

# Ultra Enterprise™ 450 Server Board Upgrade Guide

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THE NETWORK IS THE COMPUTER™

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# Contents

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**Preface v**

- 1. Ultra Enterprise 450 Server Board Upgrade Guide 1**
  - Overview 1
  - Transferring Your System's hostid and Ethernet Address 2
  - Upgrade Contents 2
  - Unpacking the Shipping Cartons 3
  - Halting Your System 3
  - Upgrading the Main Logic Board 5
    - Removing the Old Main Logic Board 5
    - Main Logic Board Jumpers 5
    - Installing the New Main Logic Board 6
    - About UltraSPARC II CPU Modules 8
    - Installing the CPU Module 9
    - Installing the Remaining Main Logic Board Components 10
  - Reassembling the System 10
  - Electromagnetic Compatibility 12
    - Class A EMC Label 12

Information for Systems Used in Taiwan	14
在台灣使用系統的資訊	14
Powering Up Your Upgraded System	15
Return Material Procedure	16

# Preface

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The *Ultra Enterprise 450 Server Board Upgrade Guide*, used with the *Ultra Enterprise 450 Server Owner's Guide*, gives you the information you need to perform a main logic board upgrade to your Ultra Enterprise™ 450 server.

Features and options, installation, troubleshooting, parts replacement, network administration information, and other topics about the Ultra Enterprise 450 server are all covered in the *Ultra Enterprise 450 Server Owner's Guide*, which accompanied your purchase of the server. Refer to the original documentation to install the parts you will be transferring from your old server into your new Ultra Enterprise 450 server. You should also use the documentation to install any options that you purchased with this upgrade.

In addition, you can also view many of the component installation and replacement procedures in the multimedia CD-ROM application ShowMe How™, which also accompanied your purchase of the original server.

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## Using UNIX Commands

This document may not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for such information:

- *Solaris 2.x Handbook for SMCC Peripherals*
- AnswerBook™ online documentation for the Solaris™ software environment
- Other software documentation that you received with your system

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# Typographic Conventions

TABLE P-1 Typographic Conventions

Typeface	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
<b>AaBbCc123</b>	What you type, when contrasted with on-screen computer output	% <b>su</b> Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized	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.
	Command-line variable; replace with a real name or value	To delete a file, type <code>rm filename</code> .

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# Shell Prompts

TABLE P-2 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	#

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## Related Documentation

TABLE P-3 Related Documentation

Application	Title
Performing diagnostic tests	<i>SunVTS User's Guide</i>
	<i>SunVTS Quick Reference Card</i>
	<i>SunVTS Test Reference Manual</i>
	<i>Solstice SyMON User's Guide</i>
System and network administration	<i>Solaris System Administrator AnswerBook</i>
	<i>SPARC: Installing Solaris Software</i>
Using operating system software	<i>Solaris User's Guide</i>
Miscellaneous	<i>Solaris on Sun Hardware AnswerBook</i>
	<i>Solaris Handbook for Sun Peripherals</i>
	<i>SPARC Hardware Platform Guide</i>

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# Ultra Enterprise 450 Server Board Upgrade Guide

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This document *and the Ultra Enterprise 450 Server Owner's Guide* contain the information you need to upgrade the main logic board in your Ultra Enterprise 450 server and to install faster CPU modules.

For important safety and electromagnetic compatibility information, read the section "Electromagnetic Compatibility" in this document.

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## Overview

The following sections of this document provide background information and cover the main steps involved in the upgrade procedure:

- "Transferring Your System's hostid and Ethernet Address" on page 2
- "Upgrade Contents" on page 2
- "Unpacking the Shipping Cartons" on page 3
- "Halting Your System" on page 3
- "Upgrading the Main Logic Board" on page 5
- "About UltraSPARC II CPU Modules" on page 8
- "Reassembling the System" on page 10
- "Electromagnetic Compatibility" on page 12
- "Powering Up Your Upgraded System" on page 15
- "Return Material Procedure" on page 16

Be sure to read each section in its entirety, and any necessary information in the *Ultra Enterprise 450 Server Owner's Guide* before attempting to perform the upgrade. You should also have on hand the documentation that came with your original system, and the documentation supplied with any third-party devices that you installed in your server. You will need to refer to that documentation to perform the procedures during this upgrade.

