

Power Systems

Common service procedures

IBM

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IBM

Note

Before using this information and the product it supports, read the information in "Safety notices" on page v, "Notices" on page 83, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125-5823.

This edition applies to IBM Power Systems™ servers that contain the POWER7 processor and to all associated models.

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Safety notices

Safety notices may be printed throughout this guide:

- **DANGER** notices call attention to a situation that is potentially lethal or extremely hazardous to people.
- **CAUTION** notices call attention to a situation that is potentially hazardous to people because of some existing condition.
- **Attention** notices call attention to the possibility of damage to a program, device, system, or data.

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, safety information documentation is included in the publications package (such as in printed documentation, on DVD, or as part of the product) shipped with the product. The documentation contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information documentation. You should also refer to the safety information documentation any time you do not clearly understand any safety information in the U.S. English publications.

Replacement or additional copies of safety information documentation can be obtained by calling the IBM Hotline at 1-800-300-8751.

German safety information

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

Laser safety information

IBM[®] servers can use I/O cards or features that are fiber-optic based and that utilize lasers or LEDs.

Laser compliance

IBM servers may be installed inside or outside of an IT equipment rack.

DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- 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 procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices.

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

DANGER

Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

CAUTION

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001)

CAUTION:

Removing components from the upper positions in the rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building:

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:
 - Remove all devices in the 32U position and above.
 - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.
 - Ensure that there are no empty U-levels between devices installed in the rack cabinet below the 32U level.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- Inspect the route that you plan to take to eliminate potential hazards.
- Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).
- Ensure that all devices, shelves, drawers, doors, and cables are secure.
- Ensure that the four leveling pads are raised to their highest position.
- Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
 - Lower the four leveling pads.
 - Install stabilizer brackets on the rack cabinet.
 - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.
- If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.

(R002)

(L001)



(L002)



(L003)



or



All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:

This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:

- 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 the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

(C026)

CAUTION:

Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

CAUTION:

This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

CAUTION:

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

CAUTION:

The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.

Do Not:

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

Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C003)

Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE

The following comments apply to the IBM servers that have been designated as conforming to NEBS (Network Equipment-Building System) GR-1089-CORE:

The equipment is suitable for installation in the following:

- Network telecommunications facilities
- Locations where the NEC (National Electrical Code) applies

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be metallically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

Note: All Ethernet cables must be shielded and grounded at both ends.

The ac-powered system does not require the use of an external surge protection device (SPD).

The dc-powered system employs an isolated DC return (DC-I) design. The DC battery return terminal *shall not* be connected to the chassis or frame ground.

Common service procedures

These procedures are common to various isolation and repair procedures.

Starting a repair action

This is the starting point for repair actions. All repair actions must begin with this procedure. From this point, you are guided to the appropriate information to help you perform the necessary steps to repair the server.

Note: In this topic, **control panel** and **operator panel** are synonymous.

Before beginning, record information to help you return the server to the same state that the customer typically uses. Examples follow:

- The IPL type that the customer typically uses for the server.
- The IPL mode that is used by the customer on this server.
- The way in which the server is configured or partitioned.

1. Has problem analysis been performed by using the procedures in Beginning problem analysis?

- **Yes:** Continue with the next step.
- **No:** Perform problem analysis by using the procedures in Beginning problem analysis.

2. Is the failing server managed by a management console?

- **Yes:** Continue with step 5.
- **No:** Continue with the next step.

3. Do you have an action plan to perform an isolation procedure?

- **Yes:** Go to Isolation procedures.
- **No:** Continue with the next step.

4. Do you have a field replaceable unit (FRU), location code, and an action plan to replace a failing FRU?

- **Yes:** Go to the removal and replacement procedures for the system you are servicing.
- **No:** Go to Part locations and location codes to find the part that you need, and then go to the removal and replacement procedures for the system you are servicing.

This ends the procedure.

5. Is the management console connected and functional?

- **Yes:** Continue with the next step.
 - **No:** Start the management console and attach it to the server. When the management console is connected and functional, continue with the next step.
-

6. Perform the following steps from the management console that is used to manage the server. During these steps, refer to the service data that was gathered earlier:

Note: If you are unable to locate the reported problem and there is more than one open problem near the time of the reported failure, use the earliest problem in the list.

- For Hardware Management Console (HMC), complete the following steps:
 1. In the navigation area, open **Service Management**.
 2. Click **Manage Serviceable Events**.
 3. For **Serviceable event status**, select **Open** .
 4. Select **ALL** for every other selection and click **OK**.
 5. Scroll through the list to determine whether a problem has a status of **Open** and to determine whether it corresponds with the customer's reported problem.
 6. Do you find the reported problem or an open problem near the time of the reported problem?
 - For IBM Systems Director Management Console (SDMC), complete the following steps:
 1. In the Service and Support Manager window, click **Serviceable Problems**.
Tip: Click **Serviceable Problems** to see a filtered list of only those problems associated with systems that are monitored by the Service and Support Manager.
 2. Scroll through the list to determine whether a problem has a status of **Open** and to determine whether it corresponds with the customer's reported problem.
 3. Do you find the reported problem or an open problem near the time of the reported problem?
 - **Yes:** Continue with the next step.
 - **No:** Go to step 4 on page 1, or if a serviceable event was not found, see Linux problem analysis.
-

7. To perform a repair operation from the management console, complete the following steps:

- For HMC, complete the following steps:
 - a. Select the serviceable event you want to repair, and click **Repair** from the selected menu.
 - b. Follow the instructions displayed on the HMC.

After you complete the repair procedure, the system automatically closes the serviceable event.
This ends the procedure.

- For SDMC, complete the following steps:
 - a. Select the serviceable event you want to repair, and select **Repair** from the **Actions** menu.
 - b. Follow the instructions displayed on the SDMC.

After you complete the repair procedure, the system automatically closes the serviceable event.
This ends the procedure.

Note: If the repair procedures are not available, go to step 4 on page 1.

Powering on and powering off a system

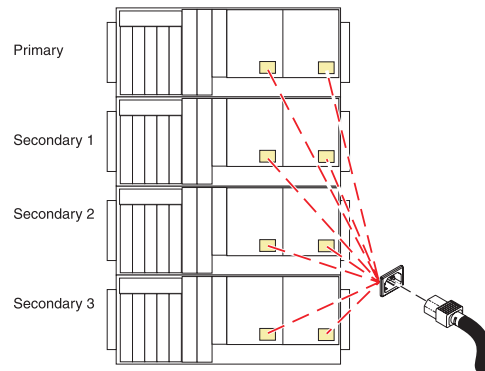
You can power on or power off a system with or without a management console by using this procedure.

Attention: If possible, have the customer shut down all applications and partitions before powering off the system. If you use the power-on button on the control panel, or enter commands at the management console to stop the system, you might cause unpredictable results in the data files if you do not shut down all applications and partitions first. Also, the next time you start the system, it might take longer if all applications are not ended before stopping the system.

Installing the power cords

Note: Before powering on a system, ensure that the power cords have been plugged in to all of the power supplies on all of the processor enclosures. Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



Powering on a system by using a management console

To power on a managed system by using a Hardware Management Console (HMC), complete the following steps:

1. In the navigation area, expand **Systems Management > Servers**.
2. Select the check box next to the name of the server you want to enable the tasks for that server.
3. From the **Tasks** menu, click **Operations > Power on**. Follow all additional instructions in the interface.

To power on a managed server by using an IBM Systems Director Management Console (SDMC), complete the following steps:

1. On the **Welcome** page under the **Resources** tab, select the server.
2. Click **Actions > Operations > Power On**.

Powering on a system without a management console

To start a system that is not managed by a management console, follow these steps:

1. On a rack-mounted system unit, open the front rack door, if necessary. On a stand-alone system unit, open the front door.
2. Before you press the power button on the control panel, ensure that power is connected to the system unit as follows:
 - All system power cables are connected to a power source.
 - The power-on light (**F**), as shown in the following figure, is slowly flashing.
 - The top of the display (**D**), as shown in the following figure, contains 01 V=F.

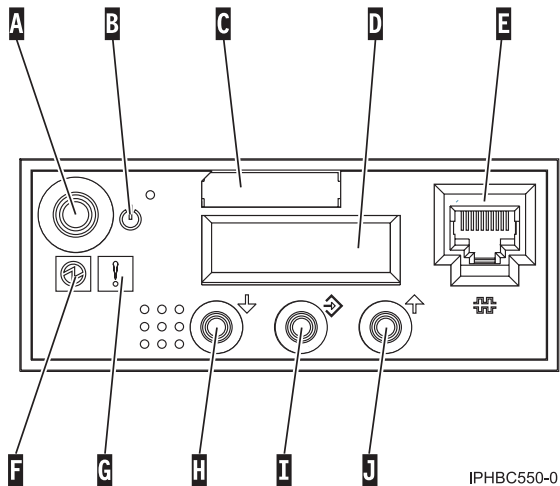


Figure 1. Control panel with labels

3. Press the power button (A), as shown in the preceding figure, on the control panel.
4. Observe the following after pressing the power button:
 - The power-on light flashes slowly (standby) and then becomes solid.
 - The system cooling fans are activated after approximately 30 seconds and begin to accelerate to operating speed.
 - Progress indicators, also referred to as checkpoints, appear on the control panel display while the system is being started. The power-on light on the control panel stops flashing and remains on, indicating that system power is on.

Powering off a system by using a management console

Attention: If possible, have the customer shut down the running logical partitions on the managed system before powering off the managed system. Powering off the managed system without first shutting down the logical partitions causes the logical partitions to shut down abnormally and can cause data loss or an extended initial program load (IPL) for one or more of the partitions the next time the system is powered on.

To power off a managed system by using HMC, complete the following steps:

1. In the navigation area, expand **Systems Management > Servers**.
2. Select the check box next to the name of the server you want to enable the tasks for that server.
3. From the **Tasks** menu, click **Operations > Power off**. Follow all additional instructions in the interface.
4. Continue with “Removing the power cords” on page 5.

To power off a managed server by using an SDMC, complete the following steps:

1. On the **Welcome** page under the **Resources** tab, select the server.
2. Click **Actions > Operations > Power Off**.

Powering off a system without a management console

1. If an operating system is running, proceed with step 2. Otherwise, press the power button (A), as shown in Figure 1 and hold for 5 seconds (a countdown is shown on the display panel). The system power turns off. Proceed to step 4 on page 5.
2. Log in to the system as a user with the authority to run the **shutdown** command.

3. At the command line, type **shutdown -h** now. The command stops the operating system. The system power turns off.

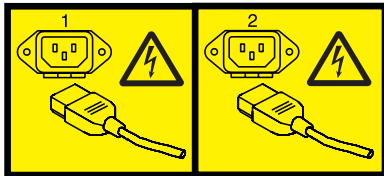
The power-on light begins to slowly flash, and the system goes into standby.

4. Remove the power cords. For instructions, see “Removing the power cords.”

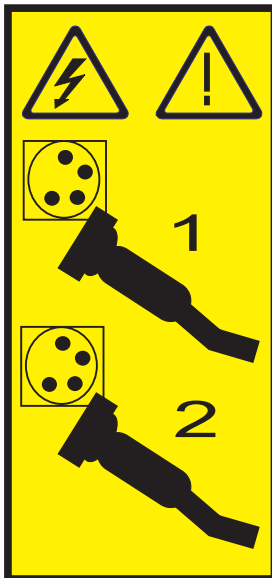
Removing the power cords

Important: The system might be equipped with a second power supply. Before continuing with this procedure, ensure that all power sources to the system have been completely disconnected.

(L003)

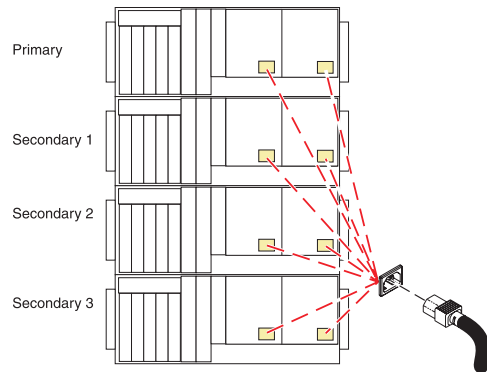


or



To remove the power cords, complete the following steps:

1. Unplug any power cables that are attached to the unit from electrical outlets.
2. Remove all power cords from all of the processor enclosures. Start with the primary processor enclosure (topmost) and then proceed with each secondary enclosure, working from top to bottom.



Primary consoles or alternative consoles

The primary console is the first workstation that the system identifies. It is attached to the first input/output adapter (IOA) or input-output processor (IOP) that supports workstations. The alternative console is the workstation that functions as the console when the primary console is not operational.

A console is a workstation that is used to view and control system operations. The system can assign alternative consoles. The alternative console can be a workstation that is attached to the next IOA or IOP that is capable of supporting workstations.

The IOA or IOP that supports a console must be on the system bus (bus 1).

If a workstation is not correctly attached to the first IOA or IOP that is capable of attaching workstations, the system will not assign a primary console. If it does not assign a primary console, the system displays a reference code on the control panel. If the system is set for manual mode, it stops during the initial program load (IPL).

For more information about how to determine the primary and alternative consoles, see “Identifying the consoles when the system is operational.”

Primary console requirements

For a workstation to be the primary console, it must be operational and attached to the system bus. It must also have the correct port and address assigned. If the workstation is a personal computer, it must also have an active workstation emulation program.

The workstation requirements follow:

- ASCII workstation
 - Port 0, Bus 1
- Personal computer attached to ASCII IOP
 - Port 0, Bus 1
 - Personal computer software to emulate a 316x or 3151 terminal
- Personal computer attached to twinaxial IOP
 - Port 0, Address 0, Bus 1
 - 5250 emulator software active on personal computer

For more information about how to determine the primary and alternative consoles, see “Identifying the consoles when the system is operational.”

Identifying the consoles when the system is operational

When the system is operational, you can determine the primary console and alternative console by using one of the following options:

- Look at the display.

Note: This resource name might have been changed by the customer.

- Use system commands to assist in identifying the consoles. See the system operation information for more details about commands.
- Use the hardware service manager function to assist in identifying the consoles:
 1. Select the System bus resources option on the Hardware Service Manager display. With the System Bus Resources display, you can view the logical hardware resources for the system bus.
Look for the less than (<) symbol next to an IOP. The less than (<) symbol indicates that the console is attached to this IOP.
 2. Select the Resources associated with the IOP and the Display detail options to collect more information about the consoles.

Determining whether the system has logical partitions

Use this procedure to determine the existence of logical partitions.

To determine whether the system has logical partitions, follow these steps:

1. Is the system managed by a management console?
 - Yes:** Continue with the next step.
 - No:** The system does not have logical partitions. Return to the procedure that sent you here. **This ends the procedure.**
2. Determine whether the system has multiple logical partitions by performing the following from the HMC:
 - a. In the navigation area, expand **Systems Management Servers**.
 - b. Click the name of the managed system you are working with to display the partitions. The partitions will be displayed.
 - c. Is there more than one logical partition listed?

Determine whether the system has multiple virtual servers by performing the following from the **IBM Systems Director Management Console (SDMC)**:

- a. On the **Welcome** page, under the **Resources** tab, select **Virtual Servers**.
- b. Is more than one virtual server listed?

Yes: The system has multiple logical partitions. Return to the procedure that sent you here. **This ends the procedure.**

No: The system does not have multiple logical partitions. Return to the procedure that sent you here. **This ends the procedure.**

Separating the 571F/575B card set and moving the cache directory card

Use this procedure to separate the 571F/575B card set and to move the cache directory card.

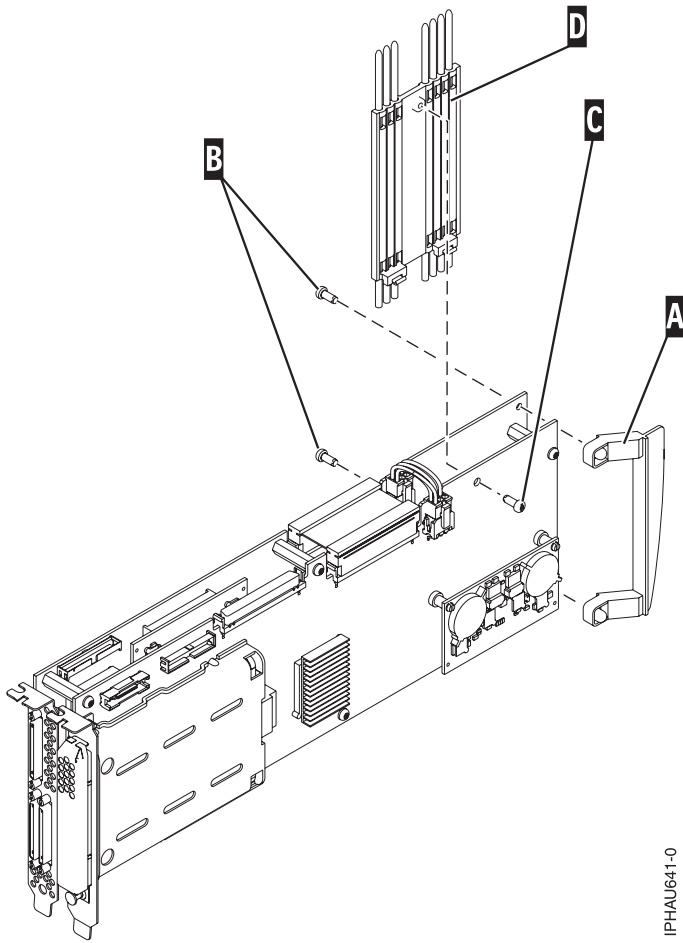
To complete this procedure, you need a special bit or driver (T-10 TORX).

Attention: To avoid loss of cache data, do not remove the cache battery during this procedure.

To separate the 571F/575B card set and to move the cache directory card, complete the following steps:

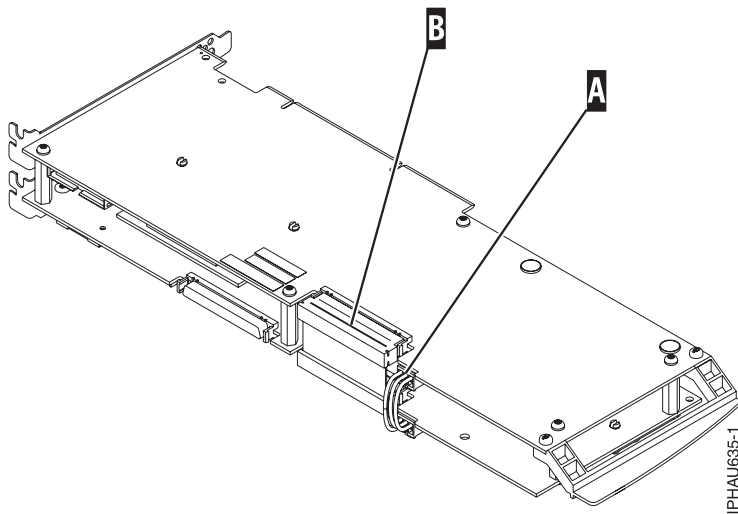
Important: All cards are sensitive to electrostatic discharge.

1. Label both sides of the card before separating them.
2. Go to the next step if you are not servicing a 571F/575B card set containing a light pipe assembly. If you are servicing a 571F/575B card set that contains a light pipe assembly, you will need to remove the light pipes. To remove the light pipes, do the following:
 - a. Place the 571F/575B card set adapter on an electrostatic discharge (ESD) protective surface.
 - b. Remove the light pipe retaining screw (**C**) from the 571F/575B card set.
 - c. Slide the light pipe assembly (**D**) from between the 571F/575B cards.
 - d. Put both the screw and the light pipe assembly in a safe place.



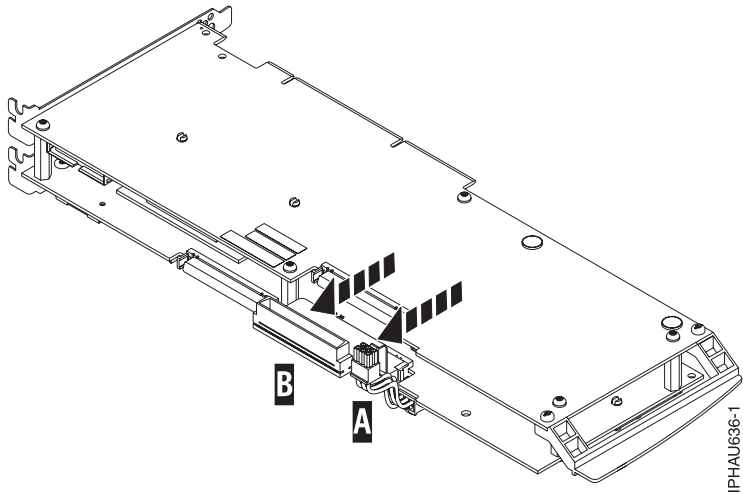
IPHAU641-0

3. Place the 571F/575B card set adapter on an ESD protective surface and orient it as shown in the following figure.

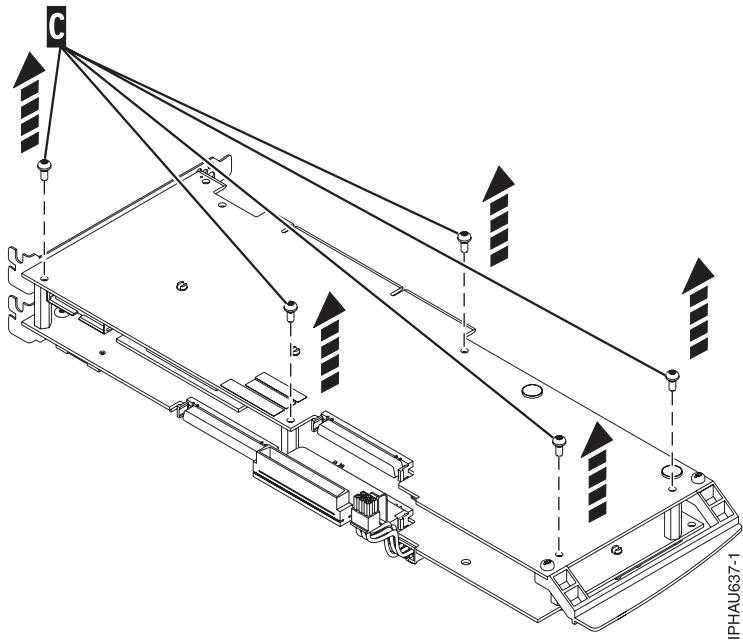


IPHAU635-1

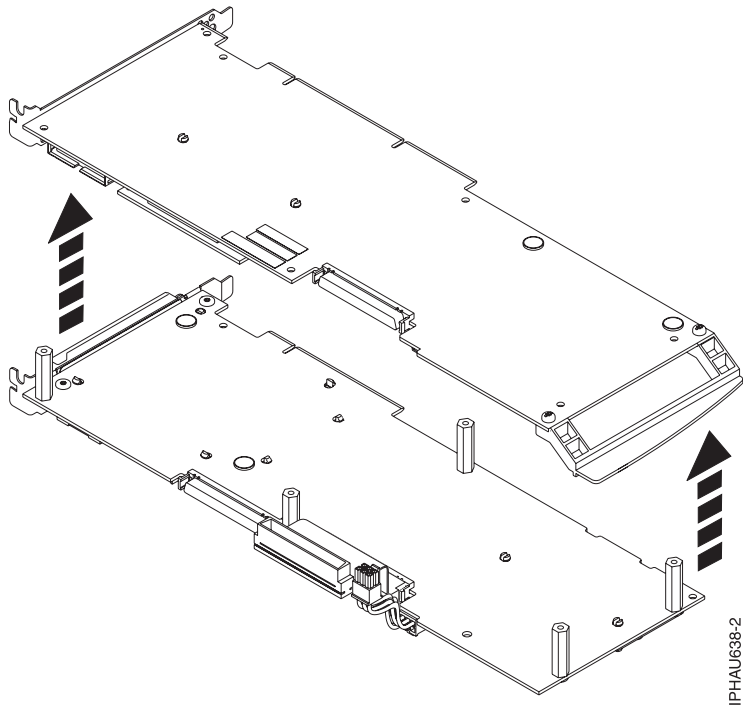
4. Disconnect battery cable (A) and the SCSI cable (B) from the 571F storage adapter. Leave the other end of the cables attached to the 575B auxiliary cache adapter.



