



Sun Fire™ V215 and V245 Servers Service Manual

Sun Microsystems, Inc.
www.sun.com

Part No. 819-3038-10
September 2006, Revision A

Submit comments about this document at: <http://www.sun.com/hwdocs/feedback>

Copyright 2006 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, California 95054, U.S.A. All rights reserved.

Sun Microsystems, Inc. has intellectual property rights relating to technology that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the U.S. patents listed at <http://www.sun.com/patents> and one or more additional patents or pending patent applications in the U.S. and in other countries.

This document and the product to which it pertains are distributed under licenses restricting their use, copying, distribution, and decompilation. No part of the product or of this document may be reproduced in any form by any means without prior written authorization of Sun and its licensors, if any.

Third-party software, including font technology, is copyrighted and licensed from Sun suppliers.

Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California. UNIX is a registered trademark in the U.S. and in other countries, exclusively licensed through X/Open Company, Ltd.

Sun, Sun Microsystems, the Sun logo, AnswerBook2, docs.sun.com, Sun Fire, and Solaris are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and in other countries.

All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the U.S. and in other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

The OPEN LOOK and Sun™ Graphical User Interface was developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees who implement OPEN LOOK GUIs and otherwise comply with Sun's written license agreements.

U.S. Government Rights—Commercial use. Government users are subject to the Sun Microsystems, Inc. standard license agreement and applicable provisions of the FAR and its supplements.

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

Copyright 2006 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, Californie 95054, Etats-Unis. Tous droits réservés.

Sun Microsystems, Inc. a les droits de propriété intellectuels relatants à la technologie qui est décrit dans ce document. En particulier, et sans la limitation, ces droits de propriété intellectuels peuvent inclure un ou plus des brevets américains énumérés à <http://www.sun.com/patents> et un ou les brevets plus supplémentaires ou les applications de brevet en attente dans les Etats-Unis et dans les autres pays.

Ce produit ou document est protégé par un copyright et distribué avec des licences qui en restreignent l'utilisation, la copie, la distribution, et la décompilation. Aucune partie de ce produit ou document ne peut être reproduite sous aucune forme, par quelque moyen que ce soit, sans l'autorisation préalable et écrite de Sun et de ses bailleurs de licence, s'il y en a.

Le logiciel détenu par des tiers, et qui comprend la technologie relative aux polices de caractères, est protégé par un copyright et licencié par des fournisseurs de Sun.

Des parties de ce produit pourront être dérivées des systèmes Berkeley BSD licenciés par l'Université de Californie. UNIX est une marque déposée aux Etats-Unis et dans d'autres pays et licenciée exclusivement par X/Open Company, Ltd.

Sun, Sun Microsystems, le logo Sun, AnswerBook2, docs.sun.com, Sun Fire, et Solaris sont des marques de fabrique ou des marques déposées de Sun Microsystems, Inc. aux Etats-Unis et dans d'autres pays.

Toutes les marques SPARC sont utilisées sous licence et sont des marques de fabrique ou des marques déposées de SPARC International, Inc. aux Etats-Unis et dans d'autres pays. Les produits portant les marques SPARC sont basés sur une architecture développée par Sun Microsystems, Inc.

L'interface d'utilisation graphique OPEN LOOK et Sun™ a été développée par Sun Microsystems, Inc. pour ses utilisateurs et licenciés. Sun reconnaît les efforts de pionniers de Xerox pour la recherche et le développement du concept des interfaces d'utilisation visuelle ou graphique pour l'industrie de l'informatique. Sun détient une licence non exclusive de Xerox sur l'interface d'utilisation graphique Xerox, cette licence couvrant également les licenciées de Sun qui mettent en place l'interface d'utilisation graphique OPEN LOOK et qui en outre se conforment aux licences écrites de Sun.

LA DOCUMENTATION EST FOURNIE "EN L'ÉTAT" ET TOUTES AUTRES CONDITIONS, DECLARATIONS ET GARANTIES EXPRESSES OU TACITES SONT FORMELLEMENT EXCLUES, DANS LA MESURE AUTORISEE PAR LA LOI APPLICABLE, Y COMPRIS NOTAMMENT TOUTE GARANTIE IMPLICITE RELATIVE A LA QUALITE MARCHANDE, A L'APTITUDE A UNE UTILISATION PARTICULIERE OU A L'ABSENCE DE CONTREFAÇON.



Please
Recycle



Adobe PostScript

Contents

Preface xv

- 1. Diagnosing Server Performance and Faults** 1-1
 - 1.1 Overview of Diagnostic Tools 1-2
 - 1.2 Choosing a Fault Isolation Tool 1-3
 - 1.3 POST Diagnostics 1-6
 - 1.3.1 Starting POST Diagnostics 1-6
 - 1.3.2 Controlling POST Diagnostics 1-7
 - 1.4 OpenBoot Diagnostics 1-9
 - 1.4.1 Starting OpenBoot Diagnostics 1-9
 - 1.4.2 Controlling OpenBoot Diagnostics Tests 1-9
 - 1.4.2.1 `test` and `test-all` Commands 1-10
 - 1.4.2.2 What OpenBoot Diagnostics Error Messages Tell You 1-11
 - 1.4.3 OpenBoot Diagnostic Commands 1-12
 - 1.4.3.1 `probe-scsi` and `probe-scsi-all` Commands 1-12
 - 1.4.3.2 `probe-ide` Command 1-13
 - 1.4.3.3 `show-devs` Command 1-14
 - 1.4.3.4 Running OpenBoot Commands 1-15
 - 1.5 Operating System Diagnostic Tools 1-15

- 1.5.1 Error and System Message Log Files 1-15
- 1.5.2 Solaris System Information Commands 1-15
 - 1.5.2.1 prtconf Command 1-16
 - 1.5.2.2 prtdiag Command 1-16
 - 1.5.2.3 prtfru Command 1-17
 - 1.5.2.4 psrinfo Command 1-17
 - 1.5.2.5 showrev Command 1-17
- 1.6 Recent Diagnostic Test Results 1-18
 - 1.6.1 Viewing Recent Test Results 1-18
- 1.7 Additional Diagnostic Tests for Specific Devices 1-18
 - 1.7.1 Confirming That the Internal Hard Drives are Active 1-19
 - 1.7.2 Confirming That the External Hard Drives Are Active 1-20
 - 1.7.3 Confirming That the DVD Super-Multi Drive is Connected 1-20
 - 1.7.4 Checking Network Connections on the Primary Network 1-21
 - 1.7.5 Checking Network Connections on Additional Network Interfaces 1-22

2. Replacing Hot-Pluggable and Hot-Swappable CRUs 2-1

- 2.1 Devices That are Hot-Pluggable or Hot-Swappable 2-2
- 2.2 Hot-Plugging a Hard Drive 2-2
 - 2.2.1 Removing a Hard Drive 2-3
 - 2.2.2 Installing a Hard Drive 2-5
- 2.3 Hot-Swapping a Fan Tray 2-7
 - 2.3.1 Removing a Fan Tray 2-8
 - 2.3.2 Installing a Fan Tray 2-10
- 2.4 Hot-Swapping a Hard Drive Fan Tray 2-11
 - 2.4.1 Removing a Hard Drive Fan Tray 2-11
 - 2.4.2 Installing a Hard Drive Fan Tray 2-12
- 2.5 Hot-Swapping a Power Supply 2-13

- 2.5.1 Removing a Power Supply 2-13
- 2.5.2 Installing a Power Supply 2-15

- 3. Replacing Cold-Swappable FRUs 3-1**
 - 3.1 Safety Information 3-2
 - 3.1.1 Safety Symbols 3-2
 - 3.1.2 Electrostatic Discharge Safety Measures 3-3
 - 3.1.2.1 Using an Antistatic Wrist Strap 3-3
 - 3.1.2.2 Using an Antistatic Mat 3-3
 - 3.2 Procedures for Parts Replacement 3-3
 - 3.2.1 Required Tools 3-4
 - 3.2.2 Powering Off the Server – ALOM Command Line 3-4
 - 3.2.3 Powering Off the Server – Graceful Shutdown 3-5
 - 3.2.4 Powering Off the Server – Emergency Shutdown 3-5
 - 3.2.5 Extending the Server to the Maintenance Position – Rackmounted Servers Only 3-5
 - 3.2.6 Removing a Server From the Rack 3-7
 - 3.2.7 Performing Electrostatic Discharge – Antistatic Prevention Measures 3-9
 - 3.2.8 Removing Power From the Server 3-10
 - 3.2.9 Removing the Rear Cover 3-10
 - 3.2.10 Removing the Bezel 3-11
 - 3.2.11 Removing the Front Cover 3-13
 - 3.2.12 (Sun Fire V245) Removing the Air Baffle 3-13
 - 3.2.13 (Sun Fire V245) Installing the Air Baffle 3-14
 - 3.3 Removing and Installing FRUs 3-15
 - 3.3.1 Removing PCI-E and PCI-X Cards 3-16
 - 3.3.2 Installing PCI-E or PCI-X Cards 3-18
 - 3.3.3 Removing PCI-E and PCI-X Riser Boards 3-19
 - 3.3.4 Installing PCI-E or PCI-X Riser Boards 3-21

- 3.3.5 Removing DIMMs 3-22
- 3.3.6 Installing DIMMs 3-25
- 3.3.7 Removing the Motherboard Assembly 3-27
- 3.3.8 Installing the Motherboard Assembly 3-34
- 3.3.9 Removing the Power Distribution Board 3-36
- 3.3.10 Installing the Power Distribution Board 3-39
- 3.3.11 Removing the Front Indicator Board 3-40
- 3.3.12 Installing the Front Indicator Board 3-41
- 3.3.13 Removing the Fan Tray Connector Boards 3-42
- 3.3.14 Installing the Fan Tray Connector Boards 3-43
- 3.3.15 Removing the Front I/O Board 3-43
- 3.3.16 Installing the Front I/O Board 3-44
- 3.3.17 Removing the DVD Super-Multi Drive 3-45
- 3.3.18 Installing the DVD Super-Multi Drive 3-46
- 3.3.19 Removing the Hard Drive Backplane 3-47
- 3.3.20 Installing the Hard Drive Backplane 3-49
- 3.3.21 Removing the Hard Drive Fan Tray 3-50
- 3.3.22 Installing the Hard Drive Fan Tray 3-52
- 3.3.23 (Sun Fire V245) Removing the Hard Drive Fan Tray Connector Board 3-53
- 3.3.24 (Sun Fire V245) Installing the Hard Drive Fan Tray Connector Board 3-54
- 3.3.25 Removing the Battery 3-55
- 3.3.26 Installing the Battery 3-56
- 3.3.27 Removing NVRAM 3-57
- 3.3.28 Installing NVRAM 3-58
- 3.4 Procedures for Finishing Up 3-58
 - 3.4.1 Installing the Front Cover and Bezel 3-58
 - 3.4.2 Installing the Rear Cover 3-60

- 3.4.3 Reinstalling the Server in the Rack 3-61
- 3.4.4 Returning the Server to the Normal Rack Position 3-62
- 3.4.5 Applying Power to the Server 3-64

A. DIMM and PCI Card Guidelines A-1

- A.1 DIMM Guidelines A-1
- A.2 PCI-E and PCI-X Card Guidelines A-3

B. Customer and Field Replaceable Units B-1

- B.1 Customer and Field Replaceable Units B-1

Index Index-1

Figures

- [FIGURE 1-1](#) Choosing a Tool to Isolate Hardware Faults 1–5
- [FIGURE 2-1](#) Locating the Hard Drive Release Button and Latch 2–4
- [FIGURE 2-2](#) Removing a Fan Tray 2–9
- [FIGURE 2-3](#) Top Fan, System Required Indicator, Locator Indicators, and Locator Button 2–10
- [FIGURE 2-4](#) Failure and Service Required Indicators 2–10
- [FIGURE 2-5](#) Hard Drive Fan Tray – Sun Fire V245 Server 2–12
- [FIGURE 2-6](#) Location of the Power Supplies and Release Latches 2–14
- [FIGURE 2-7](#) Rotating the Cable Management Arm to Access the Server Power Supplies 2–15
- [FIGURE 3-1](#) Locator Indicator/Locator Button 3–6
- [FIGURE 3-2](#) Slide Release Latches 3–7
- [FIGURE 3-3](#) Metal Lever and Cable Management Arm 3–8
- [FIGURE 3-4](#) Release Tabs and Slide Assembly 3–9
- [FIGURE 3-5](#) Removing the Rear Cover 3–11
- [FIGURE 3-6](#) Front Cover, Front Cover Door, and Latch – Sun Fire V245 3–12
- [FIGURE 3-7](#) Removing the Bezel From the Server – Sun Fire V245 3–12
- [FIGURE 3-8](#) Air Baffle, Guide Pins, and Handle – Sun Fire V245 3–14
- [FIGURE 3-9](#) Location of PCI-E and PCI-X Slots, and PCI Hold-Down Bracket – Sun Fire V215 3–16
- [FIGURE 3-10](#) Location of PCI-E and PCI-X Slots, and PCI Hold-Down Bracket – Sun Fire V245 3–17
- [FIGURE 3-11](#) Riser Board and PCI Card Connector – Sun Fire V215 3–17
- [FIGURE 3-12](#) Installing a PCI Long Card – Sun Fire V245 3–19

FIGURE 3-13	Riser Boards and PCI Option Cards – Sun Fire V215	3–20
FIGURE 3-14	PCI-E and PCI-X Riser Boards	3–21
FIGURE 3-15	Removing the Air Baffle – Sun Fire V215	3–24
FIGURE 3-16	Removing DIMMs	3–25
FIGURE 3-17	Motherboard Assembly	3–28
FIGURE 3-18	PCI-X and PCI-E Riser Boards – Sun Fire V215	3–29
FIGURE 3-19	PCI-X Riser Board Standoff – Sun Fire V215	3–30
FIGURE 3-20	Motherboard to Front I/O Board Cable	3–31
FIGURE 3-21	Upper and Lower Cable Retainers and Motherboard/SAS Backplane Cable	3–32
FIGURE 3-22	Removing the Motherboard Assembly Screws	3–33
FIGURE 3-23	Removing the Motherboard Assembly From the Chassis	3–34
FIGURE 3-24	Installing the Motherboard Assembly	3–35
FIGURE 3-25	Power Supply Release Latches – Sun Fire V245	3–37
FIGURE 3-26	Motherboard/SAS Backplane Cable Routing	3–38
FIGURE 3-27	Removing the Power Distribution Board	3–39
FIGURE 3-28	Removing the Front Indicator Board	3–41
FIGURE 3-29	Removing the Fan Tray Connector Board	3–42
FIGURE 3-30	Removing the Front I/O Board	3–44
FIGURE 3-31	Upper Cable Retainer, Motherboard/SAS Backplane Cable, DVD Super-Multi Drive, and Spring Latch	3–46
FIGURE 3-32	Removing the Hard Drive Backplane – Sun Fire V215	3–48
FIGURE 3-33	Removing the Hard Drive Backplane – Sun Fire V245	3–49
FIGURE 3-34	Opening the Rear Cover Door – Sun Fire V245	3–51
FIGURE 3-35	Hard Drive Fan Tray – Sun Fire V245	3–52
FIGURE 3-36	Hard Drive Fan Tray Cage and Screws	3–53
FIGURE 3-37	Hard Drive Fan Tray Connector Board – Connector J1	3–54
FIGURE 3-38	Removing the Battery	3–56
FIGURE 3-39	Removing NVRAM	3–57
FIGURE 3-40	Installing the Bezel	3–59
FIGURE 3-41	Installing the Front Cover – Sun Fire V245 Server	3–60

FIGURE 3-42	Installing the Rear Cover – Sun Fire V215 server	3–61
FIGURE 3-43	Returning the Server to the Rack	3–62
FIGURE 3-44	Release Tabs – Rails	3–63
FIGURE 3-45	Installing the Cable Management Arm (CMA)	3–64
FIGURE A-1	DIMM Layout	A–2
FIGURE B-1	Customer and Field-Replaceable Units, Part 1 of 2	B–2
FIGURE B-2	Customer and Field-Replaceable Units, Part 2 of 2	B–3

Tables

TABLE 1-1	Summary of Diagnostic Tools	1–2
TABLE 1-2	OpenBoot Configuration Variables	1–7
TABLE 1-3	Keywords for the <code>test-args</code> OpenBoot Configuration Variable	1–10
TABLE 2-1	Sample <code>Ap_id</code> Output	2–3
TABLE 2-2	Sample <code>Ap_id</code> Output	2–6
TABLE 2-3	Sample <code>Ap_id</code> Output	2–7
TABLE 3-1	DIMM Names, Connectors, and Locations	3–22
TABLE A-1	DIMM Name, DIMM Number, and DIMM Connector	A–2
TABLE A-2	Sun Fire V215 and V245 Servers PCI-E and PCI-X Configurations	A–3
TABLE B-1	Sun Fire V215 and V245 Servers – CRU and FRU List	B–4

Preface

Use *Sun Fire V215 and V245 Servers Service Manual* as an aid for diagnosing problems and replacing components within the Sun Fire V215 and V245 servers.

This document is written for technicians, service personnel, and system administrators who service and repair computer systems. The person qualified to use this document:

- Can open a system chassis and identify and replace internal components.
- Understands the Solaris™ Operating System and the command-line interface.
- Has superuser privileges for the system being serviced.
- Understands typical hardware troubleshooting tasks.

Before You Read This Document

This document does not cover the following topics:

- Server overview information
For information about hardware and software features such as front and rear panels, status indicators, cable connections, and environmental requirements, refer to the *Sun Fire V215 and V245 Servers Getting Started Guide*.
- Installation and rackmounting
For detailed information about installation and rackmounting, refer to the *Sun Fire V215 and V245 Servers Installation Guide*.
- General administrative tasks
For detailed information about administrative tasks, refer to the *Sun Fire V215 and V245 Servers Administration Guide*.

Before following any of the procedures described in this document, ensure that you have read the *Sun Fire V215 and V245 Servers Compliance and Safety Manual*.

How This Document Is Organized

This guide is organized into the following chapters:

[Chapter 1](#) describes the diagnostics tools available for use with the Sun Fire V215 and V245 servers.

[Chapter 2](#) explains how to replace hot-swappable and hot-pluggable customer replaceable units (CRUs).

[Chapter 3](#) describes how to replace field replaceable units (FRUs) that are cold-swappable.

[Appendix A](#) explains how to configure DIMMs, PCI-E and PCI-X cards for your server.

[Appendix B](#) describes the location customer and field replaceable units within the Sun Fire V215 and V245 Servers.

Using UNIX Commands

This document does not contain information on basic UNIX[®] commands and procedures such as shutting down the server, booting the server, and configuring devices.

Refer to one or more of the following documents for this information:

- *Solaris 10 Sun Hardware Platform Guide* (817-6337)
- Solaris Operating System documentation, which is at:
<http://docs.sun.com>
- Other software documentation that you received with your server

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.
AaBbCc123	What you type, when contrasted with on-screen computer output	% su Password:
<i>AaBbCc123</i>	Document 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.

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	#

Related Documentation

You can view and print the following manuals from the Sun documentation web site at: <http://www.sun.com/documentation>

Title	Description	Part Number
<i>Sun Fire V215 and V245 Servers Product Notes</i>	Late-breaking information about the servers	819-3040
<i>Sun Fire V215 and V245 Servers Getting Started Guide</i>	Information about where to find documentation to get your server installed and running quickly	819-3041
<i>Sun Fire V215 and V245 Servers Installation Guide</i>	Detailed rackmounting, cabling, power-on, and configuration information	819-3037
<i>Sun Fire V215 and V245 Servers Administration Guide</i>	How to perform administrative tasks that are specific to the Sun Fire V215 and V245 servers	819-3036
<i>Sun Fire V215 and V245 Servers Compliance and Safety Manual</i>	Platform specific information about regulatory compliance, safety agency compliance, and the Declaration of Conformity for the Sun Fire V215 and V245 servers.	819-3039

Read *Important Safety Information* (816-7190) and the *Sun Fire V215 and V245 Servers Getting Started Guide* (819-3039) before performing any of the procedures documented in this manual.

Third-Party Web Sites

Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products, or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods, or services that are available on or through such sites or resources.

Documentation, Support, and Training

Sun Function	URL
Documentation	http://www.sun.com/documentation/
Support	http://www.sun.com/support/
Training	http://www.sun.com/training/

Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to:

<http://www.sun.com/hwdocs/feedback>

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

Sun Fire V215 and V245 Servers Service Guide, part number 819-3038-10

Diagnosing Server Performance and Faults

This chapter describes the diagnostic tools available for use with the Sun Fire V215 and V245 servers. This chapter contains the following diagnostic sections:

- [Section 1.1, “Overview of Diagnostic Tools” on page 1-2](#)
- [Section 1.2, “Choosing a Fault Isolation Tool” on page 1-3](#)
- [Section 1.3, “POST Diagnostics” on page 1-6](#)
- [Section 1.4, “OpenBoot Diagnostics” on page 1-9](#)
- [Section 1.5, “Operating System Diagnostic Tools” on page 1-15](#)
- [Section 1.6, “Recent Diagnostic Test Results” on page 1-18](#)
- [Section 1.7, “Additional Diagnostic Tests for Specific Devices” on page 1-18](#)

1.1 Overview of Diagnostic Tools

Sun provides a range of diagnostic tools for use with the Sun Fire V215 and V245 servers. [TABLE 1-1](#) contains summaries of the diagnostic tools.

TABLE 1-1 Summary of Diagnostic Tools

Diagnostic Tool	Type	What It Does	Accessibility and Availability	Remote Capability
ALOM	Hardware and Software	Monitors environmental conditions, performs environmental fault isolation, and provides remote console access to system.	Can function on standby power and without operating system.	Designed for remote system access
Status indicators	Hardware	Indicates operational status of the overall system and sub-assemblies that have status indicators.	Accessed from system chassis. Is available anytime power is available.	Local, but operational status can be viewed in ALOM
POST	Firmware	Provides test coverage for CPUs, CPU caches, system memory, CPU interconnects, I/O bridges, and system buses.	Runs automatically on startup. Is available when the operating system is not running.	Local, but operation can be viewed in ALOM
OpenBoot™ Diagnostics	Firmware	Provides test coverage specifically on the I/O sub-systems and plug-in cards. Test coverage consists of I/O channels, boot controllers (SCSI, IDE, USB, Ethernet), non core devices (Flash, I ² C, environmental controls, NVRAM), and plug-in cards with native Fcode drivers which support IEEE 1275 self test mechanisms. OpenBoot Diagnostics provides Fcode self-tests for on-board hardware devices.	Runs automatically or interactively. Is available when the operating system is not running.	Local, but operation can be viewed in ALOM
OpenBoot Diagnostic commands	Firmware	Displays various system information (See Section 1.4.3, “OpenBoot Diagnostic Commands” on page 1-12)	Available when the operating system is not running	Local, but can be accessed in ALOM

TABLE 1-1 Summary of Diagnostic Tools (Continued)

Diagnostic Tool	Type	What It Does	Accessibility and Availability	Remote Capability
Solaris OS commands	Software	Displays various system information	Requires operating system	Local, but can be accessed in ALOM
SunVTS™	Software	Exercises and stresses the system, running tests in parallel	Requires operating system.	View and control over network
Sun Management Center	Software	Monitors both hardware environmental conditions and software performance of multiple machines. Generates alerts for various conditions	Requires operating system to be running on both monitored and master servers. Requires a dedicated database on the master server	Designed for remote access
Hardware Diagnostic Suite	Software	Exercises an operational system by running sequential tests. Also reports failed FRUs	A separately purchased optional add-on to Sun Management Center. Requires operating system and Sun Management Center	Designed for remote access

1.2 Choosing a Fault Isolation Tool

This section helps you choose the right tool to isolate a failed part in a Sun Fire V215 or V245 server. Consider the following questions when selecting a tool.

1. Have you checked the status indicators?

Certain system components have status indicators that can alert you when a component requires replacement.

2. Does the server boot?

- If the server *cannot* boot, you have to run firmware-based diagnostics that do not depend on the operating system.
- If the server *can* boot, you should use a more comprehensive tool. The typical fault isolation process is illustrated in [FIGURE 1-1](#).

3. Do you intend to run the tests remotely?

Sun Management Center, ALOM, and the Hardware Diagnostic Suite software enable you to run tests from a remote server. ALOM also provides a means of redirecting system console output, enabling you to remotely view and run tests, like POST diagnostics, that usually require physical proximity to the serial port on the back panel.

Note – The SunVTS software also enables you to run tests remotely by using the tty-mode through a remote login or a Telnet session.

4. Will the tool test the suspected sources of the problem?

Use a diagnostic tool capable of testing the suspected problem sources. [TABLE 1-1](#) shows which parts can be isolated by each fault isolating tool.

5. Is the problem intermittent or software-related?

If a problem is not caused by a defective hardware component, use a system exerciser tool rather than a fault isolation tool.

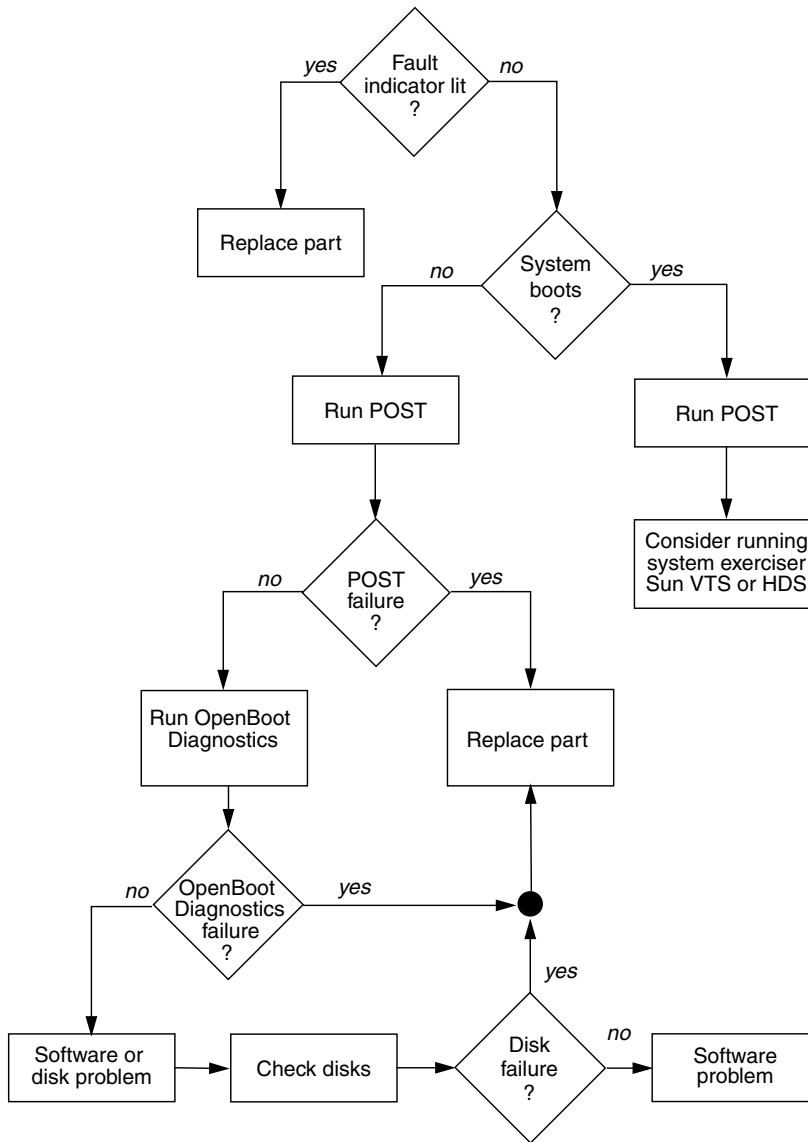


FIGURE 1-1 Choosing a Tool to Isolate Hardware Faults

1.3 POST Diagnostics

POST is a firmware program that is useful in determining if a portion of the system has failed. POST verifies the core functionality of the system, including the CPU modules, motherboard, memory, and some on-board I/O devices. POST also generates messages that can be useful in determining the nature of a hardware failure. POST can be run even if the system is unable to boot. POST resides in a PROM located on the MBC board (ALOM) and detects most persistent type fault conditions.