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# Transferring Your System's hostid and Ethernet Address

Because the new NVRAM module on the replacement board contains a new hostid and a new Ethernet address, unless you transfer the NVRAM module from your old main logic board to your replacement board, your server's Ethernet address and hostid number will change. This information is used by the system administrator to identify your server in the network configuration files, and the information is also often used for licensing application software.

If you transfer the NVRAM chip from your old main logic board to the new main logic board, you do not have to make any changes to your server configuration files or to your application software.

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**Note** – If you have customized your NVRAM module with an `nvrामrc` script, together with any non-default settings in the NVRAM, you will need to save the information separately, so that you may restore the information after you have performed the upgrade.

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If you do not transfer your NVRAM module, the system administrator will need to know the new Ethernet address and hostid stored in the new NVRAM module.

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## Upgrade Contents

Your Ultra Enterprise 450 server main logic board upgrade includes:

- Ultra Enterprise 450 server main logic board
- Class A Electromagnetic Compatibility (EMC) label
- BSMI Class A warning label (required for servers used in Taiwan only)

BSMI 甲類警告標籤（適用於在台灣使用之伺服器）

- Wrist strap
- Antistatic mat
- *Sun Upgrade Program Policy* document
- *Sun Upgrades RMA* letter

In addition to the main logic board upgrade, you may have ordered one or more of the following hardware components:

- Memory modules (32-megabyte or larger capacity SIMMs)
- CPU module
- Additional DC to DC converter(s), if necessary
- New disk drives

If any item, except CPU modules, is not included in the list above, you are expected to transfer the item(s) from your old system main logic board to your new one.

When you upgrade to an Ultra Enterprise 450 server, you must return your old main logic board to Sun Microsystems. See “Return Material Procedure” on page 16 for additional details.

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## Unpacking the Shipping Cartons

Follow these steps to unpack your main logic board:

**1. Inspect the shipping cartons before opening them.**

If there is evidence of damage to a carton, contact your sales representative and arrange for an agent of the carrier to be present when you remove the equipment.

**2. Unpack your new Ultra Enterprise 450 server main logic board.**

**3. Save the cartons and the packing material.**

You will need them to return your old main logic board.

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## Halting Your System



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**Caution** – You must halt the system in an orderly manner. When the operating system or any other standalone program is up and running, do not press Stop-a to halt the system. Abruptly aborting program execution may cause damage to data files.

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Halt your system using the following procedure:

**1. Save all your work.**

Consult your software documentation for instructions on ending a work session and saving your files. If you do not save your work, you could lose it when you switch off the power.

## 2. Perform a complete system dump before starting the upgrade process.

See your operating system documentation if you need instructions on how to do this.

## 3. Return to the operating system environment.

If you are in a windowing environment, exit from it and wait for the system prompt to appear. See the documentation supplied with your windowing system.



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**Caution** – If you are transferring your NVRAM module, and have customized your NVRAM module with an `nvrामrc` script, together with any non-default settings in the NVRAM, you will need to save the information separately now, so that you may restore the information after you have performed the upgrade.

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## 4. Halt the operating system.

See the documentation supplied with your operating system for instructions on how to halt it.

- For Solaris 2.5.1 Hardware 11/97 or later compatible systems, type:

```
% su
Password: superuser password
# /usr/sbin/shutdown -y -g60 -i0
```

The operating system warns other users of your system of the impending shutdown, and then halts itself after a one-minute delay. If you wish to provide a longer delay, see the man page for `shutdown(1)`.

The system responds with system halt messages, followed by either the `>` prompt or the `ok` prompt. When either prompt appears, you can safely turn off the power in the proper sequence.

## 5. Turn off the power in sequence to:

- a. External drive units (if any)
- b. Ultra Enterprise 450 server unit
- c. Monitor (if applicable)

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# Upgrading the Main Logic Board

For the procedures that follow in this section, use the sections in the *Ultra Enterprise 450 Server Owner's Guide*. Be sure to read all the information that precedes the steps and follow any procedures noted there in the *Ultra Enterprise 450 Server Owner's Guide*.