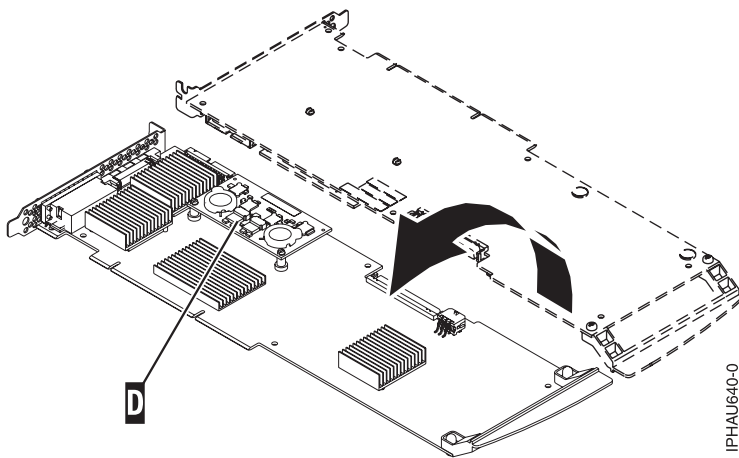
5. To prevent possible card damage, first loosen all five retaining screws (C) before removing them. After all five retaining screws have been loosened, remove the screws (C) from the 571F storage adapter.



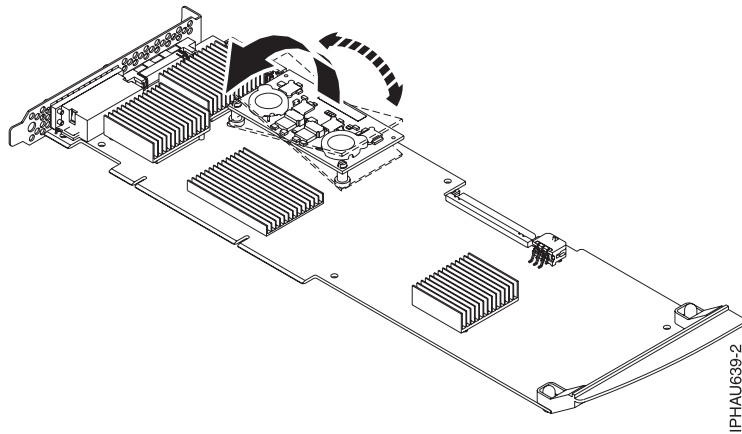
6. Carefully lift the 571F storage adapter off the standoffs and set it on the ESD protective surface.



- Turn the 571F storage adapter over so that the components are facing up, and locate the cache directory card (D) on the 571F storage adapter. It is the small rectangular card mounted on the I/O card.



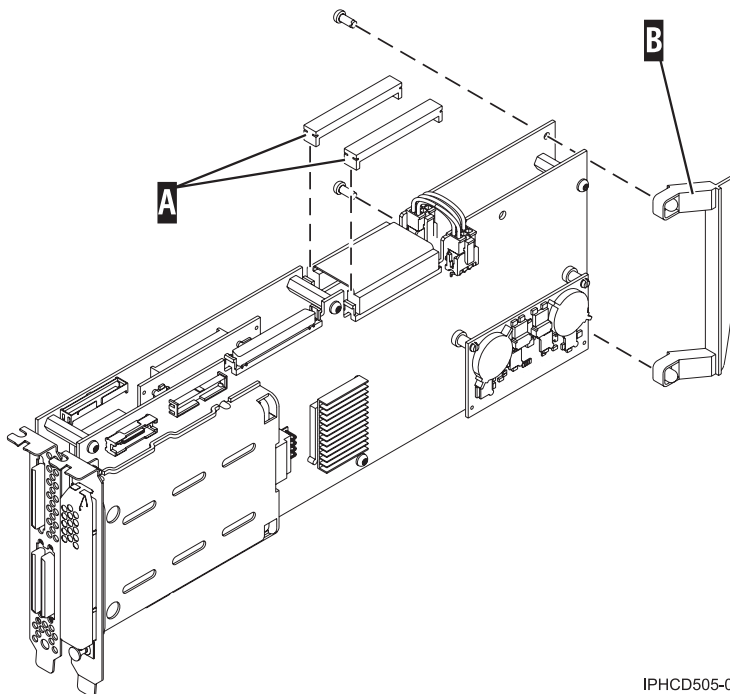
- Unseat the connector on the cache directory card by wiggling the two corners that are farthest from the mounting pegs. To disengage the mounting pegs, pivot the cache directory card back over the mounting peg.



9. Move the cache directory card to the replacement 571F storage adapter and seat it on the connector and mounting pegs.
10. To reassemble the cards, perform steps 1 - 9 in reverse order. To prevent possible card damage, insert all five screws (C) before tightening any of them.

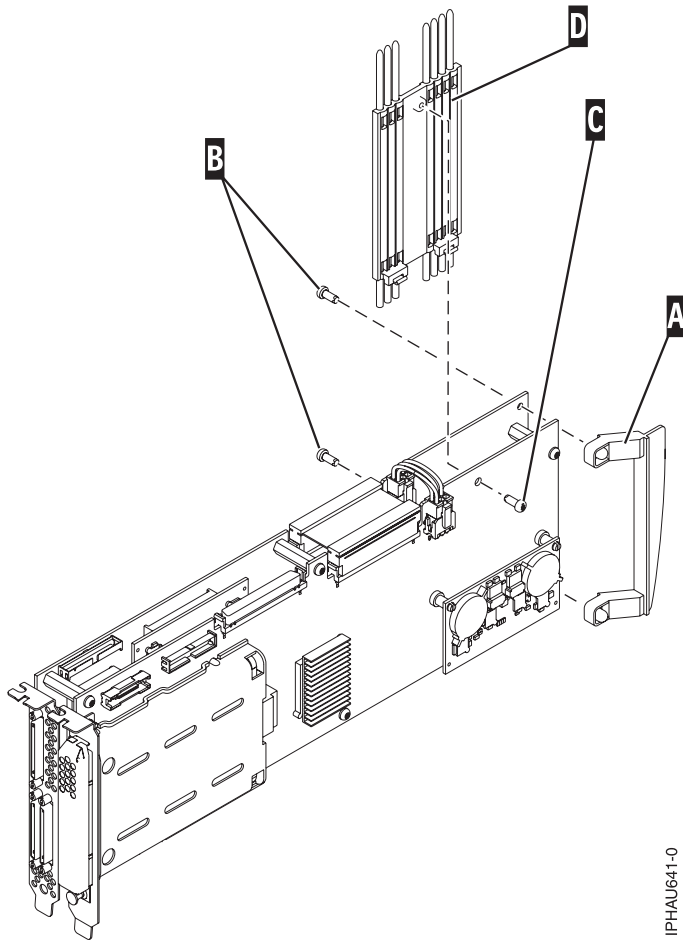
Note: If you are installing the 571F/575B card set adapter into a cassette, do the following steps:

- a. Remove the adapter handle (B) as shown in the following figure.
- b. If applicable, remove the light-pipe assembly.
- c. Remove the two plastic covers from the Small Computer Systems Interface (SCSI) jumper cable (A) as shown in the following figure.



- d. Ensure that the battery cable (A) and the SCSI cable (B) are reconnected to the 575B auxiliary cache adapter.
- e. Place an adapter in the PCI adapter double-wide cassette to complete the installation.
11. If applicable, to replace the light pipes, do the following steps:
 - a. Ensure that the 571F/575B cards are correctly assembled.
 - b. If necessary, remove the 571F/575B card handle (A) from the back of the card set.

- c. Slide the light pipe assembly (D) between the 571F/575B cards. Ensure that the threaded screw hole located on the light pipe assembly is aligned with the screw clearance hole located on the card.



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12. Return to the procedure that sent you here. **This ends this procedure.**

Determining which processor is the secondary service processor

Use this procedure to determine which service processor on your system is the secondary service processor.

1. Locate the HMC1 and HMC2 port pairs for service processor zero and for service processor one. (See Part locations and location codes for your specific model).
2. Is only one service processor with cables attached to the HMC ports?
 - No:** Continue to the next step.
 - Yes:** The secondary service processor is the service processor with no cables attached to the HMC ports. **This ends the procedure.**
3. Which console do you want to use to check for the secondary service processor?
 - Advanced System Management Interface (ASMI):** Continue to the next step.
 - Hardware management console (HMC):** Go to step 5.
4. Use the HMC to access the ASMI to determine which service processor is the secondary service processor.
 - a. Verify ASMI connectivity by logging onto the ASMI.

- b. When you are at the ASMI Welcome screen, an entry appears showing the primary service processor location (for example, Service Processor: Primary (Location U789D.001.DQDMLMM-P1-C11)). The other location is the secondary service processor. **This ends the procedure.**
5. Use the HMC to determine which service processor is the secondary service processor.
 - a. Log on to the HMC.
 - b. Select **Systems management > Servers > *servername*** (the name of server you want to examine).
 - c. From the **Tasks** menu, click **Connections**. A window displays the primary and secondary processors in the Service processor role column. **This ends the procedure.**

System reference code format description

The format of the system reference code (SRC) that you see depends on the model of your system.

System reference code information

Use this information to understand how system reference codes (SRCs) work.

An SRC is a sequence of data words (codes) that perform the following actions:

- Identifies a system status
- Describes a detected hardware, Licensed Internal Code, or software failure
- Describes the unit that is reporting the failure and its location. The SRCs can be displayed on the control panel, can appear in a system console message, or can appear in the product activity log.

The system uses the following procedure to gather information about errors:

1. The system gathers information about an error as the system detects the error.
2. The product activity log (PAL) records and stores the error information.
3. An SRC encodes information that is used to evaluate or identify a system-detected hardware or software error, failure, or status. The failure information might include the failing condition or part (or unit) that can be exchanged or replaced and its location.
4. The SRC links to the problem determination procedure when the element detecting the failure cannot isolate the failing condition.
5. The SRC link completes the isolation process.

In summary, the SRC provides the first-failure-data-capture information. The customer or support representative uses SRCs during problem determination, repair actions, and verification. The SRC provides a link to the problem determination procedures (hardcopy or softcopy). Use the SRC and the problem determination procedures to isolate the problem.

Determining system reference code address formats

Use this procedure to determine the IOP, IOA, or device address from either a control panel or a console display.

To determine the IOP, IOA, or device address from either a control panel or a console display, complete these steps.

1. Was the SRC and addressing information obtained from a control panel display, the Main Storage Dump Manager display, or the management console Partition Properties Reference Code Words display?
 - **Yes:** Addressing information is in the Bus-Bus-Bus-Bus/Card-card/board-board (*BBBBCbbb*) format as follows:
 - If characters 7 and 8 of the top 16-character line of function 12 (word two) are 60:
 - The direct select address is characters 1 - 8 of the bottom 16-character line of function 12 (word four) in the format *BBBBCbbb*.

- The device address is characters 9 - 16 of the bottom 16-character line of function 12 (word five) in the format *abcd efgh*.
- If characters 7 and 8 of the top 16-character line of function 12 (word two) are 13, 17, 27, or 29:
 - The direct select address is characters 9 - 16 of the top 16-character line of function 12 (word three) in the format *BBBBCccb*.
 - The device address is characters 1 - 8 of the bottom 16-character line of function 12 (word four) in the format *abcd efgh*.
- If characters 7 and 8 of the top 16-character line of function 12 (word two) are 62:
 - The direct select address might be characters 9 - 16 of the top 16-character line of function 13 (word seven) in the format *BBBBCccb*.
 - The device address might be characters 1 - 8 of the top 16-character line of function 13 (word six) in the format *abcd efgh*.

Go to step 2.

2. The *BBBBCccb* format is the hexadecimal direct select address of a card location in the system unit. The format definition is:

- *BBBB*: System bus
- *Cc*: System card
- *bb*: System board

Continue with the next step for IOA and device address information.

3. Unit (device) address definitions are explained in an *abcd efgh* format. For example, if the unit address is 0001 00FF, the address relates to the *abcd efgh* format as follows:

```

0 0 0 1   0 0 F F
(a b c d   e f g h)

```

Figure 2. Example of unit (device) address definitions

The characters *abcd efgh* can have different meanings, depending on the subsystem that reports the problem. However, they define the information that is contained in the unit (device) address as follows.

Table 1. Character definitions

SCSI-attached disk, tape, or optical	
a	I/O adapter
b	I/O bus
cd	Controller
ef	Device
gh	FF
Serial Attached SCSI (SAS)-attached disk, tape, or optical	
Not applicable	I/O adapter
ab	I/O bus
cd	Controller
ef	Device
gh	FF
Communications	
a	I/O bus
b	Adapter
c	0

Table 1. Character definitions (continued)

SCSI-attached disk, tape, or optical	
d	Port
e	0
f	Channel
GH	FF
Workstation	
a	I/O bus
b	Adapter
cd	Port
e	0
f	Device
g	0
h	Session

Hardware system reference code formats

Use this information to understand the system reference code (SRC) format.

Notes:

1. Other formats exist. If necessary, contact your next level of support.

Table 2. SRC format examples

SRC word number	Panel function, digits x to y (from left to right)	IOP SRC format 13	IOP SRC format 17	Device SRC format 27	IOP detected a failure format 29	LIC ¹ SRC format 60	LIC ¹ SRC format 61	LIC ¹ SRC format 62	LIC ¹ SRC format 63
1	11, 1 - 8	TTTT RRRR	TTTT RRRR	tttt rrrr	B0XX RRRR	A6xx RRRR	B6xx RRRR	B6xx RRrr or B7xx Rrrr	A600 RRRR
2	12, 1 - 8	MIGV EP13	MIGV EP17	MIGV EP27	MIGV EP29	MIGV EP60	MIGV EP61	MIGV EP62	MIGV EP63
3	12, 9 - 16	BBBB Ccbb	BBBB Ccbb	BBBB Ccbb	BBBB Ccbb	PPPP 0000	cccc cccc	cccc cccc	AAAA BBBB
4	12, 17 - 24	aaaa aaaa	aaaa aaaa	aaaa aaaa	SAPP UUFF	BBBB Ccbb	pppp pppp	pppp pppp	CCCC DDDD
5	12, 25 - 32	TTTT LMMM	TTTT LMMM	tttt lmmm	TTTT FMMV	aaaa aaaa	qqqq qqqq	qqqq qqqq	EEEE FFFF
6	13, 1 - 8	uuuu uuuu	tttt lmmm	TTTT LMMM	tttt lmmm	tttt mmmm	qqqq qqqq	qqqq qqqq	GGGG HHHH
7	13, 9 - 16	uuuu uuuu	ZZZZ rrrr	ZZZZ RRRR	zzzz rrrr	ssss ssss	0000 0000	BBBB Ccbb	JJJJ KKKK
8	13, 17 - 24	uuuu uuuu	ssss ssss	ssss ssss	0sss ssss	NNNN 0000	0000 0000	TTTT MMMM	TTTT 0MMM
9	13, 25 - 32	uuuu uuuu	uuuu uuuu	uuuu uuuu	uuuu uuuu	0000 0000	0000 0000	0000 0000	SSSS SSSS

Table 2. SRC format examples (continued)

SRC word number	Panel function, digits x to y (from left to right)	IOP SRC format 13	IOP SRC format 17	Device SRC format 27	IOP detected a failure format 29	LIC ¹ SRC format 60	LIC ¹ SRC format 61	LIC ¹ SRC format 62	LIC ¹ SRC format 63
Note:									
1. Licensed Internal Code									

Table 3. Description of SRC format examples

SRC format	Description
AAAA	Type of I/O bus (see “Logical address format” on page 17 — field A).
aaaa	Unit address.
BBBB	System bus number (see “Logical address format” on page 17 — field B).
BBBBBcbb	Bus, bus, bus, bus, card, card, and board, board address (direct select address or DSA). <ul style="list-style-type: none"> For PCI system buses 0001-0003 and 0018-FFFF, the Cc field is a 1-digit multiadapter bridge number and a 1-digit multiadapter bridge function number. For SPD system buses 0004-0017, the Cc field is a 2-digit card number.
CCCC	System board number (see “Logical address format” on page 17 — field C).
cccc cccc	Component reference code. Format 62 varies by component.
DDDD	System card number (see “Logical address format” on page 17 — field D).
EEEE	Unit address type (see “Logical address format” on page 17 — field E).
FFFF	Unit address type (see “Logical address format” on page 17 — field F).
GGGG	Unit address type (see “Logical address format” on page 17 — field G).
HHHH	Unit address type (see “Logical address format” on page 17 — field H).
JJJJ	Unit address type (see “Logical address format” on page 17 — field J).
KKKK	Unit address type (see “Logical address format” on page 17 — field K).
LMMM	Level indicator plus 3-digit model number (for example, 0001).
lmmm	Level indicator plus 3-digit model number of failing device.
0MMM	Model number of failing device (that is, MMM=001).
MIGV EP	General system status.
NNNN	Number of disk device facilities that are missing.
PPPP	Cause code.
pppp pppp	Programming reference code.
qqqq qqqq	Programming reference code qualifier.
RRRR	Unit reference code (URC).
rrrr	Outboard failing unit reference code (URC).
SAPP UUFF	Unit address.
SSSSSSSS	System reference code. This SRC is used to determine why the primary console failed to respond.
ssss	Serial number of failing unit.
TTTT	Type number or card identification number (hexadecimal).
tttt	Outboard failing unit type number (that is, 6607).

Table 3. Description of SRC format examples (continued)

SRC format	Description
uuuu	Unit-specific data.
ww	SRC type.
ZZZZ	Reserved.

Logical address format

Use the logical address to identify the resource entry.

To sort by logical address, select the Analyze log option on the product activity log display. Then select the F9 key (Sort by) and sort by logical address. For more information about the address, use the address information function.

The logical address format, A/B/C/D-E/F/G/H/J/K, has the following definitions:

- A** Type of I/O bus (transport)
 - B** System bus number
 - C** System board number (for busses that connect card enclosures)
 - D** System card (bus unit) number
 - Separates the bus address from the unit address
 - E** Unit address type
- FGHJK**
Unit address data

The values of F, G, H, J, and K vary, depending on the unit address type (E). Use the following information to determine the unit address data (FGHJK) representation.

Table 4. Unit address (E) definitions

Unit address value	Unit address definition	Unit address data				
		F	G	H	J	K
0	Reserved					
1	Communications	I/O bus	Adapter	Port	Channel	
2	Storage	I/O adapter	I/O bus	Controller	Device	
3	Workstation	I/O bus	Adapter	Port	Device	Session
4	Auxiliary processor	I/O bus	Auxiliary processor	Adapter	Port	
5	Library	I/O adapter	I/O bus	Library	Controller	Device
6	Cryptography	I/O bus	Adapter	Device		

The Logical address field contains the bus address and the unit address. The bus address describes the hardware bus, board, and card information. The unit address describes the subsystem and identifying data (see Table 4).

Note: To locate a device or card that is within the system unit, use the physical address information.

Problem reference code formats detected by Licensed Internal Code

Use this information to understand problem reference code formats that are detected by Licensed Internal Code.

Formats 60 - 63 in Table 2 on page 15 represent the formats for Licensed Internal Code SRCs.

- Format 60 is used for Licensed Internal Code attention SRCs.
- Format 61 is used when Licensed Internal Code detects a Licensed Internal Code programming problem.
- Format 62 is used when Licensed Internal Code detects an IOP bus or IOP programming problem.

RRRR Licensed Internal Code *unit reference code*.

cccc Licensed Internal Code *component reference Code*. Identifies the Licensed Internal Code component and subcomponent that generated the SRC.

pppp Licensed Internal Code *program reference code (PRC)*. Identifies the Licensed Internal Code class or component that generated the SRC and the specific error detected.

qqqq Licensed Internal Code *program reference code qualifier*. Identifies SRC words found at functions 15-3 through 19-3 or, 15-3 and 16-3, depending on the format. It provides additional error isolation information that is specific to the program reference code. One or more of these words might be 0000 0000. Format 61 has up to five words of PRC qualifier, in words 5 - 9. The PRC determines the number of PRC qualifier words. The content of words 5 - 9 is dependent on the value in word 4. Format 62 has the PRC qualifier only in words 5 - 6. Physical address and type information is included in words 7 - 9.

BBBB Ccbb

Bus, card, and board identifiers of failing component (direct select address)

@@@ Unit address.

ssss Serial number of failing unit.

TTTT Type number or card identification number of failing component (hex 2xxx - 9FFF). This value might be 0000 if system data is not available at the time the SRC is signaled.

ZZZZ Reserved.

mmmm

Model number of failing component (hex 2xxx - 9FFF). This value might be 0000 if system data is not available at the time the SRC is signaled.

CCCC Cause code.

NNNN

Number of disk device facilities missing.

MIGV EP

General system status (see "System reference code information" on page 13 for more information).

x Any hexadecimal number.

Notes:

1. For information about functions 11 and 12, see "System reference code information" on page 13.
2. Format 60 might contain data in a format other than that shown. Format 60 is an old vertical Licensed Internal Code (VLIC) format, which some new Licensed Internal Code components use. Format 60 does not have the component reference code and program reference code that formats 61 and 62 have. Formats 61 and 62 were specifically defined for the new Licensed Internal Code. Format 60 is mostly component-specific with no key information to indicate format (the developer has to interpret it).

Managing the Advanced System Management Interface

This information describes how to manage the Advanced System Management Interface (ASMI).

The ASMI is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power.

The ASMI is sometimes referred to as the service processor menus.

