

# ASUS® AP140R

Pentium® 4 1U Rackmount Server



User's Manual

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# ASUS Contact Information

## **ASUSTeK COMPUTER INC. (Asia-Pacific)**

Address: 150 Li-Te Road, Peitou, Taipei, Taiwan 112  
General Tel: +886-2-2894-3447  
General Fax: +886-2-2894-3449  
General Email: info@asus.com.tw

### Technical Support

MB/Others (Tel): +886-2-2890-7121 (English)  
Notebook (Tel): +886-2-2890-7122 (English)  
Desktop/Server (Tel): +886-2-2890-7123 (English)  
Support Fax: +886-2-2890-7698  
Support Email: tsd@asus.com.tw  
Web Site: www.asus.com.tw  
Newsgroup: cscnews.asus.com.tw

## **ASUS COMPUTER INTERNATIONAL (America)**

Address: 6737 Mowry Avenue, Mowry Business Center,  
Building 2, Newark, CA 94560, USA  
General Fax: +1-510-608-4555  
General Email: tmd1@asus.com

### Technical Support

Support Fax: +1-510-608-4555  
Notebook (Tel): 1-877-918-ASUS (2787)  
Web Site: www.asus.com  
Support Email: tsd@asus.com

## **ASUS COMPUTER GmbH (Europe)**

Address: Harkortstr. 25, 40880 Ratingen, BRD, Germany  
General Fax: +49-2102-442066  
General Email: sales@asuscom.de (for marketing requests only)

### Technical Support

Support Hotline: MB/Others: +49-2102-9599-0  
Notebook (Tel): +49-2102-9599-10  
Support Fax: +49-2102-9599-11  
Support (Email): www.asuscom.de/de/support (for online support)  
Web Site: www.asuscom.de

# FCC/CDC Statements

## Federal Communications Commission Statement

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

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

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

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

**WARNING!** The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

## Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

**This class B digital apparatus complies with Canadian ICES-003.**

# Safety Precautions

## Electrical Safety



### IMPORTANT

- Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.
- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing any additional devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- If the power supply is broken, do not try to fix it by yourself. Contact an authorized dealer.



### CAUTION

This product is equipped with a three-wire power cable and plug for the user's safety. Use the power cable with a properly grounded electrical outlet to avoid electrical shock.

## Operation Safety



### IMPORTANT

- Any mechanical operation on this server must be conducted by certified or experienced engineers.
- Before operating the server, carefully read all the manuals included with the server package.
- Before using the server, make sure all cables are correctly connected and the power cables are not damaged. If any damage is detected, contact your dealer as soon as possible.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Place the server on a stable surface.



# Introduction

“About This Manual” introduces the contents of this document. This part includes the target audience, chapter description, and conventions used. It also lists other sources of information that are not contained in this manual.

# About This Manual

# Audience

This installation guide is intended for system integrators, and experienced users with at least a basic knowledge on configuring an entry-level server.

# Contents

This manual contains the following parts:

## **Introduction: About This Manual**

This part introduces the contents of this document. It includes the target audience, chapter description, and conventions used. It also lists other sources of information that are not contained in this manual.

## **Chapter 1: System Overview**

This chapter describes the general features of the server. It includes sections on front panel and rear panel specifications.

## **Chapter 2: Hardware Setup**

This chapter lists the hardware setup procedures that you have to perform when installing system components.

## **Chapter 3: Hardware Options**

This chapter describes optional hardware procedures that you may have to do when configuring the system.

## **Appendix A: Power Supply Information**

This appendix gives information on the 200-watt switching power supply that comes with the server.

## **Appendix B: Troubleshooting**

This appendix lists the common problems that you may encounter while using the server. It lists the possible causes of the problems and offers solutions. You may refer to this part and try to solve simple problems before calling customer support.

# Conventions

## Symbols

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.



**WARNING:** Information to prevent injury to yourself when trying to complete a task.



**CAUTION:** Information to prevent damage to the components when trying to complete a task.



**IMPORTANT:** Information that you **MUST** follow to complete a task.



**NOTE:** Tips and information to aid in completing a task.

## References

Refer to the following sources for additional information and for product and software updates.

### 1. **ASUS Motherboard User's Manual**

The motherboard manual included with this server contains detailed information for advanced users.

### 2. **ASUS Websites**

The ASUS websites worldwide provide updated information on ASUS hardware and software products. The ASUS websites are listed in the ASUS Contact Information on page 6.

### 3. **Other Documentation**

Your product package may include other documentation, such as component manuals, inserts, stickers, or notices. Read all documentation before assembling or modifying the server.

# System Package Contents

The following checklist enumerates the components included in the standard system package.

## **ASUS AR-10 1U Rackmount Chassis**

- 200W ATX Power Supply
- Slim-type CD-ROM Drive
- 1.44MB Slim-type Floppy Disk Drive
- Front Bezel
- CPU Heatsink (without fan)
- AC Power Cord
- This System User's Manual

## **ASUS NB-LM Motherboard**

- 32-bit/33MHz PCI Riser Card
- Support CD with Drivers and Utilities
- Motherboard User's Manual

## **Slide Rail Assembly (Rail Kit)**

- Server-side and rack-side rails
- Mounting Ears Assembly
- Rail Kit User's Manual

## **ASUS System Management Software CD**

- System Management Software User's Manual

If any of the above items is missing, contact your dealer.

# Chapter 1

This chapter describes the general features of the server. This includes sections on front panel, rear panel, and internal features of the server.

# System Overview

# 1.1 System Features

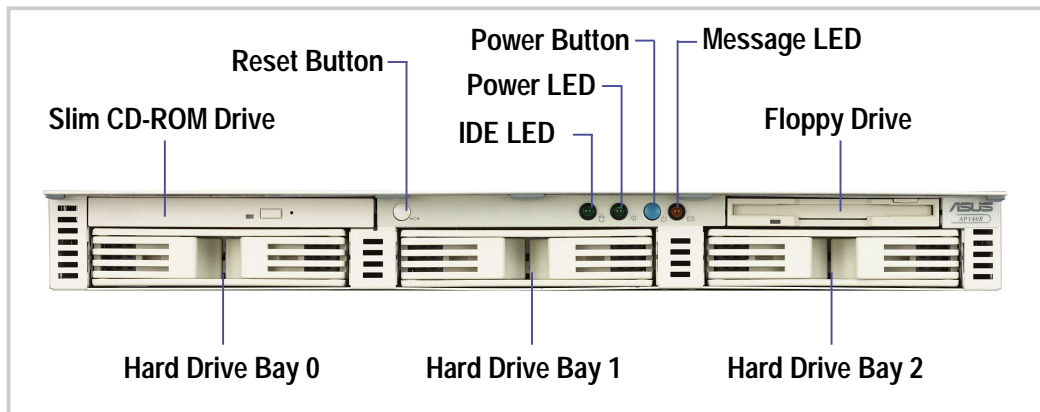
The ASUS AP140R Server is a 1U rackmount form factor that accommodates the ASUS NB-LM motherboard. The server is powered by Intel® Pentium® 4 processor, and supports the latest I/O and video technologies through the chipsets embedded on the motherboard.

Following are highlights of the server's many features.

