ESCALA Power7

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ESCALA Models Reference

The ESCALA Power7 publications concern the following models:

Bull Escala E1-700 / E3-700	(31E/2B ,8231-E2B)
Bull Escala E1-705	(31E/1C, 8231-E1C)
Bull Escala E1-715	(31E/1D, 8231-E1D)
Bull Escala E3-705	(31E/2C, 8231-E2C)
Bull Escala E3-715	(31E/2D, 8231-E2D)
Bull Escala E2-700 / E2-700T	(02E/4B, 8202-E4B)
Bull Escala E2-705 / E2-705T	(02E/4C, 8202-E4C)
Bull Escala E2-715 / E2-715T	(02E/4D, 8202-E4D)
Bull Escala E4-700 / E4-700T	(05F/6B, 8205-E6B)
Bull Escala E4-705	(05E/6C, 8205-E6C)
Bull Escala E4-715	(05E/6D, 8205-E6D)
Bull Escala E5-700	(33E/8B, 8233-E8B)
Bull Escala E5-715	(08E/8D, 8408-E8D)
Bull Escala M5-715	(09R/MD, 9109-RMD)
Bull Escala M6-700	(17M/MB, 9117-MMB)
Bull Escala M6-705	(17M/MC, 9117-MMC)
Bull Escala M6-715	(17M/MD, 9117-MMD)
Bull Escala M7-700	(79M/HB, 9179-MHB)
Bull Escala M7-705	(79M/HC, 9179-MHC)
Bull Escala M7-715	(79M/HD, 9179-MHD)
Bull Escala H9-700	(19F/HB, 9119-FHB)

References to 8236-E8C models are irrelevant.

Hardware

February 2013

Trademarks and Acknowledgements

We acknowledge the rights of the proprietors of the trademarks mentioned in this manual.

All brand names and software and hardware product names are subject to trademark and/or patent protection.

Quoting of brand and product names is for information purposes only and does not represent trademark misuse.

Contents

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, a safety information booklet is included in the publications package shipped with the product. The booklet 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 in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the U.S. English publications.

Laser safety information

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

Laser compliance

The 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 provided power cord. Do not use the 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.**
>
>   **(D005a)**

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 approved part. Recycle or discard the battery as instructed by local regulations. (C003a)

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

The following comments apply to the 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.

Installing, removing, and replacing PCI adapters

Learn about installing, removing, and replacing Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters.

About this task

Model 33E/8B and 36E/8C PCI adapters

You can remove, replace, or install PCI adapters in the 33E/8B and 36E/8C servers.

If you are installing a new adapter, you will also need to refer to PCI adapter placement for slot placement information.

Before installing or replacing a feature, ensure that the software required to support the feature is installed on your system. For information about software prerequisites, see the IBM® Prerequisite website at add URL here. If the required software is not installed, see the following websites to download it, and then install it before continuing:

- To download firmware and software updates and fixes, see the Fix Central website at add URL here.
- To download Hardware Management Console (HMC) updates and fixes, see Hardware Management Console Support and downloads.

Installing PCI adapters in the 33E/8B and 36E/8C servers

Learn about installing PCI, PCI-X, or PCIe adapters in the 33E/8B and 36E/8C servers.

About this task

Installing a PCI adapter in an 33E/8B or 36E/8C server with the power off

You can install a PCI adapter with the system power off.

About this task

If your system is managed by an HMC, use the HMC to complete the steps for installing the part in the system. See "Installing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to install the server. For instructions, see Installing a part by using the Systems Director Management Console.

If you are installing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739 or 5778, CCIN 571F and 575B), remove the lower, right standoff from between the two sides of the adapter before installing it in the system unit.

If you do not have an HMC or SDMC, complete this procedure to install a PCI adapter with the system power off:

Procedure

1. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
2. Determine in which slot to place the PCI adapter. For system-specific adapter placement information, see the PCI adapter placement.

3. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
4. Stop the system or logical partition. For instructions, see "Stopping a system or logical partition" on page 154.
5. Disconnect the power source from the system by unplugging the system.
6. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.

   a. Open the front rack door.

   b. Place the system unit in the service position.

   c. Remove or open the service access cover.

7. If necessary, remove the adapter from the antistatic package.

   Attention: Avoid touching the components and gold connectors on the adapter.

8. Place the adapter, component-side up, on a flat, antistatic surface.
9. Some PCI adapters are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
10. Slide the adapter latch **(A)** into the open position, as shown in the following figure.

Figure 1. PCI adapter or filler plate removed from the rack-mounted system unit

11. If necessary, remove the adapter expansion slot filler.
12. Ensure that the slot is empty. If you are installing a double-wide adapter, remove the PCI adapter divider if one is present. See "Removing a PCI adapter divider from the 33E/8B and 36E/8C server" on page 44.
13. Carefully grasp the adapter **(A)** by its top edge, and align the adapter with the expansion slot and its connector on the system backplane. See the following figure.
14. Press the adapter firmly into its connector.

15. Slide the adapter latch **(B)** back into place as shown in the following figure.
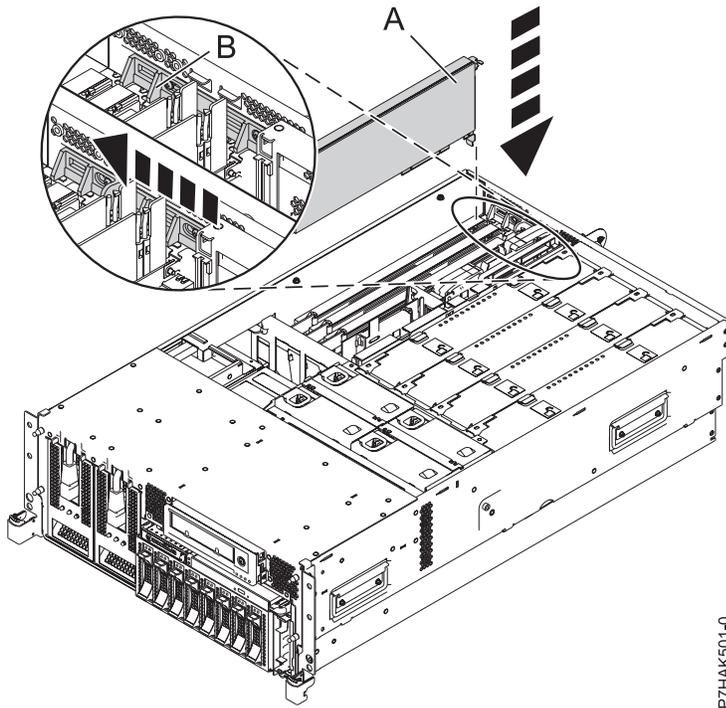
Figure 2. PCI adapter replaced in the rack-mounted system unit

16. Connect any adapter cables.
17. If you are servicing a rack-mounted system, route the cables through the cable-management arm.
18. Replace or close the service access cover and, if applicable, return the system to the operating position.
19. Reconnect the power source to the system.
20. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.
21. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Installing a PCI adapter in the 33E/8B and 36E/8C server, with the power on in an AIX environment

You can install a PCI adapter with the system power on in an AIX® environment.

About this task

If your system is managed by an HMC, use the HMC to complete the steps for installing the part in the system. See "Installing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to install the server. For instructions, see Installing a part by using the Systems Director Management Console.

If you are installing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739 or 5778, CCIN 571F and 575B), remove the lower, right standoff from between the two sides of the adapter before installing it in the system unit.

If you do not have an HMC or SDMC, complete the following steps to install a PCI adapter with the system power on in the AIX environment:

Procedure

1. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
2. Determine in which slot to place the PCI adapter. For system-specific adapter placement information, see the PCI adapter placement.
3. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
4. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.
   a. Open the front rack door.
   b. Place the system unit in the service position.
   c. Remove or open the service access cover.
5. If necessary, remove the adapter expansion slot shield.
6. If necessary, remove the adapter from the antistatic package.

   Attention: Avoid touching the components and gold connectors on the adapter.
7. Place the adapter, component-side up, on a flat, antistatic surface.
8. Some PCI adapters are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
9. If you are installing a double-wide adapter, remove the PCI adapter divider if one is present. See "Removing a PCI adapter divider from the 33E/8B and 36E/8C server" on page 44.
10. Refer to "PCI hot-plug manager access for AIX" on page 139, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.
11. From the PCI Hot-Plug Manager menu, select **Add a PCI Hot-Plug Adapter** and press Enter. The Add a Hot-Plug Adapter window displays.
12. Select the appropriate empty PCI slot from the ones listed on the screen, and press Enter.
13. Slide the adapter latch **(A)** into the open position, as shown in the following figure.
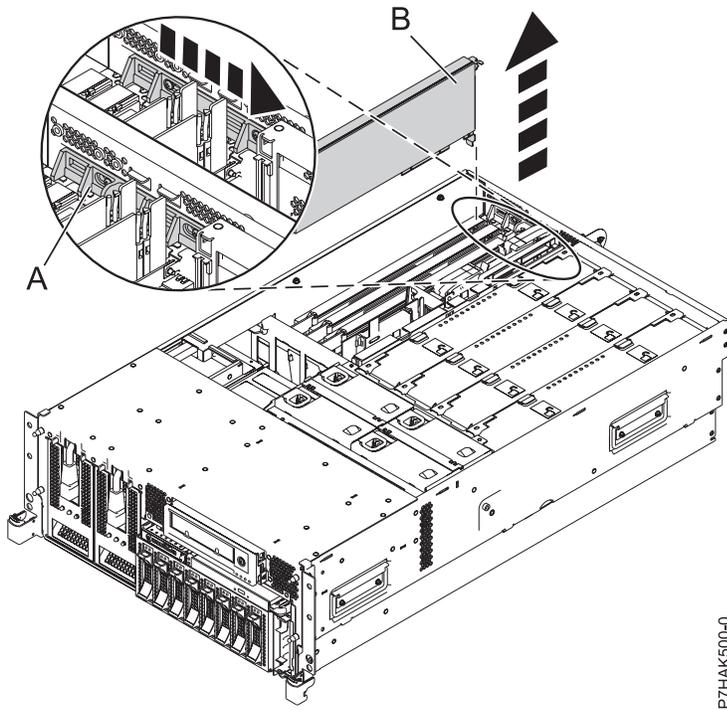
Figure 3. PCI adapter or filler plate removed from the rack-mounted system unit

14. Remove the adapter filler plate if one is present.
15. Follow the instructions on the screen to install the adapter until the LED for the specified PCI slot is set to the Action state. See "Component LEDs" on page 141.
16. When you are instructed to install the adapter in the adapter slot, carefully grasp the adapter by the edges and align the adapter **(A)** in the slot guides. Insert the adapter fully into the adapter slot connector. If you are installing a full-length adapter, ensure that both ends of the adapter engage the card guides.
17. Press the adapter firmly into its connector.
18. Slide the adapter latch **(B)** back into place as shown in the following figure.
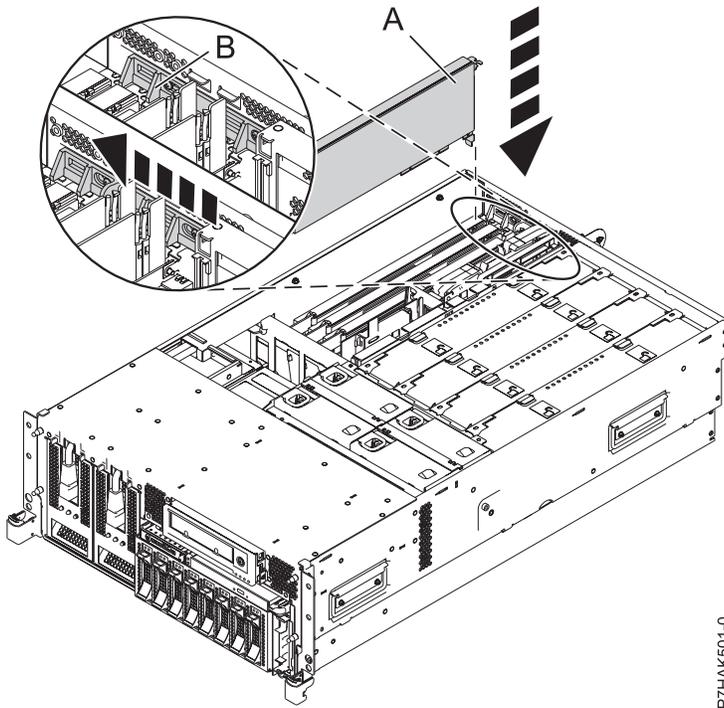
Figure 4. PCI adapter replaced in the rack-mounted system unit

19. Connect any adapter cables.
20. Replace or close the service access cover and, if applicable, return the system to the operating position.
21. Enter `cfgmgr` to configure the adapter.
22. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Installing a PCI adapter in the 33E/8B and 36E/8C server, with the power on in a Linux environment

You can install a PCI adapter with the system power on in the Linux environment.

