 4-46](#).

**6. Install the system cover.**

**7. Connect any external cables and power on the server.**

# System Specifications

---

This section contains physical, power and environmental specifications for the Sun Fire X2100 Server.

---

## A.1 Physical Specifications

[TABLE A-1](#) lists the physical specifications for the Sun Fire X2100 Server.

**TABLE A-1** Sun Fire X2100 Server Physical Specifications

Specification	British	Metric
Width	17.3 inches	445 mm
Depth	22 inches	550 mm
Height	1.73 inches	44 mm
Weight (max.)	28.7 lbs	13 kg

---

## A.2 Power Specifications

Maximum continuous power is 300W. Other specifications are shown in the following tables.

**TABLE A-2** Input Voltage Range

<b>Voltage Ranges</b>	<b>Minimum</b>	<b>Nominal</b>	<b>Maximum</b>	<b>Units</b>
Range 1	90	115	132	Vms
Range 2	180	230	264	Vms

**TABLE A-3** Input Frequency

<b>Frequency Ranges</b>	<b>Minimum</b>	<b>Nominal</b>	<b>Maximum</b>	<b>Units</b>
Range 1	57	60	63	Hz
Range 2	47	50	53	Hz

**TABLE A-4** Input Current

<b>Current Type</b>	<b>Values</b>	<b>Units</b>
Input Current	2.3 to 4.6	Amps
Maximum inrush current	100	Amps

## A.3 Environmental Specifications

Environmental specifications for the Sun Fire X2100 Server are shown in [TABLE A-5](#).

**TABLE A-5** Sun Fire X2100 Server Environmental Specifications

Specification	State	British	Metric
Humidity	Operating	7%-93% RH non-condensing, 80.6° F max wet bulb	7%-93% RH non-condensing, 38° C max wet bulb
	Nonoperating	93% RH, non-condensing, 100.4° F max wet bulb	93% RH, non-condensing, 43° C max wet bulb
Vibration	Operating	0.25 G in all axes, 5-500 Hz sine	
	Nonoperating	1.2 G in all axes, 5-500 Hz sine	
Shock	Operating	4.5 G, 11 msec. half-sine	
Temperature	Operating	41° F to 95° F	5° C to 35° C
	Nonoperating	-40° F to 149° F	-40° C to 65° C
Altitude	Operating	max 9,843 ft	max 3,000 m



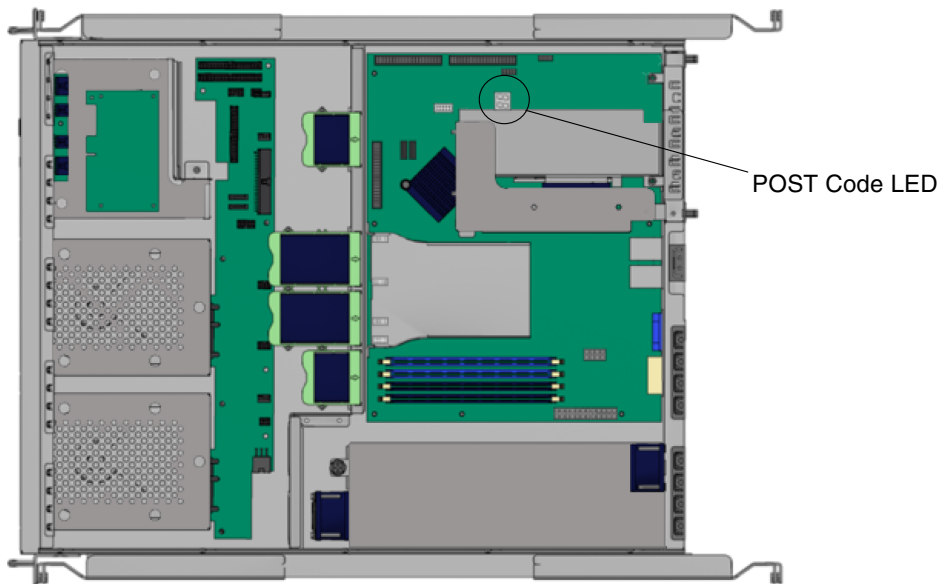


## BIOS POST Codes

Typically, the BIOS displays warning or error messages on the video display in the event of hardware or configuration errors.

However, in some cases the error may be so severe that the BIOS halts immediately or the BIOS might be unable to initialize video. In these cases, it can be useful to determine the last power-on self-test (POST) task that the BIOS was executing. This is indicated by the value written to port 80.

You can read the port 80 codes from the LED on the Sun Fire X2100 Server motherboard. The location of this LED is shown in [FIGURE B-1](#). The BIOS POST codes are listed in the following table.