- **Processor:** Support for one 478-pin Intel® Pentium® 4 Northwood processor up to 3GHz.
- **Memory:** Three DIMM sockets that support Intel PC133/PC100-compliant DIMMs, NEC's VC133-compliant Virtual Channel (VC) SDRAM, or Enhanced Memory System's High-speed DRAMs (HSDRAMs) up to 3GB
- **System Chipset:** Intel® 845 (Brookdale) chipset. The MCH and the South bridge Intel I/O Controller Hub 2 (ICH2) are interconnected through the Intel proprietary Hub interface. The MCH provides the processor interface, memory interface, AGP interface, and Hub Interface. The South bridge controller, referred to as the Intel I/O Controller Hub 2 (ICH2) of the Intel 845 chipset, provides the I/O subsystem that allows access to the rest of the system. The ICH2 integrates I/O functions such as system bus interface, Ultra ATA/100, Low Pin Count (LPC) interface, Universal Serial Bus (USB) 1.1 interface, and PCI interface.
- **LAN Chipset:** One Intel 82550 10/100 Fast Ethernet controller and one Intel 82562ET 10/100 PHY Fast Ethernet controller with ICH2 built-in Media Access Controller (MAC).
- **VGA Chipset:** ATI RAGE-XL PCI with 8MB video memory
- **Storage:** One 3.5-inch slim-type floppy device, one 5.25-inch slim-type CD-ROM drive, and supports three 3.5-inch wide 1-inch high IDE hard disk drives on removable trays
- **Expansion:** One full-length 32-bit/33MHz PCI slot on riser card
- **Power Supply:** 200-watt ATX power supply

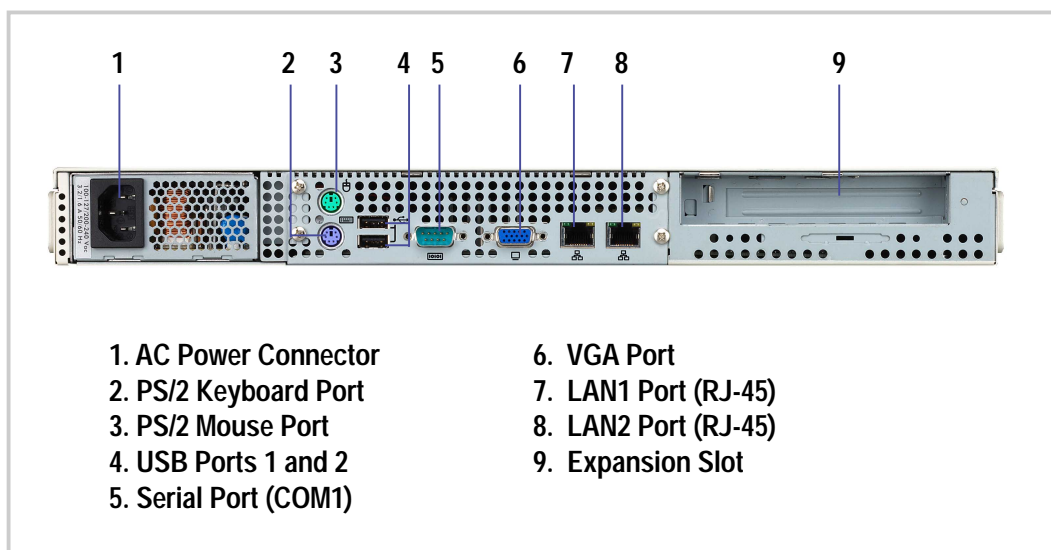
## 1.2 Front Panel Features

The front panel of the server allows easy access to the floppy, CD-ROM, and hard disk drives. The power button and the system LED indicators are also located on the front panel.



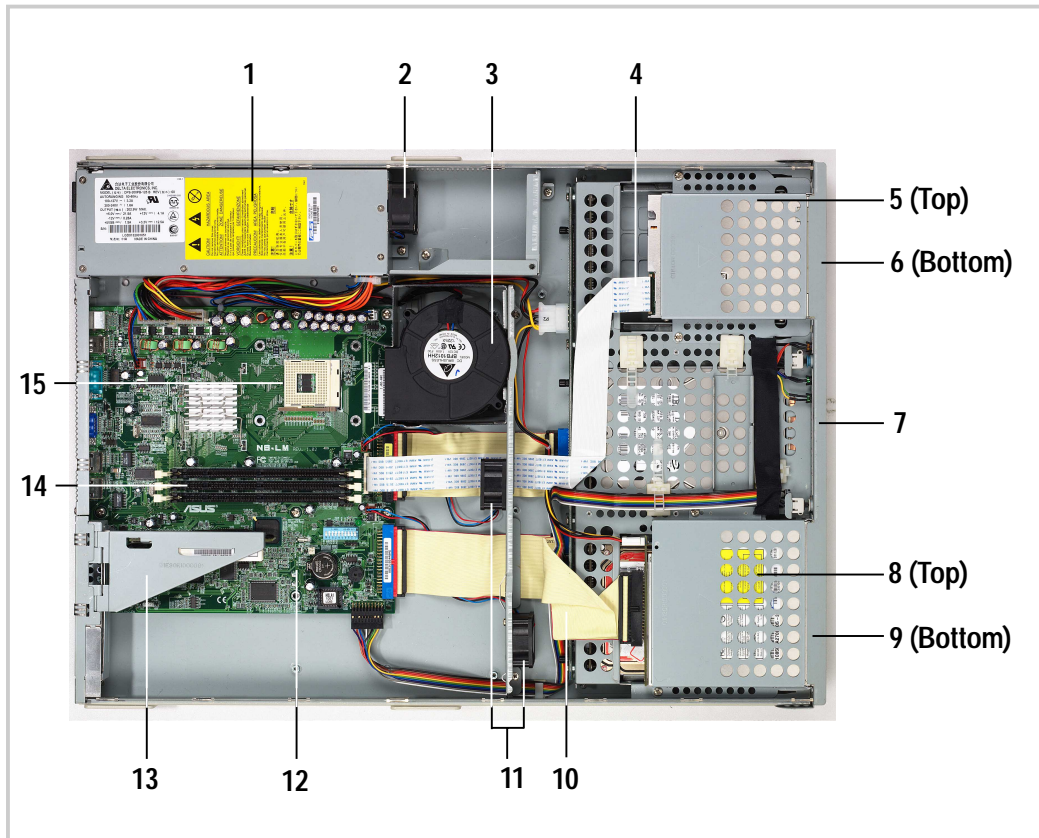
## 1.3 Rear Panel Features

The server rear panel includes the connectors the system devices and a slot for an expansion card.



# 1.4 Internal Features

The standard components inside the server include the motherboard, power supply, floppy and CD-ROM drives, and cables. The picture below shows the standard components of the server.



- |                          |  |
|--------------------------|--|
| 1. Power Supply          | 8. Slim CD-ROM Drive                   |
| 2. Power Supply Fan      | 9. Hard Disk Drive Bay 0               |
| 3. CPU Blower            | 10. 80-Wire IDE Cable                  |
| 4. Floppy Ribbon Cable   | 11. Chassis Fans                       |
| 5. Floppy Drive          | 12. Motherboard                        |
| 6. Hard Disk Drive Bay 2 | 13. Riser Card Holder                  |
| 7. Hard Disk Drive Bay 1 | 14. Memory Modules (Optional)          |
|                          | 15. Central Processing Unit (Optional) |



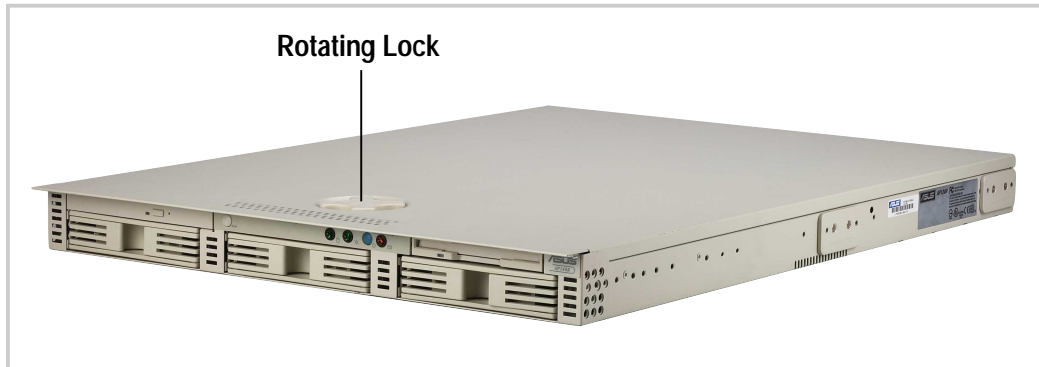
# Chapter 2

This chapter describes the hardware setup procedures that you have to perform when installing system components.

