

IBM TotalStorage™ IP Storage 200i



Service Guide

IBM TotalStorage™ IP Storage 200i



Service Guide

Note

Before using this information and the product it supports, read the general information in "Safety and environmental notices" on page 124 and "Appendix F. Notices" on page 123.

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This edition applies to the IBM TotalStorage IBM IP Storage Models 100 and 200 and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this guide

This guide provides procedures for servicing the IBM TotalStorage™ IP Storage 200i, including how to:

- Analyze a problem or symptom
- Restore normal operation to the IBM IP Storage
- Exchange any of the removable parts of the IBM IP Storage
- Run stand-alone and operational diagnostics

Who should read this guide

This guide is intended for personnel responsible for servicing the IBM IP Storage.

Safety precautions

Be sure to read all caution and danger statements in this publication before performing any of the instructions.

Leia todas as instruções de cuidado e perigo antes de executar qualquer operação.

注意和危險聲明 (简体中文)

重要事項：

本書中的所有注意和危險聲明之前都有編號。該編號用於英語的注意或危險聲明與 *Safety Information* 一書中可以找到的翻譯版本的注意或危險聲明進行交叉引用。

例如，如果一個注意聲明以編號 1 開始，那麼對該注意聲明的翻譯出現在 *Safety Information* 一書中的聲明 1 中。

在按說明執行任何操作前，請務必閱讀所有注意和危險聲明。

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執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Accertarsi di leggere tutti gli avvisi di attenzione e di pericolo prima di effettuare qualsiasi operazione.

주의 및 위험 경고문(한글)

중요:

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Frequently used terms

The following list of terms, used within this document, have these specific meanings:

Term	Definition in this document
Drive bay	A receptacle into which you insert a hard disk drive in an appliance. The bays could be physically located in a separate rack from the appliance.
Engine	The processor that responds to requests for data from clients. This is where the operating software for the IBM IP Storage appliance resides.
Storage unit	Hardware that contains one or more drive bays, power supplies, and a network interface.
Notes	These notices provide important tips, guidance, or advice.
Attention	These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
Caution	These notices indicate situations that can be potentially hazardous to you. A caution notice is placed just before descriptions of potentially hazardous procedure steps or situations.
Danger	These notices indicate situations that can be potentially lethal or extremely hazardous to you. A danger notice is placed just before descriptions of potentially lethal or extremely hazardous procedure steps or situations.

Publications

Hardcopy publications shipped with the IBM IP Storage

The following publications are shipped in hardcopy. They are also provided in softcopy on the Publications and Code CD that came with your appliance and at www.ibm.com/storage/support/nas.

- *IBM TotalStorage IP Storage 200i Installation Guide, GA27-4273*
This publication provides detailed procedures for setting up and cabling components of the IBM IP Storage and for performing initial configuration.
- *Release Notes*
This document provides any changes that were not available at the time this publication was produced.
- *IBM TotalStorage IP Storage 200i Quick Start Instructions*
This document provides a brief list of procedures for setting up, cabling, and configuring the IBM IP Storage.

Softcopy publications

The following publications support the IBM IP Storage appliance. They are available in softcopy on the Publications and Code CD that came with your appliance and at www.ibm.com/storage/support/nas.

- *IBM TotalStorage IP Storage 200i Administrator's Guide*
This publication describes instructions for configuring, maintaining, recovering, and troubleshooting the appliance.
- *IBM TotalStorage IP Storage 200i Service Guide*
This publication describes instructions for troubleshooting, recovering, and servicing the IBM IP Storage appliance.
- *IBM TotalStorage IP Storage 200i Storage Unit Installation Guide*
This publication provides instructions for installing, replacing, and troubleshooting components in the Model EXP (storage unit).
- *IBM TotalStorage 5Ux24D Tower-to-Rack Kit Installation Guide*
This publication describes how to convert the Model 100 into a rack-mountable unit.
- *IBM TotalStorage Gigabit Ethernet Copper Adapter Quick Installation Guide*
This publication describes how to quickly install the Gigabit Ethernet Copper Adapter.
- *Netfinity Gigabit Ethernet SX Adapter User's Guide*
This publication describes how to quickly install the Gigabit Ethernet SX Adapter.

Web site

You can obtain complete FAQs, parts information, technical hints and tips, technical publications, and downloadable files from:

www.ibm.com/storage/support/nas

Chapter 1. Troubleshooting

This chapter provides basic troubleshooting information to help you resolve some common problems that might occur with your appliance.

Appliance controls and indicators

Figure 1, Figure 2 on page 2, Figure 3 on page 3, and Figure 4 on page 4 illustrate the various controls and indicators on the appliance models.

Note: The Model 100 is also known as the tower model. The Model 200 is also known as the rack model.

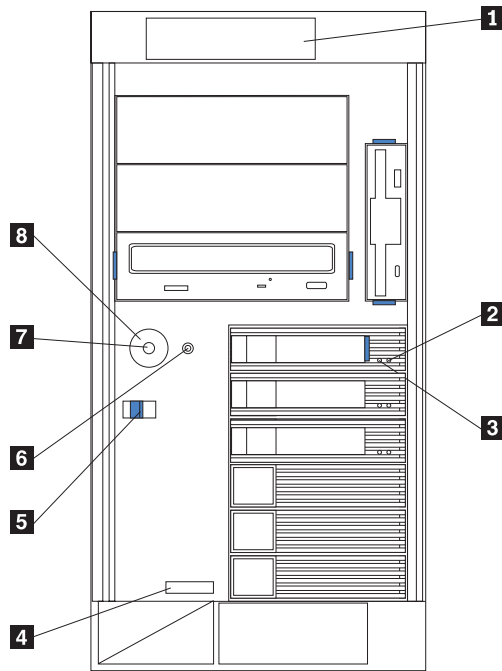


Figure 1. Model 100 front view

- 1** Operator Information panel
- 2** Hard Drive Status LED
- 3** Hard Drive Activity LED
- 4** Serial Number
- 5** Cover Release Latch
- 6** Reset Button
- 7** Power Control Button
- 8** Power Control Button Shield (if installed)

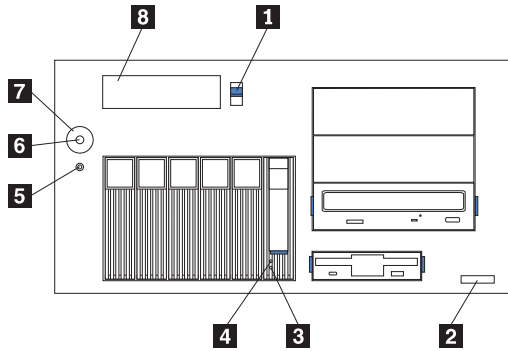


Figure 2. Model 200 front view

- 1** Cover-release latch
- 2** Serial Number
- 3** Hard Drive Status LED
- 4** Hard Drive Activity LED
- 5** Reset Button
- 6** Power Control Button
- 7** Power Control Button Shield (if installed)
- 8** Operator Information panel

Reset Button Press this button to reset the appliance and run the power-on self test (POST).

Attention: Press this button only when the appliance is hung. Pressing this button when the appliance is booting up or operating may make the appliance non-operational or corrupt the drives.

Operator Information panel

The LEDs on this panel give status information for your appliance. See “Operator information panel” on page 5 for more information.

Hard Drive Status LED

Each of the hot-swap drives has a Hard Drive Status LED. When this amber LED is on continuously, the drive has failed. When the LED flashes slowly (one flash per second), the drive is being rebuilt. When the LED flashes rapidly (three flashes per second), the controller is identifying the drive.

Hard Drive Activity LED

Each of the hot-swap drives has a Hard Drive Activity LED. When this green LED is flashing, the controller is accessing the drive.

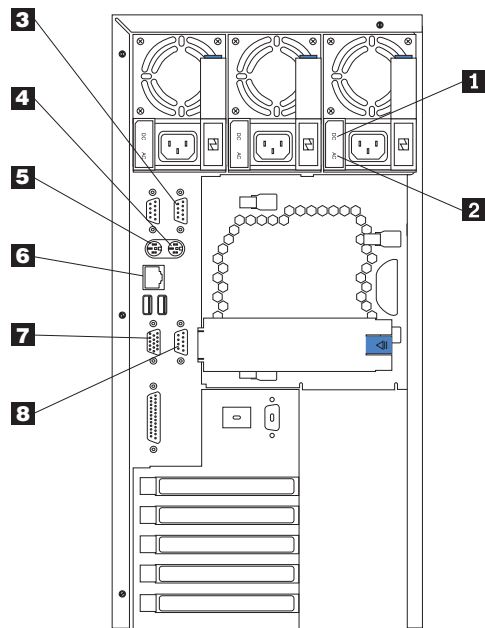


Figure 3. Model 100 rear view

- 1** AC Power LED
This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on.
- 2** DC Power LED
This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on.
- 3** Serial Port A
- 4** Mouse
- 5** Keyboard
- 6** Service Ethernet port
- 7** Video
- 8** Management

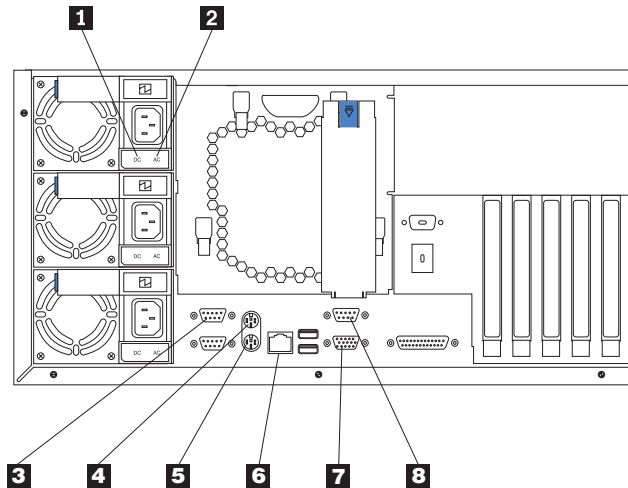


Figure 4. Model 200 rear view

- 1** AC Power LED
This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on.
- 2** DC Power LED
This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on.
- 3** Serial Port A
- 4** Mouse
- 5** Keyboard
- 6** Service Ethernet port
- 7** Video
- 8** Management

Operator information panel

The operator information panel on the front of the appliance contains status LEDs.

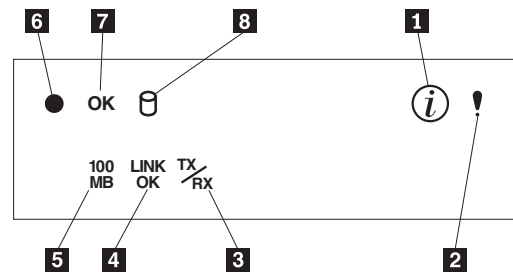


Figure 5. Operator information panel

- 1** Information LED
- 2** System Error LED
- 3** Service Ethernet Transmit/Receive Activity (TX/RX) LED
- 4** Service Ethernet Link Status (LINK OK) LED
- 5** Service Ethernet Speed (100 MB) LED
- 6** Power-on LED
- 7** POST Complete (OK) LED
- 8** SCSI Hard Drive In-use LED

Information LED

This amber LED is on when the information log contains information about certain conditions in your appliance that might affect performance. For example, the LED is on if your appliance does not have redundant power. An LED on the diagnostic panel on the system board will also be on.

System Error LED

This amber LED is on when a system error occurs. An LED on the diagnostic panel on the system board will also be on to further isolate the error.

Service Ethernet Transmit/Receive Activity LED

This green LED is on when there is transmit or receive activity to or from the appliance on the Service Ethernet port.

Service Ethernet Link Status LED

This green LED is on when there is an active connection on the Service Ethernet port.

Service Ethernet Speed LED

This green LED is on when the Service Ethernet LAN speed is 100 Mbps.

Power-on LED

This green LED is on when system power is present in the appliance. When this LED flashes, the appliance is in standby mode (the system power supply is turned off and ac power is present). If this LED is not on, the power cord is not connected, the power supply has failed, or this LED has failed.

POST Complete LED

This green LED is on when the appliance completes the POST without any errors.

SCSI Hard Drive In-use LED

This green LED is on when there is activity on a hard drive. With this appliance, the LED remains on constantly because the on-board SCSI port is disabled.

Basic Troubleshooting

Use this basic troubleshooting information as a starting point in detecting problem components. Begin with step 1 in “Basic system checkout” and proceed as directed.

Note: For more detailed troubleshooting information, refer to specific troubleshooting sections in this chapter.

Basic system checkout

1. Is the Power-on LED on or blinking? If yes, go to step 3. If no, go to step 2.
2. Are the power cords plugged in and attached to a good power supply? If yes, go to step 4.
3. Is the Power-on LED blinking? If yes, go to step 9. If no, go to step 10.
4. Is the System Error LED on? If yes, go to step 5. If no, go to step 6.
5. Open the box and use the diagnostics panel to determine which power supply to replace (see “Replacing hot-swap power supplies” on page 77).
6. Is the system fan on? If yes, go to step 7. If no, go to step 8.
7. Replace the external LED card.
8. See “Power Supply LED errors” on page 43 to troubleshoot power problems. This will determine if you need to replace a system board or fan.
9. Press the Power button. Then, go to step 9.
10. Is the POST Complete (OK) LED on? If yes, go to step 12. If no, go to step 11.
11. Connect the keyboard and monitor. Follow the directions for POST error determination (see “POST error codes” on page 44).
12. Connect the keyboard and monitor. Then, reboot the appliance. If the message Uncompressing Linux... OK, booting the kernel appears, go to step 14. If the message does not appear, go to step 13.
13. Reboot the appliance and follow the steps in “Starting the diagnostic programs” on page 10 to perform a check of the system IDE drive that contains the system code load. If the IDE drive is bad, go to step 16. If the IDE drive is good, go to step 15 to obtain a new system image.
14. Follow the steps in “Verifying the network connection is good.”
15. Use the Recovery CD. (See “Recovering the IBM IP Storage” on page 57 for information on using the Recovery CD.)
16. Replace the IDE drive (see “Installing an IDE (non-hot-swap) hard drive or CD-ROM” on page 75). Then, go to step 15.

Verifying the network connection is good

1. Do you have access to the Administrative Console from the IP-connected management console? If yes, go to step 3. If no, go to step 2.
2. Are you able to ping the appliance's IP address from the IP-connected management console? If yes, go to step 5. If no, go to step 4.
3. Check the LEDs on the Operator Information panel and act appropriately.
4. Is the Link LED on? If yes, go to step 7. If no, go to step 6.
5. Press **Reset** and allow the appliance to reboot. Then, return to step 1.
6. Check the network cabling and connections. Is the problem solved? If yes, verify step 1 and continue system operation. If no, go to step 7.
7. Connect a keyboard and monitor. Run the Gigabit Ethernet diagnostics diskette (see "Using the diagnostics diskette" on page 14).

Note: The diagnostics diskette is available at www.ibm.com/storage/support/nas.

Diagnostic tools overview

The following tools are available to help you identify and resolve hardware-related problems:

- POST beep codes, error messages, and error logs
- Light-path diagnostics
- Diagnostic programs and error messages

POST beep codes, error messages, and error logs

Note: You will need to connect a keyboard and monitor to your appliance in order to see error messages.

When you switch on the appliance, it performs a series of tests to check the operation of appliance components and some of the options installed in the appliance. This series of tests is called the power-on self-test (POST).

If POST finishes without detecting any problems, a single beep sounds and the POST Complete (OK) LED on the operator information panel is on.

If POST detects a problem, more than one beep sounds and an error message appears on your screen. See "Beep codes and their meanings" on page 31 and "POST error codes" on page 44 for more information.

Note: A single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After you correct the cause of the first error message, the other error messages usually will not occur the next time you run the test.

Event/error logs

The POST error log contains the three most-recent error codes and messages that the system generated during POST. The System Event/Error Log contains all error messages issued during POST and all system status messages from the Advanced System Management Processor.

To view the contents of the error logs:

1. Attach a keyboard and monitor to the appliance.

2. Restart the appliance.
3. Press **F1** to enter the Configuration/Setup Utility.
4. Follow the onscreen prompts.

Light-path diagnostics

If the System Error LED on the operator information panel is on, one or more LEDs inside the appliance or on the power supplies will be on. Use the light-path diagnostics to identify the type of error that occurred.

You can use the light-path diagnostics built into your appliance to quickly identify the type of system error that occurred. Your appliance is designed so that any LEDs that are illuminated remain that way when the appliance shuts down, provided that the ac power source is good and the power supplies can supply +5V dc to the appliance. This feature helps you isolate the problem if an error causes the appliance to shut down. See “Light-path diagnostics table” on page 9.

AC and DC Power LEDs

The AC and DC Power LEDs on the power supply provide status information about the power supply. See “Power Supply LED errors” on page 43.

Diagnostics panel

Figure 6 shows the LEDs on the diagnostics panel on the system board. See “Information panel System Error LED” on page 34 for information on identifying problems using these LEDs.

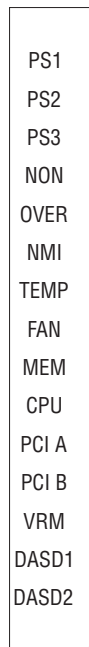


Figure 6. Diagnostics panel

Light-path diagnostics table

The System Error LED on the operator information panel is on when certain system errors occur. If the System Error LED on your appliance is on, use the table in “Information panel System Error LED” on page 34 to help determine the cause of the error, and the action you should take.

Diagnostics programs and error messages

Note: You will need to connect a keyboard and monitor to your appliance in order to see error messages.

The appliance diagnostic programs are stored in upgradable read-only memory (ROM) on the system board. These programs are the primary method of testing the major components of your appliance.

Diagnostic error messages indicate that a problem exists; they are not intended for use in identifying a failing part.

Sometimes the first error to occur causes additional errors. In this case, the appliance displays more than one error message. Always follow the suggested action instructions for the *first* error message that appears.

Error code format

The error code format is as follows:

fff-ttt-iii-date-cc-text message

where:

fff is the three-digit function code that indicates the function being tested when the error occurred. For example, function code 089 is for the microprocessor.

ttt is the three-digit failure code that indicates the exact test failure that was encountered.

iii is the three-digit device ID.

date is the date when the diagnostic test was run and the error recorded.

cc is the check digit that is used to verify the validity of the information.

text message

is the diagnostic message that indicates the reason for the problem.

Text messages

The diagnostic text message format is as follows:

Function Name: Result (test-specific string)

where:

Function Name

is the name of the function being tested when the error occurred. This corresponds to the function code (*fff*) given in the previous list.

Result can have one of the following values:

Passed: The diagnostic test completed without any errors.

Failed: The diagnostic test discovered an error.

User Aborted: You stopped the diagnostic test before it was complete.

Not Applicable: You specified a diagnostic test for a device that is not present.

Aborted: The test could not proceed because of the system configuration.

Warning: A possible problem was reported during the diagnostic test, such as when a device that was to be tested was not installed.

Test-specific string

is additional information that you can use to analyze the problem.

Starting the diagnostic programs

To start the diagnostic programs:

1. Switch ON the appliance.
2. When the message F2 for Diagnostics appears, press **F2**.
3. Select either **Extended** or **Basic** from the top of the panel.
4. When the Diagnostic Programs window appears, select the test you want to run from the list that appears; then, follow the instructions on the window.

Notes:

1. You can also press **F1** while running the diagnostic programs to obtain Help information, or press **F1** from within a help window to obtain online documentation. To exit Help and return to where you left off, press **Esc**.
2. If the appliance stops during testing and you cannot continue, restart the appliance and try running the diagnostic programs again.
3. You can view appliance configuration information (such as system configuration, memory contents, interrupt request [IRQ] use, direct memory access [DMA] use, device drivers, and so on) by selecting **Hardware Info** from the top of the panel.

When the tests have completed, you can view the Test Log by selecting **Utility** from the top of the panel.

If the hardware checks out OK, but the problem persists during normal appliance operations, a code error might be the cause. If you suspect a code problem, refer to the *IBM TotalStorage IP Storage 200i Administrator's Guide* that comes with the appliance code image load.

Viewing the test log

The test log does not contain any information until after the diagnostic program has run.

Note: If you are already running the diagnostic program, begin with step 3.

To view the test log:

1. Switch ON the appliance.

Note: If the appliance is already on but does not display the system diagnostics window, then shut down the appliance and restart the appliance in diagnostic mode.

2. When the message F2 for Diagnostics appears, press **F2**.
3. When the Diagnostic Programs panel appears, select **Utility** from the top of the panel.
4. Select **View Test Log** from the list that appears; then, follow the instructions on the panel.

The system maintains the test-log data while the appliance is powered on. When you switch off the appliance, the test log is cleared.

Diagnostics error message tables

Note: You will need to connect a keyboard and monitor to your appliance in order to see error messages.

The tables in “Diagnostics error codes” on page 37 provide descriptions of the error messages that might appear when you run the diagnostics programs.

Note: If diagnostics error messages appear that are not listed in the tables, make sure that your appliance has the latest levels of BIOS, Advanced System Management Processor, and diagnostics microcode installed.

Gigabit Ethernet adapters

This section describes how to troubleshoot the Gigabit Ethernet adapters and use the diagnostics diskette.

Note: The diagnostics diskette is available at www.ibm.com/storage/support/nas.

Troubleshooting the Gigabit Ethernet adapter

See Table 2 on page 13 and Table 1 for information on the Gigabit Ethernet adapter LEDs.

Note: See Figure 7 for the location of the Gigabit Ethernet Copper Adapter LEDs described in Table 1.

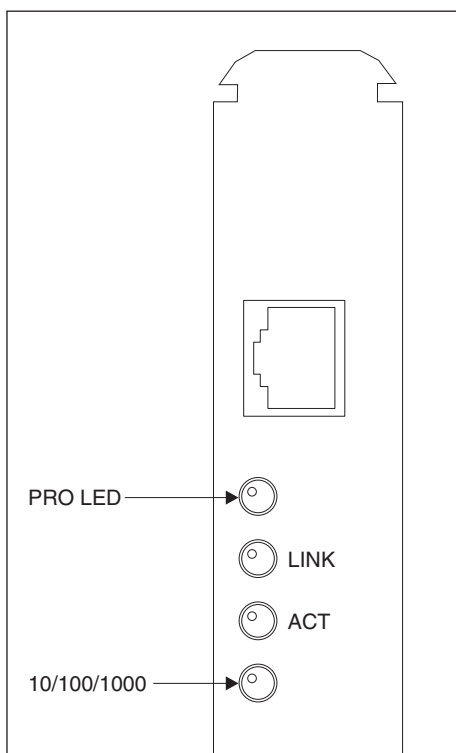


Figure 7. LEDs on the Gigabit Ethernet Copper Adapter

Table 1. LEDs on the Gigabit Ethernet Copper Adapter

LED	Meaning
PRO LED	Identifies the adapter by blinking.
LINK on	Indicates the adapter is connected to a valid link partner and is receiving pulses.
Blinking ACT LED	The adapter is sending/receiving data.
10/100/1000	Amber = 1000 Mbps Green = 100 Mbps Off = 10 Mbps

Note: See Figure 8 for the location of the Gigabit Ethernet SX Adapter LEDs described in Table 2.

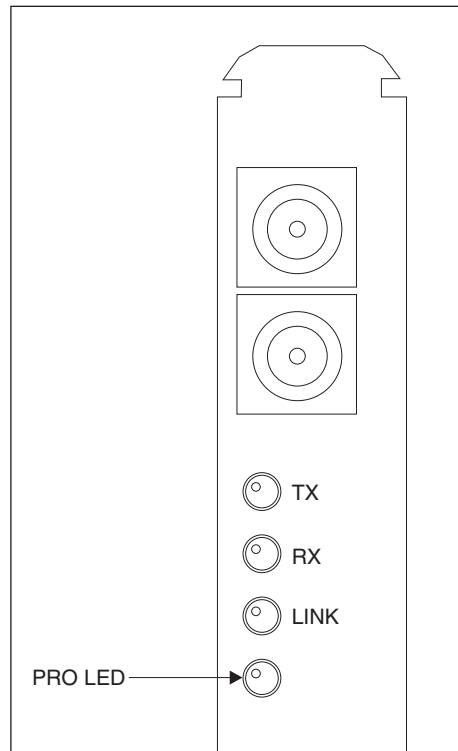


Figure 8. LEDs on the Gigabit Ethernet SX Adapter

Table 2. LEDs on the Gigabit Ethernet SX Adapter

LED	Meaning
PRO LED	Identifies the adapter by blinking.
TX on	The adapter is sending data.
RX on	The adapter is receiving data.
Link on	The adapter is connected to a valid link partner and is receiving link pulses.
Link off	Check all connections at the adapter and link partner. Make sure the link partner is set to 1000 Mbps and full duplex and the drive is loaded.

See Table 3 for information on troubleshooting the Ethernet adapter.

Table 3. Troubleshooting the Ethernet Adapters

Symptom	Suggested Actions
The computer cannot find the adapter.	<ul style="list-style-type: none"> • Ensure that the adapter is firmly seated in the slot. • Try a different PCI busmaster slot.
Diagnostic pass but the connection fails.	<ul style="list-style-type: none"> • Ensure that the network cable is securely attached.
The adapter stopped working for no apparent reason.	<ul style="list-style-type: none"> • Reseat the adapter. • Reinstall the operating system using the Recovery CD.

Table 3. Troubleshooting the Ethernet Adapters (continued)

Symptom	Suggested Actions
The Link LED does not appear.	<ul style="list-style-type: none"> • Check all connections at the adapter and the buffered repeater or switch. • Ensure that the operating system is operational. • Use a different port on the buffered repeater or switch. • Ensure that the buffered repeater or switch port is configured for 1000 Mbps and full duplex.
RX or TX LED or ACT LED does not appear	<ul style="list-style-type: none"> • Try a different adapter. • Ensure that the operating system is operational. • Log in from a workstation (the network may be idle).

Using the diagnostics diskette

Note: The diagnostics diskette is available at www.ibm.com/storage/support/nas.

You can use the diagnostics diskette to detect problems with the appliance's Gigabit Ethernet Adapter. This diskette can be used to test both Gigabit Ethernet Copper Adapters and Gigabit Ethernet SX Adapters. To use this diskette:

1. Connect a monitor and keyboard to the appliance.

Note: The monitor and keyboard are not supplied with the appliance and must be obtained separately.

2. Place the diagnostics diskette into the floppy drive slot and switch the appliance on.
3. Press **Enter** at the main diagnostics panel. The diagnostics will then search the appliance to ensure an adapter is installed.
4. If the proper adapter is detected, a selection panel will appear.
5. Select **Test the Adapter**. (If you wish to test the adapter without having a network connection, choose that option from the Main panel; then, return back to the Main panel to **Test the Adapter**.)
6. Upon successful completion of the test, exit the diagnostics program by following the onscreen prompts.

Note: If a faulty adapter is found, replace the adapter (see "Replacing a Gigabit Ethernet Adapter" on page 88) and rerun the diagnostics to ensure the new adapter is operating correctly.

7. After exiting the program, remove the diskette and press **Ctrl+Alt+Delete** to reboot the appliance.

ServeRAID controllers

This section provides basic troubleshooting information for the ServeRAID controllers. It also provides instructions on running ServeRAID controller diagnostics.

Troubleshooting the ServeRAID controllers

Figure 9 shows the ServeRAID-4H controller. Figure 10 on page 16 shows the ServeRAID-4L controller.

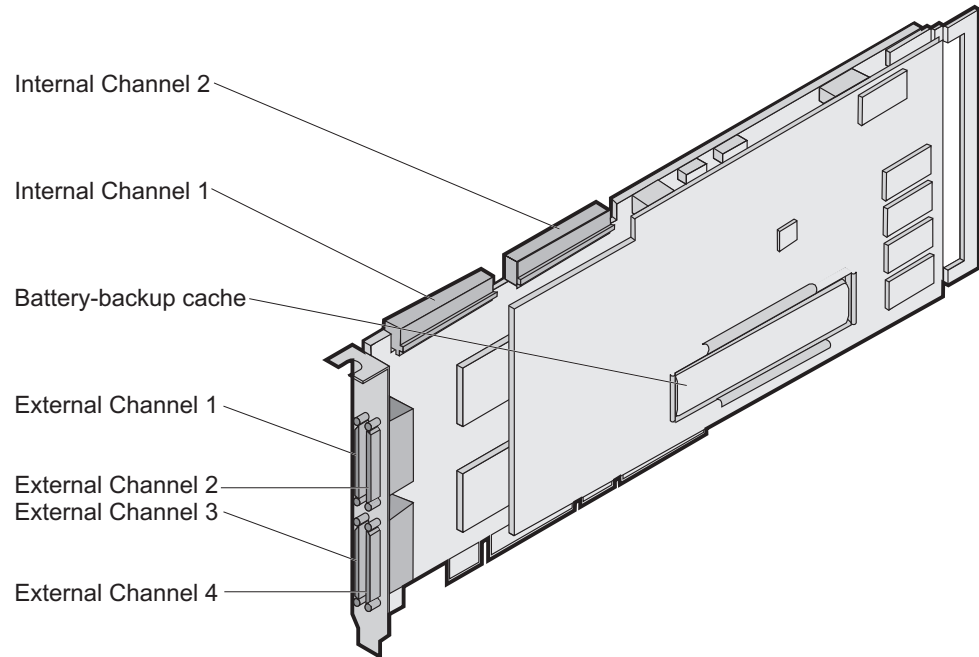


Figure 9. The ServeRAID-4H controller

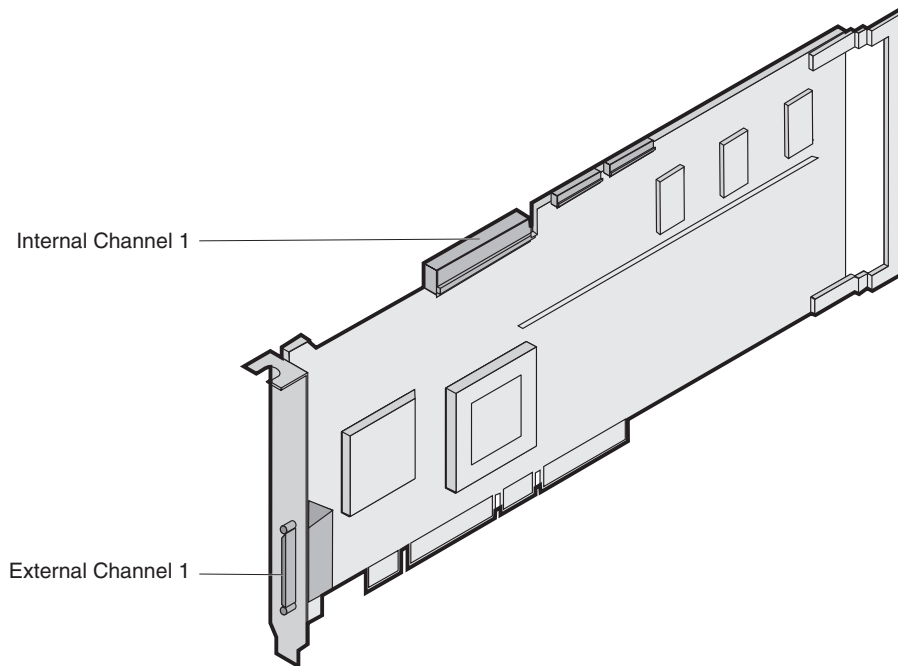


Figure 10. The ServeRAID-4L controller

ServeRAID controller messages

Note: You must connect a keyboard and monitor to the appliance to see the controller messages.

This section lists the ServeRAID messages that might appear during system startup. The ServeRAID controllers provide a Device Event Log that collects statistics on the number and types of events that occur on a selected physical drive. After correcting a problem with the disk array, clear the log so that you can identify any subsequent errors quickly.

All physical drives contain unique identifiers, such as the drive serial number and manufacturer. During configuration, the ServeRAID controller stores this information.

Following are messages associated with the ServeRAID subsystem in alphabetical order.

Table 4. ServeRAID controller messages

Message	Explanation	Action
A new drive was installed.	When the ServeRAID controller detects a new drive that is not part of the current configuration, the following message appears: x new Ready drives found where x is the number of Ready drives found.	This is an information message. No action is required.
Auto rearrange.	Auto rearrange is enabled or disabled.	This is an information message. No action is required.