**FIGURE B-1** POST Code LED Location

**TABLE B-1** BIOS Port 80 POST Codes

<b>POST Code</b>	<b>Description</b>
CFh	Test CMOS R/W functionality.
C0h	Early chipset initialization: <ul style="list-style-type: none"><li>• Disable shadow RAM.</li><li>• Disable L2 cache (socket 7 or below).</li><li>• Program basic chipset registers.</li></ul>
C1h	Detect memory: Auto-detection of DRAM size, type, and ECC. Auto-detection of L2 cache (socket 7 or below).
C3h	Expand compressed BIOS code to DRAM.
C5h	Call chipset hook to copy BIOS back to E000 and F000 shadow RAM.
01h	Expand the Xgroup codes located in the physical address 1000:0.
02h	Reserved.
03h	Initial Superio_Early_Init switch.
04h	Reserved.
05h	1. Blank out screen. 2. Clear CMOS error flag.
06h	Reserved.
07h	1. Clear 8042 interface. 2. Initialize 8042 self-test.
08h	1. Test special keyboard controller for Winbond 977 series Super I/O chips. 2. Enable keyboard interface.
09h	Reserved.
0Ah	1. Disable PS/2 mouse interface (optional). 2. Auto-detect ports for keyboard and mouse, followed by a port and interface swap (optional). 3. Reset keyboard for Winbond 977 series Super I/O chips.
0Bh	Reserved.
0Ch	Reserved.
0Dh	Reserved.
0Eh	Test F000h segment shadow to see whether it is read/write-able. If test fails, keep beeping the speaker.

**TABLE B-1** BIOS Port 80 POST Codes *(Continued)*

<b>POST Code</b>	<b>Description</b>
0Fh	Reserved.
10h	Auto-detect flash type to load appropriate flash R/W codes into the runtime area in F000 for ESCD and DMI support.
11h	Reserved.
12h	Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override.
13h	Reserved.
14h	Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers.
15h	Reserved.
16h	Initial onboard clock generator if Early_Init_Onboard_Generator is defined. See also POST 26h.
17h	Reserved.
18h	Detect CPU information, including brand, SMI type (Cyrix or Intel), and CPU level (586 or 686).
19h	Reserved.
1Ah	Reserved.
1Bh	Initial interrupts vector table. If no special is specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR and S/W interrupts to SPURIOUS_soft_HDLR.
1Ch	Reserved.
1Dh	Initial EARLY_PM_INIT switch.
1Eh	Reserved.
1Fh	Load keyboard matrix (notebook platform).
20h	Reserved.
21h	HPM initialization (notebook platform).
22h	Reserved.
23h	1. Check validity of RTC value: e.g., a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead.
24h	Prepare BIOS resource map for PCI and PnP use. If ESCD is valid, consider the ESCD's legacy information.

**TABLE B-1** BIOS Port 80 POST Codes *(Continued)*

<b>POST Code</b>	<b>Description</b>
25h	Early PCI initialization: <ul style="list-style-type: none"><li>• Enumerate PCI bus number.</li><li>• Assign memory and I/O resource.</li><li>• Search for a valid VGA device and VGA BIOS, and put it into C000:0.</li></ul>
26h	<ol style="list-style-type: none"><li>1. If Early_Init_Onboard_Generator is not defined Onboard clock generator initialization. Disable respective clock resource to empty PCI and DIMM slots.</li><li>2. Init onboard PWM.</li><li>3. Init onboard H/W monitor devices.</li></ol>
27h	Initialize INT 09 buffer.
28h	Reserved.
29h	<ol style="list-style-type: none"><li>1. Program CPU internal MTRR (P6 and PII) for 0-640K memory address.</li><li>2. Initialize the APIC for Pentium class CPU.</li><li>3. Program early chipset according to CMOS setup. Example: onboard IDE controller.</li><li>4. Measure CPU speed.</li></ol>
2Ah	Reserved.
2Bh	Invoke video BIOS.
2Ch	Reserved.
2Dh	<ol style="list-style-type: none"><li>1. Initialize double-byte language font (optional).</li><li>2. Put information on screen display, including award title, CPU type, CPU speed, full-screen logo.</li></ol>
2Eh	Reserved.
2Fh	Reserved.
30h	Reserved.
31h	Reserved.
32h	Reserved.
33h	Reset keyboard if Early_Reset_KB is defined- for example, Winbond 977 series Super I/O chips. See also POST 63h.
34h	Reserved.
35h	Test DMA Channel 0.
36h	Reserved.
37h	Test DMA Channel 1.

**TABLE B-1** BIOS Port 80 POST Codes *(Continued)*

<b>POST Code</b>	<b>Description</b>
38h	Reserved.
39h	Test DMA page registers.
3Ah	Reserved.
3Bh	Reserved.
3Ch	Test 8254.
3Dh	Reserved.
3Eh	Test 8259 interrupt mask bits for channel 1.
3Fh	Reserved.
40h	Test 8259 interrupt mask bits for channel 2.
41h	Reserved.
42h	Reserved.
43h	Test 8259 functionality.
44h	Reserved.
45h	Reserved.
46h	Reserved.
47h	Initialize EISA slot.
48h	Reserved.
49h	1. Calculate total memory by testing the last double word of each 64K page. 2. Program the write allocation for AMD K5 CPU.
4Ah	Reserved.
4Bh	Reserved.
4Ch	Reserved.
4Dh	Reserved.
4Eh	1. Program MTRR of M1 CPU. 2. Initialize L2 cache for P6 class CPU, and program CPU with proper cacheable range. 3. Initialize the APIC for P6 class CPU. 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical.
4Fh	Reserved.