POST can run under the following four conditions:

1. POST will run automatically when power is applied to the system.
2. POST will run in service mode when the system is reset with the `reset-all` command from the `ok` prompt.
3. POST will run when the keyswitch is set to the `diag` position.
4. POST will run when the `post` command is issued from the `ok` prompt.

If `diag-level` is set to `menu`, a menu of all the tests executed at power up is displayed.

POST diagnostic and error message reports are displayed on a console.

1.3.1 Starting POST Diagnostics

1. **Obtain the `ok` prompt.**
2. **Type:**

```
ok post level verbosity
```

where *level* specifies the level of diagnostics (`min`, `max`, `menu`, `off`) and *verbosity* specifies the diagnostic verbosity (`debug`, `max`, `normal`, `min`, `none`).

Status and error messages are displayed in the console window. If POST detects an error, it displays an error message describing the failure.

1.3.2 Controlling POST Diagnostics

You control POST diagnostics (and other aspects of the boot process) by setting OpenBoot configuration variables. Changes to OpenBoot configuration variables generally take effect only after the server is restarted. [TABLE 1-2](#) lists the most important and useful of these variables.

TABLE 1-2 OpenBoot Configuration Variables

OpenBoot Configuration Variable	Description and Keywords
auto-boot	Determines whether the operating system automatically starts boot. Default is <code>true</code> . <ul style="list-style-type: none">• <code>true</code> – System automatically boots operating system, once firmware diagnostics and initialization complete.• <code>false</code> – System remains at <code>ok</code> prompt until you type <code>boot</code>.
diag-level	Determines the level or type of diagnostics executed. Default is <code>max</code> . <ul style="list-style-type: none">• <code>off</code> – No testing.• <code>min</code> – Only basic tests are run.• <code>max</code> – More extensive tests might be run, depending on the device.• <code>menu</code> – Displays the Diagnostics Engineering Monitor menu.
verbosity	Displays notice, warning, error, and fatal messages on the console. <ul style="list-style-type: none">• <code>max</code> – Displays detailed progress and informational messages.• <code>normal</code> – Keeps regular output to a minimum.• <code>min</code> – Displays notice, warning, error, and fatal messages.• <code>none</code> – Displays only error and fatal messages.
diag-script	Determines which devices are tested by OpenBoot Diagnostics. Default is <code>normal</code> . <ul style="list-style-type: none">• <code>none</code> – No devices are tested.• <code>normal</code> – On-board devices are tested.• <code>all</code> – All devices that have self-tests are tested.

TABLE 1-2 OpenBoot Configuration Variables (*Continued*)

OpenBoot Configuration Variable	Description and Keywords
diag-trigger	Determines under what reset conditions, POST/OpenBoot Diagnostics shall be executed. <ul style="list-style-type: none">• none – Do not run diagnostics on any reset event (requires diag-switch? = false)• user-reset – User invoked reset• error-reset – When system encounters an error reset event (Red State Exception, Watchdog, Fatal).• power-on-reset – When power is applied to the system. Default is (power-on-reset, error-reset).
input-device	Selects where console input is taken from. Default is ttya. <ul style="list-style-type: none">• ttya – From built-in SER MGT port.• ttyb – From built-in general purpose serial port (SER TTYB)• keyboard – From attached keyboard that is part of a graphics terminal.
output-device	Selects where diagnostic and other console output is displayed. Default is ttya. <ul style="list-style-type: none">• ttya – To built-in SER MGT port.• ttyb – To built-in general purpose serial port (SER TTYB).• screen – To attached screen that is part of a graphics terminal.¹

¹ – POST messages cannot be displayed on a graphics terminal. Messages are sent to TTYA when the output-device is set to screen.

Note – These variables affect OpenBoot Diagnostics tests as well as POST diagnostics.

After POST diagnostics have finished running, POST reports back to the OpenBoot firmware the status of each test it has run. Control then reverts back to the OpenBoot firmware code.

If POST diagnostics do not uncover a fault, and the server still does not start up, run OpenBoot Diagnostics tests. See [FIGURE 1-1](#) for additional information.

1.4 OpenBoot Diagnostics

Like POST diagnostics, OpenBoot diagnostics code is firmware-based and resides in the OpenBoot PROM.

1.4.1 Starting OpenBoot Diagnostics

1. **Obtain the `ok` prompt.**

Become superuser, and then type `init 0`.

2. **Type:**

```
ok obdiag
```

This command displays the OpenBoot Diagnostics menu.

Note – If you have a PCI card installed in the server, then additional tests will appear on the `obdiag` menu.

3. **Run an `obdiag` test. Type:**

```
obdiag> test n
```

Where *n* represents the number corresponding to the test you want to run.

A summary of the tests is available. At the `obdiag>` prompt, type:

```
obdiag> help
```

1.4.2 Controlling OpenBoot Diagnostics Tests

Most of the OpenBoot configuration variables you use to control POST (see [TABLE 1-2](#)) also affect OpenBoot diagnostics tests.

- Use the `diag-level` variable to control the OpenBoot diagnostics testing level.
- Use `test-args` to customize how the tests run.

By default, `test-args` is set to contain an empty string. You can modify `test-args` using one or more of the reserved keywords shown in [TABLE 1-3](#).

TABLE 1-3 Keywords for the `test-args` OpenBoot Configuration Variable

Keyword	What It Does
<code>bist</code>	Invokes built-in self-test (BIST) on external and peripheral devices
<code>debug</code>	Displays all debug messages
<code>iopath</code>	Verifies bus and interconnect integrity
<code>loopback</code>	Exercises external loopback path for the device
<code>media</code>	Verifies external and peripheral device media accessibility
<code>restore</code>	Attempts to restore original state of the device if the previous execution of the test failed
<code>silent</code>	Displays only errors rather than the status of each test
<code>subtests</code>	Displays main test and each subtest that is called
<code>verbose</code>	Displays detailed messages of status of all tests
<code>callers=N</code>	Displays backtrace of <i>N</i> callers when an error occurs <ul style="list-style-type: none">• <code>callers=0</code> - displays backtrace of all callers before the error
<code>errors=N</code>	Continues executing the test until <i>N</i> errors are encountered <ul style="list-style-type: none">• <code>errors=0</code> - displays all error reports without terminating testing

If you want to customize the OpenBoot diagnostics testing, you can set `test-args` to a comma-separated list of keywords, as in this example:

```
ok setenv test-args debug,loopback,media
```

1.4.2.1 test and test-all Commands

You can run OpenBoot Diagnostics tests directly from the `ok` prompt. To do this, type the `test` command, followed by the full hardware path of the device (or set of devices) to be tested. For example:

```
ok test /ebus@1f,464000/serial@2,40
```

Note – Knowing how to construct an appropriate hardware device path requires precise knowledge of the hardware architecture of the Sun Fire V215 and V245 servers.

To customize an individual test, you can use `test-args` as follows:

```
ok test /ebus@1f,464000/serial@2,40:test-args={verbose,debug}
```

This affects only the current test without changing the value of the `test-args` OpenBoot configuration variable.

You can test all the devices in the device tree with the `test-all` command:

```
ok test-all
```

If you specify a path argument to `test-all`, then only the specified device and its children are tested. The following example shows the command to test the USB bus and all devices with self-tests that are connected to the USB bus:

```
ok test-all /pci@9,700000/usb@1,3
```

1.4.2.2 What OpenBoot Diagnostics Error Messages Tell You

OpenBoot diagnostics error messages are reported in a tabular format that contains a short summary of the problem, the hardware device affected, the subtest that failed, and other diagnostic information. [CODE EXAMPLE 1-1](#) displays a example OpenBoot diagnostics error message.

CODE EXAMPLE 1-1 OpenBoot Diagnostics Error Message

```
Testing /ebus@1f,464000/flashprom@0,0

ERROR    : FLASHPROM CRC-32 is incorrect
SUMMARY  : Obs=0x1ea5bc20 Exp=0x5c896226 XOR=0x422cde06 Addr=0xfeb1fffc
DEVICE   : /ebus@1f,464000/flashprom@0,0
SUBTEST  : selftest
MACHINE  : Sun Fire V215
SERIAL#  : 64196915
DATE     : 04/07/2006 23:27:45 GMT
CONTROLS: diag-level=max test-args=

Error: /ebus@1f,464000/flashprom@0,0 selftest failed, return code = 1
Selftest at /ebus@1f,464000/flashprom@0,0 (errors=1) .....
failed
Pass:1 (of 1) Errors:1 (of 1) Tests Failed:1 Elapsed Time: 0:0:0:1
```

1.4.3 OpenBoot Diagnostic Commands

OpenBoot commands that can provide useful diagnostic information are:

- `probe-scsi` and `probe-scsi-all`
- `probe-ide`
- `show-devs`

1.4.3.1 `probe-scsi` and `probe-scsi-all` Commands

The `probe-scsi` and `probe-scsi-all` commands diagnose problems with SCSI devices.



Caution – If you use the `halt` command or the Stop-A key sequence to reach the `ok` prompt and then issue the `probe-scsi` or `probe-scsi-all` command, the system might hang.

The `probe-scsi` command communicates with all SCSI devices connected to on-board SCSI controllers. The `probe-scsi-all` command additionally accesses devices connected to any host adapters installed in PCI slots.

For any SCSI device that is connected and active, the `probe-scsi` and `probe-scsi-all` commands display its loop ID, host adapter, logical unit number, unique World Wide Name (WWN), and a device description that includes type and manufacturer.

The following is example output from the `probe-scsi` command.

CODE EXAMPLE 1-2 Example `probe-scsi` Output

```
{1} ok probe-scsi
MPT Version 1.05, Firmware version 0.03.23.00

Target 0
  Unit 0   Disk      FUJITSU MAY2073RCSUN72G 0401  143374738
Blocks, 73 GB SASAddress 500000e011772152 PhyNum 0
Target 1
  Unit 0   Disk      FUJITSU MAY2073RCSUN72 0401  143374738
bLOCKS, 73 gb SASAddress 500000e0115adf42 PhyNum 1
```

The following is example output from the `probe-scsi-all` command.

CODE EXAMPLE 1-3 Example `probe-scsi-all` Output.

```
{1} ok probe-scsi-all
/pci@1e,600000/pci@0/pci@a/pci@0/pci@8/scsi@1

MPT Version 1.05 Firmware Version 0.03.23.00

Target 0
  Unit 0   Disk  FUJITSU MAY2073RCSUN72G 0401 143374738 Blocks,
73GB SASAddress 500000e011772152 PhyNum 0
Target 1
  Unit 0   Disk  FUJITSUMAY2073RCSUN72G 0401 143374738 Blocks,
73GB SASAddress 500000e0115adf42 PhyNum 1
```

1.4.3.2 `probe-ide` Command

The `probe-ide` command communicates with all Integrated Drive Electronics (IDE) devices connected to the IDE bus. This is the internal system bus for media devices such as the optional DVD super-multi drive.



Caution – If you used the `halt` command or the Stop-A key sequence to reach the `ok` prompt, then issuing the `probe-ide` command can hang the system.

The following is example output from the `probe-ide` command.

CODE EXAMPLE 1-4 Example probe-ide Output

```
{1} ok probe-ide
  Device 0 ( Primary Master )
          Removable ATAPI Model: MATSHITADVD-RAM UJ-845S

  Device 1 ( Primary Slave )
          Not Present

  Device 2 ( Secondary Master )
          Not Present

  Device 3 ( Secondary Slave )
          Not Present
```

1.4.3.3 show-devs Command

The show-devs command lists the hardware device paths for each device in the firmware device tree. [CODE EXAMPLE 1-5](#) shows some example output.

CODE EXAMPLE 1-5 show-devs Output (Truncated)

```
{1} ok show-devs /
/i2c@1f,530000
/ebus@1f,464000
/pci@1f,700000
/pci@1e,600000
/memory-controller@0,0
/SUNW,UltraSPARC-IIIi+0,0
/virtual-memory
/memory@m0,0
/aliases
/options
/openprom
/chosen
/packages
/i2c@1f, 5300000/dimm-spd@0,e2
/i2c@1f, 5300000/dimm-spd@0,e0
/i2c@1f, 5300000/clock-generator@0,dc
/i2c@1f, 5300000/rsrctc@0,d0
/i2c@1f, 5300000/hardware-monitor@0,b0
/i2c@1f, 5300000/riser-fru-prom@0,a8
/i2c@1f, 5300000/idprom@0,a6
/i2c@1f, 5300000/nvram,a6
```

1.4.3.4 Running OpenBoot Commands

1. **Halt the system to reach the `ok` prompt.**

How you do this depends on the system's condition. If possible, warn users before you shut the system down. One method is to become superuser and then type

```
init 0
```

2. **Type the appropriate OpenBoot command at the console prompt.**

1.5 Operating System Diagnostic Tools

If a system passes OpenBoot Diagnostics tests, it normally attempts to boot its multiuser operating system. For most Sun systems, this means the Solaris OS. After the server is running in multiuser mode, you have access to the software-based diagnostic tools, SunVTS and Hardware Diagnostic Suite. These tools enable you to monitor the server, exercise it, and isolate faults.

Note – If you set the `auto-boot` OpenBoot configuration variable to `false`, the operating system does *not* boot following completion of the firmware-based tests.

In addition to the tools mentioned above, you can refer to error and system message log files, and Solaris system information commands.

1.5.1 Error and System Message Log Files

Error and other system messages are saved in the `/var/adm/messages` file. Messages are logged to this file from many sources, including the operating system, the environmental control subsystem, and various software applications.

1.5.2 Solaris System Information Commands

The following Solaris commands display data that you can use when assessing the condition of a Sun Fire V215 or V245 server:

- `prtconf`
- `prtdiag`
- `prtfdu`
- `psrinfo`
- `showrev`

This section describes the information that these commands give you. More information on using these commands is contained in the appropriate man page.

1.5.2.1 prtconf Command

The `prtconf` command displays the Solaris device tree. This tree includes all of the devices probed by the OpenBoot firmware, as well as additional devices, like individual disks that are exposed to the operating system only. The output of `prtconf` also includes the total amount of system memory.

The `-p` option produces output similar to the OpenBoot `show-devs` command. This output lists only those devices that are compiled by the system firmware.

1.5.2.2 prtdiag Command

The `prtdiag` command displays a table of diagnostic information that summarizes the status of system components. The display format used by the `prtdiag` command can vary depending on what version of the Solaris OS is running on the system.

The verbose option (`-v`) includes information about the front panel status, disk status, fan status, power supplies, hardware revisions, and system temperatures.

In the event of an overtemperature condition, `prtdiag` reports an error in the Status column.

CODE EXAMPLE 1-6 prtdiag Overtemperature Indicator Output

```
System Temperatures (Celsius):
-----
Device  Temperature    Status
-----
CPU0    62                OK
CPU1    102               ERROR
```

If there is a failure of a particular component, `prtdiag` reports a fault in the appropriate Status column.

CODE EXAMPLE 1-7 `prtdiag` Fault Indicator Output

```
Fan Status:
-----

Bank          RPM      Status
-----
CPU0          4166    [NO_FAULT]
CPU1          0000    [FAULT]
```

1.5.2.3 `prtfri` Command

The Sun Fire V215 and V245 servers maintain a hierarchical list of all FRUs in the system, as well as specific information about various FRUs.

The `prtfri` command can display this hierarchical list, as well as data contained in the serial electrically-erasable programmable read-only memory (EEPROM) devices located on many FRUs.

Data displayed by the `prtfri` command varies depending on the type of FRU. In general, it includes:

- FRU description
- Manufacturer name and location
- Part number and serial number
- Hardware revision levels

1.5.2.4 `psrinfo` Command

The `psrinfo` command displays the date and time each CPU came online. With the verbose (`-v`) option, the command displays additional information about the CPUs, including their clock speed.

1.5.2.5 `showrev` Command

The `showrev` command displays revision information for the current hardware and software. When used with the (`-p`) option, this command displays installed patches.

1.6 Recent Diagnostic Test Results

Summaries of the results from the most recent POST and OpenBoot diagnostics tests are saved across power cycles.

1.6.1 Viewing Recent Test Results

1. Obtain the `ok` prompt.
2. Do either of the following:
 - To see a summary of the most recent POST results, type:

```
ok show-post-results
```

- To see a summary of the most recent OpenBoot diagnostics test results, type:

```
ok show-obdiag-results
```

This produces a system-dependent list of hardware components, along with an indication of which components passed and which failed POST or OpenBoot diagnostics tests.

1.7 Additional Diagnostic Tests for Specific Devices

You can use the `probe-scsi`, `probe-scsi-all`, `probe-ide`, `watch-net`, and `watch-net-all` commands to perform additional diagnostic tests on specific devices. This section contains procedures for using these commands.

1.7.1 Confirming That the Internal Hard Drives are Active

The `probe-scsi` command transmits an inquiry to SCSI devices connected to the system's internal SCSI interface. If a SCSI device is connected and active, the command displays the unit number, device type, and manufacturer name for that device.



Caution – If you use the `halt` command or the Stop-A key sequence to reach the `ok` prompt and then issue the `probe-scsi` or `probe-scsi-all` command, the system might hang.

1. **Obtain the `ok` prompt.**

Become superuser and type `init 0`

2. **Type `probe-scsi`.**

The following is an example of the output from the `probe-scsi` command.

```
MPT Version 1.05, Firmware version 0.03.23.00

Target 0
  Unit 0   Disk      FUJITSU MAY2073RCSUN72G 0401  143374738
Blocks, 73 GB SASAddress 500000e011772152 PhyNum 0
Target 1
  Unit 0   Disk      FUJITSU MAY2073RCSUN72 0401  143374738
bLOCKS, 73 gb SASAddress 500000@e0115adf42 Phynum 1
```

1.7.2 Confirming That the External Hard Drives Are Active

The `probe-scsi-all` command transmits an inquiry to all SCSI devices connected to both the system's internal and its external SCSI interfaces.

1. Obtain the `ok` prompt.
2. Type `probe-scsi-all`

The following shows example output from a server with no externally connected SCSI devices but containing two 73 GB hard drives, both of them active.

```
{1} ok probe-scsi-all
/pci@1e,600000/pci@0/pci@a/pci@0/pci@8/scsi@1

MPT Version 1.05 Firmware Version 0.03.23.00

Target 0
  Unit 0   Disk  FUJITSU MAY2073RCSUN72G 0401 143374738 Blocks,
73GB SASAddress 500000e011772152 PhyNum 0
Target 1
  Unit 0   Disk  FUJITSUMAY2073RCSUN72G 0401 143374738 Blocks,
73GB SASAddress 500000e0115adf42 PhyNum 1
```

1.7.3 Confirming That the DVD Super-Multi Drive is Connected

The `probe-ide` command transmits an inquiry command to internal and external IDE devices connected to the system's on-board IDE interface.

1. Obtain the `OK` prompt.
2. Type `probe-ide`.

The following example output shows a optional DVD super-multi drive installed (as Device 0) and active in a server.

```
{1} ok probe-ide
  Device 0 ( Primary Master )
    Removable ATAPI Model: MATSHITADVD-RAM UJ-845S

  Device 1 ( Primary Slave )
    Not Present

  Device 2 ( Secondary Master )
    Not Present

  Device 3 ( Secondary Slave )
    Not Present
```

1.7.4 Checking Network Connections on the Primary Network

The `watch-net` diagnostics test monitors Ethernet packets on the primary network interface. Good packets received by the system are indicated by a period (.). Errors such as the framing error and the cyclic redundancy check (CRC) error are indicated with an X and an associated error description.

1. Obtain the `ok` prompt.
2. Type the `watch-net`.

```
{1}ok watch-net
100Mbps FDX Link up
Looking for Ethernet Packets.
`.` is a Good Packet. `X` is a Bad Packet
Type any key to stop.....
```

1.7.5 Checking Network Connections on Additional Network Interfaces

The `watch-net-all` diagnostics test monitors Ethernet packets on the primary network interface and on any additional network interfaces connected to the system board. Good packets received by the system are indicated by a period (.). Errors such as the framing error and the cyclic redundancy check (CRC) error are indicated with an X and an associated error description.

1. Obtain the `ok` prompt.

Become superuser and type `init 0`

2. Type `watch-net-all` at the prompt.

```
{1}ok watch-net-all
/pci@1e,600000/pci@0/pci@a/pci@0/network@4.1
100Mbps FDX Link up
Looking for Ethernet Packets
`.` is a Good Packet. `X` is a Bad Packet
Type any key to stop.....
```

Replacing Hot-Pluggable and Hot-Swappable CRUs

This chapter describes how to replace the hot-swappable and hot-pluggable customer replaceable units (CRUs) in the Sun Fire V215 and V245 servers.

The following topics are covered:

- [Section 2.1, “Devices That are Hot-Pluggable or Hot-Swappable” on page 2-2](#)
- [Section 2.2, “Hot-Plugging a Hard Drive” on page 2-2](#)
- [Section 2.3, “Hot-Swapping a Fan Tray” on page 2-7](#)
- [Section 2.4, “Hot-Swapping a Hard Drive Fan Tray” on page 2-11](#)
- [Section 2.5, “Hot-Swapping a Power Supply” on page 2-13](#)

2.1 Devices That are Hot-Pluggable or Hot-Swappable

Hot-pluggable devices are those devices that you can remove and install while the server is running, but you must perform administrative tasks before or after installing the hardware (for example, mounting a hard drive). In the Sun Fire V215 and V245 servers, the following device is hot-pluggable:

- Hard drives

Hot-swappable devices are those devices that can be removed and installed while the server is running without affecting the rest of the servers capabilities. In the Sun Fire V215 and V245 servers the following devices are hot-swappable:

- Fan trays
- Hard drive fan tray
- Power supplies

Note – In Sun Fire V215 and V245 servers, the chassis-mounted hard drives can be hot-swappable (depending on how they are configured).

2.2 Hot-Plugging a Hard Drive

The hard drives in the Sun Fire V215 and V245 servers are hot-pluggable, but this capability depends on how the hard drives are configured. To hot-plug a drive you must take the drive offline (to prevent any applications from accessing it, and to remove the logical software links to it) before you can safely remove it.

The following situations inhibit your ability to hot-plug a drive:

- If the hard drive contains the operating system, and the operating system is not mirrored on another drive.
- If the hard drive cannot be logically isolated from the online operations of the server.

If your drive falls into one of these conditions, you must shut the server down before you replace the hard drive. See [Section 3.2.2, “Powering Off the Server – ALOM Command Line” on page 3-4](#) or [Section 3.2.3, “Powering Off the Server – Graceful Shutdown” on page 3-5](#) or [Section 3.2.4, “Powering Off the Server – Emergency Shutdown” on page 3-5](#).

2.2.1 Removing a Hard Drive

Removing a hard drive from the Sun Fire V215 and V245 servers is a three step process. You must first identify the drive you wish to remove, unconfigure that drive from the server, and then manually remove the drive from the chassis.

Perform the following process to remove a hard drive:

1. **At the Solaris prompt, issue the `cfgadm -al` command to list all drives in the device tree, including drives that are not configured. Type:**

```
# cfgadm -al
```

This should identify the `Ap_id` for the hard drive you wish to remove. For example, the output should look like:

TABLE 2-1 Sample `Ap_id` Output

<code>Ap_id</code>	Type	Receptacle	Occupant	Condition
<code>c0</code>	<code>scsi-bus</code>	<code>connected</code>	<code>configured</code>	<code>unknown</code>
<code>c0::dsk/c0t0d0</code>	<code>disk</code>	<code>connected</code>	<code>configured</code>	<code>unknown</code>
<code>c0::dsk/c0t1d0</code>	<code>disk</code>	<code>connected</code>	<code>configured</code>	<code>unknown</code>
<code>usb0/1</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb0/2</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb0/3</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb1/1</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb1/2</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb1/3</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb2/1</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb2/2</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb2/3</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb2/4</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb2/5</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb2/6</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb2/7</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>
<code>usb2/8</code>	<code>unknown</code>	<code>empty</code>	<code>unconfigured</code>	<code>ok</code>

2. Issue the `cfgadm -c unconfigure` command to unconfigure the disk. For example, type:

```
# cfgadm -c unconfigure c0::dsk/c0t1d1
```

Where `c0::dsk/c0t1d1` is the disk that you are trying to unconfigure.

3. Wait until the blue service action allowed indicator lights (FIGURE 2-1). This will help you identify which drive is unconfigured and can be removed.

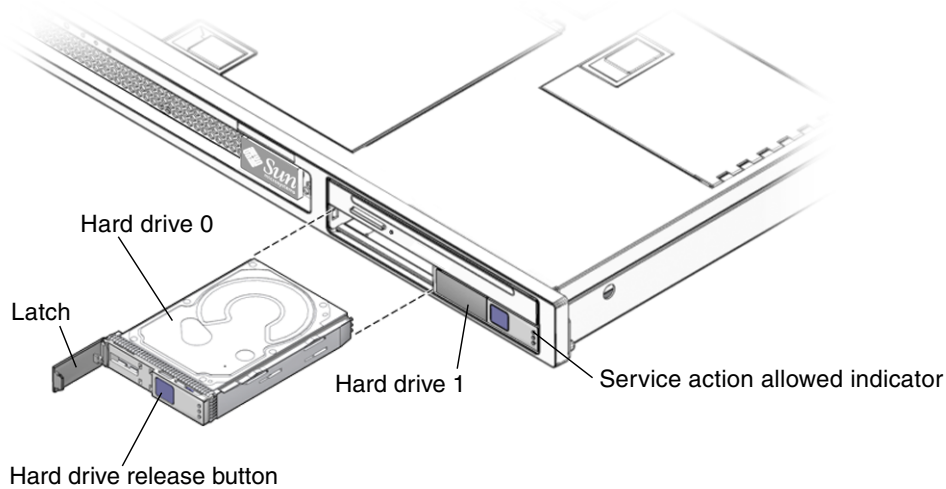


FIGURE 2-1 Locating the Hard Drive Release Button and Latch

4. On the drive you plan to remove, push the hard drive release button (FIGURE 2-1). The latch opens.



Caution – The latch is not an ejector. Do not bend it too far to the left. Doing so can damage the latch.

5. Grasp the latch and pull the drive out of the drive slot.

2.2.2 Installing a Hard Drive

Installing a hard drive into the Sun Fire V215 and V245 servers is a two step process. You must first install a hard drive into the drive slot that you wish to install the drive in, and then you must configure that drive to the server.