# Hardware Setup

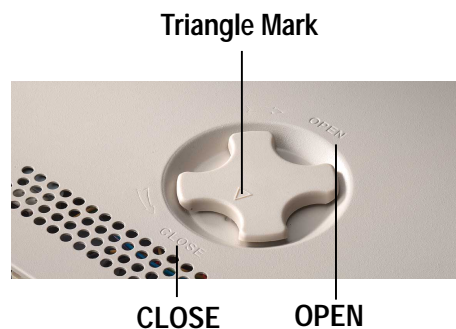
## 2.1 Opening the Chassis

The chassis is a 1U form factor designed for easy assembly and disassembly, making the installation of internal components very convenient. At the top of the chassis is a rotating lock that secures the cover to the chassis.



### Unlock the Cover

To unlock the cover, turn the rotating lock clockwise until the triangle mark points to OPEN.



### Slide the Cover

Slide the top cover toward the front for about an inch, then lift it up from the chassis. The top cover of the chassis has locking tabs at the rear end that connect to the inner side of the back panel. Make sure to disengage the locking tabs before lifting up the cover.



## 2.2 Motherboard Placement



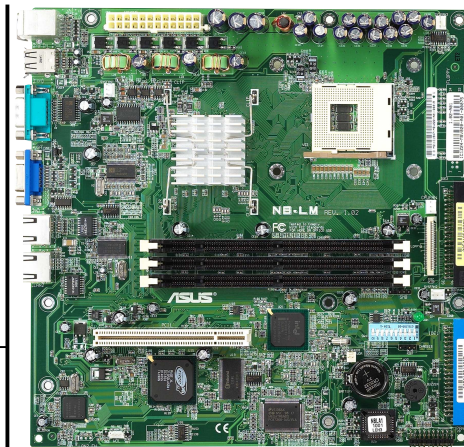
### NOTE

The motherboard and other internal components of the server are already installed as indicated in section “1.4 Internal Features”. Refer to the motherboard user’s manual for detailed technical information about the motherboard.

### Placement Direction

When installing the motherboard, make sure that you place it into the chassis correctly. The edge with the external ports goes to the rear part of the chassis.

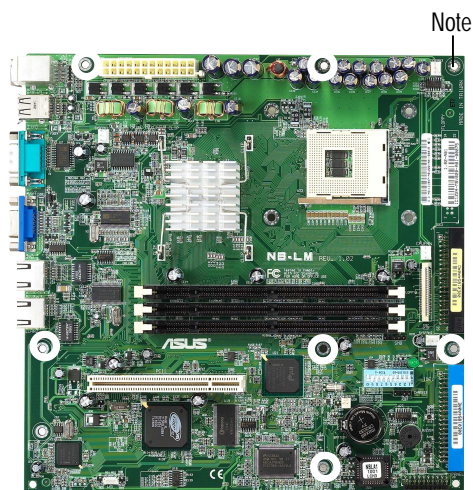
Rear Panel



### Motherboard Screws

Place six (6) screws in the holes indicated by circles to secure the motherboard to the chassis. Do not overtighten the screws. Doing so may damage the motherboard.

Note: This corner screw hole is used to secure the fan partition bracket.



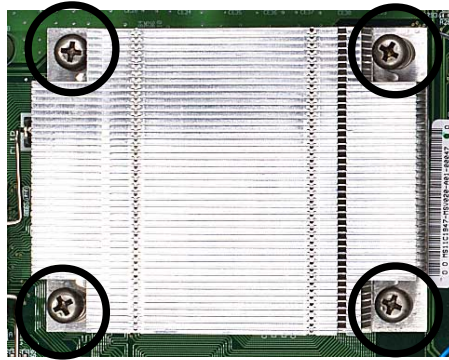
## 2.3 Installing the 1U Heatsink

### CPU Heatsink

The 1U server comes with a specially designed heatsink as shown here. The heatsink has four screws to secure it to the server chassis underneath the motherboard.

#### Install the Heatsink

Place the heatsink on top of the installed CPU matching the four screws to the holes around the socket. To secure the heatsink, tighten each screw a little at a time in a circle so that the heatsink will rest on the CPU evenly.



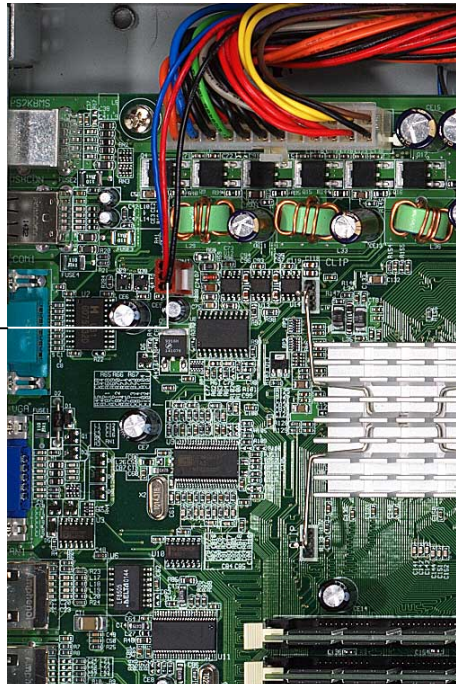
#### IMPORTANT

The CPU heatsink must be installed to prevent damaging the CPU and motherboard.

#### Connect the Fan Cable

From the factory, the CPU fan cable is already connected to the 3-pin fan connector on the motherboard marked CPU\_FAN.