About this task

If your system is managed by an HMC, use the HMC to complete the steps for installing the part in the system. See "Installing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to install the server. For instructions, see Installing a part by using the Systems Director Management Console.

If you are installing a PCI-X double-wide, quad-channel Ultra320 SCSI RAID Controller (FC 5739 or 5778, CCIN 571F and 575B), remove the lower, right standoff from between the two sides of the adapter before installing it in the system unit.

If you do not have an HMC or SDMC, complete the following steps to install a PCI adapter with the system power on in the Linux environment:

Procedure

 1. Ensure that the system meets the "Prerequisites for hot-plugging PCI adapters in Linux" on page 142.
 2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
 3. "Verifying that the hot-plug PCI tools are installed for Linux" on page 142.
 4. Determine in which slot to place the PCI adapter. For system-specific adapter placement information, see the PCI adapter placement.
 5. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
 6. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.
    a. Open the front rack door.
    b. Place the system unit in the service position.
    c. Remove or open the service access cover.
 7. If necessary, remove the adapter expansion slot shield.
 8. If necessary, remove the adapter from the antistatic package.

    Attention: Avoid touching the components and gold connectors on the adapter.
 9. Place the adapter, component-side up, on a flat, antistatic surface.
10. If you are installing a double-wide adapter, remove the PCI adapter divider if one is present. See "Removing a PCI adapter divider from the 33E/8B and 36E/8C server" on page 44.
11. Log in to the system console as the root user.
12. Run the lsslot tool to list the hot-plug PCI slots that are available in the server or partition:

    `lsslot -c pci -a`

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

    ```
    # Slot          Description              Device(s)
    U7879.001.DQD014E-P1-C1 PCI-X capable, 64 bit, 133MHz slot Empty
    U7879.001.DQD014E-P1-C4 PCI-X capable, 64 bit, 133MHz slot Empty
    U7879.001.DQD014E-P1-C5 PCI-X capable, 64 bit, 133MHz slot Empty
    ```

    Select the appropriate empty PCI slot from the ones listed by the command.
13. Slide the adapter latch **(A)** into the open position, as shown in the following figure.

Figure 5. PCI adapter or filler plate removed from the rack-mounted system unit

14. Ensure that the slot is empty. Remove the adapter filler plate if one is present.

15. Run the **drmgr** command to enable an adapter to be installed. For example, to install an adapter into PCI slot U7879.001.DQD014E-P1-C3, enter the following command:

    ```
    drmgr -c pci -r -s locationcode
    ```

    The following displays:

    ```
    The visual indicator for the specified PCI slot has been set to the
    identify state. Press Enter to continue or enter x to exit.
    ```

16. Press Enter.

    The following displays:

    ```
    The visual indicator for the specified PCI slot has been set to the
    action state. Insert the PCI card into the identified slot, connect any
    devices to be configured and press Enter to continue. Enter x to exit.
    ```

17. When you are instructed to install the adapter **(A)** in the adapter slot, carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.

18. Press the adapter firmly into its connector.

    Attention: When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

19. Slide the adapter latch **(B)** back into place as shown in the following figure.
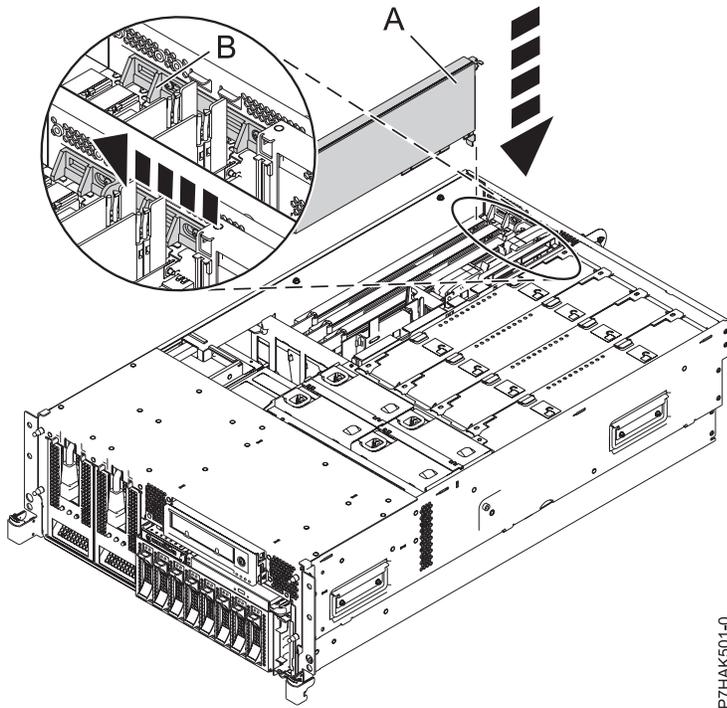
Figure 6. PCI adapter replaced in the rack-mounted system unit

20. Connect any adapter cables.
21. 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
    ```
22. If you are servicing a rack-mounted system, route the cables through the cable-management arm.
23. Replace or close the service access cover and, if applicable, return the system to the operating position.

Removing a PCI adapter from an 33E/8B or 36E/8C server

You can remove a PCI adapter.

About this task

Removing a PCI adapter from the 33E/8B and 36E/8C server with the power off

You can remove a PCI adapter with the system power off.

About this task

If your system is managed by a HMC, use the HMC to complete the steps for removing a part from the system. See "Removing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for removing a part from the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to remove a PCI adapter with the system power off:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. If you are removing a failing PCI adapter, see "Identifying a part" on page 149. If you are removing the PCI adapter for other reasons, continue to the next step.
4. Stop the system or logical partition.
5. Disconnect the power source from the system by unplugging the system.
6. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.
   a. Open the front rack door.
   b. Place the system unit in the service position.
   c. Remove or open the service access cover.
7. Determine which adapter you plan to remove, then label and disconnect all cables attached to that adapter.
8. Record the slot number and location of each adapter being removed.

   Note: Adapter slots are numbered on the rear of the system.
9. Slide the adapter latch **(A)** into the open position, as shown in the following figure.
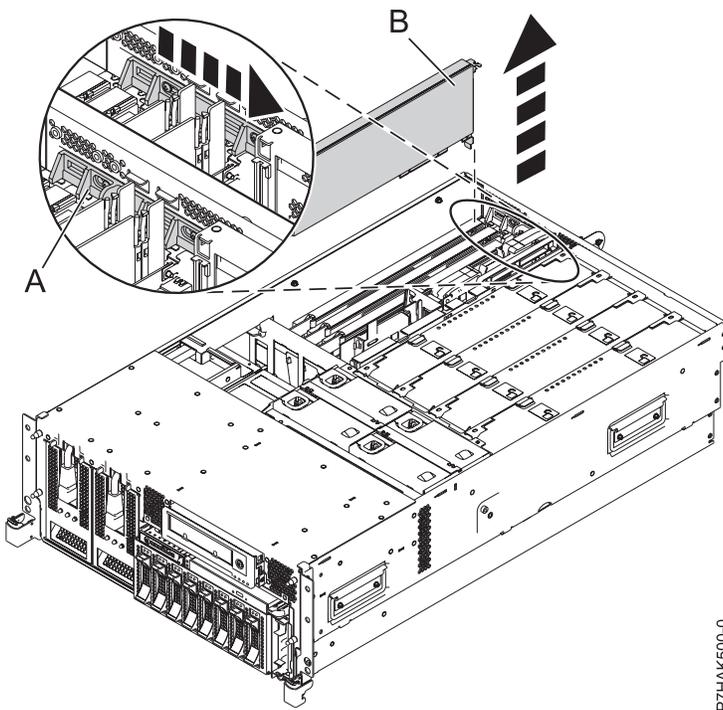
Figure 7. PCI adapter or filler plate removed from the rack-mounted system unit

10. Carefully grasp the PCI adapter **(B)** by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.
11. If you are removing a PCI adapter as part of another procedure, return to that procedure. If not, continue to the next step.
12. If you plan to install another adapter into the vacated slot, go to "Replacing a PCI adapter in the 33E/8B and 36E/8C server with the power off" on page 15; otherwise, continue with the next step.

13. Seal the expansion slot using an expansion-slot cover.
14. Replace or close the service access cover and, if applicable, return the system to the operating position.
15. Reconnect the power source to the system.
16. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.
17. To replace the PCI adapter, see "Replacing a PCI adapter in the 33E/8B or 36E/8C server" on page 15.

Removing a PCI adapter from the 33E/8B and 36E/8C server, with the power on in the AIX environment

You can remove a PCI adapter with the system power on in the AIX environment.

About this task

To remove a failing adapter and replace it with the same adapter, see "Removing and replacing a PCI adapter in the 33E/8B and 36E/8C server, with the power on in the AIX environment" on page 16. If the adapter that is removed will be placed into a different slot or system, complete this removal procedure, and then install the adapter as described in "Installing a PCI adapter in the 33E/8B and 36E/8C server, with the power on in an AIX environment" on page 3.

If your system is managed by an HMC, use the HMC to complete the steps for installing the part in the system. See "Installing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to install the server. For instructions, see Installing a part by using the Systems Director Management Console.

Note: Procedures performed on a PCI adapter with the system power on in the AIX environment, also known as hot-plug procedures, require the system administrator to take the PCI adapter offline before 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.

If you do not have an HMC or SDMC, complete the following steps to remove a PCI adapter with the system power on in the AIX environment:

Procedure
1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. If you are removing a failing PCIe adapter, see Identifying a failing part. If you are removing the PCI adapter for other reasons, continue to the next step.
4. If you are removing a failing PCI adapter, see Identifying a failing part. If you are removing the PCI adapter for other reasons, continue to the next step.
5. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.
   a. Open the front rack door.
   b. Place the system unit in the service position.
   c. Remove or open the service access cover.
6. Determine which adapters you plan to remove.
7. Record the slot number and location of each adapter being removed. Adapter slots are numbered on the rear of the system unit.

8. Ensure that any processes or applications that might use the adapter are stopped.
9. Follow these steps to remove a PCI adapter using the PCI Hot-Plug Manager menu in the AIX Diagnostic tools:

   a. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at the AIX command line.

   b. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.

   c. At the FUNCTION SELECTION menu, select **Task Selection**, then press Enter.

   d. At the Task Selection list, select **PCI Hot Plug Manager**.

   e. Select **Unconfigure a Device**, then press Enter.

   f. Press F4 (or Esc +4) to display the **Device Names** menu.

   g. Select the adapter you are removing in the **Device Names** menu.

   h. Use the Tab key to answer NO to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter. The ARE YOU SURE window displays.

   i. Press Enter to verify the information. Successful unconfiguration is indicated by the OK message displayed next to the Command field at the top of the screen.

   j. Press F4 (or Esc +4) twice to return to the Hot Plug Manager menu.

   k. Select **Replace/remove PCI Hot Plug adapter**.

   l. Select the slot that has the device to be removed from the system.

   m. Select **remove**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.

   n. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.