Table 4. ServeRAID controller messages (continued)

Message	Explanation	Action
Battery-backup cache not responding.	BIOS code detected a bad or failed battery-backup cache.	Press F9 to remove the battery-backup cache from the configuration, or press F10 to exit without change.
Battery-backup cache replacement.	The ServeRAID controller detects that the battery-backup cache is defective.	Press F8 if you replaced the battery-backup cache, or press F10 if you have not replaced the battery-backup cache.
Configured drives are missing.	<p>When the ServeRAID controller detects that a previously configured drive is missing, the following message appears:</p> <p>x Online drives not responding where x is the number of drives not responding.</p> <p>Example of a possible message: Online Drive on Channel 3 SCSI ID 3 is not responding.</p>	<p>Press one of the following keys:</p> <p>F2 Detailed description. Press this key for a detailed description of the problem.</p> <p>F4 Retry. Press this key after correcting a problem. For example, press F4 after you switch on the external storage enclosure that contains the physical drive.</p> <p>F5 Change the configuration and set the drives to defunct. Press this key to accept the new state that the ServeRAID controller will assign to the drive. For example, the ServeRAID controller will assign the drive a state of defunct or empty. You can also press F5 when you must remove a drive. RAID level-1 and RAID level-5 logical drives are present, and performance in a degraded mode is acceptable. The ServeRAID controller will assign the drive a state of defunct, but the server can complete startup. However, the array will remain in Critical mode and the potential for data loss will exist until you replace and rebuild the defunct drive. To prevent the loss of data, replace and rebuild the defunct drive in a timely manner.</p> <p>Note: A physical drive in the defunct state does not necessarily mean that you need to replace the drive. Before you replace the drive, ensure that:</p> <ol style="list-style-type: none"> 1. All cables are connected properly to the backplane and to the physical drive. Also, ensure that all cables inside the server are connected properly. 2. The hot-swap drive trays are seated properly in the drive bay. 3. If multiple drives fail in separate arrays (one physical drive per array), then replace each of the defunct physical drives. <p>After you perform these steps, if the physical drive does not function properly, replace the drive.</p> <p>F10 Continue starting without changing the configuration. Press this key to continue without change to the configuration.</p>

Table 4. ServeRAID controller messages (continued)

Message	Explanation	Action
<p>Configured drives are not in the configured location.</p>	<p>When the ServeRAID controller detects that a previously configured drive is present, but the drive is in a new location, the following message appears:</p> <p>x Online drive has been rearranged where x is the number of drives that have been rearranged.</p> <p>For example:</p> <p>Online Drive on Channel 3 SCSI ID 4 moved to Channel 3 SCSI ID 3.</p>	<p>Press one of the following keys:</p> <p>F2 Detailed description. Press this key for a detailed description of the problem.</p> <p>F4 Retry. Press this key after correcting a problem. For example, press F4 after you move the physical drive to its previously assigned location.</p> <p>F5 Change the configuration and set the drive to defunct. Press this key to accept the new state that the ServeRAID controller assigns to the drive. For example, the ServeRAID controller will assign the drive a state of defunct or empty.</p> <p>Note: A physical drive in the defunct state does not necessarily mean that you need to replace the drive. Before you replace the drive, ensure that:</p> <ol style="list-style-type: none"> 1. All cables are connected properly to the backplane and to the physical drive. Also, ensure that all cables inside the server are connected properly. 2. The hot-swap drive trays are seated properly in the drive bay. 3. If multiple drives fail in separate arrays (one physical drive per array), then replace each of the defunct physical drives. <p>After you perform these steps, if the physical drive does not function properly, replace the drive.</p> <p>F5 Change the configuration and accept the rearrangement. Press this key to change the configuration to match the current drive location. You might remove the hot-swap drives from the server for security or maintenance reasons. If you replace the drives but install them in different drive bays, you can press F6 to accept the new locations, and the ServeRAID controller will update the configuration.</p> <p>F10 Continue startup without changing the configuration. Press this key to continue without change to the configuration.</p>
<p>Controller is not responding to commands. No logical drives are installed.</p>	<p>The ServeRAID controller is not operational.</p>	<p>Service the appliance.</p>

Table 4. ServeRAID controller messages (continued)

Message	Explanation	Action
<p>New controller installed in a configured server or drives are imported.</p>	<p>When the ServeRAID controller detects that the identifiers of the drives do not match the controller configuration information, the following message appears: x Online drive(s) found with mismatch configuration</p>	<p>Press one of the following keys:</p> <p>F2 Detailed description. Press this key for a detailed description of the problem, such as the example messages above.</p> <p>F4 Retry. Press this key after correcting the problem. For example, press F4 after you move the physical drive to its previously assigned location, or after you install the original physical drives back in the server.</p> <p>F5 Change the configuration and set the drive to defunct. Press this key to accept the new state that the ServeRAID controller will assign to the drive. For example, the ServeRAID controller will assign the drive a state of defunct or empty.</p> <p>Note: A physical drive in the defunct state does not necessarily mean that you need to replace the drive. Before you replace the drive, ensure that:</p> <ol style="list-style-type: none"> 1. All cables are connected properly to the backplane or system board, and to the physical drive. Also, ensure that all cables inside the server are connected properly. 2. The hot-swap drive trays are seated properly in the drive bay. 3. If multiple drives fail in separate arrays (one physical drive per array), then replace each of the defunct physical drives. <p>After you perform these steps, if the physical drive does not function properly, replace the drive.</p> <p>F7 Import configuration information from drive. Press this key to restart the server. Press this key to import the configuration information from the drive and to update the configuration information for the ServeRAID controller. This choice is useful when you replace the ServeRAID controller in an existing ServeRAID subsystem.</p> <p>You also might press F7 if you replace a whole set of drives with drives that were configured in another server with a ServeRAID controller.</p> <p>Note: When you install drives in a server that has no logical drives defined, the F7 choice will not appear. The ServeRAID controller does not contain any logical drives in its factory configuration. Therefore, F7 will not appear. In this case, do the following:</p> <ol style="list-style-type: none"> 1. Restart the server and press Ctrl+I to enter the Mini-Configuration program. Follow the onscreen prompts. 2. Select Advanced Functions. 3. Select Copy the Configuration from Drives to the Controller and follow the instructions on the screen.
<p>Recoverable configuration error.</p>	<p>The configuration data stored in NVRAM does not match the configuration data stored in the EEPROM.</p>	<ol style="list-style-type: none"> 1. Press Ctrl+I to access the ServeRAID Mini-Configuration menu. Follow the onscreen prompts. 2. Select Advanced Functions from the Main Menu. 3. Then, select Copy the Configuration from Drives to the Controller. Follow the onscreen prompts.

Table 4. ServeRAID controller messages (continued)

Message	Explanation	Action
Unrecoverable configuration error.	The configuration data stored in NVRAM does not match the configuration data stored in the EEPROM.	<ol style="list-style-type: none"> 1. Press Ctrl+I to access the ServeRAID Mini-Configuration menu. Follow the onscreen prompts. 2. Select Advanced Functions from the Main Menu. 3. Then, select Restore to the Factory Default Settings. Follow the onscreen prompts. <p>Note: Restoring to factory default settings sets all online drives in array to ready. You must import the configuration from the drives or diskette. Otherwise, you must create a new array, install the operating system, and restore data from backup.</p>
WARNING: <i>n</i> logical drives are critical; <i>n</i> logical drives are offline.	One or more physical drives have failed.	Replace the defunct drives as soon as possible to prevent data loss.
Your server has an error due to a Blocked Logical Drive.	One or more logical drives are blocked. A blocked logical drive cannot be accessed.	Press F4 to unblock the logical drive, or press F5 to continue without unblocking.

ServeRAID ISPR, BCS, and ECS POST error codes

This section describes the ISPR, BCS, and ECS POST error codes. See Table 5 for ISPR codes and Table 6 on page 21 for BCS and ECS codes.

Note:

1. When the ServeRAID controller requires your input, a list of function keys will appear below the message.
2. Where *sid* or *ch* appears in these messages, *sid* is the SCSI ID for the device, and *ch* is the channel to which the device is attached.
3. Where *m* or *n* appears in these messages, a number will appear in the actual message.

Table 5 contains information on ISPR codes.

Table 5. ISPR (Interrupt Status Port Register) codes

Code	Explanation	Action
1xxx to 7xxx	The POST detected an internal error.	Correct any problems.
2601 to 260B	The POST detected an error with the ServeRAID subsystem.	Correct any problems.
2610	The POST detected an error with the ServeRAID controller hardware.	Correct any problems.
2620	The POST detected that a ServeRAID configuration or hard disk error occurred.	View the existing device and configuration information for your ServeRAID subsystem. Correct any problems.
8xxx to Bxxx	The POST detected an error with the SCSI interface.	Verify that the SCSI cables are correctly connected and the SCSI termination is set properly for each installed SCSI device. Correct any problems.

Table 6 contains BCS and ECS codes.

Table 6. BCS and ECS codes

BCS	ECS	Explanation and possible recovery action
Code not in table	Code not in table	Explanation: The ServeRAID controller is not functioning properly. Action: Correct any problems.
00	01	Explanation: Invalid flash configuration. Action: Run the ServeRAID BIOS configuration diskette and follow the onscreen prompts. If no instructions appear or if the problem persists, correct any problems.
00	02	Explanation: Invalid flash and NVRAM configuration. Action: Run the ServeRAID BIOS configuration diskette and follow the onscreen prompts. If no instructions appear or if the problem persists, correct any problems.
00	03	Explanation: Invalid flash and NVRAM configuration. Action: Run the ServeRAID BIOS configuration diskette and follow the onscreen prompts. If no instructions appear or if the problem persists, correct any problems.
01	08	Explanation: No configuration was found in drives, or Online/Rebuild drives are not responding. Action: Press F4, F5, F7, or F10 .
01	18	Explanation: No configuration was found in drives, or Online/rebuild and Hot-Spare/Standby Hot-Spare drives are not responding. Action: Press F4, F5, F7, or F10 .
01	28	Explanation: No configuration was found in drives, or Online/Rebuild and Ready/Standby drives are not responding. Action: Press F4, F5, F7, or F10 .
01	38	Explanation: No configuration was found in drives, or Online/Rebuild, Hot-Spare/Standby Hot-Spare drives are not responding. Action: Press F4, F5, F7, or F10 .
01	48	Explanation: No configuration was found in drives, or Online/Rebuild drives are not responding and unidentified drives were found. Action: Press F4, F5, F7, or F10 .
01	58	Explanation: No configuration was found in drives, or Online/Rebuild and Hot-Spare/Standby Hot-Spare drive are not responding and unidentified drives were found. Action: Press F4, F5, F7, or F10 .
01	68	Explanation: No configuration was found in drives, or Online/Rebuild and Ready/Standby drives are not responding and unidentified drives were found. Action: Press F4, F5, F7, or F10 .
01	78	Explanation: No configuration was found in drives, or Online/Rebuild, Hot-Spare/Standby Hot-Spare, and Ready/Standby drives are not responding and unidentified drives were found. Action: Press F4, F5, F7, or F10 .
03	88	Explanation: A drive was imported from another server and it has valid configuration, and Online/Rebuild drives are not responding. Action: Press F4, F5, F7, or F10 .

Table 6. BCS and ECS codes (continued)

BCS	ECS	Explanation and possible recovery action
03	98	Explanation: A drive was imported from another server and it has valid configuration, and Online/Rebuild and Hot Spare/Standby Hot-Spare drives are not responding. Action: Press F4 , F5 , F7 , or F10 .
03	A8	Explanation: A drive was imported from another server and it has valid configuration, and Online/Rebuild and Ready/Standby drives are not responding. Action: Press F4 , F5 , F7 , or F10 .
03	B8	Explanation: A drive was imported from another server and it has valid configuration, and Online/Rebuild, Hot-Spare/Standby Hot-Spare, and Ready/Standby drives are not responding. Action: Press F4 , F5 , F7 , or F10 .
03	C8	Explanation: A drive was imported from another server and it has valid configuration, and Online/Rebuild drives are not responding and unidentified drives were found. Action: Press F4 , F5 , F7 , or F10 .
03	D8	Explanation: A drive was imported from another server and it has valid configuration, and Online/Rebuild and Hot-Spare/Standby Hot-Spare drives are not responding and unidentified drives were found. Action: Press F4 , F5 , F7 , or F10 .
03	E8	Explanation: A drive was imported from another server and it has valid configuration, and Online/Rebuild and Ready/Standby drives are not responding and unidentified drives were found. Action: Press F4 , F5 , F7 , or F10 .
03	F8	Explanation: A drive was imported from another server and it has valid configuration, and Online/Rebuild, Hot-Spare/Standby Hot-Spare, and Ready/Standby drives are not responding and unidentified drives were found. Action: Press F4 , F5 , F7 , or F10 .
07	00	Explanation: The specified drive is not responding. Action: <ol style="list-style-type: none"> 1. If the specified physical drive is in an external enclosure, check to make sure the enclosure is powered on. If the enclosure is not powered on, switch on the power and press F4 to retry. 2. Run the ServeRAID BIOS configuration diskette. 3. Replace the failed physical drive.
07	08	Explanation: The specified drives are not responding. Action: To correct the problem: <ol style="list-style-type: none"> 1. If the specified physical drives are in an external enclosure, check to make sure the enclosure is powered on. 2. If the enclosure is not powered on, switch on the power and press F4 to retry. 3. Run the ServeRAID BIOS configuration diskette. 4. Replace the failed physical drives.
07	0C	Explanation: Online/Rebuild drives are not responding, and a drive was found at the incorrect SCSI ID. Action: Press F4 , F5 , F6 , or F10 .

Table 6. BCS and ECS codes (continued)

BCS	ECS	Explanation and possible recovery action
07	18	Explanation: Online/Rebuild and Hot-Spare/Standby Hot-Spare drives are not responding. Action: Press F4, F5, or F10.
07	1C	Explanation: Online/Rebuild and Hot Spare/Standby Hot-Spare drives are not responding, and a drive was found at the incorrect SCSI ID. Action: Press F4, F5, F6, or F10.
07	28	Explanation: Online/Rebuild and Ready/Standby drives are not responding. Action: Press F4, F5, or F10.
07	2C	Explanation: Online/Rebuild and Ready/Standby drives are not responding, and a drive was found at the incorrect SCSI ID. Action: Press F4, F5, F6, or F10.
07	38	Explanation: Online/Rebuild, Ready/Standby, and Hot-Spare/Standby Hot-Spare drives are not responding. Action: Press F4, F5, or F10.
07	3C	Explanation: Online/Rebuild, Ready/Standby, and Hot-Spare/Standby Hot-Spare drives are not responding, and a drive was found at the incorrect SCSI ID. Action: Press F4, F5, F6, or F10.
07	48	Explanation: Online/Rebuild drives are not responding, and unidentified drives were found. Action: Press F4, F5, or F10.
07	4C	Explanation: Online/Rebuild drives are not responding, and a drive was found at the incorrect SCSI ID, and unidentified drives were found. Action: Press F4, F5, F6, or F10.
07	58	Explanation: Online/Rebuild and Hot Spare/Standby Hot-Spare drives are not responding, and unidentified drives were found. Action: Press F4, F5, or F10.
07	5C	Explanation: Online/Rebuild and Hot Spare/Standby Hot-Spare drives are not responding, a drive was found at the incorrect SCSI ID, and unidentified drives were found. Action: Press F4, F5, F6, or F10.
07	68	Explanation: Online/Rebuild and Ready/Standby drives are not responding, and unidentified drives were found. Action: Press F4, F5, or F10.
07	6C	Explanation: Online/Rebuild and Ready/Standby drives are not responding, a drive was found at the incorrect SCSI ID, and unidentified drives were found. Action: Press F4, F5, F6, or F10.
07	78	Explanation: Online/Rebuild, Ready/Standby, and Hot-Spare/Standby Hot-Spare drives are not responding, and unidentified drives were found. Action: Press F4, F5, or F10.

Table 6. BCS and ECS codes (continued)

BCS	ECS	Explanation and possible recovery action
07	7C	Explanation: Online/Rebuild, Ready/Standby, and Hot-Spare/Standby Hot-Spare drives are not responding, a drive was found at the incorrect SCSI ID, and unidentified drives were found. Action: Press F4 , F5 , F6 , or F10 .
09	00	Explanation: No error occurred. Action: No action is required.
09	10	Explanation: Hot-Spare/Standby Hot-Spare drives are not responding. Action: Press F4 , F5 , or F10 .
09	20	Explanation: Ready/Standby drives are not responding. Action: Press F4 , F5 , or F10 .
09	30	Explanation: Hot-Spare/Standby Hot-Spare and Ready/Standby drives are not responding. Action: Press F4 , F5 , or F10 .
0F	00	Explanation: No error occurred. Action: No action is required.
0F	10	Explanation: Hot-Spare/Standby Hot-Spare drives are not responding. Action: Press F4 , F5 , or F10 .
0F	20	Explanation: Ready/Standby drives are not responding. Action: Press F4 , F5 , or F10 .
0F	30	Explanation: Hot-Spare/Standby Hot-Spare and Ready/Standby drives are not responding. Action: Press F4 , F5 , or F10 .

Running ServeRAID controller diagnostics

Follow these steps to run ServeRAID controller diagnostics:

1. Connect a monitor and keyboard to the appliance.
2. Start the appliance.
3. Press **F2** for System Diagnostics. Wait until it boots. A message stating F2 has been pressed. Booting to Diagnostics appears.

Note: For more details on using the diagnostics programs and viewing the test logs, see “Diagnostics programs and error messages” on page 9.

4. After the diagnostics boot is complete, the main PC Doctor panel appears.
5. Select **Extended** from the top of the panel; then, press **Enter**.
6. Scroll down to the **SCSI/RAID Controller** option; then, press **Enter**.
7. The ServeRAID controller in the appliance is **ServeRAID Controller 1**. Scroll down and ensure the tabbed area beside this option is highlighted; then, press **Enter**. This begins the testing, which may take up to fifteen minutes to complete.
8. If the tests are successful, the word **PASSED** appears in the highlighted area.

If the tests are not successful, view the results in the test log (see “Viewing the test log” on page 11) and replace the faulty device. If the ServeRAID controller is the faulty device, refer to “Replacing the ServeRAID controller” on page 82. After replacing the faulty device, return to step 1 on page 24 and repeat these steps.

Note: The SCSI drives attached to the controller are also interrogated during this test; as a result, the test log may show SCSI drive problems in addition to controller problems.

9. Press **Esc**; then, select **Quit** and press **Enter**. A prompt appears asking if you want to reboot. Enter **y** to reboot the appliance.

Troubleshooting the storage unit (Model EXP)

Use Table 7 to find solutions for storage unit problems with definite symptoms.

Table 7. Model EXP problems and suggested actions

Problem indicator	Component	Possible cause	Suggested Actions
Amber LED is on	Hard drive	Drive failure	Replace the failed drive. Refer to <i>IBM TotalStorage IP Storage 200i Storage Unit Installation Guide</i> .
	ESM board	Board failure	Replace failed board. Refer to <i>IBM TotalStorage IP Storage 200i Storage Unit Installation Guide</i> .
	Front panel	General machine fault; a Fault LED somewhere on the storage unit has been switched on	Check for amber LEDs. Refer to <i>IBM TotalStorage IP Storage 200i Storage Unit Installation Guide</i> .
Amber LED is on and green LED is off	Power supply	Power is switched off	Switch on all power supplies. See <i>IBM TotalStorage IP Storage 200i Storage Unit Installation Guide</i> .
Amber and green LEDs are on	Power supply	Power supply failure	Replace the failed power supply. See <i>IBM TotalStorage IP Storage 200i Storage Unit Installation Guide</i> .
All green LEDs are off		The storage unit is switched off	Check that all storage unit power cables are plugged in and the power is on. If applicable, check that the main circuit breakers for the rack are switched on. If the external switch 1 is set to Off, the SCSI controller must be cabled to the storage unit and switched on.
		AC power failure	Check the main circuit breaker and ac outlet.
		Power supply failed	Replace the power supply. See <i>IBM TotalStorage IP Storage 200i Storage Unit Installation Guide</i> .
		Midplane failure	Service the storage unit.
Amber LED is flashing	Hard drive	Drive rebuild or identity is in process	No corrective action is needed.
	Power supply	Fan failure	Replace the power supply.

Table 7. Model EXP problems and suggested actions (continued)

Problem indicator	Component	Possible cause	Suggested Actions
Amber LED is on and green DC power LED is off	Power supply	Power supply failure	If the power switch is ON, replace the power supply. See <i>IBM TotalStorage IP Storage 200i Storage Unit Installation Guide</i> .
Amber LED is on and green AC Power LED is off	Power supply	No ac power to power supply. Check the ac power cord (cable) or breaker	If ac power is good at the source, replace the power cord. If the power supply has failed, replace the power supply. See <i>IBM TotalStorage IP Storage 200i Storage Unit Installation Guide</i> .
Green LED is on	Drive ID=6	Cluster configuration	If the storage unit is not currently cluster configured, power cycle it to reenable ID=6.
One or more green LEDs are off	One or two drives	No activity to the drives	No action is required.
	All drives or those on one bus	No activity to the drives	No action is required.
		Damaged or loose SCSI cables	Check SCSI-bus cables and connections.
		ESM board failure	Use RAID management code to check the SCSI-bus status. Replace the ESM board. See <i>IBM TotalStorage IP Storage 200i Storage Unit Installation Guide</i> .
		Midplane failure	Service the storage unit.
	Front panel	Power supply	Make sure the cables are plugged in and power supplies are switched on.
Hardware failure		If any other LEDs are on, service the storage unit.	
Intermittent or sporadic power loss to the storage unit		Defective ac power source or partially plugged power cable	Check the ac power source. Resecure all installed power cables and power supplies. If applicable, check the power components (power units, UPS, and so on). Replace defective power cables.
		Power supply failure	Check for a fault LED on the power supply and replace the failed power supply.
		Midplane failure	Service the storage unit.
Unable to access drives on one or both SCSI buses	Drives and SCSI bus	Incorrect SCSI ID settings.	Make sure SCSI cables are undamaged and properly connected. Check the drive SCSI ID settings. Ensure that option switches 1 and 3 (inside the switch card) are set to the appropriate positions. Attention: Change switch positions only when your host server and storage unit are switched off.
		ESM board failure	Service the storage unit.
	Bridge card	Bridge card failure	All high address or all low address hard-disk drive failed; check the bridge card and replace it if necessary.

Table 7. Model EXP problems and suggested actions (continued)

Problem indicator	Component	Possible cause	Suggested Actions
Random errors	Subsystem	Midplane failure	Service the storage unit.

Note: If you cannot find the problem in the troubleshooting table, test the entire system. See your appliance documentation for more detailed information on testing and diagnostic tools.

If you already have run the server test program, or if running the test does not reveal the problem, have the system serviced.

Power checkout

Power problems can be difficult to troubleshoot. For example, a short circuit can exist anywhere on any of the power distribution buses. Usually, a short circuit will cause the power subsystem to shut down because of an overcurrent condition.

A general procedure for troubleshooting power problems is as follows:

1. Switch OFF the system and disconnect the ac cords.
2. Check for loose cables in the power subsystem. Also check for short circuits; for example, if there is a loose screw causing a short circuit on a circuit board.
3. Remove adapters and disconnect the cables and power connectors to all internal and external devices until the system is at the minimum configuration required for power-on (see page 56).
4. Reconnect the ac cord and switch ON the system. If the system starts successfully, replace adapters and devices one at a time until the problem is isolated. If the system does not start from minimal configuration, replace parts of the minimal configuration one at a time until the problem is isolated.

To use this method it is important to know the minimum configuration required for a system to start (see page 43). For specific problems, see “Power error messages” on page 52.

Temperature checkout

Proper cooling of the system is important for proper operation and system reliability. For a typical appliance, you should make sure that:

- Each of the drive bays has either a drive or a filler panel installed.
- Each of the power supply bays has a power supply installed.
- The top cover is in place during normal operation.
- There is at least 50 mm (2 in.) of ventilated space at the sides of the appliance and 100 mm (4 in.) at the rear of the appliance.
- The top cover is removed for no longer than 30 minutes while the appliance is operating.
- The processor housing cover covering the processor and memory area is removed for no longer that 10 minutes while the appliance is operating.
- A removed hot-swap drive is replaced within 2 minutes of removal.
- Cables for optional adapters are routed according to the instructions provided with the adapters (ensure that cables are not restricting air flow).

- The fans are operating correctly and the air flow is good.
- A failed fan is replaced within 48 hours.

In addition, ensure that the environmental specifications for the system are met. See “Appendix E. Specifications” on page 121.

For more information on specific temperature error messages, see “Temperature error messages” on page 51.

Troubleshooting the IDE drive

This section describes symptoms and diagnostics. See “Installing an IDE (non-hot-swap) hard drive or CD-ROM” on page 75 for information on replacing an IDE drive.

Symptoms of a problem in the IDE drive

The following symptoms may indicate a problem with your IDE drive:

- You can no longer ping the appliance from the management workstation.
- The system appears to be hung.

Running IDE diagnostics

Follow these steps to run IDE diagnostics:

1. Connect a monitor and keyboard to the appliance.
2. Start the appliance.
3. Press **F2** for System Diagnostics. Wait until it boots. A window stating F2 has been pressed. Booting to Diagnostics appears.

Note: For more details on using the diagnostics programs and viewing the test logs, see “Diagnostics programs and error messages” on page 9.

4. After completing the diagnostics boot, the main PC-Doctor window appears.
5. Select **Extended** from the top of the window; then, press **Enter**.
6. Scroll down to the **Fixed Disk** option; then, press **Enter**.
7. The IDE drive containing the code is on Drive 0. The six tests under Drive 0 are the only options that should be selected.

Note: Use the spacebar and arrow keys to deselect the other options.

8. Press **Ctrl+Enter** to run the selected tests.

Note: This may take up to ten minutes.

9. If the tests under the Disk 0 menu show an operational IDE drive, the status is passed. If the tests were not successful, go to step 11.
10. Press **Esc**; then, select **Quit** and press **Enter**. A prompt appears asking if you want to reboot. Enter **y** to reboot the appliance.
11. If the non-hot-swap (IDE) drive failed, replace it (see “Installing an IDE (non-hot-swap) hard drive or CD-ROM” on page 75).
12. Download a new system image from www.ibm.com/storage/support/nas and install the new image on the network’s FTP server.
13. Run the Recovery CD (see “Recovering the IBM IP Storage” on page 57).

Chapter 2. Symptom-to-part index

This index lists symptoms, errors, and the possible causes. The most likely part that needs to be replaced is listed first. Use this symptom-to-part index to help you decide which parts to have available when servicing the product.

The POST BIOS displays POST error codes and messages on the panel.

Beep codes and their meanings

A beep code is an audio signal consisting of a short tone or a series of short tones separated by pauses. For example, beep code **1-2-3** consists of:

- One beep
- A pause
- Two beeps
- A pause
- Three beeps

Note: One beep after the POST completes successfully indicates that the system is operating correctly.

Table 8 lists the beep codes, their meanings, and the possible cause.

Note: The most likely suspected part is listed first.

Table 8. Beep codes, meanings, and possible cause.

Beep code	Meaning	Possible cause
1-1-2	Processor register test failed	1. Optional processor (if installed) 2. Processor
1-1-3	CMOS write/read test failed	1. Battery 2. System board
1-1-4	BIOS ROM checksum failed	System Board
1-2-1	Programmable Interval Timer failed	1. System Board 2. Processor Board
1-2-2	DMA initialization failed	1. System Board 2. Processor Board
1-2-3	DMA page register write/read failed	1. System Board 2. Processor Board
1-2-4	RAM refresh verification failed	1. DIMM 2. Processor/PCI board 3. System Board
1-3-1	First 64K RAM test failed	1. DIMM 2. Processor/PCI Board 3. System Board

Table 8. Beep codes, meanings, and possible cause. (continued)

1-3-2	First 64K RAM parity test failed	1. DIMM 2. Processor 3. System Board
2-1-1	Secondary DMA register failed	1. System Board 2. Processor Board
2-1-2	Primary DMA register failed	1. System Board 2. Processor Board
2-1-3	Primary interrupt mask register failed	1. System Board 2. Processor Board
2-1-4	Secondary interrupt mask register failed	1. System Board 2. Processor Board
2-2-2	Keyboard controller failed	System Board
2-2-3	CMOS power failure and checksum checks failed	1. Battery 2. System Board
2-2-4	CMOS configuration into validation failed	1. Battery 2. System Board
2-3-1	Screen initialization failed	1. Jumper on J14 2. System Board
2-3-2	Screen memory failed	System Board
2-3-3	Screen retrace failed	System Board
2-3-4	Search for video ROM failed	System Board
2-4-1	Search for video ROM failed	System Board
3-1-1	Timer tick interrupt failed	System Board
3-1-2	Interval timer channel 2 failed	System Board
3-1-3	RAM test failed above address OFFFFH	1. DIMM 2. Processor Board 3. System Board
3-1-4	Time-of-day clock failed.	1. Battery 2. System Board
3-2-1	Serial port failed	System Board
3-2-2	Parallel port failed	System Board
3-2-4	Failure comparing CMOS memory size against actual	1. DIMM 2. Processor Board 3. Battery
3-3-1	Memory size mismatch occurred	1. DIMM 2. Processor Board 3. Battery

Table 8. Beep codes, meanings, and possible cause. (continued)

3-3-2	Critical SMBUS error occurred	Disconnect the appliance cord from the outlet, wait 30 seconds, and retry. If the symptom persists, suspect the following parts: <ol style="list-style-type: none"> 1. System Board 2. Processor/PCI Board 3. DIMMs 4. DASD Backplane 5. Power Supply 6. Power Supply Backplane 7. 12C Cable
3-3-3	No operational memory in system	<ol style="list-style-type: none"> 1. DIMMs 2. Processor/PCI Board 3. System Board
Two short beeps	Information only, the configuration has changed	<ol style="list-style-type: none"> 1. Run Diagnostics 2. Run Configuration/Setup
Three short beeps		<ol style="list-style-type: none"> 1. DIMM 2. Processor/PCI Board 3. System Board
One continuous beep		<ol style="list-style-type: none"> 1. Processor 2. Optional Processor (if installed) 3. Processor/PCI Board 4. System Board
Repeating short beeps		<ol style="list-style-type: none"> 1. Keyboard 2. Repeating Board
One long and one short beep		<ol style="list-style-type: none"> 1. Video adapter (if installed) 2. System Board
One long and two short beeps		<ol style="list-style-type: none"> 1. Video adapter (if installed) 2. System Board
One long and three short beeps	Monitor not present	None Note: This is normal.
Two long and two short beeps		Video adapter

Symptoms that have no beep codes

Table 9 lists symptoms with no beep codes and suggested actions.

Table 9. Symptoms that have no beep codes

No Beep System	Meaning	Suspected Parts/Suggested Actions
No beep but the system operates correctly.		Check speaker cables. If the problem persists, suspect the following parts: <ol style="list-style-type: none">1. Speaker2. System Board
No beeps occur after successfully completing POST.	The Power-on Status is disabled	Rerun the BIOS Configuration and Update diskette.
No ac power	Power Supply AC LED is off	Suspected parts: <ul style="list-style-type: none">• Power Backplane• Hot-Swap Power AC Inlet Box Suggested actions: <ol style="list-style-type: none">1. Check the power cord.2. Exchange the unlit power supply with a power supply that has a Power Supply AC LED on. This will determine if the unlit power supply is defective.
No beep and no video		Refer to “Undetermined Problems” on page 56.
System will not power-on	AC Power LED is on	Refer to “Power Supply LED errors” on page 43.

Information panel System Error LED

The System Error LED is switched on when an error is detected. If the System Error LED is on, remove the cover and check the diagnostic panel LEDs (in the upper right corner of the system board). Table 10 on page 35 is a complete list of diagnostic panel LEDs and the suggested action.

Note: If a diagnostic panel LED is on and the information LED panel system error LED is off, there is probably an LED problem. Run the light-panel diagnostics by pressing **F2** (see “Light-path diagnostics” on page 8).

Notes:

1. To locate the LEDs on the processor board see “System board” on page 64.
2. Check the System Error Log for additional information before replacing a part.
3. The DIMM error LEDs, processor error LEDs, and VRM error LEDs turn off when the system is switched off.

Table 10 describes panel system error LED settings, their meanings, and suspected parts/suggested actions.