You should also have on hand the documentation supplied with any third-party devices that you installed in your server's main logic board. You will need to refer to that documentation to perform some of the procedures during this upgrade.

The following sections cover the main steps involved in the main logic board upgrade procedure:

- “Removing the Old Main Logic Board” on page 5
- “Main Logic Board Jumpers” on page 5
- “Installing the New Main Logic Board” on page 6
- “About UltraSPARC II CPU Modules” on page 8
- “Installing the CPU Module” on page 9
- “Installing the Remaining Main Logic Board Components” on page 10

Be sure to read each section in its entirety, and any necessary information in the *Ultra Enterprise 450 Server Owner's Guide* to upgrade the main logic board.

## Removing the Old Main Logic Board

- **Remove the old main logic board using the steps in the section “How to Remove the Main Logic Board” in the *Ultra Enterprise 450 Server Owner's Guide*.**

Remove and clearly label the old NVRAM module, if you plan to transfer it to the new main logic board.

## Main Logic Board Jumpers

The following information supersedes the information presented in the *Ultra Enterprise 450 Server Owner's Guide* concerning main logic board jumpers:

- The clock mode select jumper (J2701) is now used on the Ultra Enterprise 450 server main logic board.

Set the clock mode jumper shunt at address J2701 to correspond to the speed of your UltraSPARC II CPU module(s). Verify that the jumper setting is correct before starting the system.

Jumper	Shunt on Pins 1 + 2 Selects	Shunt on Pins 2 + 3 Selects	Default Shunt <sup>1</sup> on Pins	Signal Controlled
J2701	Correct clock mode for UltraSPARC II 250- and 300-MHz CPU modules	Correct clock mode for UltraSPARC II 400-MHz CPU modules	1 + 2	UPA_RATIO2

1. Factory setting for main logic boards shipped without CPU modules installed.

## Installing the New Main Logic Board

### 1. Install the new main logic board.

- a. If you are using the new NVRAM, perform the steps in the section “How to Install the Main Logic Board” in the *Ultra Enterprise 450 Server Owner’s Guide*, and then go to the next section “About the New NVRAM Module Data” on page 7.
- b. If you are transferring the old NVRAM module, perform the first three steps in the section “How to Install the Main Logic Board” in the *Ultra Enterprise 450 Server Owner’s Guide*. Then perform the following steps.

### 2. Disconnect the main logic board from its power connector.

Loosen the captive screws that secure the board to the system rear panel, and pull the handles at the rear of the board until the board is fully disengaged from its power connector.



**Caution** – Failure to do so could corrupt the information stored in the NVRAM module and adversely affect operation of the system.

### 3. Remove the new NVRAM module from the new main logic board using the steps in the section “How to Remove the NVRAM Module” in the *Ultra Enterprise 450 Server Owner’s Guide*.

Be sure to keep the old and the new NVRAM modules clearly identified. You will need to install the new module in the old system board when you return it to Sun Microsystems.

4. **Install the old NVRAM module onto the new main logic board using the steps in the section “How to Install the NVRAM Module” in the *Ultra Enterprise 450 Server Owner’s Guide*. Then perform the remaining steps below.**

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**Note** – If you have customized your NVRAM module with an `nvrामrc` script, together with any non-default settings in the NVRAM, you will need to restore the information separately, after you have performed the upgrade.

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5. **Reconnect the main logic board to its power connector.**

Push the handles at the rear of the board until the board is fully engaged in its power connector. Tighten the captive screws that secure the board to the system rear panel.

6. **Follow the remaining steps in the section “How to Install the Main Logic Board” in the *Ultra Enterprise 450 Server Owner’s Guide*, and then go to the section “About UltraSPARC II CPU Modules” on page 8.**

## About the New NVRAM Module Data

The `hostid` and Ethernet address are stored in the NVRAM module on the main logic board.

Locate the NVRAM module on the main logic board. If necessary, see the section “How to Remove the NVRAM Module” in the *Ultra Enterprise 450 Server Owner’s Guide*.