**TABLE B-1** BIOS Port 80 POST Codes *(Continued)*

<b>POST Code</b>	<b>Description</b>
50h	Initialize USB keyboard and mouse.
51h	Reserved.
52h	Test all memory (clear all extended memory to 0).
53h	Clear password according to H/W jumper (optional).
54h	Reserved.
55h	Display number of processors (multiprocessor platform).
56h	Reserved.
57h	1. Display PnP logo. 2. Early ISA PnP initialization -Assign CSN to every ISA PnP device.
58h	Reserved.
59h	Initialize the combined Trend Anti-Virus code.
5Ah	Reserved.
5Bh	(Optional feature) Show message for entering AWDFLASH.EXE from FDD.
5Ch	Reserved.
5Dh	1. Initialize Init_Onboard_Super_IO. 2. Initialize Init_Onboard_AUDIO.
5Eh	Reserved.
5Fh	Reserved.
60h	Okay to enter setup utility; that is, it is not until this POST stage can users enter the CMOS setup utility.
61h	Reserved.
62h	Reserved.
63h	Reset keyboard if Early_Reset_KB is not defined.
64h	Reserved.
65h	Initialize PS/2 mouse.
66h	Reserved.
67h	Prepare memory size information for function call: INT 15h ax=E820h.
68h	Reserved.
69h	Turn on L2 cache.
6Ah	Reserved.

**TABLE B-1** BIOS Port 80 POST Codes *(Continued)*

<b>POST Code</b>	<b>Description</b>
6Bh	Program chipset registers according to items described in Setup and auto-configuration table.
6Ch	Reserved
6Dh	1. Assign resources to all ISA PnP devices. 2. Auto-assign ports to onboard COM ports if the corresponding item in Setup is set to AUTO.
6Eh	Reserved.
6Fh	1. Initialize diskette controller. 2. Set up diskette-related fields in 40:hardware.
70h	Reserved.
71h	Reserved.
72h	Reserved.
73h	Reserved.
74h	Reserved.
75h	Detect and install all IDE devices: HDD, LS120, ZIP, CD-ROM, and so on.
76h	(Optional feature) Enter AWDFLASH.EXE if: <ul style="list-style-type: none"><li>• AWDFLASH.EXE is in diskette drive.</li><li>• You press ALT+F2.</li></ul>
77h	Detect serial ports and parallel ports.
78h	Reserved.
79h	Reserved.
7Ah	Detect and install coprocessor.
7Bh	Reserved.
7Ch	Initialize HDD write-protect.
7Dh	Reserved.
7Eh	Reserved.
7Fh	Switch back to text mode if full screen logo is supported. If errors occur, report errors and wait for keys If no errors occur or F1 key is pressed to continue: Clear EPA or customization logo.
80h	Reserved.
81h	Reserved.

**TABLE B-1** BIOS Port 80 POST Codes (Continued)

POST Code	Description
E8POST.ASM starts	
82h	<ol style="list-style-type: none"><li>1. Call chipset power management hook.</li><li>2. Recover the text font used by EPA logo (not for full-screen logo).</li><li>3. If password is set, ask for password.</li></ol>
83h	Save all data in stack back to CMOS.
84h	Initialize ISA PnP boot devices.
85h	<ol style="list-style-type: none"><li>1. Do the USB final initialization.</li><li>2. Switch screen back to text mode.</li></ol>
86h	Reserved.
87h	NET PC: Build SYSID structure.
88h	Reserved.
89h	<ol style="list-style-type: none"><li>1. Assign IRQs to PCI devices.</li><li>2. Set up ACPI table at top of the memory.</li></ol>
8Ah	Reserved.
8Bh	<ol style="list-style-type: none"><li>1. Invoke all ISA adapter ROMs.</li><li>2. Invoke all PCI ROMs (except VGA).</li></ol>
8Ch	Reserved.
8Dh	<ol style="list-style-type: none"><li>1. Enable/disable Parity Check according to CMOS setup.</li><li>2. Initialize APM.</li></ol>
8Eh	Reserved.
8Fh	Clear noise of IRQs.
90h	Reserved.
91h	Reserved.
92h	Reserved.
93h	Read HDD boot-sector information for Trend Anti-Virus code.
94h	<ol style="list-style-type: none"><li>1. Enable L2 cache.</li><li>2. Program daylight saving.</li><li>3. Program boot-up speed.</li><li>4. Initialize final Chipset.</li><li>5. Initialized final power management.</li><li>6. Clear screen and display summary table.</li><li>7. Program K6 write allocation.</li><li>8. Program P6 class write combining.</li></ol>



**TABLE B-1** BIOS Port 80 POST Codes *(Continued)*

<b>POST Code</b>	<b>Description</b>
95h	Update keyboard LED and typematic rate.
96h	<ol style="list-style-type: none"><li>1. Build MP table.</li><li>2. Build and update ESCD.</li><li>3. Set CMOS century to 20h or 19h.</li><li>4. Load CMOS time into DOS timer tick.</li><li>5. Build MSIRQ routing table.</li></ol>
FFh	Boot attempt (INT 19h).