Use the following information to help you manage the ASMI:

Accessing the Advanced System Management Interface

You can access the Advanced System Management Interface (ASMI) through a web browser, an ASCII console, or the management console.

Accessing the Advanced System Management Interface by using a web browser

You can connect a PC or notebook computer to the server to access the Advanced System Management Interface (ASMI). The web interface to the ASMI is available during all phases of system operation including the initial program load (IPL) and run time.

The web interface to the ASMI is accessible through Microsoft Internet Explorer 6.0, Netscape 7.1, Opera 7.23, or Mozilla Firefox running on a PC or notebook computer that is connected to the service processor. The web interface is available during all phases of system operation including the IPL and run time. However, some of the menu options in the web interface are unavailable during IPL or run time to prevent usage or ownership conflicts if the system resources are in use during that phase.

Note: To perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power, you must set up the ASMI.

The following instructions apply to systems that are not connected to a management console. If you are managing the server by using a management console, see “Accessing the Advanced System Management Console Interface using a management console” on page 21.

To set up the web browser for direct or remote access to the ASMI, complete the following steps.

1. Connect the power cord from the server to a power source, and wait for the control panel to display 01.
2. Select a PC or notebook computer that has a supported browser for connection to your server. For information about supported browsers, see ASMI requirements.

If you do not plan to connect your server to your network, this PC or notebook computer will be your ASMI console.

If you plan to connect your server to your network, this PC or notebook computer will be temporarily connected directly to the server only for setup purposes. After setup, you can use any PC or notebook computer on your network that is running Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 as your ASMI console.

3. Connect an Ethernet cable from the PC or notebook computer to the Ethernet port labeled HMC1 on the back of the managed system. If HMC1 is occupied, connect an Ethernet cable from the PC or notebook computer to the Ethernet port labeled HMC2 on the back of the managed system.
4. Configure the Ethernet interface on the PC or notebook computer to an IP address and subnet mask within the same subnet as the server so that your PC or notebook computer can communicate with the server. Use the following table to help you determine these values:

Table 5. PC or notebook computer network configuration information

Server connector	Subnet mask	IP address
HMC1	255.255.255.0	169.254.2.147
HMC2	255.255.255.0	169.254.3.147

For example, if you connected your PC or notebook computer to HMC1, the IP address for your PC or notebook computer could be 169.254.2.1 and the subnet mask would be 255.255.255.0. Set the gateway IP address to the same IP address as the PC or notebook computer.

5. Use Table 5 to determine the IP address of the Ethernet port that your PC or notebook computer is connected to, and type the IP address in the **Address** field of your PC's or notebook computer's web browser. For example, if you connected your PC or notebook computer to HMC1, type `https://169.254.2.147` in your PC's or notebook computer's web browser.
6. When the login display appears, enter one of the following default user IDs and passwords.

Table 6. Default user IDs and passwords for the web interface

User ID	Password
general	general
admin	admin

7. Change the default password when prompted.
8. If you plan to connect your PC or notebook computer to your network, complete the following steps:
 - a. From the navigation area, expand **Network Services**.
 - b. Click **Network Configuration**. Do one of the following:
 - If your PC or notebook computer is connected to HMC1, fill in the section labeled Network interface eth0.
 - If your PC or notebook computer is connected to HMC2, fill in the section labeled Network interface eth1.
 - c. Ensure that the following fields are filled in correctly.

Table 7. Fields and values for network configuration

Field	Value
Configure this interface?	Selected
Type of IP address	Static
IP address	This is the same address that you used in step 5.
Subnet mask	255.255.255.0

- d. Click **Save Settings**.
- e. Disconnect your PC or notebook computer from the server.
- f. Connect the server to your company network.
- g. Go to any PC or notebook computer on your company network that is running a supported browser. For information about supported browsers, see ASMI requirements.

Type the following in the Address field of your browser:

`https://host name.domain name`

where *host name* and *domain name* are the host name and domain name you entered when completing step 8c.

- h. Log in to the ASMI.
9. Set the time of day on the server.

Accessing the Advanced System Management Interface by using an ASCII terminal

You can connect the ASCII console to the server to access the Advanced System Management Interface (ASMI).

The ASCII interface to the ASMI provides a subset of the web interface functions. The ASCII console is available only when the system is in platform-standby state. It is not available during the initial program load (IPL) or run time. The ASMI on an ASCII console is not available during some phases of system operation, such as the initial program load (IPL) and run time.

To set up the ASCII console for direct or remote access to the ASMI, complete the following tasks:

1. Complete the following steps to cable an ASCII console, or equivalent, to the server:

Using a cable equipped with a null modem, connect the ASCII console to system connector S1 1 on the back of the server or to system port FS1 on the control panel using an RJ-45 connector.

Note: Both system port 1 connections are not available simultaneously; when one is connected, the other is deactivated.

2. Connect the power cord from the server to a power source.
3. Wait for the control panel to display 01.
4. Ensure that your ASCII console is set to the following general attributes.

These attributes are the default settings for the diagnostic programs. Be sure your terminal is set to these attributes before proceeding to the next step.

General setup attributes	3151 /11/31/41 settings	3151 /51/61 settings	3161 /64 settings	Description
Line speed	19,200	19,200	19,200	Uses the 19,200 (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects 8 bits as a data word length (byte).
Parity	No	No	No	Does not add a parity bit and is used together with the word length attribute to form the 8-bit data word (byte).
Stop bit	1	1	1	Places a bit after a data word (byte).

5. Press a key on the ASCII console to allow the service processor to confirm the presence of the ASCII console.
6. When the login display is shown, enter one of the following default user IDs and passwords.

Table 8. Default user IDs and passwords for the web interface

User ID	Password
general	general
admin	admin

7. Change the default password when you are prompted.
8. Set the time of day on the server.

Accessing the Advanced System Management Console Interface using a management console

You can access the Advanced System Management Console Interface (ASMI) through the Hardware Management Console (HMC) or the IBM Systems Director Management Console (SDMC).

To access ASMI by using the HMC, complete the following steps:

1. Ensure that the HMC is set up and configured.
2. In the navigation area, select the server.
3. Expand and click **Operations**.
4. In the content area, click **Advanced System Management (ASMI)**.
5. Log on to the ASMI by using the administrator user ID and password.

To access ASMI by using the SDMC, complete the following steps:

1. On the **Welcome** page, under the **Resources** tab, select the server.
2. Click **Actions > Operations > Launch Advanced System Management (ASM)**.
3. Log on to ASMI by using the administrator user ID and password.

Displaying error and event logs

You can view error and event logs that are generated by various service processor firmware components. The content of these logs can be useful in solving hardware or server firmware problems.

To perform the display operation, your authority level must be one of the following values:

- General
- Administrator
- Authorized service provider

Informational and error logs can be viewed by all authority levels. Hidden error logs can be viewed by authorized service providers.

The following table shows error log types that might be displayed, the conditions that make an error log specific to that error log type, and the user authority level that you need to view specific types of error logs.

Error log type	Conditions		User availability
	Severity	Action	
Informational logs	Informational	Report to operating system (OS) but not hidden	Available to all users
Error logs	Not informational	Report to OS but not hidden	Available to all users
Hidden logs	Not informational and informational	Report to OS, hidden, or both	Available only to the authorized service provider and users with higher authority.

To view error and event logs in summary or full detailed format, do the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Service Aids** and click **Error/Event Logs**. If log entries exist, a list of error and event log entries is displayed in a summary view.
3. To view the full detail format of any of the logs listed, select the log's corresponding check box and click **Show details**. When multiple logs are selected, any action applies to each selected log. The full detail information might span several pages. The contents and layout of the full detail output is defined by the event or error logging component.

4. Click **Mark as reported** to mark platform error entries whose underlying causes have been resolved. By doing so, these entries are not reported to the operating system again when the system reboots. After they are marked, these errors can be overwritten by other errors logged in the service processor history log.

Note: The **Mark as reported** button is available only when your authority level is an authorized service provider.

Setting the system enclosure type

Use this procedure to set values that uniquely identify the type of enclosures attached to the system.

When setting the system enclosure type, ensure that the **Enclosure serial number** field matches the original value, which can be found on a label affixed to the unit. Updating the **Enclosure serial number** field keeps the configuration and error information synchronized, and this information is used by the system when creating the location codes. This task must be done by using the ASMI, not with the control panel. However, if you do not have access to the ASMI, the system will still operate without updating this information.

For example, when replacing the I/O backplane, you must re-enter the original enclosure serial number into the **Enclosure serial number field** to overwrite the serial number that is recorded for the new I/O backplane. Failure to enter the correct enclosure serial number will result in logical partition mappings being incorrect.

Note: You cannot boot the system until valid values are entered for all fields in the enclosure-type information.

To perform this operation, your authority level must be one of the following values:

- Administrator
- Authorized service provider

To change the system enclosure type, complete the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration > Program Vital Product Data**.
3. Click **System Enclosures**. In the right pane, the current system enclosures are displayed.
4. Enter the desired settings for the **Enclosure location**, **Feature Code/Sequence Number**, and **Enclosure serial number** fields using the naming convention described in the ASMI help.

The value of the **Enclosure serial number** field is different from the serial number of the system. Set the **Reserved** field to blank spaces unless directed otherwise by Level 3 technical support.

5. Click **Save settings** to update the system enclosure type information and save it to the VPD.

Setting the system identifiers

You can set the system-unique ID, serial number, machine type, and machine model. If you do not know the system-unique ID, contact your next level of support.

To perform this operation, your authority level must be one of the following values:

- Administrator
- Authorized service provider

Note: You cannot boot the system until valid values are entered for all fields. You can change these entries only once.

To set the system keywords, do the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration > Program Vital Product Data**.
3. Click **System Keywords**.
4. In the right pane, enter the desired values for the system serial number, machine type, and machine model by using the naming convention shown in the ASMI help. Set the **Reserved** field to blank spaces unless directed otherwise by service and support.
5. Click **Continue**. The Data Validation display is shown, which includes your entered settings.
6. Click **Save settings** to update the system keywords and save them to the VPD.

Displaying vital product data

You can view all or selected manufacturer's vital product data (VPD), such as serial numbers and part numbers.

You can view manufacturer's VPD stored from the system boot prior to the one in progress now.

To perform this operation, your authority level must be one of the following levels:

- General
- Administrator
- Authorized service provider

To display the VPD, complete the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Information > Vital Product Data**. A list of field replaceable units (FRUs) that exist on the system and their descriptions are displayed.
3. Select a single FRU or multiple FRUs from this list that you would like to view.
4. Click **Display Details** to display the details for selected FRUs, or click **Display all details** to display details for all VPD entries.

Clearing all deconfiguration errors

Use the Advanced System Management Interface (ASMI) to clear error records for all or individual system hardware resources that include the processor, memory, L2 and L3 cache, I/O hubs, service processor card, and clock card.

To clear all deconfiguration errors, your authority level must be an authorized service provider.

Notes:

- Before performing this operation, record error messages or ensure that the error record data is no longer needed; otherwise, you will lose all error data from the hardware resources.
- After completion of this procedure, the system must be powered off, and in standby mode, for the deconfiguration errors to be cleared.

To clear all deconfiguration errors, do the following steps:

1. If the server is not powered off and in standby state, ask the customer to power off the server. When the server is in standby state (the power on LED on the control panel is flashing slowly), continue with the next step.
2. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
3. In the navigation area, expand **System Configuration and Hardware Deconfiguration**.
4. Click **Clear All Deconfiguration Errors**.
5. In the right pane, select the desired hardware resource from the menu. You can click **All hardware resources** or an individual resource.

6. Click **Clear errors for selected hardware resource**.
7. Power on the server after clearing the deconfiguration errors. This will cause the flexible service processor (FSP) to retest the hardware as it powers on.

Service functions

Service functions provide enough detail for the service provider to gather information about hardware problems while under the direction of the next level of support.

This information provides basic information about some of the service functions that are commonly used by authorized service providers.

Before using this information, you should know how to service this particular hardware model. You must also know how to safely work with electrical components.

Attention: Misuse of service tools or using them with inappropriate security safeguards might result in loss of data, programs, or other objects on the system.

Working with storage dumps

This information describes how to work with storage dumps.

A main storage dump (MSD) is a process of collecting data from the system's main storage. For more information on main storage dumps, including platform system dumps, see *Performing a platform or main storage dump*.

A main storage dump can be performed in the following ways:

- Automatically - by the service processor as the result of a system failure.
- Manually - by using control panel functions when the system waits, loops, or appears to have an operating system failure.

Managing dumps

After you have performed a dump, or one occurs automatically, use this information to manage the dump, including copying, reporting, and deleting it.

Dumps are deleted automatically when a new dump occurs, except for log dumps.

Performing dumps

Learn more about the types of dumps that can be performed and how to manage them, including copying, reporting, and deleting them.

Dumps can occur automatically after a failure or external reset, or after a manual request. The dump information provides valuable information about system status and should be reported to your next level of support or your hardware service provider.

- **Platform system dump:** A platform system dump is a collection of data from server hardware and firmware, either after a system failure or a manual request.
- **Service processor dump:** A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request.

In addition, other dumps, which are generated automatically, are:

- **Platform event log entry dumps** (which are generated by server firmware when a platform event log entry is truncated)
- **Resource dumps**

- **SMP dumps**

Performing a platform system dump:

A platform system dump is performed when your next level of support or your service provider suspects a wait or loop in the server firmware.

Only perform a platform system dump under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

Note: Before performing a platform system dump, collect any reference code information from the control panel or from the HMC.

Performing a system dump by using the management console:

Your next level of support or your service provider might request that you perform a system dump if a wait or a loop in the server firmware is suspected. You can use the Hardware Management Console (HMC) or the IBM Systems Director Management Console (SDMC) to perform a *system dump*, which is a collection of data from the server hardware and firmware.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

To start a system dump on HMC, follow these steps:

1. Perform a controlled shut down of all partitions.

Note: A system dump will abnormally end any running partitions.

2. In the navigation area, open **Systems Management**.
3. Select the server and open it.
4. Click **Serviceability > Manage Dumps > Action > Initiate System Dump**. The dump is automatically saved to the HMC. For details on how to copy, report, or delete a dump after you have completed a dump, refer to “Managing dumps” on page 25.

To start a system dump on SDMC, follow these steps:

1. Perform a controlled shutdown of all partitions.

Note: A system dump abnormally ends any running partitions.

2. From the main IBM Systems Director welcome page, click **View support files** under the Service and Support Manager link.
Alternatively, click **Manage support files** from the main Service and Support Manager summary page.
3. From the **Manage Support Files** page, click **Collect Support Files**.
4. Click the **System** tab. In the **Show** field, select **All Targets**, select the endpoint system from which you want to collect support files, and click **Add >** to move the endpoint system into the **Selected** area.
5. Click the **Support Files** tab, and select the type of support file from the list of available types.

Note: The server endpoint determines the list of available support file types.

6. Provide any custom information required for the type of support file you selected, and click **Collect**.

Performing a system dump using the control panel:

Your next level of support or your service provider might request that you perform a system dump if a wait or a loop in the server firmware is suspected. If you do not have a management console, you can use the control panel to perform a system dump, which is a collection of data from the server hardware and firmware.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

If you do not have a management console, follow these steps to perform a system dump:

1. Perform a controlled shut-down of the operating system.

Note: A platform system dump will abnormally end any running partitions.

2. On the control panel, select manual mode.
3. Use the increment or decrement buttons to select **function 42** (system dump).
4. Press Enter on the control panel.
5. Is 00000000 or FF displayed on the control panel for more than 30 seconds?
 - **Yes:** The service processor or server firmware is not responding to a request from the control panel. Contact your next level of support or your hardware service provider. **This ends the procedure.**
 - **No:** An attention SRC A1xx3042 is displayed, which indicates that function 42 has been selected.
6. Perform the following steps:
 - a. Reselect function 42 and press Enter on the control panel.
 - b. Switch back to normal mode and wait for the dump to complete.
 - c. Wait for the system to perform another IPL.
7. For details on how to copy, report, or delete a dump after you have completed a dump, refer to "Managing dumps" on page 25.

Performing a system dump using the Advanced System Management Interface:

Your next level of support or your service provider might request that you perform a system dump if a wait or a loop in the server firmware is suspected. You can use the Advanced System Management Interface (ASMI) to perform a system dump, which is a collection of data from the server hardware and firmware.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

To perform a system dump using the ASMI, see Using the ASMI to perform a system dump.

Performing a service processor dump:

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request.

Only perform a service processor dump under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

Performing a service processor dump using the management console:

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request. You can use the management console to perform a service processor dump.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

Use the Advanced System Management Interface (ASMI) to start a service processor dump on an IBM Systems Director Management Console (SDMC).

To start a service processor dump on a Hardware Management Console (HMC), follow these steps:

1. In the navigation area, open **Systems Management**.
2. Select the server and open it.
3. Click **Serviceability > Manage Dumps > Action > Initiate Service Processor Dump**. The dump is automatically saved to the HMC. For details on how to copy, report, or delete a dump after you have completed a dump, refer to “Managing dumps” on page 25

Performing a service processor dump using the control panel:

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request. If you do not have an Hardware Management Console (HMC), you can use the control panel to perform a service processor dump.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

If you do not have an HMC, follow these steps to perform a service processor dump:

1. On the control panel, select manual mode.
2. Use the increment or decrement buttons to select **function 43** (service processor dump).
3. Press Enter on the control panel.
4. Is 00000000 or FF displayed on the control panel for more than 30 seconds?
 - **Yes:** The service processor or server firmware is not responding to a request from the control panel. Contact your next level of support or your hardware service provider. **This ends the procedure.**
 - **No:** An attention SRC A1xx 3043 is displayed, which indicates that function 43 has been selected.
5. Perform the following steps:
 - a. Reselect function 43 and press Enter on the control panel.
 - b. Switch back to normal mode, and wait for the dump to complete.
6. For details on how to copy, report, or delete a dump after you have completed a dump, refer to “Managing dumps” on page 25.

Performing a service processor dump using the Advanced System Management Interface:

A service processor dump is a collection of data from a service processor either after a failure, external reset, or manual request. You can use the Advanced System Management Interface (ASMI) to perform a service processor dump.

Use this procedure only under the direction of your next level of support or your service provider, after first providing to your next level of support or service provider a dump of the operating system.

To perform a service processor dump using the ASMI, see Initiating a service processor dump.

Copying a dump

Use this procedure to copy a current platform dump or current main storage dump when the main storage dump auto copy option is disabled. Copying the current dump allows another dump of the same type to be created.

Note: If you have a management console, you must manage your platform dumps with the management console.

Copying a dump by using a management console:

You can copy a dump by using the Hardware Management Console (HMC) or the IBM Systems Director Management Console (SDMC).

Note: If you have a management console, you must manage your platform dumps with the management console.

To copy a dump by using the HMC, complete the following steps:

1. In the navigation area, open **Systems Management**.
2. Select the server and open it.
3. Click **Serviceability > Manage Dumps > Selected > Copy Dump**.
4. Select the dump to copy.
5. Verify that the HMC that contains the dump is the HMC being used to copy the dump.
6. To copy the dump to DVD media, Click **Selected > Copy Dump File to DVD Media**.
7. Load the media and follow the instructions on the display.
8. When the copy procedure is successfully completed, remove the media and process it according to the instructions of your next level of support or your hardware service provider.
9. If you encounter a problem with the copy procedure, contact your next level of support or your hardware service provider.

To copy a dump by using the SDMC, complete the following steps:

1. From the main IBM Systems Director welcome page, click **View support files** under the **Service and Support Manager** link.

Alternatively, select **Manage support files** from the main Service and Support Manager summary panel.

2. From the **Manage Support Files** page, click the dump file to open the properties page of the file.
3. Click **Actions > Copy to media**.

Note: One or more support files can be copied to a Universal Serial Bus (USB) device that exists on the SDMC appliance. If multiple USB devices are available on the SDMC appliance, you can select the USB device to use.

4. When the copy procedure is successfully completed, remove the media and process it according to the instructions of your next level of support or your hardware service provider.
5. If you encounter a problem with the copy procedure, contact your next level of support or your hardware service provider.

Copying a dump by using a Linux command:

You can copy a dump by using a Linux command.

Copy the dump only if you are directed to do so by your next level of support or service provider.

Note: If you have a management console, you must manage your platform dumps with the management console. For details, see “Copying a dump by using a management console.”

Platform dumps are saved in Linux in the following directory:

`/var/log/dump/`

Reporting a dump

Find out how to report a dump by using the management consoleLinux command.

Reporting a dump by using a management console:

You can report a dump by using the Hardware Management Console (HMC) or the IBM Systems Director Management Console (SDMC).

To report a dump by using the HMC, complete the following steps:

1. In the navigation area, open **Systems Management**.
2. Select the server and open it.
3. Click **Serviceability > Manage Dumps > Selected > Call Home Dump**.
4. Verify that the **HMC** that contains the dump is the HMC being used to report the dump.
5. Click **Selected > Call Home Dump**. The dump summary display shows the date, time and size of the dump. Report the summary information to your next level of support or your hardware service provider.
6. Has your next level of support or your hardware service provider requested a copy of the dump?
 - **Yes:** Continue to the next step.
 - **No:** Contact your next level of support or your hardware service provider on the problem.
7. To copy a dump to removable media, perform the following steps:
 - a. Click **Copy Dump File to DVD Media**.
 - b. Load the media and follow the instructions on the display.
 - c. When the copy procedure is successfully completed, remove the media and process it according to the instructions of your next level of support or your hardware service provider. If you encounter a problem with the copy procedure, contact your next level of support or your hardware service provider.
8. To copy a dump to another system, perform the following steps:
 - a. Click **Selected > Copy Dump File to Other System**.
 - b. Follow the instructions on the display.
 - c. When the copy procedure is complete, contact your next level of support or your hardware service provider.

To report a dump by using the SDMC, complete the following steps:

1. From the main IBM Systems Director welcome page, select **View support files** under the **Service and Support Manager** link.
Alternatively, click **Manage support files** from the main Service and Support Manager summary page.
2. From the **Manage Support Files** window, select the dump file, and then click **Submit to IBM**.

Reporting a dump by using a Linux command:

You can report a dump by using a Linux command.

Report the dump only if you are directed to do so by your next level of support or service provider.

Deleting a dump

Use this procedure to delete a dump when dump copies are no longer needed by your next level of support or by your hardware service provider.

Deleting a dump by using a management console:

You can delete a dump by using the Hardware Management Console (HMC) or the IBM Systems Director Management Console (SDMC).

Dumps are stored in the HMC's Manage Serviceable Events tool and are automatically deleted when room is required for new dumps.

To manually delete a dump on the HMC, complete the following steps:

1. In the navigation area, open **Systems Management**.
2. Select the server and open it.
3. Click **Serviceability > Manage Dumps > Selected > Delete Dump**.
4. Select the dump to be deleted.
5. Verify that the HMC containing the dump is the HMC being used to delete the dump.
6. Click **Selected > Delete Dump**.