**The system’s new Ethernet address** is on the label on the new NVRAM module. The label contains part of the system’s Ethernet address, a six-digit hexadecimal number.

For example, the NVRAM label numbers might read 79F843. These numbers comprise the last three pairs of numbers in the system’s Ethernet address. The system’s Ethernet address is the label number *with* a prefix of the numbers 080020. Thus the system’s new Ethernet address in this example would be 08:00:20:79:F8:43.

**The system’s new `hostid`** is on the label on the new the NVRAM module. The label contains part of the system’s `hostid`, a six-digit hexadecimal number.

For example, the NVRAM label numbers might read 79F843. The system’s `hostid` is the hexadecimal number *with* a prefix of the number 80. Thus the system’s new `hostid` in this example would be 8079F843.

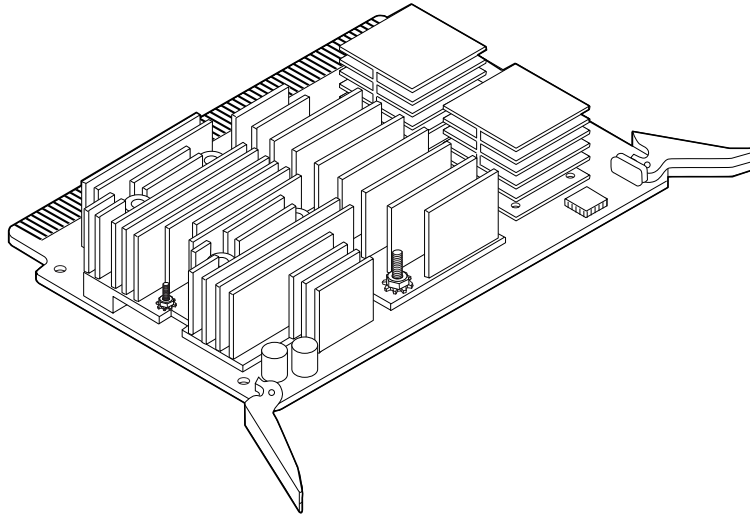
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**Note** – The system’s Ethernet address and `hostid` are also displayed at power up on the system banner.

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# About UltraSPARC II CPU Modules

The Ultra Enterprise 450 server supports up to four 400-MHz UltraSPARC™ II CPU modules, each with 4 Mbytes of integrated cache memory. The following figure shows the new unshrouded 400-MHz UltraSPARC II CPU module.



## Identifying CPU Modules

Before installing a CPU module, verify that the module is one of the following UltraSPARC II modules for Ultra Enterprise 450 server systems. The following table identifies CPU module speeds.

Module Speed (MHz)	Part Number
250 MHz	501-4857 or 501-4278
300 MHz	501-4849 or 501-4196
400 MHz	501-5239 or 501-5446

**Note** – If the CPU module you are installing has a part number of 501-5239-04 or higher, you will need to apply a Class A EMC label to your Ultra Enterprise 450 server. Follow the instructions under “Class A EMC Label” on page 12.



## CPU Module Configuration Rules

Before configuring your CPU modules, to determine if your new system will support the power requirements of the new configuration, review the section “System Power Requirements Worksheet” on page 9 of this guide, and see the section “How to Determine System Power Requirements” in the *Ultra Enterprise 450 Server Owner’s Guide*.

If you need to know your system’s power consumption, see the section “How to Determine System Power Requirements” in the *Ultra Enterprise 450 Server Owner’s Guide* to determine if your new system will support the power requirements of the new configuration.

Configure your UltraSPARC II CPU modules in your server according to the rules in the section “About CPU Modules” in your *Ultra Enterprise 450 Server Owner’s Guide*.

## System Power Requirements Worksheet

The following information is an addition to the section “System Power Requirements Worksheet” in the *Ultra Enterprise 450 Server Owner’s Guide*. If you are calculating your power needs for systems that will include one or more 400-MHz CPU modules and the SunCD™ 32 CD-ROM, you will need the following information for your calculations.