Perform the following process to install a hard drive.

1. **If necessary, remove the blank panel from the chassis.**

Note – Sun Fire V215 servers might have a single blank panel that covers the hard drive slot. Sun Fire V245 servers might have as many as three blank panels which cover the unoccupied hard drive slots.

2. **Align the replacement drive to the drive slot** ([FIGURE 2-1](#)).

Hard drives are physically addressed according to the slot in which they are installed. If you removed an existing hard drive from a slot in the server, you must install the replacement drive in the same slot as the drive that was removed.

3. **Slide the drive into the drive slot until it is fully seated.**
4. **Close the latch to lock the drive in place.**
5. **At the Solaris prompt, issue the `cfgadm -al` command to list all drives in the device tree, including any drives that are not configured. Type:**

```
# cfgadm -al
```

This should help you identify the `Ap_id` for the hard drive you installed. For example, the output should look like:

TABLE 2-2 Sample Ap_id Output

Ap_id	Type	Receptacle	Occupant	Condition
c0	scsi-bus	connected	configured	unknown
c0::dsk/c0t0d0	disk	connected	configured	unknown
c0::sd1	disk	connected	unconfigured	unknown
usb0/1	unknown	empty	unconfigured	ok
usb0/2	unknown	empty	unconfigured	ok
usb0/3	unknown	empty	unconfigured	ok
usb1/1	unknown	empty	unconfigured	ok
usb1/2	unknown	empty	unconfigured	ok
usb1/3	unknown	empty	unconfigured	ok
usb2/1	unknown	empty	unconfigured	ok
usb2/2	unknown	empty	unconfigured	ok
usb2/3	unknown	empty	unconfigured	ok
usb2/4	unknown	empty	unconfigured	ok
usb2/5	unknown	empty	unconfigured	ok
usb2/6	unknown	empty	unconfigured	ok
usb2/7	unknown	empty	unconfigured	ok
usb2/8	unknown	empty	unconfigured	ok

6. Issue the `cfgadm -c configure` command to configure the disk. For example, type:

```
# cfgadm -c configure c0::sd1
```

Where `c0::sd1` is the disk that you are trying to configure.

7. Wait until the blue service action allowed indicator goes off on the drive that you installed (FIGURE 2-1).
8. At the Solaris prompt, issue the `cfgadm -al` command to list all drives in the device tree, including any drives that are not configured. Type:

```
# cfgadm -al
```

This should identify the `Ap_id` for the hard drive that you installed. The drive you installed should be is configured. For example, the output should look like:

TABLE 2-3 Sample Ap_id Output

Ap_Id	Type	Receptacle	Occupant	Condition
c0	scsi-bus	connected	configured	unknown
c0::dsk/c0t0d0	disk	connected	configured	unknown
c0::dsk/c0t1d0	disk	connected	configured	unknown
usb0/1	unknown	empty	unconfigured	ok
usb0/2	unknown	empty	unconfigured	ok
usb0/3	unknown	empty	unconfigured	ok
usb1/1	unknown	empty	unconfigured	ok
usb1/2	unknown	empty	unconfigured	ok
usb1/3	unknown	empty	unconfigured	ok
usb2/1	unknown	empty	unconfigured	ok
usb2/2	unknown	empty	unconfigured	ok
usb2/3	unknown	empty	unconfigured	ok
usb2/4	unknown	empty	unconfigured	ok
usb2/5	unknown	empty	unconfigured	ok
usb2/6	unknown	empty	unconfigured	ok
usb2/7	unknown	empty	unconfigured	ok
usb2/8	unknown	empty	unconfigured	ok

9. Issue the `iostat -E` command. Type:

```
# iostat -E
```

The `iostat -E` command displays information about your systems installed devices such as manufacturer, model number, serial number, size and system error statistics.

2.3 Hot-Swapping a Fan Tray

Six hot-swappable fans trays are located under the front cover door.

Two working fan trays are required to provide adequate cooling for the Sun Fire V215 and V245 servers. If a fan tray fails, replace it as soon as possible to maximize server availability.

The following indicators are lit when a fan tray fault is detected:

- Front and rear Service Required indicators ([FIGURE 2-3](#)) and ([FIGURE 2-4](#)).
- Top Fan indicator on the front of the server ([FIGURE 2-3](#))
- Fan Fault indicator on the faulty fan ([FIGURE 2-2](#))

If an overtemperature conditions occurs, the front panel CPU overtemperature indicator lights and a message is displayed on the console and logged by ALOM.

Tip – You can use the `showfault` command at the `sc>` prompt to view the current faults.

2.3.1 Removing a Fan Tray

1. Gain access to the top of the server where the front cover door for the fan tray is located ([FIGURE 2-2](#)).

You might need to extend the server to a maintenance position. See [Section 3.2.5, “Extending the Server to the Maintenance Position – Rackmounted Servers Only”](#) on page 3-5.

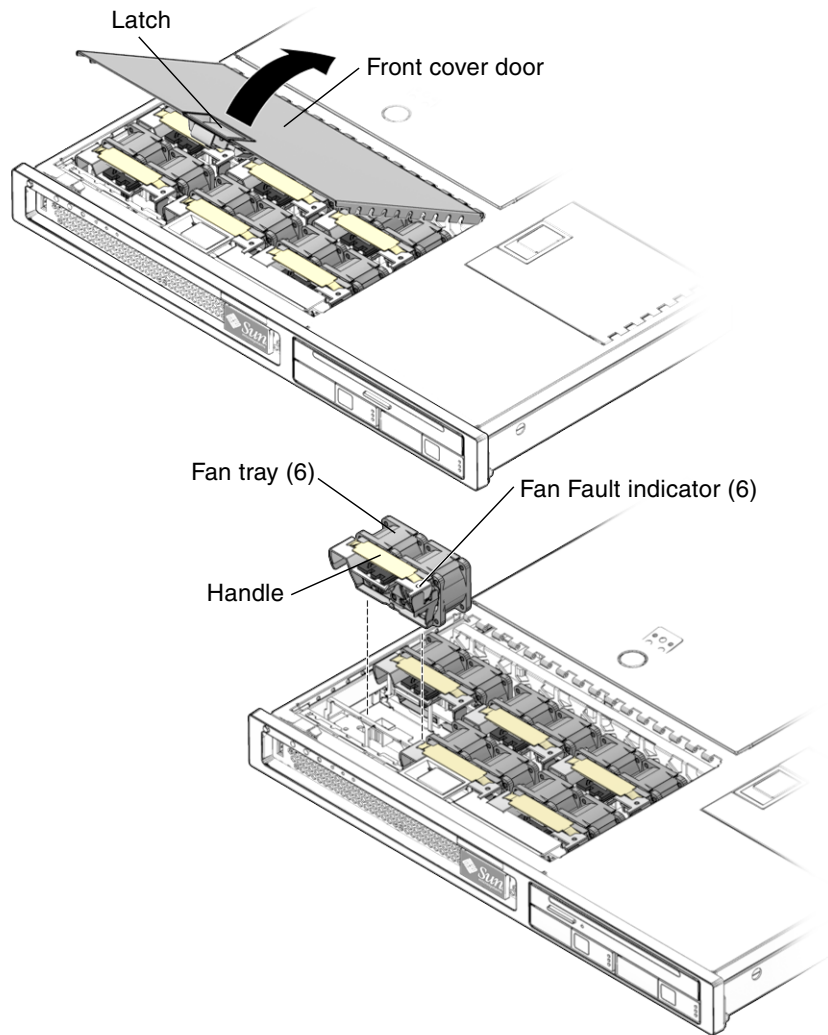


FIGURE 2-2 Removing a Fan Tray

- 2. Lift the latch, and open the front cover door.**
- 3. Identify the faulty fan tray.**

A lit Fan Fault indicator on the top of a fan tray indicates that the fan tray is faulty.

Note – Sun Fire V215 servers have 2 fans installed in each fan tray.

4. Pull up on the fan tray handle until the fan tray is removed from the chassis.

2.3.2 Installing a Fan Tray

1. With the front cover door open, install the replacement fan tray into the server (FIGURE 2-2).
2. Apply firm pressure to fully seat the fan tray.
3. Verify that the Fan Fault indicator on the replaced fan tray is not lit. Also verify that the Top Fan indicator, Service Required indicators, and the Locator indicator/Locator button are not lit (FIGURE 2-2), (FIGURE 2-3) and (FIGURE 2-4).

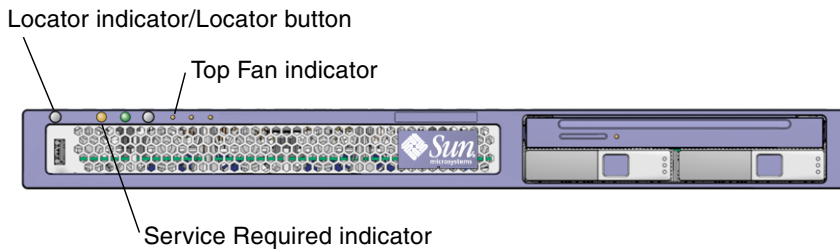


FIGURE 2-3 Top Fan, System Required Indicator, Locator Indicators, and Locator Button

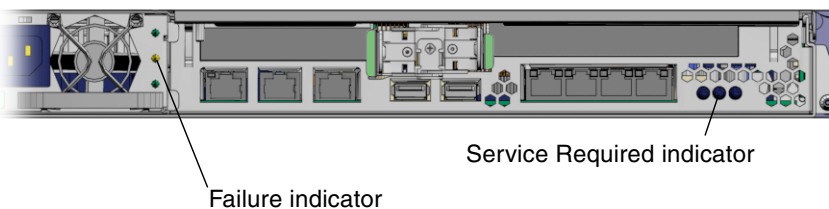


FIGURE 2-4 Failure and Service Required Indicators

Note – Each power supply has a failure indicator.

4. Close the front cover door.
5. If necessary, return the server to its normal position in the rack.

2.4 Hot-Swapping a Hard Drive Fan Tray

A single hot-swappable fan tray is located under the rear fan tray cover door (Sun Fire V245 server).

Note – This hot-swappable fan tray is located under front fan tray cover door on the Sun Fire V215 server.

If the fan tray fails, replace it as soon as possible to maximize server availability.

2.4.1 Removing a Hard Drive Fan Tray

1. Gain access to the top of the server where the rear cover door for the fan tray is located ([FIGURE 2-5](#)).

The hot-swappable fan tray for the Sun Fire V215 server is located under the front fan tray cover door.

Note – You might need to extend the server to a maintenance position. See [Section 3.2.5, “Extending the Server to the Maintenance Position – Rackmounted Servers Only”](#) on page 3-5.

2. Lift the latch, and open the rear cover door.
3. Verify that the fan tray is faulty.

A lit Fan Fault indicator on the top of a fan tray indicates that the fan tray is faulty.

Note – The hard drive fan tray has two fans.

4. Pull up on the fan tray handle and remove the fan tray from the chassis.

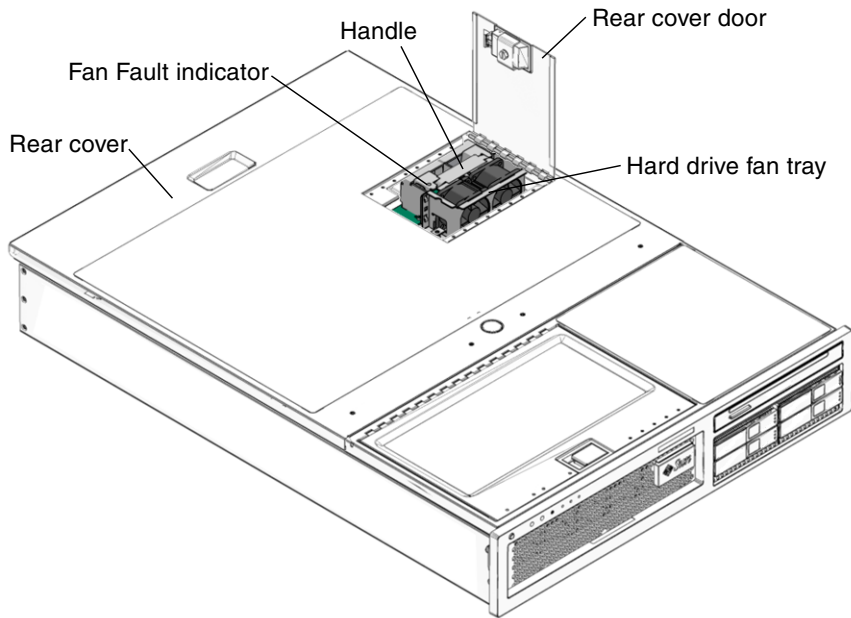


FIGURE 2-5 Hard Drive Fan Tray – Sun Fire V245 Server

2.4.2 Installing a Hard Drive Fan Tray

1. **With the rear cover door open, install the replacement fan tray into the server (FIGURE 2-5).**

The hot-swappable fan tray for the Sun Fire V215 server is located under front fan tray cover door.

2. **Apply firm pressure to fully seat the fan tray.**
3. **Verify that the Fan Fault indicator on the replaced fan tray is not lit.**
4. **Close the rear cover door.**

2.5 Hot-Swapping a Power Supply

The Sun Fire V245 server's standard redundant hot-swappable power supplies enable you to remove and replace a power supply without shutting the server down provided that the other power supply is online and working.

Note – An optional redundant, hot-swappable power supply is available for the Sun Fire V215 server.

The following indicators are lit when a power supply fault is detected:

- Front and rear Service Required indicators (FIGURE 2-3) or (FIGURE 2-4).
- Rear PS Failure indicator on the bezel of the server (FIGURE 2-4)
- Failure indicator on the faulty power supply (FIGURE 2-6)

If a power supply fails and you do not have a replacement available, leave the failed power supply installed to ensure proper air flow in the server.

2.5.1 Removing a Power Supply

1. **Identify which power supply (0 or 1) requires replacement** (FIGURE 2-6).

A lit (amber) failure indicator on a power supply indicates that a failure was detected.

Tip – Additional information about power supply status can be found the *Sun Fire V215 and V245 Getting Started Guide* (819-3041).

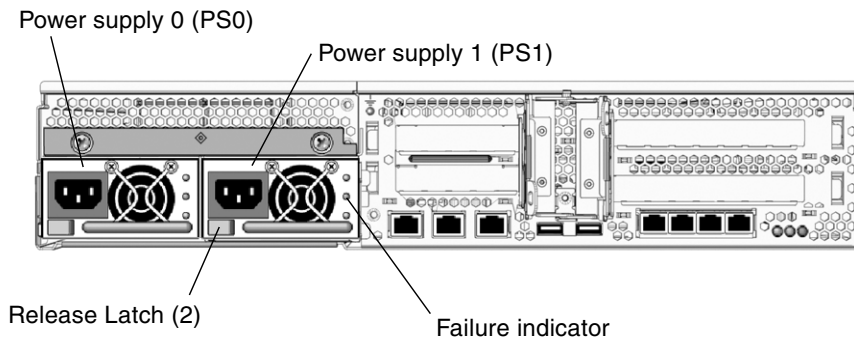


FIGURE 2-6 Location of the Power Supplies and Release Latches

2. **Gain access to the rear of the server where the faulty power supply is located.**
3. **Release the cable management arm (CMA) (FIGURE 2-7).**
The CMA is located at the rear of the server rack.
 - a. **Press and hold the tab.**
 - b. **Rotate the cable management arm out of the way so that you can access the power supply.**
4. **Disconnect the power cord from the faulty power supply.**
5. **Grasp the power supply handle and move the power supply latch to the right.**
6. **Pull the power supply out of the chassis.**

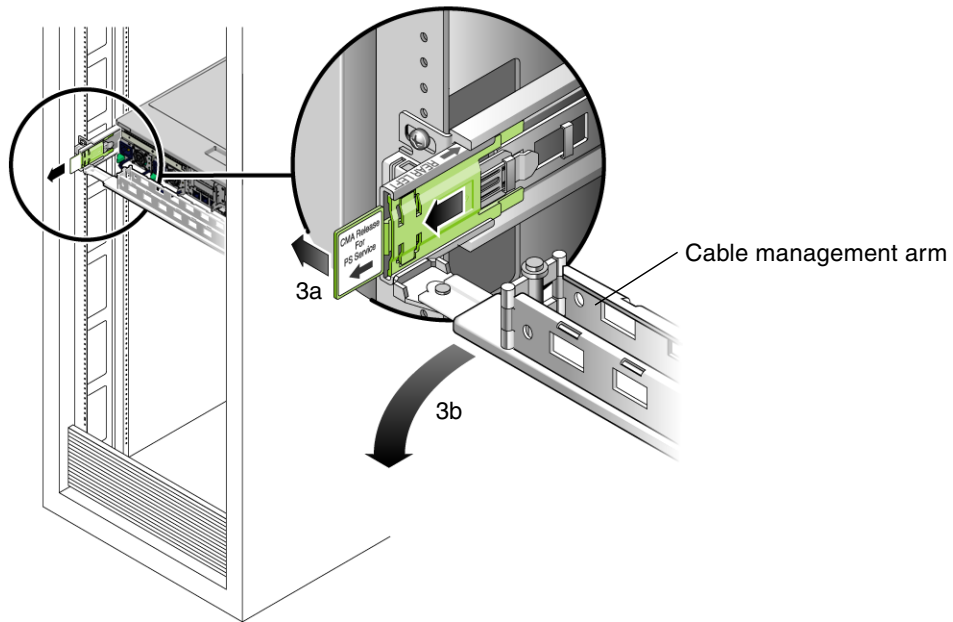


FIGURE 2-7 Rotating the Cable Management Arm to Access the Server Power Supplies

2.5.2 Installing a Power Supply

1. Align the replacement power supply with the empty power supply chassis bay.
2. Slide the power supply into the bay until it is fully seated.
3. Reconnect the power cord to the power supply.
4. Close the CMA, inserting the end of the CMA into the rear left rail bracket (FIGURE 2-7).
5. Verify that the Failure indicator on the replaced power supply (FIGURE 2-4), the Service Required (FIGURE 2-3) indicator, and the front and rear Service Required indicators are not lit (FIGURE 2-3) and (FIGURE 2-4).
6. At the `sc>` prompt, type the `showenvironment` command to verify the status of the power supplies.

Replacing Cold-Swappable FRUs

This chapter describes how to replace cold-swappable, field-replaceable units (FRUs) in the Sun Fire V215 and V245 servers.

The following topics are covered:

- [Section 3.1, “Safety Information” on page 3-2](#)
- [Section 3.2, “Procedures for Parts Replacement” on page 3-3](#)
- [Section 3.3, “Removing and Installing FRUs” on page 3-15](#)
- [Section 3.4, “Procedures for Finishing Up” on page 3-58](#)

For a list of CRUs and FRUs, see [Section B.1, “Customer and Field Replaceable Units” on page B-1](#).



Caution – Never attempt to run the server with the covers removed. Hazardous voltage present.



Caution – Equipment damage possible. The covers must be in place for proper air flow.

3.1 Safety Information

This section describes important safety information that you need to know prior to removing or installing parts in the Sun Fire V215 and V245 servers.

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

- Follow all Sun cautions, warnings, and instructions marked on the equipment and described in *Important Safety Information for Sun Hardware Systems* (816-7190).
- Follow all cautions, warnings, and instructions marked on the equipment and described in the *Sun Fire V215 and V245 Compliance and Safety Manual* (819-3039).
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Follow the electrostatic discharge safety practices as described in this section.

3.1.1 Safety Symbols

The following symbols might appear in this document, note their meanings:



Caution – There is a risk of personal injury and or equipment damage. To avoid personal injury and equipment damage, follow the instructions.



Caution – Hot surface. Avoid contact. Surfaces are hot and might cause personal injury if touched.



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

3.1.2 Electrostatic Discharge Safety Measures

Electrostatic discharge (ESD) sensitive devices, such as the motherboards, PCI cards, hard drives, and memory cards require special handling.



Caution – Circuit boards and hard drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or the work environment can destroy the components located on these boards. Do not touch the components along their connector edges.

3.1.2.1 Using an Antistatic Wrist Strap

Wear an antistatic wrist strap and use an antistatic mat when handling components such as hard drive assemblies, circuit boards, or PCI cards. When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis. Following this practice equalizes the electrical potentials between you and the server.

Note – An antistatic wrist strap is no longer included in the accessory kit for the Sun Fire V215 and V245 Servers. However, antistatic wrist straps are still included with x-options.

3.1.2.2 Using an Antistatic Mat

Place ESD-sensitive components such as motherboards, memory, and other PCBs on an antistatic mat.

3.2 Procedures for Parts Replacement

Before replacing parts that are not hot-swappable or hot-pluggable inside the Sun Fire V215 and V245 servers, perform the following procedures:

- [Section 3.2.2, “Powering Off the Server – ALOM Command Line” on page 3-4](#) or [Section 3.2.3, “Powering Off the Server – Graceful Shutdown” on page 3-5](#) or [Section 3.2.4, “Powering Off the Server – Emergency Shutdown” on page 3-5](#)
- [Section 3.2.5, “Extending the Server to the Maintenance Position – Rackmounted Servers Only” on page 3-5](#)

- [Section 3.2.7, “Performing Electrostatic Discharge – Antistatic Prevention Measures”](#) on page 3-9
- [Section 3.2.8, “Removing Power From the Server”](#) on page 3-10

Note – These procedures do not apply to the hot-swappable and hot-pluggable devices (fans, power supplies, and hard drives) described in [Chapter 2](#).

The procedures that you perform after removing, installing, or repairing the servers are described in [Section 3.4, “Procedures for Finishing Up”](#) on page 3-58.

3.2.1 Required Tools

The Sun Fire V215 and V245 servers can be serviced with the following tools:

- Antistatic wrist strap
- Antistatic mat
- No. 2 Phillips screwdriver
- No. 1 Flat-blade screwdriver (battery removal)
- Pen or pencil (power on server)

3.2.2 Powering Off the Server – ALOM Command Line

Note – Additional information about powering on the server is located in the *Sun Fire V215 and V245 Servers Administration Guide* (819-3036).

You can use ALOM to perform a graceful shutdown of the server and ensure that all of your data is saved and the server is ready for restart.

1. Login as superuser or equivalent.

Depending on the type of problem, you might want to view server status, log files, or run diagnostics before you shut down the server. Refer to the *Sun Fire V215 and V245 Server Administration Guide* (819-3036) for log file information.

2. Notify affected users.

Refer to your Solaris system administration documentation for additional information.

3. Save any open files and quit all running programs.

Refer to your application documentation for specific information on these processes.

4. Shut down the Solaris OS.

Refer to the Solaris system administration documentation for additional information.

5. Switch from the system console to the ALOM `sc>` prompt by typing the #. (Pound Period) key sequence.

c. At the ALOM `sc>` prompt, issue the `poweroff -fy` command.

```
sc> poweroff -fy
SC Alert: SC Request to Power Off Host Immediately.
```

Note – You can also use the Power button on the front of the server to initiate a graceful server shutdown (See [Section 3.2.3, “Powering Off the Server – Graceful Shutdown”](#) on page 3-5). This button is recessed to prevent accidental server power-off. Use the tip of a pen to operate this button.

Refer to the *Sun Advanced Lights Out Management (ALOM) Administration Guide* for more information about the ALOM `poweroff` command.

3.2.3 Powering Off the Server – Graceful Shutdown

- **Press and release the Power button.**

If necessary, use a pen or pencil to press the Power button.

3.2.4 Powering Off the Server – Emergency Shutdown



Caution – All applications and files will be closed abruptly without saving changes. File system corruption might occur.

- **Press and hold the Power button for 4 seconds.**

3.2.5 Extending the Server to the Maintenance Position – Rackmounted Servers Only

If the server is installed in a rack with extendable slide rails use this procedure to extend the server to the maintenance position.

1. (Optional) Issue the following command from the ALOM `sc>` prompt to locate the system that requires maintenance (FIGURE 3-1).

```
sc> setlocator on  
Locator indicator is on.
```

Once you have located the server, press the Locator indicator/Locator button to turn it off.



FIGURE 3-1 Locator Indicator/Locator Button

2. **Verify that no cables will be damaged or interfere when the server is extended.**
Although the cable management arm (CMA) that is supplied with the server is hinged to accommodate extending the server, you should ensure that all cables and cords are capable of extending.
3. **From the front of the server, release the two slide release latches (FIGURE 3-2).**
Squeeze the green slide release latches to release the slide rails.

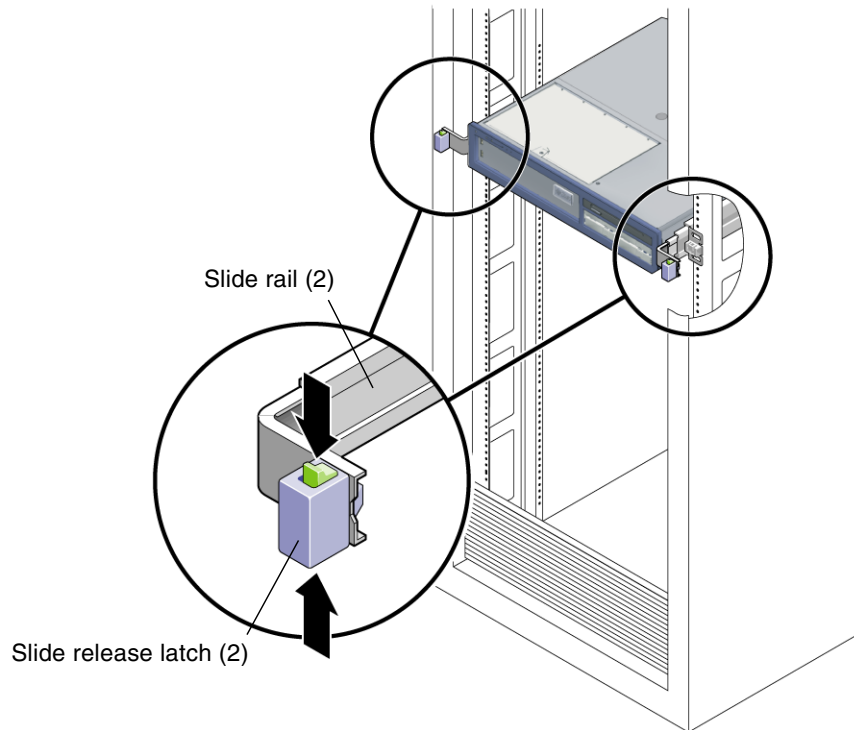


FIGURE 3-2 Slide Release Latches

4. While squeezing the slide release latches, slowly pull the server forward until the slide rails latch.

3.2.6

Removing a Server From the Rack



Caution – If necessary, use two people to dismount and carry the chassis.

1. Disconnect all the cables and power cords from the server.
2. Extend the server to the maintenance position.

See [Section 3.2.5, “Extending the Server to the Maintenance Position – Rackmounted Servers Only”](#) on page 3-5.

3. Press the metal lever that is located on the inner side of the rail to disconnect the cable management arm (CMA) from the rail assembly (FIGURE 3-3).

The CMA is still attached to the cabinet, but the server chassis is now disconnected from the CMA.