To manually delete a dump on the SDMC, complete the following steps:

1. From the main IBM Systems Director welcome page, select **View support files** under the **Service and Support Manager** link.
Alternatively, click **Manage support files** from the main Service and Support Manager summary page.
2. From the **Manage Support Files** page, select the dump file, and then click **Delete Support Files**.
3. Click **OK**.

Deleting a dump by using a Linux command:

You can delete a dump by using a Linux command.

Platform dumps are saved in Linux under the following directory: `/var/log/dump/`

Only delete the dump if directed to do so by your next level of support or service provider.

Performing a slow boot

Use this procedure to perform a slow boot by using the Hardware Management Console (HMC), control panel, or Advanced System Management Interface (ASMI) menus depending on your configuration.

In some cases, you need to perform a slow-mode boot to perform extended diagnostic testing.

Note: A slow-mode boot might produce a new reference code on the control panel or new errors in the service processor error log. When the server reports a new error code, record it for use in subsequent steps.

Performing a slow boot by using the Hardware Management Console

You can perform a slow boot by using the Hardware Management Console (HMC).

In some cases, you need to perform a slow-mode boot to perform extended diagnostic testing.

Note: A slow-mode boot might produce a new reference code on the control panel or new errors in the service processor error log. When the server reports a new error code, record it for use in subsequent steps.

To perform a slow boot, complete the following steps:

1. Record any reference codes appearing on the control panel or HMC.

2. Shut down all logical partitions and the server.
3. In the navigation area, open **Systems Management**.
4. Open **Servers**.
5. Select the server on which you want to perform a slow boot.
6. In the **Tasks** area, click **Properties**.
7. Click the **Power-On Parameters** tab.
8. Click **Slow** from the list in the Power-on speed override field in the Next column.

Note: These settings apply only to the current boot. After you complete the service action, the settings revert back to the original setting.

9. Click **OK**.
10. After you are done, return to the step in the procedure that caused you to perform a slow boot. **This ends the procedure.**

Performing a slow boot using the control panel

You can perform a slow boot using the control panel.

In some cases, you need to perform a slow-mode boot to perform extended diagnostic testing.

Note: A slow-mode boot might produce a new reference code on the control panel, or new errors in the service processor error log. When the server reports a new error code, record it for use in subsequent steps.

To perform a slow boot using the control panel, complete the following steps:

1. Record any reference codes that appear on the control panel.
2. Stop the operating system by performing the following steps:
 - a. Log in to the system as a user with the authority to run the shutdown or pwrdownsys (Power Down System) command.
 - b. At the command line, enter one of the following commands:

Note: These commands stop the operating system. The system power turns off, the power-on light begins to slowly flash, and the system goes into a standby state.

- If your system is running Linux, type `shutdown -h now`

3. On the control panel, use the increment or decrement buttons to scroll to function 02.
4. Press Enter to start function 02. The current IPL type (with pointer) and speed is displayed.
5. Use the increment or decrement buttons to scroll through the IPL types and speeds.
6. When manual is shown, press Enter to select the IPL type of manual. The current IPL type and speed (with pointer) is displayed.
7. Use the increment or decrement buttons to scroll through the IPL speeds.
8. When S is shown, press Enter to select the IPL speed of slow.
9. To exit function 02, press Enter multiple times until only 02 is displayed.
10. Power on the server by pressing the white power button. Then return to the procedure that caused you to perform a slow boot. **This ends the procedure.**

Performing a slow boot by using the Advanced System Management Interface menus

You can perform a slow boot by using the Advanced System Management Interface (ASMI) menus.

In some cases, you need to perform a slow-mode boot to perform extended diagnostic testing.

Note: A slow-mode boot might produce a new reference code on the control panel or new errors in the service processor error log. When the server reports a new error code, record it for use in subsequent steps.

To perform a slow boot by using the ASMI, complete the following steps:

1. Record any reference codes that appear on the control panel or HMC.
2. Shut down all logical partitions and the server.
3. In the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
4. Expand **Power/Restart Control** and click **Power On/Off System**.
5. Record the settings so that you can reenter them after you complete the service actions.
6. On the Power on/off system menu, select the following options:
 - Click **Slow** in the **Set System Boot Speed** field.
 - Click **Running** in the **Boot to system server firmware** field.
7. Select **Save Settings**.

Note: These settings will apply to all future boots. After you complete the service action, change the settings back to what you recorded in step 5.

8. After you are done, return to the step in the procedure that caused you to perform a slow boot. **This ends the procedure.**

Determining the primary or alternate console

Use this procedure to determine the primary or alternate console.

If the management console has been configured as the primary console, the system will open a console on the management console.

If the Operations Console has been configured as the primary console, the system will start the Operations Console. If the Operations Console has not been configured, the primary console is a workstation that is attached to the first input/output processor (IOP) that is capable of supporting workstations.

In addition to the primary console, the system can assign an alternative consoles. The alternative console can be a workstation that is attached to the next IOP or input/output adapter (IOA) that is capable of supporting workstations.

The IOP that supports the console must be on the first system bus (bus 1).

If a workstation is not correctly attached to the first IOP that is capable of attaching workstations, then the system will not assign a primary console. The system displays a reference code on the operator's panel. In addition, if the IPL (initial program load) mode is set to manual, the system will stop.

Primary console workstation requirements

To be the primary console, the workstation must be operational and have the correct port and address. If the workstation is a PC, it must also have an active emulation program on the workstation.

The workstation requirements follow:

- Management consoles
- Twinaxial workstation - Port 0 Address 0
- ASCII workstation - Port 0
- PC attached to ASCII IOP or IOA
 - Port 0

- PC software to emulate a 316x or 3151 terminal
- PC attached to twinaxial IOP
 - Port 0 Address 0
 - 5250 emulator software active on PC
- PC attached to a LocalTalk IOA (6054)
 - SNAPS 5250 Version 1.2 (or above) application
 - Console capable selected on MacIntosh (IOA converts to Port 0 Address 0)
- PC attached to a 2609, 2612, 2699, or 2721 communications IOA
 - Client Access Console cable attached to the 2609 or 2612 P2 port (part number 46G0450 or 46G0479), 2699 (part number 21H3779), or 2721 (part number 44H7504)
 - Operations Console cable attached to the 2609 or 2612 (part number 97H7555), 2699 (part number 97H7556), or 2721 (part number 97H7557) with 5250 emulation or Rumba active on PC

Finding the primary console when the system is operational

Various methods are available to find the primary console when the system is operational.

The following methods are available to find the primary console:

- **Method 1:** Look for a sign-on display with DSP01 shown in the upper-right corner.
- **Method 2:** If the device name (DSP01) for the console has been changed, you can verify the device name for the primary console by doing the following steps:
 1. Enter DSPCTLD QCTL on a command line. The Display Controller Description display is shown.
 2. Find the Resource name parameter (such as CTL01) and record it.
 3. Enter PRTDEVADR *rrrrr* on a command line, where *rrrrr* is the resource name you recorded.

Note: If the printer is active, the data will print.

- **Method 3:**
 1. Enter STRSST on any command line. The System Service Tools display is shown.
 2. Select option 1 (Start a service tool).
 3. Select option 7 (Hardware service manager).
 4. Select option 2 (Logical hardware resources).
 5. Select option 1 (System bus resources). On the Logical Hardware Resources on System Bus display, the less than (<) symbol indicates the IOP that the console is attached to.
 6. Use option 9 (Resource associate with IOP and display detail) to find the location of the system bus, board, and card.

Finding the primary console when the system power is off

Various methods are available to find the primary console when the system power is off.

Use one of the following methods:

- Turn on the system in manual mode and look for the IPL and Install System display.
- Turn on the system in normal mode and look for DSP01 on the Sign On display.

Note that the name might have been changed. See “Finding the primary console when the system is operational” to determine the device name.

Resetting the service processor

Use this procedure to ensure that the service processor is reset properly under the direction of your hardware service provider.

Note: Use this procedure only under the direction of your next level of support or your hardware service provider. During this procedure you will be powering off the system and removing and reapplying ac power.

1. Inform anyone using the server that it will be shut down.
2. Stop all applications that are running on the server.
3. Stop the operating system and server by choosing from the following options:
 - If you have a management console, shut down all logical partitions and the server. For instructions see Powering on and powering off a system. Then continue with step 6.
 - If you do not have an HMC, continue with the next step.
4. Log in to the system as a user with the authority to run the appropriate shutdown command.
5. At the command line, type `shutdown -h now`. This command stops the operating system. The system power turns off, the power-on light begins to slowly flash, and the system goes into a standby state.
6. Unplug the ac power cord and plug it back in.
7. The service processor is reset. Start the server. **This ends the procedure.**

Resetting the managed system connection from the HMC

Use this procedure to reset the managed system connection from the HMC.

Perform these steps to reset the managed system connection:

1. In the navigation area, open **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server on which you want to reset the connection.
4. In the **Tasks** area, open **Connections**.
5. Select **Reset or Remove Connection**.
6. Select **Reset Connection**.
7. Click **OK**.

Checking for a duplicate IP address

You can check for a duplicate IP address by using the Hardware Management Console (HMC) or the IBM Systems Director Management Console (SDMC).

To check for a duplicate IP address by using the HMC, complete the following steps:

1. On the HMC, right-click the desktop and select **terminal** > **rshterm**.
2. Issue this command: `lssyscfg -r sys -F "name,ipaddr"`.
A list of managed system names and their IP addresses (or host names) is displayed.
3. Check for duplicate IP addresses.

To check for a duplicate IP address by using the SDMC, complete the following steps:

1. On the SDMC, right-click the desktop and select **terminal** > **rshterm**.
2. Issue this command: `smcli lssyscfg -r sys -F "name,ipaddr"`.
A list of managed system names and their IP addresses (or host names) is displayed.
3. Check for duplicate IP addresses.

Disk drive

Use this procedure to replace the disk drive.

Your system can be powered off or powered on when you replace the disk drive. If the system is running, you can replace a disk drive with the power on. If it is not, or if the disk drive to be replaced is in the Linux root volume group (rootvg) and it is not protected with either a redundant array of independent disks (RAID) or mirroring, use the procedure for replacing the disk drive with the power off.

1. Do you want to replace the disk drive concurrently with system operations and the unit powered on?

Yes: Go to next step.

No: Go to Replace the disk drive nonconcurrently.

2. Choose the procedure for the operating system running in the partition that the disk drive resource is assigned to.

For Linux, go to Replace the disk drive using Linux .

Replacing the disk drive nonconcurrently

Use this procedure to remove and replace a disk drive nonconcurrently.

1. The component will not be serviced concurrently. If this system is powered on, power it off before continuing.

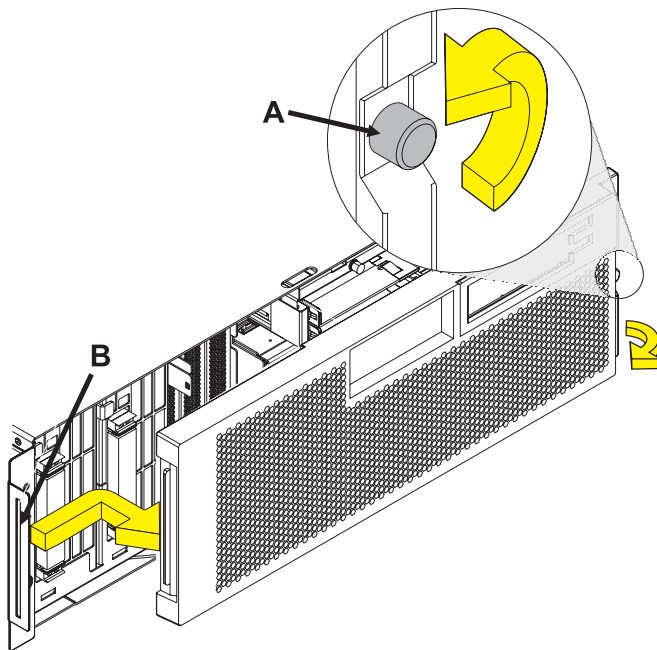
When the system is powered off, disconnect the AC input source from the enclosure being serviced. Do not apply power to the enclosure until directed to do so in this procedure.

2. Access the unit by:

a. Open the front rack door.

b. Loosen the thumbscrew (A) on the right side of the cover.

c. Slide the cover to the right and remove it from the system unit slot (B).

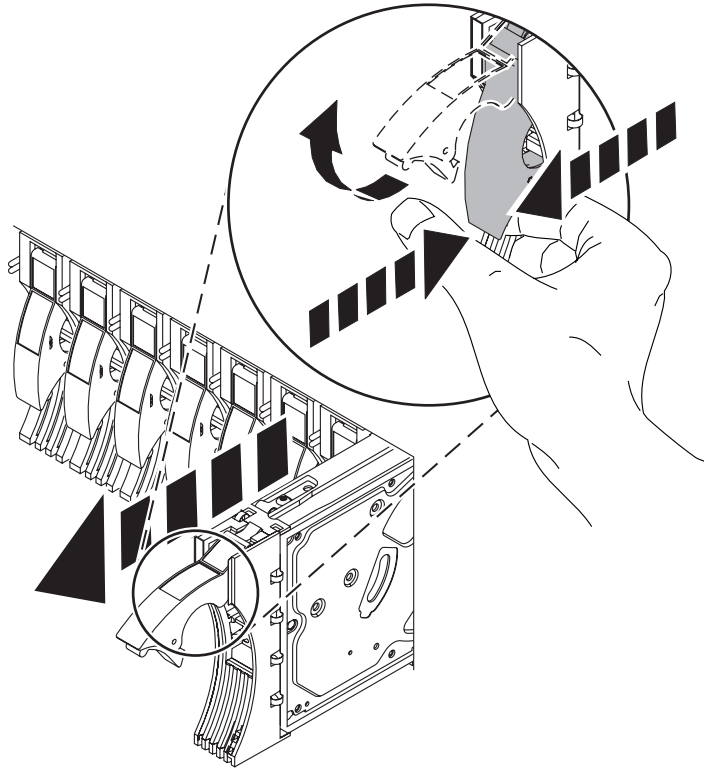


3. Remove the disk drive by:

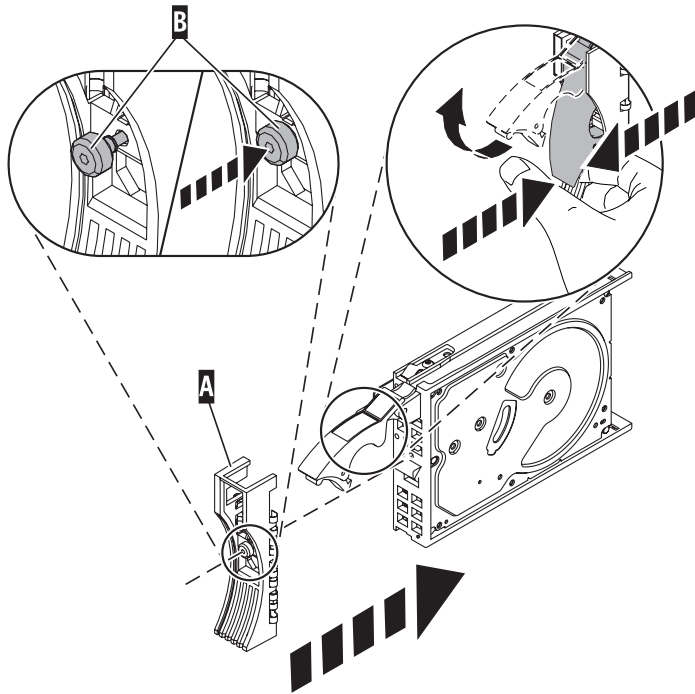
a. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.

b. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

The concurrent maintenance light for the slot turns off when you remove the disk drive.



4. Install the bezel on the new disk drive:
 - a. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
 - b. Remove the disk drive from its static protective package.
 - c. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
 - d. Attach the disk drive bezel (A) to the replacement disk drive as shown.
 - e. Press in and then tighten the thumbscrew (B) to secure the bezel to the disk drive.



5. Install the disk drive:
 - a. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
 - b. Slide the disk drive into the system until it stops.
 - c. Push the disk drive handle in until it locks.

Note: It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.

- d. Reconnect the power source.
- e. Power on the unit, and then go to Verifying a repair. **This completes this procedure.**

Replacing the disk drive using Linux

This procedure is used to replace a disk drive in a location that is controlled by a system or logical partition that is running the Linux operating system.

Preparing to remove the disk drive

1. Log in as root user.
2. Type `iprconfig` on the command line of the Linux session and press Enter.
The IBM Power RAID Configuration Utility display is shown.
3. Select **Analyze log**. Press Enter. The Kernel Messages Log display is shown.

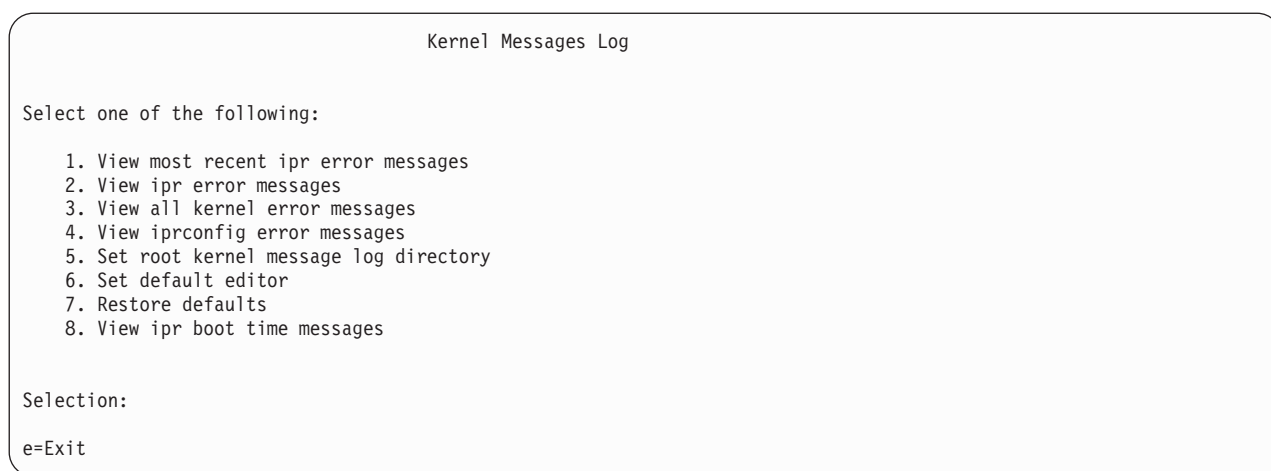


Figure 3. Kernel Messages Log

4. Select **View most recent ipr error messages** from the Kernel Messages Log display. Press Enter.
5. Find the entry in the log for the disk drive you want to replace.
6. Record the location information for the disk drive.

Note: The location information has the form of 2:0:8:0. In this example, 2 is the SCSI host number, 0 is the SCSI bus, 8 is the SCSI target ID, and 0 is the LUN (logical unit).

7. Return to the command line.
8. Type the following code phrase:
`ls -ld /sys/class/scsi_host/host#/device`
where # is the SCSI host number. Press Enter.
9. Record the PCI location information.

Note: The PCI location information has the form of 61:01:0:2.

10. Type `iprconfig` on the command line and press Enter.
The IBM Power RAID Configuration Utility display is shown.
11. Select **Display hardware status** from the IBM Power RAID Configuration Utility display. Press Enter.
The Display Hardware Status display is shown.

```

Display Hardware Status

Type option, press Enter.
  1=Display hardware resource information details

OPT Name  PCI/SCSI Location      Description      Status
-----
          0000:01:01.0.0/        PCI-X SCSI Adapter  Operational
          0000:41:01.0.1/        PCI-X SCSI Adapter  Operational
sda       0000:41:01.0.1/0:3:0    Physical Disk       Active
sdb       0000:41:01.0.1/0:4:0    Physical Disk       Active
sdc       0000:41:01.0.1/0:8:0    Physical Disk       Active
sdd       0000:41:01.0.1/1:3:0    Physical Disk       Active
sde       0000:41:01.0.1/1:4:0    Physical Disk       Active
sdf       0000:41:01.0.1/1:5:0    Physical Disk       Active
          0001:61:01.0.2/        PCI-X SCSI RAID Adapter  Operational
sdg       0001:61:01.0.2/0:3:0    Physical Disk       Active
          0001:61:01.0.2/0:6:0    Advanced Function Disk  Active
sdi       0001:61:01.0.2/0:9:0    Physical Disk       Active
sdh       0001:61:01.0.2/255:0:0  RAID 10 Disk Array   Failed
          0001:61:01.0.2/0:4:0    RAID 10 Array Member  Failed
          0001:61:01.0.2/0:5:0    RAID 10 Array Member  Failed

e=Exit  q=Cancel  r=Refresh  t=Toggle

```

Figure 4. Example Display Hardware Status

12. Look for the disk drive at the PCI location you recorded. The disk drive might have a failed status.
13. If the disk drive you want to replace is unprotected or in use, move the data from the disk drive before continuing with this procedure.
For information, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.
14. Type option 1 (Display hardware resource information details) next to the disk drive you want to replace. Press Enter.

A Disk Hardware Resource Information Details display similar to the following is shown.

```

Disk Unit Hardware Resource Information Details

Manufacturer . . . . . : IBM
Product ID . . . . . : ST336607LC
Firmware Version . . . . . : 43353048 (C50H)
Serial Number. . . . . : 00006719
Capacity . . . . . : 36.40 GB
Resource Name. . . . . : /dev/sdd

Physical location
PCI Address. . . . . : 0001:50:01.0
SCSI Host Number . . . . . : 2
SCSI Channel . . . . . : 0
SCSI Id. . . . . : 4
SCSI Lun . . . . . : 0

Extended Details
FRU Number . . . . . : 00P2676

Press Enter to Continue

e=Exit  q=Cancel  f=PageDn  b=PageUp

```

Figure 5. Example Disk Hardware Resource Information Details display

15. Record the physical location information.
16. Return to the IBM Power RAID Configuration Utility display.

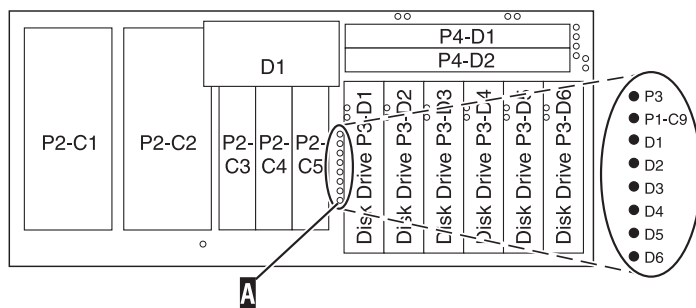
Removing the disk drive

1. From the IBM Power RAID Configuration Utility display, select **Work with disk unit recovery**. Press Enter.
2. From the Work with Disk Unit Recovery display, select **Concurrent remove device**. Press Enter. A Concurrent Device Remove display is shown, similar to the following display.