# Using the Optional Service Processor

---

This chapter contains the following sections:

- [Section C.1, “Service Processor Overview” on page C-1](#)
- [Section C.2, “Util. exe Utility” on page C-2](#)
- [Section C.3, “Setting up the SMDC for IPMItool v1.8.5” on page C-6](#)

---

## C.1 Service Processor Overview

The M3290 Service Management Daughter Card (SMDC) is an optional service processor that you can install on your Sun Fire X2100 Server.

The SMDC is powered by the Baseboard Management Control (BMC) controller (based on the Qlogic Zicon processor), which is a standalone CPU-like device, running its own real-time OS. As long as standby power supports the system, the SMDC will monitor the system.

You will need at least two different tools to interact with the SMDC: The `util.exe` utility and an Intelligent Platform Management Interface (IPMI) v1.5 compliant server management client, such as, IPMItool v1.8.5 or the Sun N1 System Manager.

Use the `util.exe` utility for the following tasks:

- Initial set up of the following: passwords, IP address, gateway address and netmask.
- Flashing the BMC Firmware.

See [Section C.2, “Util. exe Utility” on page C-2](#) for information on using the `util.exe` tool.

After performing initial set up tasks with the `util.exe` utility, you can use IPMItool v1.8.5 to monitor the following:

- Sensors: Voltage, Temperature, Tachometers, Fan Speed Control, Chassis Intrusion
- Control Command Set: Power up/down, System reset, System Power Cycle, System NMI, Watchdog Timer
- Diagnostic Command Set: Power-Good, CPU Voltage Identification, ACPI State Detection, Request Message Redirection, Remote Console Redirection Over LAN

To use the IPMItool v1.8.5 client see, [Section C.3.1, “Setting Up the SMDC Using IPMItool” on page C-6](#).

The Sun N1 System Manager is a IPMI v1.5 client that is offered by Sun Microsystems. For more information on the Sun N1 System Manager, see the following URL:

[http://www.sun.com/software/products/system\\_manager](http://www.sun.com/software/products/system_manager)

---

## C.2 Util. exe Utility

The `util.exe` utility is located on the Sun Fire X2100 Supplemental CD. Use this utility for initial configuration of the SMDC. Before configuring the LAN values, you will need to get the following information from your system administrator:

- BMC IP address
- BMC Netmask
- BMC Gateway

You can use either a command line option or a GUI option for the SMDC configuration.

---

**Note** – The command line does not offer all the functions available in the GUI.

---

See the section for the option that you want to use:

- [Section C.2.1, “Using the util.exe Command Line Options” on page C-3](#)
- [Section C.2.2, “Using the util.exe GUI” on page C-4](#)

## C.2.1 Using the `util.exe` Command Line Options

The `util.exe` can be invoked with a number of command line options. To run the `util.exe` tool from the command line:

1. Insert the Sun Fire X2100 Server Supplemental CD into the Sun Fire X2100 Server DVD drive and reboot the server.
2. When the Supplemental CD Main Menu displays, select the DOS Utility option.
3. Change to the latest IPMI subdirectory:  

```
> cd flash\bios\latest\IPMI
```
4. Enter one of the `util.exe` commands at the prompt to set the appropriate value.

The command line options are listed in [TABLE C-1](#)

TABLE C-1

Command	Function
<code>util.exe/rom=filename</code>	Load the BMC firmware from <i>filename</i>
<code>util.exe/c</code>	Clear all user passwords
<code>util.exe/ip=x.x.x.x</code>	Set BMC IP address
<code>util.exe/net=x.x.x.x</code>	Set BMC netmask
<code>util.exe/?</code>	Help
<code>util.exe/h</code>	Help

Examples:

- To set the IP address of the M3290: `util.exe/ip=129.148.53.250`
- To load a new version of firmware: `util.exe/rom=new.bin`

See [Section C.2.2, “Using the `util.exe` GUI”](#) on page C-4 for information on additional values to configure.

## C.2.2 Using the `util.exe` GUI

1. Insert the Sun Fire X2100 Server Supplemental CD into the Sun Fire X2100 Server DVD drive and reboot the server.
2. When the Supplemental CD Main Menu displays, select the DOS Utility option.
3. Change to the latest IPMI subdirectory:  

```
> cd flash\bios\latest\IPMI
```
4. Type: `util.exe` at the prompt.

The `util.exe` Main Menu appears.