CPU Fan Connector

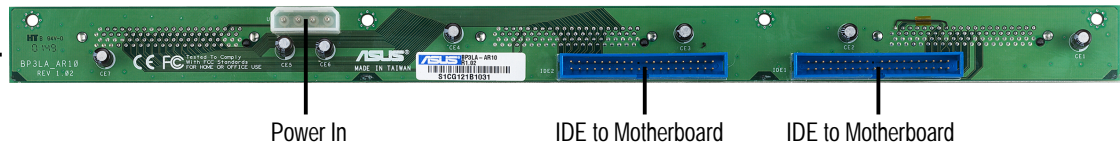




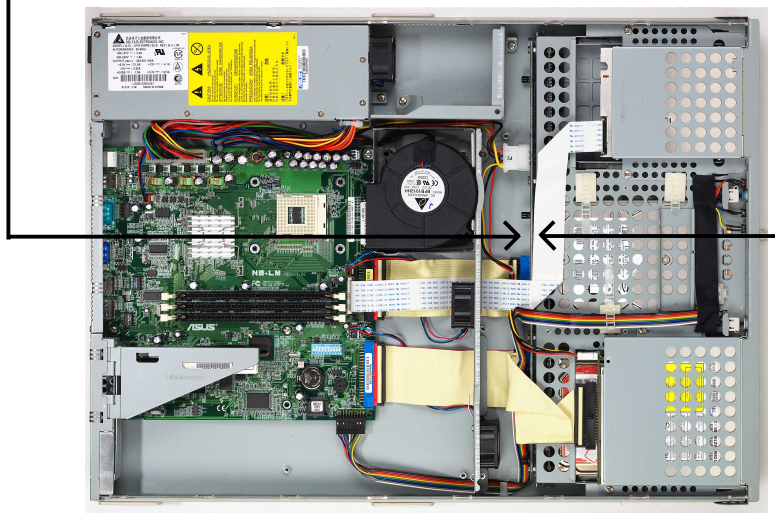
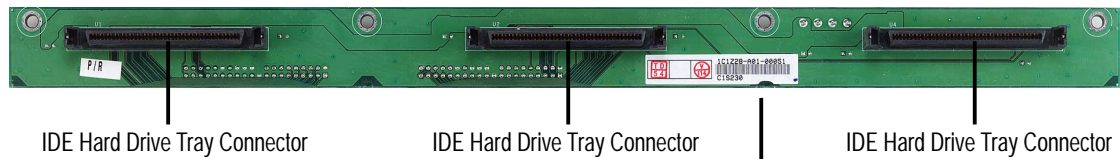
# 2.4 Hard Drive Connector Boards

The server comes with three externally accessible drive bays connected to the IDE back plane by swappable connectors.

### IDE Back Plane - IDE Connector Side



### IDE Back Plane - Hard Drive Side

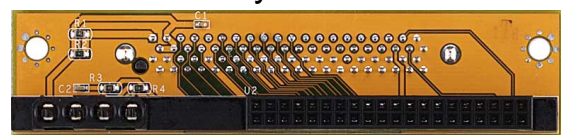


### Hard Drive Tray Board

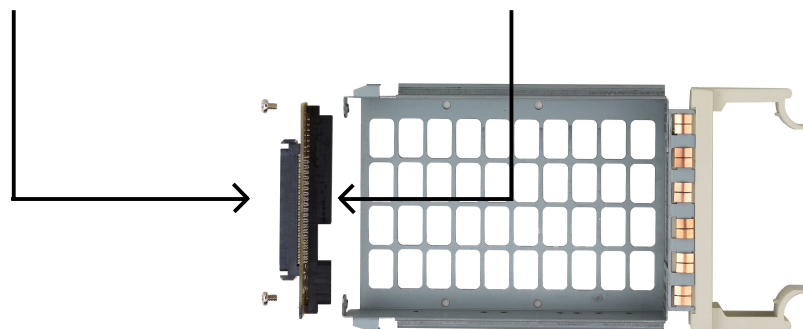


### IDE Back Plane Side

### Hard Drive Tray Board



### Hard Drive Side

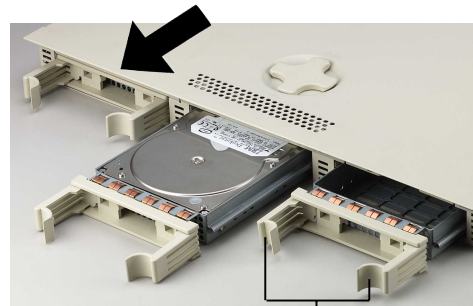


## 2.5 Installing a Hard Disk Drive

The server comes with three externally accessible drive bays. Due to mechanical issues, the drive tray's connector board may not fit some hard drives. Make sure the connector board will fit the hard drive before purchasing. Do not force the connector board onto the hard drive.

### Drive Trays

In each of the drive bays is a removable tray for mounting a hard disk drive. Flip open the tray levers to release the tray, then pull the tray out of the chassis.



Tray Levers

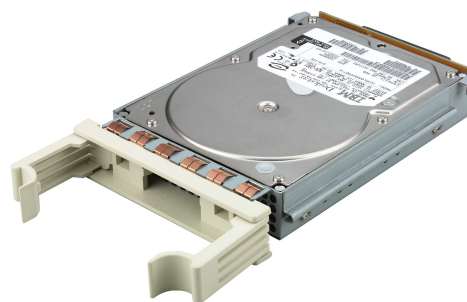
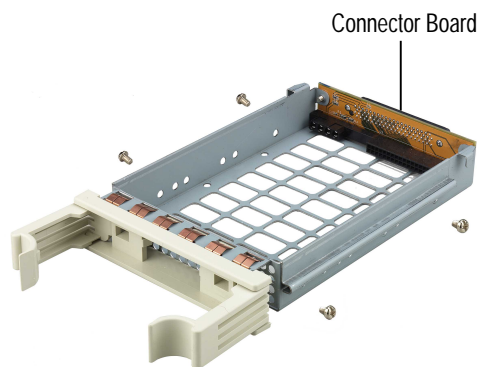
### Mount the Hard Drive

1. Set hard drive to "Cable Select".
2. Remove the connector board.
3. Place hard drive into drive tray.
4. Secure the drive using 4 screws.
5. Attach connector board to drive.
6. Secure the connector board using the original two screws.

Example: IBM hard drive's default is "Master".



You must change to "Cable Select" for this server.



### Install the Hard Drive

After the drive is secured to the tray, carefully insert the drive into the bay, then push the levers back into place.

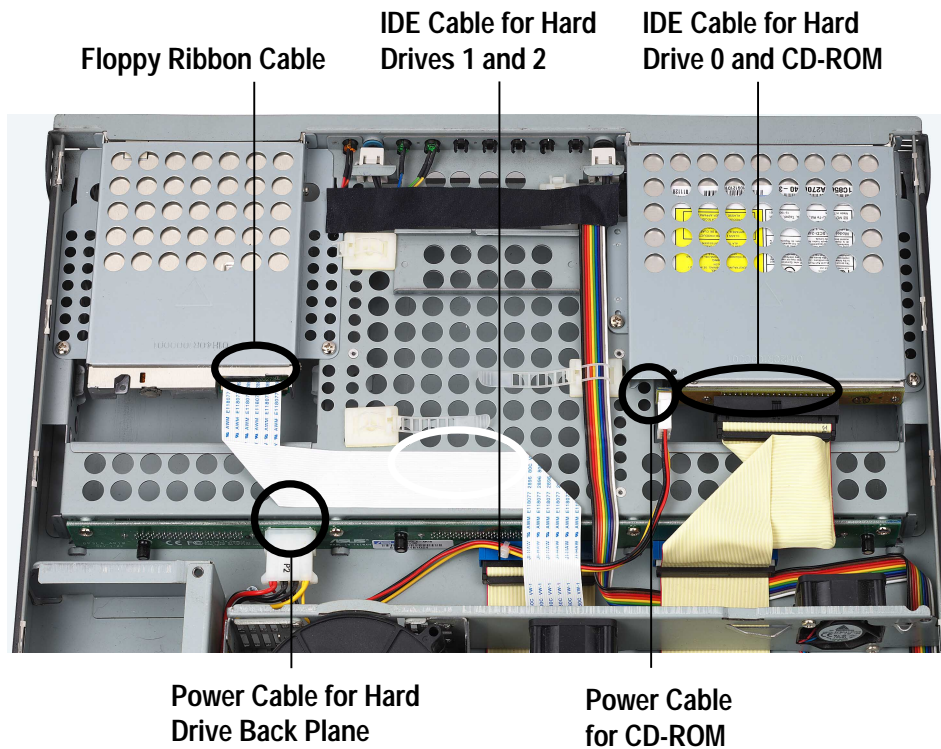


Tray Levers

## 2.5 Installing a Hard Disk Drive

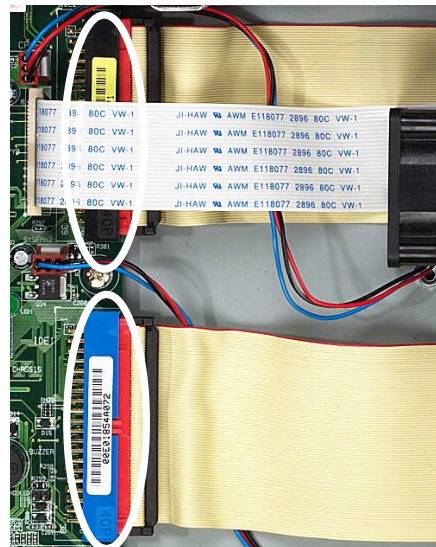
### IDE and Power Cable Configurations

The IDE and power cables in the chassis are pre-arranged so you can conveniently connect the cables. The picture below shows the cable arrangement and proper connections.