Concurrent Device Remove				
Choose a single location for remove operations				
1=Select				
OPT	Name	PCI/SCSI Location	Description	Status
sdc		0000:41:01.0.1/0:8:0	Physical Disk	Active
		0000:41:01.0.1/0:5:		Empty
sdb		0000:41:01.0.1/0:4:0	Physical Disk	Active
sda		0000:41:01.0.1/0:3:0	Physical Disk	Active
		0000:41:01.0.1/1:8:		Empty
sdf		0000:41:01.0.1/1:5:0	Physical Disk	Active
sde		0000:41:01.0.1/1:4:0	Physical Disk	Active
sdd		0000:41:01.0.1/1:3:0	Physical Disk	Active
		0001:61:01.0.2/0:8:		Empty
sdh		0001:61:01.0.2/0:9:0	Physical Disk	Active
sdg		0001:61:01.0.2/0:3:0	Physical Disk	Active

Figure 6. Example Concurrent Device Remove display

3. Type option 1 (Select) next to the location for the disk drive you want to replace. Press Enter.
4. The Verify Device Concurrent Remove display is shown. The concurrent maintenance light turns on for that disk drive slot.



5. On the Verify Device Concurrent Remove display, verify that the selected disk drive is the disk drive you want to replace, then press Enter. The identify light turns on for the disk drive.

Note: Ensure that the disk drive is not in use to prevent loss of data.

6. The Complete Device Concurrent Remove display is shown.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
7. Squeeze and pull the handle of the disk drive out toward you before you remove the disk drive as shown in Figure 7 on page 42 or Figure 8 on page 42. If the handle is not all the way out, the disk

drive will not slide out of the system or expansion unit.

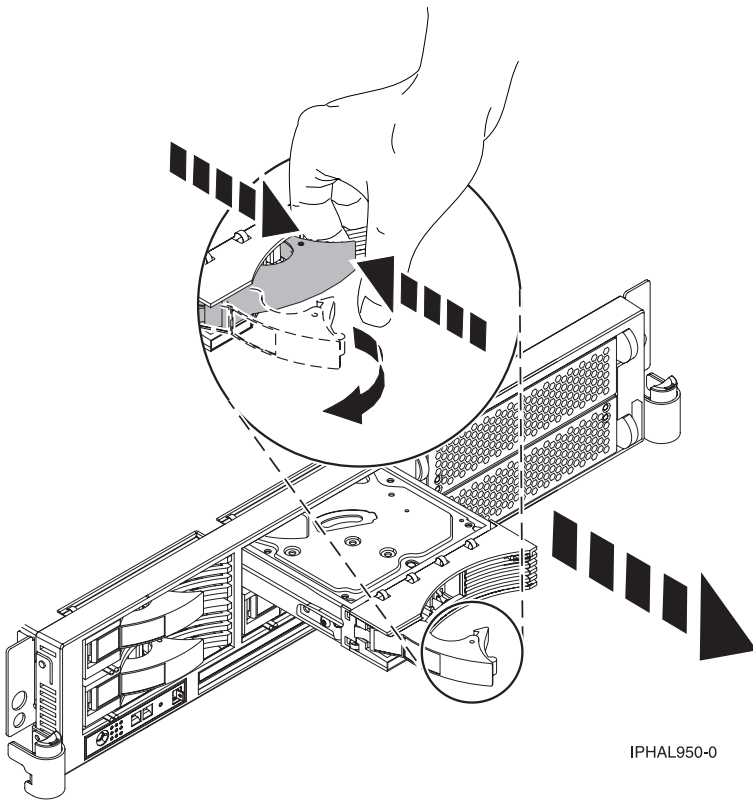


Figure 7. Removing a disk drive from the system unit

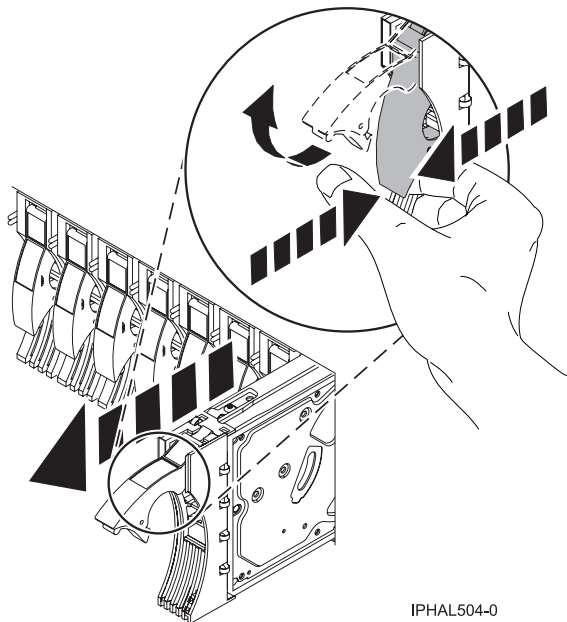
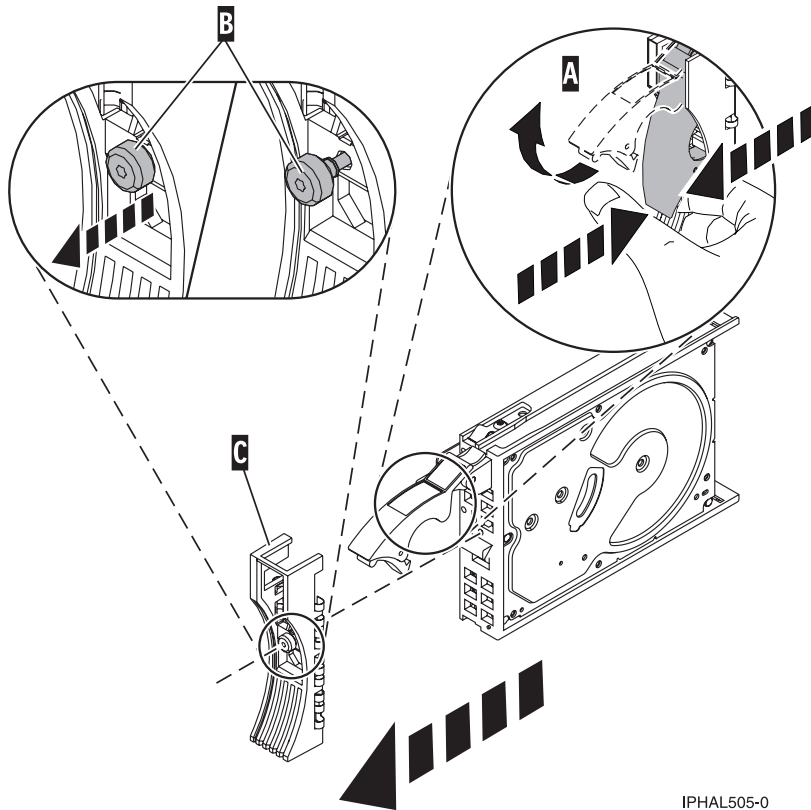


Figure 8. Removing a disk drive from the system unit

8. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

- Loosen and pull out on the thumbscrew (B) to release the disk-drive bezel (C) from the disk drive, as shown in the following figure.



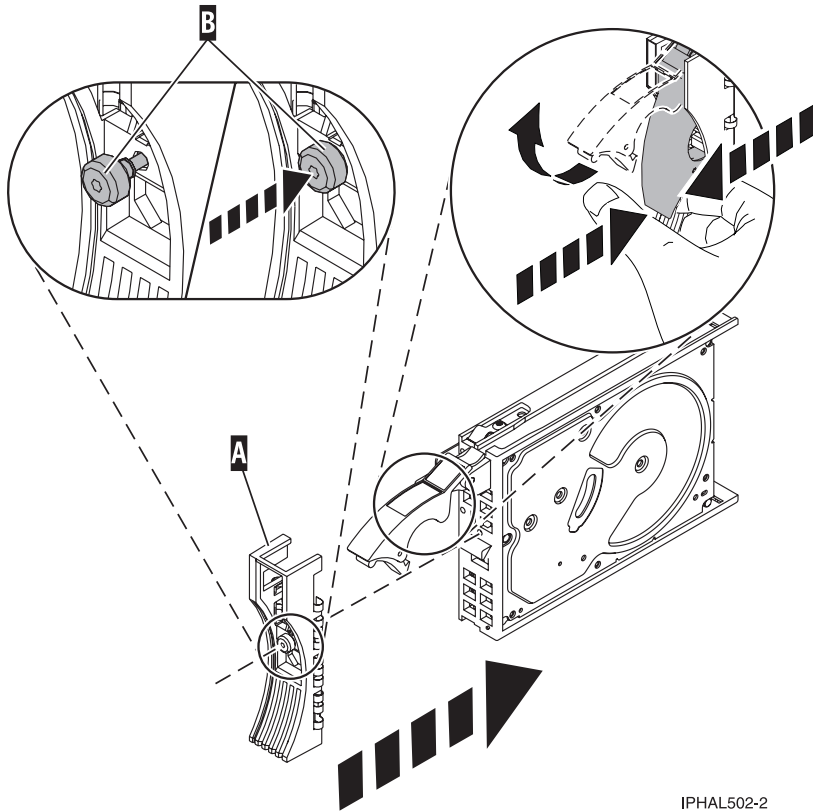
IPHAL505-0

Figure 9. Removing a disk-drive bezel

- Press Enter on the IBM Power RAID Configuration Utility to indicate that you have removed the disk drive.

Replacing the disk drive

- Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle them with care.
- Remove the disk drive from its protective package.
- Unlock the disk drive handle by squeezing and pulling it out toward you before you install the disk drive. If the handle is not all the way out, the disk drive will not slide into the system or expansion unit.
- Follow these steps to install the disk-drive bezel on the replacement disk drive:
 - Attach the bezel (A) to the disk drive, as shown in the following figure.
 - Press in and then tighten the thumbscrew (B) to secure the bezel to the disk drive.



IPHAL502-2

Figure 10. Attaching a bezel to the disk drive

5. From the IBM Power RAID Configuration Utility display, select **Work with disk unit recovery**. Press Enter.
6. From the Work with Disk Unit Recovery display, select **Concurrent add device**. Press Enter. A Concurrent Device Add display similar to the following is shown.

Concurrent Device Add			
Choose a single location for add operations			
1=Select			
OPT Name	PCI/SCSI Location	Description	Status
	0000:41:01.0.1/0:5:		Empty
	0000:41:01.0.1/1:8:		Empty
	0001:61:01.0.2/0:8:		Empty

Figure 11. Example Concurrent Device Add display

7. Type option 1 (Select) next to the location from which you removed the disk drive. The Verify Device Concurrent Add display is shown.
8. Press Enter on the Verify Device Concurrent Add display. The Complete Device Concurrent Add display is shown.
9. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
10. Slide the disk drive all the way into the system or expansion unit and then lock it in place by pushing in the disk drive handle, as shown in Figure 12 on page 45 or Figure 13 on page 45.

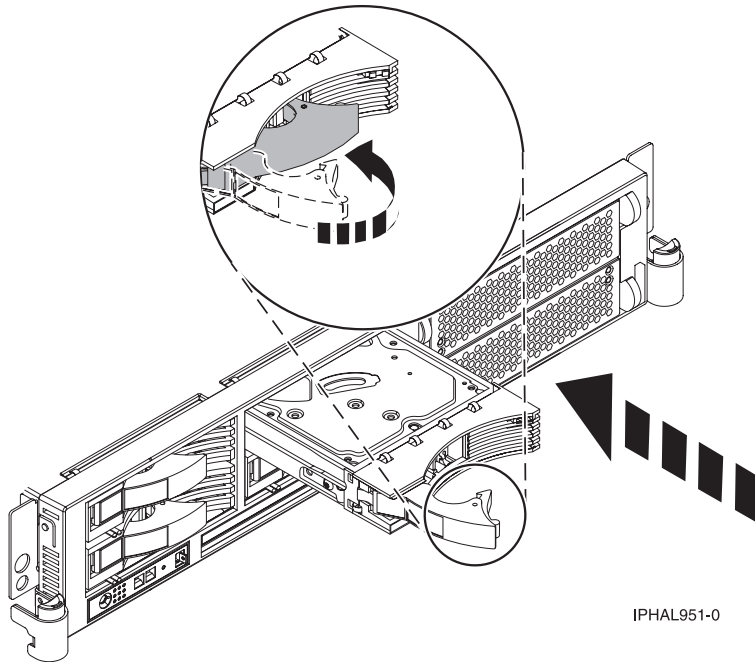


Figure 12. Installing a disk drive in the system unit

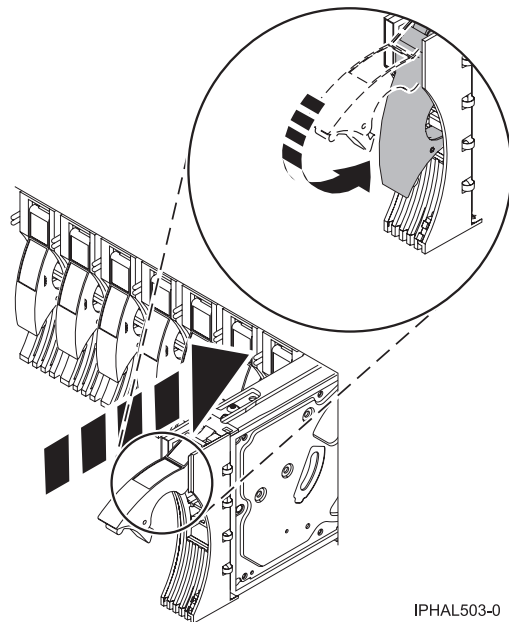


Figure 13. Installing a disk drive in the system unit

11. Press Enter on the Complete Device Concurrent Add display to indicate that the disk drive is installed.
12. Rebuild the data on the replacement disk drive. For instructions, go to "Rebuilding data on a replacement disk drive by using Linux" on page 46.
13. Go to Verifying a repair. **This completes this procedure.**

Rebuilding data on a replacement disk drive by using Linux

Use this procedure to rebuild data on a replacement disk drive.

To rebuild data on the replacement disk drive, complete the steps listed here.

For an unprotected disk drive

If the disk drive you are replacing is in a RAID Level 0 disk array or in a failed RAID Level 5 or RAID Level 10 disk array, complete the following steps:

1. Re-create the disk array.
2. Re-create the file systems on the disk array.
3. Copy the data back to the restored disk array from your backup media.

For information on these tasks, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*, SA23-1327.

PCI adapter

Use this procedure to service a PCI adapter.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing and replacing a PCI adapter. For instructions, see *Removing a part by using the Hardware Management Console*.

The PCI adapter is serviced concurrently. Select the procedure below based on your operating system.

If you are doing a concurrent repair by using the Linux operating system, go to *Removing and replacing a PCI adapter contained in a cassette in a Linux partition that is powered on*.

Removing and replacing a PCI adapter contained in a cassette in a Linux partition that is powered on

Procedures performed on a PCI adapter in a Linux partition that is powered on, also known as hot-plug procedures, require the system administrator to take the PCI adapter offline prior to performing the operation. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

Before performing this procedure, do the following steps:

- Ensure that the system meets the “Prerequisites for hot-plugging PCI adapters in a Linux partition” on page 58
- “Verifying that the hot-plug PCI tools are installed on the Linux partition” on page 59.

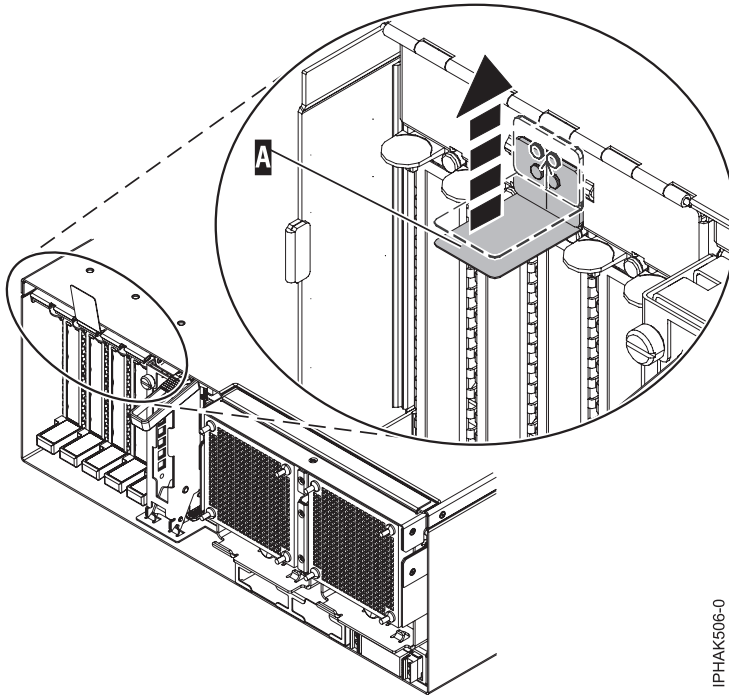
To remove and replace an adapter, do the following steps:

1. Determine the location of the PCI adapter in the system.
2. Record the slot number and location of each adapter being removed. Adapter slots are numbered on the rear of the system unit.
3. Ensure that any processes or applications that might use the adapter are stopped.
4. Run the `drmogr -c pci` command to enable an adapter to be replaced:
For example, to replace the PCI adapter in slot U7879.001.DQD014E-P1-C3 run this command:

```
drmogr -c pci -r -s U7879.001.DQD014E-P1-C3
```

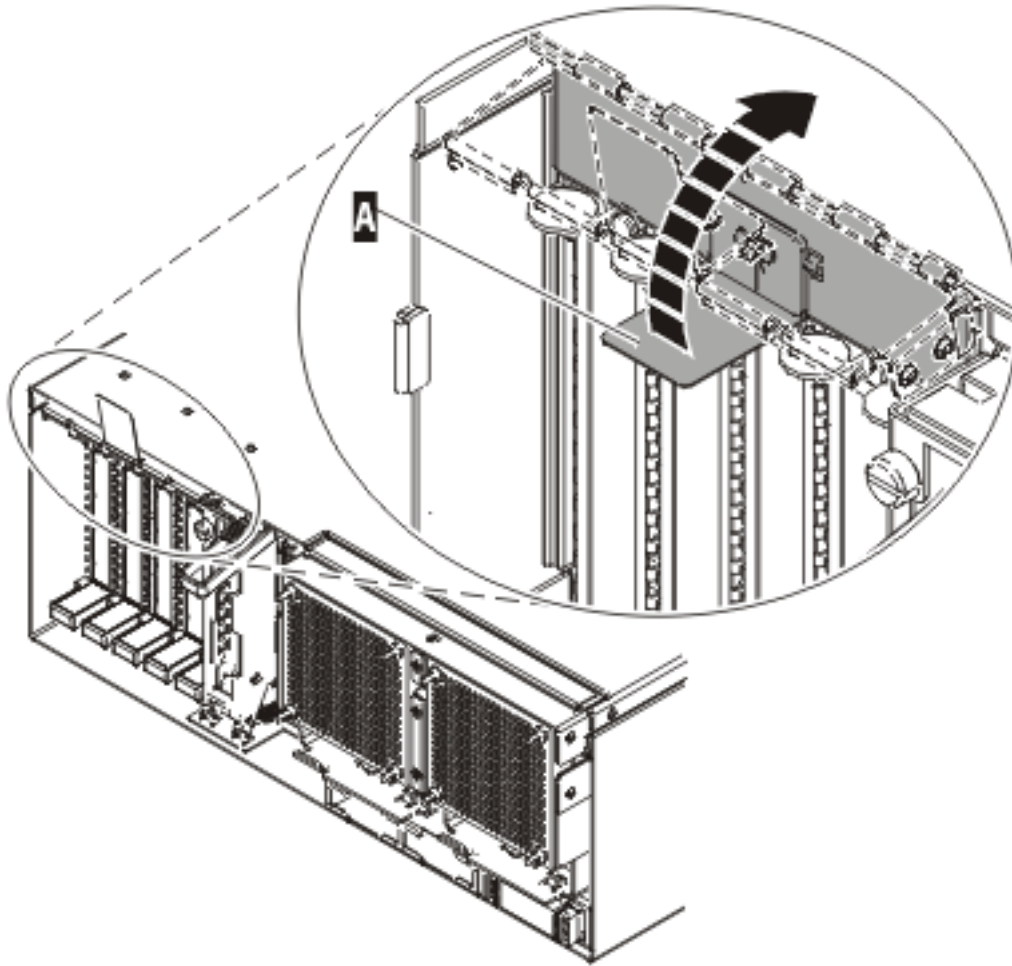
Follow the instructions on the display to complete the task.
5. Label, and then disconnect all cables attached to the adapter you plan to remove.

6. Lift up on the PCI adapter EMC shield (A) as shown in Figure 14 and then rotate it up and away from the cassette as shown in Figure 15 on page 48.
If the PCI adapter does not have an EMC shield, go to step 7.



IPHAK506-0

Figure 14. Lift up on the EMC shield

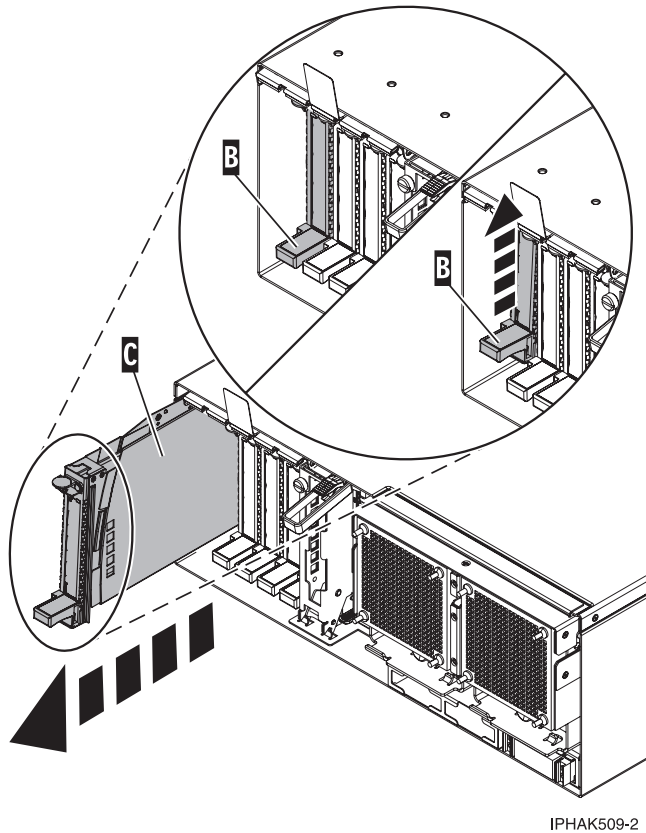


IPHAK907-0

Figure 15. Rotate the EMC shield into the open position

7. Remove the cassette. Lift up the lower cassette handle (B) as shown in the following figure. Pull the PCI cassette (C) out of the system.