The active main menu items are described in the following sections:

- [Section C.2.2.1, “Flash Firmware” on page C-4](#): This menu item gives you the option to flash the BMC firmware.
- [Section C.2.2.2, “Lan Config” on page C-4](#): This menu item gives you the option to set or change the following LAN settings: IP address, Net Mask, Gateway, MAC address, Broadcast ARP.
- [Section C.2.2.3, “Setting User Names and Passwords” on page C-5](#): This menu item enables you to set passwords for each of the preset user names.

### C.2.2.1 Flash Firmware

To flash the firmware, do the following:

1. Select the **Flash Firmware...** option from the Main Menu.

You will be prompted for a file name.

---

**Note** – When flashing to IPMI firmware v4.13, ensure the system BIOS is at v1.1.1.

---

2. Enter a file name in the format `xxx.bin`.

Where `xxx` is the firmware version number.

For example, firmware v4.13 will be located in the `413.bin` file.

### C.2.2.2 Lan Config

To change LAN configuration, do the following:

1. Select the **Lan Config** option from the main menu.

The LAN Configuration Viewer screen appears.

2. Press the Tab key to select Edit at the bottom of the screen and press Return.
3. Use the arrow keys to select the values that you want to change and edit the values.
4. When you are finished editing, press the Tab key to select OK at the bottom of the screen and press Return.
5. Press the Esc key to return to the Main Menu.

### C.2.2.3 Setting User Names and Passwords

To set passwords for the preset user names:

1. Select the User and Password Setting option from the Main Menu.  
The User and Password Settings screen appears.
2. Press the Tab key to select Edit at the bottom of the screen and press Enter.  
A prompt appears in the NULL Password field.
3. Use the arrow keys to navigate the password that you want to change.
4. Type a password in the Password field and press the Enter.
5. Repeat [Step 3](#) and [Step 4](#) for each password that you want to change.
6. Press the Tab key to select OK and press Enter.
7. Press the Esc key to return to the Main Menu.

### C.2.2.4 Setting PEF

Use the PEF Configuration Viewer to set the IP and MAC address for the system that will receive monitor alerts.

1. Select the PEF Setting option in the main menu.  
The PEF Configuration Viewer appears.
2. Press the Tab key to select Edit at the bottom of the screen and press Enter.
3. Use the arrow keys to select the value and edit the value.
4. When you finish editing, select OK at the bottom of the screen and press Enter.  
A message appears during the PEF configuration process.
5. Press the Esc key to return to the Main Menu.

---

## C.3 Setting up the SMDC for IPMItool v1.8.5

The following procedures describe how to set up the Sun Fire X2100 Server SMDC for use with IPMItool v1.8.5, or greater.

The following procedures are included in this section:

- [Section C.3.1, “Setting Up the SMDC Using IPMItool” on page C-6](#)
- [Section C.3.2, “Setting Up the System BIOS” on page C-7](#)
- [Section C.3.3, “Setting Up on Solaris” on page C-8](#)
- [Section C.3.4, “Setting Up on Linux” on page C-9](#)
- [Section C.3.5, “Setting Up the Console System” on page C-10](#)

### C.3.1 Setting Up the SMDC Using IPMItool

The following procedure provides instructions for setting up the SMDC for console redirection using IPMItool v1.8.5 or greater. For more details on specific menu items in the util.exe utility, see [Section C.2, “Util. exe Utility” on page C-2](#).

Before starting the SMDC set up, you will need to determine the following:

- IP address and gateway for the SMDC (these values will be different from those of the server)
- MAC address of the Broadcom NIC (if needed)
- User names and passwords for all users

To setup up the SMDC card:

**1. Insert the Supplemental CD into the DVD drive.**

See the following URL for the latest version of the CD:

<http://www.sun.com/servers/entry/x2100/downloads.jsp>

**2. Reboot the Sun Fire X2100 server.**

The Supplemental CD Main Menu displays.

**3. Select Option 4, Exit to DOS.**

**4. Change to the ipmi directory:**

```
> cd \flash\bios\latest\ipmi
```

**5. Type util at the prompt to enter the util.exe GUI.**



6. Once in the GUI, go to the Lan Config section and enter the correct IP address and gateway for the system. Also, if needed, enter the MAC address of the Broadcom NIC.

Make sure that you enter the IP address and gateway for the SMDC card, and not for the system.

7. Go to the User and Password Settings section in the GUI and enter passwords for all user names.

8. Verify that the firmware is v4.11 or higher.

The firmware version is listed at the lower right corner of the GUI. Firmware v4.12 is required for soft power off.

9. If necessary, load new firmware using the Flash Firmware section of the GUI.

10. Press the ESC key to exit out of the GUI.

## C.3.2 Setting Up the System BIOS

The minimum BIOS requirement is v1.0.7. This BIOS version is available on Supplemental CD v1.2 or later.

See the following table for key sequences that replace the function keys in BIOS v1.0.7 and later.