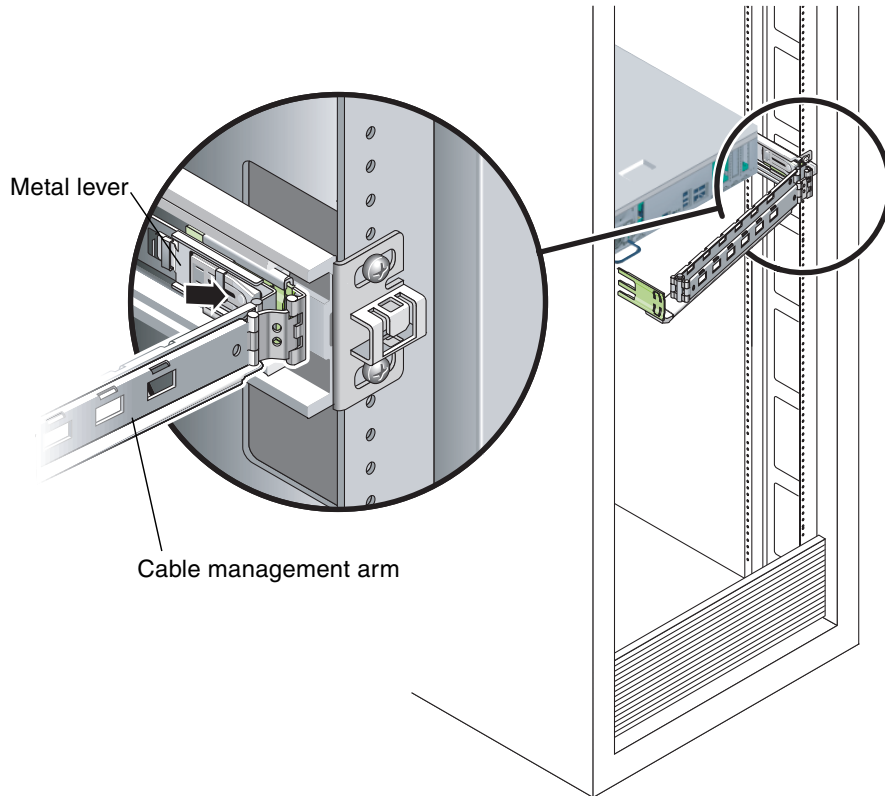


FIGURE 3-3 Metal Lever and Cable Management Arm



Caution – If necessary, use two people to dismount and carry the chassis.

4. From the front of the server, pull the release tabs forward and pull the server forward until it is free of the rack rails (FIGURE 3-4).

A release tab is located on each rail.

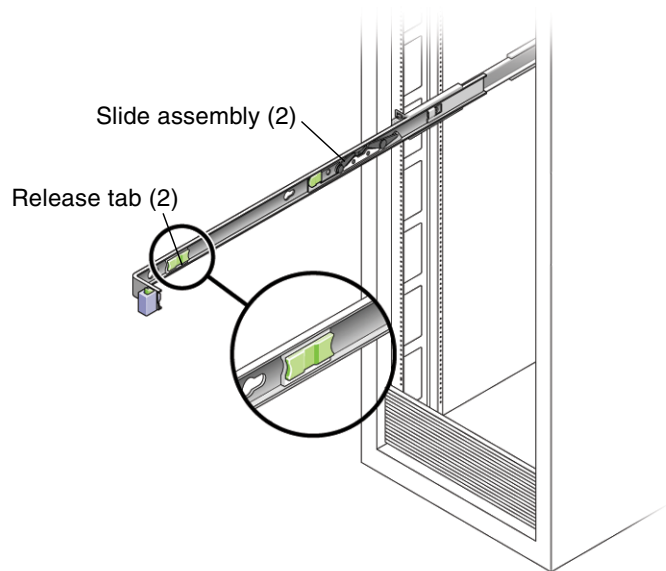


FIGURE 3-4 Release Tabs and Slide Assembly

5. Set the server on a sturdy work surface.

3.2.7 Performing Electrostatic Discharge – Antistatic Prevention Measures

1. Prepare an antistatic surface to set parts on during the removal, installation, or replacement process.

Place ESD-sensitive components such as the printed circuit boards on an antistatic mat. The following items can be used as an antistatic mat:

- Antistatic bag used to wrap a Sun replacement part
- Sun ESD mat, part number 250-1088
- A disposable ESD mat (shipped with some replacement parts or optional system components)

2. Attach an antistatic wrist strap.

When servicing or removing server components, attach an antistatic strap to your wrist and then to a metal area on the chassis.

3.2.8 Removing Power From the Server



Caution – The system supplies standby power to the circuit boards even when the server is powered off.

- **Disconnect the power cords from the power supplies.**

3.2.9 Removing the Rear Cover

Note – Some field-replaceable units (FRUs) require removal of the rear cover.

1. **Press and hold the rear cover release button**([FIGURE 3-5](#)).
2. **Slide the rear cover toward the rear of the server.**
Slide the rear cover to the rear about a 0.5 inch (12.7 mm).
3. **Remove the rear cover.**
Lift up and remove the cover.

Note – If the rear cover is removed before the server is powered down, the Sun Fire V215 server will go into Standby mode.

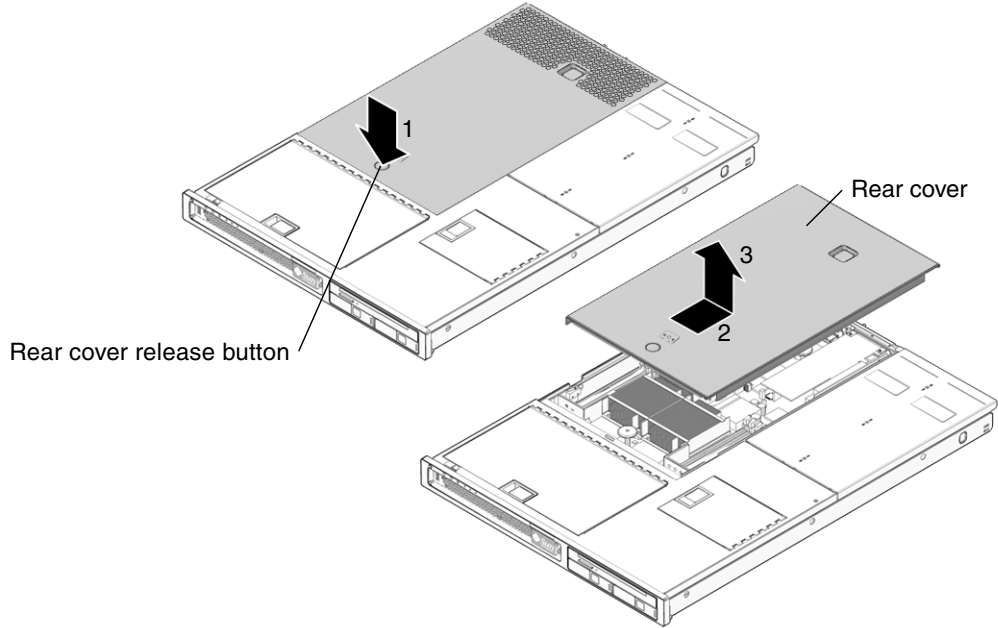


FIGURE 3-5 Removing the Rear Cover

3.2.10 Removing the Bezel

1. **Open front cover door** (FIGURE 3-6).
Lift the latch and open the front cover door.

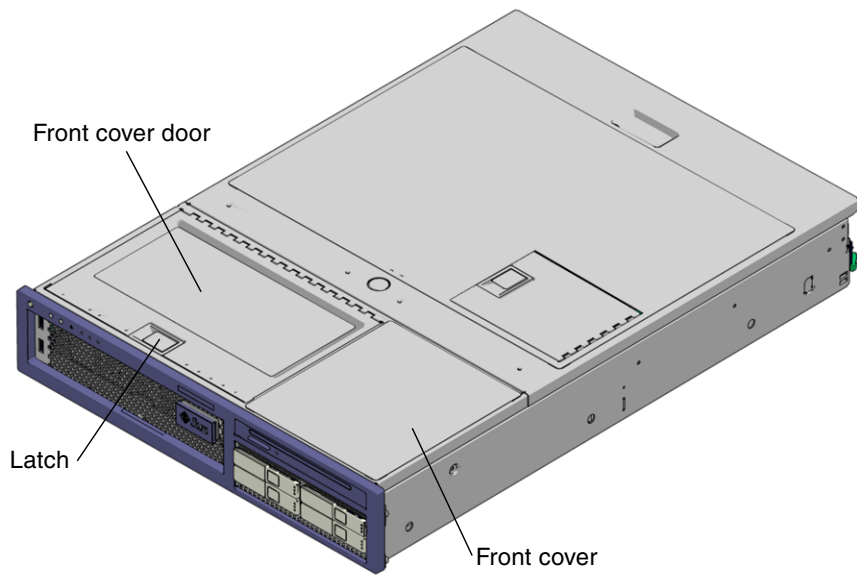


FIGURE 3-6 Front Cover, Front Cover Door, and Latch – Sun Fire V245

2. Loosen the captive screw (FIGURE 3-7).

Use a screwdriver to loosen the captive screw. The captive screw secures the bezel to the server.

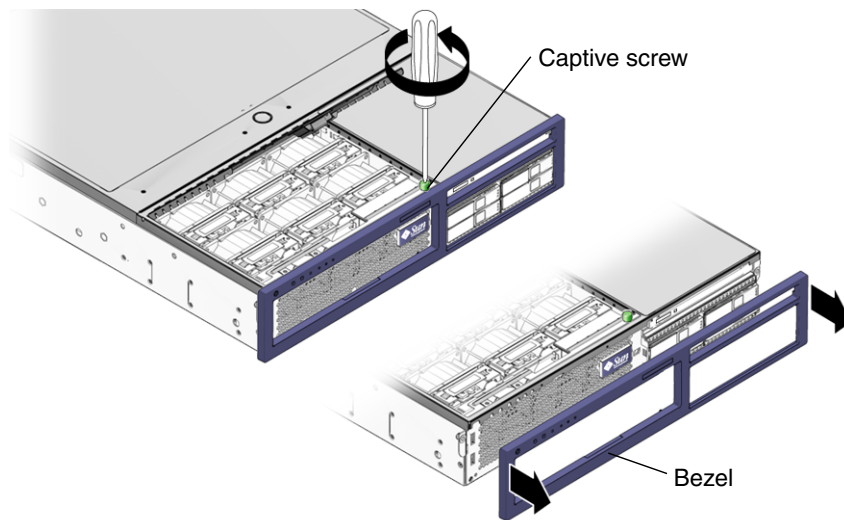


FIGURE 3-7 Removing the Bezel From the Server – Sun Fire V245

3. Remove the bezel from the chassis.

The bezel is held in place by a mounting tab and four, five, or six fasteners that secure the bezel to the chassis.

3.2.11 Removing the Front Cover

Note – Some field-replaceable units (FRUs) require the removal of the front cover.

1. Remove the rear cover.

See [Section 3.2.9, “Removing the Rear Cover”](#) on page 3-10.

2. Open the front cover door ([FIGURE 3-6](#)).

3. Remove the bezel.

See [Section 3.2.10, “Removing the Bezel”](#) on page 3-11.

4. Remove the front cover ([FIGURE 3-6](#)).

While holding the front cover door open, slide the front cover forward and remove.

3.2.12 (Sun Fire V245) Removing the Air Baffle



Caution – To prevent the system from overheating, ensure that the air baffle is correctly installed before powering on the server.

1. Perform the procedures described in [Section 3.2, “Procedures for Parts Replacement”](#) on page 3-3.

2. Remove the rear cover.

See [Section 2.2.7, “Removing the Rear Cover”](#) on page 2-9.

3. Lift the handle and remove the air baffle from the server ([FIGURE 3-8](#)).

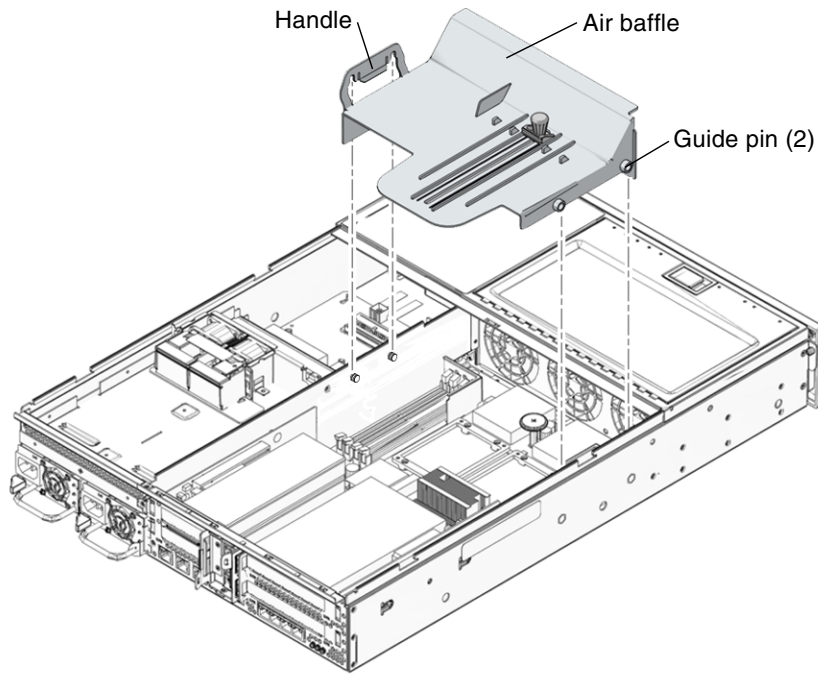


FIGURE 3-8 Air Baffle, Guide Pins, and Handle – Sun Fire V245

3.2.13 (Sun Fire V245) Installing the Air Baffle



Caution – When the server is in operation, ensure that the air baffle is correctly installed to prevent the system from overheating.

1. Use the guide pins to align and install the air baffle into the chassis ([FIGURE 3-8](#)). Ensure that the air baffle is aligned and fully seated in the chassis.
2. Perform the procedures described in [Section 3.4, “Procedures for Finishing Up”](#) on [page 3-58](#).

3.3 Removing and Installing FRUs

This section provides procedures for replacing the following field replaceable units (FRUs) inside the server chassis:

- [Section 3.3.1, “Removing PCI-E and PCI-X Cards” on page 3-16](#)
- [Section 3.3.2, “Installing PCI-E or PCI-X Cards” on page 3-18](#)
- [Section 3.3.3, “Removing PCI-E and PCI-X Riser Boards” on page 3-19](#)
- [Section 3.3.4, “Installing PCI-E or PCI-X Riser Boards” on page 3-21](#)
- [Section 3.3.5, “Removing DIMMs” on page 3-22](#)
- [Section 3.3.6, “Installing DIMMs” on page 3-25](#)
- [Section 3.3.7, “Removing the Motherboard Assembly” on page 3-27](#)
- [Section 3.3.8, “Installing the Motherboard Assembly” on page 3-34](#)
- [Section 3.3.9, “Removing the Power Distribution Board” on page 3-36](#)
- [Section 3.3.10, “Installing the Power Distribution Board” on page 3-39](#)
- [Section 3.3.11, “Removing the Front Indicator Board” on page 3-40](#)
- [Section 3.3.12, “Installing the Front Indicator Board” on page 3-41](#)
- [Section 3.3.13, “Removing the Fan Tray Connector Boards” on page 3-42](#)
- [Section 3.3.14, “Installing the Fan Tray Connector Boards” on page 3-43](#)
- [Section 3.3.15, “Removing the Front I/O Board” on page 3-43](#)
- [Section 3.3.16, “Installing the Front I/O Board” on page 3-44](#)
- [Section 3.3.17, “Removing the DVD Super-Multi Drive” on page 3-45](#)
- [Section 3.3.18, “Installing the DVD Super-Multi Drive” on page 3-46](#)
- [Section 3.3.19, “Removing the Hard Drive Backplane” on page 3-47](#)
- [Section 3.3.20, “Installing the Hard Drive Backplane” on page 3-49](#)
- [Section 3.3.21, “Removing the Hard Drive Fan Tray” on page 3-50](#)
- [Section 3.3.22, “Installing the Hard Drive Fan Tray” on page 3-52](#)
- [Section 3.3.23, “\(Sun Fire V245\) Removing the Hard Drive Fan Tray Connector Board” on page 3-53](#)
- [Section 3.3.24, “\(Sun Fire V245\) Installing the Hard Drive Fan Tray Connector Board” on page 3-54](#)
- [Section 3.3.25, “Removing the Battery” on page 3-55](#)
- [Section 3.3.26, “Installing the Battery” on page 3-56](#)
- [Section 3.3.27, “Removing NVRAM” on page 3-57](#)
- [Section 3.3.28, “Installing NVRAM” on page 3-58](#)

To locate these FRUs, see [Section B.1, “Customer and Field Replaceable Units”](#) on page B-1.

Note – Procedures for removing and installing hot-swappable and hot-pluggable CRUs are described in [Chapter 2](#).

3.3.1 Removing PCI-E and PCI-X Cards

1. **Perform the procedures described in [Section 3.2, “Procedures for Parts Replacement”](#) on page 3-3.**
2. **Remove the rear cover.**
See [Section 3.2.9, “Removing the Rear Cover”](#) on page 3-10.
3. **(Sun Fire V245) Remove the air baffle.**
Removal of a long PCI card might require you to remove the air baffle.
4. **Locate the PCI card that you want to remove.**

To locate the PCI card slots, refer to [FIGURE 3-9](#) and [FIGURE 3-10](#).

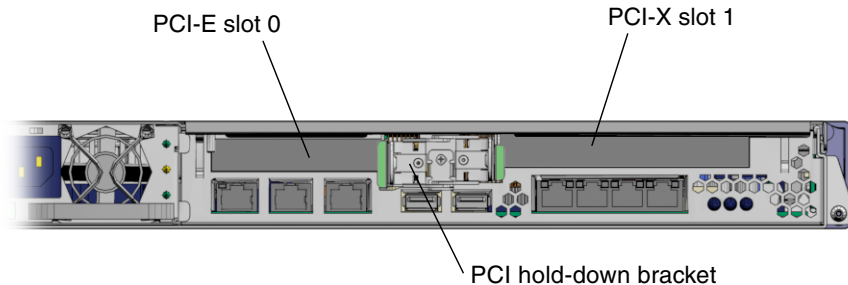


FIGURE 3-9 Location of PCI-E and PCI-X Slots, and PCI Hold-Down Bracket – Sun Fire V215

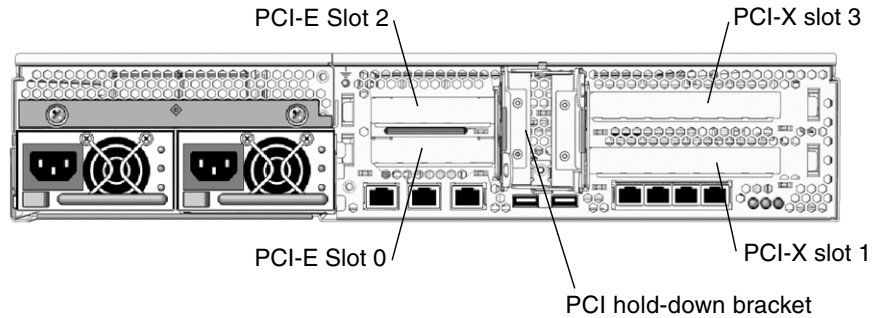


FIGURE 3-10 Location of PCI-E and PCI-X Slots, and PCI Hold-Down Bracket – Sun Fire V245

5. If necessary, make a note of where the PCI card is installed. Also note the location of any cables for reinstallation later.
6. Release the PCI hold-down bracket ([FIGURE 3-9](#)) or ([FIGURE 3-10](#)).
Rotate the PCI hold-down bracket 90 degrees so it no longer covers the PCI card that you want to remove.
7. Carefully remove the PCI card from the PCI card slot and riser board connector ([FIGURE 3-11](#)).

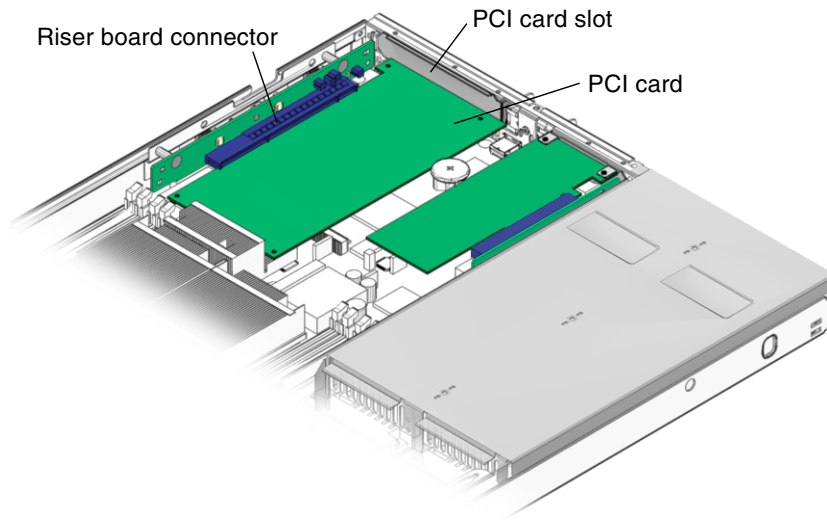


FIGURE 3-11 Riser Board and PCI Card Connector – Sun Fire V215

8. Place the PCI card on an antistatic mat.

3.3.2 Installing PCI-E or PCI-X Cards

1. Unpackage the replacement PCI-E or PCI-X card and place it on an antistatic mat.
2. Locate the proper PCI slot for the card you are replacing ([FIGURE 3-9](#)) or ([FIGURE 3-10](#)).
3. If necessary, review the PCI-E and PCI-X Card Guidelines to plan your installation.
See [Section A.2, "PCI-E and PCI-X Card Guidelines"](#) on page A-3 for additional information.
4. Rotate the PCI hold-down bracket 90 degrees so you can install the card.
5. If necessary, remove the filler panel.
6. Insert the PCI card into the slot.
7. Rotate the PCI hold-down bracket 90 degrees to lock the card in place.
8. (Sun Fire V245) If a PCI long card is installed use the brace from the air baffle to support the card.

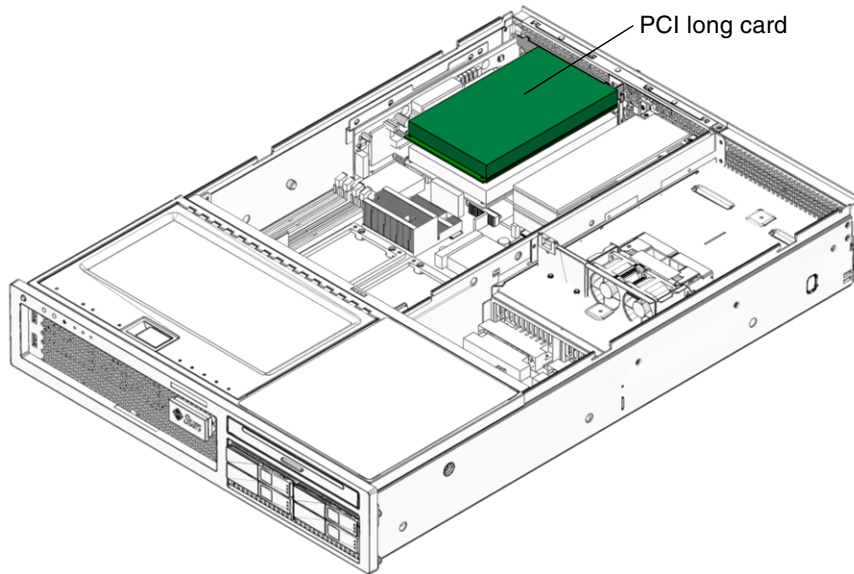


FIGURE 3-12 Installing a PCI Long Card – Sun Fire V245

9. Perform the procedures described in [Section 3.4, “Procedures for Finishing Up”](#) on page 3-58.

3.3.3 Removing PCI-E and PCI-X Riser Boards

1. Perform the procedure described in [Section 3.2, “Procedures for Parts Replacement”](#) on page 3-3.
2. Remove the rear cover.
See [Section 3.2.9, “Removing the Rear Cover”](#) on page 3-10.
3. (Sun Fire V245) Remove the air baffle.
See [Section 3.2.12, “\(Sun Fire V245\) Removing the Air Baffle”](#) on page 3-13.
4. Remove any PCI option cards that are installed ([FIGURE 3-13](#)).

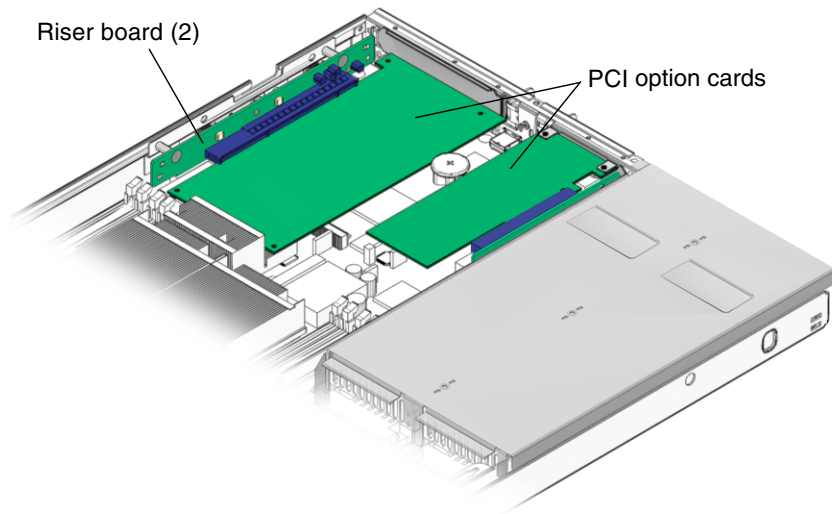


FIGURE 3-13 Riser Boards and PCI Option Cards – Sun Fire V215

5. Remove the PCI-X and PCI-E riser boards (FIGURE 3-14).

If necessary, remove the screws that secure the riser board to the chassis.

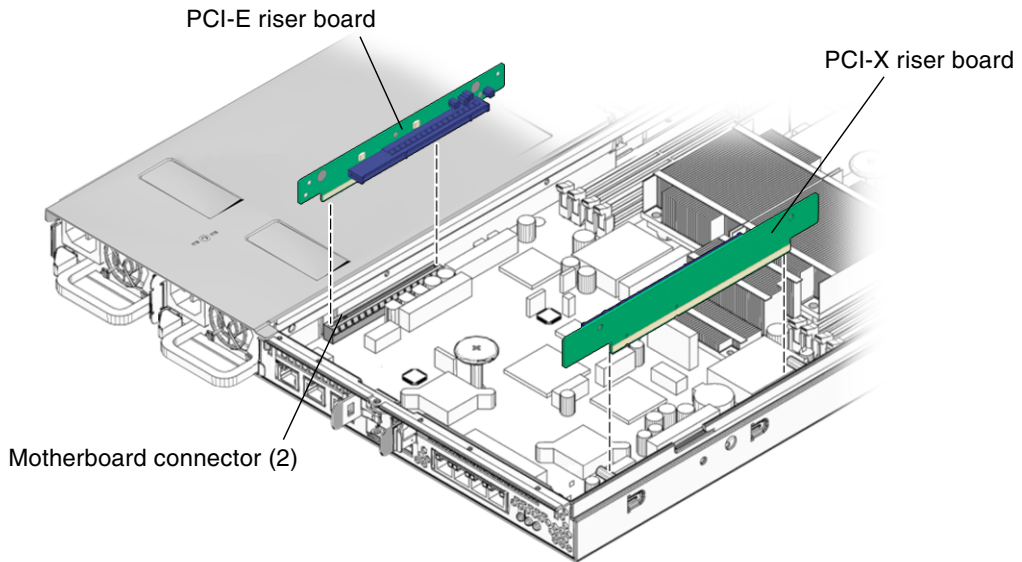


FIGURE 3-14 PCI-E and PCI-X Riser Boards

6. Place the PCI riser boards on an antistatic mat.

3.3.4 Installing PCI-E or PCI-X Riser Boards

1. Unpackage the replacement PCI-E or PCI-X card and place it on an antistatic mat.
2. Install the PCI-E and PCI-X riser boards in the motherboard connectors (FIGURE 3-14).
If necessary, install the screws that secure the riser board to the chassis.
3. Install the PCI option cards.
See [Section 3.3.2, “Installing PCI-E or PCI-X Cards”](#) on page 3-18.
4. (Sun Fire V245) If a PCI long card is installed use the brace from the air baffle to support the card.
5. Perform the procedures described in [Section 3.4, “Procedures for Finishing Up”](#) on page 3-58.