10. Label, and then disconnect all cables attached to the adapter you plan to remove.
11. Slide the adapter latch **(A)** into the open position, as shown in the following figure.
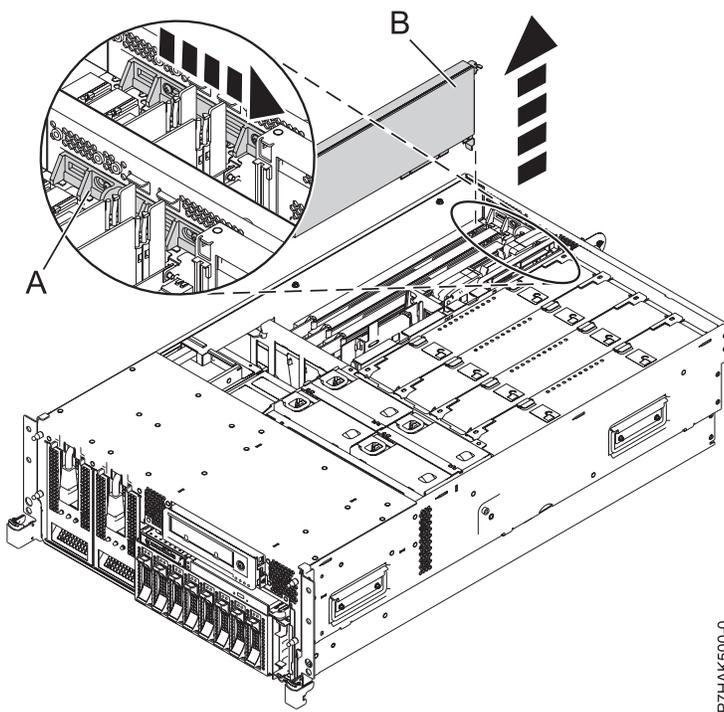
Figure 8. PCI adapter or filler plate removed from the rack-mounted system unit

12. Carefully grasp the PCI adapter **(B)** by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.

13. If you plan to install another adapter into the vacated slot, go to "Installing a PCI adapter in the 33E/8B and 36E/8C server, with the power on in an AIX environment" on page 3; otherwise, continue with the next step.

14. Seal the expansion slot using an expansion-slot cover.

15. Lower the plastic retainer seat over the PCI adapter faceplate.

16. Rotate the locking latch clockwise until it clicks into the locked position.

17. Continue to follow the screen instructions until you receive a message that the adapter removal is successful. Successful removal is indicated by the OK message displayed next to the Command field at the top of the screen.

18. If you have other adapters to remove, press the F3 key to return to the PCI Hot-Plug Manager menu and then return to step 10 on page 12.

    If you do not have other adapters to remove, continue with the next step.

19. Press F10 to exit the Hot-Plug Manager.

20. Run the diag -a command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.

21. Replace or close the service access cover and, if applicable, return the system to the operating position.

22. To replace the PCI adapter, see "Replacing a PCI adapter in the 33E/8B or 36E/8C server" on page 15.

Removing a PCI adapter from the 33E/8B and 36E/8C server, with the power on in the Linux environment

You can remove a PCI adapter with the system power on in theLinux environment.

About this task

If your system is managed by a HMC, use the HMC to complete the steps for removing a part from the system. See "Removing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for removing a part from the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to remove a PCI adapter with the system power on in the Linux environment:

Procedure

1. Ensure that the system meets the "Prerequisites for hot-plugging PCI adapters in Linux" on page 142.

2. "Verifying that the hot-plug PCI tools are installed for Linux" on page 142.

3. Complete the prerequisite tasks that are described in "Before you begin" on page 143.

4. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.

5. If you are removing a failing PCIe adapter, see Identifying a failing part. If you are removing the PCI adapter for other reasons, continue to the next step.

6. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.

   a. Open the front rack door.

   b. Place the system unit in the service position.

   c. Remove or open the service access cover.

7. Determine which adapter you plan to remove, then label and disconnect all cables attached to that adapter.
8. Record the slot number and location of each adapter being removed.

    Note: Adapter slots are numbered on the rear of the system.
9. Label, and then disconnect all cables attached to the adapter you plan to remove.

    Note: Before performing a PCI hot-plug removal of storage devices, ensure that the file systems on those devices are unmounted.
10. Run the **drmgr** command to enable an adapter to be removed:

    For example, to remove the PCI adapter in slot U7879.001.DQD014E-P1-C3, run this command:

    `drmgr -c pci -r -s locationcode`

    Follow the instructions on the display to complete the task.
11. Slide the adapter latch **(A)** into the open position, as shown in the following figure.
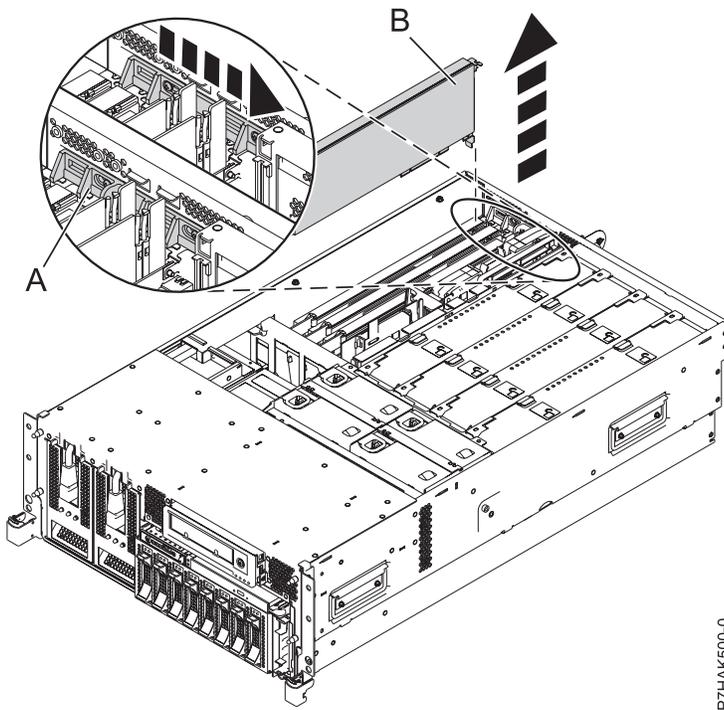
Figure 9. PCI adapter or filler plate removed from the rack-mounted system unit

12. Carefully grasp the PCI adapter **(B)** by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.
13. If you are removing a PCI adapter as part of another procedure, return to that procedure. If not, continue to the next step.
14. If you plan to install another adapter into the vacated slot, go to "Replacing a PCI adapter in the 33E/8B and 36E/8C server with the power on in the Linux environment" on page 20; otherwise, continue with the next step.
15. Seal the expansion slot using an expansion-slot cover.
16. Replace or close the service access cover and, if applicable, return the system to the operating position.

Replacing a PCI adapter in the 33E/8B or 36E/8C server

You can replace a PCI adapter.

Replacing a PCI adapter in the 33E/8B and 36E/8C server with the power off

You can replace a PCI adapter with the system power off.

About this task

You must have already completed the procedure "Removing a PCI adapter from the 33E/8B and 36E/8C server with the power off" on page 9 in order to have the slot powered off.

If your system is managed by an HMC, use the HMC to complete the steps for replacing the part in the system. See "Replacing a part by using the HMC" on page 147.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for replacing the part in the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to replace a PCI adapter with the system power off:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. If necessary, remove the adapter from the antistatic package.

   Attention: Avoid touching the components and gold connectors on the adapter.
4. Place the adapter, component-side up, on a flat, static-protective surface.
5. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
6. Press the adapter **(A)** firmly into its connector.

   Attention: When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.
7. Slide the adapter latch **(B)** back into place as shown in the following figure.
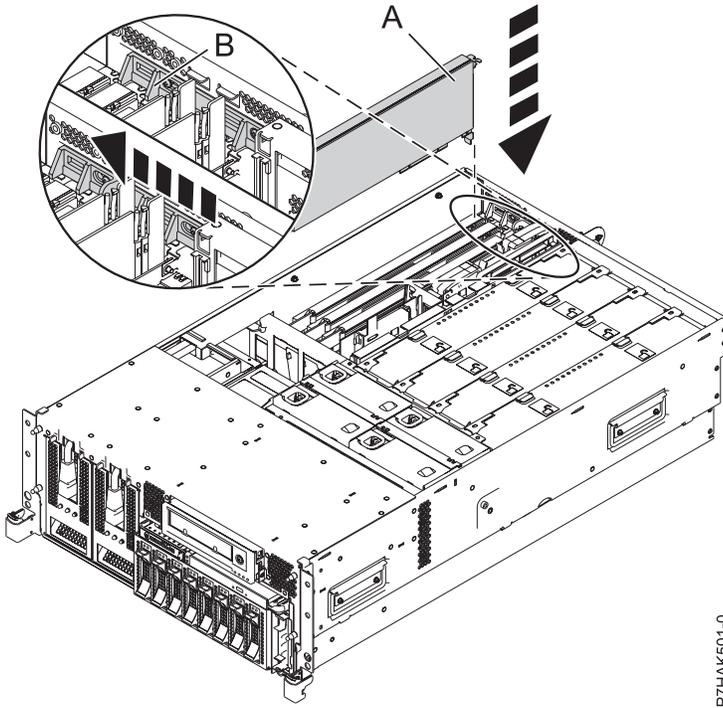
Figure 10. PCI adapter replaced in the rack-mounted system unit

8. Connect the adapter cables.
9. If you are servicing a rack-mounted system, route the cables through the cable-management arm.
10. Replace or close the service access cover and, if applicable, return the system to the operating position.
11. Reconnect the power source to the system.
12. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.
13. Verify the installed part.
    * If you replaced the part because of a service action, verify the installed part.
    * If you installed the part for any other reason, verify the installed part.

Removing and replacing a PCI adapter in the 33E/8B and 36E/8C server, with the power on in the AIX environment

You can replace a PCI adapter with the system power on in the AIX environment.

About this task

If your system is managed by an HMC, use the HMC to complete the steps for replacing the part in the system. See "Replacing a part by using the HMC" on page 147.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for replacing the part in the system. See Removing a part by using the SDMC.

Read the following notes to determine if this is the correct procedure for the task to be performed.

Notes:

* Use this procedure if you intend to remove a failing PCI adapter and replace it with the same type of adapter.

- If you plan to remove a failing adapter and leave the slot empty, see "Removing a PCI adapter from the 33E/8B and 36E/8C server, with the power on in the AIX environment" on page 11.
- This procedure should not be used to remove an existing adapter and install a different type of adapter. To install a different adapter, remove the existing adapter as described in "Removing a PCI adapter from the 33E/8B and 36E/8C server, with the power on in the AIX environment" on page 11, then install the new adapter as described in "Installing a PCI adapter in the 33E/8B and 36E/8C server, with the power on in an AIX environment" on page 3.
- Procedures performed on a PCI adapter with the system power on in AIX, also known as hot-plug procedures, require the system administrator to take the PCI adapter offline before 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.

If you do not have an HMC or SDMC, complete the following steps to replace a PCI adapter with the system power on in the AIX environment:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. If you are removing a failing PCIe adapter, see Identifying a failing part. If you are removing the PCI adapter for other reasons, continue to the next step.
4. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.
   a. Open the front rack door.
   b. Place the system unit in the service position.
   c. Remove or open the service access cover.
5. Follow these steps to replace a PCI adapter using the PCI Hot-Plug Manager menu in the AIX Diagnostic tools:
   a. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at the AIX command line.
   b. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
   c. At the FUNCTION SELECTION menu, select **Task Selection**, then press Enter.
   d. At the Task Selection list, select **PCI Hot Plug Manager**.
   e. Select **Unconfigure a Device**, then press Enter.
   f. Press F4 (or Esc +4) to display the **Device Names** menu.
   g. Select the adapter you are removing in the **Device Names** menu.
   h. Use the Tab key to answer YES to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter. The ARE YOU SURE window displays.
   i. Press Enter to verify the information. Successful unconfiguration is indicated by the OK message displayed next to the Command field at the top of the screen.
   j. Press F3 (or Esc +3) twice to return to the Hot Plug Manager menu.
   k. Select **Replace/remove PCI Hot Plug adapter**.
   l. Select the slot that has the device to be removed from the system.
   m. Select **Replace**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.
   n. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
6. Label, and then disconnect all cables attached to the adapter you plan to remove.