Function Key	New Key Sequences for BIOS v1.0.7
F1	F1+ F1
F2	F2+F2
F3	ESC+3
F4	ESC+4
F8	ESC+8
F12	ESC+B
ESC	ESC+ESC
CNTRL-ALT-DEL	ESC+C

---

**Note** – When using the ESC sequences above, press the ESC key, then the other key. Repeatedly pressing the keys can hang the LAN on the SMDC card. If this occurs, you must manually reboot the system using the system reset button.

---

To setup the system BIOS:

1. **Reboot the server and press the F2 key at the Sun Logo screen.**
2. **Select Console Redirection in the Advanced BIOS features section, and set the Console Redirection to Enabled over SMDC.**
3. **Select F10 to save your settings and exit the BIOS Setup Utility.**

## C.3.3 Setting Up on Solaris

---

**Note** – With BIOS versions of 1.1.1 or earlier, you must modify the `asy.conf` configuration file. For this reason, you cannot perform an initial Solaris installation from a CD over the SMDC card.

---

To set up SMDC Console Redirection for the Solaris OS, do the following steps:

1. **Install BGE patch# 122028-02 or greater to fix bug ID# 6337341.**
2. **If the BIOS version is earlier than v1.1.2, update it to release v1.1.2, or use an editor to add the following line to the `/kernel/drv/asy.conf` file:**

```
name="asy" parent="isa" reg=1,0x3f8,8 interrupts=4;
```

3. **Ensure that the console is set to `ttya` with the `eeprom` command:**

```
eeprom console=ttya
```

To verify that the console is set to `ttya`, use an editor to view the `/boot/solaris/bootenv.rc` file.

4. **To eliminate the splash image:**

- a. **Verify the location of the `/boot/grub/menu.lst` file:**

```
# bootadm list-menu
```

- b. **Use `vi` to edit the active `menu.lst` file:**

```
# vi /boot/grub/menu.lst
```

- c. **Comment out the line defining the splash image location:**

```
# splashimage /boot/grub/splash.xpm.gz
```

5. **After updating the `menu.lst` file, update the boot archives:**

```
# bootadm update-archive
```

## C.3.4 Setting Up on Linux

These instructions apply for all supported Red Hat and SUSE operating systems, except as noted. To set up SMDC Console Redirection for the Linux OS, do the following steps:

1. **Log in to the system as root (superuser).**
2. **Open the `/etc/inittab` file in a text editor.**
3. **Change the following in `/etc/inittab`:**
  - a. **Find the `getty` section of the `inittab` and edit the `getty`'s for init level 3 so that the line reads as follows:**

```
3:2345:respawn:/sbin/agetty -L 19200 ttyS0 vt100
```
  - b. **Locate the following line in the file:**

```
id:5:initdefault
```
  - c. **Change the default init level from 5 to 3 as shown in the following example:**

```
id:3:initdefault
```
4. **If you plan to log in to the OS as root using the remote console, you need to add the following line to edit the `/etc/securetty` file:**

```
ttyS0
```

Alternatively, you can create a non-root account, which can log in without this change.
5. **To see all of the startup messages in Red Hat, edit the `/etc/grub.conf` file as follows:**
  - a. **Open the `/etc/grub.conf` file in a text editor.**
  - b. **Add the following to the kernel line:**

```
'console=tty0 console=ttyS0,9600'
```

## C.3.5 Setting Up the Console System

Use IPMItool v1.8.5 or greater version on the console system.

On the console system:

1. **Download IPMItool v1.8.5 or greater version from the following URL:**  
<http://ipmitool.sourceforge.net>
2. **Install the tool on the console system.**

---

**Note** – For the Red Hat version, you must open the IPMItool in an xterm window. If you open it in a regular window, the ESC keys can hang the LAN on the SMDC card, and you have to manually press the system reset button to get out of it.

---

3. **Type `xterm` in a regular terminal window to start an xterm window.**
4. **Enter the `IPMItool` command with the following options to start the tool:**

```
ipmitool -A password -H first_ip_address -I lan -U Admin -P password tsol  
second_ip_address
```

Where the *first\_IP\_address* is the address of the X2100 SMDC card, the *password* variable is the password set up for the user in the SDMC, and the *second\_ip\_address* is the address of the console system.

The options in the IPMItool command have the following functions:

---

Option	Function
-U	User name
-I	Interface type
-P	password for user account on SMDC
-A	Means by which SMDC is administered.
-H	Host IP address

---

## Booting the Supplemental CD from a PXE Server

---

If you have Sun Fire X2100 Server that does not have a DVD drive, you can run the Pc-Check diagnostics and flash the BIOS from a Preboot Execution Environment (PXE) server.

Two boot images are available on the Supplemental CD:

- A Supplemental CD boot image that allows you to run diagnostics and flash the BIOS.
- A `pxe_flash` boot image that allows you to flash the BIOS on multiple servers using one configuration file.