3.3.5 Removing DIMMs



Caution – This procedure requires that you handle components that are sensitive to static discharge. This sensitivity can cause the component to fail. To avoid this problem, ensure that you follow antistatic practices as described in [Section 3.2.7, “Performing Electrostatic Discharge – Antistatic Prevention Measures”](#) on page 3-9.



Caution – Ensure that all power is removed from the server before removing or installing DIMMs.

1. **Perform the procedures described in [Section 3.2, “Procedures for Parts Replacement”](#) on page 3-3.**
2. **Remove the rear cover.**
[Section 3.2.9, “Removing the Rear Cover”](#) on page 3-10.
3. **Remove any PCI-X or PCI-E cards.**
See [Section 3.3.1, “Removing PCI-E and PCI-X Cards”](#) on page 3-16.
4. **(Sun Fire V245) Remove the air baffle ([FIGURE 3-8](#)).**
See [Section 3.2.12, “\(Sun Fire V245\) Removing the Air Baffle”](#) on page 3-13.
5. **(Sun Fire V215) Remove the motherboard to front I/O board cable ([FIGURE 3-20](#)).**
6. **Locate the DIMMs that you want to replace (See [FIGURE 3-15](#) and [TABLE 3-1](#)).**

Tip – If you are removing DIMMs as a result of a system error or fault, refer to [TABLE 3-1](#) for additional information.

TABLE 3-1 DIMM Names, Connectors, and Locations

DIMM Name Used in System Fault Message	DIMM Connector	DIMM Location
/CHASSIS/MB/P0/B0/D0	J5	DIMM 0
/CHASSIS/MB/P0/B0/D1	J2	DIMM 1
/CHASSIS/MB/P0/B1/D0	J4	DIMM 2
/CHASSIS/MB/P0/B1/D1	J1	DIMM 3
/CHASSIS/MB/P1/B0/D0	J25	DIMM 4

TABLE 3-1 DIMM Names, Connectors, and Locations

DIMM Name Used in System Fault Message	DIMM Connector	DIMM Location
/CHASSIS/MB/P1/B0/D1	J29	DIMM 5
/CHASSIS/MB/P1/B1/D0	J27	DIMM 6
/CHASSIS/MB/P1/B1/D1	J30	DIMM 7

Tip – Make a note of the DIMM location so that you can install the replacement DIMM in the same location.

Note – For memory configuration information see [Section A.1, “DIMM Guidelines”](#) on page A-1.

7. (Sun Fire V215) Remove the screws and air baffles for the DIMMs you want to remove ([FIGURE 3-15](#)).

To obtain adequate clearance, it might be necessary to remove the front cover, see [Section 3.2.11, “Removing the Front Cover”](#) on page 3-13.

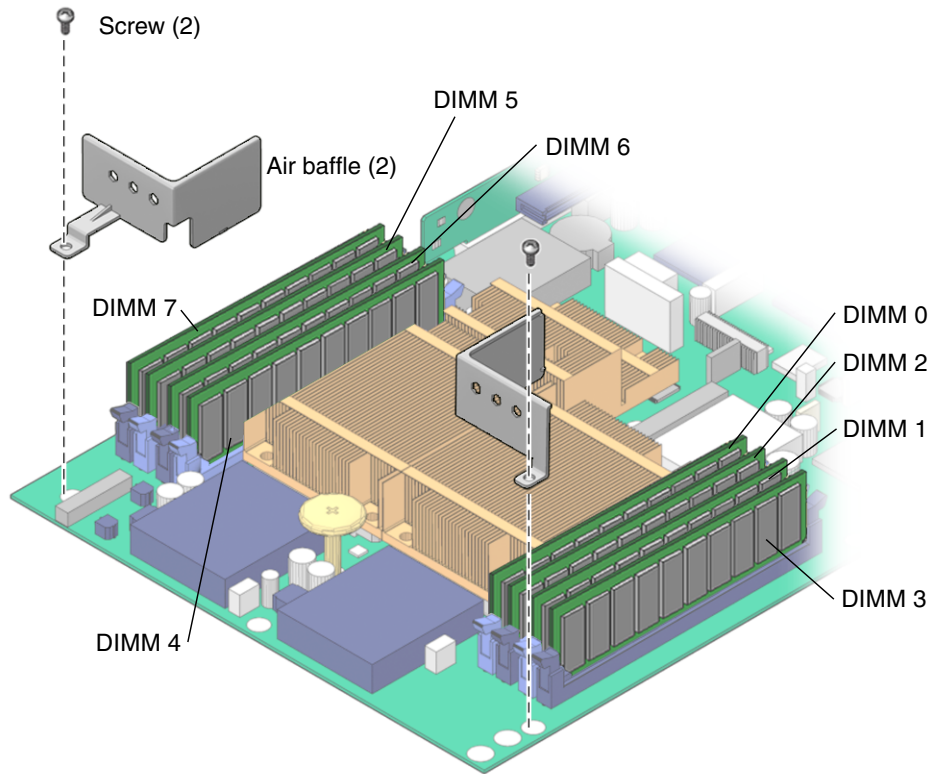


FIGURE 3-15 Removing the Air Baffle – Sun Fire V215

8. Push down on the ejector tabs on each side of the DIMM until the DIMM is released ([FIGURE 3-16](#)).

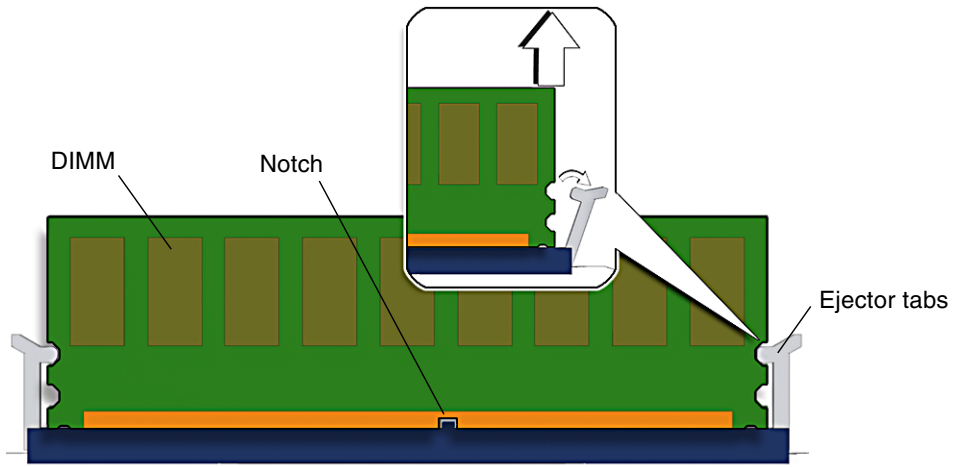


FIGURE 3-16 Removing DIMMs

9. Grasp the top corners of the faulty DIMM and remove it from the server.
10. Place the DIMM on an antistatic mat.
11. Repeat [Step 8](#) through [Step 10](#) until all DIMMs have been removed.

3.3.6 Installing DIMMs



Caution – Ensure that all power is removed from the server before removing or installing DIMMs or damage to the DIMMs might occur.

1. Unpackage the replacement DIMMs and place them on an antistatic mat.

Tip – See [Section A.1, “DIMM Guidelines”](#) on page A-1 for information about configuring the DIMMs.

2. Ensure that the ejector tabs are in the open position.
3. Line up the replacement DIMM with the connector ([FIGURE 3-16](#)).
Align the DIMM notch with the key in the connector. This ensures that the DIMM is oriented correctly.

4. **Push the DIMM into the connector until the ejector tabs lock the DIMM in place.**
If the DIMM does not easily seat into the connector, verify that the orientation of the DIMM is as shown in [FIGURE 3-16](#). If the orientation is reversed damage to the DIMM might occur.
5. **Repeat Step 2 through Step 4 until all replacement DIMMs are installed.**
6. **(Sun Fire V245) Reinstall the air baffle.**
See [Section 3.2.13, “\(Sun Fire V245\) Installing the Air Baffle”](#) on page 3-14.
7. **(Sun Fire V215) Reinstall the screws and the air baffles ([FIGURE 3-15](#)).**
8. **(Sun Fire V215) Reinstall the motherboard to front I/O board cable ([FIGURE 3-20](#)).**
9. **Perform the procedures described in [Section 3.4, “Procedures for Finishing Up”](#) on page 3-58.**
10. **Perform the following steps to verify that there are no faults:**
 - a. **Set the virtual keyswitch to Diag mode so that POST will run in Service mode.**

```
sc> setkeyswitch diag
```

- b. **Issue the `poweron` command.**

```
sc> poweron
```

c. Switch to the system console to view POST output.

```
sc> console
```

Watch the POST output for possible fault messages. The following output is a sign that POST did not detect any faults:

```
.  
. .  
0:0>POST Passed all devices.  
0:0>  
0:0>DEMON: (Diagnostics Engineering MONitor)  
0:0>Select one of the following functions  
0:0>POST:Return to OBP.  
0:0>INFO:  
0:0>POST Passed all devices.  
0:0>Master set ACK for vbsc runpost command and spin...
```

Note – Depending on the configuration of ALOM, POST variables, and whether POST detected faults or not, the server might boot, or the system might remain at the ok prompt. If the system is at the ok prompt, type boot.

d. Issue the Solaris OS `fmadm faulty` command.

```
# fmadm faulty
```

No memory or DIMM faults should be displayed.

3.3.7

Removing the Motherboard Assembly



Caution – This procedure requires that you handle components that are sensitive to electrostatic discharge. This discharge can cause server components to fail. To avoid this problem, ensure that you follow the antistatic practices as described in [Section 3.2.7, “Performing Electrostatic Discharge – Antistatic Prevention Measures” on page 3-9.](#)

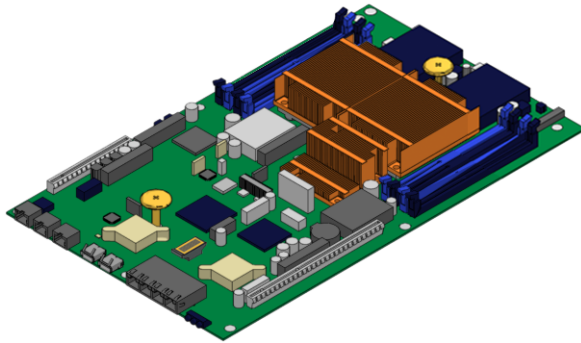


FIGURE 3-17 Motherboard Assembly

- 1. Perform the procedure described in [Section 3.2, "Procedures for Parts Replacement"](#) on page 3-3.**
- 2. If necessary, remove the server from the rack.**
See [Section 3.2.6, "Removing a Server From the Rack"](#) on page 3-7.
Ensure that you remove all cables as well as the power cords.
- 3. Remove the rear cover.**
See [Section 3.2.9, "Removing the Rear Cover"](#) on page 3-10.
- 4. Remove the bezel.**
[Section 3.2.10, "Removing the Bezel"](#) on page 3-11.
- 5. Remove the front cover.**
[Section 3.2.11, "Removing the Front Cover"](#) on page 3-13.
- 6. (Sun Fire V245) Remove the air baffle.**
See [Section 3.2.12, "\(Sun Fire V245\) Removing the Air Baffle"](#) on page 3-13.
- 7. Remove any PCI option cards that are installed.**
See [Section 3.3.1, "Removing PCI-E and PCI-X Cards"](#) on page 3-16.
- 8. Remove the PCI-X and PCI-E riser boards ([FIGURE 3-18](#)).**

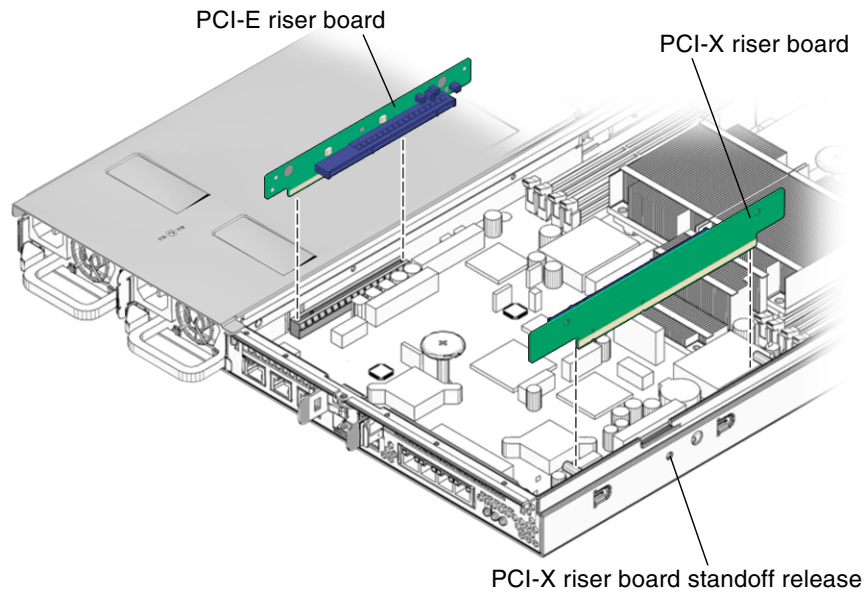


FIGURE 3-18 PCI-X and PCI-E Riser Boards – Sun Fire V215

9. (Sun Fire V215) Remove the PCI-X riser board standoff (See [FIGURE 3-19](#) and [FIGURE 3-19](#)).

It might be necessary to unlock the PCI-X riser board standoff from the chassis. Press the release and then remove the PCI riser board standoff ([FIGURE 3-18](#)).

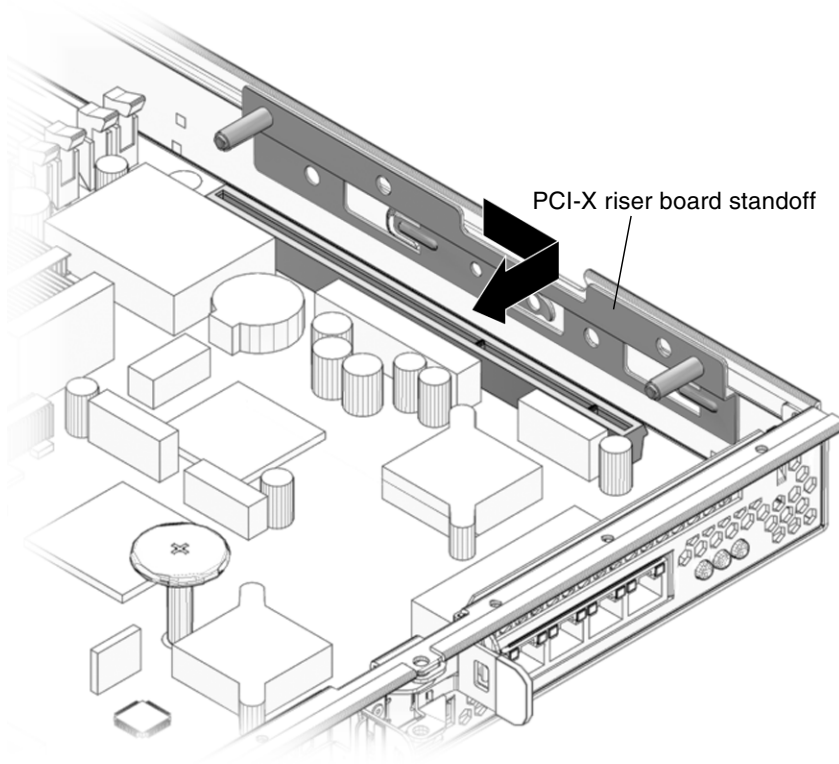


FIGURE 3-19 PCI-X Riser Board Standoff – Sun Fire V215

- 10. Disconnect the motherboard to front I/O board cable (FIGURE 3-20).**
This is the cable between the motherboard and the front I/O board.

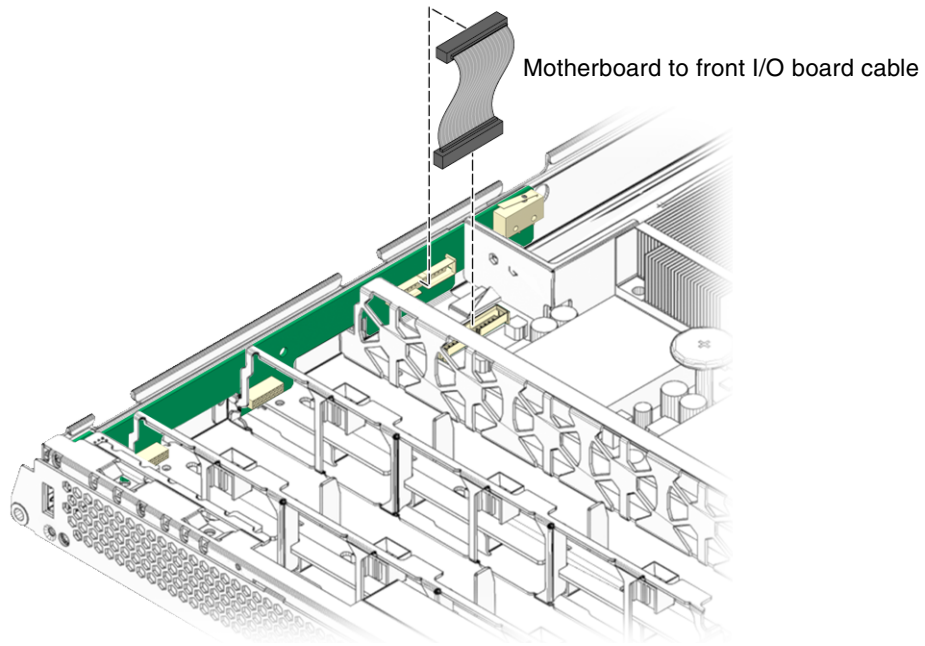


FIGURE 3-20 Motherboard to Front I/O Board Cable

11. (Sun Fire V215) Remove the screws and the air baffles (FIGURE 3-15).
12. If necessary, make note of the memory configuration so that you can reinstall the memory in the replacement motherboard.
13. Remove all DIMMs.
See [Section 3.3.5, “Removing DIMMs”](#) on page 3-22 from the motherboard assembly.
14. Remove NVRAM.
See [Section 3.3.27, “Removing NVRAM”](#) on page 3-57.
15. Remove the upper and lower cable retainers (FIGURE 3-21).

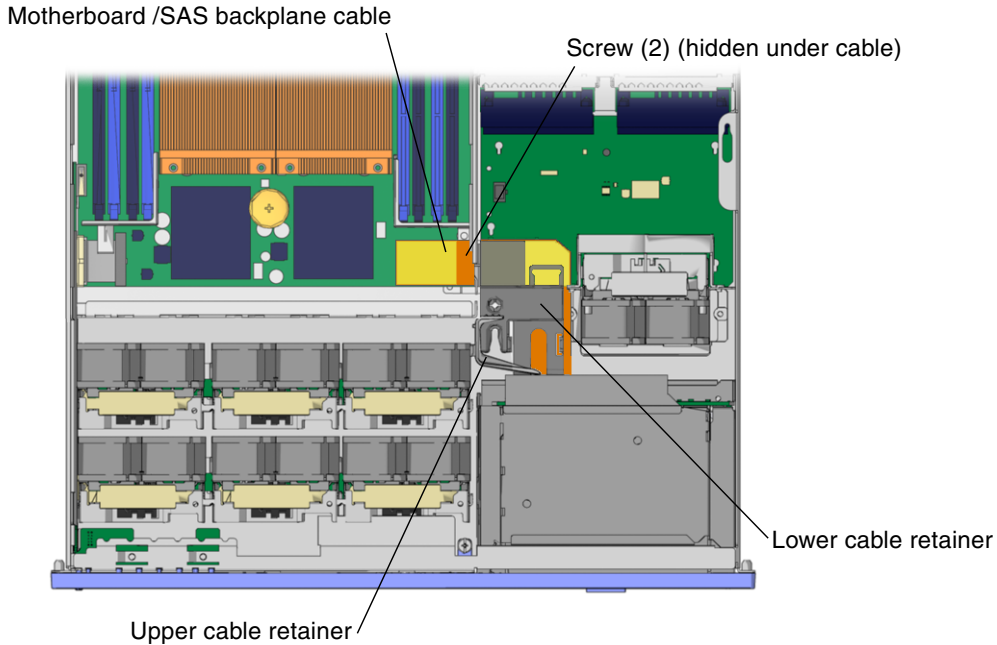


FIGURE 3-21 Upper and Lower Cable Retainers and Motherboard/SAS Backplane Cable

16. Remove the motherboard/SAS backplane cable (FIGURE 3-21).
17. Using a number 2 Phillips screwdriver, remove the eleven screws that secure the motherboard assembly to the chassis (FIGURE 3-22).

The two screws that are installed under the motherboard/SAS backplane cable are black in color. The screws connect the motherboard to the power distribution board through bus bars.

Note – When you reinstall the motherboard, replace the black screws into the same screw holes.

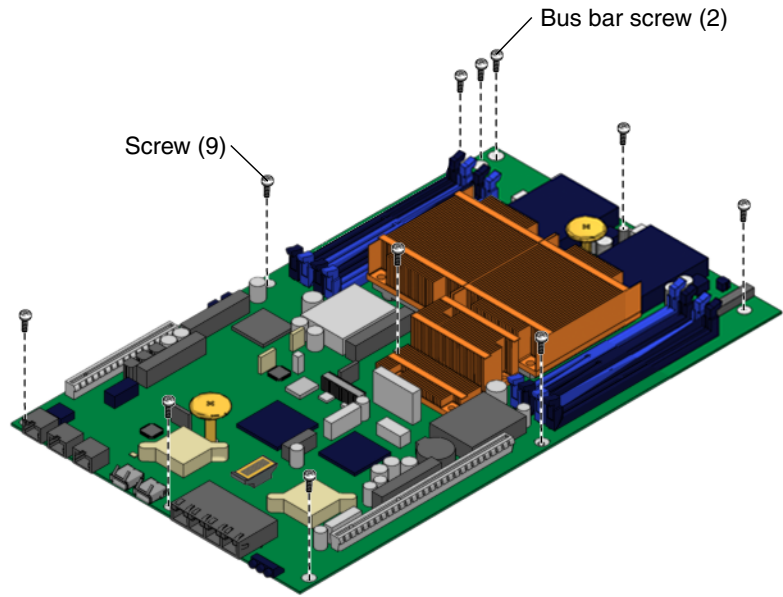


FIGURE 3-22 Removing the Motherboard Assembly Screws

18. Using the green handles, slide the motherboard forward and tilt the motherboard assembly to lift it out of the chassis (FIGURE 3-23).

Grab the handles and move the motherboard to the front of the system and lift it out of the chassis.

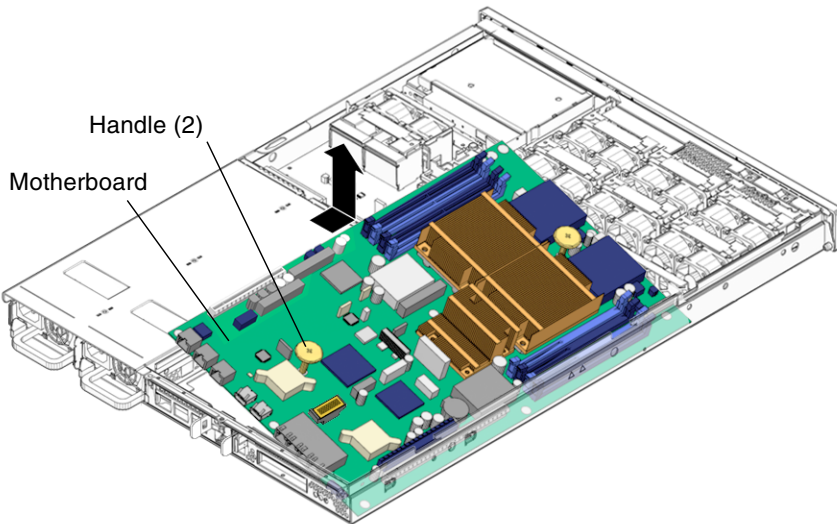


FIGURE 3-23 Removing the Motherboard Assembly From the Chassis

19. Place the motherboard assembly on an antistatic mat.

3.3.8 Installing the Motherboard Assembly



Caution – This procedure requires that you handle components that are sensitive to static discharge. Static discharges can cause the component failures. To avoid this problem, ensure that you follow antistatic practices as described in [Section 3.2.7, “Performing Electrostatic Discharge – Antistatic Prevention Measures”](#) on page 3-9.

1. Unpackage the replacement motherboard assembly and place it on an antistatic mat.
2. Using the green handles, tilt the motherboard assembly to position it into the chassis (FIGURE 3-24).

When you install the motherboard ensure that you position the board as far forward in the chassis as possible.

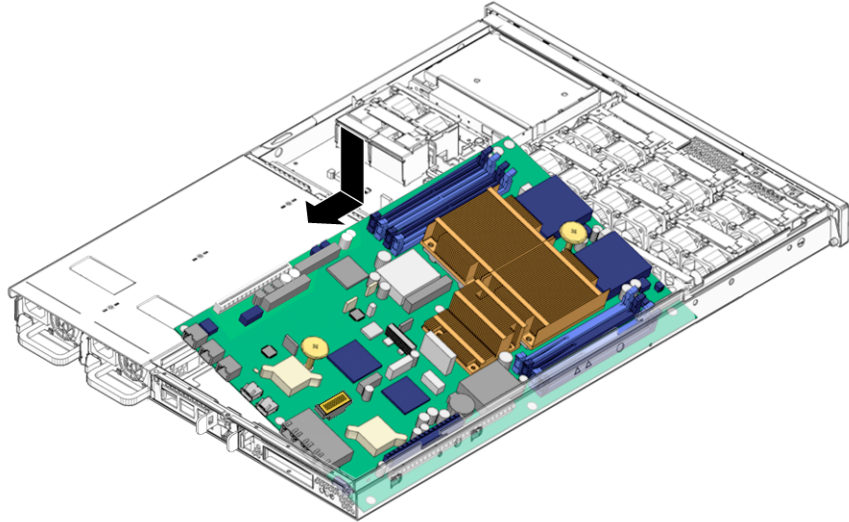


FIGURE 3-24 Installing the Motherboard Assembly

3. Position the motherboard so that its screw holes align with the chassis standoffs.
4. Using the green handles, push down firmly and equally while sliding the motherboard to the rear of the chassis.