7. Slide the adapter latch **(A)** into the open position, as shown in the following figure.
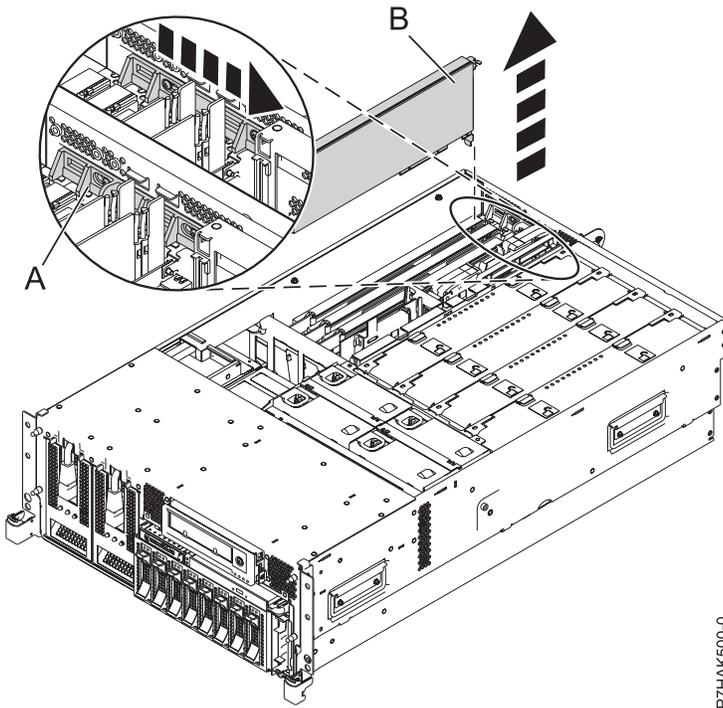
Figure 11. PCI adapter or filler plate removed from the rack-mounted system unit

8. Carefully grasp the PCI adapter **(B)** by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.

9. If necessary, remove the replacement adapter from the antistatic package.

   Attention: Avoid touching the components and gold connectors on the adapter.

10. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.

11. Press the adapter **(A)** firmly into its connector. See the following figure.

   Attention: When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

12. Slide the adapter latch **(B)** back into place as shown in the following figure.
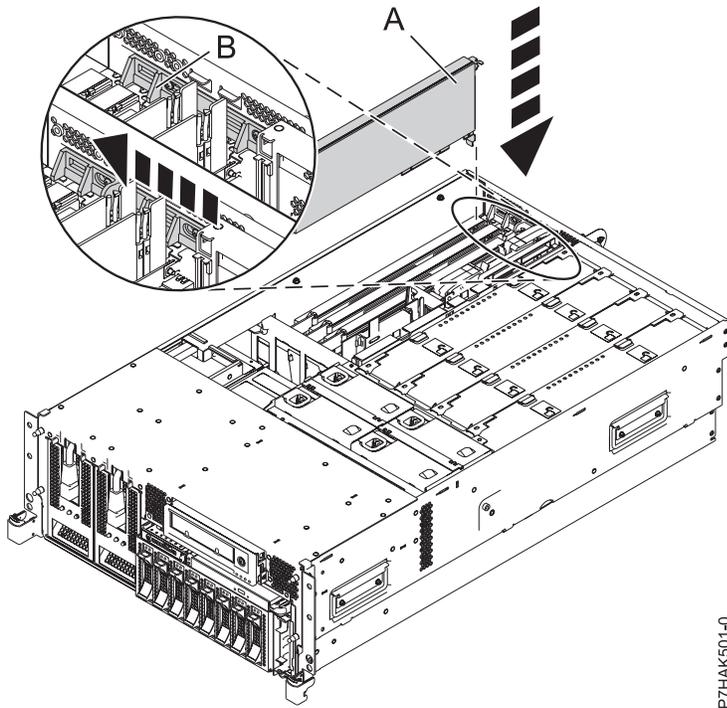
Figure 12. PCI adapter replaced in the rack-mounted system unit

13. Connect the adapter cables.
14. Press enter and continue to follow the instructions in the system diagnostics until you receive a message that the replacement is successful. Successful replacement is indicated by the OK message displayed next to the **Command** field at the top of the menu.
15. Press the F3 (or Esc+3) key to return to the **PCI Hot-Plug Manager** menu.
16. Press the F3 (or Esc+3) key to return to the **TASK** selection list.
17. Select **Log Repair Action**.
18. Select the resource just replaced, press Enter, press Commit (F7 or ESC 7), then press Enter.
19. Press F3 (or Esc+3) to return to **TASK Selection List**.
20. Select **Hot Plug Task**, press enter.
21. Select **PCI Hot Plug Manager**, then select **Configure a defined device**, then press Enter.
22. Select the device just replaced from the list, then press Enter. The device is now configured.
23. Press the F10 key to exit the diagnostic program.

    Note: If you are running the stand-alone diagnostics, do not exit the program completely.
24. Verify the PCI adapter by using the following instructions:
    a. Did you replace the adapter with the system power on?
       - Yes - Go to the next step.
       - No - Load the diagnostic program by doing the following:
         – If AIX is available, boot AIX, log in as root or CELOGIN, then enter the **diag** command.
         – If AIX is not available, boot the stand-alone diagnostics
    b. Type the **diag** command if you are not already displaying the diagnostic menus
    c. Select **Advance Diagnostic Routines**, then select **Problem Determination**.
    d. Select the name of the resource just replaced from the menu. If the resource just replaced is not shown, choose the resource associated with it. Press Enter, then press **Commit** ((F7 or Esc+7)).

e. Did the Problem Determination identify any problems?
  - No: Continue to the next step.
  - Yes: A problem is identified
    – If you are a customer, record the error information, then contact your service provider.
    – If you are an authorized service provider, return to map 210-5.
25. Press the F10 key to exit the diagnostic program.
26. Replace or close the service access cover and, if applicable, return the system to the operating position.
27. Verify the installed part.
  - If you replaced the part because of a service action, verify the installed part.
  - If you installed the part for any other reason, verify the installed part.

Replacing a PCI adapter in the 33E/8B and 36E/8C server with the power on in the Linux environment

You can replace a PCI adapter with the system power on in the Linux environment.

About this task

You must have already completed the procedure "Removing a PCI adapter from the 33E/8B and 36E/8C server, with the power on in the Linux environment" on page 13.

If your system is managed by an HMC, use the HMC to complete the steps for replacing the part in the system. See "Replacing a part by using the HMC" on page 147.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for replacing the part in the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to replace a PCI adapter with the system power on in the Linux environment:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. If necessary, remove the adapter from the antistatic package.

   Attention: Avoid touching the components and gold connectors on the adapter.
4. Place the adapter, component-side up, on a flat, static-protective surface.
5. Run the **drmgr** 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:

   `drmgr -c pci -r -s locationcode`

   Follow the instructions on the display to complete the task.
6. Press the adapter firmly into its connector.

   Attention: When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.
7. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
8. Press the adapter **(A)** firmly into its connector.

Attention: When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

9. Slide the adapter latch **(B)** back into place as shown in the following figure.
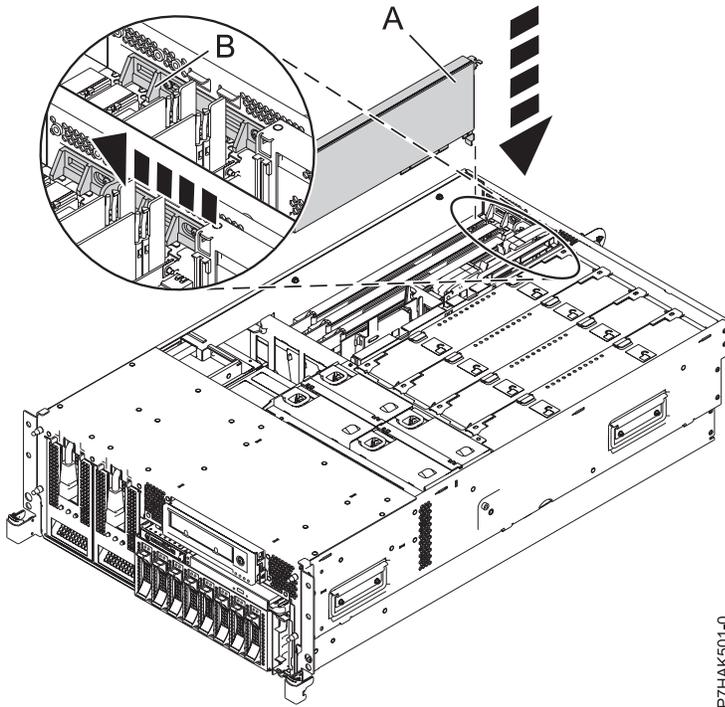
Figure 13. PCI adapter replaced in the rack-mounted system unit

10. Connect the adapter cables.
11. 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
    ```
12. If you are servicing a rack-mounted system, route the cables through the cable-management arm.
13. Replace or close the service access cover and, if applicable, return the system to the operating position.
14. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Model 33E/8B or 36E/8C PCIe RAID and SSD SAS adapters

You can remove, replace, or install PCIe RAID and SSD SAS adapters in the 33E/8B or 36E/8C.

The PCIe RAID and SSD SAS adapter is a double-wide adapter. Although it plugs into a single PCIe slot, two adjacent PCIe slots are required for installation (slot 3 for plugging, slot 2 for expansion).

Before installing or replacing a feature, ensure that the software required to support the feature is installed on your system. For information about software prerequisites, see the IBM Prerequisite website at add URL here. If the required software is not installed, see the following websites to download it, and then install it before continuing:

- To download firmware and software updates and fixes, see the Fix Central website at add URL here.
- To download Hardware Management Console (HMC) updates and fixes, see Hardware Management Console Support and downloads.

Related information:

➦ SAS RAID enablement and cache battery pack

Installing a PCIe RAID and SSD SAS adapter in the 33E/8B and 36E/8C server

You can install a PCIe RAID and SSD SAS adapter in a server.

About this task

Installing a PCI RAID and SSD SAS adapter in the 33E/8B and 36E/8C server with the power off

You can install a PCIe RAID and SSD SAS adapter with the system power off.

Before you begin

Attention: If you are servicing a failing part, see the service procedures for "Removing a PCI RAID and SSD SAS adapter from the 33E/8B and 36E/8C server with the power off" on page 30 and "Replacing a PCIe RAID and SSD SAS adapter in the 33E/8B and 36E/8C server with the power off" on page 36. This procedure is intended for installing a new or upgraded PCIe RAID and SSD SAS adapter.

About this task

The PCIe RAID and SSD SAS adapter is a double-wide adapter. Although it plugs into a single PCIe slot, two adjacent PCIe slots are required for installation (slot 3 for plugging, slot 2 for expansion).

Before installing or replacing a feature, ensure that the software required to support the feature is installed on your system. For information about software prerequisites, see the IBM Prerequisite website at add URL here. If the required software is not installed, see the following websites to download it, and then install it before continuing:

- To download firmware and software updates and fixes, see the Fix Central website at add URL here.
- To download Hardware Management Console (HMC) updates and fixes, see Hardware Management Console Support and downloads.

If your system is managed by an HMC, use the HMC to complete the steps for installing the part in the system. See "Installing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to install the server. For instructions, see Installing a part by using the Systems Director Management Console.

If you do not have an HMC or SDMC, complete the following steps to install a PCIe RAID and SSD SAS with the system power off:

Procedure

1. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.

2. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
3. Stop the system or logical partition. For instructions, see "Stopping a system or logical partition" on page 154.
4. Disconnect the power source from the system by unplugging the system.
5. If you are installing, removing, or replacing a PCIe adapter in a rack-mounted system, follow these steps to remove the service access cover.

   a. Open the front rack door.
   b. Place the system unit in the service position.
   c. Remove or open the service access cover.

6. Determine that slots 2 and 3 are open for the PCIe adapter.
7. If necessary, remove the adapter from the antistatic package.