The following topics are included in this section:

- [Section D.1, “Setting up the Supplemental CD Image on the PXE Server” on page D-2](#)
- [Section D.2, “Accessing the Supplemental CD From the Target Sun Fire X2100 Server” on page D-4](#)
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## D.1 Setting up the Supplemental CD Image on the PXE Server

Consult your Linux vendor for instructions on setting up a PXE Server.

You will need the following to set up the PXE server using Red Hat:

- Red Hat kickstart server with a CD or DVD drive  
Instructions for setting up the Red Hat kickstart server can be found in the system administration guides for Red Hat Enterprise Linux:
  - Red Hat Enterprise Linux 3 manual:  
<http://www.redhat.com/docs/manuals/enterprise/RHEL-3-Manual/sysadmin-guide/>
  - Red Hat Enterprise Linux 4 manual:  
<http://www.redhat.com/docs/manuals/enterprise/RHEL-4-Manual/sysadmin-guide/>
- Sun Fire X2100 Server Supplemental CD
- MEMDISK kernel from the SYSLINUX project. Access this kernel from:  
<http://www.kernel.org/pub/linux/utils/boot/syslinux/>

To set up the PXE server:

1. **Log in as root (superuser) to the PXE server.**
2. **Determine the directory where the Red Hat image is installed on the PXE server.**

The default directory for the PXE image is usually `/tftpboot/linux-install`. The remainder of this procedure assumes that the PXE files have been installed in this directory.

---

**Note** – If your PXE files are not installed in the `/tftpboot/linux-install` directory, modify the procedure as necessary.

---

3. **Make a directory for the Sun Fire X2100 Server Supplemental CD contents.**

```
# mkdir /tftpboot/linux-install/suppl_aq
```

4. **Insert the Sun Fire X2100 Server Supplemental CD into the PXE server and copy the `boot.img` file located in the root directory of the CD to the new Sun Fire X2100 Server supplemental directory created in Step 3.**

```
# cp /mnt/cdrom/boot.img /tftpboot/linux-install/suppl_aq
```

**5. Download the MEMDISK kernel.**

**a. Go to the latest SYSLINUX project web site at:**

<http://www.kernel.org/pub/linux/utils/boot/syslinux/>

**b. Save the latest `syslinux-version.zip` file to your root directory.**

Where *version* is the latest SYSLINUX project version. Version 3.11 is the latest version at the time of this writing.

**6. Unzip the file:**

For example:

```
# unzip syslinux-3.09.zip
```

**7. Change to the `memdisk` directory.**

For example:

```
# cd /syslinux-3.09/memdisk
```

**8. Copy the `memdisk` kernel to the new Sun Fire X2100 Server Supplemental Directory created in [Step 3](#).**

For example:

```
# cp /syslinux-3.09/memdisk/memdisk /tftpboot/linux-install/suppl_aq
```

**9. Edit the Boot Message Screen as follows:**

**a. Open the `boot.msg` file in a text editor.**

For example:

```
# vi /tftpboot/linux-install/msgs/boot.msg
```

**b. Add the following line after `0-Local Machine`.**

```
suppl_aq - Sun Fire X2100 Server Supplemental CD
```

**c. Save and close the `boot.msg` file.**

**10. Edit the default PXE Configuration file as follows:**

**a. Open the `default` file in a text editor.**

For example:

```
# vi /tftpboot/linux-install/pxelinux.cfg/default
```

**b. Add the following lines after the `label0` section:**

```
label suppl_aq
kernel suppl_aq/memdisk
append initrd=suppl_aq/boot.img
```

**c. Save and close the `default` file.**

**11. Test the installation on the test machine.**

---

## D.2 Accessing the Supplemental CD From the Target Sun Fire X2100 Server

You will need the following to run diagnostics on a target Sun Fire X2100 Server:

- PXE server configured as shown in [Section D.1, “Setting up the Supplemental CD Image on the PXE Server”](#) on page D-2.
- Sun Fire X2100 Server set up on the same network as the PXE server.

1. **Connect the Sun Fire X2100 Server to the same network as the PXE server.**
2. **Power on (or reboot) the Sun Fire X2100 Server.**
3. **Press the F12 key during POST.**
4. **The Boot Message Screen located on your PXE server at `/tftpboot/linux-install/mmsg/boot.msg` displays on the screen.**

5. **Type `suppl_aq` at the prompt and press Return.**

This allows the memdisk kernel and the bootable portion of the Supplemental CD to download over the network and into the memory of the test machine.

Once downloaded, the bootable portion of the Supplemental CD boots.

6. **The main menu of the bootable portion of the Supplemental CD displays on the target Sun Fire X2100 Server.**
7. **You can now run the hardware diagnostics and/or update the System BIOS.**

You can also update the BIOS using the procedure in [Section D.3, “Flashing System BIOS from a PXE Server”](#) on page D-4.

See the [Chapter 3](#) for information on running Pc-Check diagnostics software.

---

## D.3 Flashing System BIOS from a PXE Server

The Supplemental CD includes a bootable `pxe_flash` image. After you copy the image to a PXE server, you can run the `pxe_flash.sh` script on the PXE server to flash (update) the BIOS for one or more systems.