Tip – After installing the motherboard into the chassis, ensure that the motherboard is correctly seated by gently lifting up on the handles. If the board moves upward, then it is not correctly seated. Also, check for binds and ensure that the indicators, connectors, and ports are correctly aligned at the rear of the server.

5. Install the screws that secure the motherboard to the chassis ([FIGURE 3-22](#)).

The two screws that are installed under the motherboard/SAS backplane cable are black in color. The screws connect the motherboard to the power distribution board through bus bars.

Note – When you reinstall the motherboard, use only the black screws in screw holes that attach the motherboard to the bus bars.

6. **Reinstall the motherboard/SAS backplane cable to the motherboard (FIGURE 3-21).**
This cable supplies power from the power distribution board to the motherboard, hard drive backplane, and optional DVD super-multi drive connectors.
7. **Install the upper and lower cable retainers (FIGURE 3-21).**
The cable retainers protect the motherboard/SAS backplane cable from damage.
8. **Reinstall all DIMMs in the motherboard assembly.**

Tip – Only install the DIMMs in the slots (connectors) from which they were removed. See [Section 3.3.6, “Installing DIMMs”](#) on page 3-25.

9. **Reinstall NVRAM.**
See [Section 3.3.28, “Installing NVRAM”](#) on page 3-58.
10. **(Sun Fire V215) Reinstall the air baffles for the DIMMs and the screws (FIGURE 3-15).**
11. **Reinstall the motherboard to front I/O board cable (FIGURE 3-20).**
Connect the cable between the front I/O board and the motherboard.
12. **(Sun Fire V215) Reinstall the PCI-X riser board standoff (FIGURE 3-19).**
13. **Reinstall the PCI-E and PCI-X riser boards (FIGURE 3-18).**
14. **Reinstall any PCI option cards that were removed.**
See [Section 3.3.2, “Installing PCI-E or PCI-X Cards”](#) on page 3-18.
15. **(Sun Fire V245) Reinstall the air baffle.**
See [Section 3.2.13, “\(Sun Fire V245\) Installing the Air Baffle”](#) on page 3-14.
16. **Perform the procedures described in Section 3.4, “Procedures for Finishing Up” on page 3-58.**

3.3.9 Removing the Power Distribution Board

1. **Perform the procedures described in Section 3.2, “Procedures for Parts Replacement” on page 3-3.**



Caution – The system supplies power to the power distribution board even when the server is powered off. To avoid personal injury or damage to the server, you must disconnect power cords before servicing the power distribution board.

2. Remove the rear cover.

See [Section 3.2.9, “Removing the Rear Cover”](#) on page 3-10.

3. Remove the bezel.

See [Section 3.2.10, “Removing the Bezel”](#) on page 3-11.

4. Remove the front cover.

See [Section 3.2.11, “Removing the Front Cover”](#) on page 3-13.

5. Remove the power supplies from the chassis ([FIGURE 3-25](#)).

The power supplies are attached to the power distribution board. Push the power supply latch to the right and pull the power supply out a few inches to disengage it from the power distribution board.

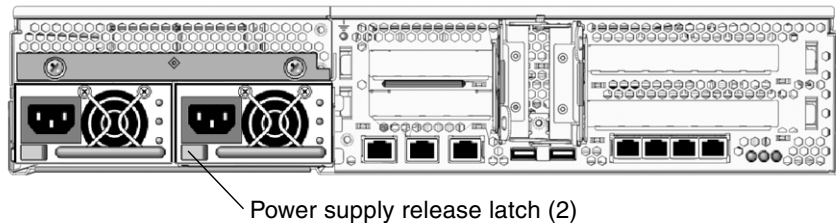


FIGURE 3-25 Power Supply Release Latches – Sun Fire V245

6. Remove the upper and lower cable retainers for the motherboard/SAS backplane cable ([FIGURE 3-21](#)).

The retainers protect the optional DVD super-multi drive, hard drive backplane, and motherboard cable from damage.

7. Disconnect the motherboard/SAS backplane cable from the power distribution board, hard drive backplane board, motherboard and if necessary, the optional DVD super-multi drive ([FIGURE 3-26](#)).

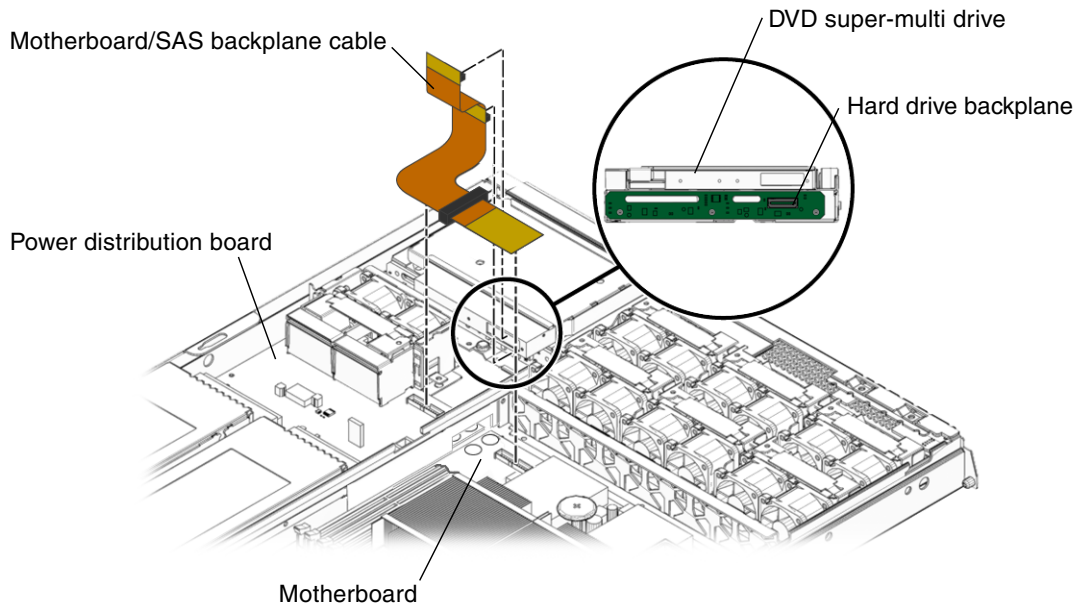


FIGURE 3-26 Motherboard/SAS Backplane Cable Routing

8. **Disconnect the cable from connector J6 on the power distribution board** (FIGURE 3-37).
9. **Remove the hard drive fan tray.**
See Section 3.3.21, “Removing the Hard Drive Fan Tray” on page 3-50.
10. **Remove the two screws** (FIGURE 3-36).
Remove the two screws that attach the hard drive fan cage to the chassis of the server.
11. **Remove the hard drive fan tray cage.**
12. **Remove the three screws that secure the power distribution board to the chassis** (FIGURE 3-27).

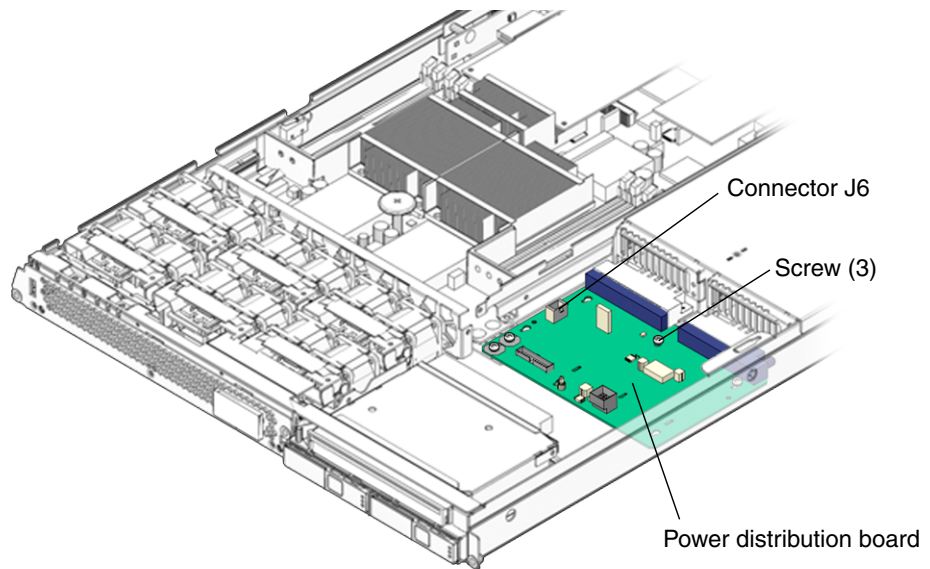


FIGURE 3-27 Removing the Power Distribution Board

13. Slide the power distribution board toward the front of the chassis and remove it.
14. Place the power distribution board on an antistatic mat.

3.3.10 Installing the Power Distribution Board



Caution – The system supplies power to the power distribution board even when the server is powered off. To avoid personal injury or damage to the server, you must disconnect all power cords before servicing the power distribution board.

1. Unpackage the replacement power distribution board and place it on an antistatic mat.
2. Loosely fit the power distribution board onto the locator pins in the chassis and slide the board toward the rear of the chassis (FIGURE 3-27).
3. Reinstall the power distribution board and the three screws.
4. Reconnect the cable from connector J1 on the hard drive fan tray connector board to connector J6 on the power distribution board (FIGURE 3-37).
5. Reinstall the hard drive fan tray cage (FIGURE 3-36).

6. Reinstall the two screws.

Install the two screws that attach the hard drive fan cage to the chassis of the server.

7. Reinstall the hard drive fan tray.

See [Section 3.3.22, “Installing the Hard Drive Fan Tray”](#) on page 3-52.

8. Reinstall the motherboard/SAS backplane cable (FIGURE 3-26).

Connect the motherboard/SAS backplane cable to:

- Optional DVD super-multi drive (if installed)
- Hard drive backplane
- Power distribution board
- Motherboard

9. Reinstall the upper and lower cable retainers for the motherboard/SAS backplane cable (FIGURE 3-21).

10. Reinstall the power supplies.

See [Section 2.5.2, “Installing a Power Supply”](#) on page 2-15.

11. Perform the procedures described in Section 3.4, “Procedures for Finishing Up” on page 3-58.

Note – After replacing the power distribution board and powering on the system, you must run the `setcsn` command on an ALOM console to electronically input the chassis serial number.

3.3.11 Removing the Front Indicator Board

1. Perform the procedures described in Section 3.2, “Procedures for Parts Replacement” on page 3-3.

2. Remove the rear cover.

See [Section 3.2.9, “Removing the Rear Cover”](#) on page 3-10.

3. Remove the bezel.

See [Section 3.2.10, “Removing the Bezel”](#) on page 3-11.

4. Remove the front cover.

See [Section 3.2.11, “Removing the Front Cover”](#) on page 3-13.

5. Remove the two screws that secure the front indicator board to the chassis (FIGURE 3-28).

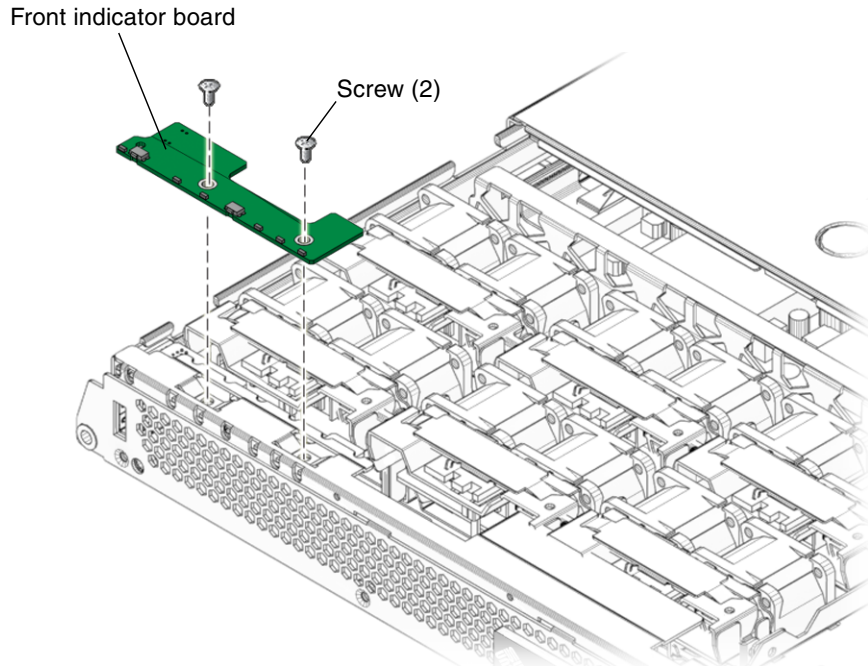


FIGURE 3-28 Removing the Front Indicator Board

6. Remove the front indicator board.

Slide the board to the right to disconnect it from the front I/O board.

7. Place front indicator board on an antistatic mat.

3.3.12 Installing the Front Indicator Board

1. Unpackage the replacement front indicator board and place it on an antistatic mat.

2. Install the front indicator board in the chassis (FIGURE 3-28).

Slide the board to the left to connect it to the front I/O board.

3. Secure the front indicator board to the chassis using two philips screws.

4. Perform the procedures described in [Section 3.4, “Procedures for Finishing Up”](#) on [page 3-58](#).

3.3.13 Removing the Fan Tray Connector Boards

1. Perform the procedures described in [Section 3.2, “Procedures for Parts Replacement”](#) on page 3-3.

2. Remove the fan trays.

Only remove the fan trays that are necessary to remove the defective fan tray connector board.

See [Section 2.3.1, “Removing a Fan Tray”](#) on page 2-8).

Note – Sun Fire V215 servers have two fans for each fan tray.

3. Remove the Phillips screws that secure the fan tray connector boards to the chassis ([FIGURE 3-29](#)).

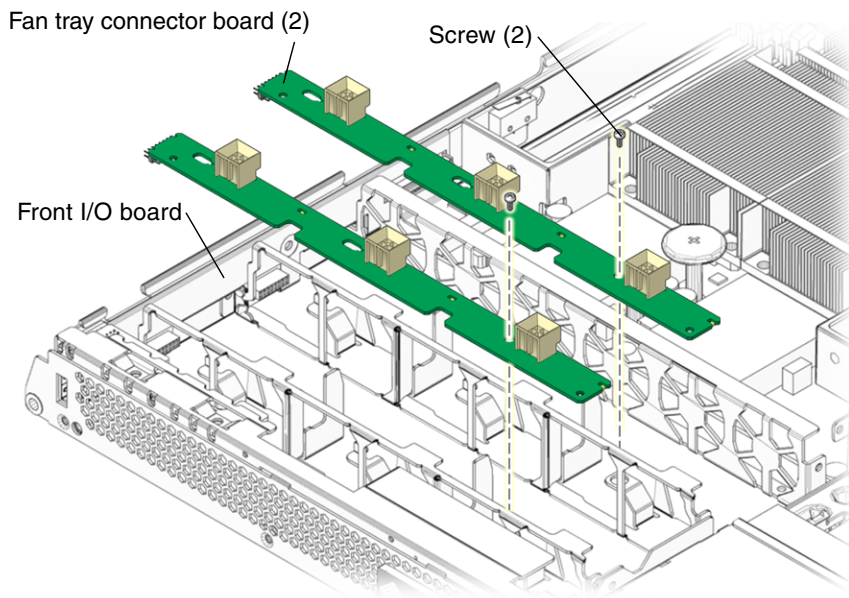


FIGURE 3-29 Removing the Fan Tray Connector Board

4. Slide the fan tray connector boards to the right to disengage them from the front I/O board.

5. Remove the fan tray connector boards and place the boards on an antistatic mat.

3.3.14 Installing the Fan Tray Connector Boards

1. **Unpackage the replacement fan tray connector boards and place the boards on an antistatic mat.**
2. **Lower the boards into place and slide the boards to the left to plug the boards into the front I/O board.**
3. **Secure the boards to the chassis with the Phillips screws.**
4. **Reinstall the fan trays.**
See [Section 2.3.2, “Installing a Fan Tray”](#) on page 2-10.

Note – Sun Fire V215 servers have two fans for each fan tray.

5. **Perform the procedures described in [Section 3.4, “Procedures for Finishing Up”](#) on page 3-58.**

3.3.15 Removing the Front I/O Board

1. **Perform the procedures described in [Section 3.2, “Procedures for Parts Replacement”](#) on page 3-3.**
2. **Remove the rear cover.**
See [Section 3.2.9, “Removing the Rear Cover”](#) on page 3-10.
3. **(Sun Fire V245) Remove the air baffle.**
See [Section 3.2.12, “\(Sun Fire V245\) Removing the Air Baffle”](#) on page 3-13.
4. **Remove the bezel.**
See [Section 3.2.10, “Removing the Bezel”](#) on page 3-11.
5. **Remove the front cover.**
See [Section 3.2.11, “Removing the Front Cover”](#) on page 3-13.
6. **Remove the motherboard to front I/O board cable (FIGURE 3-20).**
This cable connects the front I/O and motherboards.
7. **Remove all six fans trays.**
See [Section FIGURE 2-2, “Removing a Fan Tray”](#) on page 2-9.
8. **Remove the fan tray connector boards from the front I/O board.**
See [Section 3.3.13, “Removing the Fan Tray Connector Boards”](#) on page 3-42.

9. Remove the front indicator board.

See [Section 3.3.11, “Removing the Front Indicator Board”](#) on page 3-40.

10. Remove the front I/O board (FIGURE 3-30).

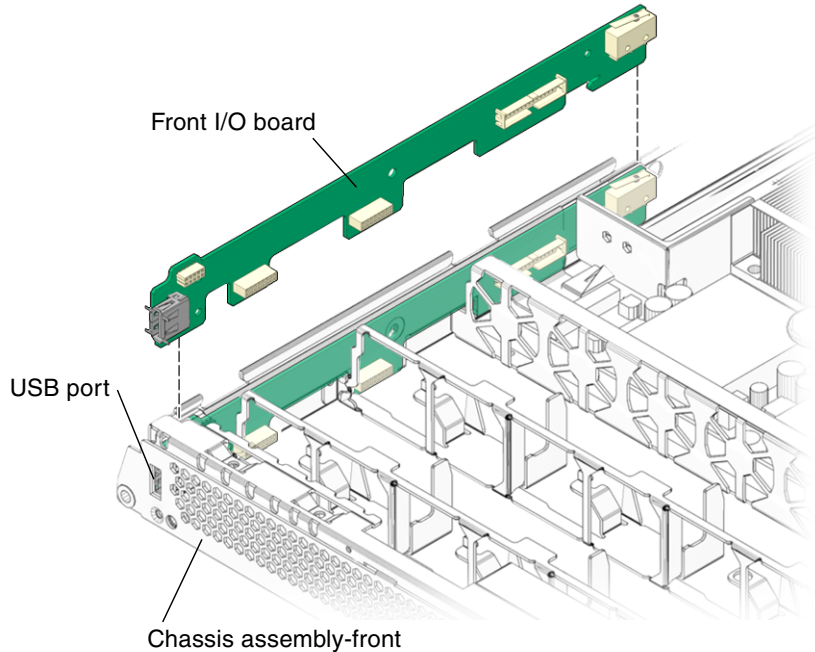


FIGURE 3-30 Removing the Front I/O Board

11. Place the front I/O board on an antistatic mat.

3.3.16 Installing the Front I/O Board

1. Unpackage the front I/O board and place it on an antistatic mat.

2. Tip the front I/O board downwards and slightly forward and push it into place, aligning the board with the chassis (FIGURE 3-30).

When the board is fully seated the USB port is mounted flush against the front of the chassis assembly.

3. Reinstall the front indicator board.

See [Section 3.3.12, “Installing the Front Indicator Board”](#) on page 3-41.

4. **Reinstall the fan tray connector boards.**
Section 3.3.14, “Installing the Fan Tray Connector Boards” on page 3-43.
5. **Reinstall all six fan trays.**
See Section 2.3.2, “Installing a Fan Tray” on page 2-10.
6. **Reinstall the motherboard to front I/O board cable (FIGURE 3-20).**
7. **(Sun Fire V245) Reinstall the air baffle.**
See Section 3.2.13, “(Sun Fire V245) Installing the Air Baffle” on page 3-14.
8. **Perform the procedures described in Section 3.4, “Procedures for Finishing Up” on page 3-58.**

3.3.17 Removing the DVD Super-Multi Drive

1. **Perform the procedures described in Section 3.2, “Procedures for Parts Replacement” on page 3-3.**
2. **Remove the rear cover.**
See Section 3.2.9, “Removing the Rear Cover” on page 3-10.
3. **Remove the bezel.**
Section 3.2.10, “Removing the Bezel” on page 3-11.
4. **Remove the front cover.**
Section 3.2.11, “Removing the Front Cover” on page 3-13.
5. **Remove the upper cable retainer (FIGURE 3-31).**

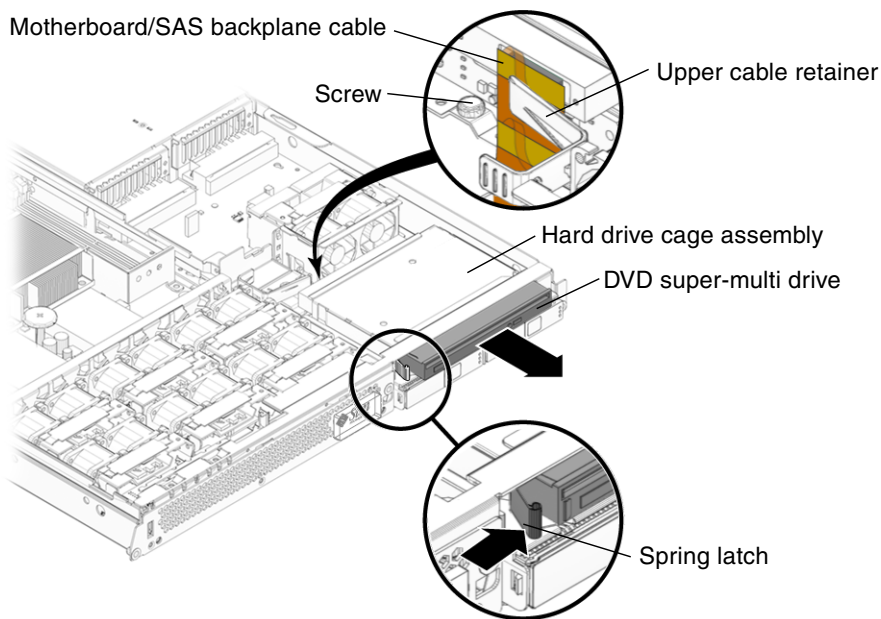


FIGURE 3-31 Upper Cable Retainer, Motherboard/SAS Backplane Cable, DVD Super-Multi Drive, and Spring Latch

6. Disconnect the motherboard/SAS backplane cable.

Disconnect the motherboard/SAS backplane cable at the connector for the DVD super-multi drive. It is not necessary to disconnect the motherboard/SAS backplane cable from the hard drive backplane or the power distribution board.

7. Push the spring latch to the right and hold (FIGURE 3-31).

Release the spring latch that secures the DVD super-multi drive to the hard drive cage assembly.

8. Remove the DVD super-multi drive from the chassis.

Push the drive from the rear and remove it from the chassis.

9. Place the drive on an antistatic mat.

3.3.18 Installing the DVD Super-Multi Drive

1. Unpackage the DVD super-multi drive and place it on an antistatic mat.

2. Slide the DVD super-multi drive into the front of the chassis until it seats.
3. Connect the motherboard/SAS backplane cable to the DVD super-multi drive (FIGURE 3-31).
4. Install the upper cable retainer.
5. Perform the procedures described in Section 3.4, “Procedures for Finishing Up” on page 3-58.

3.3.19 Removing the Hard Drive Backplane

1. Perform the procedures described in Section 3.2, “Procedures for Parts Replacement” on page 3-3.
2. Remove the optional DVD super-multi drive from the chassis (if installed).
See Section 3.3.17, “Removing the DVD Super-Multi Drive” on page 3-45.
3. Remove all hard drives from the chassis.
See Section 2.2.1, “Removing a Hard Drive” on page 2-3.

Note – Identify the slot in which each hard drive belongs for later installation into the chassis.

4. Remove the upper and lower cable retainers (FIGURE 3-21).
5. Disconnect the motherboard/SAS backplane cable from the hard drive backplane (FIGURE 3-26).
6. (Sun Fire V215) Remove the screw that secures the hard drive assembly and DVD super-multi drive to the chassis (FIGURE 3-32).
7. (Sun Fire V215) Remove the hard drive cage assembly.
The DVD super-multi drive and hard drive assembly are housed together in the hard drive cage assembly. When the screw is removed you can remove hard drive cage assembly from the chassis.
8. (Sun Fire V215) Remove the three screws that secure the SAS drive backplane to the hard drive card cage.

9. (Sun Fire V215) Place the hard drive backplane on an antistatic mat.

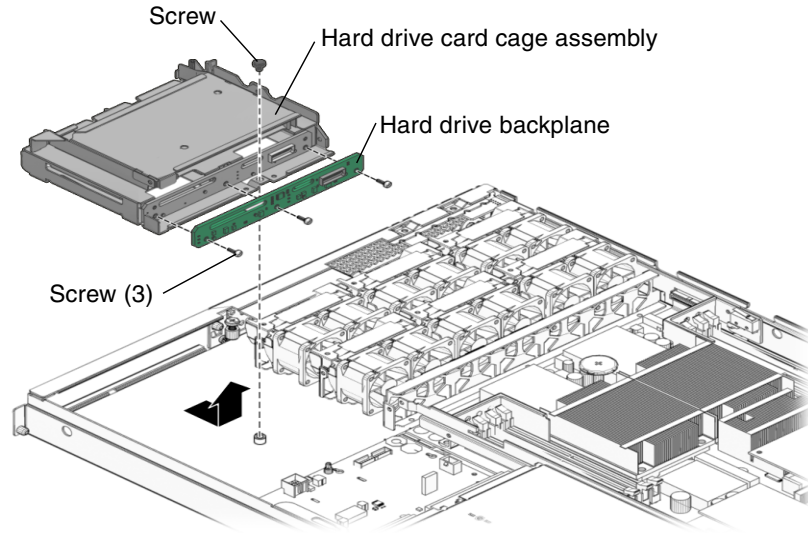


FIGURE 3-32 Removing the Hard Drive Backplane – Sun Fire V215

10. (Sun Fire V245) Remove the three screws that secure the hard drive backplane to the hard drive card cage assembly ([FIGURE 3-33](#)).

In the Sun Fire V245 it is not necessary to remove the hard drive cage assembly in order to remove the hard drive backplane.