   Attention: Avoid touching the components and gold connectors on the adapter.
8. Place the adapter, component-side up, on a flat, antistatic surface.
9. Some PCI adapters are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
10. Slide the adapter latch **(A)** into the open position, as shown in the following figure.
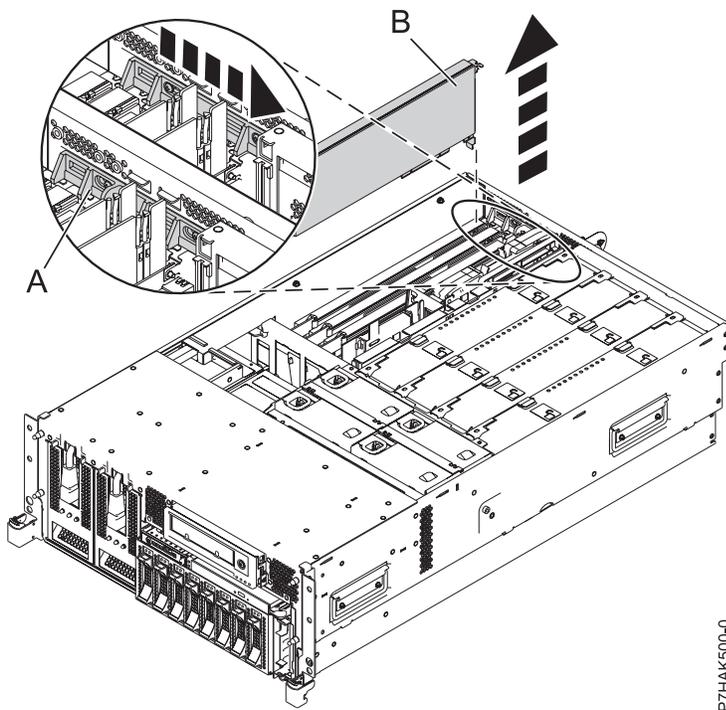
Figure 14. PCI adapter or filler plate removed from the rack-mounted system unit

11. If necessary, remove the adapter expansion slot filler.
12. Remove the PCI adapter divider if one is present. See "Removing a PCI adapter divider from the 33E/8B and 36E/8C server" on page 44.
13. Remove the solid expansion slot cover and install the perforated expansion slot cover that shipped with your PCIe adapter. Press the expansion slot cover firmly into position in the adjacent slot to the left of the adapter slot.

14. Carefully grasp the adapter **(A)** by its top edge, and align the adapter with the expansion slot and its connector on the system backplane. See the following figure.
15. Press the adapter firmly into its connector.
16. Slide the adapter latch **(B)** back into place as shown in the following figure.
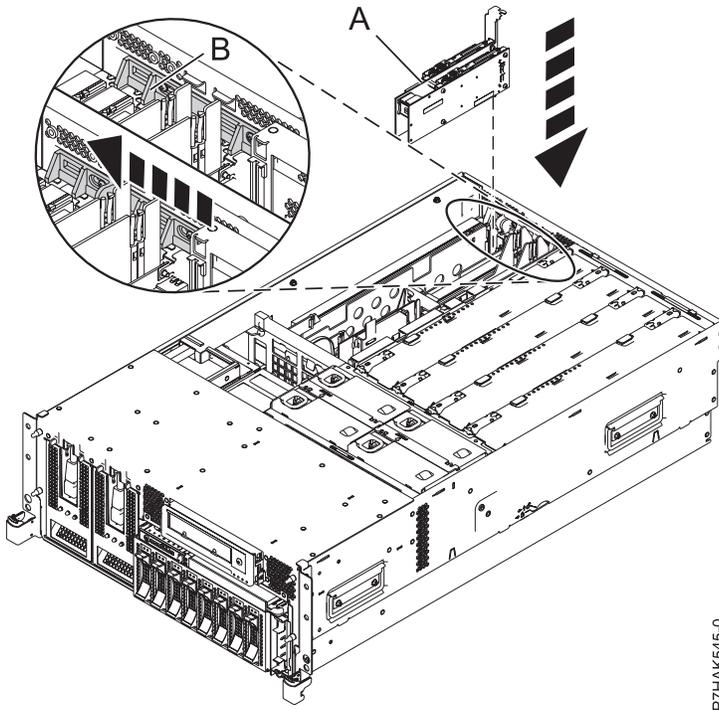
Figure 15. PCIe RAID and SSD SAS adapter replaced in the rack-mounted system unit

17. If you are servicing a rack-mounted system, route the cables through the cable-management arm.
18. Replace or close the service access cover and, if applicable, return the system to the operating position.
19. Reconnect the power source to the system.
20. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.
21. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Related information:

SAS RAID enablement and cache battery pack

Installing a PCI RAID and SSD SAS adapter in the 33E/8B and 36E/8C server, with the power on in the AIX environment

You can install a PCI RAID and SSD SAS adapter with the system power on in the AIX environment.

About this task

The PCIe RAID and SSD SAS adapter is a double-wide adapter. Although it plugs into a single PCIe slot, two adjacent PCIe slots are required for installation (slot 3 for plugging, slot 2 for expansion).

Before installing or replacing a feature, ensure that the software required to support the feature is installed on your system. For information about software prerequisites, see the IBM Prerequisite website at add URL here. If the required software is not installed, see the following websites to download it, and then install it before continuing:

- To download firmware and software updates and fixes, see the Fix Central website at add URL here.
- To download Hardware Management Console (HMC) updates and fixes, see Hardware Management Console Support and downloads.

If your system is managed by an HMC, use the HMC to complete the steps for installing the part in the system. See "Installing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to install the server. For instructions, see Installing a part by using the Systems Director Management Console.

If you do not have an HMC or SDMC, complete the following steps to install a PCIe RAID and SSD SAS with the system power on in the AIX environment:

Procedure

1. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
2. Determine in which slot to place the PCI adapter. For system-specific adapter placement information, see the PCI adapter placement.
3. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
4. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.
   a. Open the front rack door.
   b. Place the system unit in the service position.
   c. Remove or open the service access cover.
5. If necessary, remove the adapter expansion slot shield.
6. If necessary, remove the adapter from the antistatic package.

   Attention: Avoid touching the components and gold connectors on the adapter.
7. Place the PCIe adapter, component-side up, on a flat, antistatic surface.
8. Some PCIe adapters are shipped from the manufacturer with a blue handle or support bracket along the back edge of the card. To use adapters of this type in this system, you must remove the blue handle or support bracket from the card.
9. Remove the PCI adapter divider if one is present. See "Removing a PCI adapter divider from the 33E/8B and 36E/8C server" on page 44.
10. Refer to "PCI hot-plug manager access for AIX" on page 139, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.
11. From the PCI Hot-Plug Manager menu, select **Add a PCI Hot-Plug Adapter** and press Enter. The Add a Hot-Plug Adapter window displays.
12. Select slot 3 from the appropriate empty PCI slots listed on the screen, and press Enter.
13. Slide the adapter latch **(A)** into the open position, as shown in the following figure.
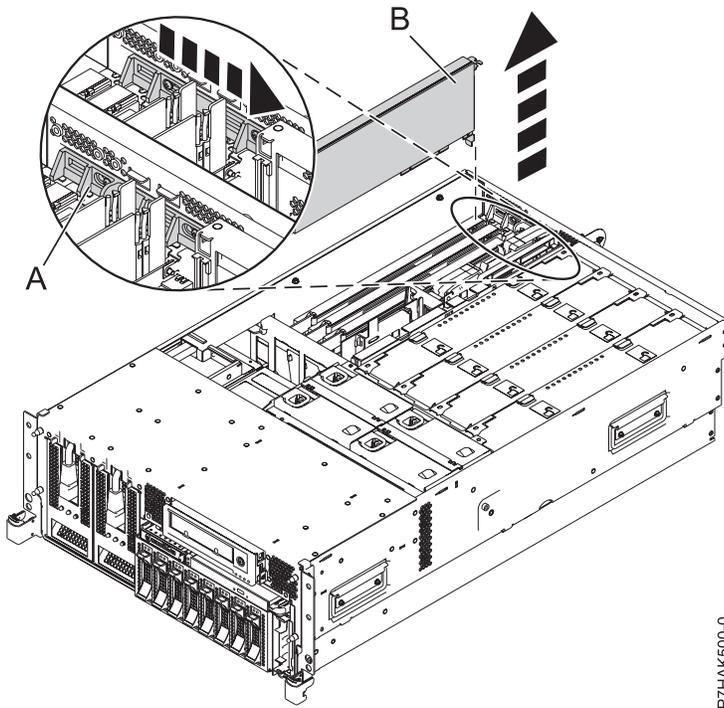
Figure 16. PCI adapter or filler plate removed from the rack-mounted system unit

14. Remove the adapter filler plate if one is present.
15. Remove the solid expansion slot cover and install the perforated expansion slot cover that shipped with your PCIe adapter. Press the expansion slot cover firmly into position in the adjacent slot to the left of the adapter slot.
16. Follow the instructions on the screen to install the adapter until the LED for the specified PCIe slot is set to the Action state. See "Component LEDs" on page 141.
17. When you are instructed to install the adapter in the adapter slot, carefully grasp the adapter by the edges and align the adapter **(A)** in the slot guides. Insert the adapter fully into the adapter slot connector. If you are installing a full-length adapter, ensure that both ends of the adapter engage the card guides.
18. Press the adapter firmly into its connector.
19. Slide the adapter latch **(B)** back into place as shown in the following figure.
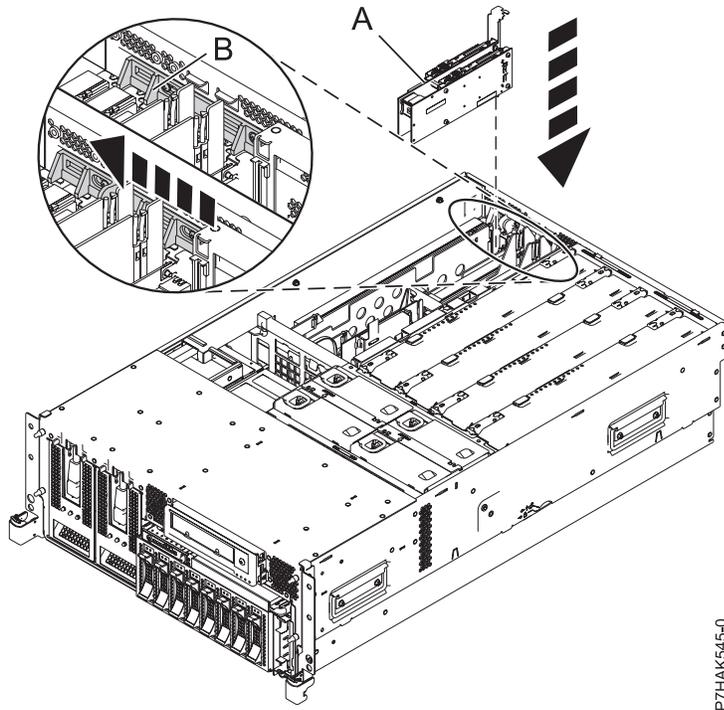
Figure 17. PCI RAID and SSD SAS adapter replaced in the rack-mounted system unit

20. Replace or close the service access cover and, if applicable, return the system to the operating position.
21. Enter `cfgmgr` to configure the adapter.
22. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Related information:

➡ SAS RAID enablement and cache battery pack

Installing a PCI RAID and SSD SAS adapter in the 33E/8B and 36E/8C server, with the power on in the Linux environment

You can install a PCI RAID and SSD SAS adapter with the system power on in the Linux environment.

About this task

The PCIe RAID and SSD SAS adapter is a double-wide adapter. Although it plugs into a single PCIe slot, two adjacent PCIe slots are required for installation (slot 3 for plugging, slot 2 for expansion).

Before installing or replacing a feature, ensure that the software required to support the feature is installed on your system. For information about software prerequisites, see the IBM Prerequisite website at add URL here. If the required software is not installed, see the following websites to download it, and then install it before continuing:

- To download firmware and software updates and fixes, see the Fix Central website at add URL here.
- To download Hardware Management Console (HMC) updates and fixes, see Hardware Management Console Support and downloads.

If your system is managed by an HMC, use the HMC to complete the steps for installing the part in the system. See "Installing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to install the server. For instructions, see Installing a part by using the Systems Director Management Console.