### Motherboard IDE Connectors

The motherboard has two IDE connectors that support four IDE devices on two channels. Each channel supports one master and one slave device, for a total of four.





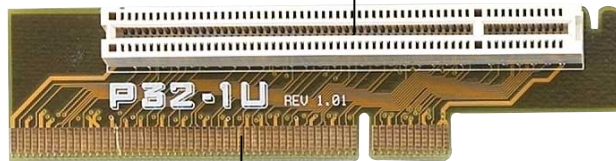


## 2.6 Installing an Expansion Card

The motherboard includes one 32-bit PCI expansion slot. A PCI riser card comes installed in this slot to accommodate a PCI expansion card.

### PCI Riser Card

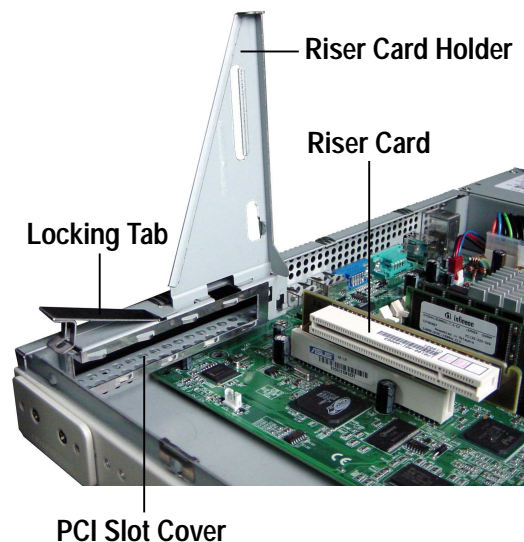
Install a PCI card into this slot



Install these golden fingers into the motherboard PCI slot

### Remove the Riser Card, Holder, and Bracket

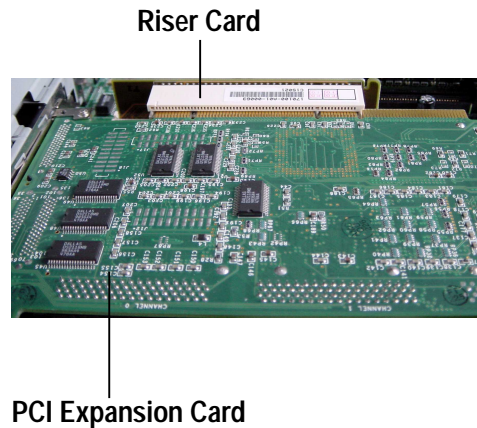
1. Lift up the Riser Card Holder to access the PCI riser card.
2. Lift up the Locking Tab beside the riser card holder.
3. Remove the PCI Slot Cover from the rear panel.



## 2.6 Installing an Expansion Card

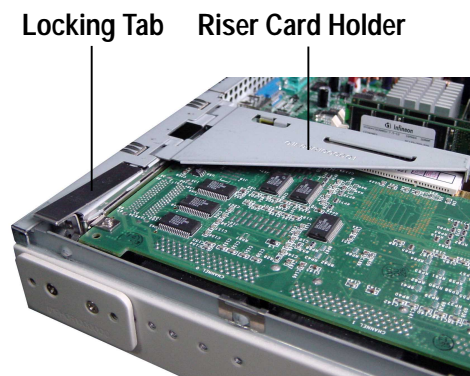
### Install the PCI Card

1. Install a PCI expansion card into the slot on the riser card.
2. Install the riser card golden fingers into the PCI slot on the motherboard. Align and fit the PCI card bracket into the slot opening on the rear panel.



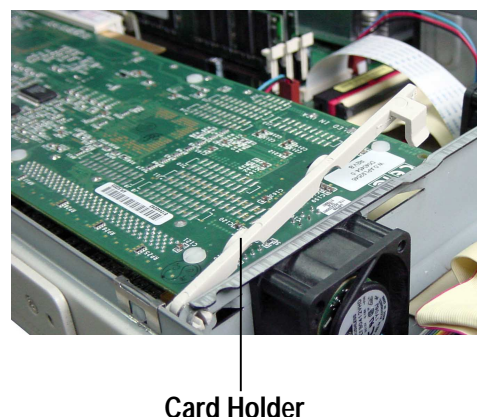
### Secure the PCI Card

1. When the PCI card is installed, replace and push down the locking tab to hold the card in place.
2. Replace the riser card holder to secure the riser card and the PCI card to the chassis.



### Extended PCI Card

If you are installing an extended PCI card, pull up the the plastic card holder before installing the card. When the card is in place, push down the card holder to secure the end of the extended PCI card.



# Chapter 3

This chapter describes optional hardware procedures that you may have to do when configuring the system.

# Hardware Options

# 3.1 Remove/Install a CD-ROM Drive

The 1U server supports a slim CD-ROM drive. The CD-ROM drive is already installed in the chassis. If you have to remove and re-install the drive in the future, refer to the instructions in this section.

## CD-ROM Drive Location

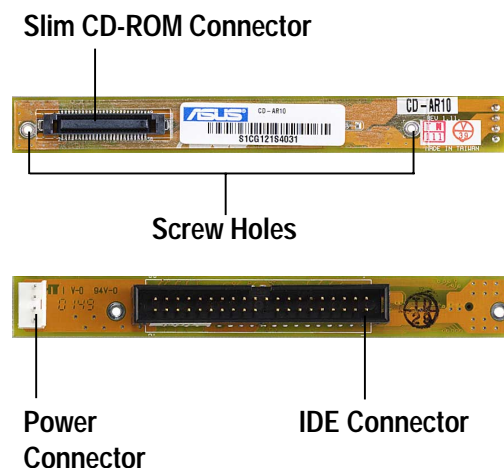
The slim CD-ROM drive is on top of the HDD0 bay (leftmost bay when you are facing the front panel).



## CD-ROM Adapter Board

The slim CD-ROM drive includes an adapter board with a special connector that matches the connector at the back of the slim CD-ROM drive. Two screw holes are available for securing the board to the drive.

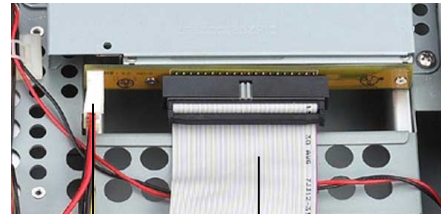
On the other side of the adapter board, a power connector and a standard IDE connector are available.