Table 10. Panel system error LED settings

Diagnostic Panel LED	Meaning	Suspected Part/Suggested Action
All LEDs off	The System Error Log is 75% full.	Suggested actions: 1. Clear the log 2. PFA alert a. Clear PFA alert b. Remove ac power for at least 20 seconds c. Reconnect d. Switch on the system 3. Run Information Panel diagnostics
CPU LED is on	The LED next to the failing CPU should be on.	Suspected parts: 1. Processor 1 or 2 2. Processor/PCI Board
VRM LED is on	The LED next to the failing VRM should be on.	Suspected parts: 1. Voltage regulator module indicated by the VRM LED on the processor board that is switched on 2. Processor/PCI Board 3. Processor indicated by the Processor LED
DASD1 LED is on	The LED located next to the drive bay that the failing drive is installed in should be on.	Note: This light is not on because the onboard SCSI is disabled. Suspected parts: 1. SCSI Backplane 2. Failing drive: SCSI channel A has failed (This is the SCSI channel for the hot-swap hard disk drives) Suggested actions: 1. Check amber drive LED for failing hard drive 2. Ensure that the fans are operating correctly and the air flow is good
DASD2 LED is on	The LED located next to the drive bay that the failing drive is installed in is on.	Note: This light is not on because the onboard SCSI is disabled. Suspected parts: 1. SCSI Backplane 2. Failing drive: SCSI channel B has failed Suggested actions: 1. Check amber drive LED for failing hard drive 2. Ensure the fans are operating correctly and the air flow is good
FAN LED is on		Suspected parts: 1. Fan Cable 2. Processor/PCI Board 3. System Board 4. Power Backplane Board Suggested actions: 1. Check individual fan LEDs 2. Replace respective fan

Table 10. Panel system error LED settings (continued)

Diagnostic Panel LED	Meaning	Suspected Part/Suggested Action
MEM LED is on	The LED next to the failing DIMM is on.	Suspected parts: 1. Failing DIMM in slot J1 - J4 2. Processor/PCI Board
NMI LED is on		Suggested actions: 1. Reboot the system 2. Check the System Error Log
PCI A LED is on		Suspected parts: 1. PCI Card in slot 5 2. Processor/PCI Board 3. System Board Suggested action: Remove all PCI adapters from slots 1–5
PCI B LED is on		Suspected parts: 1. System Board 2. Processor/PCI Board 3. Card in slots 3–5 Suggested action: Remove all PCI adapters from slots 1–5
PCI C LED is on		Suspected parts: 1. Processor/PCI Board 2. I/O Legacy Board Suggested action: Remove all PCI adapters from slots 1–5
PS1 LED is on		Suspected part: Power Backplane Suggested action: Check the DC Power LED on power supply 1. If it is off, replace power supply 1.
PS2 LED is on		Suspected part: Power Backplane Suggested action: Check the DC Power LED on power supply 2. If off, replace power supply 2.
OVER LED is on		Suggested action: Check for a faulty adapter or remove the optional devices from the appliance.
SMI LED is on		Suggested action: Reboot the system

Table 10. Panel system error LED settings (continued)

Diagnostic Panel LED	Meaning	Suspected Part/Suggested Action
TEMP LED is on	Look at the test cases.	<p>Suspected parts:</p> <ol style="list-style-type: none"> 1. Processor/PCI Board 2. I/O Legacy Board <p>Suggested actions:</p> <ol style="list-style-type: none"> 1. Ambient temperature is within normal operating specifications. See "Appendix E. Specifications" on page 121. 2. Ensure that fans are operating correctly. 3. Examine the System Error Log. <ol style="list-style-type: none"> a. System is over the recommended temperature. <ol style="list-style-type: none"> 1) Information LED Panel. 2) I/O Legacy Board. b. DASD is over the recommended temperature (the DASD LED is also on). <ol style="list-style-type: none"> 1) Overheating hard drive 2) DASD Backplane. 3) I/O Legacy Board. c. System is over the recommended temperature for CPU X (where X is CPU 1, 2, 3, or 4) (CPU LED also on). <ol style="list-style-type: none"> 1) CPU X. 2) Processor/PCI Board d. The I/O Legacy Board is over the recommended temperature. 4. If the CPU LED on the diagnostics panel is also on, one of the microprocessors has caused the error.

Diagnostics error codes

Note: In the following error codes, if *XXX* is 000, 195, or 197, *do not* replace a part. These error codes have the following meanings:

- 000** The test passed.
- 195** **Esc** was pressed to end the test.
- 197** This is a warning error and may not indicate a hardware failure.

For all other error codes, replace the part or perform the actions indicated.

Table 11 describes diagnostic error codes and their suggested actions.

Table 11. Diagnostic error codes

Error Code	Meaning	Suspected Part/Suggested Actions
001-XXX-000	Failed core tests	Suspected part: 1. Processor/PCI Board 2. System Board
001-XXX-001	Failed core tests	Suspected part: Processor/PCI Board
001-250-000	Failed System Board ECC	Suspected part: 1. Processor/PCI Board 2. System Board
001-250-001	Failed Processor Board ECC	Suspected part: 1. Processor/PCI Board 2. System Board
005-XXX-000	Failed Video test	Suspected part: 1. System Board 2. Processor Board
011-XXX-000	Failed COM1 Serial Port test	Suspected part: System Board
011-XXX-001	Failed COM2 Serial Port test	Suspected part: System Board
014-XXX-000	Failed Parallel Port test	Suspected part: System Board
015-XXX-001	Failed USB test	Suspected part: System Board
020-XXX-000	Failed PCI Interface test	Suspected part: 1. Processor/PCI Board 2. System Board
020-XXX-001	Failed Hot-Swap Slot 1 LED Latch test.	Suspected part: 1. PCI Hot-Swap Latch Assembly 2. System Board
020-XXX-002	Failed Hot-Swap Slot 2 PCI Latch test	Suspected part: 1. PCI Hot-Swap Latch Assembly 2. System Board
020-XXX-003	Failed Hot-Swap Slot 3 PCI Latch test	Suspected part: 1. PCI Hot-Swap Latch Assembly 2. System Board
020-XXX-004	Failed Hot-Swap Slot 4 PCI Latch test	Suspected part: 1. PCI Hot-Swap Latch Assembly 2. System Board
030-XXX-000	Failed Internal SCSI interface test	Suspected part: System Board
030-XXX-00N	Failed SCSI test on PCI slot N	Suspected part: Adapter Suggested action: Check system error log before replacing a part.

Table 11. Diagnostic error codes (continued)

Error Code	Meaning	Suspected Part/Suggested Actions
035-XXX-099	No adapters were found	Suggested action: If the adapter is installed, recheck the connection.
035-XXX-S99	Failed RAID test on PCI slot S	Note: Check the System Error Log before replacing a part. Suspected part: 1. Cable 2. SCSI Backplane 3. Adapter
035-XXX-SNN	NN = SCSI ID of failing hard disk	Note: Check the System Error Log before replacing a part. Suspected part: Hard Disk with SCSI ID NN on RAID adapter in PCI slot S.
035-253-S99	RAID adapter initialization failure; ServeRAID Adapter in slot S is not configured properly	Suspected part: 1. Cable 2. SCSI Backplane 3. Adapter Suggested action: Obtain the basic and extended configuration status.
075-XXX-000	Failed Power Supply test	Suspected part: Power Supply
089-XXX-001	Failed Microprocessor test	Suspected part: 1. VRM 1 2. Microprocessor 1
089-XXX-002	Failed Microprocessor test	Suspected part: 1. VRM 2 2. Microprocessor 2
165-XXX-000	Failed Service Processor test	Suspected part: 1. System Board. Note: Before replacing the System Board, ensure that System Board jumper J-45 (the default) is not installed when the error occurs. 2. Processor Board 3. Power Backplane 4. Hot-Swap Drive Backplane
180-XXX-000	Diagnostics LED failure	Suspected part: Power Switch Assembly Suggested action: Run the light-path diagnostics test for the failing LED (see "Light-path diagnostics" on page 8).
180-XXX-001	Failed information LED panel test	Suspected part: 1. Information LED panel 2. Diagnostic LED panel
180-XXX-002	Failed Diagnostics LED Panel test	Suspected part: 1. Diagnostics LED Panel 2. Power Switch Assembly
180-XXX-003	Failed System Board LED test	Suspected part: System Board

Table 11. Diagnostic error codes (continued)

Error Code	Meaning	Suspected Part/Suggested Actions
180-XXX-004	Failed Processor Board LED test	Suspected part: 1. Processor/PCI Board 2. System Board
180-XXX-005	Failed SCSI Backplane LED test	Suspected part: 1. SCSI Backplane 2. SCSI Backplane Cable 3. System Board
180-XXX-006	Memory Board LED test	Suspected part: 1. Memory 2. Processor/PCI Board 3. System Board
201-XXX-0NN	Failed Memory test	Suspected part: 1. DIMM Location DIMM1 - DIMM4 where <i>NN</i> can be a value from 01 to 04. 01 = DIMM2, 02 = DIMM1, 03 = DIMM4, 04 = DIMM3 2. System Board
201-XXX-999	Multiple DIMM failure; see error text for failing DIMMs	Suspected part: System Board
202-XXX-001	Failed System Cache test	Suspected part: 1. VRM 1 2. Microprocessor 1
202-XXX-002	Failed System Cache test	Suspected part: 1. VRM 2 2. Microprocessor 2
206-XXX-000	Failed Diskette Drive test	Suspected part: 1. Cable 2. Diskette Drive 3. System Board
215-XXX-000	Failed IDE CD-ROM test	Suspected part: 1. CD-ROM Drive Cables 2. CD-ROM Drive 3. System Board
217-XXX-000	Failed BIOS Hard Disk test Note: If RAID is configured, the hard disk number refers to the RAID logical array.	Suspected part: Hard Disk 1
217-XXX-001	Failed BIOS Hard Disk test Note: If RAID is configured, the hard disk number refers to the RAID logical array.	Suspected part: Hard Disk 2
217-XXX-002	Failed BIOS Hard Disk test. Note: If RAID is configured, the hard disk number refers to the RAID logical array	Suspected part: Hard Disk 3

Table 11. Diagnostic error codes (continued)

Error Code	Meaning	Suspected Part/Suggested Actions
217-XXX-003	Failed BIOS Hard Disk test Note: If RAID is configured, the hard disk number refers to the RAID logical array.	Suspected part: Hard Disk 4
217-XXX-004	Failed BIOS Hard Disk test Note: If RAID is configured, the hard disk number refers to the RAID logical array.	Suspected part: Hard Disk 5
264-XXX-0NN	Failed Tape Drive test	Suspected part: <ol style="list-style-type: none"> 1. Tape Cartridge, if user executed the Read/Write Tape Drive test (XXX = 256) 2. SCSI or Power Cable connected to tape drive with SCSI ID <i>NN</i>. 3. Tape Drive with SCSI ID <i>NN</i> (Refer to the Help and Service Information appendix of the tape drive's user guide). 4. System Board or SCSI Controller (Run SCSI Controller Diagnostic to determine if the SCSI bus is functioning properly.)
264-XXX-999	Errors on multiple tape drives	Suggested action: See error messages/text in the PC Doctor error log for detailed information on each individual tape drive error.
301-XXX-000	Failed Keyboard test	Suspected part: Keyboard
405-XXX-000	Failed Ethernet test on controller on the System Board	Suspected part: System Board Suggested action: Verify that Ethernet is not disabled in BIOS
405-XXX-00N	Failed Ethernet test on adapter in PCI slot N	Suspected part: <ol style="list-style-type: none"> 1. Adapter in PCI slot <i>N</i>. 2. System Board
415-XXX-000	Failed Modem test	Suspected part: <ol style="list-style-type: none"> 1. Cable 2. Modem Note: Ensure that the modem is present and attached to appliance. 3. System Board

Error symptoms

Table 12 contains information on error symptoms and suggested actions.

Table 12. Error symptoms and suggested actions

Error Symptom	Suspected Part/Suggested Action
CD is not working properly	Suggested action 1. Clean the CD 2. Run CD-ROM Diagnostic
CD-ROM drive tray is not working	Suspected part: CD-ROM Drive Suggested action: 1. Ensure the appliance is switched ON 2. Insert the end of a paper clip into the manual tray-release opening 3. Run CD-ROM Diagnostic
CD-ROM drive is not recognized	Suspected part: 1. CD-ROM Drive 2. System Board Suggested action: 1. Run Configuration/Setup, enable primary IDE channel 2. Check cables and jumpers 3. Check for correct device driver 4. Run CD-ROM diagnostics
Power switch does not work and reset button does work.	Suspected part: 1. Power Switch Assembly 2. System Board Suggested action: Verify that the power-on control jumper on J23 extension cable is on pins 1 and 2
Diskette drive in-use LED stays on, or the system bypasses the diskette drive, or the diskette drive does not work.	Suspected part: 1. Cable 2. Diskette Drive 3. System Board Suggested action: 1. If there is a diskette in the drive, verify that: a. The diskette drive is enabled in the Configuration/Setup utility program b. The diskette is good and not damaged (try another diskette if you have one) c. The diskette is inserted correctly in the drive d. The diskette contains the necessary files to start the appliance e. The code program is OK f. The cable is installed correctly (proper orientation) 2. Run Diskette Drive Diagnostics

Table 12. Error symptoms and suggested actions (continued)

Error Symptom	Suspected Part/Suggested Action
Monitor problems (general)	<p>Suspected part: Monitor</p> <p>Note: Some IBM monitors have their own self-tests. If you suspect a problem with the monitor, refer to the information that comes with the monitor for adjusting and testing instructions.</p> <p>Suggested action:</p> <ol style="list-style-type: none"> 1. Run Video Diagnostics <p>Note: If the diagnostics pass, the problem may be a video driver</p> <ol style="list-style-type: none"> 2. Display Adapter/System Board

Power Supply LED errors

Use the Power Supply LED information in the following section to troubleshoot power supply problems.

Minimum configuration requirements: The minimum configuration required for the DC Power LED to come on is:

- Power Supply
- Power Backplane
- Processor/PCI Board (With pins 2 and 3 on J23 extension cable connected together to bypass the power switch.
- Processor/PCI Board (Verify that Processor/PCI Board and System Board are properly connected together.

Table 13 describes Power Supply LED errors and actions.

Table 13. Power Supply LED errors and actions

AC Power LED	DC Power LED	Description	Part/Action
Off	Off	No power to system or ac problem	<p>Suspected part:</p> <ol style="list-style-type: none"> 1. Power Supply 2. Power Backplane 3. Power ac Inlet Box <p>Suggested action: Check ac power to system</p>

Table 13. Power Supply LED errors and actions (continued)

AC Power LED	DC Power LED	Description	Part/Action
On	Off	Standby mode or dc problem	<p>Suspected part:</p> <ol style="list-style-type: none"> 1. Power Supply 2. Power Backplane 3. System Board 4. Processor Board <p>Suggested action:</p> <ol style="list-style-type: none"> 1. Check processor board cable connector, J33. Move jumper on the J32 extension cable to pins 2 and 3 to bypass power control. If the DC Good LED comes on, press Ctrl+Alt+Delete. Watch the screen for any POST errors. Check the System Error Log for any listed problems. If the system powers up with no errors: <ol style="list-style-type: none"> a. Power Switch Assembly b. System Board 2. Remove the adapters and disconnect the cables and power connectors to all internal and external devices. Power-on the system. If the DC Power LED comes on, replace the adapters and devices one at a time until you isolate the problem.
On	On	Power is OK	N/A

POST error codes

Table 14 describes POST error codes and their suggested actions. X can be any number or letter.

Table 14. POST error codes

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
062	Three consecutive boot failures using the default configuration	<p>Suspected part:</p> <ol style="list-style-type: none"> 1. Battery 2. System Board 3. Processor/PCI Board 4. Processor <p>Suggested action: Run Configuration/Setup</p>
101, 102	System and processor error	<p>Suspected part:</p> <ol style="list-style-type: none"> 1. System Board 2. Processor/PCI Board
106	System and processor error	<p>Suspected part:</p> <ol style="list-style-type: none"> 1. System Board 2. Processor/PCI Board
111	Channel check error	<p>Suspected part:</p> <ol style="list-style-type: none"> 1. Failing ISA Adapter 2. Memory DIMM 3. System Board

Table 14. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
114	Adapter read-only memory error	Suspected part: 1. Failing Adapter 2. Run Diagnostics
129	Internal cache error	Suspected part: 1. Processor 2. Optional Processor (if installed) 3. Processor Board
151	Real time clock error	Suspected part: 1. Battery 2. System Board Suggested action: Run Diagnostics
161	Real time clock battery error	Suspected part: 1. Battery 2. System Board Suggested action: Run Configuration/Setup
162	Device Configuration error	Suspected part: 1. Battery 2. Failing Device 3. System Board Suggested action: Run Configuration/Setup Note: Be sure to load the default settings and any additional desired settings; then, <i>save the configuration</i> .
163	Real-Time Clock error	Suspected part: 1. Battery 2. System Board Suggested action: Run Configuration/Setup
164	Memory configuration changed	Suspected part: 1. DIMM 2. Processor/PCI Board Suggested action: Run Configuration/Setup
175	Hardware error	Suspected part: 1. System Board 2. Processor/PCI Board
176	Computer cover or cable cover was removed without a key being used	Suspected part: 1. System Board 2. C2 Security Switch Suggested action: Run Configuration/Setup
177, 178	Security hardware error	Suspected part: System Board Suggested action: Run Configuration/Setup
184	Power-on password corrupted	Suspected part: System Board Suggested action: Run Configuration/Setup

Table 14. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
185	Drive startup sequence information corrupted	Suspected part: System Board Suggested action: Run Configuration/Setup
186	Security hardware control logic failed	Suspected part: System Board Suggested action: Run Configuration/Setup
187	VPD serial number not set	Suspected part: System Board Suggested action: Set serial number in Setup
188	Bad EEPROM CRC #2	Suspected part: System Board Suggested action: Run Configuration/Setup
189	An attempt was made to access the appliance with invalid passwords	Suggested action: Run Configuration/Setup, enter the administrator password
201	Memory test error	Suspected part: 1. DIMM 2. Processor/PCI Board 3. System Board Suggested action: If the appliance does not have the latest level of BIOS installed, update the BIOS to the latest level and run the diagnostic program again.
229	Cache error	Suspected part: 1. Processor 2. Second Processor 3. Processor/PCI Board Suggested action: Run Configuration/Setup
262	DRAM parity configuration error	Suspected part: 1. Battery 2. System Board
289	DIMM has been disabled by the user or system	Suspected part: Processor/PCI Board Suggested action: 1. Run Configuration/Setup, if disabled by user 2. Disable DIMM, if not disabled by user
301	Keyboard or keyboard controller error	Suspected part: 1. Keyboard 2. System Board
303	Keyboard controller error	Suspected part: 1. System Board 2. Keyboard
602	Invalid diskette boot record	Suspected part: 1. Diskette 2. Diskette Drive 3. Cable 4. System Board

Table 14. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
604	Diskette drive error	Suspected part: 1. Diskette Drive 2. Drive Cable 3. System Board Suggested action: Run Configuration/Setup and Diagnostics
605	Unlock failure	Suspected part: 1. Diskette Drive 2. Drive Cable 3. System Board
662	Diskette drive configuration error	Suspected part: 1. Diskette Drive 2. Drive Cable 3. System Board Suggested action: Run Configuration/Setup and Diagnostics
762	Coprocessor configuration error	Suspected part: 1. Battery 2. Processor Suggested action: Run Configuration/Setup
962	Parallel port error	Suspected part: System Board Suggested action: 1. Disconnect external cable on parallel port. 2. Run Configuration/Setup
11XX	System board serial port 1 or 2 error	Suggested action: 1. Disconnect external cable on serial port. 2. Run Configuration/Setup 3. System Board
0001200	Machine check architecture error	Suspected part: 1. Processor 2. Optional Processor 3. Processor/PCI Board
0001295	ECC circuit check	Suspected part: Processor/PCI Board
1301	I ² C cable to front panel not found	Suspected part: 1. Cable 2. Front Panel 3. Power Switch Assembly 4. System Board
1302	I ² C cable from system board to power on and reset switches not found	Suspected part: 1. Cable 2. Power Switch Assembly 3. System Board

Table 14. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
1303	I ² C cable from system board to power backplane not found	Suspected part: 1. Cable 2. Power Backplane 3. System Board
1304	I ² C cable to diagnostic LED board not found	Suspected part: 1. Cable 2. Diagnostic LED Board 3. Power Switch Assembly 4. System Board
1600	The Service Processor is not functioning	Suspected part: 1. System Board 2. Processor/PCI Board Suggested action: Do the following before replacing: 1. Ensure that a jumper is not installed on J-51 2. Remove the ac power to the system, wait 20 seconds; then, reconnect the ac power. Wait 30 seconds; then, power-on the system.
1601	The system is able to communicate to the Service Processor, but the Service Processor failed to respond at the start of POST	Suspected part: 1. System Board 2. Processor/PCI Board Suggested action: Do the following before replacing a part: 1. Remove the ac power to the system, wait 20 seconds; then, reconnect the ac power. Wait 30 seconds; then, power-on the system. 2. Flash update the Service Processor.
1762	Hard Disk Configuration error	Suspected part: 1. Hard Disk Cables 2. Hard Disk Adapter 3. Hard Disk Drive 4. SCSI Backplane 5. System Board Suggested action: Run Configuration/Setup
178X	Hard Disk error	Suspected part: 1. Hard Disk Cables 2. Hard Disk Adapter 3. Hard Disk Drive 4. System Board Suggested action: Run Diagnostics

Table 14. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
1800	No more hardware interrupt available for PCI adapter	Suspected part: 1. Failing Adapter 2. System Board Suggested action: Run Configuration/Setup
1962	Drive does not contain a valid boot sector	Suspected part: 1. Hard Disk Drive 2. SCSI Backplane 3. Cable 4. System Board Suggested action: 1. Verify a bootable operating system is installed. 2. Run Diagnostics
2400	Video controller test failure	Suspected part: 1. Video Adapter (if installed) 2. System Board
2462	Video memory configuration error	Suspected part: 1. Video Adapter (if installed) 2. System Board
5962	IDE CD-ROM configuration error	Suspected part: 1. CD-ROM Drive 2. CD-ROM Power Cable 3. IDE Cable 4. System Board 5. Battery Suggested action: Run Configuration/Setup
8603	Pointing Device error	Suspected part: 1. Pointing Device 2. System Board
00019501	Processor 1 is not functioning	Suspected part: 1. VRM 1, VRM 2 2. Processor 1 3. Processor Board 4. System Board Suggested action: Check VRM and processor LEDs
00019502	Processor 2 is not functioning	Suspected part: 1. VRM 2 2. Processor 2 3. Processor Board 4. System Board Suggested action: Check VRM and processor LEDs

Table 14. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
00019701	Processor 1 failed BIST	Suspected part: 1. Processor 1 2. Processor/PCI Board 3. System Board
00019702	Processor 2 failed BIST	Suspected part: 1. Processor 2 2. Processor/PCI Board 3. System Board
00180100	No room for PCI option ROM	Suspected part: 1. Failing Adapter 2. System Board Suggested action: Run Configuration/Setup
00180200	No more I/O space available for PCI adapter	Suspected part: 1. Failing Adapter 2. System Board Suggested action: Run Configuration/Setup
00180300	No more memory (above 1 MB for PCI adapter)	Suspected part: 1. Failing Adapter 2. System Board Suggested action: Run Configuration/Setup
00180400	No more memory (below 1 MB for PCI adapter)	Suspected part: 1. Failing Adapter 2. System Board Suggested action: 1. Move the failing adapter to slot 1 or 2 2. Run Configuration/Setup
00180500	PCI option ROM checksum error	Suspected part: System Board Suggested action: Remove Failing PCI Card
00180600	PCI built-in self-test failure; PCI to PCI Bridge error	Suspected part: 1. Failing Adapter 2. System Board Suggested action: 1. Run Configuration/Setup 2. Move the failing adapter to slot 1 or 2
00180700, 00180800	General PCI error	Suspected part: 1. System Board 2. PCI Card

Table 14. POST error codes (continued)

Error Code/Symptom	Meaning	Suspected Part/Suggested Action
01295085	ECC checking hardware test error	Suspected part: 1. Processor/PCI Board 2. Processor
01298001	No update data for processor 1	Suspected part: Processor 1 Suggested action: Ensure all processors are the same stepping level and cache size.
01298002	No update data for processor 2	Suspected part: Processor 2 Suggested action: Ensure all processors are the same stepping level and cache size.
01298101	Bad update data for processor 1	Suspected part: Processor 1 Suggested action: Ensure all processors are the same stepping level and cache size.
01298102	Bad update data for processor 2	Suspected part: Processor 2 Suggested action: Ensure all processors are the same stepping level and cache size.
I9990301	Fixed boot sector error	Suspected part: 1. Hard Disk Drive 2. SCSI Backplane 3. Cable 4. System Board
I9990305	Fixed boot sector error, no operating system installed	Suggested action: Install the operating system to the hard disk drive
I9990650	AC power has been restored	Suspected part: Power Cable Suggested action: 1. Check cable 2. Check for interruption of power supply

Temperature error messages

Table 15 describes temperature error messages, their meanings, and suggested actions.

Note: You will need to connect a keyboard and monitor to your appliance in order to see error messages.

Table 15. Temperature errors and actions

Error Message	Meaning	Suggested Action
DASD X Over Temperature	Level-critical; Direct Access Storage Device bay X was over temperature	Ensure system is being properly cooled; see "Appendix E. Specifications" on page 121.
DASD X Over recommended Temperature	Level-warning; DASD bay X had over temperature condition	Ensure system is being properly cooled; see "Appendix E. Specifications" on page 121.

Table 15. Temperature errors and actions (continued)

Error Message	Meaning	Suggested Action
DASD X under recommended temperature	Level-warning; direct access storage device bay X had under temperature condition	Ambient temperature must be within normal operating specifications; see "Appendix E. Specifications" on page 121.
DASD 1 Over Temperature	Level-critical; sensor for DASD1 reported temperature over recommended range	Ensure system is being properly cooled; see "Appendix E. Specifications" on page 121.
Power Supply X Temperature Fault	Level-critical; power supply X had over temperature condition	<ol style="list-style-type: none"> 1. Ensure system is being properly cooled; see "Appendix E. Specifications" on page 121. 2. Replace Power Supply X.
System board is over recommended temperature		<ol style="list-style-type: none"> 1. Ensure system is being properly cooled; see "Appendix E. Specifications" on page 121. 2. Replace the system board.
System board is under recommended temperature		Ambient temperature must be within normal operating specifications; see "Appendix E. Specifications" on page 121.
System over temperature for CPU X	Level-warning; CPU X reporting over temperature condition	Ensure system is being properly cooled; see "Appendix E. Specifications" on page 121.
System under recommended CPU X temperature	Level-warning; system reporting under temperature condition for CPU X	Ambient temperature must be within normal operating specifications; see "Appendix E. Specifications" on page 121.

Fan error messages

Table 16 describes fan error messages and their suggested actions.

Note: You will need to connect a keyboard and monitor to your appliance in order to see error messages.

Table 16. Fan errors and actions

Message	Meaning	Suggested Action
Fan X failure	Level-critical; fan X had a failure	<ol style="list-style-type: none"> 1. Check connections to fan X 2. Replace fan X
Fan X fault	Level-critical; fan X beyond recommended RPM range	<ol style="list-style-type: none"> 1. Check connections to fan X 2. Replace fan X

Power error messages

Table 17 on page 53 describes power error messages and their suggested actions.

Note: You will need to connect a keyboard and monitor to your appliance in order to see error messages.

Table 17. Power errors and actions

Message	Meaning	Action
Power supply X current fault	Level-critical; excessive current demand on power supply X	See "Power checkout" on page 27.
Power supply X DC good fault	Level-critical; power good signal not detected for power supply X	Replace power supply X.
Power supply X fan fault	Level-critical; fan fault in power supply X	Replace power supply X
Power supply X fault	Level-critical; overcurrent condition exists	See "Power checkout" on page 27.
Power supply X 12V fault	Level-critical; overcurrent condition detected	See "Power checkout" on page 27.
Power supply X 3.3V fault	Level-critical; 3.3V power supply X had an error	See "Power checkout" on page 27.
Power supply X 5V fault	Level-critical; 5V power supply X had an error	See "Power checkout" on page 27.
System over recommended X current	Level-non-critical; system running too much current on that voltage	See "Power checkout" on page 27.
System running non-redundant power	Level-non-critical; system does not have redundant power	<ol style="list-style-type: none"> 1. Check that all power supplies are operational 2. Remove options from system <p>Note: The system can continue to operate without redundancy protection if steps 1 and 2 are not followed.</p>
System under recommended voltage for X v	Level-warning; indicated voltage supply under nominal value; value for X can be +12, -12, or +5	<ol style="list-style-type: none"> 1. Check connections to power subsystem 2. Replace power supply 3. Replace power backplane
System under recommended voltage on 3.3 v	Level-warning; 3.3 volt supply under nominal value	<ol style="list-style-type: none"> 1. Check connections to power subsystem 2. Replace power supply 3. Replace power backplane
System under recommended X current	Level-non-critical; system drawing less current than recommended on voltage X	See "Power checkout" on page 27.
X V bus fault	Level-critical; overcurrent condition on X voltage bus	<ol style="list-style-type: none"> 1. Check for short circuit on X voltage bus 2. See "Power checkout" on page 27.
12V X bus fault	Level-critical; overcurrent condition on 12-V X voltage bus	<ol style="list-style-type: none"> 1. Check for short circuit on 12-V X voltage bus 2. See "Power checkout" on page 27.
5V fault	Level-critical; overcurrent condition on 5-V subsystem	<ol style="list-style-type: none"> 1. Check for short circuit on 5-V bus. 2. See "Power checkout" on page 27.
240 VA bus fault	Level-critical; overcurrent or overvoltage condition in power subsystem.	See "Power checkout" on page 27.

System shutdown

Refer to Table 18, Table 19, Table 20 on page 55, Table 21 on page 55, and Table 22 on page 55, when experiencing system shutdown related to voltage or temperature problems.

Voltage related system shutdown

Table 18 describes voltage related system shutdowns, their meanings, and suggested actions.

Table 18. Voltage related shutdown messages and actions

Message	Meaning	Suggested Action
System shutoff due to X current over max value	Level-critical; system drawing too much current on voltage X bus	See "Power checkout" on page 27.
System shutoff due to X current over min value	Level-critical; current on voltage bus X under minimum value	See "Power checkout" on page 27.
System shutoff due to X V over voltage	Level-critical; system shutoff due to X supply over voltage	<ol style="list-style-type: none">1. Check power supply connectors2. Replace power supply3. Replace power backplane
System shutoff due to X V under voltage	Level-critical system shutoff due to X supply under voltage	<ol style="list-style-type: none">1. Check power supply connectors.2. Replace power supply3. Replace power backplane
System shutoff due to VRM X over voltage		<ol style="list-style-type: none">1. Replace power supply2. Replace power supply backplane

Temperature related system shutdown

Table 19 describes temperature-related shutdown messages and suggested actions.

Table 19. Temperature related shutdown messages and suggested actions

Message	Meaning	Suggested Action
System shutoff due to board over temperature	Level-critical; board is over temperature	<ol style="list-style-type: none">1. Ensure system is being properly cooled, see "Appendix E. Specifications" on page 121.2. Replace board
System shutoff due to CPU X over temperature	Level-critical; CPU X is over temperature	<ol style="list-style-type: none">1. Ensure system is being properly cooled, see "Appendix E. Specifications" on page 121.2. Replace CPU X
System shutoff due to CPU X under temperature	Level-critical; CPU X is under temperature	Ambient temperature must be within normal operating specifications; see "Appendix E. Specifications" on page 121.
System shutoff due to DASD temperature (sensor X)	Level-critical; DASD area reported temperature outside recommended operating range	Ensure system is being properly cooled, see "Appendix E. Specifications" on page 121.
System shutoff due to high ambient temperature	Level-critical; high ambient temperature	Ambient temperature must be within normal operating specifications; see "Appendix E. Specifications" on page 121.

Table 19. Temperature related shutdown messages and suggested actions (continued)

Message	Meaning	Suggested Action
System shutoff due to system board under temperature	Level-critical; system board is under temperature	Ambient temperature must be within normal operating specifications; see "Appendix E. Specifications" on page 121.

DASD checkout

Table 20 describes a DASD checkout message and its suggested action.

Table 20. DASD checkout message and action

Message	Meaning	Suggested Action
Hard drive X removal detected	Level-critical; hard drive X has been removed	Information only, take action as appropriate

Host Built-In Self-Test (BIST)

Table 21 describes a BIST message and its suggested action.

Table 21. Host built-in self-test message and suggested actions

Message	Meaning	Suggested Action
Host BIST fail	Level-informational; host's built-in self-test failed	<ol style="list-style-type: none"> 1. Reseat CPU 2. Reseat VRM 3. Replace CPU

Bus fault messages

Table 22 describes bus fault messages and their suggested actions.

Table 22. Bus fault messages and suggested actions

Message	Suggested Action
Failure reading 12C device	<ol style="list-style-type: none"> 1. Check devices on bus 0 2. Replace system board
Failure reading 12C device	<ol style="list-style-type: none"> 1. Check devices on bus 1 2. Reseat Power Supply 3. Replace Power Supply 4. Replace Power Supply backplane 5. Replace system board
Failure reading 12C device	<ol style="list-style-type: none"> 1. Check devices on bus 2 2. Replace DASD backplane 3. Replace system board
Failure reading 12C device	<ol style="list-style-type: none"> 1. Check devices on bus 3 2. Replace system board
Failure reading 12C device	<ol style="list-style-type: none"> 1. Check devices on bus 4 2. Replace DIMM 3. Replace system board

Undetermined Problems

Read this section if the diagnostic tests did not identify the failure, the devices list is incorrect, or the system is inoperative.

Note: A corrupt CMOS can cause undetermined problems.