If you do not have an HMC or SDMC, complete the following steps to install a PCIe RAID and SSD SAS with the system power on in the Linux environment:

Procedure

1. Ensure that the system meets the "Prerequisites for hot-plugging PCI adapters in Linux" on page 142.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. "Verifying that the hot-plug PCI tools are installed for Linux" on page 142.
4. Determine in which slot to place the PCI adapter. For system-specific adapter placement information, see the PCI adapter placement.
5. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
6. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.
   a. Open the front rack door.
   b. Place the system unit in the service position.
   c. Remove or open the service access cover.
7. If necessary, remove the adapter expansion slot shield.
8. If necessary, remove the adapter from the antistatic package.

   Attention: Avoid touching the components and gold connectors on the adapter.
9. Place the PCIe adapter, component-side up, on a flat, antistatic surface.
10. Remove the PCI adapter divider if one is present. See "Removing a PCI adapter divider from the 33E/8B and 36E/8C server" on page 44.
11. Log in to the system console as the root user.
12. Run the lsslot tool to list the hot-plug PCI slots that are available in the server or partition:

    ```
    lsslot -c pci -a
    ```

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

    ```
    # Slot           Description            Device(s)
    U7879.001.DQD014E-P1-C1 PCI-X capable, 64 bit, 133MHz slot Empty
    U7879.001.DQD014E-P1-C4 PCI-X capable, 64 bit, 133MHz slot Empty
    U7879.001.DQD014E-P1-C5 PCI-X capable, 64 bit, 133MHz slot Empty
    ```

    Select the appropriate empty PCI slot from the ones listed by the command.
13. Slide the adapter latch **(A)** into the open position, as shown in the following figure.

Figure 18. PCI adapter or filler plate removed from the rack-mounted system unit

14. Ensure that the slot is empty. Remove the adapter filler plate if one is present.

15. Run the **drmgr** command to enable an adapter to be installed. For example, to install an adapter into PCI slot U7879.001.DQD014E-P1-C3, enter the following command:

    ```
    drmgr -c pci -r -s locationcode
    ```

    The following displays:

    ```
    The visual indicator for the specified PCI slot has been set to the
    identify state. Press Enter to continue or enter x to exit.
    ```

16. Press Enter.

    The following displays:

    ```
    The visual indicator for the specified PCI slot has been set to the
    action state. Insert the PCI card into the identified slot, connect any
    devices to be configured and press Enter to continue. Enter x to exit.
    ```

17. Remove the solid expansion slot cover and install the perforated expansion slot cover that shipped with your PCIe adapter. Press the expansion slot cover firmly into position in the adjacent slot to the left of the adapter slot.

18. When you are instructed to install the adapter **(A)** in the adapter slot, carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.

19. Press the adapter firmly into its connector.

    Attention: When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

20. Slide the adapter latch **(B)** back into place as shown in the following figure.
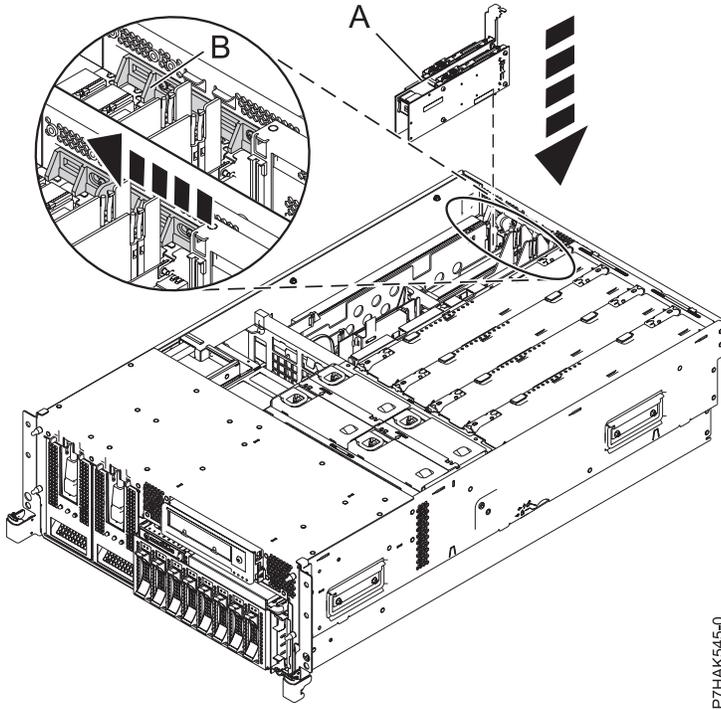
Figure 19. PCI RAID and SSD SAS adapter replaced in the rack-mounted system unit

21. 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
    ```

22. If you are servicing a rack-mounted system, route the cables through the cable-management arm.

23. Replace or close the service access cover and, if applicable, return the system to the operating position.

24. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Related information:

➥ SAS RAID enablement and cache battery pack

Removing a PCIe RAID and SSD SAS adapter from an 33E/8B and 36E/8C server

You can remove a PCI adapter.

About this task

Removing a PCI RAID and SSD SAS adapter from the 33E/8B and 36E/8C server with the power off

You can remove a PCI RAID and SSD SAS adapter with the system power off.

Before you begin

Attention: If you are removing a PCIe adapter in order to install a new or upgraded PCIe adapter, see Installing a PCIe RAID and SSD SAS adapter in the 8233-E8B and 8236-E8C server with the power off to obtain slot locations and required prerequisites. If you are removing a PCIe adapter as part of a service procedure, continue to use the following procedure.

About this task

When an SSD on the PCIe adapter fails, the entire adapter must be removed from the system before replacing the individual SSD. For information about replacing SSDs, see Replacing an SSD module on the PCIe RAID and SSD SAS adapter.

To remove a PCIe adapter with the system power off, do the following steps:

Procedure
 1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
 2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
 3. If you are removing a failing PCIe adapter, see Identifying a failing part. If you are removing the PCI adapter for other reasons, continue to the next step.
 4. Stop the system or logical partition. For instructions, see "Stopping a system or logical partition" on page 154.
 5. Disconnect the power source from the system by unplugging the system.
 6. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.
    a. Open the front rack door.
    b. Place the system unit in the service position.
    c. Remove or open the service access cover.
 7. Attach the wrist strap.
    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 before 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.
 8. Locate the PCIe adapter you plan to remove.
 9. Record the slot number and location of each adapter being removed.

    Note: Adapter slots are numbered on the rear of the system.
10. Slide the adapter latch **(A)** into the open position, as shown in the following figure.

Figure 20. PCI RAID and SSD SAS adapter removed from the rack-mounted system unit

11. Carefully grasp the PCIe adapter **(B)** by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.

12. If you are removing a PCIe adapter as part of another procedure, return to that procedure. If not, continue to the next step.

13. If you plan to install another PCIe adapter into the vacated slot, go to "Replacing a PCIe RAID and SSD SAS adapter in the 33E/8B and 36E/8C server with the power off" on page 36; otherwise, continue with the next step.

14. Seal the expansion slot using an expansion-slot cover.

15. Replace or close the service access cover and, if applicable, return the system to the operating position.

16. Reconnect the power source to the system.

17. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.

Related information:

➦ SAS RAID enablement and cache battery pack

Removing a PCIe RAID and SSD SAS adapter from the 33E/8B and 36E/8C server, with the power on in the AIX environment

You can remove a PCIe RAID and SSD SAS adapter with the system power on in the AIX environment.

About this task

When an SSD on the PCIe adapter fails, the entire adapter must be removed from the system before replacing the individual SSD. For information about replacing SSDs, see Replacing an SSD module on the PCIe RAID and SSD SAS adapter.

To remove a failing PCIe adapter and replace it with another PCIe adapter, see "Removing and replacing a PCI RAID and SSD SAS adapter in the 33E/8B and 36E/8C server, with the power on in the AIX environment" on page 38. If the adapter that is removed will be placed into a different slot or system, complete this removal procedure, then install the adapter as described in "Installing a PCI RAID and SSD SAS adapter in the 33E/8B and 36E/8C server, with the power on in the AIX environment" on page 24.

If your system is managed by a HMC, use the HMC to complete the steps for removing a part from the system. See "Removing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for removing a part from the system. See Removing a part by using the SDMC.

Note: Procedures performed on a PCIe adapter with the system power on in AIX, also known as hot-plug procedures, require the system administrator to take the PCIe adapter offline before 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.

If you do not have an HMC or SDMC, complete the following steps to remove a PCIe RAID and SSD SAS adapter with the system power on in the AIX environment:

Procedure
1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. If you are removing a failing PCIe adapter, see Identifying a failing part. If you are removing the PCI adapter for other reasons, continue to the next step.
4. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.
    a. Open the front rack door.
    b. Place the system unit in the service position.
    c. Remove or open the service access cover.
5. Determine which adapter you plan to remove.
6. Record the slot number and location of each adapter being removed. Adapter slots are numbered on the rear of the system unit.
7. Ensure that any processes or applications that might use the adapter are stopped.
8. Follow these steps to remove a PCI adapter using the PCI Hot-Plug Manager menu in the AIX Diagnostic tools:
    a. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at the AIX command line.
    b. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
    c. At the FUNCTION SELECTION menu, select **Task Selection**, then press Enter.
    d. At the Task Selection list, select **PCI Hot Plug Manager**.
    e. Select **Unconfigure a Device**, then press Enter.
    f. Press F4 (or Esc +4) to display the **Device Names** menu.
    g. Select the adapter you are removing in the **Device Names** menu.
    h. Use the Tab key to answer NO to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter. The ARE YOU SURE window displays.
    i. Press Enter to verify the information. Successful unconfiguration is indicated by the OK message displayed next to the Command field at the top of the screen.
    j. Press F4 (or Esc +4) twice to return to the Hot Plug Manager menu.

k. Select **Replace/remove PCI Hot Plug adapter**.

l. Select the slot that has the device to be removed from the system.

m. Select **remove**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.

n. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.

9. Slide the adapter latch **(A)** into the open position, as shown in the following figure.
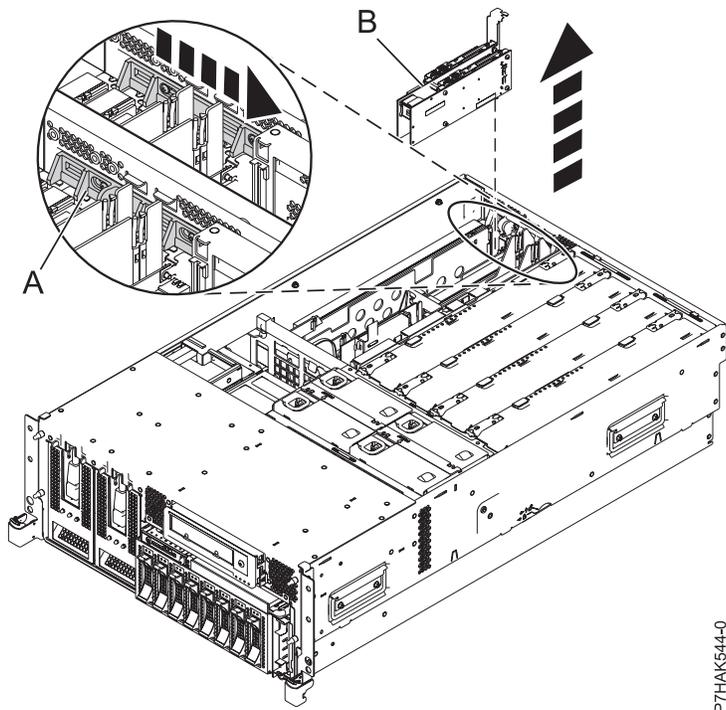

Figure 21. PCI RAID and SSD SAS adapter removed from the rack-mounted system unit

10. Carefully grasp the PCIe adapter **(B)** by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.

11. If you plan to install another adapter into the vacated slot, go to "Installing a PCI RAID and SSD SAS adapter in the 33E/8B and 36E/8C server, with the power on in the AIX environment" on page 24; otherwise, continue with the next step.

12. Seal the expansion slot using an expansion-slot cover.

13. Lower the plastic retainer seat over the PCI adapter faceplate.

14. Rotate the locking latch clockwise until it clicks into the locked position.

15. Continue to follow the screen instructions until you receive a message that the adapter removal is successful. Successful removal is indicated by the OK message displayed next to the Command field at the top of the screen.