Line No.	Option	Qty	+3.3 VDC Amps	Total Amps @ 3.3 V	+5 VDC Amps	Total Amps @ 5 V	+12 VDC Amps	Total Amps @ 12 V
<b>CPU Options</b>								
	400 MHz CPU with 4 MB Ecache and DC/DC converter		5.0		5.6			
<b>Internal Storage Device Options</b>								
	SunCD 32 CD-ROM				0.55		0.61	

## Installing the CPU Module



**Caution** – Before you install any CPU module in your new main logic board, read the section “Main Logic Board Jumpers” on page 5, and verify that the jumper setting on the new main logic board is correct for the speed of the CPU module you are installing. Serious system damage can result if your main logic board clock mode jumper is set incorrectly.

- **Install each CPU module using the steps in the section “How to Install a CPU Module” in the *Ultra Enterprise 450 Server Owner’s Guide*.**



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**Caution** – All CPUs installed in a system must operate at identical clock speeds.

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**Note** – Before you install the fourth CPU module in the top CPU slot (CPU-A1), remove the blank baffle installed in the connector (J0101). Grasp the blank baffle by the front handle and slide it out of the CPU slot.

Keep the blank baffle. If you ever remove a CPU module from the top CPU slot (CPU-A1), re-install the blank baffle in the connector (J0101).

---

## Installing the Remaining Main Logic Board Components

Refer to the following sections in the *Ultra Enterprise 450 Server Owner’s Guide* to restore the remaining main logic board components you removed from the main logic board.

1. **Install any PCI cards using the steps in the section “How to Install a PCI Card.”**
2. **Install any DC/DC converter using the steps in the section “How to Install a DC/DC Converter.”**
3. **Install any memory module using the steps in the section “How to Install a Memory Module.”**

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**Note** – If you purchased new memory modules, be sure to consult the configuration rules in the section “About Memory” in the *Ultra Enterprise 450 Server Owner’s Guide*.

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## Reassembling the System

Refer to the following sections in the *Ultra Enterprise 450 Server Owner’s Guide* to reassemble the system.

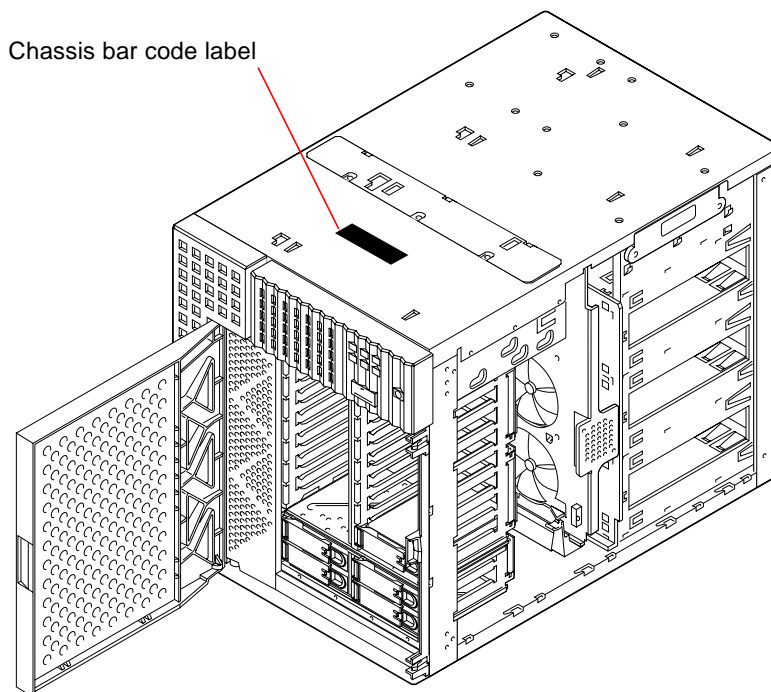
1. **Install the CPU fan tray using the steps in the section “How to Install the CPU Fan Tray Assembly.”**

2. **Reconnect any other devices that you disassembled from the main logic board to perform the upgrade.**

Consult the documentation that accompanied these devices for details about installing and configuring them.