## 3.1 Remove/Install a CD-ROM Drive

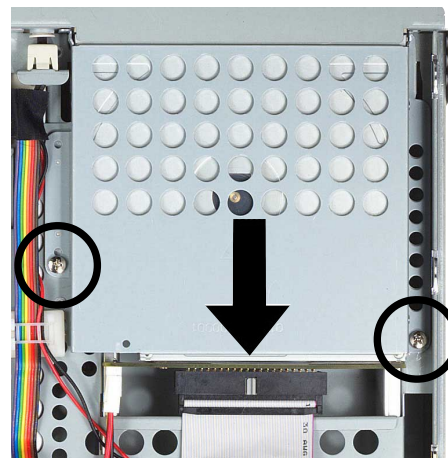
### Removing the CD-ROM Drive

1. Disconnect the power and IDE cables from the CD-ROM adapter board. The board remains attached to the drive.



Power Cable IDE Cable

2. Remove the screws that secure the CD-ROM cage. The picture on the right shows the locations of the screws.



3. Slide the CD-ROM drive cage outward to disengage it from the chassis. See the direction of the arrow in the above picture.
4. Lift up the drive cage from the chassis.
5. The drive is secured by four screws (two on each side) to the cage. Remove these screws to detach the drive from the cage.

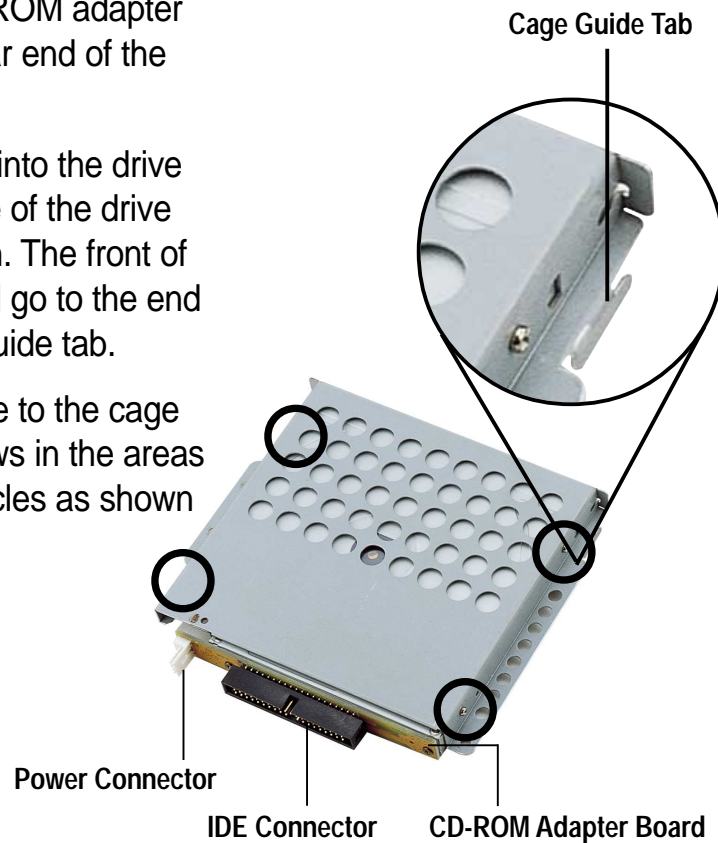
#### NOTE

If you wish to replace the CD-ROM drive, detach the adapter board from the drive and attach it to the new drive. Remove the two screws that secure the adapter board to the drive.

## 3.1 Remove/Install a CD-ROM Drive

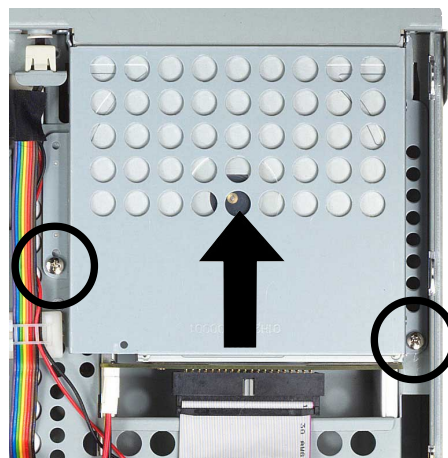
### Mounting the CD-ROM Drive

1. Attach the CD-ROM adapter board to the rear end of the slim CD-ROM.
2. Place the drive into the drive cage. Take note of the drive cage orientation. The front of the drive should go to the end with the cage guide tab.
3. Secure the drive to the cage using four screws in the areas indicated by circles as shown in the picture.



### Installing the CD-ROM Drive

1. Place the CD-ROM drive on its bay and slide it inward for about an inch (as indicated by the arrow), making sure that the cage guide tab locks in place.
2. Secure the drive cage to the chassis with two screws in the areas indicated by circles.
3. Connect the IDE and power cables to the connectors on the rear of the drive.





## 3.2 Floppy Drive

The 1U server comes with a slim floppy disk drive already installed. Refer to this section if you need to remove and re-install the floppy drive in the future.

### Removing the Floppy Drive

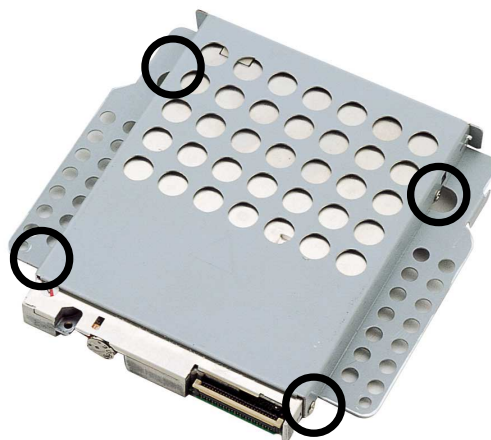
1. Disconnect the floppy cable from the rear of the drive.
2. Remove the screws that secure the floppy drive. The picture on the right shows the locations of the screws.
3. Slide the floppy drive cage out of the bay.
4. The drive is secured by four screws (two on each side) to the cage. Remove these screws to detach the drive from the cage.



Slim Floppy Disk Drive Cable

### Mounting the Floppy Drive

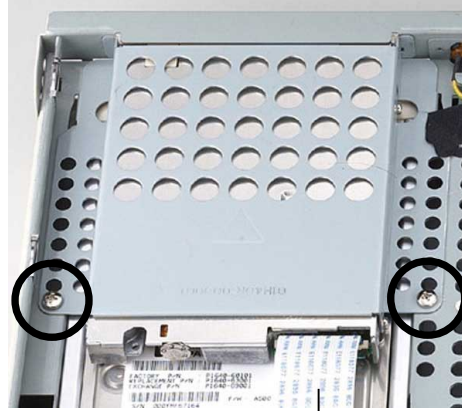
1. Place the floppy drive into the drive cage as shown.
2. Secure the drive to the cage with the four screws that you removed earlier.



## 3.2 Floppy Drive

### Installing the Floppy Drive

1. Place the floppy drive on its bay and slide it in until it fits.
2. Secure the drive cage to the chassis with two screws in the areas indicated by circles.
3. Connect the floppy drive cable to the connector on the rear of the drive.