16. Press F10 to exit the Hot-Plug Manager.

17. Run the diag -a command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.

18. Replace or close the service access cover and, if applicable, return the system to the operating position.

19. To replace the PCIe adapter, see "Removing and replacing a PCI RAID and SSD SAS adapter in the 33E/8B and 36E/8C server, with the power on in the AIX environment" on page 38.

Related information:

⮕ SAS RAID enablement and cache battery pack

Removing a PCIe RAID and SSD SAS adapter from the 33E/8B and 36E/8C server, with the power on in the Linux environment

You can remove a PCIe RAID and SSD SAS adapter with the system power on in the Linux environment.

About this task

When an SSD on the PCIe adapter fails, the entire adapter must be removed from the system before replacing the individual SSD. For information about replacing SSDs, see Replacing an SSD module on the PCIe RAID and SSD SAS adapter.

If your system is managed by a HMC, use the HMC to complete the steps for removing a part from the system. See "Removing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for removing a part from the system. See Removing a part by using the SDMC.
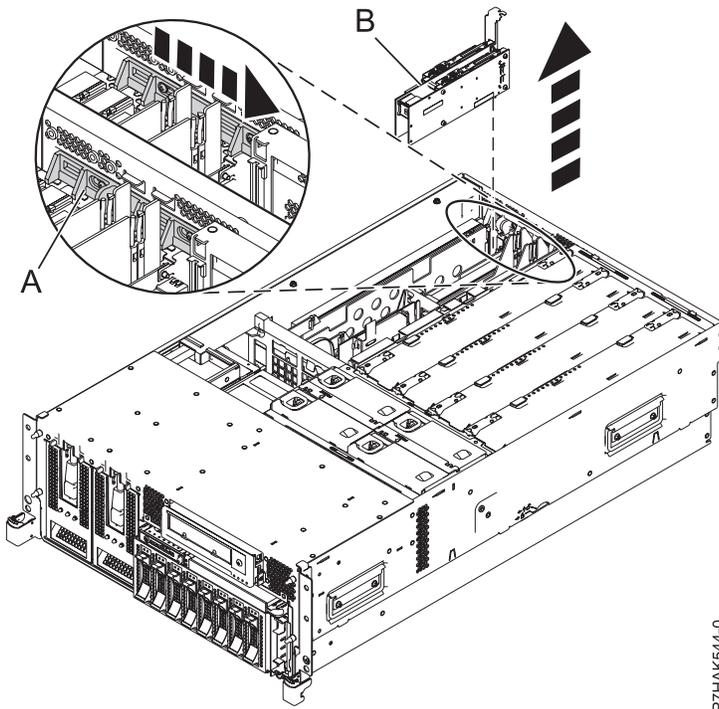
Note: Procedures performed on a PCIe adapter with the system power on in AIX, also known as hot-plug procedures, require the system administrator to take the PCIe adapter offline before performing the operation. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

If you do not have an HMC or SDMC, complete the following steps to remove a PCIe RAID and SSD SAS adapter with the system power on in the Linux environment:

Procedure

1. Ensure that the system meets the "Prerequisites for hot-plugging PCI adapters in Linux" on page 142.
2. "Verifying that the hot-plug PCI tools are installed for Linux" on page 142.
3. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
4. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
5. If you are removing a failing PCIe adapter, see . If you are removing the PCIe adapter for other reasons, continue to the next step.
6. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.
   a. Open the front rack door.
   b. Place the system unit in the service position.
   c. Remove or open the service access cover.
7. Determine which adapter you plan to remove.

   Note: Before performing a PCI hot-plug removal of storage devices, ensure that the file systems on those devices are unmounted.
8. Record the slot number and location of each adapter being removed.

   Note: Adapter slots are numbered on the rear of the system.
9. Run the **drmgr** command to enable an adapter to be removed:

   For example, to remove the PCI adapter in slot U7879.001.DQD014E-P1-C3, run this command:

   ```
   drmgr -c pci -r -s locationcode
   ```

Follow the instructions on the display to complete the task.

10. Slide the adapter latch **(A)** into the open position, as shown in the following figure.
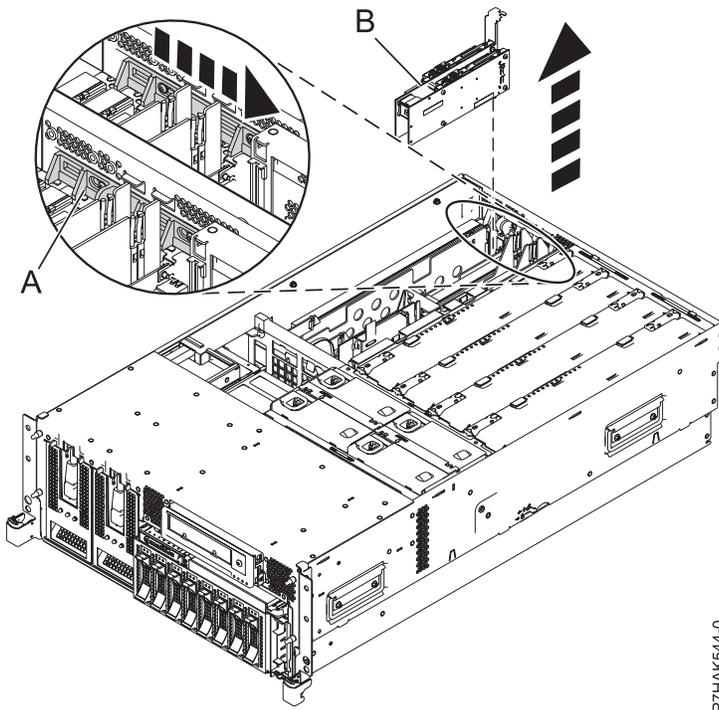
Figure 22. PCI RAID and SSD SAS adapter removed from the rack-mounted system unit

11. Carefully grasp the PCIe adapter **(B)** by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.

12. If you are removing a PCIe adapter as part of another procedure, return to that procedure. If not, continue to the next step.

13. If you plan to replace an adapter into the vacated slot, go to "Replacing a PCI RAID and SSD SAS adapter in the 33E/8B and 36E/8C server with the power on in the Linux environment" on page 42; otherwise, continue with the next step.

14. Seal the expansion slot using an expansion-slot cover.

15. Replace or close the service access cover and, if applicable, return the system to the operating position.

Related information:

➡ SAS RAID enablement and cache battery pack

Replacing a PCIe RAID and SSD SAS adapter in the 33E/8B and 36E/8C server

You can replace a PCIe RAID and SSD SAS adapter.

Replacing a PCIe RAID and SSD SAS adapter in the 33E/8B and 36E/8C server with the power off

You can replace a PCIe RAID and SSD SAS adapter with the system power off.

Before you begin

Attention: If you are installing a new or upgraded adapter, see "Installing a PCI RAID and SSD SAS adapter in the 33E/8B and 36E/8C server with the power off" on page 22 to obtain slot locations and required prerequisites. If you are replacing an adapter as part of a service procedure, continue to use the following procedure.

About this task

Use this procedure if you intend to remove a failing PCI RAID and SSD SAS adapter and replace it with the same type of adapter. The PCIe RAID and SSD SAS adapter is a double-wide adapter. Although it plugs into a single PCIe slot, two adjacent PCIe slots are required for installation.

You must have already completed the procedure "Removing a PCI RAID and SSD SAS adapter from the 33E/8B and 36E/8C server with the power off" on page 30 in order to have the slot powered off.

To replace a PCIe RAID and SSD SAS adapter with the system power off, do the following steps:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. Stop the system or logical partition. For instructions, see "Stopping a system or logical partition" on page 154.
4. Disconnect the power source from the system by unplugging the system.
5. If you are installing, removing, or replacing a PCIe adapter in a rack-mounted system, follow these steps to remove the service access cover.
    a. Open the front rack door.
    b. Place the system unit in the service position.
    c. Remove or open the service access cover.
6. Attach the wrist strap.

    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 before 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. Determine that slots 2 and 3 are open for the PCIe adapter.
8. If necessary, remove the adapter from the antistatic package.

    Attention: Avoid touching the components and gold connectors on the adapter.
9. Place the PCIe adapter, component-side up, on a flat, static-protective surface.
10. Label the location of each SSD as you transfer the SSDs from the replaced adapter to the same location on the new adapter you are installing. For information about replacing SSDs, see Replacing an SSD module on the PCIe RAID and SSD SAS adapter. Repeat this step for each SSD.
11. After all SSDs have been transferred to the new adapter, carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.
12. Press the PCIe adapter **(A)** firmly into its connector.

Attention: When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

13. Slide the adapter latch **(B)** back into place as shown in the following figure.

Figure 23. PCI RAID and SSD SAS adapter replaced in the rack-mounted system unit

14. If you are servicing a rack-mounted system, route the cables through the cable-management arm.
15. Replace or close the service access cover and, if applicable, return the system to the operating position.
16. Reconnect the power source to the system.
17. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.
18. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Related information:

SAS RAID enablement and cache battery pack

Removing and replacing a PCI RAID and SSD SAS adapter in the 33E/8B and 36E/8C server, with the power on in the AIX environment

You can replace a PCIe RAID and SSD SAS adapter with the system power on in the AIX environment.

About this task

Read the following notes to determine if this topic contains the correct procedure for the task to be performed.

Notes:

- Use this procedure if you intend to remove a failing PCIe RAID and SSD SAS adapter and replace it with the same type of adapter.
- If you plan to remove a failing adapter and leave the slot empty, see "Removing a PCI adapter from the 33E/8B and 36E/8C server, with the power on in the AIX environment" on page 11.
- Do not use this procedure to remove an existing adapter and install a different type of adapter. To install a different adapter, remove the existing adapter as described in "Removing a PCIe RAID and SSD SAS adapter from the 33E/8B and 36E/8C server, with the power on in the AIX environment" on page 32, then install the new adapter as described in "Installing a PCI adapter in the 33E/8B and 36E/8C server, with the power on in an AIX environment" on page 3.
- Procedures performed on a PCIe adapter with the system power on in AIX, also known as hot-plug procedures, require the system administrator to take the PCIe adapter offline before 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.

The PCIe RAID and SSD SAS adapter is a double-wide adapter. Although it plugs into a single PCIe slot, two adjacent PCIe slots are required for installation.

If your system is managed by an HMC, use the HMC to complete the steps for replacing the part in the system. See "Replacing a part by using the HMC" on page 147.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for replacing the part in the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to replace a PCIe RAID and SSD SAS adapter with the system power on in the AIX environment:

Procedure
1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. If you are removing a failing PCIe adapter, see . If you are removing the PCIe adapter for other reasons, continue to the next step.
4. If you are installing, removing, or replacing a PCI adapter in a rack-mounted system, follow these steps to remove the service access cover.
   a. Open the front rack door.
   b. Place the system unit in the service position.
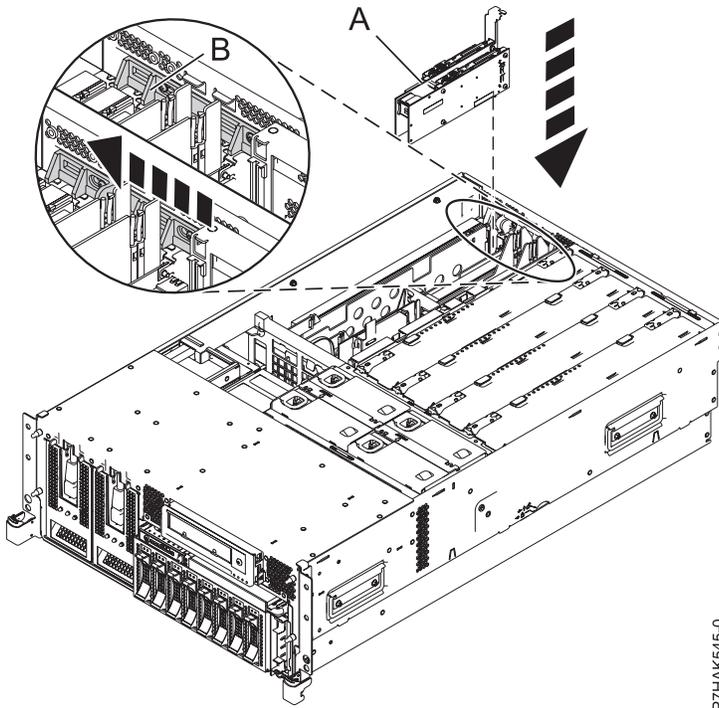   c. Remove or open the service access cover.
5. Locate the PCIe adapters you plan to remove.
6. Record the slot numbers and location of the adapter being removed.