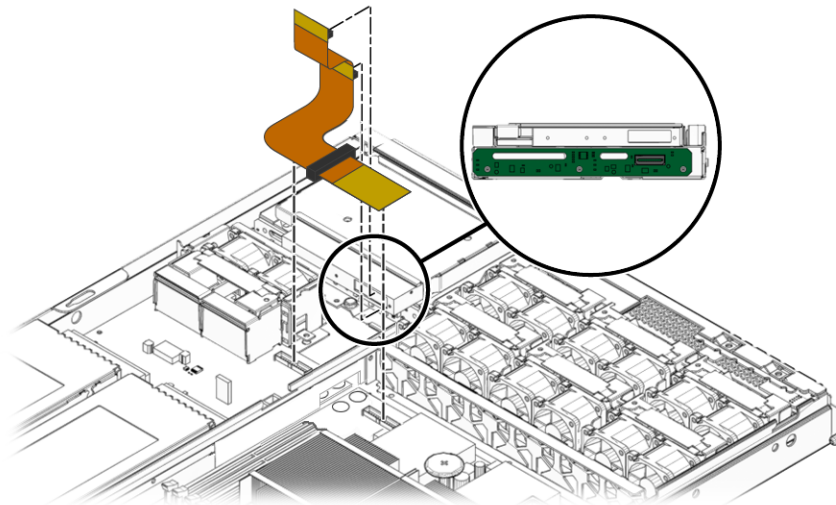


FIGURE 3-33 Removing the Hard Drive Backplane – Sun Fire V245

11. (Sun Fire V245) Remove the hard drive backplane from the chassis and place it on an antistatic mat.

3.3.20 Installing the Hard Drive Backplane

1. Unpackage the replacement hard drive backplane and place it on an antistatic mat.
2. (Sun Fire V215) Install the three screws that secure the hard drive backplane to the hard drive card cage assembly.

Note – Do not tighten the screws until all three are installed.

3. (Sun Fire V215) Install the DVD super-multi drive and hard drive assembly into the chassis.
The DVD super-multi drive and hard drive assembly are housed together in the hard drive cage assembly.
4. (Sun Fire V215) Install the screw that secures the hard drive cage assembly to the chassis ([FIGURE 3-31](#)).

5. (Sun Fire V245) Use three screws to attach the hard drive backplane to the hard drive cage assembly (FIGURE 3-32).

Note – Do not tighten the screws until all three of them are in place.

6. Reinstall the DVD super-multi drive (if necessary).
See Section 3.3.18, “Installing the DVD Super-Multi Drive” on page 3-46.
7. Connect the motherboard/SAS backplane cable to the replacement hard drive backplane.
8. If necessary, connect the motherboard/SAS backplane cable to the DVD super-multi drive.
9. Install the upper and lower cable retainers (FIGURE 3-21).
10. Reinstall all hard drives in the slots from which you removed them.
If necessary, see Section 2.2.2, “Installing a Hard Drive” on page 2-5.
11. Perform the procedures described in Section 3.4, “Procedures for Finishing Up” on page 3-58.

3.3.21 Removing the Hard Drive Fan Tray

1. Open the rear cover door (FIGURE 3-34).
Lift the rear cover door latch.

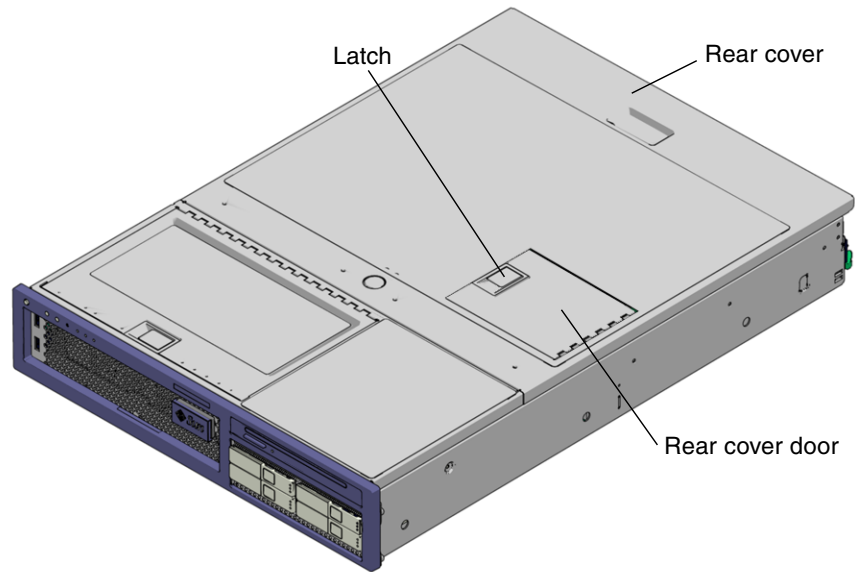


FIGURE 3-34 Opening the Rear Cover Door – Sun Fire V245

2. Remove the hard drive fan tray ([FIGURE 3-35](#)).

Note – The hard drive fan tray has two fans.

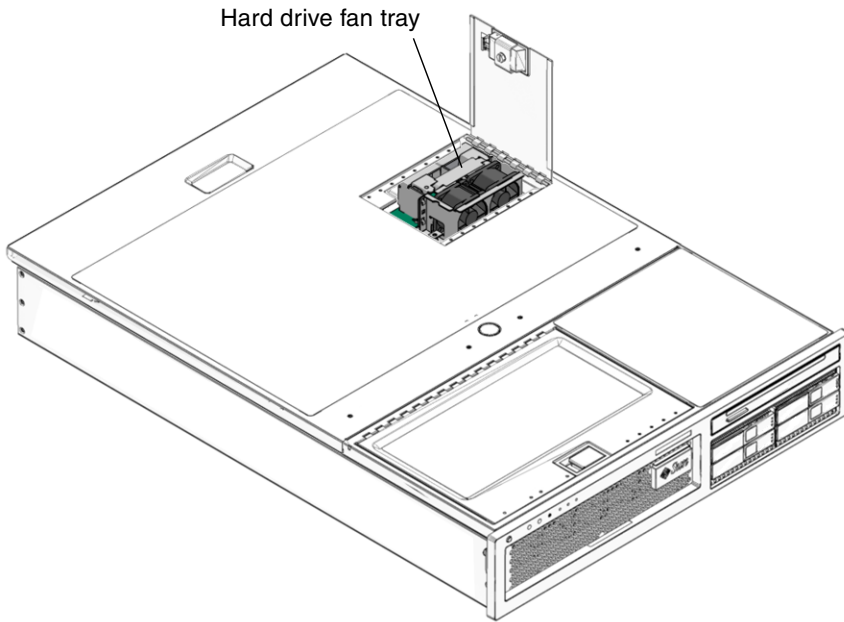


FIGURE 3-35 Hard Drive Fan Tray – Sun Fire V245

3.3.22 Installing the Hard Drive Fan Tray

1. **Unpackage the replacement hard drive fan tray and place it on an antistatic mat.**
2. **Open the rear cover door** ([FIGURE 3-34](#)).
Lift the latch to open the door.
3. **Install the hard drive fan tray** ([FIGURE 3-35](#)).
Ensure that the fan connector securely mates with the connector on the fan tray connector board.

Note – The hard drive fan tray has two fans.

4. **Close the rear cover door.**
5. **Perform the procedures described in** [Section 3.4, “Procedures for Finishing Up”](#) **on** [page 3-58](#).

3.3.23 (Sun Fire V245) Removing the Hard Drive Fan Tray Connector Board

1. Perform the procedures described in [Section 3.2, “Procedures for Parts Replacement”](#) on page 3-3.
2. Remove the rear cover.
[Section 3.2.9, “Removing the Rear Cover”](#) on page 3-10.
3. Remove the hard drive fan tray.
See [Section 3.3.21, “Removing the Hard Drive Fan Tray”](#) on page 3-50.

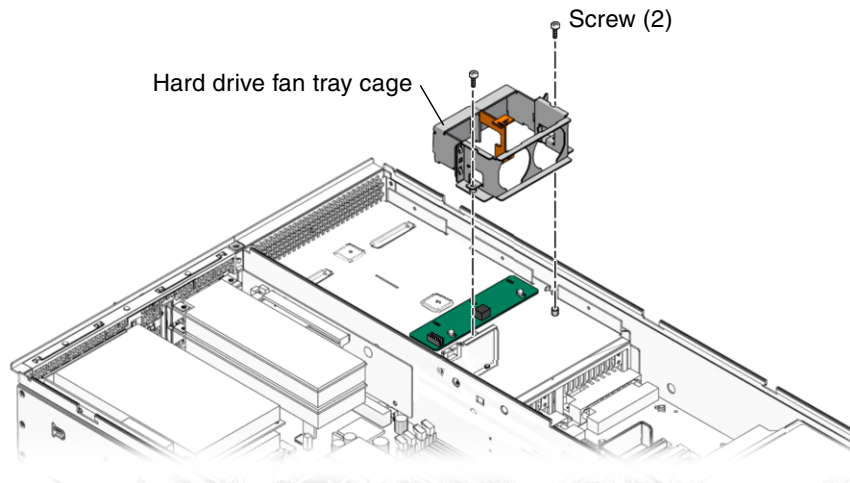


FIGURE 3-36 Hard Drive Fan Tray Cage and Screws

4. Remove the two screws ([FIGURE 3-36](#)).
These screws attach the fan tray cage to the chassis of the server.
5. Remove the hard drive fan tray cage.
6. Disconnect the cable from connector J1 ([FIGURE 3-37](#)).
This cable connects connector J1 on the hard drive fan tray connector board to connector J6 on the power distribution control board.

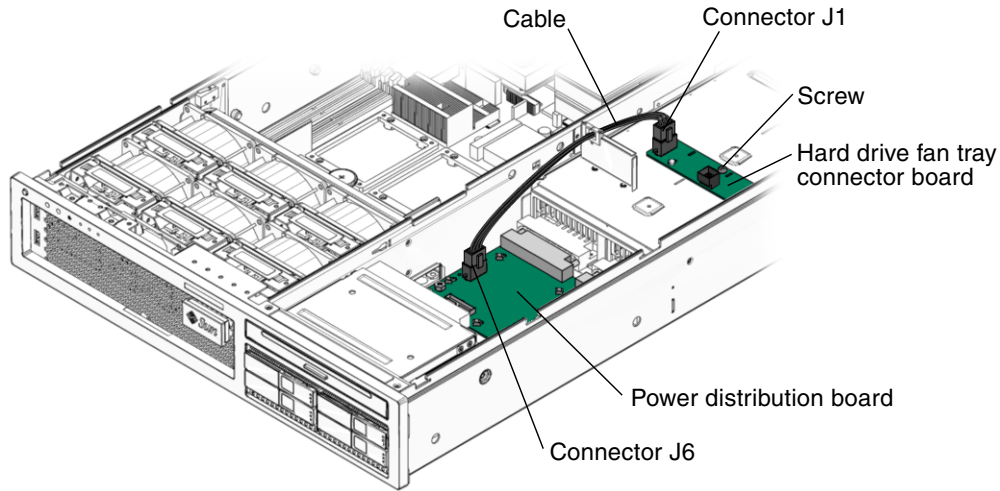


FIGURE 3-37 Hard Drive Fan Tray Connector Board – Connector J1

7. Remove the screw.

This screw secures the hard drive fan tray connector board to the chassis.

8. Remove the hard drive fan tray connector board.

3.3.24 (Sun Fire V245) Installing the Hard Drive Fan Tray Connector Board

1. Unpackage the replacement hard drive fan tray connector board and place it on an antistatic mat.

2. Install the hard drive fan tray connector board (FIGURE 3-37).

3. Install the screw.

This screw secures the board to the chassis.

4. Connect the cable between the hard drive fan connector board and the power distribution board.

This cable connects connector J1 on the hard drive fan tray connector board to connector J6 on the power distribution control board.

5. Install the hard drive fan tray cage (FIGURE 3-36).

6. Install the two screws.

These screws secure the hard drive fan tray cage to the chassis.

7. Install the hard drive fan tray.

See [Section 3.3.22, “Installing the Hard Drive Fan Tray”](#) on page 3-52.

8. Perform the procedures described in [Section 3.4, “Procedures for Finishing Up”](#) on page 3-58.

3.3.25 Removing the Battery

1. Perform the procedures described in [Section 3.2, “Procedures for Parts Replacement”](#) on page 3-3.

2. Remove the rear cover.

See [Section 3.2.9, “Removing the Rear Cover”](#) on page 3-10.

3. If necessary, remove any PCI or PCI-X cards.

See [Section 3.3.1, “Removing PCI-E and PCI-X Cards”](#) on page 3-16.

4. Remove the plastic insulator from the heat sinks.

5. (Sun Fire V245) Remove the air baffle.

See [Section 3.2.12, “\(Sun Fire V245\) Removing the Air Baffle”](#) on page 3-13.

6. Using a small (No. 1 flat-blade) screwdriver, press the latch and remove the battery from the motherboard ([FIGURE 3-38](#)).

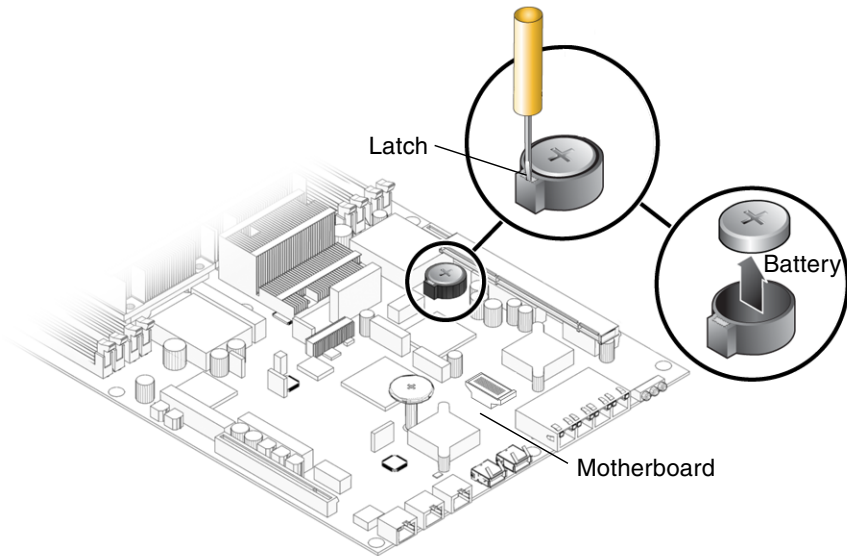


FIGURE 3-38 Removing the Battery

3.3.26 Installing the Battery

1. **Unpackage the replacement battery.**
2. **Press the new battery into the motherboard** ([FIGURE 3-38](#)).
Install the positive side (+) facing upward, away from the motherboard.
3. **Reinstall the plastic insulator on the heat sinks.**
4. **If necessary, reinstall the PCI and PCI-X cards.**
See [Section 3.3.2, "Installing PCI-E or PCI-X Cards"](#) on page 3-18.
5. **(Sun Fire V245) Install the air baffle.**
See [Section 3.2.13, "\(Sun Fire V245\) Installing the Air Baffle"](#) on page 3-14.
6. **Perform the procedures described in [Section 3.4, "Procedures for Finishing Up"](#) on page 3-58.**
7. **Use the `ALOM setdate` command to set the day and time.**
Use the `setdate` command before you power on the host system.

3.3.27 Removing NVRAM

1. **Perform the procedures described in Section 3.2, “Procedures for Parts Replacement” on page 3-3.**
2. **Remove the rear cover.**
See Section 3.2.9, “Removing the Rear Cover” on page 3-10.
3. **If necessary, remove the PCI and PCI-X cards.**
See Section 3.3.1, “Removing PCI-E and PCI-X Cards” on page 3-16.
4. **Remove the plastic insulator for the heat sinks.**
5. **(Sun Fire V245) Remove the air baffle.**
See Section 3.2.12, “(Sun Fire V245) Removing the Air Baffle” on page 3-13.
6. **Locate the NVRAM (FIGURE 3-39).**

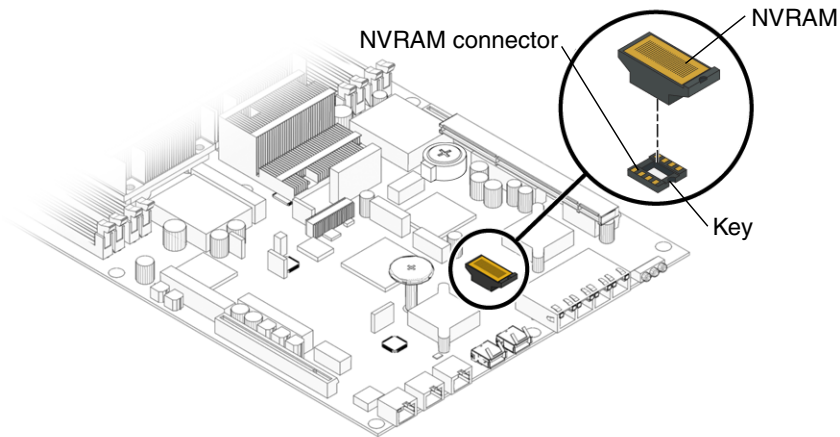


FIGURE 3-39 Removing NVRAM

7. **Pull the NVRAM straight up from the connector.**
NVRAM and the NVRAM connector are keyed.

Note – The server will not function correctly without NVRAM installed.

3.3.28 Installing NVRAM

1. **Unpackage the replacement NVRAM and set it on an antistatic mat.**
2. **Locate the NVRAM connector** ([FIGURE 3-39](#)).
3. **Align the NVRAM module with the NVRAM connector.**

Note – NVRAM and the NVRAM connector are keyed.

4. **Press the NVRAM down until it seats.**
5. **Reinstall the plastic insulator for the heat sinks.**
6. **If necessary, reinstall the PCI and PCI-X cards.**
See [Section 3.3.2, “Installing PCI-E or PCI-X Cards”](#) on page 3-18.
7. **(Sun Fire V245) Install the air baffle.**
See [Section 3.2.13, “\(Sun Fire V245\) Installing the Air Baffle”](#) on page 3-14.
8. **Perform the procedures described in [Section 3.4, “Procedures for Finishing Up”](#) on page 3-58.**

3.4 Procedures for Finishing Up

3.4.1 Installing the Front Cover and Bezel

If you removed the front cover or bezel perform these steps:

1. **Open the front cover door.**
Lift the latch.
2. **Install the front cover.** ([FIGURE 3-41](#)).
(Sun Fire V245) The interlock switch is actuated when the front cover is installed.
3. **Slide the front cover to the rear until it seats.**
4. **Position the bezel on the front of the chassis and snap it into place** ([FIGURE 3-40](#)).

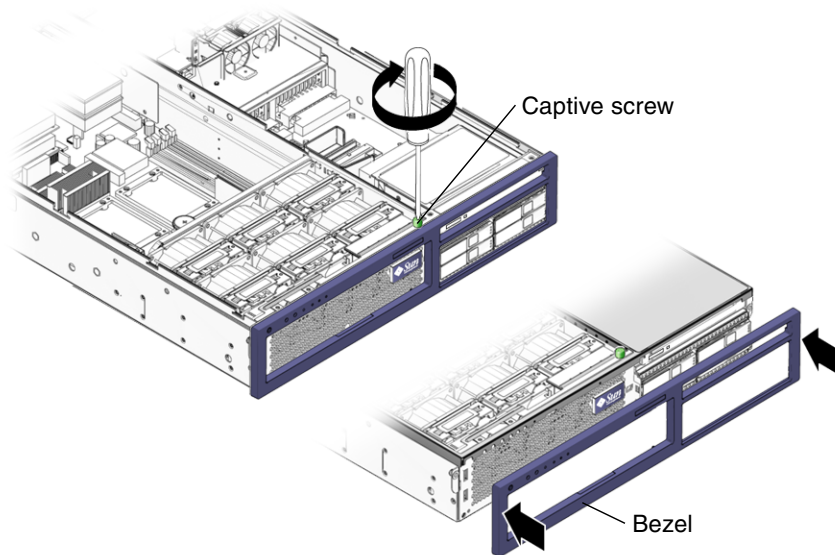


FIGURE 3-40 Installing the Bezel

5. Tighten the captive screw to secure the bezel to the chassis.
6. Close the front cover door.

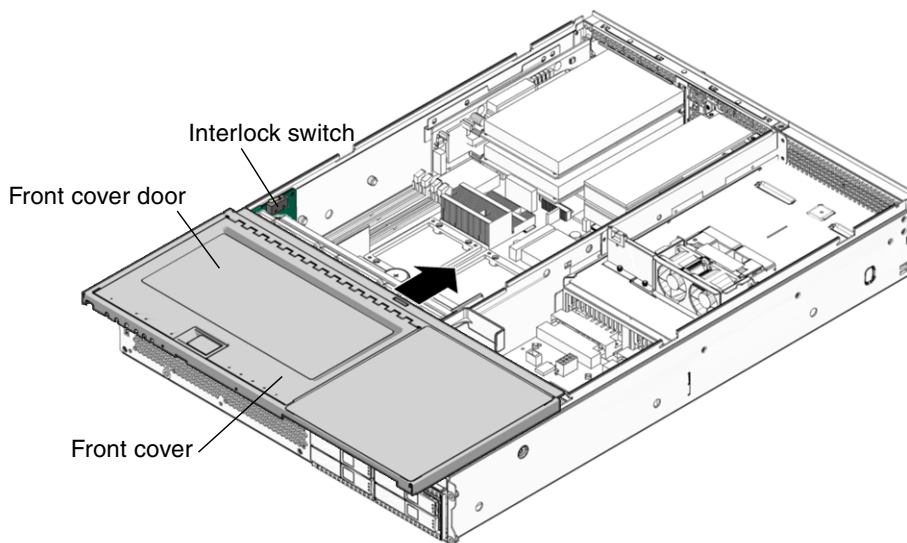


FIGURE 3-41 Installing the Front Cover – Sun Fire V245 Server

Note – The interlock switch for the Sun Fire V215 servers is actuated when the rear cover is installed.

3.4.2 Installing the Rear Cover

If you removed the rear cover, perform these steps:

1. Place the rear cover on the chassis.

Set the cover down so that it hangs over the rear of the server by about an inch (25.4 mm).



Caution – When installing the rear cover do not damage the interlock switch (Sun Fire V215).

2. Slide the rear cover forward until it seats (FIGURE 3-42).

Note – The interlock switch for the Sun Fire V215 servers is actuated when the rear cover is installed.

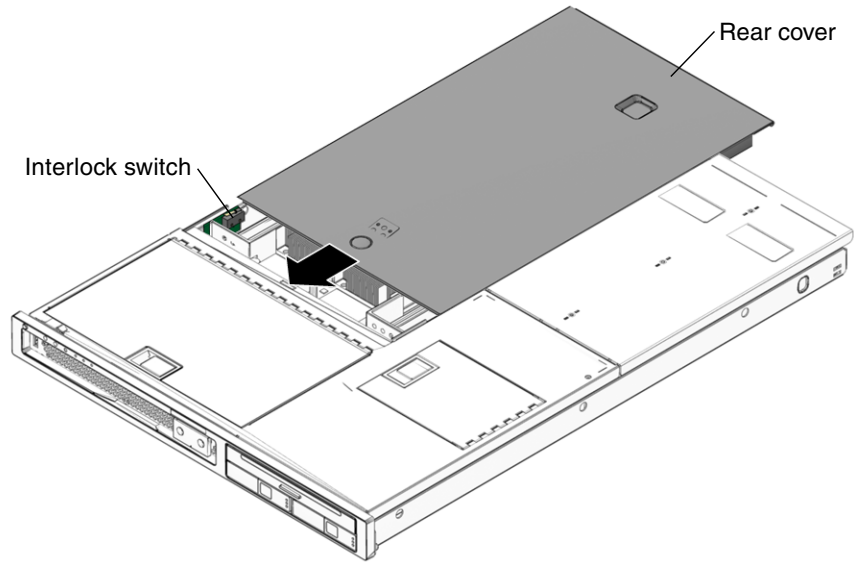


FIGURE 3-42 Installing the Rear Cover – Sun Fire V215 server

3.4.3 Reinstalling the Server in the Rack

If you removed the server chassis from the rack, perform these steps.



Caution – The servers are heavy. Two people might be required to carry the chassis and install it in the rack.

1. On the rack, ensure that the slide rails are extended.
2. Place the ends of the chassis mounting brackets into the slide rails ([FIGURE 3-43](#)).

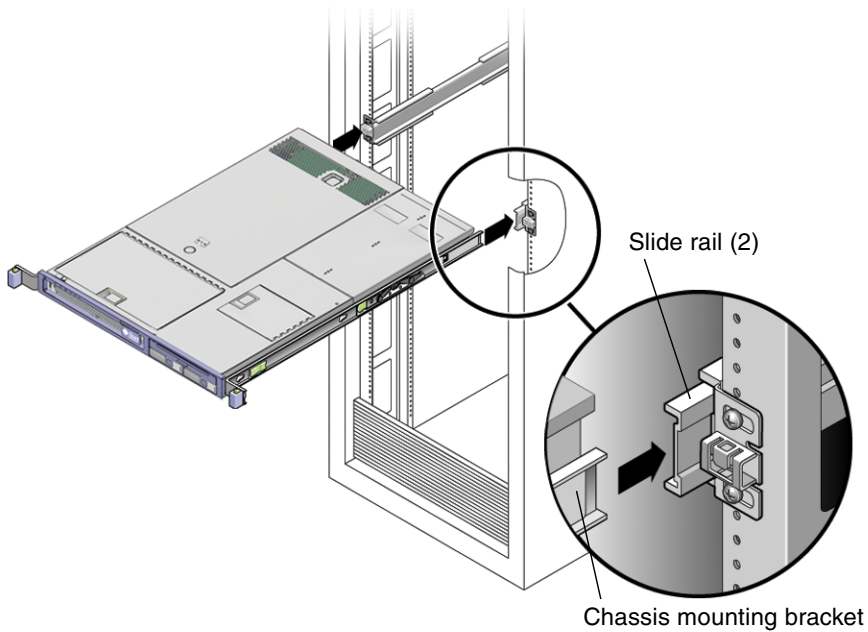


FIGURE 3-43 Returning the Server to the Rack

- 3. Slide the server into the rack until the brackets lock into place.**

The server is now in the extended maintenance position.

3.4.4 Returning the Server to the Normal Rack Position

If you extended the server to the maintenance position, use this procedure to return the server to the normal rack position.

- 1. Release the slide rails from the fully extended position by pushing the release tabs on the side of each rail (FIGURE 3-44).**

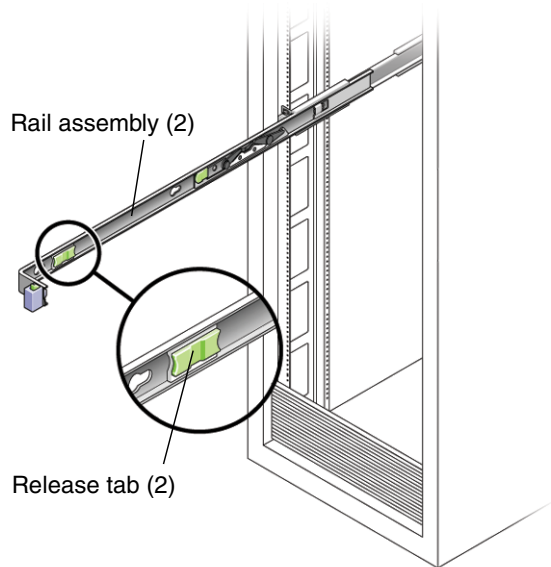


FIGURE 3-44 Release Tabs – Rails

2. **While pushing on the release tabs, slowly push the server into the rack.**
Ensure that the cables do not get in the way.
3. **Reconnect the cable management arm (CMA) into the back of the rail assembly:**

Note – Refer to the *Sun Fire V215 and V245 Server Installation Guide* for detailed CMA installation instructions.