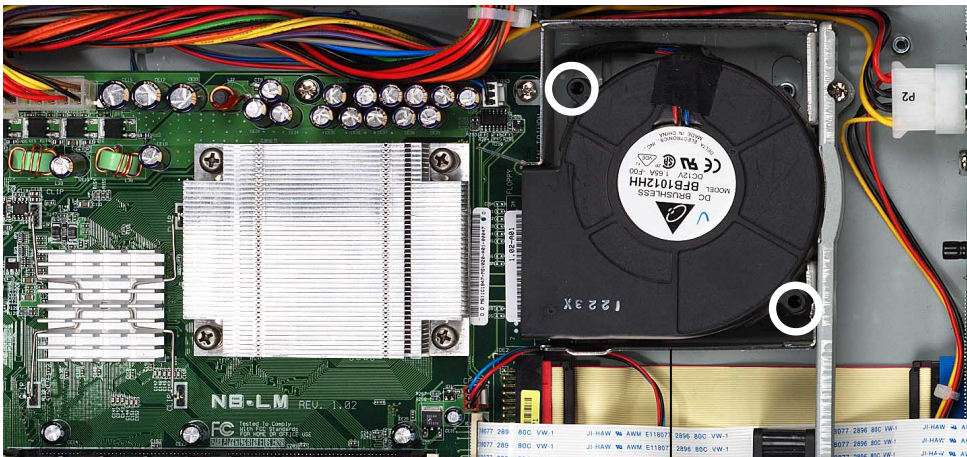
Slim Floppy Disk Drive Cable



## 3.3 Cooling System

### CPU Blower

The system has one 9 cm CPU blower that maintains the optimal CPU temperature. The blower is secured to the bracket using two screws from the bottom side.



CPU Blower



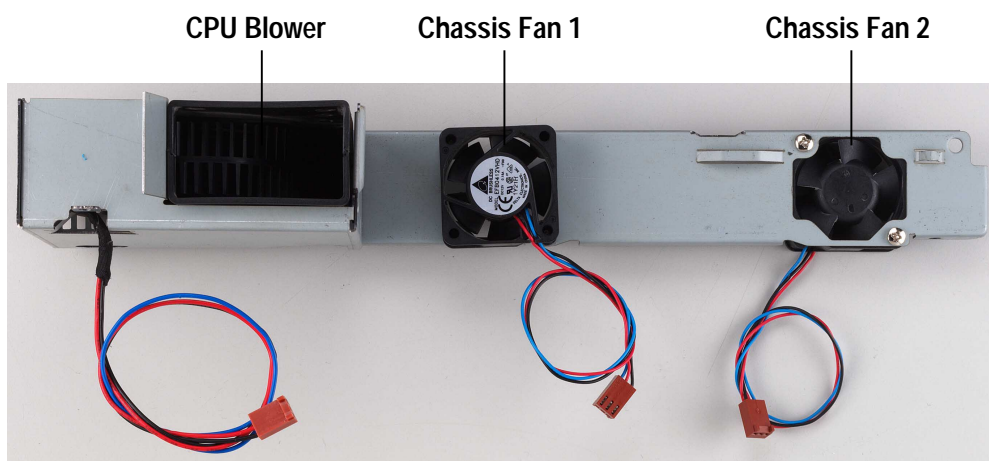
### IMPORTANT

Make sure that the 3-pin blower cable is connected to the connector marked CPU\_FAN on the motherboard to prevent thermal monitoring problems.

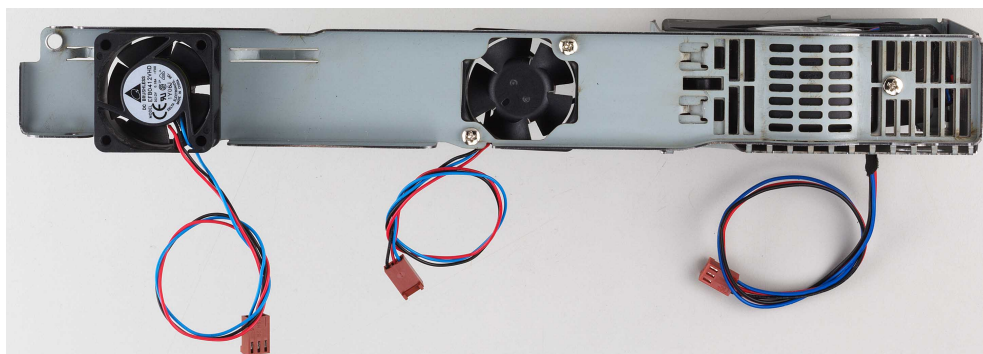
## 3.3 Cooling System

### Chassis Fans

Also included in the server cooling system are chassis fans that help maintain efficient air circulation among the components within the chassis. The chassis fans are attached to the metal bracket between the disk drives and the motherboard components.



Rear View



Front View

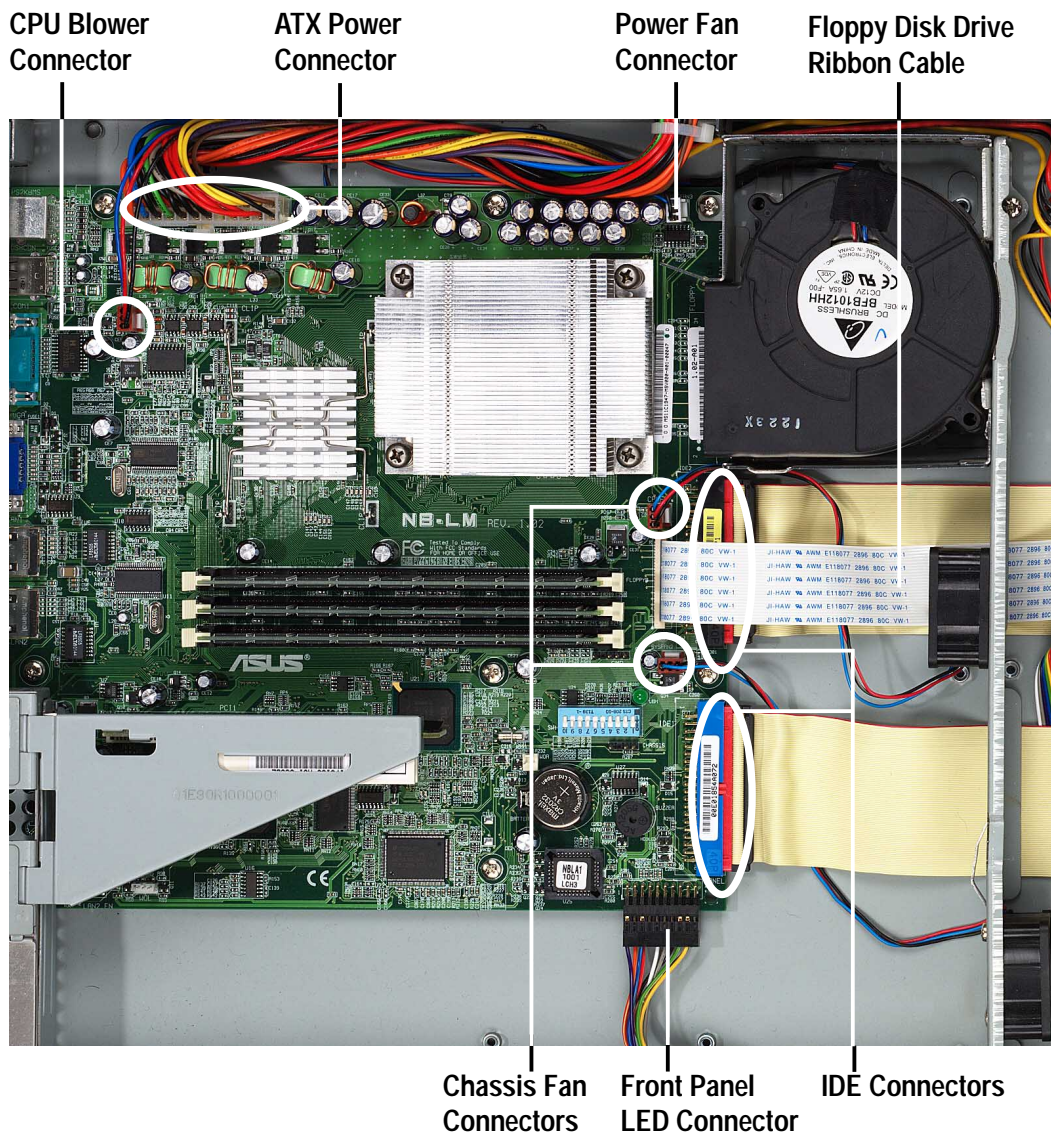


#### IMPORTANT

Make sure that the chassis fan cables are connected to the chassis fan connectors on the motherboard to prevent thermal monitoring problems.