3. **Remove the right side panel using the steps in the section “How to Remove the Right Side Panel.”**

Examine the chassis bar code label on the top of the system (see figure below). On the bottom line is a number. Write down the number. If your number is the same, or lower than 5402833-04, you must apply a Class A EMC label to your Ultra Enterprise 450 server.



4. **Install the right side panel using the steps in the section “How to Install the Right Side Panel.”**
5. **Install the left side panel using the steps in the section “How to Install the Left Side Panel.”**
6. **Reconnect any external cables to the rear panel of the main logic board; see the section “Locating Rear Panel Features.”**

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# Electromagnetic Compatibility

If either of the following scenarios are true for your system, you must read the section “Class A EMC Label” and apply onto the server the Class A EMC label included in your upgrade kit.

- The number you recorded in Step 3 in the section “Reassembling the System” is the same or lower than 5402833-04.
- The CPU module you are installing has a part number of 501-5239-04 or higher.

If the chassis number you recorded in Step 3 in the section “Reassembling the System” is higher than 5402833-04 *and* the CPU module you are installing has a part number of 501-5239-03 or lower, your Ultra Enterprise 450 server system meets Class B requirements for electromagnetic interference (EMI) conforming to international standards. Read the following paragraphs, and then skip forward to the section “Powering Up Your Upgraded System” on page 15.

Some of the Class B standards are noted in the “Declaration of Conformity” in the “Regulatory Compliance Statements” at the beginning of the *Ultra Enterprise 450 Server Owner’s Guide*. The Class B requirements are intended for home use, and are more stringent than Class A requirements. The Class B limits are designed to provide reasonable protection in the home against radio frequency interference.



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**Caution** – Connecting headphones to the headphone jack of the Ultra Enterprise 450 CD-ROM drive can result in radio frequency emissions that exceed Class B limits. Please read the sections that apply to Class A equipment in the “Regulatory Compliance Statements” at the beginning of the *Ultra Enterprise 450 Server Owner’s Guide*. There are several measures you can take to correct interference problems. For additional correction details, see the FCC Class B Notice in the “Regulatory Compliance Statements in the *Ultra Enterprise 450 Server Owner’s Guide*.”

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## Class A EMC Label

Any Ultra Enterprise 450 server configured with a chassis numbered 5402833-04 or lower, with an upgraded main logic board or with new 400-MHz, 4-Mbyte UltraSPARC II CPU modules with a part number of 501-5239-04 or higher, meets the Class A system requirements for EMI, but not the Class B requirements. Please read the sections that apply to Class A products in the “Regulatory Compliance Statements” at the beginning of the *Ultra Enterprise 450 Server Owner’s Guide*.

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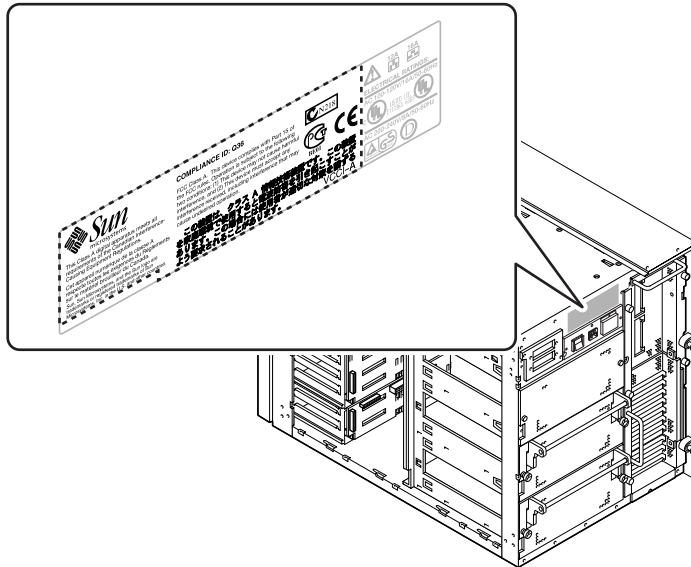
**Note** – To be compliant with international EMC regulations, the upgrade label provided *must* be correctly applied to the upgraded system.