The steps below are specifically written for a PXE server running Red Hat Linux Release 3 or 4.



## D.3.1 Installing the pxe\_flash Image on the PXE Server

1. Log in as root (superuser) to the PXE server.
2. Make a directory for the Sun Fire X2100 Server Supplemental CD contents.  

```
# mkdir /pxe_flash
```
3. Insert the Sun Fire X2100 Server Supplemental CD into the PXE server and copy the files located in the /utilities/pxe\_flash directory to the /pxe\_flash directory.  

```
# cp /utilities/pxe_flash /pxe_flash
```
4. Download the MEMDISK kernel.
  - a. Go to the latest SYSLINUX project web site at:  
<http://www.kernel.org/pub/linux/utils/boot/syslinux/>
  - b. Download and save the latest `syslinux-version.zip` file to /pxe\_flash.  
Where *version* is the latest SYSLINUX project version. Version 3.36 is the latest version at the time of this writing.
5. Unzip the `syslinux-version.zip` file. For example:  

```
# unzip syslinux-3.11.zip
```
6. Change to the `memdisk` directory. For example:  

```
# cd /pxe_flash/syslinux-3.11/memdisk
```
7. Copy the `memdisk` kernel to the /pxe\_flash directory. For example:  

```
# cp /pxe_flash/syslinux-3.11/memdisk/memdisk /pxe_flash
```
8. Edit /pxe\_flash/input\_file to include the system information and the commands you want executed on one or more target systems. For example:

# Sys MAC Addr	Mgmt IP Addr	Commands
00:E0:81:55:XX:XX	129.129.129.129	pxe_flash_bios
00:E0:81:55:XX:XX	129.129.129.129	power_status

where:

- *Sys MAC Addr* is the system MAC address for the target system
- *MGMT IP ADDR* is the IP address for the IPMI card on the target system

- *command* is one of the following command options available to the `pxe_flash.sh` script:

Command Option	Description
<code>power_status</code>	Returns the power status (on or off) for the target system
<code>power_reset</code>	Issues a hard power reset to the target system
<code>power_on</code>	Issues a power on signal to the target system
<code>power_off</code>	Issues a power off signal to the target system
<code>power_soft</code>	Issues a soft power reset to the target system, but only if the OS supports ACPI
<code>pxe_flash_bios</code>	Flashes the BIOS on the target system

Command options are single parameter commands (the command option is the single parameter). You can issue multiple commands to each target system. Simply put a space between the commands.

For example, we can modify the `input_file` above to read as follows:

# Sys MAC Addr	Mgmt IP Addr	Commands
00:E0:81:55:XX:XX	129.129.129.129	<code>pxe_flash_bios power_status</code>

The script generates results similar to the following example:

```

129.129.129.129 has 2 Total Commands
=====
Chassis Power is on
129.129.129.129 "pxe_flash_bios" = In order to flash the system BIOS, system
must be powered off for System 00:E0:81:55:XX:XX

129.129.129.129 "power_status" = Chassis Power is on for System
00:E0:81:55:XX:XX

```

**9. Save and exit** `/pxe_flash/input_file`.

## D.3.2 Flashing the BIOS using the PXE Server Image

1. Ensure that the power is off for the target system(s). If the system power is on, the script issues an error message asking you to power off the system.
2. To issue a valid user ID and password to the target system through IPMI, edit `/pxe_flash/pxe_flash.sh`.

Starting at Line 228 of the `pxe_flash.sh` script, modify the value of variables `USERID` and `PASSWORD`. These variables will be used when contacting the remote machine via IPMI. All target systems must accept the same user ID and password for the script to function properly.

3. To flash the BIOS on all targets specified in the `input_file`, type the following command:

```
sh pxe_flash.sh -f input_file
```

For example, when the input file includes the following text and the target system power is on, the script generates the results below.

# Sys MAC Addr	Mgmt IP Addr	Commands
00:E0:81:55:XX:XX	129.129.129.129	pxe_flash_bios

```
129.129.129.129 has 1 Total Commands

=====

Chassis Power is on
129.129.129.129 "pxe_flash_bios" = In order to flash the system BIOS, system
must be powered off for System 00:E0:81:55:XX:XX
129.129.129.129 has 1 Total Commands

=====
129.129.129.129 "power_status" = Chassis Power is on for System
00:E0:81:55:XX:XX
```

## D.3.3 Removing the PXE Flash Configuration File(s)

The `pxe_flash_bios` command option generates a configuration file for each target system. To use PXE for any purpose other than flashing the BIOS, delete the configuration file for each target system.

1. Change directories to `/tftpboot/linux-install/pxelinux.cfg`.  
`cd /tftpboot/linux-install/pxelinux.cfg`

## 2. Delete the configuration file for each target system.

For example, the `pxe_flash_bios` command for MAC Address `00:E0:81:55:XX:XX` creates a PXE configuration file named `00-E0-81-55-XX-XX`.

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