Check the LEDs on all the power supplies (see “AC and DC Power LEDs” on page 8.) If the LEDs indicate the power supplies are working correctly, return here and go through the following steps:

1. Power off the computer.
2. Be sure that the system is cabled correctly.
3. Remove or disconnect the following devices and parts (one at a time) until you find the failure (power on the computer and reconfigure each time):
 - a. Any external devices
 - b. Surge suppressor device (on the computer)
 - c. Modem, printer, or non-IBM devices
 - d. Each adapter
 - e. Drives
 - f. Memory modules (Minimum requirement = 256 MB)

Minimum operating requirements

- Three power supplies
 - Power backplane
 - Processor/PCI board (with pins 2 and 3 on J-23 extension cable connected together to bypass the power switch; default is pins 1 and 2)
 - System Board (Verify that connection to Processor/PCI Board is secure.)
 - One Microprocessor and VRM
 - Memory module (with a minimum of 1 bank of 256-MB DIMMs)
4. Power-on the computer. If the problem remains, suspect the following parts in the order listed:
 - a. Power Supply
 - b. Power Backplane
 - c. Processor/PCI Board
 - d. System Board

Notes:

1. If the problem goes away when you remove an adapter from the system, and replacing that adapter does not correct the problem, suspect the Processor/PCI board, then the system board.
2. If you suspect a networking problem and all the system tests pass, it could be a network cabling problem external to the system.

Chapter 3. Recovery

Recovery procedures are provided in case an appliance engine loses its code banks either completely or in part (for example, a disk failure or a logical-partition corruption occurs). The appliance code system image is obtained by booting the appliance with the Recovery Boot diskette. This allows the Recovery CD to boot and start the restore procedure. The Recovery CD is supplied with the appliance. The Recovery Boot diskette is available at www.ibm.com/storage/support/nas.

Recovering the IBM IP Storage

The Recovery CD (in conjunction with the Recovery Boot diskette) enables you to load the system image from an FTP server. Before attempting to recover the appliance, verify the following requirements:

- A serial console or equivalent device must be attached to serial port A of the appliance using a null-modem cable.
- The appliance must be attached to a working Ethernet network through the Service Ethernet port on the system board.
- The appliance must be connected to a working FTP server on the same Ethernet network as the Service Ethernet port that contains the application code image and supports anonymous FTP attached to the same network.
- You must have the Recovery Boot diskette. You can download the diskette image from www.ibm.com/storage/support/nas.

To recover the appliance code image using the Recovery CD and Recovery Boot diskette:

1. Configure the serial console using the following communications settings:

19200 baud
8 data bits
No parity
1 stop bit

2. Verify that the appliance has the latest BIOS level.

Note: To obtain the most recent version, go to www.ibm.com/storage/support/nas.

3. Verify that the system image is available from the FTP server.

Note: To obtain the most recent version, go to www.ibm.com/storage/support/nas.

4. Place the Recovery CD in the IBM IP Storage CD-ROM drive. You might have to temporarily switch on the appliance to do this.
5. Place the Recovery Boot diskette in the diskette drive. The Recovery CD formats the IDE drive.

Note: You can download the recovery diskette from www.ibm.com/storage/support/nas.

6. You will see the message:

Careful: Continue in /dev/hda setup?

Type **y** and press **Enter**.

7. Wait for formatting to complete and the Service and Recovery Console prompt (svc>) to appear.
8. Enter **?** to display a list of possible options available from the Service and Recovery Console prompt.
9. Ensure that the IP address of the Service Ethernet resides in the same network as the FTP server that contains the system image to be reloaded. You can do this in one of two ways:
 - Set up the FTP server so it resides in the default network that includes the Service Ethernet's default IP address (192.9.200.1). Then, skip to step 11.
 - Or, change the Service Ethernet's default IP address (192.9.200.1) to match one that resides in the network that the FTP server operates in. Then, continue with step 10.
10. Type **en**et and then press **Enter**. Follow the onscreen instructions. This allows you to change the default Service Ethernet IP address so it matches the network IP address where the FTP server resides. Then, enter **reboot** and follow the onscreen prompts. When the svc> prompt returns, continue with step 11.
11. Load the image from the FTP server by typing **ftp** and pressing **Enter**. When prompted, type the following responses and press **Enter** after each:

```

get
load
FTP_server_address
image_file
a

```

where *FTP_server_address* is the IP address of the FTP server and *image_file* is the path and file name of the system image.

Status messages indicate the system image is loading into bank A.

12. When loading is complete, set bank A as the bank to load after a reboot by typing **set** and pressing **Enter**. When prompted, type the following response and press **Enter**:


```

a

```
13. Remove the Recovery CD and diskette.
14. Type **reboot** and press **Enter** to reboot the appliance.

Recovering the BIOS

If the BIOS becomes corrupted (for example, from a power failure during a flash update), you can recover the BIOS using the recovery boot block and a BIOS flash diskette.

Note: You can download a BIOS flash diskette from www.ibm.com/storage/support/nas.

The flash memory of the IBM IP Storage contains a protected area that cannot be overwritten. The recovery boot block is a section of code in this protected area that enables the appliance to start up and to read a flash diskette. The flash utility recovers the system BIOS from the BIOS recovery files on the diskette.

To recover the BIOS:

1. Switch OFF the appliance and peripheral devices, and disconnect all external cables and power cords; then, remove the cover.
2. Locate the boot block jumper (J37) on the system board.
3. Place a jumper on pins 1 and 2 to enable BIOS recovery mode.
4. Insert the BIOS flash diskette into the diskette drive.
5. Switch ON the appliance.

The Recovery Boot panel appears. A progress report, Loading data from diskette *xx%*, is displayed. When programming is underway, a further progress report, Programming block *n of 7 yy%*, is displayed. When recovery is complete, the following message is displayed:

Recovery complete, remove the diskette and return boot block switch to the off position before rebooting.

6. Remove the flash diskette from the diskette drive.
7. Switch OFF the appliance.
8. Remove the jumper on the boot-block jumper block, or move the jumper to pins 2 and 3 to return to normal startup mode.
9. Switch ON the appliance. The system should start up normally.

Chapter 4. Adding and replacing components

This chapter instructs you on how to add and replace components, informs you about safety and system reliability, and shows you the location of the major components.

Before you begin

Before you begin to install options in your Models 100 and 200, read the following information:

- Become familiar with the safety and handling guidelines specified under “Handling electrostatic discharge-sensitive devices” on page 127.
- You do not need to switch off the Models 100 and 200 or remove covers to install or replace hot-swap power supplies or hot-swap hard drives.
- The blue color on components and labels inside your Models 100 and 200 identifies touch points where a component can be gripped, a latch moved, and so on.
- Ensure that you have an adequate number of properly grounded electrical outlets for Models 100 and 200 and any other options that you intend to install.
- Back up all important data before you make changes to hard drives.
- Have a small, flat-blade screwdriver available.

Safety information

Before you begin installing components, read the safety information found in “Translated safety notices” on page 127. For translations of the safety notices that are included in this guide, refer to *Safety Information*.

System reliability considerations

To help ensure proper cooling and system reliability, make sure that:

- Each of the drive bays has either a drive or a filler panel installed.
- The cover is in place during normal operations, or is removed for no longer than 30 minutes while the appliance is operating.

Note: The front door (Model 100) can be removed permanently without affecting system reliability.

- There is space around the appliance to allow the appliance cooling system to work properly.
 - For the Model 100, leave about 127 mm (5 in.) of space around the front and rear of the appliance.
 - For the Model 200, refer to the documentation that comes with the rack.
- A removed hot-swap drive is replaced within 2 minutes of removal.
- Cables for optional adapters are routed according to the instructions provided with the adapters.
- A failed fan is replaced within 48 hours.

Working inside an appliance while power is on

Your appliance is designed to operate safely while switched on with the cover removed. Follow these guidelines when you work inside an appliance that is switched on:

- Avoid loose-fitting clothing on your forearms. Button long-sleeved shirts before working inside the appliance; do not wear cuff links while you are working inside the appliance.
- Do not allow your necktie or scarf to hang inside the appliance.
- Remove jewelry, such as bracelets, rings, necklaces, and loose-fitting wrist watches.
- Remove items from your shirt pocket (such as pens or pencils) that could fall into the appliance as you lean over it.
- Take care to avoid dropping any metallic objects, such as paper clips, hair pins, or screws, into the appliance.

Major components of the IBM IP Storage appliance

Figure 11 shows the locations of major components in your appliance.

Note: The illustrations in this document might differ slightly from your hardware.

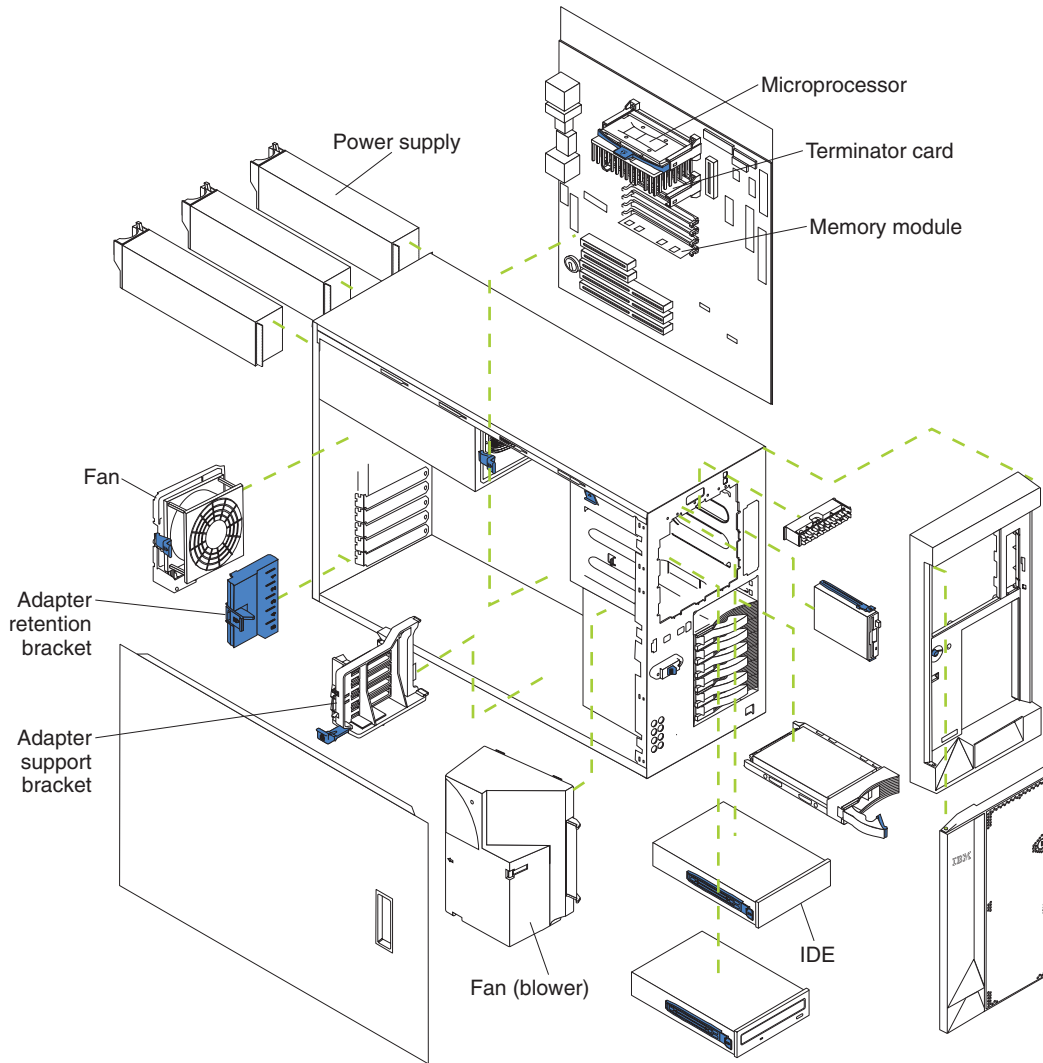


Figure 11. Locations of major components

System board

Figure 12 identifies system-board connectors for user-installable options.

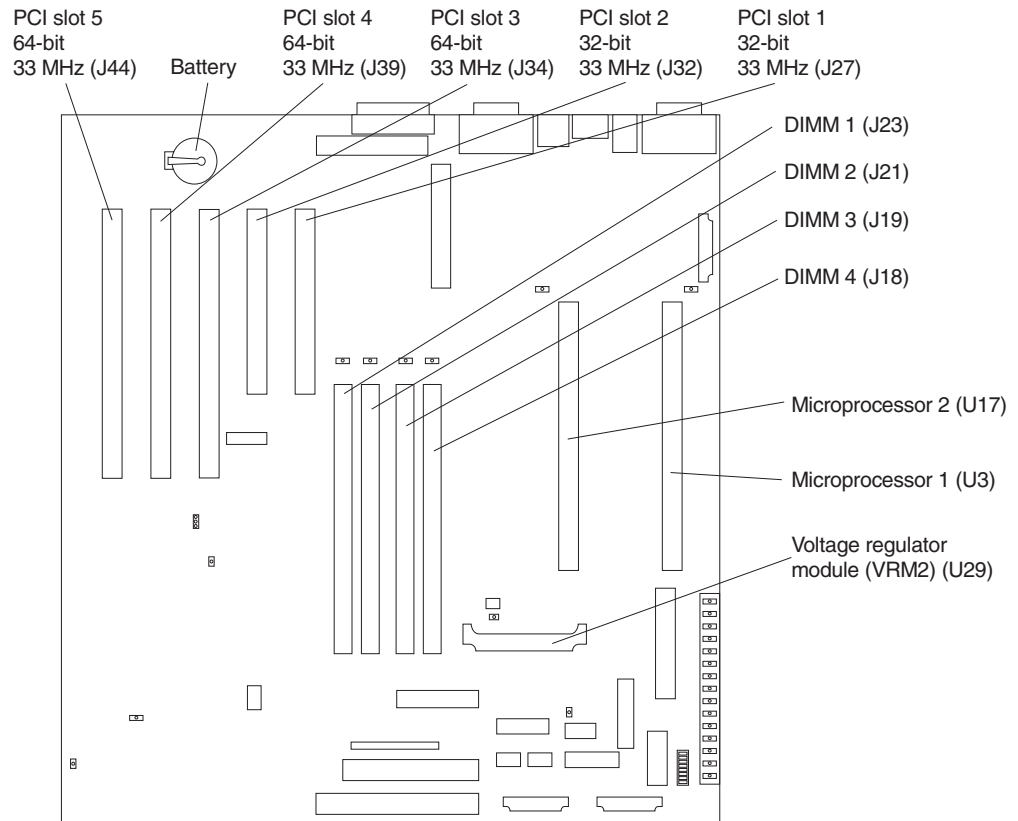


Figure 12. System-board options connectors

Figure 13 identifies system-board connectors for internal cables.

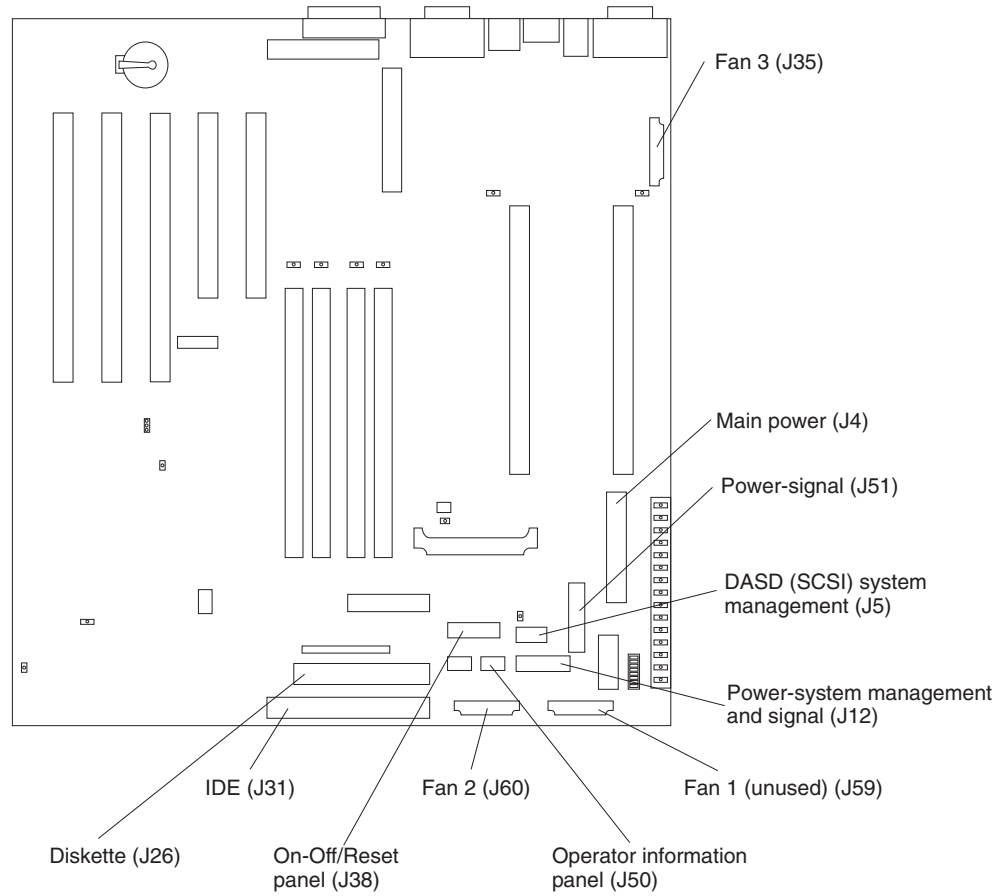


Figure 13. System-board internal cable connectors

Figure 14 identifies the switches and jumpers on the system board.

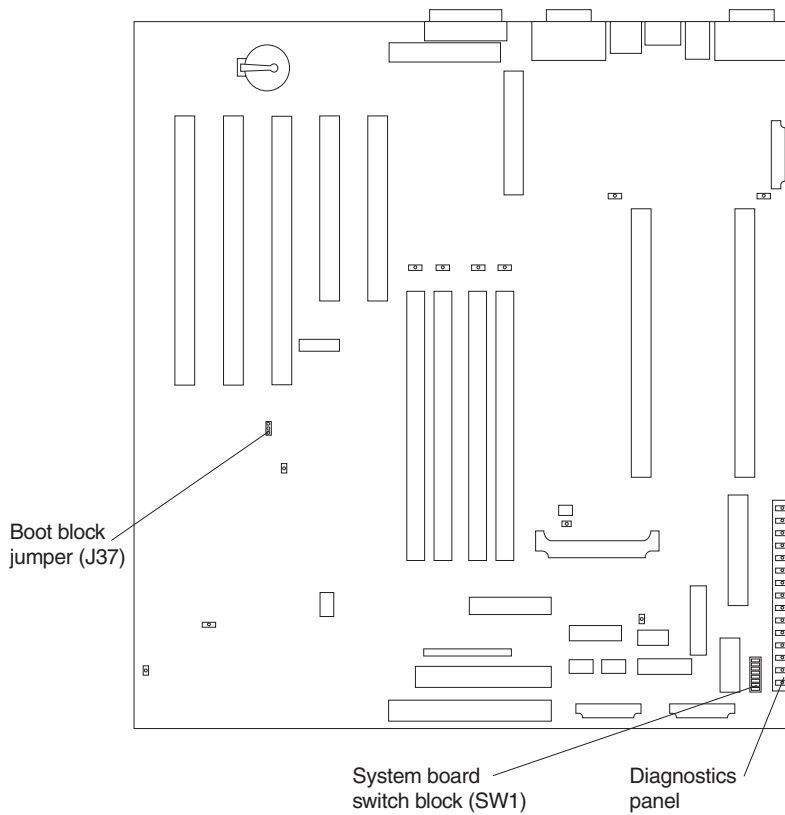


Figure 14. System board switches and jumpers

Figure 15 identifies system-board LEDs. You might need to refer to this figure when troubleshooting a problem.

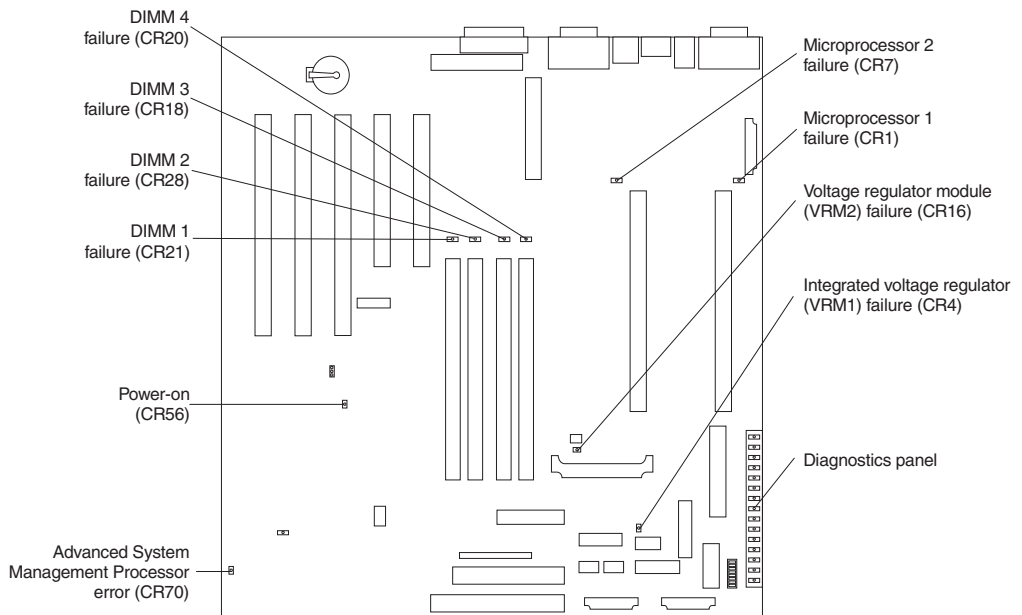


Figure 15. System board LED locations

Note: The power-on indicator (CR56) is on when system power is present in the appliance. When this LED flashes, the appliance is in standby mode (the system power supply is turned off and current is present).

Diagnostics panel LEDs:

PS1 Power supply 1 failure.

PS2 Power supply 2 failure.

PS3 Power supply 3 failure.

NON Non-redundant power.

OVER Overspec. The system has exceeded the power capabilities of the installed power supply units.

NMI Non-maskable-interrupt occurred.

TEMP System temperature exceeded maximum rating.

FAN A fan failed or is operating slowly.

MEM Memory failure. One or more memory DIMMS have failed.

CPU Microprocessor failure. One or both microprocessors have failed.

PCI A Error on PCI channel A or system board.

Note: PCI bus A is often referred to as PCI bus 0.

PCI B Error on PCI channel B or system board.

Note: PCI bus B is often referred to as PCI bus 1.

VRM Error on voltage regulator module or on integrated voltage regulator.

DASD1

A hot-swap disk drive, backplane, or other part of SCSI channel A has failed.

Note: This light is disabled and will not be on.

DASD2

A SCSI device on SCSI channel B has failed.

Note: This light is disabled and will not be on.

Controls and indicators

See “Appliance controls and indicators” on page 1 for illustrations of the various controls and indicators on the IBM IP Storage.

Adding or removing internal hardware components

This section describes how to add or remove internal hardware components.

Removing the cover (Model 100)

The following sections describe how to remove the cover, the door (for the Model 100), and the bezel.

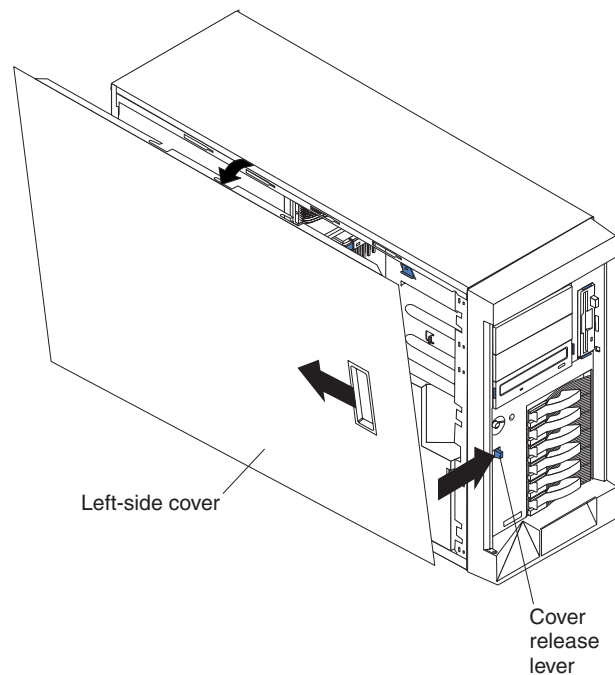


Figure 16. Removing the cover of the Model 100

To remove the left-side cover of the Model 100:

1. Review the information in “Before you begin” on page 61.
2. If you are planning to install or remove any part other than a hot-swap hard disk drive or hot-swap power supply, switch off the appliance and all attached devices and disconnect all external cables and power cords.
3. Slide the cover-release lever on the front of the appliance to release the cover; then, slide the cover toward the rear of the appliance about 25 mm (1 in.). Move the top edge of the cover out from the appliance; then, lift the cover off the appliance. Set the cover aside.

Attention: For proper cooling and airflow, replace the cover before switching on the appliance. Operating the appliance for extended periods of time (over 30 minutes) with the cover removed might damage appliance components.

Removing the cover (Model 200)

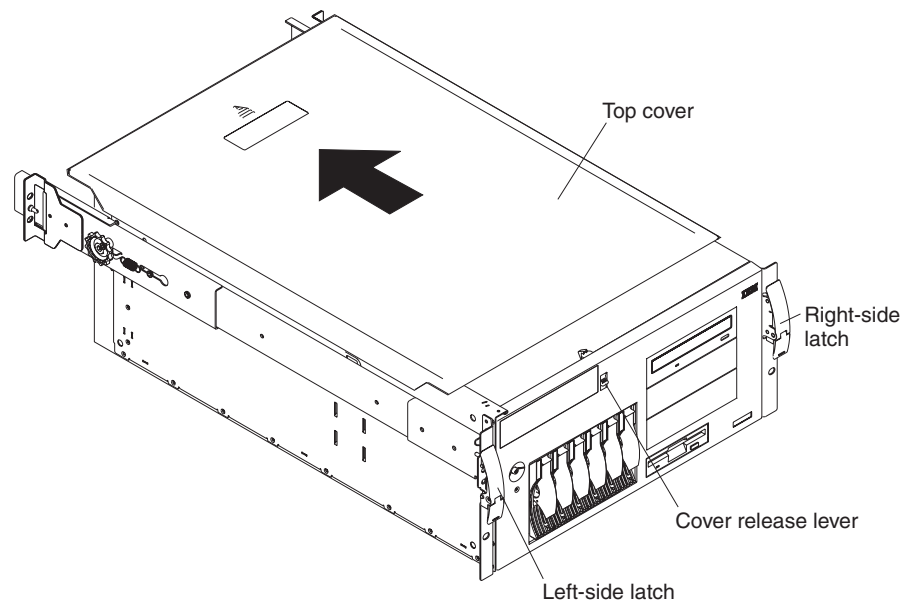


Figure 17. Removing the cover of the Model 200

To remove the appliance top cover:

1. Review the information in “Before you begin” on page 61.
2. If you are planning to install or remove any part other than a hot-swap hard disk drive or hot-swap power supply, switch OFF the appliance and all attached devices and disconnect all external cables and power cords.
3. Release the left and right side latches and pull the appliance out of the rack enclosure until both slide rails lock.

Note: When the appliance is in the locked position, you can reach the cables on the back of the appliance.

4. Move the cover-release lever down while sliding the top cover toward the rear of the appliance about 25 mm (1 in.). Lift the cover off the appliance and set the cover aside.

Attention: For proper cooling and airflow, replace the cover before switching on the appliance. Operating the appliance for extended periods of time (over 30 minutes) with the cover removed might damage appliance components.

Removing the door and bezel (Model 100)

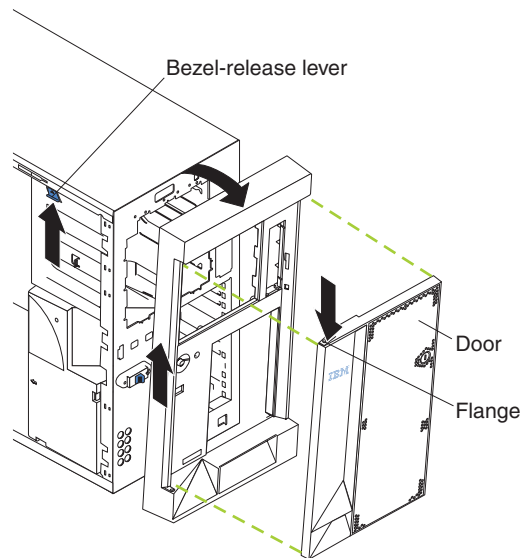


Figure 18. Removing the appliance door of the Model 100

To remove the appliance door:

1. Unlock and open the appliance door.
2. Locate the flange on the top edge of the door.
3. Press down on the flange while pressing out on the door; then, lift the appliance door up and off the hinge. Set the door aside in a safe place.

To remove the bezel:

1. Move the blue bezel-release lever, following the curve of the lever opening.
2. Lift the bezel tabs out of the slots and pull the bezel away from the appliance front. Store the bezel in a safe place.

Removing the bezel (Model 200)

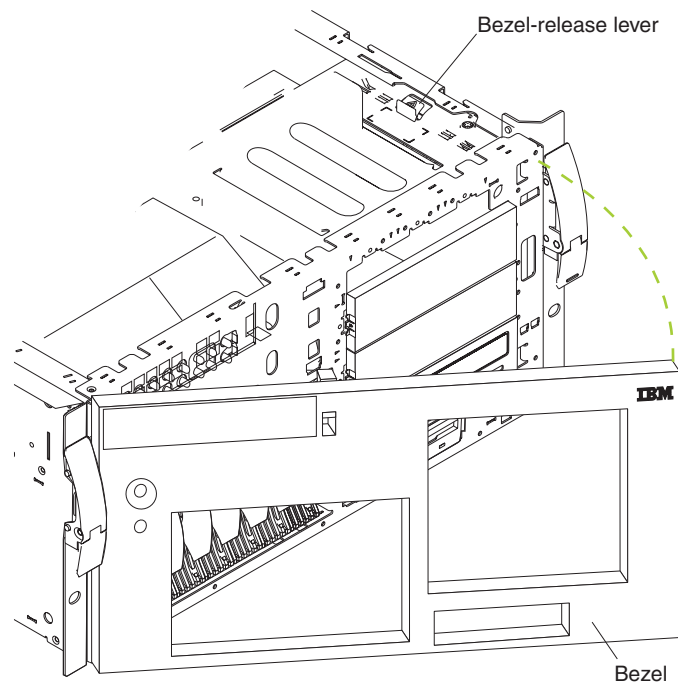


Figure 19. Removing the bezel of the Model 200

To remove the bezel:

1. Move the blue bezel-release lever, following the curve of the lever opening.
2. Lift the bezel tabs out of the slots and pull the bezel away from the appliance front. Store the bezel in a safe place.

Installing and replacing a hot-swap hard drive

Use the following instructions to install or replace a hot-swap hard drive.

Installing a hot-swap hard drive

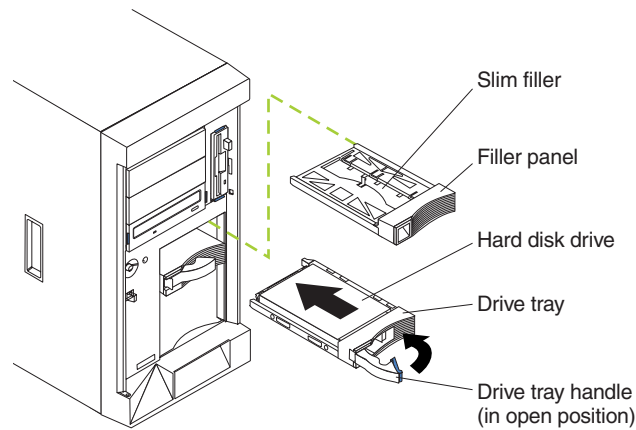


Figure 20. Installing a hot-swap drive

To install a drive in a hot-swap hard drive bay:

Attention:

- To maintain proper system cooling, do not operate the appliance for more than two minutes without either a hard drive or a filler panel installed for each bay. Therefore, if you are replacing a defective hot-swap drive, either leave the defective drive in place or put in a filler panel until you have a replacement drive.
 - When you handle electrostatic discharge-sensitive devices (ESDs), take precautions to avoid damage from static electricity. For details on handling these devices, refer to “Handling electrostatic discharge-sensitive devices” on page 127.
1. Remove the filler panel from one of the empty hot-swap drive bays by inserting your finger into the depression at the left side of the filler panel and pulling it away from the appliance.

Note: If you are installing a half-high hard drive, you will need to remove two adjacent filler panels. The two filler panels should be from either the top pair of drive bays, the middle pair of drive bays, or the bottom pair of drive bays.

2. Install the hard drive in the hot-swap drive bay:
 - a. Ensure that the tray handle is open (that is, perpendicular to the hard drive).
 - b. Align the rails on the hard drive assembly with the guide rails in the drive bay.
 - c. Gently push the hard drive assembly into the drive bay until the hard drive connects to the backplane.
 - d. Push the tray handle toward the closed position until it locks the hard drive in place.