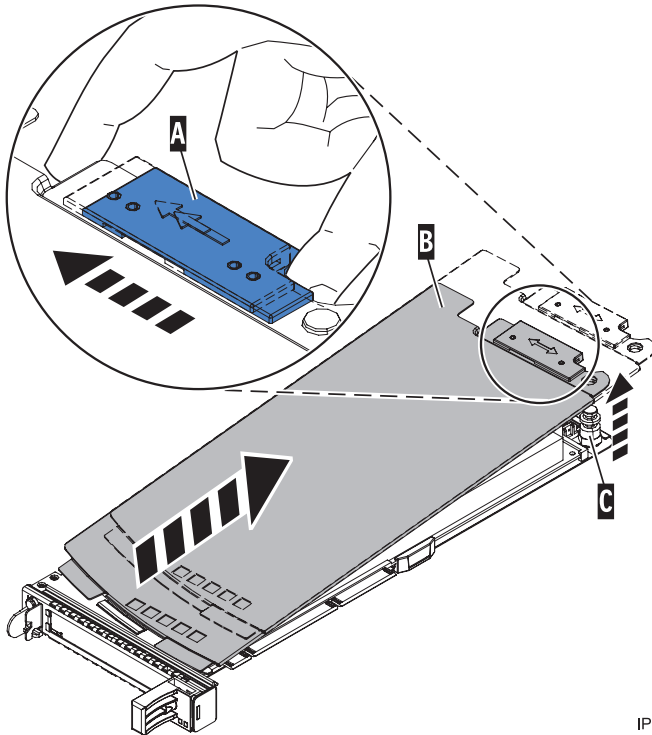
Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling.



IPHAK509-2

Figure 16. PCI adapter cassette removed from the system unit

8. Place the cassette with the cover facing up on an approved ESD surface. The cover will have a label on it.
9. Install the replacement adapter into the PCI adapter cassette by completing the following steps. If the cassette is not going to contain a replacement adapter, use this same procedure to place an adapter filler panel in the cassette.
 - a. Remove the cassette cover by doing the following steps:
 - 1) Slide the cover latch (**A**) to disengage it from the pivot pin (**C**) as shown in the following figure.
 - 2) Lift the cover (**B**) off of the pivot pin.
 - 3) Slide the cover off of the cassette.



IPHA520-0

Figure 17. PCI adapter cassette cover removed

b. Remove the adapter from the cassette by doing the following steps:

- 1) Unlock the adapter retainers by rotating the retainer clip (A) into the horizontal position. See Figure 18 on page 51.

Notes:

- The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter **tailstock**.
 - Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock.
 - When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.
 - If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.
- 2) Push the adapter retainers (B) away from the adapter.
 - 3) Unlock the adapter tailstock clamp (C).
 - 4) Rotate the adapter out of the cassette by grasping the edge of the adapter opposite the tailstock, and then firmly rotate the adapter toward the bottom of the cassette.
 - 5) Lift the adapter out of the tailstock retaining channel.

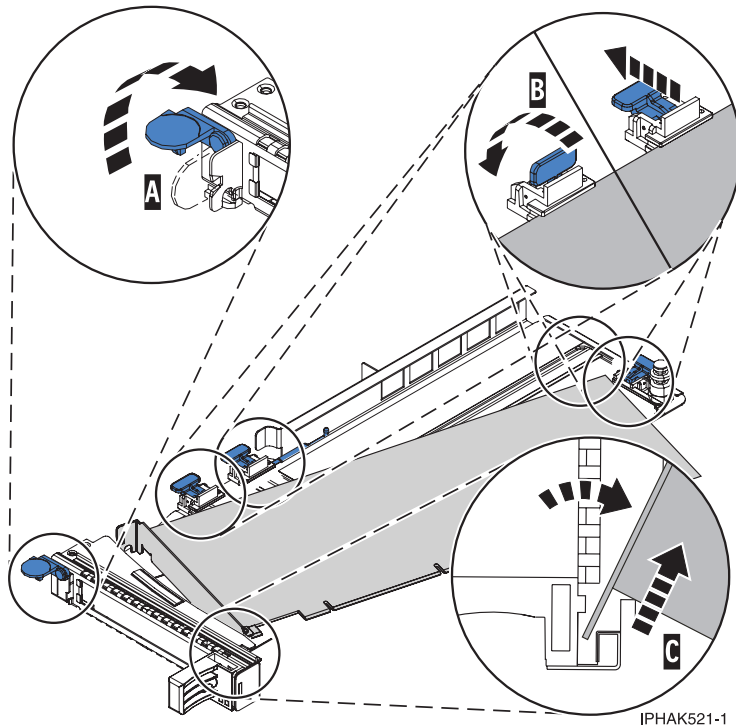
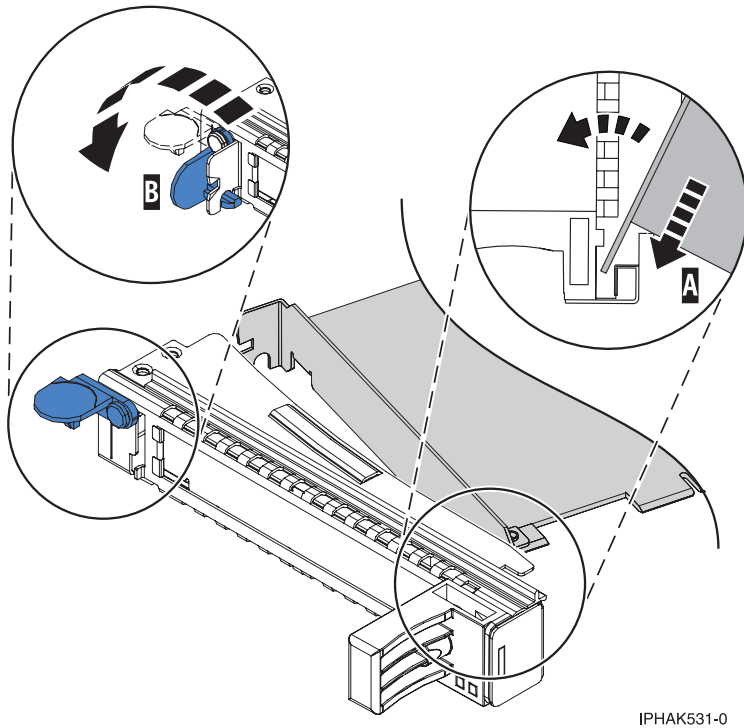


Figure 18. Adapter removed from the PCI adapter cassette

- c. Place the new adapter in the cassette.

Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling. If the cassette is not going to contain a PCI adapter, use this same procedure to place an adapter filler panel in the cassette.

- 1) Remove any shipping handles or brackets attached to the adapter.
- 2) With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel (A). See Figure 19 on page 52.
- 3) Rotate the adapter toward the top of the cassette and into place.
- 4) Close the tailstock clamp.



IPHAK531-0

Figure 19. Adapter removed from the PCI adapter single-width cassette

- 5) Position the adapter retainers to support the adapter, and then rotate the retainer clip **(B)** into the closed position. See Figure 19.

Note: Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock. When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter. Place the retainers on the adapter according to the length of the adapter being used. Select the appropriate instructions:

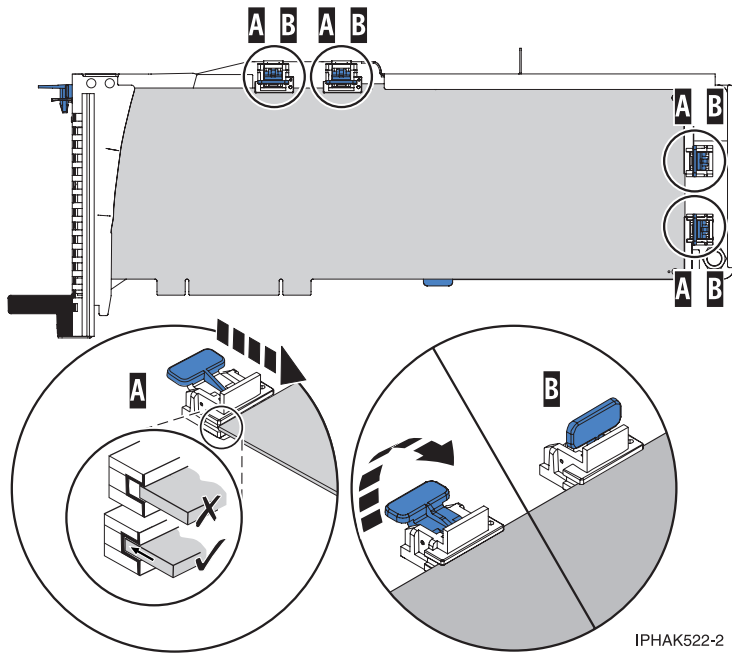
- Adapter-cassette retainer placement for large adapters
- Adapter-cassette retainer placement for mid-sized adapters
- Adapter-cassette retainer placement for small adapters

Adapter-cassette retainer placement for long adapters

- Place and lock the retainers **(B)**. See Figure 20 on page 53.

Attention: Use of the lower corner support retainer might interfere with the docking of the PCI card when positioned within the system. Ensure the retainer does not interfere with the adapter connectors on the system backplane.

- Ensure the adapter edge is seated in each retainer groove **(A)**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

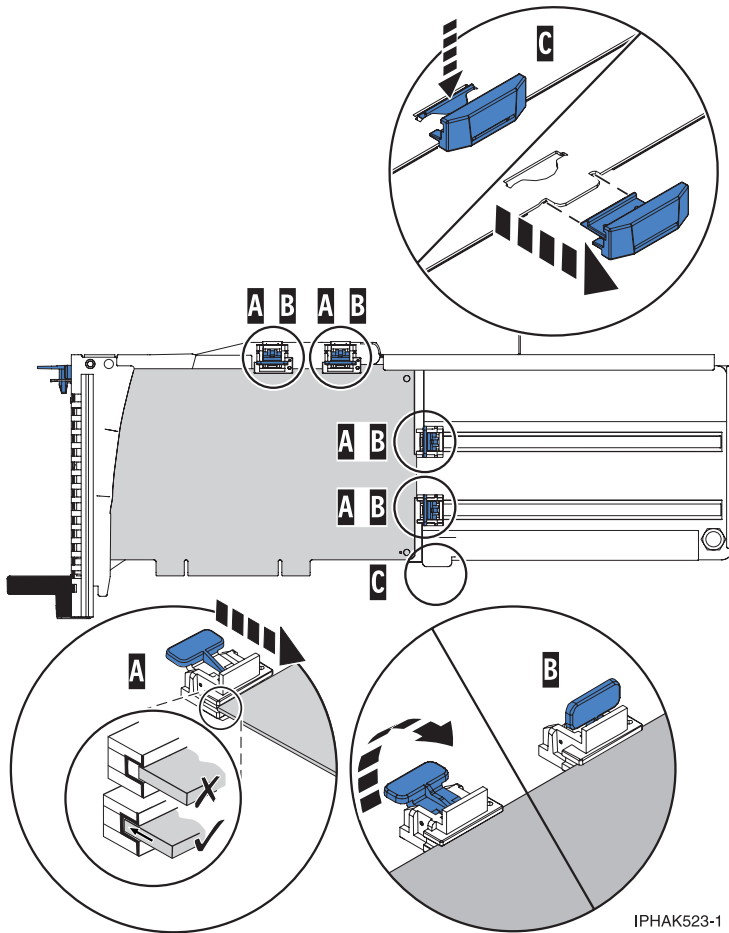


IPHA522-2

Figure 20. Long adapter in the PCI adapter cassette with the supports and stabilizer in place

Adapter-cassette retainer placement for medium-length adapters

- Remove the adapter stabilizer (C). See Figure 21 on page 54.
- Place and lock the retainers (B).
- Ensure the adapter edge is seated in each retainer groove (A). If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

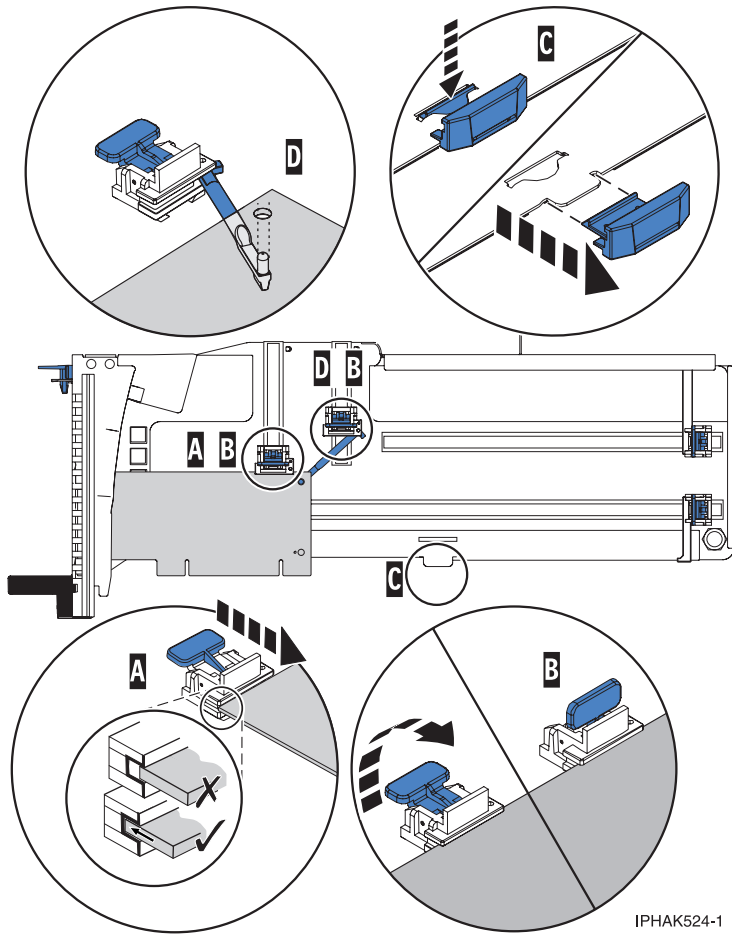


IPHAK523-1

Figure 21. Medium-length adapter in the PCI adapter cassette with the supports in place

Adapter-cassette retainer placement for short adapters

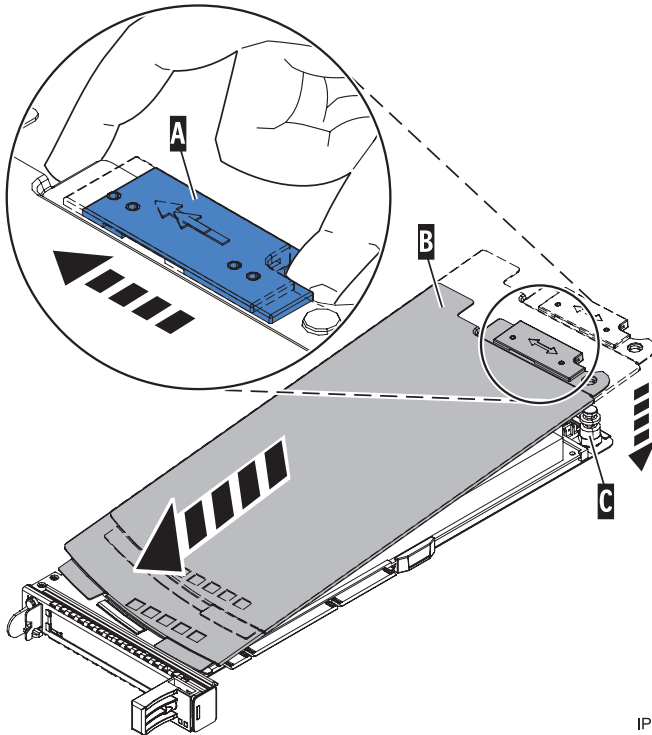
- Remove the adapter stabilizer (C). See Figure 22 on page 55.
- Place the hookarm (D) into the hole in the corner of the adapter. This supports the card when it is undocked from the connector on the system backplane.
- Place and lock the retainers (B).
- Ensure the adapter edge is seated in each retainer groove (A). If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.



IPHA524-1

Figure 22. Short adapter in the PCI adapter cassette with the supports and the hookarm in place

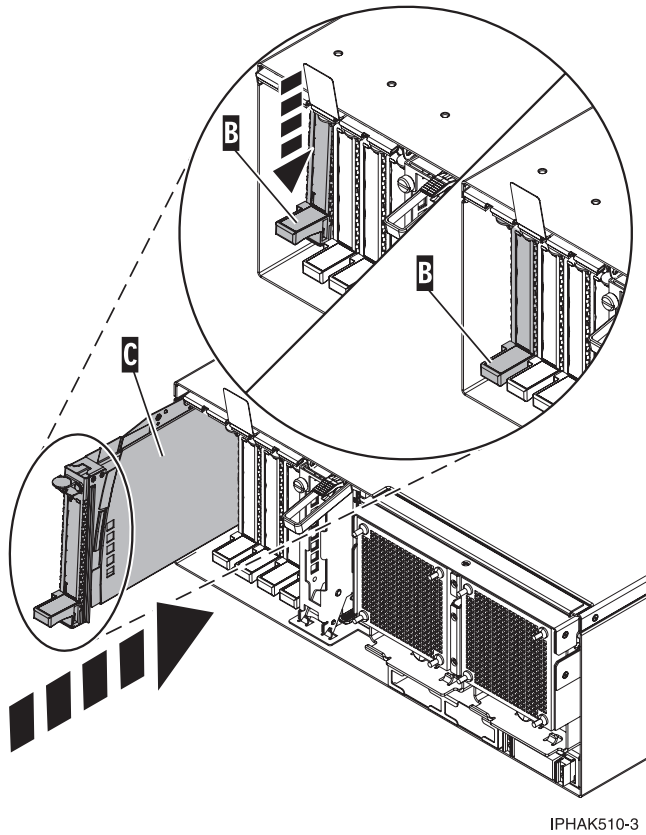
- d. Replace the cassette cover by doing the following steps:
- 1) Slide the cover (B) into position on the cassette.
 - 2) While holding the cover latch (A) in the open position, place the cover over the pivot pin (C).
 - 3) Release the cover latch to lock the cover into place.



IPHAK530-0

Figure 23. PCI adapter cassette cover replaced

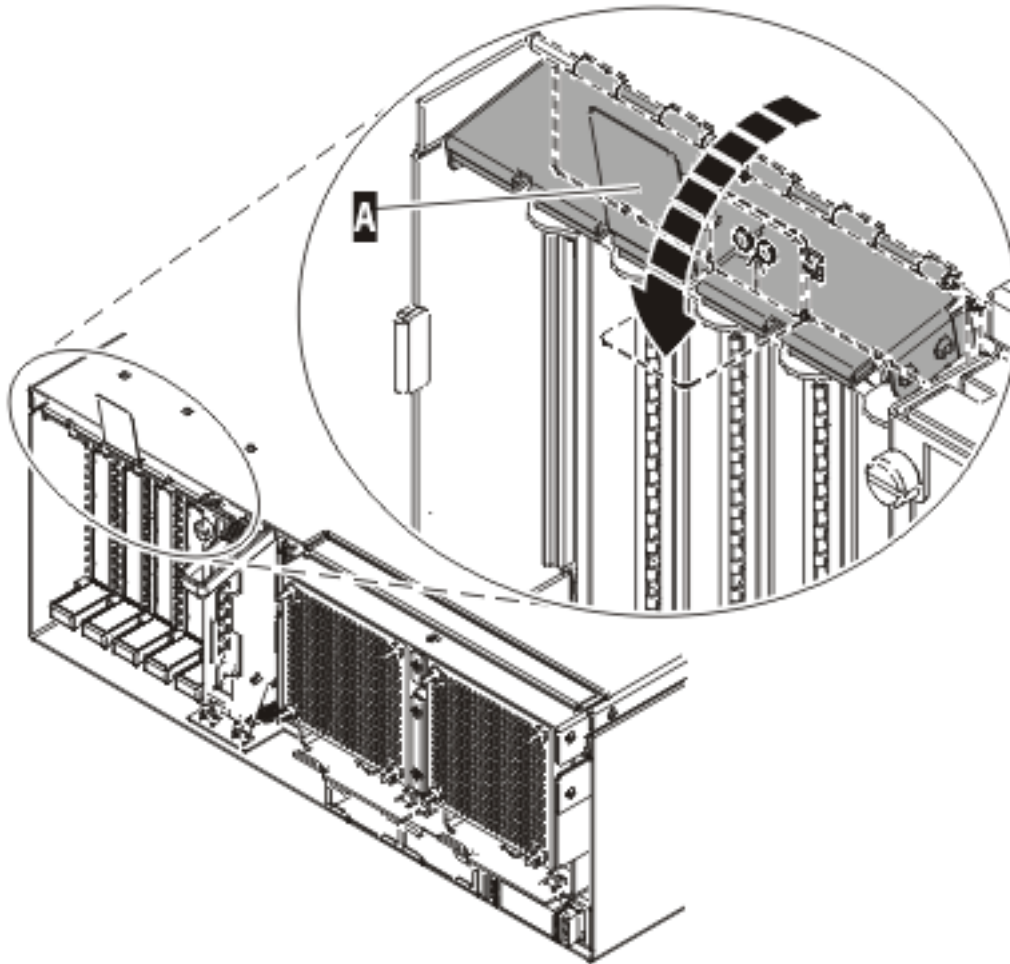
10. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
11. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be docked in the system.
12. Lift and hold the PCI adapter EMC shield in the open position. See Figure 14 on page 47 and Figure 15 on page 48.
13. Slide the cassette (C) into the cassette slot as shown in the following figure.
14. When the cassette is fully inserted into the system, firmly press downward on the lower cassette handle (B) to lock the adapter in its connector.



IPHAK510-3

Figure 24. PCI adapter cassette removed from the system unit

15. Connect the adapter cables.
16. Lower the PCI adapter EMC shield (A) into the closed position, close the shield latch, then close the rear rack door.



IPHAK508-0

Figure 25. PCI adapter EMC shield in the closed position

17. Run the `lsslot` command to verify that the slot is occupied.

For example, Enter `lsslot -c pci -s U7879.001.DQD014E-P1-C3`

The following is an example of the information displayed by this command:

```
# Slot      Description      Device(s) U7879.001.DQD014E-P1-C3 PCI-X capable,
64 bit, 133MHz slot 0001:40:01.0
```

Prerequisites for hot-plugging PCI adapters in a Linux partition

When you install, remove, or replace a PCI adapter in a Linux partition that is powered on, you might need to complete some prerequisite tasks.

The Linux system administrator needs to take the PCI adapter offline prior to removing, replacing, or installing a PCI adapter with the system power on (hot-plugging). Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

Before hot-plugging adapters for storage devices, ensure file systems on those devices are unmounted. After hot-plugging adapters for storage devices, ensure the file systems on those devices are remounted.