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Read and follow the directions in the next section.

## Applying a Class A Label

- 1. Locate the Class B label on the rear panel of the Ultra Enterprise 450 server.**  
The label is located at the top of the back panel in the middle, just above the AC line filter.
- 2. Peel off the new Class A label from its backing material.**
- 3. With the sticky side down, align the left edge of the new label with the left edge of the existing large label.**
- 4. Position the new label so that it covers all of the old label *except* the right side panel containing Electrical Ratings and Product Safety marks; and on older labels, the country of origin in the bottom left corner. Press the label firmly into place.**



## Information for Systems Used in Taiwan

If your Ultra Enterprise 450 server meets Class A requirements as defined in the section “Electromagnetic Compatibility” on page 12, the following warning applies to your system:

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

To be compliant with BSMI electromagnetic compatibility regulations, you must apply the supplied BSMI warning label (part number 263-0719-01) onto your system as indicated in the figure.

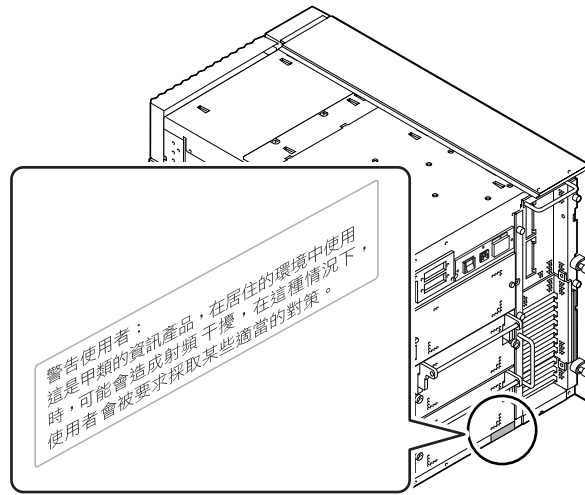
### 在台灣使用系統的資訊

如果您的 Ultra Enterprise 450 伺服器符合第 12 頁「電磁相容性」一節所定義的甲類要求，下述警告適用於您的系統：

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這中情況下，使用者會被要求採取某些適當的對策。

要符合 BSMI 電磁相容性規則，您必須依圖中所示，將提供的 BSMI 警告標籤（文件號碼：263-0719-01）貼在您的系統上。



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## Powering Up Your Upgraded System

The procedure for powering up your system depends on the operating system you are using. Refer to the *Ultra Enterprise 450 Server Owner's Guide* for instructions about configuring your server. Your system is connected to a network, and the network environment may require some advance preparation before you turn on your server. What you, or your system administrator will have to do will also depend on whether you decided to transfer your old NVRAM module to the new main logic board.

If you did not transfer your old NVRAM module, be sure to inform your system administrator of the new hostid and the new Ethernet address before you power up the server. You, or your administrator, will need to update certain network configuration files before your system can join the network. In addition, you may also need to register any software licenses that use your system's new hostid

number. This information is used by the system administrator to identify your server in the network configuration files, and the information is also often used for licensing application software.

Do not power up your system until you have notified your system administrator and have received permission to proceed. If you must act as your own system administrator, see the documentation that accompanies your operating system software.

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## Return Material Procedure

With your upgrade you ordered a Return Material Authorization (RMA) documentation set that includes a letter and instructions for returning your old equipment to Sun Microsystems.

Once you have completed the upgrade procedure, you must return your old main logic board to Sun Microsystems. Before returning your old main logic board, be sure to remove and keep any memory modules that you have purchased, but did not transfer to the new main logic board.

To return your old equipment to Sun Microsystems:

- 1. Disconnect any cables that may still be attached to the system unit.**
- 2. Pack the components in appropriate packing materials.**

Use the main logic board's Ultra Enterprise 450 upgrade packing materials, if possible. Be sure that the components are secure and well padded inside their respective shipping cartons.
- 3. Follow the instructions in the *Sun Upgrades RMA Letter* to return the equipment to Sun Microsystems.**

You have completed the upgrade procedure. If you encounter any difficulties with your new server, call the Sun Response Center or your authorized service provider.