- a. **Insert the smaller extension into the clip located at the end of the mounting bracket (FIGURE 3-45).**

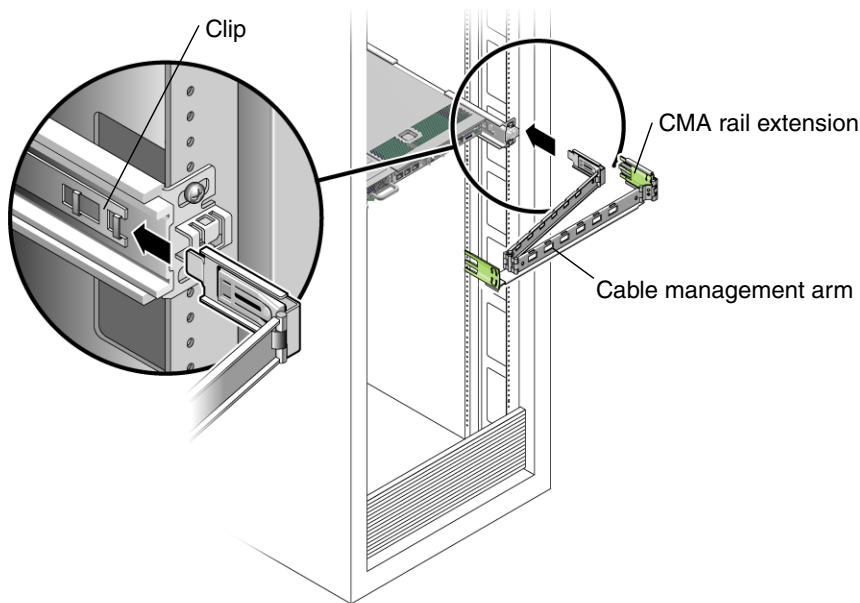


FIGURE 3-45 Installing the Cable Management Arm (CMA)

b. Plug the CMA rail extension into the end of the left rail assembly.

The tab at the front of the rail extension clicks into place.

4. Reconnect the cables to the back of the server.

If the CMA is in the way, disconnect the left CMA release and swing the CMA open.

5. Reconnect all cables that were removed from the rear of the server.

3.4.5 Applying Power to the Server

- **Reconnect both power cords to the power supplies.**

Note – As soon as the power cords are connected, standby power is applied, and depending on the configuration of the firmware, the system might boot.

DIMM and PCI Card Guidelines

This appendix describes DIMM and PCI configuration guidelines for the Sun Fire V215 and V245 Servers.

The following topics are covered:

- [Section A.1, “DIMM Guidelines” on page A-1](#)
- [Section A.2, “PCI-E and PCI-X Card Guidelines” on page A-3](#)

A.1 DIMM Guidelines

Use the DIMM guidelines, [FIGURE A-1](#), and [TABLE A-1](#) to help you plan the memory configuration of your server.

- There are 8 slots that hold industry-standard DDR 333 memory DIMMs (providing a total of 32 GB of memory).
- Sun Fire V215 and V245 servers accept the following DIMM sizes:
 - 512 MB
 - 1 GB
 - 2 GB
 - 4 GB
- Sun Fire V215 and V245 servers support two ranks of four DIMMs each.
- At minimum, rank 0 must be fully populated with four DIMMS of the same capacity.
- DIMMs can be added four at a time, of the same capacity, to fill rank 1.

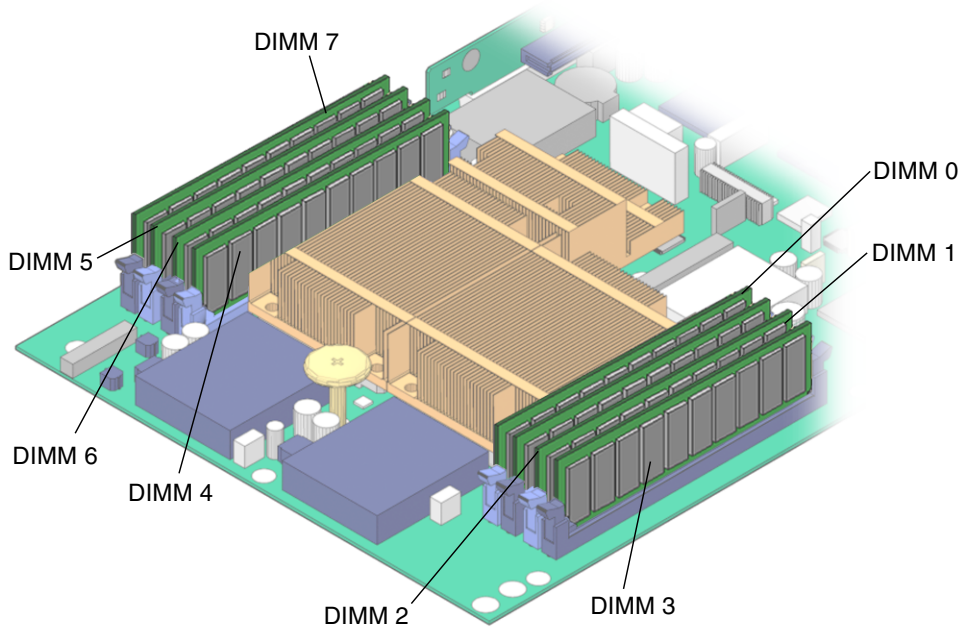


FIGURE A-1 DIMM Layout

TABLE A-1 DIMM Name, DIMM Number, and DIMM Connector

	DIMM Name	DIMM Number	Motherboard DIMM Connector
Rank 0	/MB/P0/B0/D0	DIMM 0	J5
	/MB/P0/B0/D1	DIMM 1	J2
	/MB/P0/B1/D0	DIMM 2	J4
	/MB/P0/B1/D1	DIMM 3	J1
Rank 1	/MB/P1/B0/D0	DIMM 4	J25
	/MB/P1/B0/D1	DIMM 5	J29
	/MB/P1/B1/D0	DIMM 6	J27
	/MB/P1/B1/D1	DIMM 7	J30

Note – DIMM names in messages are displayed with the full name such as /MB/P0/B0/D0/.

A.2 PCI-E and PCI-X Card Guidelines

The PCI expansion system is configured using a variety of riser cards. Use [TABLE A-2](#) to plan your configuration:

The Sun Fire V215 and V245 server provides the following PCI-E and PCI-X configurations:

TABLE A-2 Sun Fire V215 and V245 Servers PCI-E and PCI-X Configurations

Server	Configuration	PCI-E or PCI-X
Sun Fire V215 Server	Configuration 1	1 PCI-X 133 MHz full height/short 1 PCI-E x8L/x16 low profile short
	Configuration 2	1 PCI-E x8 full height/short 1 PCI-E x8L/x16C low profile short
Sun Fire V245 Server	Configuration 1	1 PCI-X 133 MHz full height/short 1 PCI-X 133 MHz full height/short
		1 PCI-E x8L/x16C low profile/short 1 PCI-E x4L/x16C low profile/short
	Configuration 2	1 PCI-E x8L/x16C full height/long 1 PCI-E x8L/x16C full height/short
		1 PCI-E x8L/x16C low profile/short 1 PCI-E x4L/x16C low profile/short

Note – There are a variety of PCI-X and PCI-E card on the market. Read the product documentation for your device for additional installation requirements and instructions that are not covered here.

Customer and Field Replaceable Units

This appendix describes the location customer and field replaceable units within the Sun Fire V215 and V245 Servers.

B.1 Customer and Field Replaceable Units

[FIGURE B-1](#), [FIGURE B-2](#), and [TABLE B-1](#) illustrates and lists the locations of the customer (CRUs) and field-replaceable units (FRUs) in the Sun Fire V215 and V245 servers.

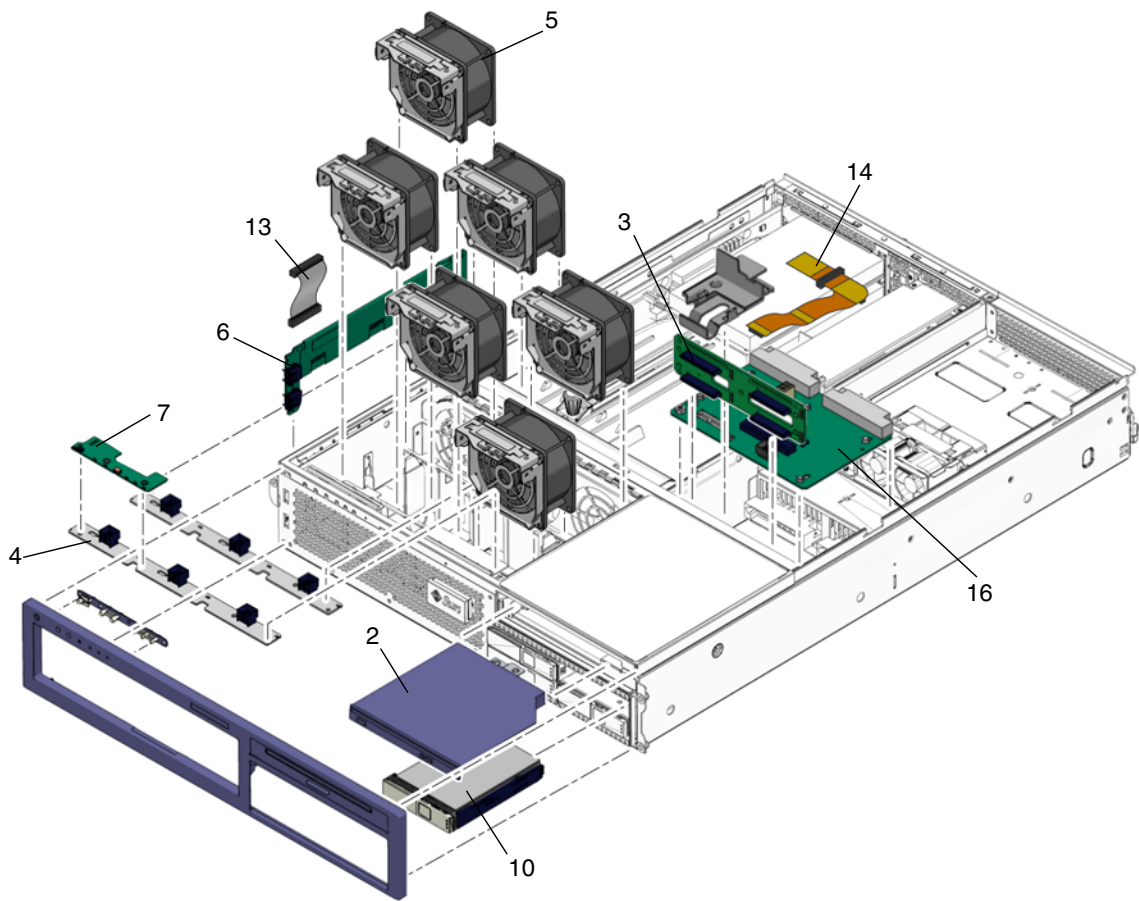


FIGURE B-1 Customer and Field-Replaceable Units, Part 1 of 2

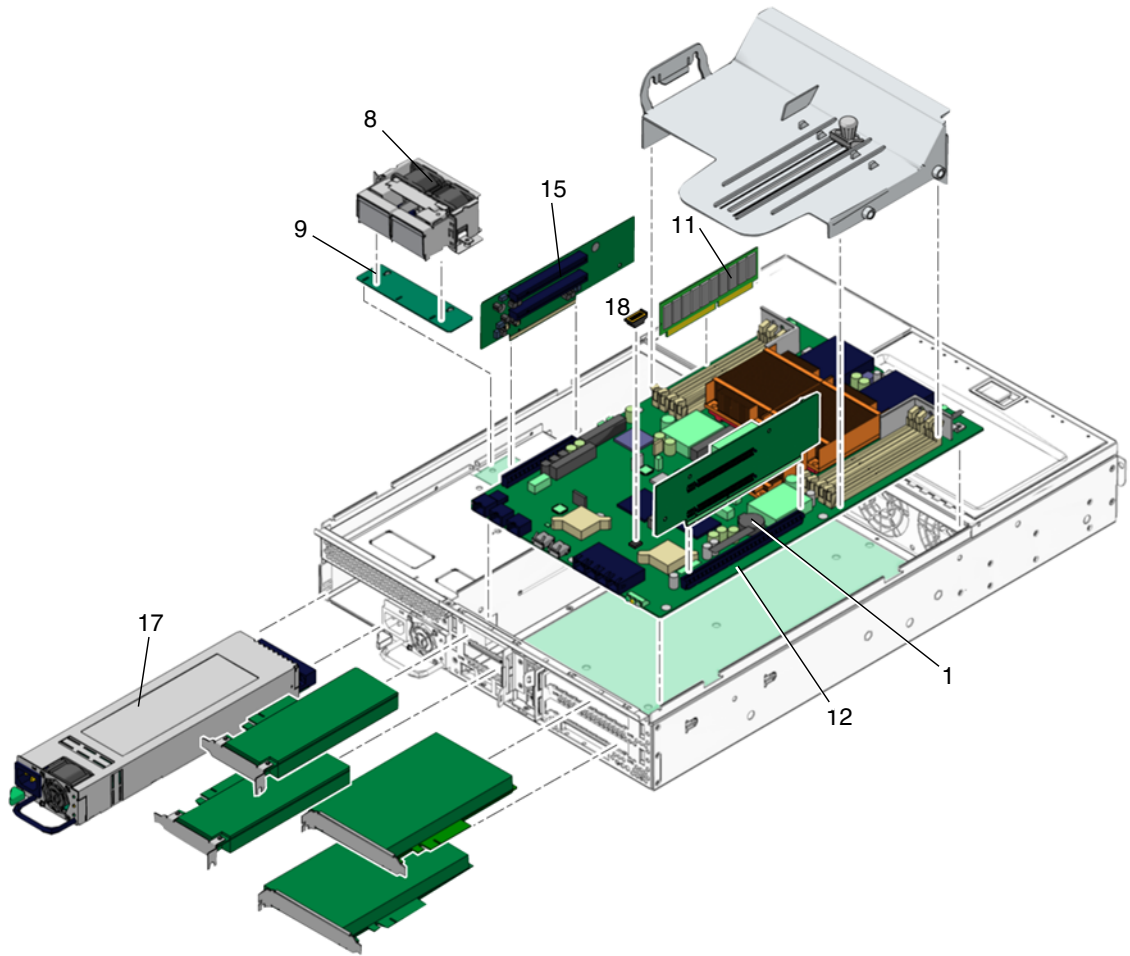


FIGURE B-2 Customer and Field-Replaceable Units, Part 2 of 2

TABLE B-1 Sun Fire V215 and V245 Servers – CRU and FRU List

Item No.	CRU or FRU Name and Description	Removal Instructions	Installation Instructions
1	Lithium Battery	Section 3.3.25, "Removing the Battery" on page 3-55.	Section 3.3.26, "Installing the Battery" on page 3-56.
2	Optional DVD super-multi drive	Section 3.3.17, "Removing the DVD Super-Multi Drive" on page 3-45.	Section 3.3.18, "Installing the DVD Super-Multi Drive" on page 3-46.
3	Hard drive backplane The backplane board that contains the Molex connector for interfacing to 2.5 inch SAS or SATA drives.	Section 3.3.19, "Removing the Hard Drive Backplane" on page 3-47.	Section 3.3.20, "Installing the Hard Drive Backplane" on page 3-49.
4	Fan tray connector board Houses the power connectors for the fan assemblies.	Section 3.3.13, "Removing the Fan Tray Connector Boards" on page 3-42.	Section 3.3.14, "Installing the Fan Tray Connector Boards" on page 3-43.
5	Fan tray Fans trays 0, 1, 2, 3, 4, and 5	Section 2.3.1, "Removing a Fan Tray" on page 2-8.	Section 2.3.2, "Installing a Fan Tray" on page 2-10.
6	Front I/O board	Section 3.3.15, "Removing the Front I/O Board" on page 3-43.	Section 3.3.16, "Installing the Front I/O Board" on page 3-44.
7	Front indicator board Contains the circuitry and indicators that are displayed on the bezel of the system.	Section 3.3.11, "Removing the Front Indicator Board" on page 3-40.	Section 3.3.12, "Installing the Front Indicator Board" on page 3-41.
8	Hard drive fan tray (2)	Section 3.3.21, "Removing the Hard Drive Fan Tray" on page 3-50.	Section 3.3.22, "Installing the Hard Drive Fan Tray" on page 3-52.
9	Hard drive fan tray connector board Driver board for hard drive fan tray, Sun Fire V245 only	Section 3.3.23, "(Sun Fire V245) Removing the Hard Drive Fan Tray Connector Board" on page 3-53.	Section 3.3.24, "(Sun Fire V245) Installing the Hard Drive Fan Tray Connector Board" on page 3-54.
10	Hard drives SAS or SATA hard drives	Section 2.2.1, "Removing a Hard Drive" on page 2-3.	Section 2.2.2, "Installing a Hard Drive" on page 2-5.

TABLE B-1 Sun Fire V215 and V245 Servers – CRU and FRU List (*Continued*)

Item No.	CRU or FRU Name and Description	Removal Instructions	Installation Instructions
11	DIMMs Can be ordered in the following sizes: <ul style="list-style-type: none"> • 512 MB • 1 GB • 2 GB • 4 GB 	Section 3.3.5, “Removing DIMMs” on page 3-22.	Section 3.3.6, “Installing DIMMs” on page 3-25.
12	Motherboard The motherboard assembly is a single FRU consisting of one or more UltraSPARC™ III+ CPU processors.	Section 3.3.7, “Removing the Motherboard Assembly” on page 3-27.	Section 3.3.8, “Installing the Motherboard Assembly” on page 3-34.
13	Motherboard/ front I/O board cable Interface between the motherboard and the front I/O board	See FIGURE 3-20.	
14	Motherboard/SAS backplane cable Interface cable between the motherboard and the hard drive backplane and the optional DVD super-multi drive	See FIGURE 3-21.	
15	PCI-E and PCI-X riser boards	Section 3.3.3, “Removing PCI-E and PCI-X Riser Boards” on page 3-19.	Section 3.3.4, “Installing PCI-E or PCI-X Riser Boards” on page 3-21.
16	Power distribution board (PDB) Provides a 12VDC power connection between the power supplies and other boards.	Section 3.3.9, “Removing the Power Distribution Board” on page 3-36.	Section 3.3.10, “Installing the Power Distribution Board” on page 3-39.
17	Power supply (PS) The power supplies provide 3.3 VDC standby power at @ 3 Amps and 12 VDC at 45 Amps.	Section 2.5.1, “Removing a Power Supply” on page 2-13.	Section 2.5.2, “Installing a Power Supply” on page 2-15.
18	NVRAM	Section 3.3.27, “Removing NVRAM” on page 3-57.	Section 3.3.28, “Installing NVRAM” on page 3-58.

Index

Symbols

`/var/adm/messages` file, 1-15

A

ALOM POST variables, 3-27

ALOM prompt, 3-5

antistatic mat, 3-3

antistatic wrist strap, 3-3

`auto-boot?` variable, 1-7

B

battery, B-4

BIST, *See* built-in self-test

built-in self-test, `test-args` variable, 1-10

C

cable

motherboard/front I/O board, B-5

motherboard/SAS backplane, B-6

motherboard/SAS backplane,, 3-36

cable management arm, 2-14

central processing unit, *See* CPU

chassis mounting brackets, 3-61

clock speed (CPU), 1-17

command

`cfgadm -al`, 2-3, 2-5, 2-6

`cfgadm -c`, 2-4, 2-6

`fmadm faulty`, 3-27

`poweroff`, 3-5

`poweron`, 3-26

`set keyswitch`, 3-26

`setcsn`, 3-40

`setdate`, 3-56

`setlocator`, 3-6

`showenvironment`, 2-15

`showfault`, 2-8

common procedures finishing up, 3-58

common procedures parts replacement, 3-3

compliance and safety manual, 3-2

CPU, displaying information about, 1-17

CRU, 2-1

CRUs and FRUs, B-1

D

device paths, hardware, 1-10, 1-11, 1-14

device tree, Solaris, displaying, 1-16

`diag-level` variable, 1-7

`diag-level` variable, 1-7, 1-9

diagnostic tools, summary, 1-2

diagnostics, POST, 1-6

`diag-script` variable, 1-7

`diag-trigger`, 1-8

DIMM

connector numbers, 3-22

guidelines, A-1

layout, A-2

locations, 3-22

name, 3-22

rank, A-2

size, B-5

DIMM messages, 3-22

DIMMs, B-5

DVD super-multi drive, B-4

E

ejector tabs, 3-24

electrostatic discharge, 3-3

emergency shutdown, 3-5

error messages

 OpenBoot Diagnostics, 1-11

 OpenBoot Diagnostics tests, 1-11

ESD, 3-9

F

fan connector board, B-4

Fan Fault indicator, 2-8

fan tray, B-4

fan tray connector board, 3-42, 3-43

front cover door, 3-13

front fan tray cover door, 2-11, 2-12

front I/O board, B-4

front indicator board, B-4

front LED board, B-4

FRU

 contents of IDPROM, 1-17

 hardware revision level, 1-17

 hierarchical list of, 1-17

 manufacturer, 1-17

 part number, 1-17

G

graceful shutdown, 3-4, 3-5

H

hard drive, B-5

 addressing, 2-5

 backplane, B-4

 cage assembly, 3-47

 fan tray, B-5

 fan tray board, B-5

 release button, 2-4

hard drive fan tray, B-5

hardware device paths, 1-10, 1-11, 1-14

hardware revision, displaying with `showrev`, 1-17

host adapter (`probe-scsi`), 1-12

hot-pluggable, 2-1

hot-pluggable devices, 2-2

hot-plugging, hard drive, 2-2

hot-swappable, 2-1

hot-swappable devices, 2-2

hot-swapping

 fan tray, 2-7

 hard drive fan tray, 2-11

 power supply, 2-13

I

IDE bus, 1-13

important safety information, 3-2

indicator

 blue service action required, 2-4, 2-6

 failure, 2-10, 2-13

 Fan Fault, 2-8

 Locator, 2-10

 rear power supply failure, 2-13

 Service Required, 2-10, 2-13, 2-14

 Top Fan, 2-10

input-device variable, 1-8

installing

 DIMMs, 3-25

 DVD drive, 3-46

 fan tray, 2-10

 fan tray connector boards, 3-43

 front cover and bezel, 3-58

 front I/O board, 3-44

 front indicator board, 3-41

 hard drive, 2-5

 hard drive backplane, 3-49

 hard drive fan tray, 2-12

 motherboard assembly, 3-34

 NVRAM, 3-58

 PCI-E and PCI-X cards, 3-18

 PCI-E and PCI-X riser boards, 3-21

 power distribution board, 3-39

 power supply, 2-15

Integrated Drive Electronics, *See* IDE bus

interlock switch, 3-60

L

latch, 2-4

 power supply, 2-14

 slide rail, 3-6

location of hard drives, 2-4

locator button, 2-10

Locator indicator/Locator button, 2-10

log files, 1-15
logical unit number (`probe-scsi`), 1-12
loop ID (`probe-scsi`), 1-12

M

maintenance position, 3-5, 3-7
message, POST, 1-6
motherboard, B-5
 front I/O cable, B-5
 SAS backplane cable, B-6
motherboard handles, 3-34
motherboard/front I/O board cable, 3-30
motherboard/SAS backplane cable, 3-32, 3-37

N

NVRAM, B-6

O

OpenBoot commands
 `probe-ide`, 1-13
 `probe-scsi`, 1-12
 `probe-scsi-all`, 1-12
 `show-devs`, 1-14
OpenBoot configuration variables
 purpose of, 1-7
 table of, 1-7
OpenBoot Diagnostics tests
 error messages, 1-11
 hardware device paths, 1-10
 running from the `ok` prompt, 1-10
 test command, 1-10
 `test-all` command, 1-11
output-device variable, 1-8
overtemperature condition, determining with
 `prtdiag`, 1-16

P

patches, installed determining with `showrev`, 1-17
PCI-E and PCI-X
 card guidelines, A-3
 hold down bracket, 3-17
 riser boards, B-6
 slots Sun Fire V215, 3-16
 slots Sun Fire V245, 3-17
PCI-E and PCI-X riser boards, B-6
PCI-X riser board standoff, 3-29, 3-30, 3-36

PCI-X riser board standoff release, 3-29

POST

 limitations of message display, 1-8
 messages, 1-6
power distribution board, 3-38, B-6
power supply, B-6
power supply latch, 2-14
powering off server
 ALOM, 3-4
 ALOM Command, 3-4
 graceful shutdown, 3-5
`probe-ide` command (OpenBoot), 1-13
procedures, parts replacement, 3-3
processor speed, displaying, 1-17
`prtconf` command (Solaris), 1-16
`prtdiag` command (Solaris), 1-16
`prtfru` command (Solaris), 1-17
`psrinfo` command (Solaris), 1-17

R

rear cover, 3-60
rear cover release button, 3-10
rear fan tray cover door-Sun Fire V215, 2-11
reinstalling server in rack, 3-61
removing
 air baffle V245, 3-22
 battery, 3-55
 DIMMs, 3-22
 DVD Super-Multi drive, 3-45
 fan tray, 2-8
 fan tray connector boards, 3-42
 front bezel, 3-11
 front I/O board, 3-43
 front indicator board, 3-40
 hard drive backplane, 3-47
 hard drive fan tray, 2-11
 motherboard assembly, 3-27
 NVRAM, 3-57
 PCI-E and PCI-X cards, 3-16
 PCI-E and PCI-X riser boards, 3-19
 power, 3-10
 power distribution board, 3-36
 rear cover, 3-10
 server from rack, 3-7
removing hard drive, 2-3
required tools, 3-4

- revision, hardware and software
 - displaying with `showrev`, 1-17
- riser boards, 3-20

S

- safety symbols, 3-2
- SAS drive backplane, 3-49
- SCSI devices, diagnosing problems, 1-12
- SEEPROM, B-6
- Service Required indicator, 2-8
- `show-devs` command (OpenBoot), 1-14
- `showrev` command (Solaris), 1-17
- software revision, displaying with `showrev`, 1-17
- Solaris commands
 - `prtconf`, 1-16
 - `prtdiag`, 1-16
 - `prtfru`, 1-17
 - `psrinfo`, 1-17
 - `showrev`, 1-17
- spring latch, 3-46
- Sun Fire V215 air baffle, 3-23
- system configuration card, 1-6
- system memory, determining amount, 1-16

T

- `test` command (OpenBoot Diagnostics tests), 1-10
- `test-all` command (OpenBoot Diagnostics tests), 1-11
- `test-args` variable, 1-10
 - keywords, 1-10
- Top Fan indicator, 2-8, 2-10

U

- Universal Serial Bus devices, running OpenBoot Diagnostics self-tests, 1-11
- upper and lower cable retainers, 3-37, 3-38, 3-40

W

- World Wide Name (`probe-scsi`), 1-12