Before hot-plugging an adapter, ensure that the server or partition is at the correct level of the Linux operating system (Linux operating system 2.6 or later).

Install the Linux Service Aids. These service aids enable system serviceability, as well to improve system management.

If you are using a Linux distribution with Linux kernel version 2.6 or greater, you can install the Service Aids that gives you access to more capabilities, which can help you diagnose problems on your system.

This software is available at the Service and productivity tools for Linux website. (<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags>)

Verifying that the hot-plug PCI tools are installed on the Linux partition

When you install, remove, or replace a PCI adapter in a Linux partition that is powered on, you might need to use the hot-plug PCI tools. Use this procedure to verify that you have the hot-plug PCI tools installed.

1. Enter the following command to verify that the hot-plug PCI tools are installed:

```
rpm -aq | grep rpa-pci-hotplug
```

If the command does not list any rpa-pci-hotplug packages, the PCI Hot Plug tools are not installed.

2. Enter the following command to ensure that the rpaphp driver is loaded:

```
ls -l /sys/bus/pci/slots/
```

The directory should contain data. If the directory is empty, the driver is not loaded or the system does not contain hot-plug PCI slots. The following is an example of the information displayed by this command:

```
drwxr-xr-x 15 root root 0 Feb 16 23:31 .
drwxr-xr-x  5 root root 0 Feb 16 23:31 ..
drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.0
drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.2
drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.4
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.0
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.2
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.4
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.6
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.0
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.2
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.4
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.6
```

If the directory does not exist, run the following command to mount the filesystem:

```
mount -t sysfs sysfs /sys
```

3. Ensure the following tools are available in the /usr/sbin directory.
 - lsslot
 - drmgr -c pci
4. Return to the procedure that sent you here.

Preparing for hot-plug SCSI device or cable deconfiguration

Use this procedure when you are preparing to unconfigure a hot-plug Small Computer System Interface (SCSI) device or cable. This procedure will help determine if a SCSI device or SCSI device cable is causing your system problem.

Disconnect all cables attached to the adapter, (except for the cable to the device from which you boot to run diagnostics; temporarily move these device cables to another SCSI port while you are trying to find the problem).

1. Go to Running the online and stand-alone diagnostics and perform the prerequisite tasks described in the Before you begin topic.
2. Determine which SCSI adapter you plan to remove the cables or devices from.

3. Adapter slots are numbered on the rear of the system unit, record the slot number and location of each adapter being removed.
4. Ensure that any processes or applications that might use the adapter are stopped.
5. Enter the system diagnostics by logging in as root user or as the CE login user. Type the `diag` command on the command line.
6. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, and press Enter. The FUNCTION SELECTION menu appears.
7. From the FUNCTION SELECTION menu, select Task Selection, and then press Enter.
8. From the Task Selection list, select Hot Plug Manager, and select PCI Hot Plug Manager.
9. From the PCI Hot Plug Manager menu, select Unconfigure a Device, and then press Enter.
10. Press F4 or ESC+4 to display the Device Names menu.
11. Select the adapter from which you are removing the cables or devices in the Device Names menu.
12. In the Keep Definition field, use the tab key to answer Yes.
13. In the Unconfigure Child Devices field, use the Tab key to answer Yes, then press Enter. The ARE YOU SURE screen is displayed.
14. Press Enter to verify the information. A successful deconfiguration is indicated by the OK message displayed next to the **Command** field at the top of the screen.
15. Press F4 or ESC+4 twice to return to the Hot Plug Manager menu.
16. Select replace/remove PCI Hot Plug adapter.
17. Select the slot that has the adapter you want to remove the cables or devices from in the system.
18. Select **Remove**.

Note: A fast flashing amber LED located at the back of the machine indicates the slot that you selected.

19. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system. (You do not need to remove the adapter, unless it makes removing the cables attached to it easier).

Powering off an expansion unit

This procedure provides detailed instructions for powering off an expansion unit.

Before beginning, read this entire procedure. If there are procedural steps that cannot be performed at this time, the procedure must be delayed until a later time.

Attention: The server must be managed by a management console to power off an expansion unit when the server power is turned on.

Attention: Do *not* use this procedure to replace disk units that are supported under device concurrent maintenance. Use the device concurrent maintenance procedure instead.

Attention: Do *not* use this procedure on the system unit or the system unit's integrated expansion unit. For systems and system integrated expansion units see Powering on and powering off a system.

Notes:

1. References to the console in this procedure refer to the console of the logical partition in which you are working.
2. Throughout this procedure, the term *HSL I/O bridge* is interchangeable with *RIO adapter*.
3. Throughout this procedure, the term *tower* is interchangeable with *expansion unit*.
4. Messages that may be generated on the HMC during the procedure refer to specific partitions by their partition IDs. A partition's ID is a numeric value that represents the order in which the partitions

were created. The partitions listed in the Server Management content area are not necessarily listed in order of partition ID. A partition's ID is listed under the *General* tab in the Partition Properties.

Perform the following with the assistance of the customer:

1. If you have not already done so, record the expansion unit's location code and machine type-model-serial numbers (MTMS).
2. Can the expansion unit be powered off with the server powered on (the server is HMC-managed), and does the customer want to perform the procedure with the server powered on?

No: The expansion unit must be powered off by powering off the server. See Powering on and powering off a system for instructions on powering off the server, then return to the procedure that sent you here.

Yes: Go to step 3.

Note: If the activated firmware level of the server to which the expansion unit is attached is lower than SF235, there is a small chance that bus numbers for the PCI buses in the expansion unit will change if the I/O backplane in the expansion unit is replaced with the server powered off. If this occurs on a server with multiple logical partitions, the I/O slot resources in the expansion unit will have to be reassigned to the appropriate partitions. If the I/O backplane is replaced with the server powered off, be prepared to perform these reconfiguration activities after the procedure. If the I/O backplane is replaced with the server powered on, either to firmware standby or firmware running, reconfiguration will not be required.

If it is desirable to replace the I/O backplane with the server powered off, but configuration changes cannot be tolerated, powering off the server and then powering it on to firmware standby state before performing the procedure might be a satisfactory alternative.

The activated firmware level of the server is displayed in the upper right corner of the ASMI welcome page.

3. Verify that the expansion unit being powered off is the correct one. If the expansion unit has an alphanumeric display on the control panel, you can verify that the type, model, and serial number of the expansion unit displayed on the user interface match that shown on the control panel display. Otherwise, you can activate the identify indicator on the expansion unit. To activate the Identify indicator on the expansion unit, do the following steps for your particular interface:
 - From the HMC V7 and later, use *Select managed system* > **Operations** > **LED Status** > **Identify LED**. Select the desired expansion unit and use **Activate LED** to turn on the LED and thus verify that the tower is the correct one. Then, use **Deactivate LED** to turn off the LED.
 - From the HMC V6R1.3 or earlier, use **Service Focal Point** > **Service Utilities** > **Identify LED processing**.
 - From the IBM Systems Director Management Console (SDMC), complete the following steps:
 - a. On the **Welcome** page, under the **Resources** tab, select the server.
 - b. Click **Actions** > **Service and Support** > **Hardware** > **Identify LED**.
 - c. Select the desired expansion unit and click **Activate LED** to turn on the LED and thus verify that the expansion unit is the correct one. Then, click **Deactivate LED** to turn off the LED.
 - Are you powering off the correct expansion unit?
4. The system will prevent the expansion unit from being powered off if there are failed or inactive links in the HSL loop that the expansion unit is on, other than the links adjacent to the expansion unit. If an attempt is made to power off the expansion unit under these circumstances, a descriptive error message will be presented. Determine if there are failed or inactive links.

Are there external links that are not operational in the HSL loop, other than those adjacent to the expansion unit being powered off?

No: Go to step 5.

Yes: Repair the failed or inactive links, except those adjacent to the expansion unit being powered off. If you need assistance, contact your service provider. Then perform this procedure again.

5. Verify that the SPCN loop is complete. A 10009135 reference code in the error log indicates an incomplete SPCN loop. A complete SPCN loop is not required, but is highly recommended. Powering off an expansion unit with an incomplete SPCN loop could cause lost contact with other expansion units on the SPCN loop. The expansion units that the system lost contact with will continue to function; however, the system may log additional errors and will not be able to monitor those units. Work with the customer to determine whether the SPCN loop is complete, whether correction is necessary, and then continue with the next step.
6. Determine if any of the I/O resources in the expansion unit are owned by partitions running Linux. Power off the partitions running Linux and go to the next step.
7. If applicable, work with the customer to end I/O activity to the expansion unit. Then go to the next step.
8. Power off all external DVD-RAM storage devices (containing their own power supplies) connected to resources in the expansion unit, and then go to the next step.
9. Use one of the following procedures to power off the expansion unit. Carefully follow the instructions provided by the utility to complete the power off.

To turn off the power in an expansion unit with the server power on, do one of the following procedures:

- If the server is HMC-managed, the power off and power on functions must be performed by using the Power On/Off Unit utility on the HMC.
 - For HMC V6R1.3 and earlier, do the following steps:
 - a. In the navigation area, open the Service Applications folder.
 - b. Select **Service Focal Point**.
 - c. In the contents area, select **Service Utilities**.
 - d. In the Service Utilities window, select the system on which you are working.
 - e. Select **Selected > Power On/Off Unit**
 - For HMC V7 and later, do the following steps:
 - a. Select the managed system, then select **Serviceability -> Hardware -> Power on/off IO Unit**.
 - b. In the Power on/off IO Unit window, expand the Managed system I/O and select the appropriate unit.
 - c. Click the **Power off** button.
 - For the IBM Systems Director Management Console (SDMC), complete the following steps:
 - a. On the **Welcome** page, under the **Resources** tab, select the server.
 - b. Click **Actions > Service and Support > Hardware > Power on/off IO Unit**.

Notes:

- a. If I/O activity to resources in the expansion unit was not ended, the power off will not continue and messages will be presented indicating which partition resources need to be varied off or unconfigured. Similarly for other conditions described previously in this page that prevent the power off.
- b. Carefully follow all instructions given by the utility. For instance, you may be informed that critical disk resources exist in the expansion unit and that panel function 69 must be used to power the expansion unit back on.
- c. Wait for the expansion unit to power off. This might take up to 15 minutes depending on the configuration.

- d. When the utility gives notification that the power off has completed, ensure that the expansion unit is actually powered off by verifying that one of the two air moving devices (AMDs) in the expansion unit has stopped and that the power LED/indicator on the expansion unit control panel is off.
 - e. If the expansion unit does not power off after more than 15 minutes, the system may be hung. If this occurs, contact your service provider for assistance.
10. Were you directed here to power off the expansion unit to set the expansion unit configuration ID or the machine type-model-serial numbers (MTMS)?
- No:** Go to the next step.
 - Yes:** Return to the procedure that sent you here.
11. Does the procedure that sent you here instruct you to remove the ac power from the expansion unit?
- No:** Return to the procedure that sent you here.
 - Yes:** Go to the next step.
12. Is this an expansion unit with ac power cords connected from this unit's ac input/charger to an SPCN-controlled expansion unit (for example, a 5088 expansion I/O unit)?
- No:** This expansion unit can be serviced without affecting an SPCN controlled expansion unit. Return to the procedure that sent you here.
 - Yes:** Servicing this expansion unit may affect an SPCN-controlled expansion unit that is receiving ac power from this expansion unit. Go to the next step.
13. You may be able to maintain ac power to the expansion unit that is receiving ac power from this expansion unit and remove power from this expansion unit so that you can service it. The following steps will help you to determine what you can do. Were you directed to this procedure as part of a procedure to exchange the ac input/charger, any of the device boards, or the power board?
- No:** You can maintain ac power to the expansion unit receiving ac power from this expansion unit while you are servicing this expansion unit. When the expansion unit is powered off, open the rear cover and trace the ac jumper cords from the three power supplies to the ac input charger. Then disconnect them at the ac charger. Power is now removed from the components that you will be working with or near. Return to the procedure that sent you here.
 - Yes:** You must search for an alternate ac power source for the expansion unit receiving ac power from this expansion unit. Go to the next step.
14. Can you find an alternate ac power source for the expansion unit that is receiving ac power from this expansion unit?
- No:** You must power off the system to service this expansion unit. See Powering on and powering off a system for instructions on powering off the system, then return to the procedure that sent you here.
 - Yes:** Move each of the expansion unit's ac power cords one at a time to the alternate ac power source to prevent the expansion unit from losing ac power. Return to the procedure that sent you here.

Powering on an expansion unit

You can power on an expansion unit that is either managed by a management console (such as the Hardware Management Console (HMC) or the IBM Systems Director Management Console (SDMC)) or not managed by a management console.

Attention:

- Before beginning, read this entire procedure. If there are procedural steps that cannot be performed at this time, the entire procedure must be delayed until a later time.
- If the server is managed by a management console, the power off and power on functions must be performed by using the Power On/Off Unit utility on the management console.

To use the Power On/Off Unit utility from the HMC display, complete the following steps:

1. Expand the Systems Management topic.
2. Select **Servers**.
3. From the Select column, select the server you are working on.
4. In the Tasks area select the following options:
 - a. Select **Serviceability**.
 - b. Select **Hardware**.
 - c. Select **Power on/off I/O unit**.
 - d. Select **Power on**.

To use the Power On/Off Unit utility from the SDMC display, complete the following steps:

1. On the **Welcome** page, under the **Resources** tab, select the server.
2. Click **Actions > Operations > Power On**.

Attention: Do not use this procedure in either of the following situations:

- To replace disk units that are supported under device concurrent maintenance. Use the device concurrent maintenance procedure instead.
- On the system unit or the system unit's integrated I/O enclosure. For system units and system units integrated I/O enclosures, see the "Powering on or off a system". This procedure is located in your host system's service information.

Notes:

1. References to the console in this procedure refer to the console of the logical partition in which you are working.
2. Throughout this procedure, the term *HSL I/O bridge* is interchangeable with *RIO adapter*.
3. Messages that may be generated on the HMC during the procedure refer to specific partitions by their partition IDs. A partition ID is a numeric value that represents the order in which the partitions were created. The partitions listed in the Server Management content area are not necessarily listed in order of partition ID. A partition ID is listed under the *General* tab in the Partition Properties.

Perform the following with the assistance of the customer.

1. If the ac power cords were disconnected when the enclosure was powered off and have not been reconnected, reconnect them now.
 - The enclosure will automatically power on when the ac power cords are connected.
 - If this is a server managed by an HMC, power off the enclosure again. See "Powering off an expansion unit" on page 60. Then go to step 2.
2. Power on the enclosure by using either the Power On/Off Unit utility from the HMC as described at the top of this page. Go to step 3.

3. Wait for I/O resources in the enclosure to be brought back online to a functional state, and then continue with the next step.
4. Work with the customer to restart all I/O bus activity that was ended when the enclosure was powered off. Then go to the next step.
5. If you moved the ac power cords of an enclosure from this enclosure to an alternate ac power source when this enclosure was powered off, move them back to this enclosure. To prevent the enclosure from losing ac power, move only one of the enclosure's ac power cords at a time. Then go to the next step.
6. If the enclosure was configured as switchable when you powered off the enclosure, and you changed the mode to private, work with the customer to restore the mode of the enclosure to switchable. Then go to the next step.
7. If you ended Cluster Resource Groups (CRGs) when you powered off the enclosure, work with the customer to start the CRGs. Then go to the next step.
8. If ownership of the enclosure's HSL I/O bridge was changed when the enclosure was powered off, work with the customer to restore the desired ownership.
9. Return to the procedure that sent you here.

After hot-plug SCSI device or cable deconfiguration

Use this procedure after you deconfigure or hot-plug a SCSI device to ensure that the replaced component was successfully installed.

1. Press Enter, then continue to follow the screen instructions until you receive a message that the replacement is successful. A successful replacement is indicated by the OK message displayed next to the command field at the top of the screen.
2. Press the F3 or ESC 3 key to return to the **PCI Hot-Plug Manager** menu.
3. Press the F3 or ESC 3 key to return to the **Hot-Plug Manager** menu.
4. Press the F3 or ESC 3 key to return to the **TASK** selection list.
5. Select **Log Repair Action**.
6. Select the adapter you just removed the cables or devices from, then press Enter.
7. Press Commit (F7 or ESC 7), then press Enter.
8. Press the F10 or the ESC 0 key to exit diagnostics.
9. Type the **diag -a** command on the command line.

Verifying a repair

Use these procedures to verify hardware operation after making repairs to the system.

Choose from the following options:

- To verify the repair of a system that is currently powered off, go to step 1.
 - To verify the repair of a system that is currently powered on with no operating system loaded, go to step 3 on page 66.
 - To verify the repair of a system that is currently powered on and that has an operating system loaded, go to step 5 on page 66.
1. Power on the server and all attached I/O enclosures.

Did all the enclosures power on?

Yes: Go to step 3 on page 66. ↓ Go to step 3 on page 66.

No: Continue with the next step.

2. Choose from the following options:

- If the original problem was that an enclosure would not power on and you have another FRU to replace, locate and replace the next field-replaceable unit (FRU).
 - If the next FRU in the FRU list is an isolation procedure, perform the isolation procedure.
 - If the original problem was that an enclosure would not power on and you have an isolation procedure to complete, perform the isolation procedure.
 - If the original problem was that an enclosure would not power on and there are no more FRUs or isolation procedures in the FRU list, contact your next level of support.
 - If you have a new problem, perform problem analysis and repair the new problem.
-

3. Load the operating system.

Did the operating system load successfully?

Yes: Go to step 5.

No: Continue with the next step.

4. Choose from the following options:

- If the original problem was a failing disk drive that contained the operating system software, go to step 5.
 - If the original problem was that the operating system would not load and you have another FRU to replace, go to your FRU locations section to locate the next FRU.
 - If the next FRU in the FRU list is an isolation procedure, perform the isolation procedure.
 - If the original problem was that the operating system would not load and you have an isolation procedure to complete, perform the isolation procedure.
 - If the original problem was that the operating system would not load and there are no more FRUs or isolation procedures in the FRU list, contact your next level of support.
 - If you have a new problem, perform problem analysis and repair the new problem.
-

5. Go to “Verifying the repair in Linux.”

Verifying the repair in Linux

You can use this procedure to verify that a repair is complete by using the Linux operating system.

1. Run stand-alone diagnostics from either a CD or from a Network Installation Management (NIM) server. See Running the stand-alone diagnostics from CD-ROM.

Did you encounter any problems?

No Reboot the operating system and continue with the close of call procedure.

Yes If the original problem still exists, replace the field-replaceable unit (FRU) or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurs go to Beginning problem analysis and repair the new problem.

Verifying the repair from the management console

Perform these procedures to close problem numbers, clear hardware messages, and prepare the server to return to the customer by using the management console.

Follow this checklist before performing the procedures:

- You return the server to the state that the customer normally uses, such as IPL type, IPL mode, and the way the system is configured or partitioned.

Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every 2 hours.

- While you were performing the problem analysis on the original serviceable event, other serviceable-event numbers might have been opened. Close all serviceable events that were opened as a result of your service activity.
- Server verification has been performed and there are no problems that require additional service actions.
- If the repair was done by using the HMC online repair procedures, ensure that the original serviceable event is now closed.

1. Is a management console used to manage the server that you are servicing?

- **Yes:** Continue with the next step.
 - **No:** Return to the “Verifying a repair” on page 65. **This ends the procedure.**
-

2. Are you closing a service event that was a repair on the management console personal computer?

- **Yes:** Continue with the next step.
 - **No:** Go to step 4.
-

3. Power on the management console. Did the power-on process complete without errors?

- **Yes:** Ensure that the management console can be used to perform server management tasks, and return the management console to normal operations. Go to “Closing a service call” on page 72. **This ends the procedure.**
 - **No:** Go to the *HMC isolation procedures*. **This ends the procedure.**
-

4. Log into the management console as the service representative. If invalid user or invalid password is displayed, get the correct login information from the system administrator.

1. If logged into the System Manager, select **Exit from the Console**, located in the System Manager window.
 2. Log in to the System Manager with the following:
 - User identification - service
 - Password - service mode
-

5. View Serviceable Event Details.

1. In the navigation area, click **Service Applications**.
 2. In the navigation area, click **Service Focal Point**.
 3. In the Contents area, click **Manage Serviceable Events**.
 4. Designate the set of Serviceable Events you want to view. When you are finished, click **OK**. The **Service Event Overview** window opens.
-

Note: Only the events that match all of the criteria you specify are shown.

6. Close open or delayed events.

1. Select the problem to close in the Service Event Overview window.
 2. Select the **Selected** menu, located on the menu bar.
 3. Click **Close Event**.
 4. Enter your comments in the **Serviceable Event Comments** window, and click **Close Event**.
 5. Close all events associated with the problem on which you were working.
-

7. Did the Service Event Overview window contain the event or events on which you were working?

- **Yes:** Return the HMC to normal operations. Go to “Closing a service call” on page 72. **This ends the procedure.**
 - **No:** Go to Detecting problems. **This ends the procedure.**
-

Activating and deactivating LEDs

You can use these procedures to activate or deactivate light-emitting diodes (LEDs) by using the management console or the Advanced System Management Interface (ASMI).

For IBM PowerLinux rack servers that contain the POWER7[®] processor, the LEDs can be used to identify or verify a part that you are servicing. The error and identify function (amber) LED indicates an error and corresponds to the location code in the system reference code (SRC). The LED is activated and deactivated automatically.

Additionally, the following procedures can also be used to activate and deactivate LEDs.

- “Deactivating a system attention LED or partition LED by using the management console”
- “Activating or deactivating an identify LED by using the management console” on page 69
- “Deactivating a system attention LED or logical partition LED by using the Advanced System Management Interface” on page 69
- “Activating or deactivating an identify LED by using the Advanced System Management Interface” on page 70

Deactivating a system attention LED or partition LED by using the management console

You can deactivate a system attention LED or a logical partition LED if you decide that a problem is not a high priority and you decide to repair the problem at a later time. You can do this task from the Hardware Management Console (HMC) or the IBM Systems Director Management Console (SDMC).

If you want to be alerted if another problem occurs, you must deactivate the system attention LED so that it can be activated again if another problem occurs.

To deactivate a system attention LED by using the HMC, complete the following steps:

1. In the navigation area, open **Systems management**.
2. Select the server you are working on.
3. Open **Operations > LED Status**.
4. Select **View System Attention**. The System attention LED window opens. The selected system and its LED state are displayed in the upper part of the window. The logical partition and its LED state are displayed in the lower part of the window. From the system attention LED window, you can deactivate both the System attention LED and the logical partition LED.
5. Select **Deactivate System Attention LED** from the **Action** menu. A confirmation window is displayed that provides the following information:
 - A verification that the system attention LED was deactivated.
 - An indication that there still might be open problems within the system.
 - An indication that you cannot activate the system attention LED.
6. Select one of the logical partitions in the lower table, and select **Deactivate partition LED** from the **Partition Operations** menu. A confirmation window is displayed that provides the following information:
 - A verification that the logical partition LED was deactivated.
 - An indication that there still might be open problems within the logical partition.
 - An indication that you cannot activate the logical partition LED.