3. If you installed a half-high hard disk drive, install a slim filler in the gap above the hard drive:
 - a. Locate the slim filler that is designed for use with these half-high hard drives. It is stored on the empty tray of the filler panel that you removed earlier in this procedure.
 - b. Pull the slim filler off the filler panel.
 - c. Gently push the slim filler into place in the gap above the hard drive.
4. Check the hard drive status indicators to verify that the hard drives are operating properly (the Hard Drive Status LED is immediately to the right of the hard disk drive).
 - When the amber LED is on continuously, the hard drive has failed.
 - When the green LED flashes slowly (one flash per second), the hard drive is being rebuilt.
 - When the green LED flashes rapidly (three flashes per second), the controller is identifying the hard drive.

Note: If your appliance has a RAID adapter installed, refer to the information provided with the RAID adapter for information about adding a hard drive.

Replacing a hot-swap hard drive

You do not have to switch off the appliance to remove or install the hot-swap hard drives.

Attention:

1. Before you replace a hot-swap hard drive, check the Hard Drive Status LED on the front of the drive to see if the drive is defective (if the drive is defective, the LED will be amber). If you partially or completely remove a good drive instead of a defective one, you might lose valuable data.

This situation is especially relevant because your appliance has a RAID adapter installed. The RAID adapter can rebuild the data that you need, provided that certain conditions are met.
2. Before you remove a hot-swap hard drive that is not defective, back up all important data.
3. To avoid damage to a hard drive, pull on the release lever to disengage the hard drive connector from the backplane at the back of the drive bay, wait approximately 30 seconds to allow the hard drive to spin down, and then completely remove it from the bay.

Refer to Figure 21 while you perform the steps in this procedure.

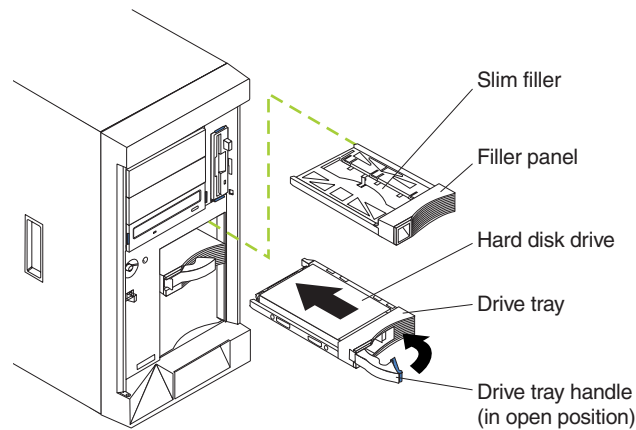


Figure 21. Replacing a drive in a hot-swap drive bay in the Model 100

To replace a drive in a hot-swap drive bay:

1. Before you begin, do the following:
 - Read the documentation that comes with your hard drive.
 - If your appliance has a RAID adapter installed, review the information provided with the RAID adapter for information about replacing a hard drive.
2. If your appliance is a Model 100, unlock and open the appliance door.

Attention: To maintain proper system cooling, do not operate the appliance for more than two minutes without either a hard drive or a filler panel installed for each drive bay.
3. Locate the defective hard drive (look for an amber Hard Drive Status LED on the front of the drive).
4. Remove the defective hard drive: move the handle on the hard drive to the open position (perpendicular to the hard drive) and pull the hot-swap hard drive assembly from the drive bay.
5. Install the replacement hard drive in the hot-swap drive bay:
 - a. Ensure that the tray handle is open (that is, perpendicular to the hard drive).
 - b. Align the rails on the hard drive assembly with the guide rails in the drive bay.
 - c. Gently push the hard drive assembly into the drive bay until the hard drive connects to the backplane.
 - d. Push the tray handle toward the closed position until it locks the hard drive in place.
6. Check the hard drive status indicators to verify that the hard drive is installed properly (the Hard Drive Status LED is located to the immediate right of the hard disk drive).
 - When the amber LED is on continuously, the hard drive has failed.
 - If you have a RAID adapter installed:
 - When the green LED flashes slowly (one flash per second), the hard drive is being rebuilt.
 - When the green LED flashes rapidly (three flashes per second), the controller is identifying the hard drive.
7. If your appliance is a Model 100, close and lock the appliance door.

Installing an IDE (non-hot-swap) hard drive or CD-ROM

Note: The appliance's electromagnetic interference (EMI) integrity and cooling are both protected by having the non-hot-swap drive bays covered or occupied. When you install a hard disk drive, save the filler panel from the bay in case you later remove the drive and do not replace it with another.

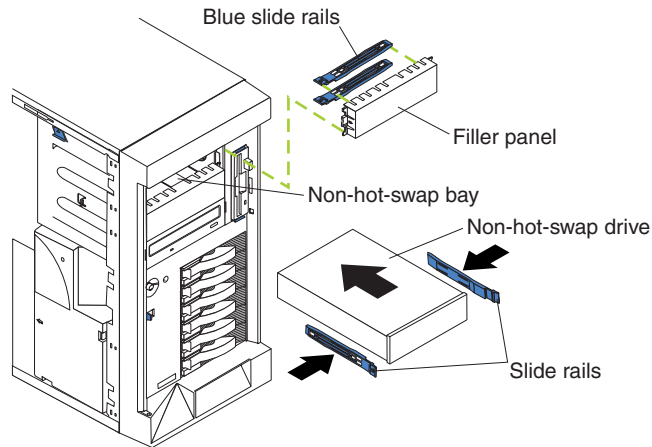


Figure 22. Installing a non-hot-swap hard drive

To install a non-hot-swap hard disk drive (5.25-inch, removable media) in one of the non-hot-swap drive bays:

1. Review the safety precautions in “Translated safety notices” on page 127.
2. Switch off the appliance and peripheral devices and then remove the cover and the bezel (see “Removing the cover (Model 100)” on page 68 for details).
3. Remove the filler panel from the bay opening by pulling the filler panel away from the appliance. You do not need the filler panel when you have a hard drive installed in the drive bay.
4. If the drive is a laser product, observe the following safety precaution:



CAUTION:

When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Note: For translations of this safety notice, refer to *Safety Information*.

5. Touch the static-protective bag containing the drive to any unpainted metal surface on the appliance; then, remove the drive from the bag and place it on a static-protective surface.
6. Set any jumpers or switches on the drive according to the documentation that comes with the drive.
7. Install rails on the drive. If you are installing a standard-size drive:
 - a. Pull the blue slide rails off the back of the filler panel.
 - b. Clip the rails onto the sides of the drive.
8. Align the rails on the drive with the guide rails in the drive bay.
9. Push the drive into the bay until it clicks into place.
10. Plug a connector on the IDE cable into the back of the drive.
11. Ensure that the other end of the IDE cable is plugged into the IDE connector on the system board.
12. Connect a power cable to the back of the drive. Power cables for non-hot-swap drives are in your appliance. The connectors are keyed and can be inserted only one way.
13. If you are installing another non-hot-swap drive, do so at this time; otherwise, continue with the next step.
14. If you have other options to install or remove, do so now; otherwise, replace the cover (see "Replacing the cover" on page 93 for details).

Replacing hot-swap power supplies

Your appliance comes with three hot-swap power supplies, installed in bays 1, 2, and 3. The third power supply provides additional redundancy. Each power supply has two status indicators; see the following illustration for information about the status indicators and power supply bay locations.

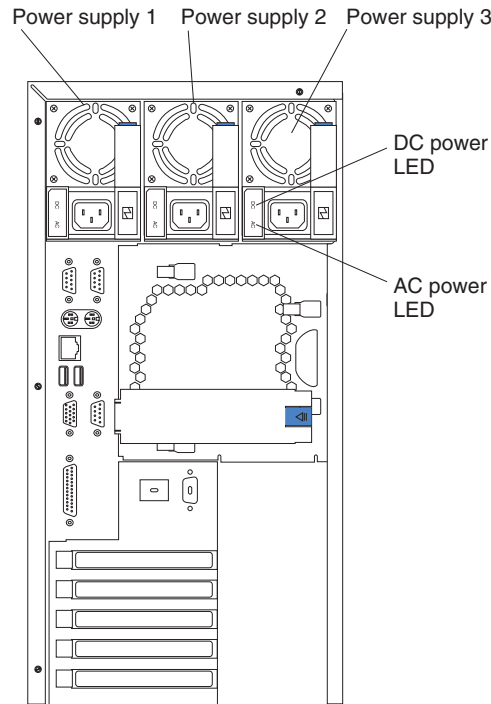


Figure 23. Replacing a hot-swap power supply

Power Supply 1

LED PS1 on the system board diagnostics panel refers to this power supply. See Figure 15 on page 66 for more information about the diagnostics panel.

Power Supply 2

LED PS2 on the system board diagnostics panel refers to this power supply. See Figure 15 on page 66 for more information about the diagnostics panel.

Power Supply 3

LED PS3 on the system board diagnostics panel refers to this power supply. See Figure 15 on page 66 for more information about the diagnostics panel.

AC Power LED

This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on. Refer to the Power Supply LEDs section in the *IBM TotalStorage IP Storage 200i Administrator's Guide* for more information.

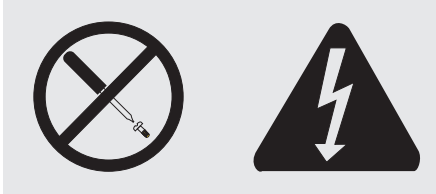
DC Power LED

This LED provides status information about the power supply. During normal operation, both the AC and DC Power LEDs are on. Refer to the Power Supply LEDs section in the *IBM TotalStorage IP Storage 200i Administrator's Guide* for more information.

Removing a hot swap power supply



CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Note: For translations of this safety notice, refer to *Safety Information*.

You normally have power redundancy and hot-swappability. However, if the load on your appliance requires the capacity of all installed power supplies, you do not have redundancy or hot-swappability and must switch off the appliance before removing any of your power supplies.

Attention: If you remove a power supply while the system is running and when you do not have power redundancy, your system will abruptly cease to function.

To remove a hot swap power supply

1. Remove the engine covers.
2. Check the LEDs on the diagnostics panel on the system board.
 - a. If the NON (non-redundant) LED is on, you do not have redundancy: **switch OFF the appliance** and peripheral devices; then, continue with step 3 on page 79.

Note: The Information LED on the operator information panel on the front of the appliance also will be on. See “Appliance controls and indicators” on page 1 for the location and contents of the operator information panel.

- b. If the NON LED is not lit, you have redundancy and do not need to switch off the appliance. Continue with step 3 on page 79.

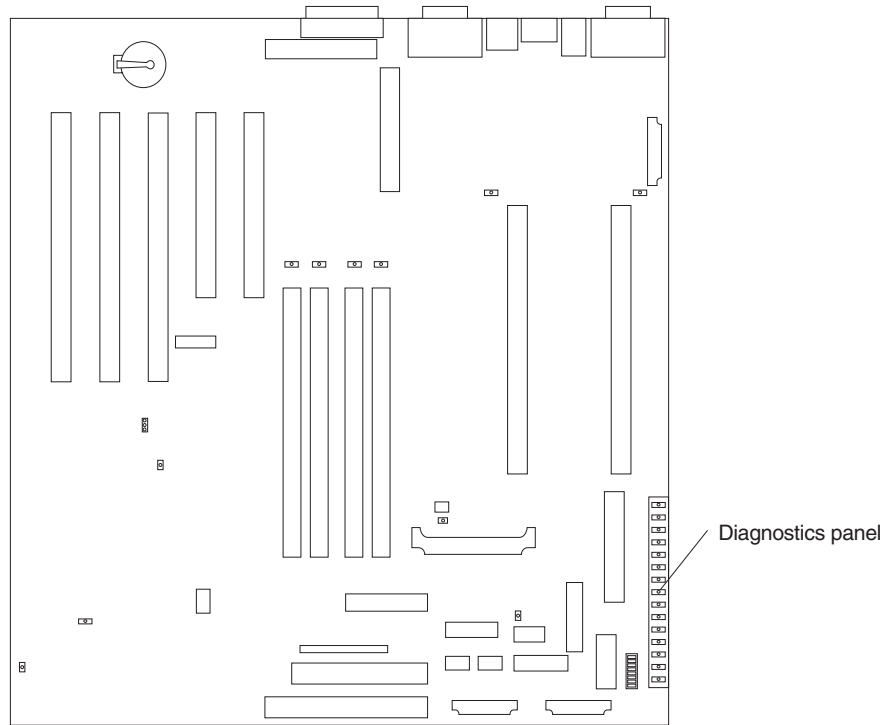


Figure 24. Location of the diagnostics panel LEDs on the system board

3. Unplug the power cord from the power supply.



CAUTION:
The following label indicates a hot surface nearby.



Note: For translations of this safety notice, refer to *Safety Information*.

4. Remove the defective power supply.
5. Install a replacement power supply (see “Replacing a hot-swap power supply” on page 80).
6. Plug the power cord for the power supply into the power cord connector.
7. Verify that the AC Power LED and DC Power LED are on, indicating that the power supply is operating correctly.
8. If you switched the appliance off in step 2.2a on page 78, switch ON the appliance and peripheral devices.

Replacing a hot-swap power supply

After you replace a power supply, verify that the power-supply status indicators (AC Power LED and DC Power LED) are on, indicating that the power supply is operating properly.

Notes:

1. You do not need to switch off the power to the appliance to install hot-swap power supplies.
2. When replacing a power supply, do not remove the power supply until you are ready to install its replacement.

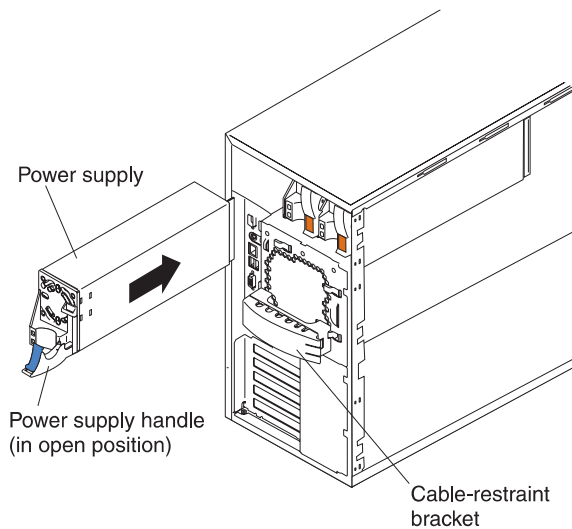


Figure 25. Installing a hot-swap power supply

To replace a hot-swap power supply:

1. Remove the power supply that you want to replace.
2. Install the replacement power supply in the bay:
 - a. Place the handle on the power supply in the open position (that is, perpendicular to the power supply) and slide the power supply into the chassis.
 - b. Gently close the handle to seat the power supply in the bay.
3. Plug the power cord for the power supply you just installed into the power cord connector.
4. Route the power cord through the cable-restraint bracket.
5. Plug the power cord into a properly grounded electrical outlet.
6. Verify that the DC Power LED and AC Power LED on the power supply are on, indicating that the power supply is operating correctly.
7. If you have other options to install or remove, do so now; otherwise, go to “Replacing the cover” on page 93.

Installing or replacing memory modules

You can increase the amount of memory in your appliance by installing *memory-module kits*. Each kit contains one industry-standard, dual-inline memory module (DIMM). Your appliance uses a noninterleaved memory configuration.

Your appliance comes with a dual-inline memory module (DIMM) installed on the system board in connector J23.

Note: The Model 100 supports additional 256-MB, 512-MB, and 1-GB DIMMs. The Model 200 supports additional 512-MB DIMMs. Both models support a maximum of 2-GB of memory.

To install or replace a memory module (DIMM):

Attention: When you handle electrostatic discharge-sensitive devices (ESDs), take precautions to avoid damage from static electricity. For details on handling these devices, refer to “Handling electrostatic discharge-sensitive devices” on page 127.

1. Review the safety precautions listed in Statement 1 and Statement 5 in “Translated safety notices” on page 127.
2. Review the documentation that comes with your option.
3. Switch off the appliance and peripheral devices and disconnect all external cables and power cords.
4. Remove the cover (see “Removing the cover (Model 100)” on page 68 or “Removing the cover (Model 200)” on page 69).
5. Touch the static-protective package containing the DIMM to any unpainted metal surface on the appliance. Then, remove the DIMM from the package.

Note: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.

6. Install or replace the DIMM:

Note: If you are replacing a DIMM, remove the old DIMM before performing the following steps.

- a. Insert the DIMM into the connector by pressing on one edge of the DIMM and then on the other edge of the DIMM. Be sure to press straight into the connector. Be sure that the retaining clips snap into the closed positions.
- b. Ensure that the retaining clips are in the closed position. If a gap exists between the DIMM and the retaining clips, the DIMM has not been properly installed. In this case, open the retaining clips and remove the DIMM; then, reinsert the DIMM.

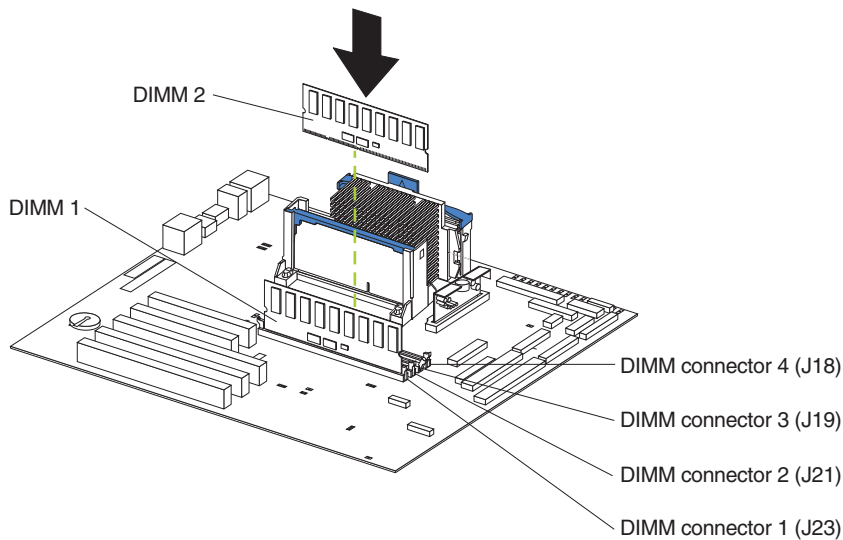


Figure 26. Installing a DIMM

7. Install additional DIMMs in the order specified in the documentation that comes with your option. (See Figure 26 for memory connector locations.)
8. Connect a keyboard and monitor to the appliance.
9. Restart the appliance.
10. The system displays a message indicating that a configuration error occurred. Follow the onscreen prompts to review and save the new memory configuration. After you save changes and exit the **Configuration/Setup Utility** program, the appliance will restart.
11. If you have other options to install or remove, do so now; otherwise, replace the cover (see “Replacing the cover” on page 93) and then return to these procedures.
12. Disconnect the keyboard and monitor.

Replacing the ServeRAID controller

This section provides illustrations of the SCSI channel connectors and cable connectors for the ServeRAID-4H and ServeRAID-4L controllers.

ServeRAID-4H controller connector locations

The ServeRAID-4H controller has four independent SCSI channel connectors: Channel 1, Channel 2, Channel 3, and Channel 4. Each of these SCSI channels supports up to 15 physical devices.

Note: The battery-backup cache protects the data being stored in the ServeRAID cache memory during a power outage or failure when using the write-back mode.

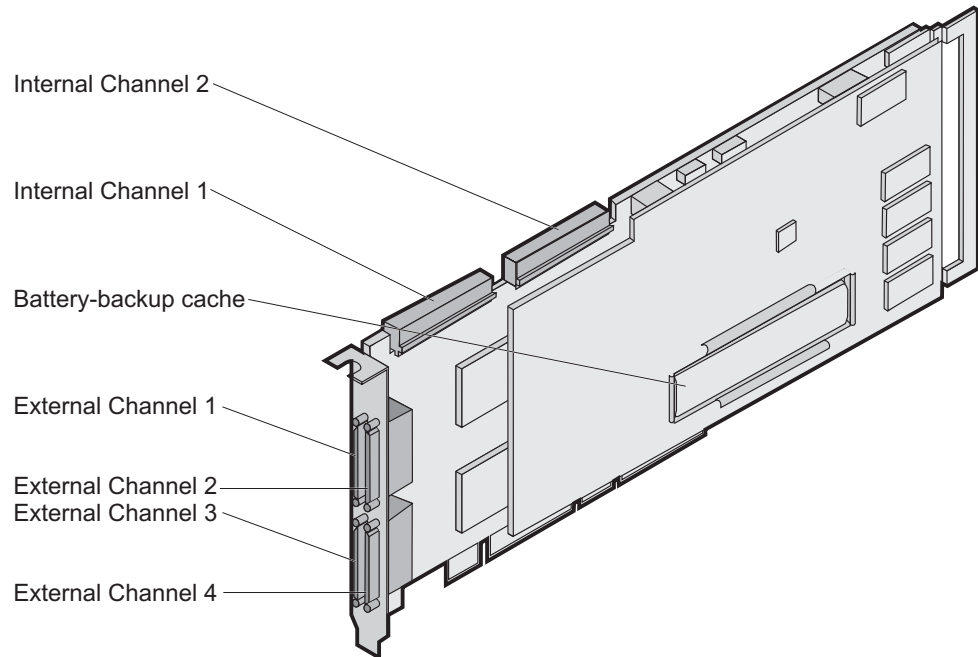


Figure 27. ServeRAID-4H controller

In the ServeRAID-4H controller, an internal SCSI device is attached to channel 1. This means you cannot attach an external SCSI device to channel 1.

Note: The ServeRAID-4H controller uses the module (P/N 38L3386) containing a lithium battery.

Statement 2



CAUTION:

When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

Note: For translations of this safety notice, refer to *Safety Information*.

ServeRAID-4L controller connector locations

The ServeRAID-4L controller has one independent SCSI channel connector: Channel 1. This SCSI channels supports up to 15 physical devices.

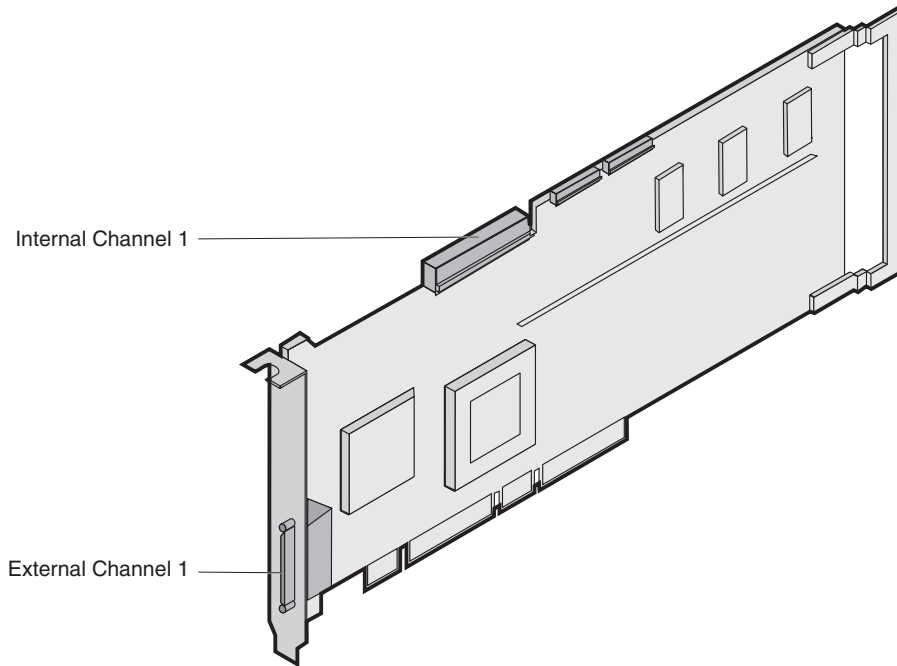


Figure 28. ServeRAID-4L controller

You cannot attach any external devices to the ServeRAID-4L controller.

Note: The ServeRAID-4L controller uses the module (P/N 38L3386) containing a lithium battery.

Statement 2



CAUTION:

When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

Note: For translations of this safety notice, refer to *Safety Information*.

Installing the ServeRAID controller

During the installation, you might need a small, flat-blade screwdriver.

To install the ServeRAID-4H or ServeRAID-4L controller:

1. Review the *Safety Information* book provided with your appliance.
2. Switch off the appliance and disconnect all power cords and cables from the appliance.
3. Remove the appliance cover.
4. Remove the expansion-slot cover.
5. Touch the static-protective package containing the controller to an unpainted metal expansion-slot cover on the appliance. This discharges any static electricity from the package and from your body.
6. Remove the controller from the static-protective package holding the controller by the edges. Do not touch any exposed components on the controller.
7. Insert the controller in the PCI expansion slot. Press the controller firmly into the slot so that it is fully seated.

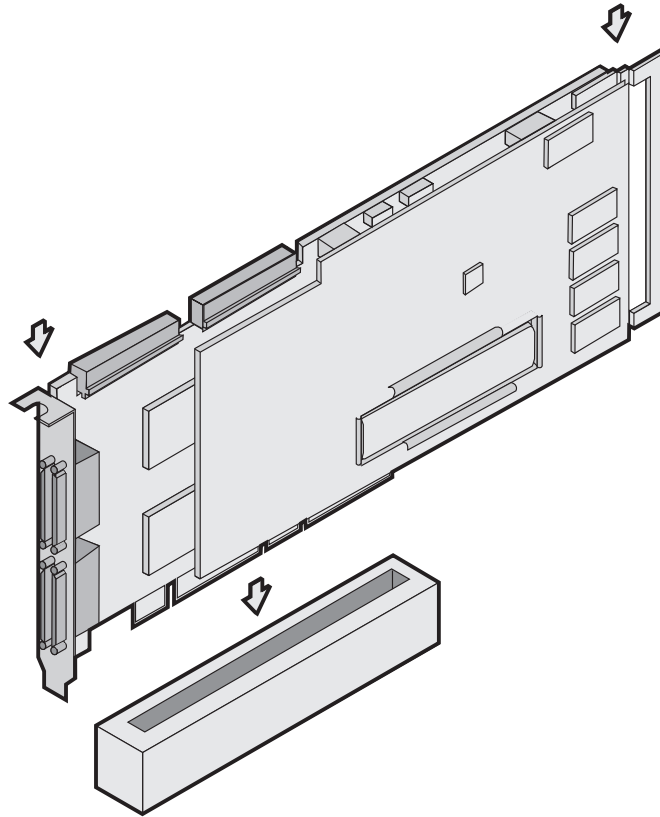


Figure 29. Inserting a ServeRAID-4H controller into the PCI expansion slot

8. Secure the controller by either tightening the expansion-slot screw on the top of the controller or closing the latch, depending on your appliance.
9. Connect the internal SCSI cable to the controller. If you intend to attach external devices only, go to step 13 on page 86. Otherwise, continue with step 10.
10. Connect one end of a 68-pin ANSI standard cable to the internal channel connector on the ServeRAID controller.

Note: Refer to “ServeRAID-4L controller connector locations” on page 84 for the channel connector locations.

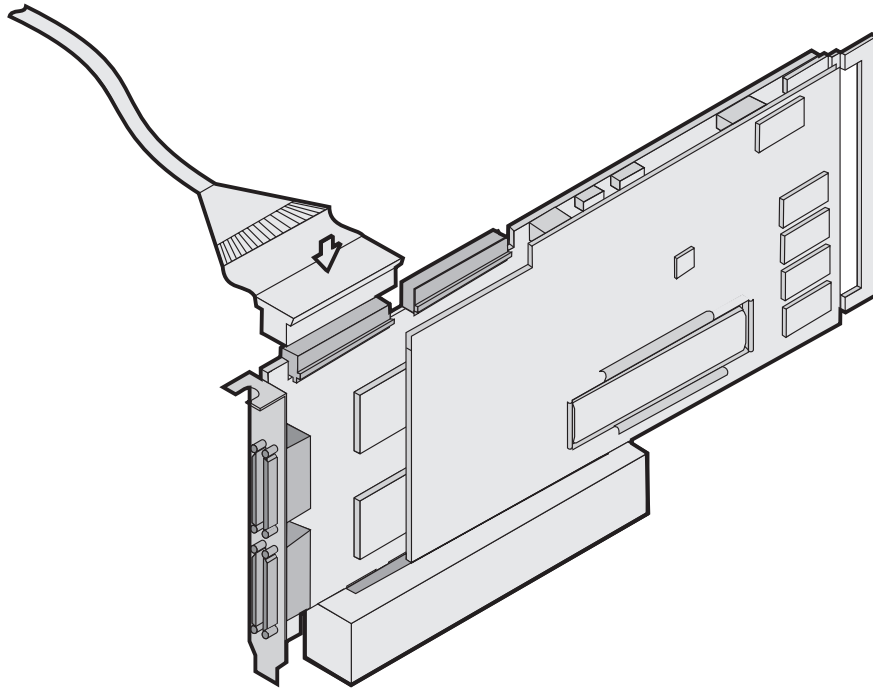


Figure 30. Connecting a ServeRAID-4H controller internal channel connector

11. Ensure that the other end of the SCSI cable is attached to the SCSI backplane.
12. If you have physical drives to install, install them now. See your appliance documentation for drive installation instructions.

Note: The ServeRAID controllers use SCSI ID 7.

13. Install the appliance cover.
14. If you disconnected the cables and power cords in step 2 on page 85, reconnect the cables and cords. See your appliance documentation if you need detailed instructions.
15. If you want to attach an external SCSI device to the ServeRAID controller, continue with “Connecting external devices”. Otherwise, go to “Updating BIOS and firmware code” on page 87.

Connecting external devices

Note: The ServeRAID-4L does not support external connection. The ServeRAID-4H supports external connection on Channels 2, 3, and 4.

To attach SCSI devices to an external channel connector on the ServeRAID-4H controller:

1. Connect one end of a 68-pin very high density connector interface (VHDCI) SCSI cable to an external channel connector on the ServeRAID controller.

Note: Refer to “ServeRAID-4H controller connector locations” on page 82 for the channel connector locations.

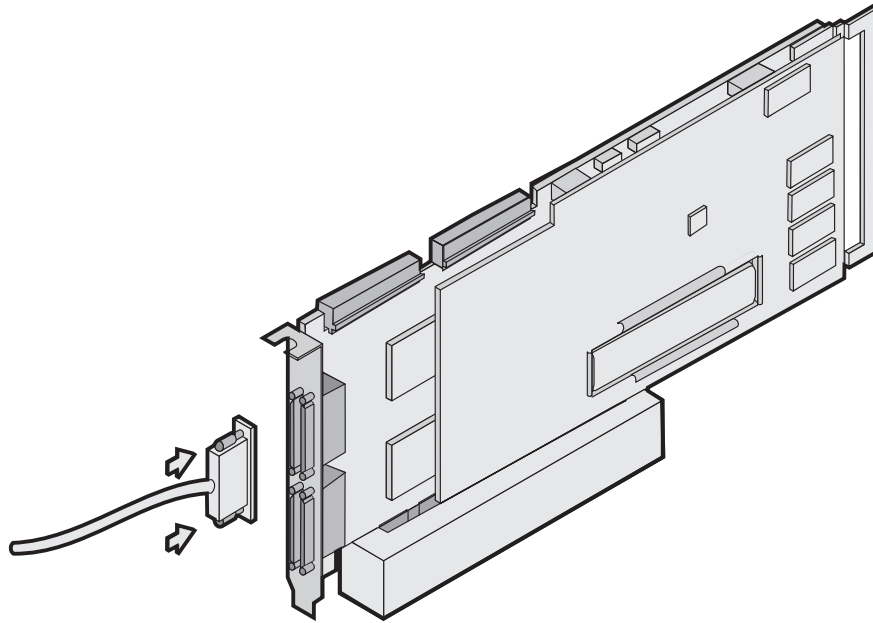


Figure 31. Connecting a ServeRAID-4H controller external channel connector

2. Connect the other end of the SCSI cable to the external SCSI device.
3. Continue with “Updating BIOS and firmware code.”

Updating BIOS and firmware code

Before configuring the ServeRAID™ controller, you must have the latest BIOS and firmware code installed on your appliance.

1. Attach a keyboard and monitor to the appliance.
2. Start a browser.
3. Go to www.ibm.com/storage/support/nas.
4. Select **BIOS and firmware code for the ServeRAID controller**.
5. Boot the diskettes as directed and follow the onscreen instructions.
6. Remove the diskette and reboot the appliance.

Configuring the ServeRAID Controller

Follow these instructions to configure a ServeRAID Controller:

1. Connect a keyboard and monitor to the appliance; then, switch on the appliance.

Note: A ServeRAID BIOS message appears. If the BIOS detects a mismatch in the configuration, it shows a status of Fail and prompts you to press a function key to continue. Press **F10** to continue without changing the configuration.

2. When prompted to start the Mini-Configuration Program, press **Ctrl+I**.

3. Select **Advanced functions**.
4. Select **Copy the configuration from drives to the controller**.
5. Confirm the action by typing **y**. Wait until prompted to Press any key to continue.
6. From the **Advanced functions** menu, select **Configure BIOS settings**.
7. Select **Bypass read/verify operations** and ensure that it says Yes. If it says No, then press **Enter** to change the option to Yes.
8. Select **Save configuration to the ServeRAID controller**.
9. Select **Exit**; then, select **Exit** again. This will terminate the Mini-Configuration program.
10. Press **Ctrl+Alt+Del** to reboot the appliance.