# 3.4 Cable Connections

Most of the cables in the server are already pre-connected to their respective connectors. This section illustrates the cable connections for your reference, in case you unplugged the cables while installing or removing system components.



**NOTE**  
Refer to the motherboard user's manual for detailed information on the motherboard connectors.



# Appendix A

This appendix gives information on the 200-watt auto switching power supply that comes with the server.

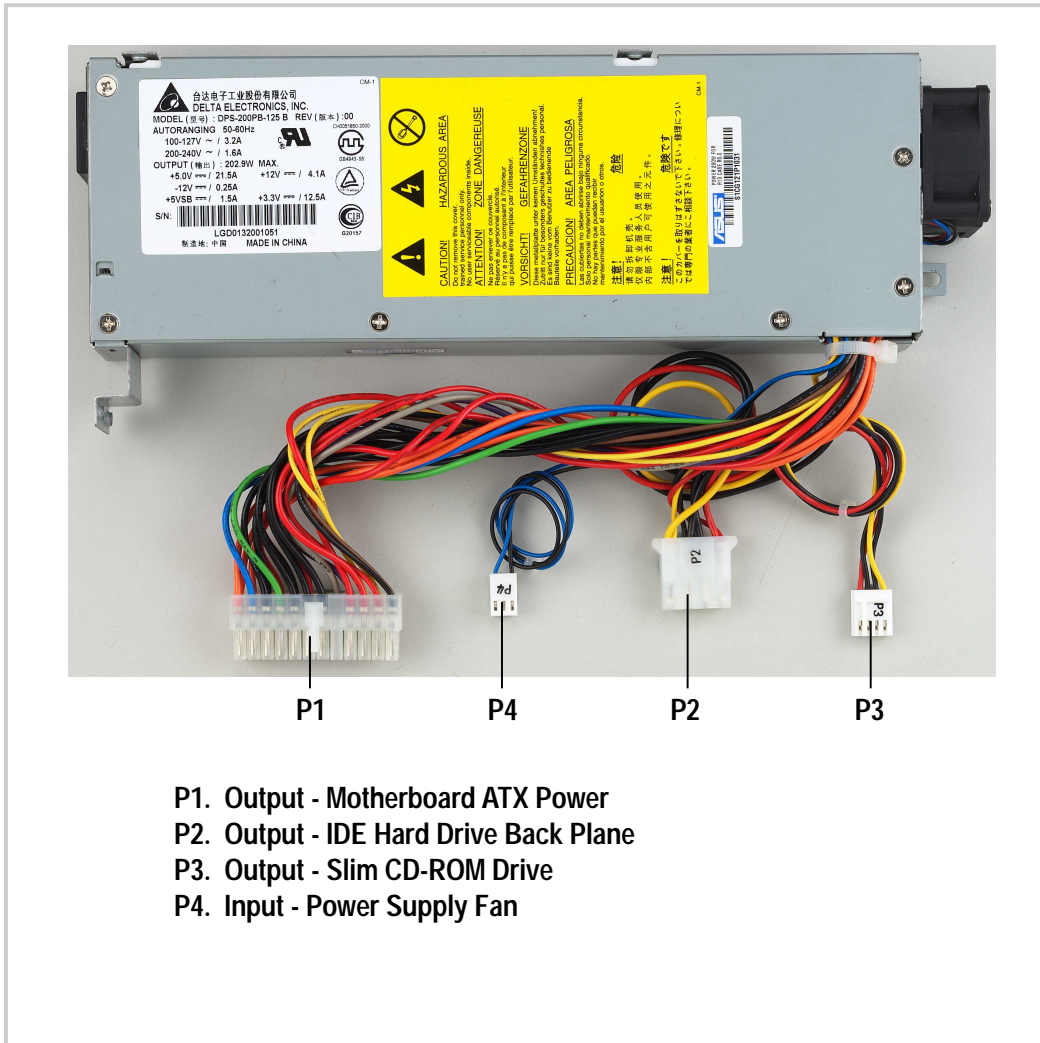
# Power Supply



# A.1 General Description

The server comes with a 200W ATX power supply with universal AC input and PFC/ATX-compliant output cables and connectors. The power supply includes a cooling fan.

The power supply has five plugs labeled P1 to P4. The picture below shows the specific device assignments for the plugs.



# A.2 Specifications

## Output Voltage Regulation

Output Voltage	Min (V)	Nom (V)	Max (V)	Ripple/Noise
+3.3V	3.2	3.30	3.465	50mV <sub>p-p</sub>
+5V	4.8	5.00	5.25	50mV <sub>p-p</sub>
+12V	11.4	12.00	12.60	120mV <sub>p-p</sub>
-12V	-10.8	-12.00	-13.20	200mV <sub>p-p</sub>
+5VSB	4.8	5.00	5.25	100mV <sub>p-p</sub>

## Output Current Capacity

Output Voltage	Min (A)	Max (A)	Max. Load (W)
+3.3V	0.5	12.5	41.25
+5V	0.5	21.5	107.5
+12V	0.8	4.1	69.2
-12V	0.0	0.25	3.0
+5VSB	0.1	1.5	7.5

## Over-Voltage Protection (OVP)

Voltage	Min (V)	Nom (V)	Max (V)
+3.3V	3.8	4.1	4.3
+5V	5.7	6.25	6.5
+12V	13.5	-	15.0





# Appendix B

This appendix lists the common problems that you may encounter while using the server. It lists the possible causes of the problems and offers solutions. You may refer to this part and try to solve simple problems before calling customer support.

# Troubleshooting

# B.1 Simple Fixes



## NOTE

Some problems that you may encounter are not due to defects on the system or the components. These problems only requires simple troubleshooting actions that you can perform by yourself.

Problem	Action
<b>The power LED on the server and/or the monitor do not light up</b>	<ol style="list-style-type: none"><li>1. Make sure that the 115V/230V voltage selector switch (if available) is set to the correct voltage supply in your area.</li><li>2. Check the power cable connection on the system rear panel if properly connected.</li><li>3. Make sure that the power cables are connected to a grounded power outlet.</li><li>4. Press the power button to make sure that the system is turned on.</li></ol>
<b>The keyboard does not work</b>	Make sure the keyboard is connected to the keyboard port.
<b>The mouse does not work</b>	Make sure the mouse is connected to the mouse port.
<b>The system does not perform power-on self tests (POST) after it was turned on</b>	<ol style="list-style-type: none"><li>1. Check the memory modules and make sure you installed the DIMMs the system supports.</li><li>2. Make sure that the DIMMs are properly installed on the sockets.</li></ol>

<b>Problem</b>	<b>Action</b>
<b>The system continuously beeps after it was turned on</b>	<ol style="list-style-type: none"> <li>1. Check the memory modules and make sure you installed the DIMMs the system supports.</li> <li>2. Make sure that the DIMMs are properly installed on the sockets.</li> </ol>
<b>The message “Non-system disk or disk error” appears</b>	<p>A primary logical partition must be created and set active to boot from it.</p>
<b>Network connection not available</b>	<ol style="list-style-type: none"> <li>1. Make sure the network cable is connector the RJ-45 port on the rear panel.</li> <li>2. Make sure that you have installed the network drivers from the motherboard support CD.</li> </ol>