To deactivate a system attention LED by using the SDMC, complete the following steps:

1. On the **Welcome** page, under the **Resources** tab, select the server.

2. Click **Actions > Service and Support > Hardware > System Attention LED**.
3. Click **OK**.

Activating or deactivating an identify LED by using the management console

You can activate or deactivate an identify LED for components attached to the system from the Hardware Management Console (HMC) or from the IBM Systems Director Management Console (SDMC).

The system provides several LEDs that help identify various components in the system, such as enclosures or field-replaceable units (FRUs). For this reason, they are called *identify LEDs*.

You can activate or deactivate the following types of identify LEDs:

- **Identify LED for an enclosure.** If you want to add an adapter to a specific drawer (enclosure), you need to know the machine type, model, and serial number (MTMS) of the drawer. To determine whether you have the correct MTMS for the drawer that needs the new adapter, you can activate the LED for a drawer and verify that the MTMS corresponds to the drawer that requires the new adapter.
- **Identify LED for a FRU associated with a specified enclosure.** If you want to hook up a cable to a specific I/O adapter, you can activate the LED for the adapter, which is a field replaceable unit (FRU), and then physically check to see where you should connect the cable. This is especially useful when you have several adapters with open ports.

To activate or deactivate an identify LED for an enclosure or FRU by using the HMC, follow these steps:

1. In the navigation area, open **Systems management**.
2. Select the server you are working on.
3. Click **Operations > LED Status > Identify LED**. The **Identify LED, Select Enclosure** window opens.
4. To activate or deactivate an identify LED for an enclosure, select an enclosure from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.
5. To activate or deactivate an identify LED for a FRU, select an enclosure from the table, and then select **Selected > List FRUs**.
6. Select one or more FRUs from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.

To activate or deactivate an identify LED for an enclosure or FRU by using the SDMC, complete these steps:

1. On the **Welcome** page, under the **Resources** tab, select the server.
2. Click **Actions > Service and Support > Hardware > Identify LED**.
3. To activate or deactivate an identify LED for an enclosure, select an enclosure from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.
4. To activate or deactivate an identify LED for a FRU, select an enclosure from the table, and then click **List FRUs**.
5. Select one or more FRUs from the table, and then click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.

Deactivating a system attention LED or logical partition LED by using the Advanced System Management Interface

You can deactivate a system attention LED or a logical partition LED by using the Advanced System Management Interface (ASMI).

The system attention indicator provides a visual signal that the system as a whole requires attention or service. Each system has a single system attention indicator. When an event occurs that either needs your intervention or that of service and support, the system attention indicator lights continuously. The system

attention indicator is turned on when an entry is made in the service processor error log. The error entry is transmitted to the system error log and to the operating system error log.

To perform this operation, your authority level must be one of the following levels:

- Administrator
- Authorized service provider

To turn off the system attention indicator, do the following steps:

1. In the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration > Service Indicators > System Attention Indicator**.
3. In the right pane, click **Turn off system attention indicator**. If the attempt is unsuccessful, an error message is displayed.

Activating or deactivating an identify LED by using the Advanced System Management Interface

You can activate or deactivate an identify LED by using the Advanced System Management Interface (ASMI).

You can specify the location code of any indicator to view or modify its current state. If you provide the wrong location code, the advanced system manager attempts to go to the next higher level of the location code.

The next level is the base-level location code for that field replaceable unit (FRU). For example, a user types the location code for the FRU located on the second I/O slot of the third enclosure in the system. If the location code for the second I/O slot is incorrect (the FRU does not exist at this location), an attempt to set the indicator for the third enclosure is initiated. This process continues until a FRU is located or no other level is available.

To perform this operation, your authority level must be one of the following levels:

- Administrator
- Authorized service provider

To change the current state of an indicator, do the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration > Service Indicators > Indicators by Location code**.
3. In the right pane, enter the location code of the FRU and click **Continue**.
4. Select the preferred state from the list.
5. Click **Save settings**.

Gathering and uploading system configuration information

You can use the **snap** command to gather and upload system configuration information to a remote location for support. The information gathered with the **snap** command might be required to identify and resolve system-related problems.

The **snap** command gathers system configuration information and compresses the information into a .pax file (snap.pax.Z). The snap command can automatically append the problem management report (PMR) to the system configuration information.

Gathering system configuration information

- To gather general system configuration information, for example, error logs and firmware levels, enter the following command:

```
snap -r
```

Note: This command removes any prior snap data.

- To gather the Serial Storage Architecture (SSA) information, enter the following command:

```
snap -gbc
```

Note: The time required to run this command depends on the number of SSA drives attached to the system.

- To gather the SSA and TCP/IP information, enter the following command:

```
snap -gtbc
```

Uploading system configuration information

Before you upload the .pax file, snap.pax.Z, to the remote location for the support center to access the system configuration information, rename the pax file to include the PMR number and the branch office details.

To set the directory and to rename the .pax file, enter the following command, where:

```
cd /tmp/ibmsupt
```

```
mv snap.pax.Z xxxxx.YYY.000.snap.pax.Z
```

Note: xxxxx represents the PMH number and YYY represents the branch office of the support center organization.

To upload the pax file to the remote location, complete the following steps:

1. Ping the remote server to ensure network connectivity.

```
ping testcase.software.ibm.com
```

Note: Where *testcase.software.ibm.com* represents the remote location, which can be accessed by the support center organization.

2. Set the directory that contains the .pax file to be the working directory. Use the **ftp** command to connect to the remote server.

```
ftp testcase.software.ibm.com
```

The new command prompt is **ftp>**.

3. Log in as anonymous and use your email address as the password.

4. Enter the following command:

```
ftp> cd /toibm/hw
```

5. Enter the following command:

```
ftp> bin
```

6. Enter one of the following commands:

- ftp> put xxxxx.YYY.000.snap.pax.Z or
- ftp> xxxxx.YYY.000.snap.pax.Z

7. To return to the earlier command prompt, enter the following command:

```
ftp> quit
```

8. If the support center representative directs you to send the .pax file as an email attachment, send it to shift@us.ibm.com.

Note: Do not send a .pax file unless directed to do so by support. This email address is not monitored.

Closing a service call

Perform these procedures to close serviceable events, clear hardware messages, and prepare the server to return to the customer.

Follow this checklist before performing the procedure:

- Return the server to the state that the customer normally uses such as IPL type, IPL mode, and the way the system is configured or partitioned.
Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.
 - While you were performing the problem analysis on the original serviceable event, other serviceable events might have been opened. Close all serviceable events that were opened as a result of your service activity.
 - Ensure that server verification has been performed and no problems require additional service actions.
 - If the repair was done using the management console online repair procedures, ensure that the original serviceable event is now closed.
 1. Record the system reference code (SRC), or symptom, and the location code of the field-replaceable unit (FRU) you replaced, for future reference. Is the server managed by a management console?
 - **Yes:** Continue with the next step.
 - **No:** If the server is managed by Integrated Virtualization Manager (IVM), go to “Closing a service call by using Integrated Virtualization Manager” on page 77
-

2. On the Hardware Management Console (HMC), open **Manage Serviceable Events** and examine the service action event log for any open service action events.
-

3. Are any service action events open?

- **Yes:** Continue with the next step.
 - **No:** If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 68. Return the system to the customer. **This completes the repair.**
-

4. Record the list of open service action events.
-

5. From the list of serviceable events recorded in step 4, complete the following steps 6 - step 31 on page 75 for each open service action event.
-

6. Determine the error class of the serviceable event. Record for future use.
-

7. Examine the details of the open service action event.

Is the error code that is associated with this service action event the same as recorded in step 1?

- **Yes:** Go to step 11.
 - **No:** Continue with the next step.
-

8. Examine the FRU list of the service action event. Are any FRUs listed for the service action event?

- **Yes:** Continue with the next step.
 - **No:** Go to step 11.
-

9. Is the FRU list identical that is, the same FRUs, same number of FRUs, and same order of FRUs) to the FRU list of the error code recorded in step 1 on page 72?

- **Yes:** Go to step 11.
 - **No:** Continue with the next step.
-

10. The FRU list is different. Is the FRU you replaced and recorded in step 1 on page 72 in the list of FRUs for this service action event?

- **Yes:** Continue with the next step.
 - **No:** Go to step 31 on page 75.
Note: Some service action events will remain open when you leave this MAP. Further service actions might be required to complete the repair.
-

11. Examine the details of this service action event, and record the partitions involved in this service action event for use in a later step.

12. Is the error code associated with this service action event of the form A11-xxx or A01-xxx?

- **Yes:** Continue with the next step.
 - **No:** Go to step 17.
-

13. Have you begun a list of Axx partitions from prior service action events that you processed in this MAP?

- **Yes:** Go to step 15.
 - **No:** Continue with the next step.
-

14. Begin a new list of Axx partitions by copying the list of partitions obtained in step 11. Go to step 16.

15. Add the partition list obtained in step 11 to the existing list of Axx partitions obtained from processing previous service action events in this maintenance analysis procedure (MAP).

16. Remove all entries in the list of all partitions you recorded in step 11. If you are referred to the list of partitions obtained in step 11 in future steps, the list is empty. Go to step 17.

17. Select and highlight the service action event from the Error Associated With This Serviceable Event window.

18. Click **Close Event**.

19. Add comments for the serviceable event. Include any unique additional information. Click **OK**. The following steps will add or update FRU information.

20. Did you replace, add, or modify a FRU of the open service action event?

- **Yes:** Continue with the next step.
 - **No:** Go to step 22.
-

21. From the FRU list, select a FRU that you need to update. Double-click the FRU, and update the FRU information. Go to step 23.

22. Select the **No FRU Replaced for this Serviceable Event** option.

23. Click **OK** to close the service action event.

24. Is the list of all partitions you recorded in step 11 on page 73 empty?

- **Yes:** Go to step 31 on page 75.
 - **No:** Continue with the next step.
-

25. Does the list of all partitions you recorded in step 11 on page 73 contain more than one entry?

- **Yes:** Continue with the next step.
 - **No:** Go to step 31 on page 75.
-

26. Perform all the following steps for each entry in the list of all partitions you recorded in step 11 on page 73, except for the partition you were using to debug the original problem.

27. From the list of all partitions, open the HMC virtual terminal window of a partition, and then type `diag` at the command prompt.

28. When the diagnostic operating instructions are displayed, complete the following steps:

1. Press Enter.
2. Select the **Task Selection** option.
3. Select the **Log Repair** option.
4. Select the resource associated with the repair action:
 - If the repair action was reseating a cable or adapter, select the resource associated with that repair action.
 - If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
5. Click **Commit** after you make your selection.

Note: If the terminal type is not defined, you are prompted to define it before you can proceed.

29. Exit from diagnostics in this partition and return to the command prompt.
-

30. Have all the partitions in the list of all the partitions you recorded in step 11 on page 73 been processed?

- **Yes:** Continue with the next step.
 - **No:** Go to step 24 on page 74 to process the next partition in the list you recorded in step 11 on page 73.
-

31. Have all the serviceable events recorded in step 4 on page 72 been processed?

- **Yes:** Continue with the next step.
 - **No:** Go to step 5 on page 72 and process the next service action event in the list of serviceable events recorded in step 4 on page 72.
-

32. While processing all service action events, were you directed to step 14 on page 73?

- **Yes:** Continue with the next step.
 - **No:** If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 68. Return the system to the customer. **This completes the repair.**
Note: If, during the processing of the list of open service action events, some service action events remained open, further service actions might be required to complete the repair.
-

33. Perform all the following steps for each entry in the list of *Axx* partitions you began recording in step 14 on page 73, except for the partition you were using to debug the original problem.
-

34. From the list of *Axx* partitions, open the management console virtual terminal window of a partition , and then type `diag` at the command prompt.
-

35. When the diagnostic operating instructions are displayed, complete the following steps:

1. Press Enter.
 2. Select the **Task Selection** option.
Note: If the terminal type is not defined, you are prompted to define it before you can proceed.
 3. Select the resource associated with the repair action:
 - If the repair action was reseating a cable or adapter, select the resource associated with that repair action.
 - If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
 4. Click **Commit** after you make your selection.
-

36. Exit from diagnostics in this partition and return to the command prompt.

37. Have all the partitions in the list of Axx partitions you began recording in step 14 on page 73 been processed?

- **Yes:** Continue with the next step.
 - **No:** Go to step 33 on page 75 to process the next partition in the list you recorded in step 14 on page 73.
-

38. If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 68. **This completes the repair.** Return the system to the customer.

Note: If, during the processing of the list of open service action events, some service action events remained open, further service actions might be required to complete the repair.

Closing a service call by using Linux

If the server is not connected to a management console and not using Integrated Virtualization Manager (IVM), perform these procedures to close serviceable events, clear hardware messages, and prepare the server to return to the customer.

Follow this checklist before performing the procedure:

- Return the server to the state that the customer normally uses, such as IPL type, IPL mode, and the way the system is configured or partitioned.
Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.
 - While you were performing the problem analysis on the original serviceable event, other serviceable-event numbers might have been opened. Close all serviceable events that were opened as a result of your service activity.
 - Ensure that server verification has been performed and that no problems require additional service actions.
 - If the repair was done by using the IVM online repair procedures, ensure that the original serviceable event is now closed.
1. Did you use a hot-swap operation by using a diagnostics service aid to change the FRU?
 - **Yes:** Go to step 3 on page 77
 - **No:** Continue with the next step.
-

2. Do you have any field-replaceable units (FRUs) (for example cards, adapters, cables, or devices) that were removed during problem analysis that you want to put back into the system?

Note: If the system backplane or battery has been replaced and you are loading diagnostics from a server over a network, it might be necessary for the customer to set the network boot information for this system before diagnostics can be loaded. Also, set the system time and date information after the repair is completed.

- **Yes:** Reinstall all of the FRUs that were removed during problem analysis. Continue with the next step.
 - **No:** Continue with the next step.
-

3. Run stand-alone diagnostics in problem determination mode from either a CD-ROM or from a Network Installation Management (NIM) server.

Note: For instructions about running stand-alone diagnostics from a CD and not by using an HMC, go to Running the stand-alone diagnostics from CD on a server without an HMC attached.

For instructions about running stand-alone diagnostics from a NIM server, go to Running the stand-alone diagnostics from a Network Installation Management server.

Did you encounter any problems?

- **Yes:** Go to Problem analysis.
 - **No:** Continue with the next step.
-

4. The system hardware is functioning correctly.

If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 68.

This completes the repair.

Note: If, during the processing of the list of open service action events, some service action events remained open, further service actions might be required to complete the repair.

Return the server to the state that the customer normally uses, such as IPL type, IPL mode, and the way the system is configured or partitioned. This might require you to reboot the operating system.

Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.

Closing a service call by using Integrated Virtualization Manager

Perform these procedures to close serviceable events, clear hardware messages, and prepare the server to return to the customer.

Follow this checklist before performing the procedure:

- Return the server to the state that the customer normally uses, such as IPL type, IPL mode, and the way the system is configured or partitioned.

Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.

- While you were performing the problem analysis on the original serviceable event, other serviceable-event numbers might have been opened. Close all serviceable events that were opened as a result of your service activity.

- Ensure that server verification has been performed and there are no problems that require additional service actions.
 - If the repair was done by using the Integrated Virtualization Manager (IVM) online repair procedures, ensure that the original serviceable event is now closed.
 1. Record the system reference code (SRC), or symptom, and the location code of the field-replaceable unit (FRU) you replaced for future reference.
-

2. On the IVM, open **Manage Serviceable Events** and look at existing serviceable events.

3. Are there any service action events that are open?

- **Yes:** Continue with the next step.
 - **No:** If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 68. Return the system to the customer. **This completes the repair.**
-

4. Record the list of open service action events.

5. From the list of serviceable events recorded in step 4, complete steps 6 - 30 on page 80 for each open service action event.

6. Determine the error class of the serviceable event. Record it for future use.

7. Examine the details of the open service action event.

Is the error code associated with this service action event the same as recorded in step 1?

- **Yes:** Go to step 11 on page 79.
 - **No:** Continue with the next step.
-

8. Examine the FRU list of the service action event. Are any FRUs listed for the service action event?

- **Yes:** Continue with the next step.
 - **No:** Go to step 11 on page 79.
-

9. Is the FRU list identical that is, the same FRUs, same number of FRUs, and same order of FRUs) to the FRU list of the error code recorded in step 1?

- **Yes:** Go to step 11 on page 79.
 - **No:** Continue with the next step.
-

10. Is the FRU you replaced and recorded in step 1 in the list of FRUs for this service action event?

- **Yes:** Continue with the next step.
 - **No:** Go to step 30 on page 80.
Note: Some service action events remain open when you leave this MAP. Further service actions might be required to complete the repair.
-

11. Examine the details of this service action event, and record the partitions involved in this service action event for use in a later step.

12. Is the error code associated with this service action event of the form A11-xxx or A01-xxx?

- **Yes:** Continue with the next step.
 - **No:** Go to step 17.
-

13. Have you begun a list of Axx partitions from prior service action events that you processed in this maintenance analysis procedure (MAP)?

- **Yes:** Go to step 15.
 - **No:** Continue with the next step.
-

14. Begin a new list of Axx partitions by copying the list of partitions obtained in step 11. Go to step 16.

15. Add the partition list obtained in step 11 to the existing list of Axx partitions obtained from processing previous service action events in this MAP.

16. Remove all entries in the list of all partitions you recorded in step 11. If you are referred to the list of partitions obtained in step 11 in future steps, the list is empty. Go to step 17.

17. Select and highlight the service action event from the Manage Serviceable Events window.

18. Click **Close Event**.

19. Add comments for the serviceable event. Include any unique additional information. Click **OK**.

20. Add or update the FRU information:

Did you replace, add, or modify a FRU of the open service action event?

- **Yes:** Continue with the next step.
 - **No:** Go to step 22 on page 80.
-

21. Click **OK** to close the service action event.

22. Is the list of all partitions you recorded in step 11 on page 79 empty?

- **Yes:** Go to step 30.
 - **No:** Continue with the next step.
-

23. Does the list of all partitions you recorded in step 11 on page 79 contain more than one entry?

- **Yes:** Continue with the next step.
 - **No:** Go to step 30.
-

24. Is the error class recorded in step 23?

- **Yes:** Continue with the next step.
 - **No:** Go to step 30.
-

25. Perform all the following steps for each entry in the list of all partitions you recorded in step 11 on page 79, except for the partition you were using to debug the original problem.

26. From the list of all partitions, open the IVM virtual terminal window of a partition, and then type `diag` at the command prompt.

27. When the diagnostic operating instructions are displayed, complete the following steps:

1. Press Enter.
2. Select the **Task Selection** option.
3. Select the **Log Repair** option.
4. Select the resource associated with the repair action:
 - If the repair action was reseating a cable or adapter, select the resource associated with that repair action.
 - If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
5. Click **Commit** after you make your selection.

Note: If the terminal type is not defined, you are prompted to define it before you can proceed.

28. Exit from diagnostics in this partition and return to the command prompt.

29. Have all the partitions in the list of all partitions you recorded in step 11 on page 79 been processed?

- **Yes:** Continue with the next step.
 - **No:** Go to step 25 to process the next partition in the list you recorded in step 11 on page 79.
-

30. Have all the serviceable events recorded in step 4 on page 78 been processed?

- **Yes:** Continue with the next step.
 - **No:** Go to step 5 on page 78 and process the next service action event in the list of serviceable events recorded in step 4 on page 78.
-

31. While processing all service action events, were you directed to step 14 on page 79?

- **Yes:** Continue with the next step.
 - **No:** If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 68. Return the system to the customer. **This completes the repair.**
Note: If during the processing of the list of open service action events, some service action events remained open, further service actions might be required to complete the repair.
-

32. Complete all the following steps for each entry in the list of Axx partitions you began recording in step 14 on page 79, except for the partition you were using to debug the original problem.

33. From the list of Axx partitions, open the management console virtual terminal window of a partition , and then type diag at the command prompt.

34. When the diagnostic operating instructions are displayed, complete the following steps:

1. Press Enter.
 2. Select the **Task Selection** option.
Note: If the terminal type is not defined, you are prompted to define it before you can proceed.
 3. Select the **Log Repair** option.
 4. Select the resource associated with the repair action:
 - If the repair action was reseating a cable or adapter, select the resource associated with that repair action.
 - If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
 5. Click **Commit** after you make your selection.
-

35. Exit from diagnostics in this partition and return to the command prompt.

36. Have all the partitions in the list of Axx partitions you began recording in step 14 on page 79 been processed?

- **Yes:** Continue with the next step.
 - **No:** Go to step 32 to process the next partition in the list you recorded in step 14 on page 79.
-

37. If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 68. **This completes the repair.** Return the system to the customer.

Note: If, during the processing of the list of open service action events, some service action events remained open, further service actions might be required to complete the repair.

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Industry Canada Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

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European Community contact:
IBM Deutschland GmbH
Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Tele: +49 7032 15 2941
email: lugi@de.ibm.com

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Japanese Electronics and Information Technology Industries Association (JEITA) Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)

高調波ガイドライン適合品

Japanese Electronics and Information Technology Industries Association (JEITA) Confirmed Harmonics Guideline with Modifications (products greater than 20 A per phase)

高調波ガイドライン準用品

Electromagnetic Interference (EMI) Statement - People's Republic of China

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IBM Taiwan Contact Information:

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台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

Electromagnetic Interference (EMI) Statement - Korea

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Germany Compliance Statement

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

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

"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A

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

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Regulations, Abteilung M372
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 7032 15 2941
email: lugi@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

Electromagnetic Interference (EMI) Statement - Russia

ВНИМАНИЕ! Настоящее изделие относится к классу А.
В жилых помещениях оно может создавать
радиопомехи, для снижения которых необходимы
дополнительные меры

Class B Notices

The following Class B statements apply to features designated as electromagnetic compatibility (EMC) Class B in the feature installation information.

Federal Communications Commission (FCC) statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM-authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM-authorized dealers. IBM is not responsible for

any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate this 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 Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC 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.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication equipment.

European Community contact:
IBM Deutschland GmbH
Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Tele: +49 7032 15 2941
email: lugi@de.ibm.com

VCCI Statement - Japan

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取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

Japanese Electronics and Information Technology Industries Association (JEITA) Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)

高調波ガイドライン適合品

**Japanese Electronics and Information Technology Industries Association (JEITA)
Confirmed Harmonics Guideline with Modifications (products greater than 20 A per
phase)**

高調波ガイドライン準用品

IBM Taiwan Contact Information

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台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

Electromagnetic Interference (EMI) Statement - Korea

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Germany Compliance Statement

**Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse B EU-Richtlinie zur
Elektromagnetischen Verträglichkeit**

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse B ein.

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Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

**Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von
Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse B**

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

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
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Tel: +49 7032 15 2941
email: lugi@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse B.

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