Replacing a Gigabit Ethernet Adapter

Your appliance comes with three PCI slots. One slot contains the Gigabit Ethernet Adapter, one slot contains the ServeRAID, and the third slot always remains vacant.

The Gigabit Ethernet Adapter can be either a Gigabit Ethernet Copper Adapter or a Gigabit Ethernet SX Adapter, depending on your needs. Use these instructions to replace a bad Gigabit Ethernet Adapter or to change your adapter type (for example, changing from a Gigabit Ethernet Copper Adapter to a Gigabit Ethernet SX Adapter).

Put the Gigabit Ethernet Adapter in the Computer

1. Switch OFF and unplug your system. Then remove its cover.
2. Remove the cover bracket from the PCI busmaster slot. Ensure that the exposed end does not contact any conducting part of the motherboard.
3. Push the adapter into the slot until the adapter is firmly seated. Then secure the adapter brackets with a screw.
4. Replace the computer cover and plug in the power cord.
5. Switch the power on. The computer's PCI BIOS automatically assigns resources to the adapter or adapters.

Attach the Network Cable

This section describes how to attach the network cable to a Gigabit Ethernet Copper Adapter or Gigabit Ethernet SX Adapter.

Gigabit Ethernet Copper Adapter: Insert the Category 5 twisted-pair RJ-45 network cable into the adapter's connector.

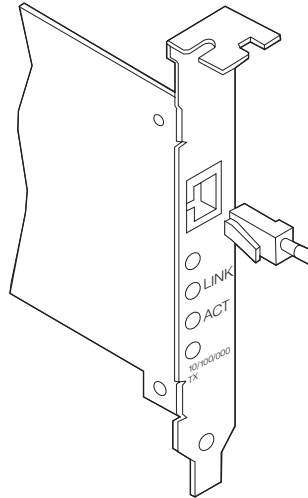


Figure 32. Attaching a Gigabit Ethernet Copper Adapter

For 1000BASE-T or 100BASE-TX, your network cable must be Category 5, twisted-pair wiring. If you plan to run the adapter at 1000 Mbps, it must be connected to a compatible 1000 Mbps switch.

Note: Most compatible switches do not support all three speeds on a single port. Check your switch documentation for details.

For 10BASE-T, use Category 3, 4, or 5 twisted-pair wiring. If you want to use this adapter in a residential environment, you must use a Category 5 cable.

Gigabit Ethernet SX Adapter:

Note: The Gigabit Ethernet SX Adapter is a fiber adapter. Remove and save the fiber optic connection cover. Insert a 1000BASE-SX duplex type SC fiber optic connector into the ports on the PRO/1000 Gigabit adapter bracket, as shown in the following illustration. The connector and ports are keyed for proper orientation.

The PRO/1000 fiber-based adapter must be connected to an IEEE 802.3z-compliant gigabit switch, such as the Intel® 470 Gigabit Switch.

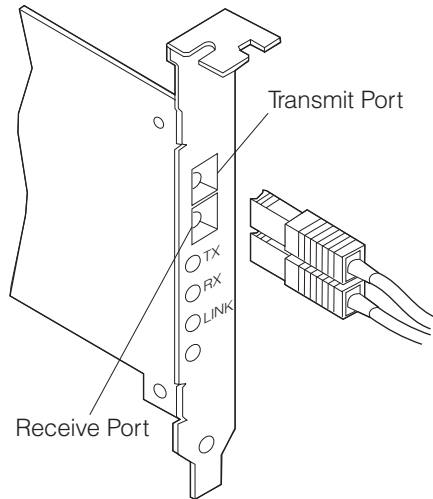


Figure 33. Attaching a Gigabit Ethernet SX Adapter

Replacing microprocessors

The Model 100 includes one microprocessor installed on the system board.

Notes:

1. Before you replace a microprocessor, review the documentation that comes with the microprocessor, so that you can determine whether you need to update the appliance basic input/output system (BIOS). The latest level of BIOS for your appliance is available at:
www.ibm.com/storage/support/nas
2. Your appliance comes with one microprocessor installed in the microprocessor connector (U3) that is closest to the power supply. This is the startup (boot) microprocessor. A microprocessor installed in connector U17 is microprocessor 2. If more than one microprocessor is installed, the microprocessor installed in microprocessor connector U17 is the startup processor and the microprocessor installed in U3 is the application processor.

Attention: To avoid damage and ensure proper appliance operation when you replace a microprocessor, use microprocessors that have the same cache size and type, and the same clock speed. Microprocessor internal clock frequencies and external clock frequencies must be identical.

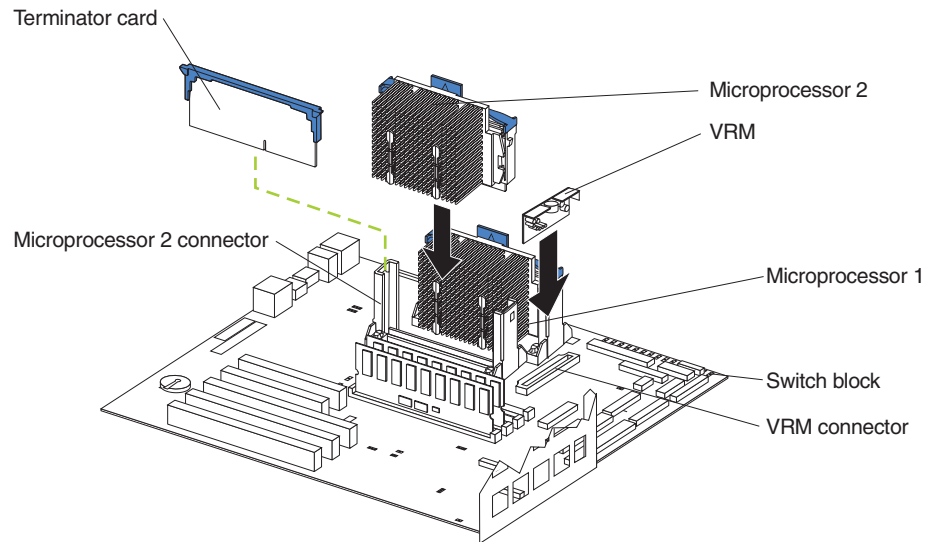


Figure 34. Replacing a microprocessor

To replace a microprocessor:

Attention: When you handle electrostatic discharge-sensitive devices (ESDs), take precautions to avoid damage from static electricity. For details on handling these devices, refer to “Handling electrostatic discharge-sensitive devices” on page 127.

1. Review the safety precautions listed in Statement 1 and Statement 5 in “Translated safety notices” on page 127.
2. Switch off the appliance and peripheral devices and disconnect all external cables and power cords; then remove the cover (see “Removing the cover (Model 100)” on page 68 for details).
3. Remove the terminator card from the microprocessor connector. Store the terminator card in a safe place in the static-protective package that your new microprocessor is shipped in; you will need to install it again if you ever remove the microprocessor and do not replace the microprocessor.
4. Replace the microprocessor:
 - a. Touch the static-protective package containing the new microprocessor to any *unpainted* metal surface on the appliance; then remove the microprocessor from the package.
 - b. Center the microprocessor over the microprocessor connector and carefully press the microprocessor into the connector.

Note: To remove a microprocessor, pull upward on the microprocessor handle tab.

5. Install the voltage regulator module (VRM) included in the microprocessor kit.

Attention: Use of other VRMs might cause your appliance to overheat.

- a. Center the VRM over the VRM connector. Ensure that the VRM is oriented and aligned correctly.
- b. Press the VRM into the connector.

Note: If you remove the microprocessor later, remember to install the terminator card in the appropriate microprocessor connector and to remove the VRM.

6. If you have other options to install or remove, do so now; otherwise, go to “Replacing the cover” on page 93.

Replacing the fan assembly

Your appliance comes with two fan assemblies.

Attention: Replace a fan that has failed within 48 hours to help ensure proper cooling.

Figure 35 shows the replacement of a fan assembly.

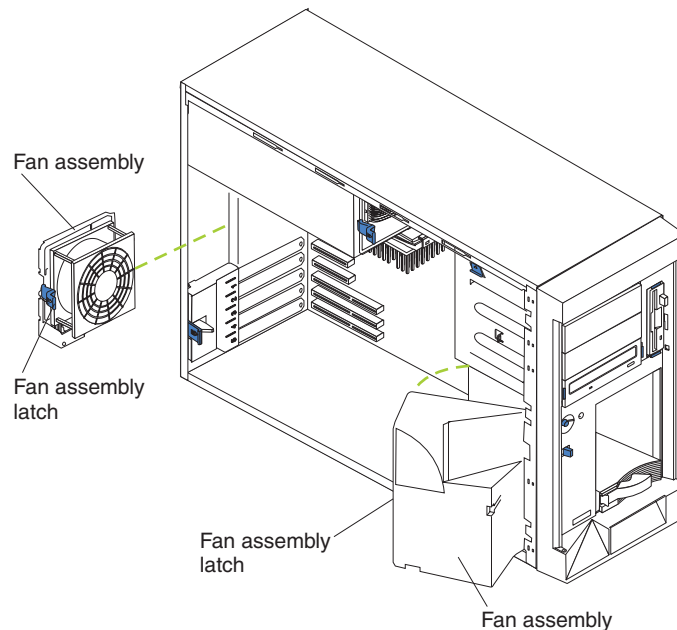


Figure 35. Replacing the fan assembly

To replace the fan assembly:

1. Review the safety precautions listed in Statement 1 and Statement 5 in “Translated safety notices” on page 127.
2. Switch off the appliance and peripherals.
3. Remove the cover. See “Removing the cover (Model 100)” on page 68 for details.
4. Determine which fan assembly to replace by checking the LED on each fan; an LED that is on indicates the fan you need to replace.
5. Remove the fan assembly from the appliance:
 - a. Disconnect the fan cable from the system board.
 - b. Press the blue release latch for the fan and pull the fan away from the appliance.
6. Slide the replacement fan assembly into the appliance until it clicks into place.
7. Connect the fan cable to the system board.
8. Verify that the FAN LED on the diagnostic panel is not on. If the FAN LED is on, reseat the fan.
9. If you have other options to install or remove, do so now; otherwise, go to “Replacing the cover” on page 93.

Replacing the cover, door, and bezel

Replacing the cover

Model 100:

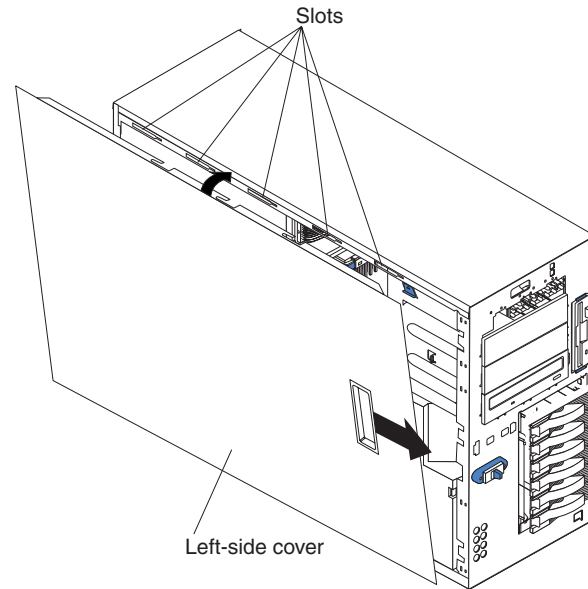


Figure 36. Replace the Model 100 cover

To replace the appliance left-side cover:

1. Align the cover with the left side of the appliance, about 25 mm (1 in.) from the front of the appliance; place the bottom of the cover on the bottom rail of the chassis.
2. Insert the tabs at the top of the cover into the slots at the top of the appliance.
3. Hold the cover against the appliance and slide the cover toward the front of the appliance until the cover clicks into place.

Model 200:

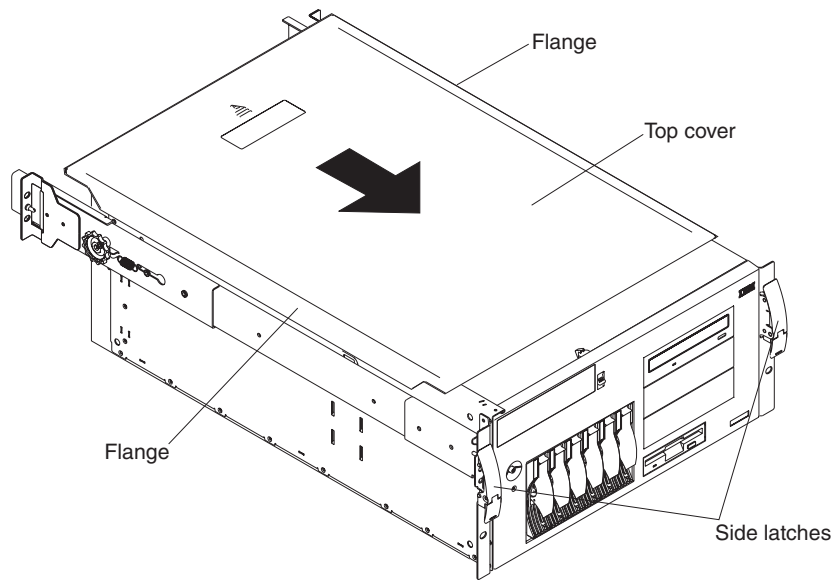


Figure 37. Replacing the Model 200 cover

To replace the appliance top cover:

1. Align the top cover with the top of the appliance, about 25 mm (1 in.) from the front of the appliance; the flanges on the left and right sides of the cover should be on the outside of the appliance chassis.
2. Hold the cover against the appliance and slide the cover toward the front of the appliance until the cover clicks into place.

Replacing the door and bezel

Model 100:

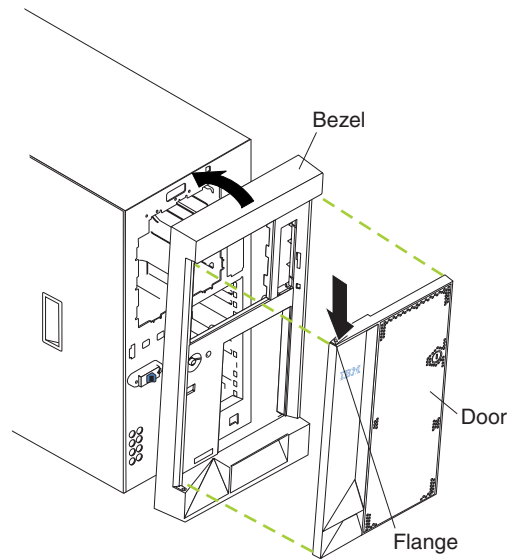


Figure 38. Replacing the Model 100 bezel

To replace the bezel:

1. Place the tabs at the bottom edge of the bezel in the slots at the bottom front of the appliance.
2. Press the top of the bezel toward the appliance until it clicks into place.

To install the appliance door:

1. Set the door on the bottom hinge.
2. Press the flange downward while pressing the top of the door toward the appliance, until the flange connects with the top hinge. Then, release the flange.
3. Close and lock the appliance door.

Attention: Be sure to maintain a clearance of at least 127 mm (5 in.) on the front and rear of the appliance to allow for air circulation.

Model 200:

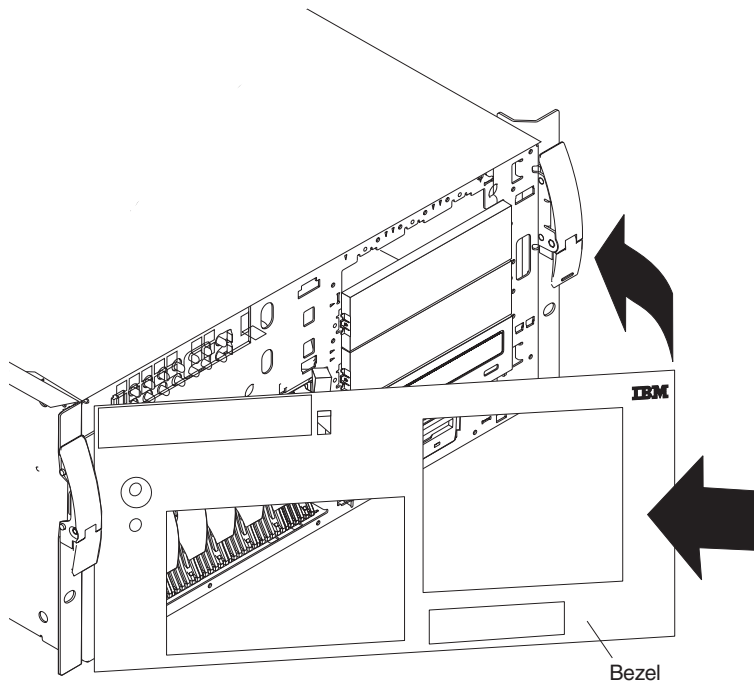


Figure 39. Replacing the Model 200 bezel

To replace the bezel:

1. Place the tabs on the left side of the bezel in the slots at the left front of the appliance.
2. Press the right end of the bezel toward the appliance until the bezel clicks into place.

Connecting external options

This section shows you the location of the parts to which you can connect any external devices.

If you have a Model 200, you can attach a Model EXP enclosure to your appliance.

Installation procedure

To attach an external device:

1. Read “Before you begin” on page 61 and the documentation that comes with your options.
2. Switch off the appliance and all attached devices.
3. Follow the instructions that come with the option to prepare it for installation and to connect it to the appliance.

Input/output connector locations

The following illustration shows the input/output connectors (ports) and the expansion slots on the rear of the appliance. For pin assignments and other details about these connectors, see “Input/output ports”.

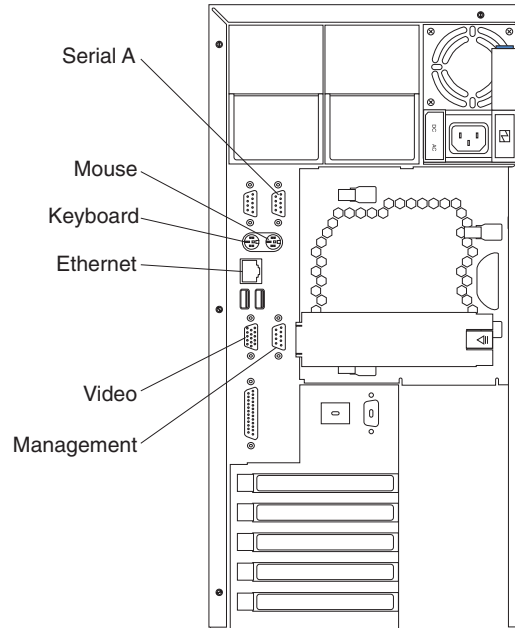


Figure 40. Input/output connectors (ports) and expansion slots

Input/output ports

This section provides information about the input/output (I/O) ports on your appliance. These ports include the following:

- One video port
- One keyboard port
- One serial port
- One Service Ethernet port (used for configuration and service only)

Keyboard port

There is one keyboard port on the rear of your appliance.

The following table shows the pin-number assignments for the keyboard connector on the rear of your appliance.

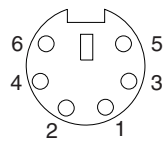


Table 23. Keyboard connector pin-number assignments

Pin	I/O	Signal
1	I/O	Data
2	N/A	Reserved
3	N/A	Ground

Table 23. Keyboard connector pin-number assignments (continued)

Pin	I/O	Signal
4	N/A	+5 V dc
5	I/O	Keyboard clock
6	N/A	Reserved

Auxiliary device (pointing device) port

The system board has one auxiliary-device port that supports a mouse or other pointing device.

Note: Attaching a mouse to this appliance causes a system configuration error. To correct this error:

1. Attach a keyboard and monitor.
2. Follow the on-screen prompts to save the configuration with a mouse.

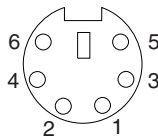


Figure 41. Auxiliary-device port

The following table shows the pin-number assignments for the auxiliary-device connector on the rear of your appliance.

Table 24. Auxiliary-device connector pin-number assignments

Pin	Signal
1	Data
2	Not connected
3	Ground
4	+5 V dc
5	Clock
6	Not connected

Video port

Your appliance comes with an integrated super video graphics array (SVGA) video controller.

Service Ethernet port

The Service Ethernet port is for service use only.

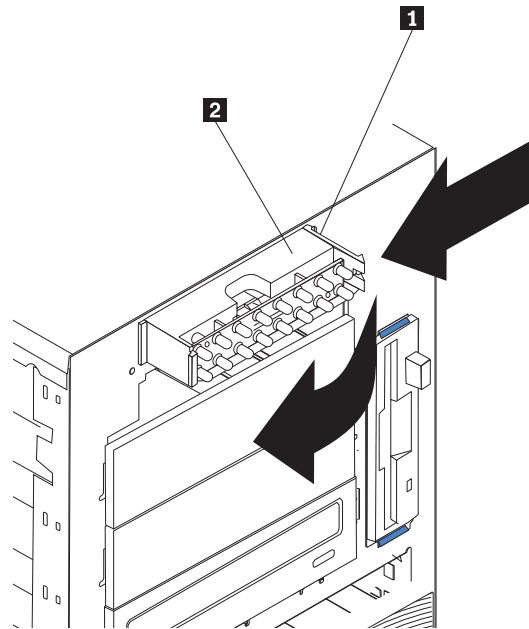
Notes:

1. The 100BASE-TX Fast Ethernet standard requires that the cabling in the network be Category 5 or higher.

Configuring the Ethernet controller: When you connect your appliance to the network, the Ethernet controller automatically detects the data-transfer rate (10 Mbps or 100 Mbps) on the network and then sets the controller to operate at the appropriate rate. That is, the Ethernet controller will adjust to the network data rate, whether the data rate is standard Ethernet (10BASE-T), Fast Ethernet

(100BASE-TX), half duplex (HDX), or full duplex (FDX). The controller supports half-duplex (HDX) and full-duplex (FDX) modes at both speeds.

Removing the external LED card

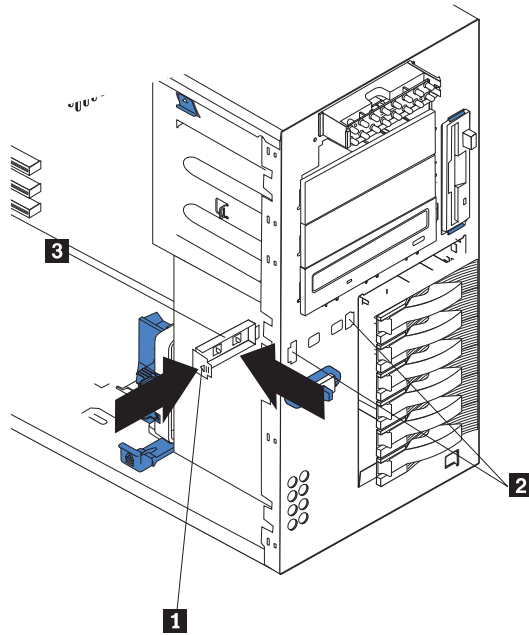


- 1** Tab
- 2** External LED card

To remove the external LED card, go through the following steps:

1. Power OFF the appliance.
2. Disconnect all external cables.
3. Remove the cover. See “Removing the cover (Model 100)” on page 68.
4. Remove the blower fan assembly (see “Replacing the fan assembly” on page 92).
5. Disconnect cables.
6. Press the arrow on the tab **1** to release the bracket.
7. Rotate the LED card **2** away from the front bezel to slide the card out of the slot.

Removing the power reset card

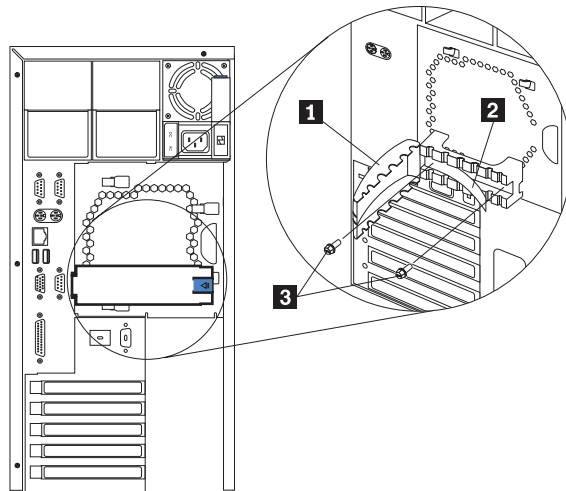


- 1** Tab
- 2** Slots (2)
- 3** Power reset card

To remove the on/off reset board:

1. Power OFF the appliance
2. Disconnect cables.
3. Press the arrow on the tab **1** to release.
4. Gently pull the power reset card **3** out of slots **2** to remove it from the front panel.

Removing the rear cable bracket

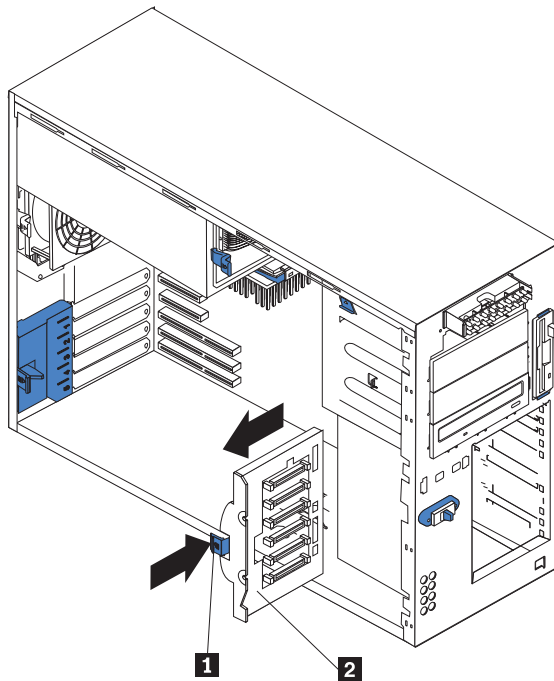


- 1** Rear cable bracket
- 2** Adhesive strip
- 3** Screws (2)

To remove the on/off reset board:

1. Power OFF the appliance
2. Disconnect cables.
3. Press the arrow on the tab of the rear cable bracket **1** to release the bracket arm.
4. Carefully peel away the adhesive strip **2**.
5. Remove the screws **3**.
6. Gently pull the rear cable bracket **1** to remove it.

Removing the DASD backplane assembly

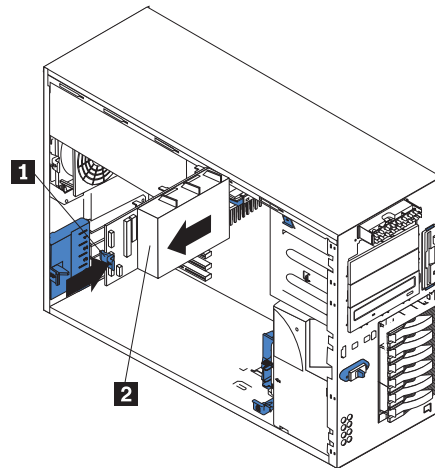


- 1** Tab
- 2** DASD backplane

To remove the DASD backplane assembly:

1. Power OFF the appliance.
2. Disconnect all external cables from the appliance.
3. Pull out the hot-swap drives far enough to remove the DASD backplane assembly.
4. Remove the cover (see “Removing the cover (Model 100)” on page 68 or “Removing the cover (Model 200)” on page 69).
5. Disconnect cable.
6. Press the arrow on the tab **1** to release the backplane.
7. Carefully slide out the DASD backplane **2** to remove it.

Removing the power supply backplane

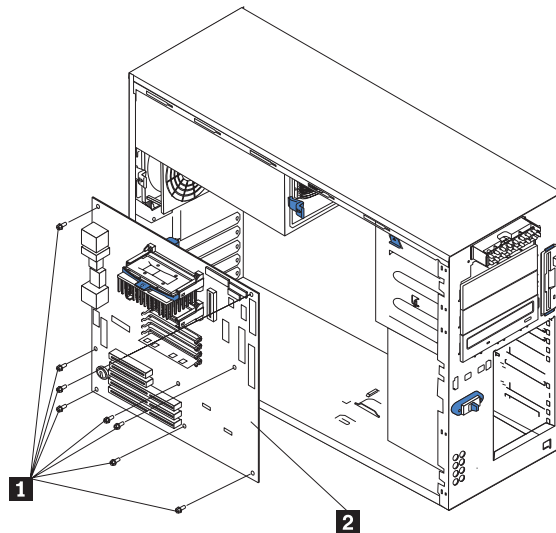


- 1** Tab
- 2** Power supply backplane

To remove the power supply backplane:

1. Power OFF the appliance.
2. Disconnect all external cables from the appliance.
3. Pull the power supplies out far enough to remove the power supply backplane.
4. Remove the cover. See “Removing the cover (Model 100)” on page 68.
5. Disconnect cables from the backplane.
6. Press the arrow on the tab **1** to release the backplane.
7. Slide out the power supply backplane **2** to remove it.

Removing the system board



- 1** Screws (9)
- 2** System Board

To remove the system board:

1. Power OFF the appliance.
2. Disconnect all external cables from the appliance.
3. Remove the cover. See “Removing the cover (Model 100)” on page 68.
4. Remove the rear air flow fan. See “Replacing the fan assembly” on page 92.
5. Remove the DASD backplane assembly. See “Removing the DASD backplane assembly” on page 102.
6. Remove the power supply backplane. See “Removing the power supply backplane” on page 103.
7. Disconnect the system board cables.
8. Remove the screws (9) **1**.
9. Gently pull out the system board **2** to remove it.

Appendix A. Rack Installation Instructions

The following reduced-size illustration in Figure 42 of the front and the back of the rack-mounting template shows where to place the clip nuts or cage nuts when installing your appliance in a rack.

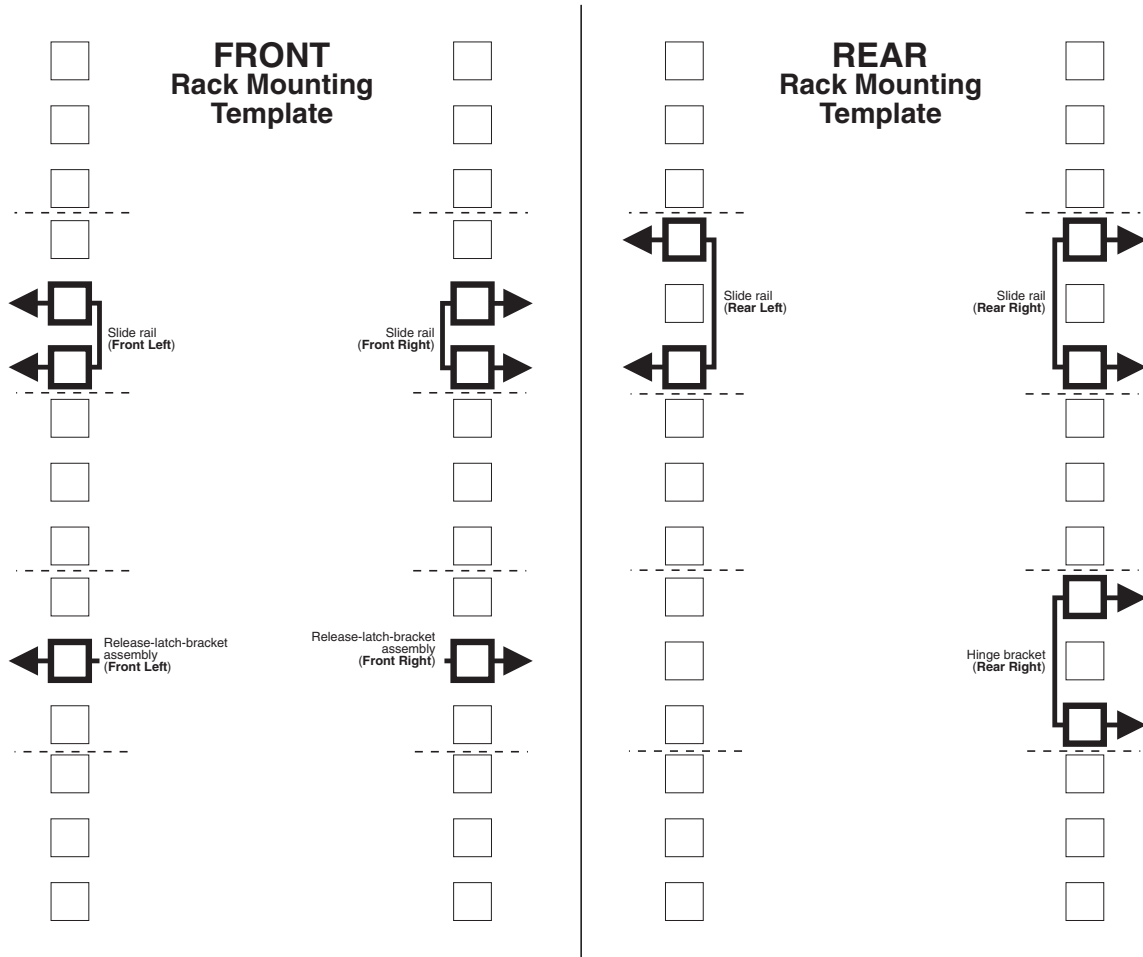
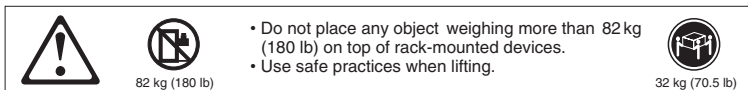


Figure 42. Rack mounting template

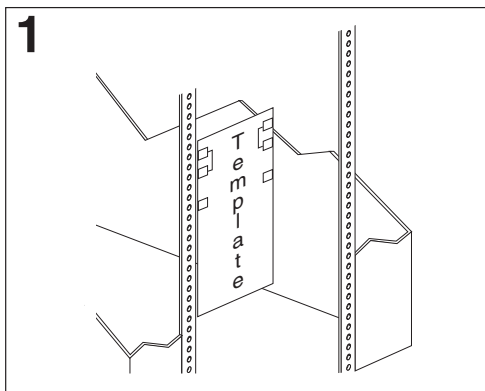
Rack Mounting Instructions

- Review the documentation that comes with your rack enclosure.
- Maintain 15 cm (6 in.) of clearance around your appliance for air circulation.
- Ensure the room air temperature is below 35°C (95°F).
- Plan the appliance installation working from the bottom of the rack up.
- Remove the rack doors and the side panels during the installation, if necessary.
- Position the template to the rack so that the edges of the template do not overlap any other devices to be installed.
- Connect all power cords on the appliance and on other devices to properly wired and grounded electrical outlets.
- Take precautions to prevent the rack from overloading the power outlets when you install multiple devices in a rack.

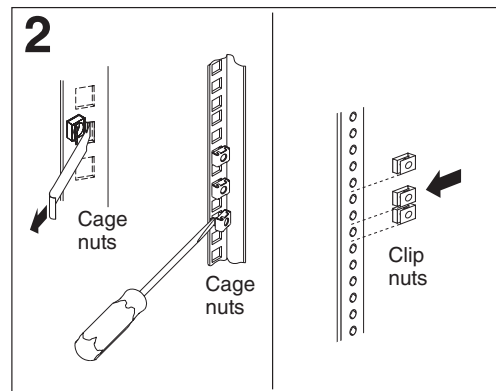


The following is a list of items shipped in your rack installation kit. If any items are missing or damaged, contact your place of purchase.

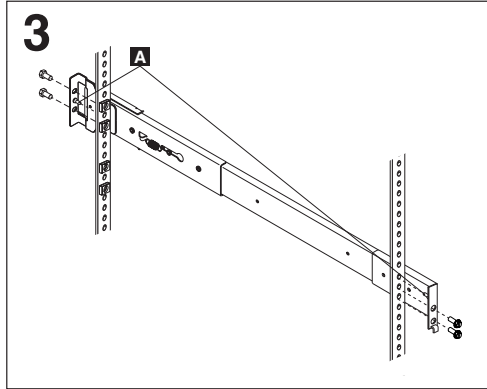
- Cable-management assembly
- Cable straps (7)
- Cable ties (10)
- Cage nuts (12)
- Clip nuts (12)
- Screw packages (2)
- Slide rails (2)



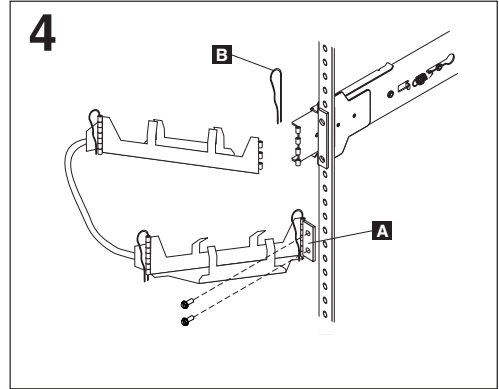
1 Use the attached stickers to mark the holes on the front and the rear of the rack in the locations indicated by the arrows on the template.



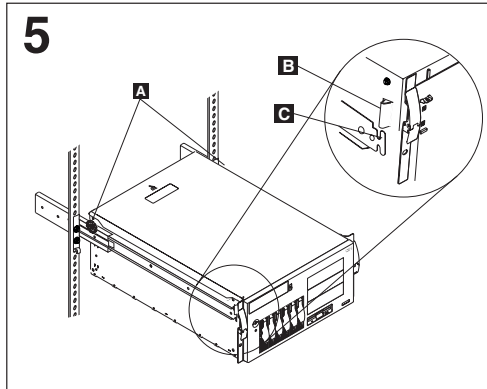
2 Use a screwdriver or the cage-nut-insertion tool to insert the cage nuts, or slide on the clip nuts, as required for your rack, into all the marked holes.



Use the pins **A** on the slide rail to align the slide rail to the rack. Use the M6 screws to bolt the slide rail to the rack (left front of rack shown here). Repeat this step for the other slide rail.



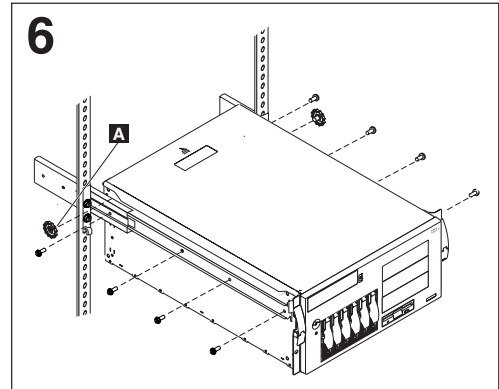
Use the M6 screws to attach the hinge bracket **A** to the rear of the rack. Then, use the hinge pin **B** to attach the cable-management assembly to the slide rail. (Right rear of rack shown here).



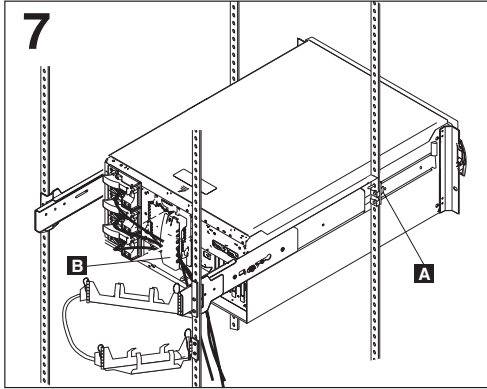
Caution: To avoid injury, do not place your fingers around the rack-support wheels when lowering the appliance onto the rails.

Fully extend the slide rails out of the rack. Lift the appliance above the rails; then, rest the rack-support wheels **A** located on the rear of the appliance on the slide rails. Lower the front of the appliance onto the slide rails.

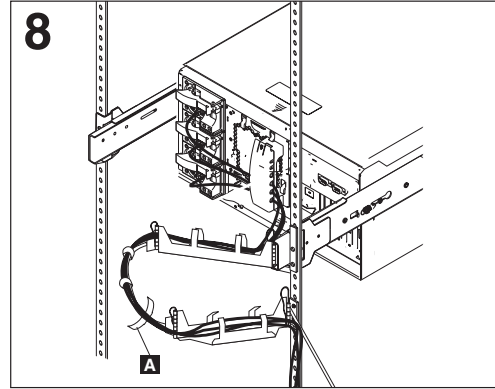
Note: Be sure the bracket notches **B** on the front of the appliance fit securely on the tabs **C** located on the front of the slide rails.



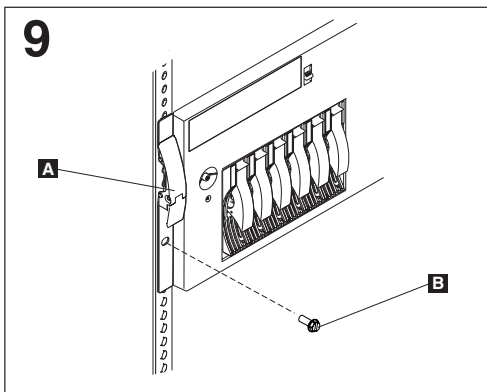
Use the M4 screws to secure the appliance to the rails. Unscrew the rack-support wheels **A** and store them in a safe place.



7 Press in on the safety latches **A** and slide the appliance halfway into the rack. Attach the power, keyboard, mouse, and monitor cables (if required) to the appliance and route them through the cable restraint bracket **B**. Then, attach all other required cables to the appliance.



8 Route all the cables through the cable-management assembly as shown. Then, use the cable straps **A** or the cable ties to secure the cables to the cable-management assembly.



9 Slide the appliance into the rack until the release latches **A** snap shut. Then, insert the M6 screws **B** through the release-latch-bracket assembly.
Note: Inserting the M6 screws **B** is optional, unless you are moving the rack or the rack is in a vibration-prone area.

Appendix B. Service and Recovery Console commands

This section describes Service and Recovery Console commands, or commands which are entered at the Service and Recovery Console (svc>) prompt.

Command names

The following commands can be entered at the svc> prompt.

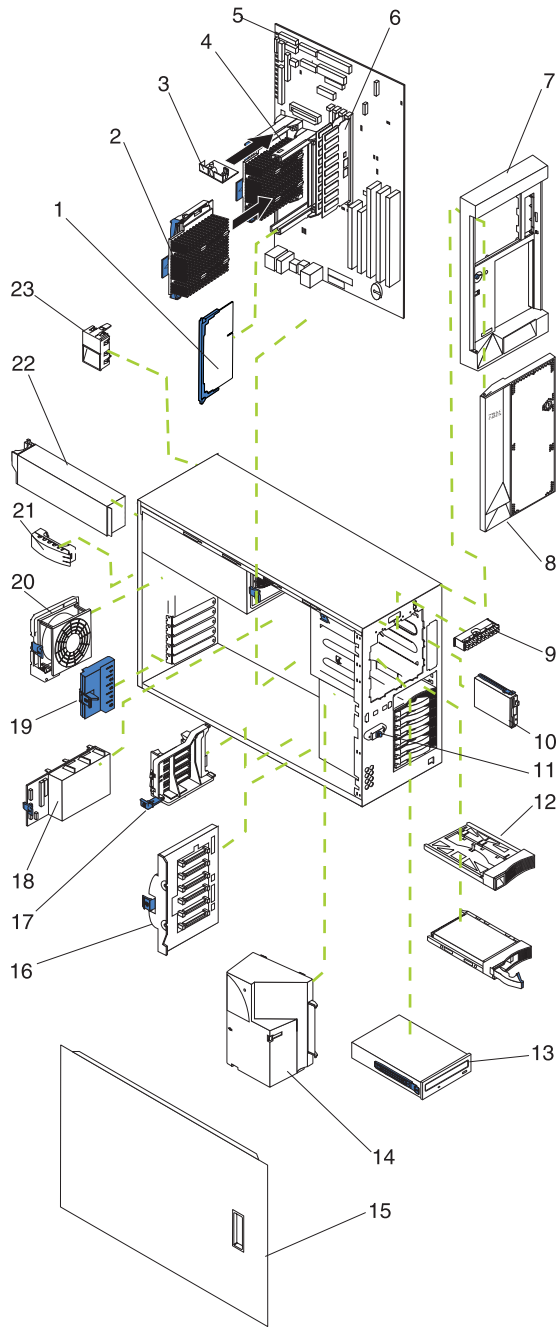
?	Display command help
copy	Copy code image on a node
describe	Describe code level info
enet	Set Service Ethernet IP subnets
erase	Erase code image on a node
ethstat	Display Ethernet information
ftp	FTP get/put image or config on a node
help	Display command help
raid	Monitor ServeRAID
?	Display command help
config	Get current RAID configuration
event	Get event information
help	Display command help
status	Get current controller status
return	Return to the Service and Recovery Console
iscsi	Enter iscsi commands
?	Display command help
arpdump	Display the arp table
disks	Display iSCSI virtual disks
gmsg	Grep for messages
help	Display command help
imsg	Display iSCSI messages
lmsg	Display latest messages
maps	Display iSCSI initiator LUN maps
msg	Display all messages
msglvl	Set/Reset the message level
netstat	Display network information
ping	Ping an IP host
return	Return to the Service and Recovery Console
sessions	Display iSCSI sessions
setaddr	Set Ethernet address temporarily

	summary	Display iSCSI summary
	tasks	Display iSCSI initiator tasks
	users	Display users assigned to a virtual disk
	vmstat	Virtual memory statistics
logs		View log files
	?	Display command help
	access	Display access logs
	error	Display HTTP errors
	help	Display command help
	iscsi	Display iSCSI errors
	return	Return to main menu
	system	Display system messages
misctrace		Miscellaneous Trace Control
reboot		Reboot node
senddebug		Send debug information
set		Set node code image to activate
shutdown		Shutdown node
snmptrace		SNMP Agent Trace Control

Appendix C. Parts Listing

This parts list contains reference drawings and corresponding index for all field-replaceable parts. The index provides the part number, the quantity required (units), and a description of the part.

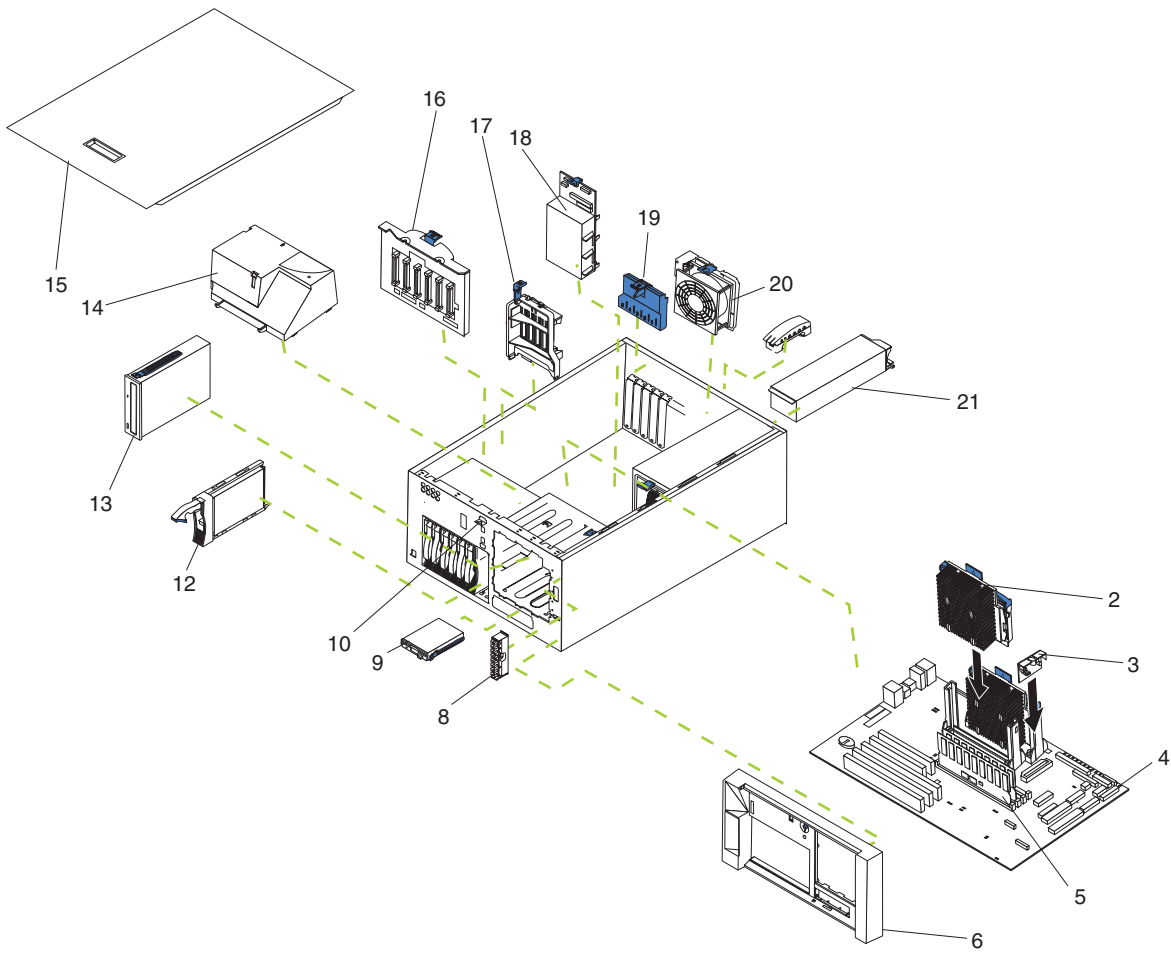
Assembly 1: 4125 IP Storage Model 100



Assembly 1: (continued)

Asm-Index	Part Number	Units	Description
1-1	37L5949	1	• Terminator card assembly
-2	36L8901	1	• 800/133FSB/256 processor
-3	22P1797	1	• Voltage regulator
-4	09N7844	1	• System board assembly
-5			• Memory
-	33L3126	1	• • 256 MB 133 MHz ECC SDRAM RDIMM
-	33L3128	2	• • 512 MB 133 MHz ECC SDRAM RDIMM
-	33L3130	1	• • 1 GB 133 MHz ECC SDRAM RDIMM
-6	38P7619	1	• Bezel assembly
-7	24P0615	1	• Door assembly
-8	37L6773	1	• External LED card assembly
-9	76H4091	1	• Floppy drive, 1.44 MB
-10	00N6377	1	• Power reset card assembly
-11	00N7259	1	• Hard disk drive filler blank
-12	19K1469	3	• 36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL hard drive
-13	36L8756	1	• CD ROM, 40X
-14	36L9998	1	• Blower assembly
-15	00N6401	1	• Cover set assembly
-16	00N9557	1	• DASD backplane assembly
-17	00N7056	1	• PCI adapter card support assembly
-18	00N6391	1	• Power backplane card assembly
-19	36L9994	1	• PCI adapter card retainer
-20	36L9995	1	• Rear fan assembly
-21	36L8819	3	• Power Supply, 250 Watt
-		1	• Network interface card
-	38P7680		• • Gigabit Ethernet Copper Adapter
-	06P3709		• • Gigabit Ethernet SX Adapter
-	00N6412	2	• Plastic CD/DASD slide
-	00N6413	2	• Floppy disk drive slide
-	00N6407	1	• 5.25" media blank bezel
-			• Cables
-	00N6579	1	• • Power Backplane to DASD Backplane
-	00N6581	1	• • Power Backplane to System Board-I2C
-	00N6582	1	• • Power Backplane to System Board-Signal
-	00N6583	1	• • Power Backplane to Media
-	37L6777	1	• • Power Backplane to System Board-Power
-	37L0350	1	• • LVD SCSI
-	38P7715	1	• • IDE cable
-	37L6057	1	• • Floppy disk drive
-	00N6393	1	• Key lock assembly
-	00N6411	4	• Foot, Screw-in
-	00N7046	1	• Chassis, weldment
-	00N7048	1	• Chassis, mechanical shell

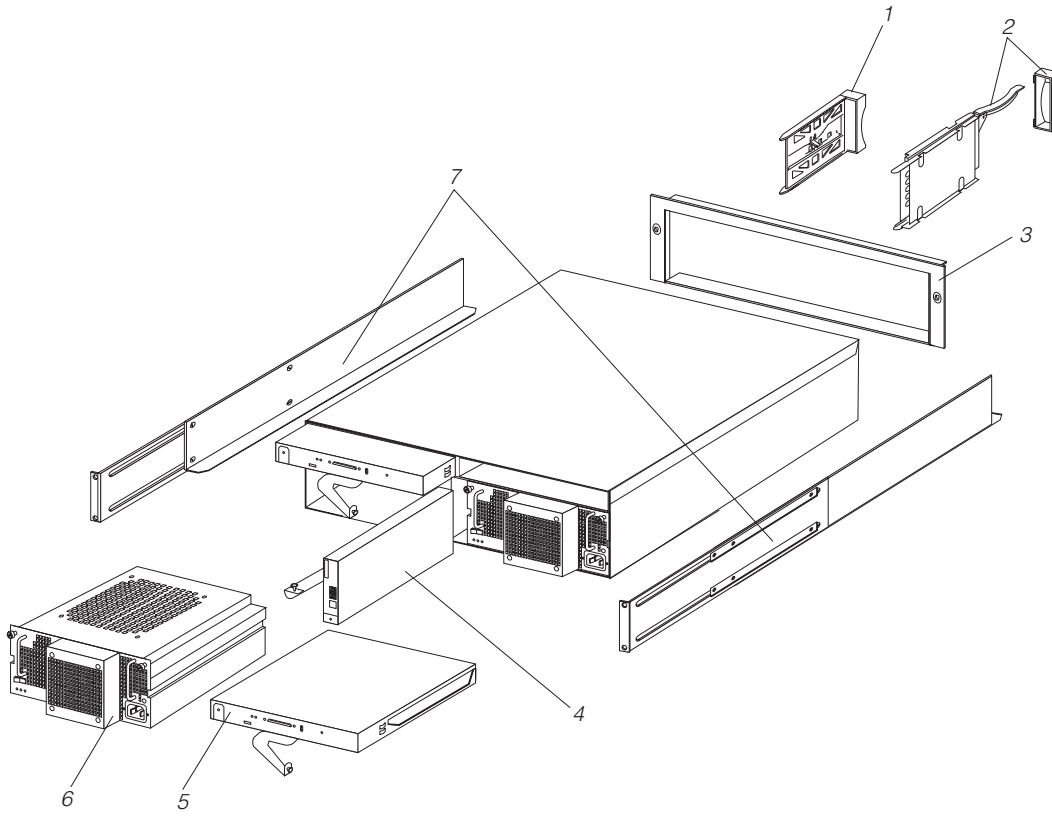
Assembly 2: 4125 IP Storage Model 200



Assembly 2: (continued)

Asm-Index	Part Number	Units	Description
2-2	22P1797	2	• 800/133FSB/256 processor
-3	36L8901	1	• Voltage regulator
-4	09N7844	1	• System board assembly
-5			• Memory
-	33L3126	4	• • 256 MB 133 MHz ECC SDRAM RDIMM
-	33L3128	2	• • 512 MB 133 MHz ECC SDRAM RDIMM
-	33L3130	1	• • 1 GB 133 MHz ECC SDRAM RDIMM
-6	38P7621	1	• Bezel assembly (Model 200)
-8	37L6773	1	• External LED card assembly
-9	76H4091	1	• Floppy drive, 1.44 MB
-10	00N6377	1	• Power reset card assembly
-12	19K1469	6	• 36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL hard drive
-13	36L8756	1	• CD ROM, 40X
-14	36L9998	1	• Blower assembly
-15	00N6403	1	• Cover set assembly
-16	00N9557	1	• DASD backplane assembly
-17	00N7056	1	• PCI adapter card support assembly
-18	00N6391	1	• Power backplane card assembly
-19	36L9994	1	• PCI adapter card retainer
-20	36L9995	1	• Rear fan assembly
-21	36L8819	3	• Power Supply, 250 Watt
-		1	• Network interface card
-	38P7680		• • Gigabit Ethernet Copper Adapter
-	06P3709		• • Gigabit Ethernet SX Adapter
-	00N6412	2	• Plastic CD/DASD slide
-	00N6413	2	• Floppy disk drive slide
-	00N6407	1	• 5.25" media blank bezel
-			• Cables
-	00N6579	1	• • Power Backplane to DASD Backplane
-	00N6581	1	• • Power Backplane to System Board-I2C
-	00N6582	1	• • Power Backplane to System Board-Signal
-	00N6583	1	• • Power Backplane to Media
-	37L6777	1	• • Power Backplane to System Board-Power
-	37L0350	1	• • LVD SCSI
-	38P7715	1	• • IDE cable
-	37L6057	1	• • Floppy disk drive
-	00N6417	1	• Rack kit
-	00N6419	1	• Miscellaneous rack parts kit
-	00N6429	2	• Rack bracket assembly
-	00N7046	1	• Chassis, weldment
-	00N7050	1	• Chassis, mechanical shell

Assembly 3: 4125 IP Storage Model EXP



Assembly 3: (continued)

Asm- Index	Part Number	Units	Description
3-1	19K1469	14	• 36.4 GB 10K-4 Ultra160 SCSI Hot-Swap SL hard drive
-2	19K1172	1	• Bridge card
-3	38P7716	1	• Plastic bezel
-4	19K1173	1	• Switch card
-5	19K1171	1	• SCSI controller
-6	07K5985	2	• Power supply
-7	19K1169	1	• Rack mounting rail kit

Assembly 3: (continued)

Appendix D. Connecting the Service Port

The service port is the RS-232 connection data terminal equipment (DTE) that uses a standard 9-pin male "D" shell connector. To connect to a personal computer or terminal, you must have a "null modem" cable. Figure 44, Table 16, and Table 17 show the pin layout designations for this connector.

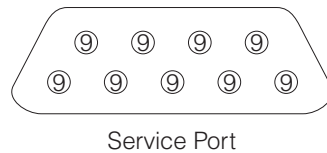


Figure 43. Service port pin layout

Table 25. DB-9 RS-232 connector pin assignments

Pin Number	Signal Name	Abbreviation	Direction Relative to the SAN Data Gateway
1	Carrier detect	CD	In
2	Receive data	RD	In
3	Transmit data	TD	Out
4	Data terminal ready	DTR	Out
5	Signal ground	SG	—
6	Data set ready	DSR	In
7	Request to send	RTS	Out
8	Clear to send	CTS	In
9	Ring indicator	RI	In

Table 26. Null modem cable connections

Service Port Pin Number	Signal Name	9-Pin AT Connector	25-pin (DB25) Connector (DTE)
1	Carrier detect (not used)	N/C (not connected)	N/C (not connected)
2	Receive data <-> Transmit data	3	2
3	Transmit data <-> Receive data	2	3
4	Data terminal ready <-> Data set ready	6	6
5	Signal ground	5	7
6	Data set ready <-> Data terminal ready	4	20
7	Request to send <-> Clear to send	8	5
8	Clear to send <-> Request to send	7	4

Table 26. Null modem cable connections (continued)

9	Ring indicator (not used)	N/C (not connected)	
---	---------------------------	---------------------	--

Connecting the service terminal

This section contains the hardware information needed to interconnect the service terminal.

Attention: You will need HyperTerminal to read the messages.

Note: Service terminal settings must be:

- 19200 baud
- 8 data bits
- No parity
- 1 stop bit

Hardware Required

- RS-232 DB9F to DB9F null modem cable
- Desktop computer or laptop computer, or a 232 DTE terminal, or a desktop or laptop computer that runs terminal emulation software
- RS-232 DB9M to DB25F adapter if the terminal uses a DB25M connector

Appendix E. Specifications

Dimensions

	Model 100	Model 200	Model EXP
Front	217.3 mm (8.6 in)	426.5 mm (16.8 in)	444.0 mm (17.5 in)
Side	659.3 mm (26.0 in)	629.3 mm (24.8 in)	519.0 mm (20.4 in)
Height	426.5 mm (16.8 in)	217.3 mm (8.6 in)	127.5 mm (5.0 in)

Weight

Model 100	Model 200	Model EXP
Approx. 26.6 kg (58.6 lb) without extra hard drives	Approx. 25.2 kg (55.7 lb) without extra hard drives	
Approx. 37.5 kg (82.7 lb) when fully configured	Approx. 36.2 kg (79.8 lb) when fully configured	Approx. with all hard drives: 34.5 kg (76 lb)

Operating environment

	Models 100 and 200
Air temperature	
at altitudes up to 914 m (2999 ft.)	10° - 35° C (50.0° - 95.0° F)
at altitudes from 914 m (2999 ft.) to 2133 m (6998 ft)	10° - 32° C (50.0° - 89.6° F).
Humidity	8% - 80%

Nonoperating (power-off) environment

	Models 100 and 200
Temperature (at max. altitude of 2133 m [6998 ft])	10° - 43° C (50.0° - 109.4° F)
Humidity	8% - 80%

Heat output

Approximate heat output for Models 100 and 200:	
Minimum configuration	683 BTU (200 watts)
Maximum configuration	2048 BTU (600 watts)

Power requirements

Voltage low range	100 - 127 V ac, 50 - 60 Hz
Voltage high range	200 - 240 V ac, 50 - 60 Hz
Power consumption	0.08 - 0.52 kVA

Appendix F. Notices

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Safety and environmental notices

The following sections describe the safety and environmental items you must consider for an IBM Network Attached Storage Appliance.

Safety notices

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
 1. Ensure you can stand safely without slipping.
 2. Distribute the weight of the object equally between your feet.
 3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
 4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb.) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

Remember: Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

Electrical safety



Caution:

Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the appliance covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

Important: Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.

Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
 - Performing a mechanical inspection
 - Working near power supplies
 - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
 - Ensure that another person, familiar with the power-off controls, is near you.
Remember: Another person must be there to switch off the power, if necessary.
 - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.
Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
 - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
 - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
 - Power supply units
 - Pumps
 - Blowers and fans
 - Motor generators
 - Similar units

This practice ensures correct grounding of the units.

- If an electrical accident occurs:
 - Use caution; do not become a victim yourself.
 - Switch off power.
 - Send another person to get medical aid.

Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
 - a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.

- b. The power cord should be the appropriate type as specified in the parts listings.
- c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

Note: The use of a grounding system is desirable but not required to protect against ESD damage.

- Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
- Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
- Use the round ground-prong of the AC plug on AC-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Translated safety notices

The safety notices in this section are provided in the following languages:

- English

- Brazilian Portuguese
- Chinese
- French
- German
- Italian
- Korean
- Spanish

Important: All safety notices in the *Appliance Library* begin with a number. This number is used to cross-reference an English caution or danger notice with translated versions of the caution or danger notice in this section.

Be sure to read all safety notices before performing any of the instructions.

Statement 1



DANGER

Electrical current from power, telephone and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

To Connect

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Statement 2



CAUTION:

When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

Statement 3



CAUTION:

When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Statement 4



≥18 kg (37 lbs)



≥32 kg (70.5 lbs)



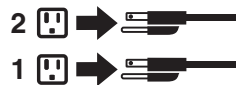
≥55 kg (121.2 lbs)

CAUTION:
Use safe practices when lifting.

- Statement 5



CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 10



CAUTION:
Do not place any object weighing more than 82 kg (180 lb.) on top of rack-mounted devices.



Importante:

Todas as instruções de cuidado e perigo da *appliance Library* começam com um número. Este número é utilizado para fazer referência cruzada de uma instrução de cuidado ou perigo no idioma inglês com as versões traduzidas das instruções de cuidado ou perigo encontradas nesta seção.

Por exemplo, se uma instrução de cuidado é iniciada com o número 1, as traduções para aquela instrução de cuidado aparecem nesta seção sob a instrução 1.

Certifique-se de ler todas as instruções de cuidado e perigo antes de executar qualquer operação.

Instrução 1



PERIGO

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicações é perigosa.

Para evitar risco de choque:

- Não conecte ou desconecte cabos e não realize instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.
- Conecte todos os cabos de alimentação a tomadas elétricas corretamente instaladas e aterradas.
- Conecte todos os equipamentos ao qual esse produto será conectado a tomadas corretamente instaladas.
- Sempre que possível, utilize apenas uma das mãos para conectar ou desconectar cabos de sinal.
- Nunca ligue qualquer equipamento quando existir evidência de danos por fogo, água ou na estrutura.
- Desconecte cabos de alimentação, sistemas de telecomunicação, redes e modems antes de abrir as tampas dos dispositivos, a menos que especificado de maneira diferente nos procedimentos de instalação e configuração.
- Conecte e desconecte cabos conforme descrito na seguinte tabela, ao instalar ou movimentar este produto ou os dispositivos conectados, ou ao abrir suas tampas.

Para Conectar:	Para Desconectar:
<ol style="list-style-type: none"> 1. DESLIGUE Tudo. 2. Primeiramente, conecte todos os cabos aos dispositivos. 3. Conecte os cabos de sinal aos conectores. 4. Conecte os cabos de alimentação às tomadas. 5. LIGUE os dispositivos. 	<ol style="list-style-type: none"> 1. DESLIGUE Tudo. 2. Primeiramente, remova os cabos de alimentação das tomadas. 3. Remova os cabos de sinal dos conectores. 4. Remova todos os cabos dos dispositivos.

Instrução 2



CUIDADO:

Ao substituir a bateria de lítio, utilize apenas uma bateria IBM, Número de Peça 33F8354 ou uma bateria de tipo equivalente, recomendada pelo fabricante. Se o seu sistema possui um módulo com uma bateria de lítio, substitua-o apenas pelo mesmo tipo de módulo, do mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada e descartada de maneira correta.

Não:

- Jogue ou coloque na água
- Aqueça a mais de 100°C (212°F)
- Conserte nem desmonte

Para descartar a bateria, entre em contato com a área de atendimento a clientes IBM, pelo telefone (011) 889-8986, para obter informações sobre como enviar a bateria pelo correio para a IBM.

Instrução 3



PRECAUCIÓN:

Quando produtos a laser (unidades de CD-ROM, unidades de DVD, dispositivos de fibra ótica, transmissores, etc.) estiverem instalados, observe o seguinte:

- Não remova as tampas. A remoção das tampas de um produto a laser pode resultar em exposição prejudicial à radiação de laser. Nenhuma peça localizada no interior do dispositivo pode ser consertada.
- A utilização de controles ou ajustes ou a execução de procedimentos diferentes dos especificados aqui pode resultar em exposição prejudicial à radiação.



PERIGO

Alguns produtos a laser contêm um diodo laser da Classe 3A ou Classe 3B embutido. Observe o seguinte:

Radiação de laser quando aberto. Não olhe diretamente para o raio a olho nu ou com instrumentos óticos, e evite exposição direta ao raio.

Instrução 4



≥18 kg (37 lbs)



≥32 kg (70,5 lbs)



≥55 kg (121,2 lbs)

CUIDADO:

Ao levantar a máquina, faça-o com segurança.

Instrução 5



CUIDADO:

Os botões Liga/Desliga localizados no dispositivo e na fonte de alimentação não desligam a corrente elétrica fornecida ao dispositivo. O dispositivo também pode ter mais de um cabo de alimentação. Para remover toda a corrente elétrica do dispositivo, assegure que todos os cabos de alimentação estejam desconectados da fonte de energia elétrica.



CUIDADO:

Instrução 10



CUIDADO:



Não coloque nenhum objeto com peso superior a 82 kg (180 lbs.) sobre dispositivos montados em rack.

重要:

Netfinity Server Library 中的所有提醒和危险条款前都有一个数字标识。该数字是用来交叉引用一个英文的提醒和危险条款及本部分中的与之对应的已翻译成其它文字的提醒和危险条款。

例如，如果一个提醒条款前的数字为 1，则本部分中相应的译文也带有标号 1。

在执行任何指示的操作之前，请确保您已经阅读了全部提醒和危险条款。

声明 1



危险

电源、电话和通信电缆中带有危险电流。

为避免电击：

雷电期间不要拆接电缆或安装、维修及重新配置本产品。

将所有电源线连接至正确布线并已安全接地的电源插座上。

将与本产品连接的所有设备连接至正确布线的插座上。

尽量只使用单手拆接信号电缆。

有水、火及结构损坏迹象时，请勿打开任何设备。

除非在安装配置过程中有明确指示，否则，打开设备机盖前应先断开与电源线、远程通信系统、网络和调制解调器的所有连接。

安装、移动或打开本产品及其附带设备的机盖时，应按下表所述连接和断开电缆。

连接时：

1. 关闭所有设备。
2. 首先将所有电缆连接至设备。
3. 将信号电缆连接至接口。
4. 将电源线连接至插座。

断开连接时：

1. 关闭所有设备。
2. 首先从插座中拔出电源线。
3. 从接口上拔下信号电缆。

声明 2



警告:

更换锂电池时, 只能使用 IBM 产品号 33F8354 或者是厂商推荐的等同类型的电池。

如果系统模块中含有锂电池, 则只能使用同一厂商制造的同一类型的模块进行更换。电池中含有锂, 如果使用、拿放或处理不当, 可能会发生爆炸。

请勿对电池进行下列操作:
扔入或浸入水中
加热超过 100 (212 F)
进行修理或分解
请按本地法规要求处理电池。

声明 3



警告:

安装激光产品 (如 CD-ROM、DVD 驱动器、光纤设备或送话器) 时, 应注意以下事项:

不要拆除外盖。拆除激光产品的外盖可能会导致激光辐射的危险, 本设备中没有用户可维修的部件。

非此处指定的其它控制、调整或与性能有关的操作都有可能致激光辐射的危险。



危险

某些激光产品中包含内嵌的 3A 级或 3B 级激光二极管。请注意以下事项。
打开时会产生激光辐射。不要直视光束, 不要使用光学仪器直接观看光束, 避免直接暴露于光束之下。

声明 4



≥18 kg (37 磅)



≥32 kg (70.5 磅)



≥55 kg (121.2 磅)

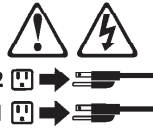
警告：
抬起时请采用安全操作方法。

声明 5



警告：

使用设备上的电源控制按钮和电源上的开关都不能断开本设备上的电流。
另外，本设备可能带有多条电源线。如果要断开设备上的所有电流，请确
保所有电源线均已与电源断开连接。



声明 6



警告：

如果在电源线连接设备的一端安装了固定松紧夹，则必须将电源线的另一端连接至
使用方便的电源。

声明 7



警告:

如果设备带有外门，则在移动或抬起设备前应将其拆除或固定以避免造成人员伤害。外门支撑不了设备的重量。

声明 8



警告:

不要拆除电源外盖或贴有下列标签的任何部件。



贴有此标签的组件内部存在高电压、高电流的危险。这些组件中没有用户可维修的部件。如果怀疑其中的部件存在问题，应与服务技术人员联系。

声明 9



警告:

为避免人员伤害，拆除设备上的风扇前应拨下热插拔风扇电缆。

声明 10



警告:

机柜安装的设备上面不能放置重于 82kg (180 磅) 的物品。



> 82 kg (180 磅)

声明 11



警告：

下面的标签表明附近有锋利的边、角或接头。



声明 12



警告：

下面的标签表明附近有高热表面。



重要資訊：

Netfinity Server Library 中所有「注意」及「危險」的聲明均以數字開始。此一數字是用來作為交互參考之用；英文「注意」或「危險」聲明可在本節中找到相同內容的「注意」或「危險」聲明的譯文。

例如，有一「危險」聲明以數字 1 開始，則該「危險」聲明的譯文將出現在本節的「聲明」1 中。

執行任何指示之前，請詳讀所有「注意」及「危險」的聲明。

聲明 1



危險

電源、電話及通信電纜上所產生的電流均有危險性。

欲避免電擊危險：

- 在雷雨期間，請勿連接或切斷本產品上的任何電纜線，或安裝、維修及重新架構本產品。
- 請將電源線接至接線及接地正確的電源插座。
- 請將本產品隨附的設備連接至接線正確的插座。
- 儘可能使用單手來連接或切斷信號電纜線。
- 當設備有火燒或洩水的痕跡，或有結構性損害時，請勿開啓該設備的電源。
- 在安裝及架構之時，若非非常熟悉，在開啓裝置蓋子之前，請切斷電源線、電信系統、網路及數據機。
- 在安裝、移動本產品或附加裝置，或開啓其蓋子時，請依照下表中「連接」及「切斷」電纜線的步驟執行。

連接：

1. 關閉所有開關。
2. 先將所有電纜線接上裝置。
3. 將信號電纜接上接頭。
4. 再將電源線接上電源插座。
5. 開啓裝置的電源。

切斷：

1. 關閉所有開關。
2. 先自電源插座拔掉電源線。
3. 拔掉接頭上的所有信號電纜。
4. 再拔掉裝置上的所有電纜線。

聲明 2



注意：

更換電池時，只可使用 IBM 零件編號 33F8354 的電池，或製造商建議之相當類型的電池。若系統中具有包含鋰電池的模組，在更換此模組時，請使用相同廠商製造的相同模組類型。如未正確使用、處理或丟棄含有鋰的電池時，可能會引發爆炸。

請勿將電池：

- 丟入或浸入水中
- 加熱超過 100 °C (212 °F)
- 修理或拆開

請遵照當地法令規章處理廢棄電池。

聲明 3



注意：

安裝雷射產品 (如 CD-ROM、DVD 光碟機、光纖裝置或發射器) 時，請注意下列事項：

- 請勿移開蓋子。移開雷射產品的蓋子，您可能會暴露於危險的雷射輻射之下。裝置中沒有需要維修的組件。
- 不依此處所指示的控制、調整或處理步驟，您可能會暴露於危險的輻射之下。



危險

有些雷射產品含有內嵌式 Class 3A 或 Class 3B 雷射二極體。請注意下列事項：

開啓時會產生雷射輻射。請勿凝視光束，不要使用光學儀器直接觀察，且應避免直接暴露在光束下。

聲明 4

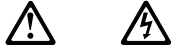


≥ 18 公斤 (37 磅) ≥ 32 公斤 (70.5 磅) ≥ 55 公斤 (121.2 磅)

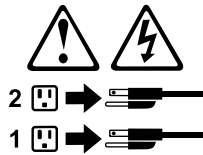
注意：

抬起裝置時，請注意安全措施。

聲明 5



注意：
裝置上的電源控制按鈕及電源供應器上的電源開關均無法關閉裝置上的電流。
本裝置可能有一條以上的電源線。如要移除裝置上的所有電流，請確認所有電源線已與電源分離。



聲明 10



注意：
請勿將任何重量超過 82 公斤 (180 磅) 的物品置於已安裝機架的裝置上方。



> 82 公斤 (180 磅)

Important:

Toutes les consignes Attention et Danger indiquées dans la bibliothèque *appliance* sont précédées d'un numéro. Ce dernier permet de mettre en correspondance la consigne en anglais avec ses versions traduites dans la présente section.

Par exemple, si une consigne de type Attention est précédée du chiffre 1, ses traductions sont également précédées du chiffre 1 dans la présente section.

Prenez connaissance de toutes les consignes de type Attention et Danger avant de procéder aux opérations décrites par les instructions.



DANGER

Le courant électrique passant dans les câbles de communication, ou les cordons téléphoniques et d'alimentation peut être dangereux.

Pour éviter tout risque de choc électrique:

- **Ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.**
- **Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.**
- **Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.**
- **Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.**
- **Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.**
- **Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relient aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).**
- **Lorsque vous installez ou que vous déplacez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.**

Connexion	Déconnexion
<ol style="list-style-type: none">1. Mettez les unités hors tension.2. Commencez par brancher tous les cordons sur les unités.3. Branchez les câbles d'interface sur des connecteurs.4. Branchez les cordons d'alimentation sur des prises.5. Mettez les unités sous tension.	<ol style="list-style-type: none">1. Mettez les unités hors tension.2. Débranchez les cordons d'alimentation des prises.3. Débranchez les câbles d'interface des connecteurs.4. Débranchez tous les câbles des unités.



Notice n° 2

ATTENTION:

Remplacez la pile au lithium usagée par une pile de référence identique exclusivement - voir la référence IBM - ou par une pile équivalente recommandée par le fabricant. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et présente donc un risque d'explosion en cas de mauvaise manipulation ou utilisation.

- **Ne la jetez pas à l'eau.**
- **Ne l'exposez pas à une température supérieure à 100 °C.**
- **Ne cherchez pas à la réparer ou à la démonter.**

Pour la mise au rebut, reportez-vous à la réglementation en vigueur.



Notice n° 3

ATTENTION:

Si des produits laser sont installés (tels que des unités de CD-ROM ou de DVD, des périphériques contenant des fibres optiques ou des émetteurs-récepteurs), prenez connaissance des informations suivantes:

- **N'ouvrez pas ces produits pour éviter une exposition directe au rayon laser. Vous ne pouvez effectuer aucune opération de maintenance à l'intérieur.**
- **Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent document.**



DANGER

Certains produits laser contiennent une diode laser de classe 3A ou 3B.
Prenez connaissance des informations suivantes:

Rayonnement laser lorsque le carter est ouvert. Évitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques. Évitez une exposition directe au rayon.

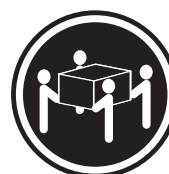
Notice n° 4



≥18 kg



≥32 kg



≥55 kg

ATTENTION:

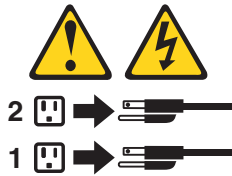
Faites-vous aider pour soulever ce produit.

Notice n° 5



ATTENTION:

Le bouton de mise sous tension/hors tension de l'unité et l'interrupteur d'alimentation du bloc d'alimentation ne coupent pas l'arrivée de courant électrique à l'intérieur de la machine. Il se peut que votre unité dispose de plusieurs cordons d'alimentation. Pour isoler totalement l'unité du réseau électrique, débranchez tous les cordons d'alimentation des socles de prise de courant.



Notice n° 10



ATTENTION:

Ne posez pas d'objet dont le poids dépasse 82 kg sur les unités montées en armoire.

Wichtig:

Alle Sicherheitshinweise in dieser *server-Bibliothek* beginnen mit einer Nummer. Diese Nummer verweist auf einen englischen Sicherheitshinweis mit den übersetzten Versionen dieses Hinweises in diesem Abschnitt.

Wenn z. B. ein Sicherheitshinweis mit der Nummer 1 beginnt, so erscheint die Übersetzung für diesen Sicherheitshinweis in diesem Abschnitt unter dem Hinweis 1.

Lesen Sie alle Sicherheitshinweise, bevor Sie eine Anweisung ausführen.

Hinweis 1



VORSICHT

Elektrische Spannungen von Netz-, Telefon- und Datenübertragungsleitungen sind gefährlich.

Aus Sicherheitsgründen:

- Bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.

- Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.
- Signalkabel möglichst einhändig anschließen oder lösen.
- Keine Geräte einschalten, wenn die Gefahr einer Beschädigung durch Feuer, Wasser oder andere Einflüsse besteht.
- Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem öffnen des Gehäuses zu unterbrechen. Es sei denn, dies ist in den zugehörigen Installations- und Konfigurationsprozeduren anders angegeben.
- Nur nach den nachfolgend aufgeführten Anweisungen arbeiten, die für Installation, Transport oder öffnen von Gehäusen von Personal Computern oder angeschlossenen Einheiten gelten.

Kabel anschließen:	Kabel lösen:
<ol style="list-style-type: none"> 1. Alle Geräte ausschalten und Netzstecker ziehen. 2. Zuerst alle Kabel an Einheiten anschließen. 3. Signalkabel an Anschlußbuchsen anschließen. 4. Netzstecker an Steckdose anschließen. 5. Gerät einschalten. 	<ol style="list-style-type: none"> 1. Alle Geräte ausschalten. 2. Zuerst Netzstecker von Steckdose lösen. 3. Signalkabel von Anschlußbuchsen lösen. 4. Alle Kabel von Einheiten lösen.

Hinweis 2



ACHTUNG:

Eine verbrauchte Batterie nur durch eine Batterie mit der IBM Teilenummer 33F8354 oder durch eine vom Hersteller empfohlene Batterie ersetzen. Wenn Ihr System ein Modul mit einer Lithium-Batterie enthält, ersetzen Sie es immer mit dem selben Modultyp vom selben Hersteller. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

Die Batterie nicht:

- mit Wasser in Berührung bringen.
- über 100° C erhitzen.
- reparieren oder zerlegen.

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.

Hinweis 3



ACHTUNG:

Wenn ein Laserprodukt (z. B. CD-ROM-Laufwerke, DVD-Laufwerke, Einheiten mit Glasfaserkabeln oder Transmitter) installiert ist, beachten Sie Folgendes:

- Das Entfernen der Abdeckungen des CD-ROM-Laufwerks kann zu gefährlicher Laserstrahlung führen. Es befinden sich keine Teile innerhalb des CD-ROM-Laufwerks, die vom Benutzer gewartet werden müssen. Die Verkleidung des CD-ROM-Laufwerks nicht öffnen.
- Steuer- und Einstellelemente sowie Verfahren nur entsprechend den Anweisungen im vorliegenden Handbuch einsetzen. Andernfalls kann gefährliche Laserstrahlung auftreten.



VORSICHT

Manche CD-ROM-Laufwerke enthalten eine eingebaute Laserdiode der Klasse 3A oder 3B. Die nachfolgend aufgeführten Punkte beachten.

Laserstrahlung bei geöffneter Tür. Niemals direkt in den Laserstrahl sehen, nicht direkt mit optischen Instrumenten betrachten und den Strahlungsbereich meiden.

Hinweis 4



≥18 kg



≥32 kg



≥55 kg

ACHTUNG:

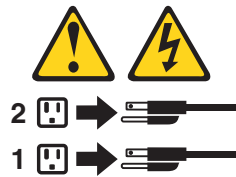
Beim Anheben der Maschine die vorgeschriebenen Sicherheitsbestimmungen beachten.

Hinweis 5



ACHTUNG:

Mit dem Betriebsspannungsschalter an der Vorderseite des Gerätes und dem Betriebsspannungsschalter am Netzteil wird die Stromversorgung für das Gerät nicht unterbrochen. Das Gerät könnte auch mehr als ein Netzkabel aufweisen. Um die gesamte Stromversorgung des Gerätes auszuschalten, muß sichergestellt werden, daß alle Netzkabel aus den Netzsteckdosen herausgezogen wurden.



Hinweis 10



ACHTUNG:



Keine Gegenstände, die mehr als 82 kg wiegen, auf Rack-Einheiten ablegen.

Importante:

Tutti gli avvisi di attenzione e di pericolo riportati nella pubblicazione *appliance Library* iniziano con un numero. Questo numero viene utilizzato per confrontare avvisi di attenzione o di pericolo in inglese con le versioni tradotte riportate in questa sezione.

Ad esempio, se un avviso di attenzione inizia con il numero 1, la relativa versione tradotta è presente in questa sezione con la stessa numerazione.

Prima di eseguire una qualsiasi istruzione, accertarsi di leggere tutti gli avvisi di attenzione e di pericolo.

Avviso 1



PERICOLO

La corrente elettrica circolante nei cavi di alimentazione, del telefono e di segnale è pericolosa.

Per evitare il pericolo di scosse elettriche:

- Non collegare o scollegare i cavi, non effettuare l'installazione, la manutenzione o la riconfigurazione di questo prodotto durante i temporali.
- Collegare tutti i cavi di alimentazione ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Collegare qualsiasi apparecchiatura collegata a questo prodotto ad una presa elettrica correttamente cablata e munita di terra di sicurezza.
- Quando possibile, collegare o scollegare i cavi di segnale con una sola mano.
- Non accendere qualsiasi apparecchiatura in presenza di fuoco, acqua o se sono presenti danni all'apparecchiatura stessa.
- Scollegare i cavi di alimentazione, i sistemi di telecomunicazioni, le reti e i modem prima di aprire i coperchi delle unità, se non diversamente indicato nelle procedure di installazione e configurazione.
- Collegare e scollegare i cavi come descritto nella seguente tabella quando si effettuano l'installazione, la rimozione o l'apertura dei coperchi di questo prodotto o delle unità collegate.

Per collegare:	Per scollegare:
<ol style="list-style-type: none">1. SPEGNERE tutti i dispositivi.2. Collegare prima tutti i cavi alle unità.3. Collegare i cavi di segnale ai connettori.4. Collegare i cavi di alimentazione alle prese elettriche.5. ACCENDERE le unità.	<ol style="list-style-type: none">1. SPEGNERE tutti i dispositivi.2. Rimuovere prima i cavi di alimentazione dalle prese elettriche.3. Rimuovere i cavi di segnale dai connettori.4. Rimuovere tutti i cavi dalle unità.

Avviso 2



ATTENZIONE:

Quando si sostituisce la batteria al litio, utilizzare solo una batteria IBM con numero parte 33F8354 o batterie dello stesso tipo o di tipo equivalente consigliate dal produttore. Se il sistema di cui si dispone è provvisto di un modulo contenente una batteria al litio, sostituire tale batteria solo con un tipo di modulo uguale a quello fornito dal produttore. La batteria contiene litio e può esplodere se utilizzata, maneggiata o smaltita impropriamente.

Evitare di:

- Gettarla o immergerla in acqua
- Riscaldarla ad una temperatura superiore ai 100°C
- Cercare di ripararla o smontarla

Smaltire secondo la normativa in vigore (D.Lgs 22 del 5/2/9) e successive disposizioni nazionali e locali.

Avviso 3



ATTENZIONE:

Quando si installano prodotti laser come, ad esempio, le unità DVD, CD-ROM, a fibre ottiche o trasmettitori, prestare attenzione a quanto segue:

- Non rimuovere i coperchi. L'apertura dei coperchi di prodotti laser può determinare l'esposizione a radiazioni laser pericolose. All'interno delle unità non vi sono parti su cui effettuare l'assistenza tecnica.
- L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.



PERICOLO

Alcuni prodotti laser contengono all'interno un diodo laser di Classe 3A o Classe 3B. Prestare attenzione a quanto segue:

Aperto l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione diretta al fascio.

Avviso 4



≥18 kg



≥32 kg



≥55 kg

ATTENZIONE:

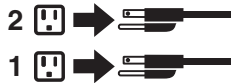
Durante il sollevamento della macchina seguire delle norme di sicurezza.

Avviso 5



ATTENZIONE:

Il pulsante del controllo dell'alimentazione situato sull'unità e l'interruttore di alimentazione posto sull'alimentatore non disattiva la corrente elettrica fornita all'unità. L'unità potrebbe disporre di più di un cavo di alimentazione. Per disattivare la corrente elettrica dall'unità, accertarsi che tutti i cavi di alimentazione siano scollegati dalla sorgente di alimentazione.



Avviso 10



ATTENZIONE:



Non poggiare oggetti che pesano più di 82 kg sulla parte superiore delle unità montate in rack.

중요:

본 *Netfinity Server Library*에 있는 모든 주의 및 위험 경고문은 번호로 시작합니다. 이 번호는 영문 주의 혹은 위험 경고문과 이 절에 나오는 번역된 버전의 주의 혹은 위험 경고문을 상호 참조하는 데 사용됩니다.

예를 들어, 주의 경고문이 번호 1로 시작하면, 번역된 해당 주의 경고문을 본 절의 경고문 1에서 찾아볼 수 있습니다.

모든 지시사항을 수행하기 전에 반드시 모든 주의 및 위험 경고문을 읽으십시오.

경고문 1



위험

전원, 전하 및 통신 케이블로부터 흘러 나오는 전류는 위험합니다.

전기 충격을 피하려면:

- 뇌우를 동반할 때는 케이블의 연결이나 철수, 이 제품의 설치, 유지보수 또는 재구성을 하지 마십시오.
- 모든 전원 코드를 적절히 배선 및 접지해야 합니다.
- 이 제품에 연결될 모든 장비를 적절하게 배선된 콘센트에 연결하십시오.
- 가능한 한 신호 케이블을 한 손으로 연결하거나 끊으십시오.
- 화재, 수해 또는 구조상의 손상이 있을 경우 장비를 켜지 마십시오.
- 설치 및 구성 프로시저에 다른 설명이 없는 한, 장치 덮개를 열기 전에 연결된 전원 코드, 원거리 통신 시스템, 네트워크 및 모뎀을 끊어 주십시오.
- 제품 또는 접속된 장치를 설치, 이동 및 덮개를 열 때 다음 설명에 따라 케이블을 연결하거나 끊도록 하십시오.

연결하려면:

1. 모든 스위치를 끕니다.
2. 먼저 모든 케이블을 장치에 연결합니다.
3. 신호 케이블을 커넥터에 연결합니다.
4. 콘센트에 전원 코드를 연결합니다.
5. 장치 스위치를 켭니다.

연결을 끊으려면:

1. 모든 스위치를 끕니다.
2. 먼저 콘센트에서 전원 코드를 뽑습니다.
3. 신호 케이블을 커넥터에서 제거합니다.
4. 장치에서 모든 케이블을 제거합니다.

경고문 2



주의:

리튬 배터리를 교체할 때는 IBM 부품 번호 33F8354 또는 제조업체에서 권장하는 동등한 유형의 배터리를 사용하십시오. 시스템에 리튬 배터리를 갖고 있는 모듈이 있으면 동일한 제조업체에서 생산된 동일한 모듈 유형으로 교체하십시오. 배터리에 리튬이 있을 경우 제대로 사용, 처리 또는 처분하지 않으면 폭발할 수 있습니다.

다음은 주의하십시오.

- 던지거나 물에 담그지 않도록 하십시오.
- 100°C(212°F) 이상으로 가열하지 마십시오.
- 수리하거나 분해하지 마십시오.

지역 법령이나 규정의 요구에 따라 배터리를 처분하십시오.

경고문 3



주의:

레이저 제품(CD-ROMs, DVD 드라이브, 광 장치 또는 트랜스미터 등과 같은)이 설치되어 있을 경우 다음을 유의하십시오.

- 덮개를 제거하지 마십시오. 레이저 제품의 덮개를 제거했을 경우 위험한 레이저 광선에 노출될 수 있습니다. 이 장치 안에는 서비스를 받을 수 있는 부품이 없습니다.

- 여기에서 지정하지 않은 방식의 제어, 조절 또는 실행으로 인해 위험한 레이저 광선에 노출될 수 있습니다.



위험

일부 레이저 제품에는 클래스 3A 또는 클래스 3B 레이저 다이오드가 들어 있습니다. 다음을 주의하십시오.

열면 레이저 광선에 노출됩니다. 광선을 주시하거나 광학 기계를 직접 쳐다보지 않도록 하고 광선에 노출되지 않도록 하십시오.

경고문 4



≥ 18 kg (37 lbs)



≥ 32 kg (70.5 lbs)



≥ 55 kg (121.2 lbs)

주의:

기계를 들 때는 안전하게 들어 올리십시오.

경고문 5



주의:

장치의 전원 제어 버튼 및 전원 공급기의 전원 스위치는 장치에 공급되는 전류를 차단하지 않습니다. 장치에 둘 이상의 전원 코드가 연결되어 있을 수도 있습니다. 장치에서 모든 전류를 차단하려면 모든 전원 코드가 전원으로부터 차단되어 있는지 확인하십시오.





주의:

서랍형 모델의 장치 상단에 82 kg(180 lbs.)이 넘는 물체를 올려 놓지 마십시오.



> 82 kg (180 lbs)

Importante:

Todas las declaraciones de precaución de esta *Biblioteca del servidor* empiezan con un número. Dicho número se emplea para establecer una referencia cruzada de una declaración de precaución o peligro en inglés con las versiones traducidas que de dichas declaraciones pueden encontrarse en esta sección.

Por ejemplo, si una declaración de peligro empieza con el número 1, las traducciones de esta declaración de precaución aparecen en esta sección bajo Declaración 1.

Lea atentamente todas las declaraciones de precaución y peligro antes de llevar a cabo cualquier operación.

Declaración 1



PELIGRO

La corriente eléctrica de los cables telefónicos, de alimentación y de comunicaciones es perjudicial.

Para evitar una descarga eléctrica:

- No conecte ni desconecte ningún cable ni realice las operaciones de instalación, mantenimiento o reconfiguración de este producto durante una tormenta.
- Conecte cada cable de alimentación a una toma de alimentación eléctrica con conexión a tierra y cableado correctos.
- Conecte a tomas de alimentación con un cableado correcto cualquier equipo que vaya a estar conectado a este producto.
- Si es posible, utilice una sola mano cuando conecte o desconecte los cables de sent.al.
- No encienda nunca un equipo cuando haya riesgos de incendio, de inundación o de daños estructurales.
- Desconecte los cables de alimentación, sistemas de telecomunicaciones, redes y módems conectados antes de abrir las cubiertas del dispositivo a menos que se indique lo contrario en los procedimientos de instalación y configuración.

- Conecte y desconecte los cables tal como se describe en la tabla siguiente cuando desee realizar una operación de instalación, de traslado o de apertura de las cubiertas para este producto o para los dispositivos conectados.

Para la conexión	Para la desconexión
<ol style="list-style-type: none"> 1. APÁGUELO todo. 2. En primer lugar, conecte los cables a los dispositivos. 3. Conecte los cables de señal a los conectores. 4. Conecte cada cable de alimentación a la toma de alimentación. 5. ENCIENDA el dispositivo. 	<ol style="list-style-type: none"> 1. APÁGUELO todo. 2. En primer lugar, retire cada cable de alimentación de la toma de alimentación. 3. Retire los cables de señal de los conectores. 4. Retire los cables de los dispositivos.

Declaración 2



PRECAUCIÓN:

Cuando desee sustituir la batería de litio, utilice únicamente el número de pieza 33F8354 de IBM o cualquier tipo de batería equivalente que recomiende el fabricante. Si el sistema tiene un módulo que contiene una batería de litio, sustitúyalo únicamente por el mismo tipo de módulo, que ha de estar creado por el mismo fabricante. La batería contiene litio y puede explotar si el usuario no la utiliza ni la maneja de forma adecuada o si no se desprende de la misma como corresponde.

No realice las acciones siguientes:

- Arrojarla al agua o sumergirla
- Calentarla a una temperatura que supere los 100°C (212°F)
- Repararla o desmontarla

Despréndase de la batería siguiendo los requisitos que exija el reglamento o la legislación local.

Declaración 3



PRECAUCIÓN:

Cuando instale productos láser (como, por ejemplo, CD-ROM, unidades DVD, dispositivos de fibra óptica o transmisores), tenga en cuenta las advertencias siguientes:

- No retire las cubiertas. Si retira las cubiertas del producto láser, puede quedar expuesto a radiación láser perjudicial. Dentro del dispositivo no existe ninguna pieza que requiera mantenimiento.
- El uso de controles o ajustes o la realización de procedimientos que no sean los que se han especificado aquí pueden dar como resultado una exposición perjudicial a las radiaciones.

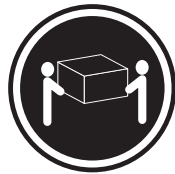


PELIGRO

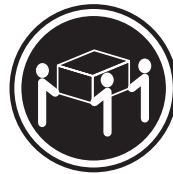
Algunos productos láser contienen un diodo de láser incorporado de Clase 3A o de Clase 3B. Tenga en cuenta la advertencia siguiente.

Cuando se abre, hay radiación láser. No mire fijamente el rayo ni lleve a cabo ningún examen directamente con instrumentos ópticos; evite la exposición directa al rayo.

Declaración 4



≥18 kg (37 libras)



≥32 kg (70,5 libras)



≥55 kg (121,2 libras)

PRECAUCIÓN:

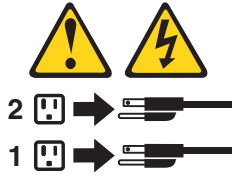
Tome medidas de seguridad al levantar el producto.

Declaración 5



PRECAUCIÓN:

El botón de control de alimentación del dispositivo y el interruptor de alimentación de la fuente de alimentación no apagan la corriente eléctrica suministrada al dispositivo. Es posible también que el dispositivo tenga más de un cable de alimentación. Para eliminar la corriente eléctrica del dispositivo, asegúrese de desconectar todos los cables de alimentación de la fuente de alimentación.



Declaración 10



PRECAUCIÓN:



No coloque ningún objeto que pese más de 82 kg (180 libras) encima de los dispositivos montados en bastidor.

Environmental notices

Electronic emission notices

Federal Communications Commission (FCC) Statement: Federal Communications Commission (FCC) Class A Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Class A emission compliance statement: This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled *Digital Apparatus*, ICES-003 of Industry Canada.

Avis de Conformité aux normes d'Industrie Canada: Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouiller : *Appareils Numériques*, NMB-003 édictée par Industrie Canada.

Australia and New Zealand Class A statement: Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

United Kingdom telecommunications safety requirement: Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

European Union (EU) conformity statement: This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. Such cables and connectors are available from IBM authorized dealers. IBM cannot accept responsibility for any interference caused by using other than recommended cables and connectors.

EMC directive 89/336/EEC statements: This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

FCCA (Text für alle in Deutschland vertriebenen EN 55022 Klasse A Geräte.): Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 30. August 1995 (bzw. der EMC EG Richtlinie 89/336)

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist Scott Enke, Director, Worldwide Manufacturing Operations, PO Box 12195, 3039 Cornwallis, Research Triangle Park, NC U.S.A. 27709-2195.

Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse A.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

“Warnung: Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen.”

EN 50082-1 Hinweis:

“Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 50082-2 festgelegt), dann kann es dabei eventuell gestört werden. In solch einem Fall ist der Abstand bzw. die Abschirmung zu der industriellen Störquelle zu vergrößern.”

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen, sind die Geräte, wie in den IBM Handbüchern angegeben, zu installieren und zu betreiben.

Taiwan electrical emission statement:

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。

Japanese Voluntary Control Council for Interference (VCCI) statement:

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に
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Glossary

D

data port. Ethernet ports used for storage-traffic and configuration purposes.

domain name server. In the Internet suite of protocols, the distributed database system used to map domain names to IP addresses.

DNS. see domain name server.

F

free disk. A physical disk that is not assigned as a hot-spare, standby hot-spare, or to a logical drive.

FTP. file transfer protocol

H

hot-spare disk. A physical disk that is automatically mapped to a logical drive if one of the logical drive's disks goes offline.

I

IDE. integrated development environment

iLUN. iSCSI client logical-unit number

iSCSI. A technology that allows the SCSI transport protocol over an IP network by connecting clients (initiators) and servers to storage.

iSCSI client. A device that creates and sends SCSI commands to the target IBM IP Storage appliance.

iSCSI client logical-unit number (iLUN). A unique number that is assigned to each VLUN. The iLUN for a single client starts at zero and increments sequentially.

L

logical drive. A unit of virtual storage that is made available to the network through VLUNs and iLUNs. It is made up of one or more physical disks that are combined using RAID 0, 1, 1E, 5, or 5E technology.

R

RAID. Redundant array of independent disks.

S

SCSI. See small computer system interface.

small computer system interface (SCSI). A standard hardware interface that enables a variety of peripheral devices to communicate with one another.

standby hot-spare disk. A physical disk that is automatically mapped to a logical drive when no suitable hot-spare disk is available.

T

target. A collection of logical units that are directly addressable on the network. The target corresponds to the server in a client-server model.

V

VLUN. See virtual logical unit.

virtual logical unit (VLUN). A subset of a logical drive.

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