   Note: PCI RAID and SSD SAS adapter slots are 3 and 2.
7. Ensure that any processes or applications that might use the adapter are stopped.
8. Follow these steps to replace a PCI adapter using the PCI Hot-Plug Manager menu in the AIX Diagnostic tools:
   a. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at the AIX command line.
   b. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
   c. At the FUNCTION SELECTION menu, select **Task Selection**, then press Enter.
   d. At the Task Selection list, select **PCI Hot Plug Manager**.
   e. Select **Unconfigure a Device**, then press Enter.

f. Press F4 (or Esc +4) to display the **Device Names** menu.

g. Select the adapter you are removing in the **Device Names** menu.

h. Use the Tab key to answer YES to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter. The ARE YOU SURE window displays.

i. Press Enter to verify the information. Successful unconfiguration is indicated by the OK message displayed next to the Command field at the top of the screen.

j. Press F3 (or Esc +3) twice to return to the Hot Plug Manager menu.

k. Select **Replace/remove PCI Hot Plug adapter**.

l. Select the slot that has the device to be removed from the system.

m. Select **Replace**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.

n. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.

9. Slide the adapter latch **(A)** into the open position, as shown in the following figure.

Figure 24. PCI adapter or filler plate removed from the rack-mounted system unit

10. Carefully grasp the PCIe adapter **(B)** by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.

11. If necessary, remove the replacement adapter from the antistatic package.

    Attention: Avoid touching the components and gold connectors on the adapter.

12. Label the location of each SSD as you transfer the SSDs from the replaced adapter to the same location on the new adapter you are installing. For information about replacing SSDs, see Replacing an SSD module on the PCIe RAID and SSD SAS adapter. Repeat this step for each SSD.

13. After all SSDs have been transferred to the new adapter, carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.

14. Press the adapter **(A)** firmly into its connector. See the following figure.

Attention: When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

15. Slide the adapter latch **(B)** back into place as shown in the following figure.
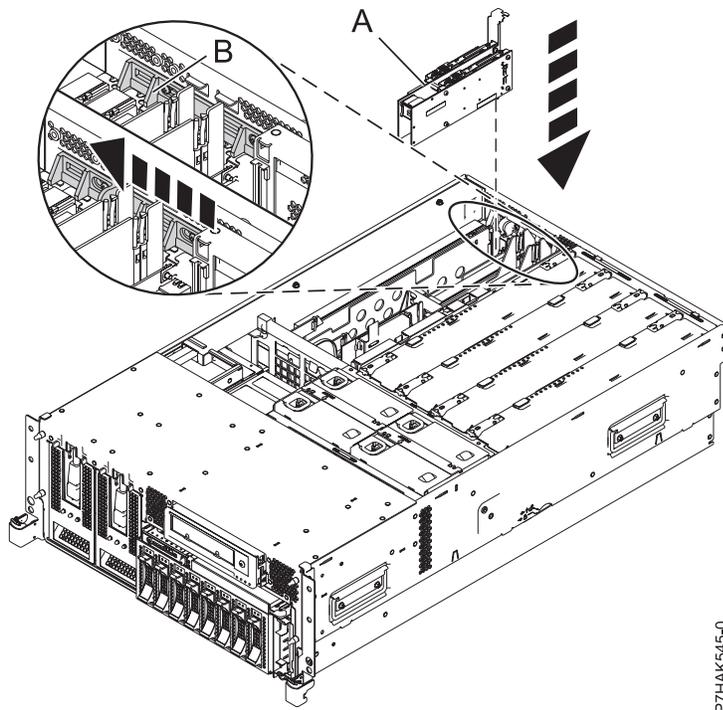
Figure 25. PCI RAID and SSD SAS adapter replaced in the rack-mounted system unit

16. Follow these steps to complete the PCI Hot Plug menus in the AIX Diagnostic tools and configure the device:

   a. Press enter and continue to follow the instructions in the system diagnostics until you receive a message that the replacement is successful. Successful replacement is indicated by the OK message displayed next to the **Command** field at the top of the menu.

   b. Press the F3 (or Esc+3) key to return to the **PCI Hot-Plug Manager** menu.

   c. Press the F3 (or Esc+3) key to return to the **TASK** selection list.

   d. Select **Log Repair Action**.

   e. Select the resource just replaced, press Enter, press Commit (F7 or ESC 7), then press Enter.

   f. Press F3 (or Esc+3) to return to **TASK Selection List**.

   g. Select **Hot Plug Task**, press enter.

   h. Select **PCI Hot Plug Manager**, then select **Configure a defined device**, then press Enter.

   i. Select the device just replaced from the list, then press Enter. The device is now configured.

   j. Press the F10 key to exit the diagnostic program.

   Note: If you are running the stand-alone diagnostics, do not exit the program completely.

17. Verify the PCIe adapter by using the following instructions:

   a. Did you replace the adapter with the system power on?

      • Yes - Go to the next step.

      • No - Load the diagnostic program by doing the following:

         – If AIX is available, boot AIX, log in as root or CELOGIN, then enter the **diag** command.

- – If AIX is not available, boot the stand-alone diagnostics
  b. Type the **diag** command if you are not already displaying the diagnostic menus
  c. Select **Advance Diagnostic Routines**, then select **Problem Determination**.
  d. Select the name of the resource just replaced from the menu. If the resource just replaced is not shown, choose the resource associated with it. Press Enter, then press **Commit** (F7 or Esc+7).
  e. Did the Problem Determination identify any problems?
     - No: Continue to the next step.
     - Yes: A problem is identified
       - – If you are a customer, record the error information, then contact your service provider.
       - – If you are an authorized service provider, return to map 210-5.
18. Press the F10 key to exit the diagnostic program.
19. Replace or close the service access cover and, if applicable, return the system to the operating position.
20. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Related information:

➦ SAS RAID enablement and cache battery pack

Replacing a PCI RAID and SSD SAS adapter in the 33E/8B and 36E/8C server with the power on in the Linux environment

You can replace a PCI RAID and SSD SAS adapter with the system power on in the Linux environment.

About this task

Use this procedure if you intend to remove a failing PCI RAID and SSD SAS adapter and replace it with the same type of adapter. The PCIe RAID and SSD SAS adapter is a double-wide adapter. Although it plugs into a single PCIe slot, two adjacent PCIe slots are required for installation.

You must have already completed the procedure "Removing a PCIe RAID and SSD SAS adapter from the 33E/8B and 36E/8C server, with the power on in the Linux environment" on page 35.

If your system is managed by an HMC, use the HMC to complete the steps for replacing the part in the system. See "Replacing a part by using the HMC" on page 147.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for replacing the part in the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to replace a PCIe RAID and SSD SAS adapter with the system power on in the Linux environment:
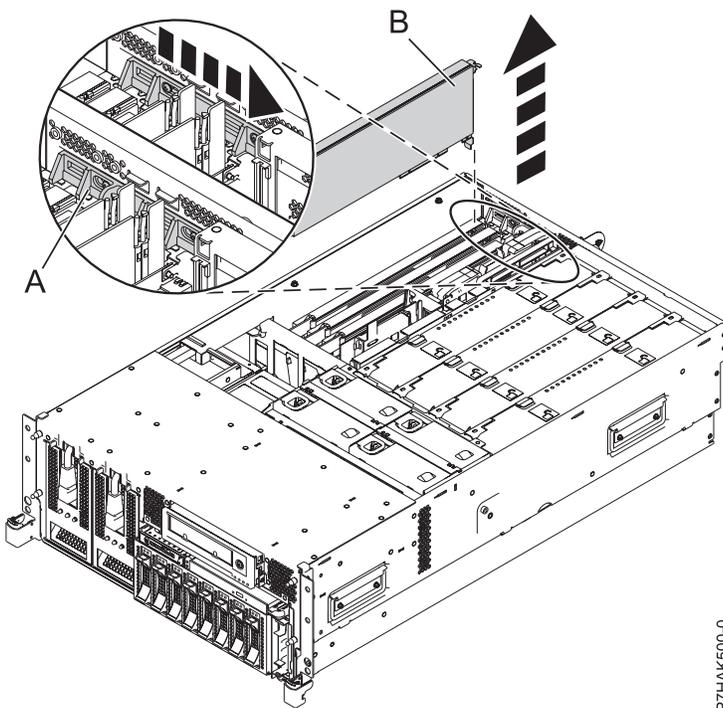
Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. If necessary, remove the PCIe adapter from the antistatic package.

   Attention: Avoid touching the components and gold connectors on the adapter.
4. Place the adapter, component-side up, on a flat, static-protective surface.

5. Label the location of each SSD as you transfer the SSDs from the replaced adapter to the same location on the new adapter you are installing. For information about replacing SSDs, see Replacing an SSD module on the PCIe RAID and SSD SAS adapter. Repeat this step for each SSD.

6. Run the **drmgr** 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:

   ```
   drmgr -c pci -r -s locationcode
   ```

   Follow the instructions on the display to complete the task.

7. Press the adapter firmly into its connector.

   Attention: When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

8. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the system backplane.

9. Press the adapter **(A)** firmly into its connector.

   Attention: When you install an adapter into the system, be sure that it is completely and correctly seated in its connector.

10. Slide the adapter latch **(B)** back into place as shown in the following figure.
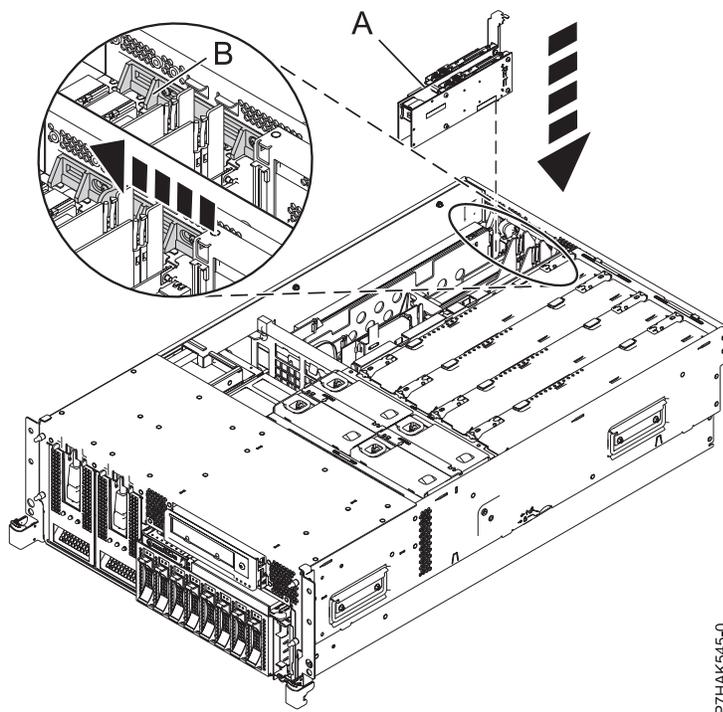
Figure 26. PCI RAID and SSD SAS adapter replaced in the rack-mounted system unit

11. 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
    ```

12. If you are servicing a rack-mounted system, route the cables through the cable-management arm.

13. Replace or close the service access cover and, if applicable, return the system to the operating position.

14. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Related information:

➡ SAS RAID enablement and cache battery pack

Model 33E/8B and 36E/8C PCI adapter dividers

You might need to remove, replace, or install PCI adapter dividers. Use the procedures in this section to perform these tasks.

Removing a PCI adapter divider from the 33E/8B and 36E/8C server

You can remove a PCI adapter divider.

About this task

The following procedure describes the removal of PCI adapter dividers with the system power off. This procedure can be done with the system power on by omitting the steps related to powering off the system.

To remove a divider, do the following steps:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. Stop the system or logical partition. For instructions, see "Stopping a system or logical partition" on page 154.
4. Disconnect the power source from the system by unplugging the system.
5. Remove the unit's cover if you are installing or removing a PCI adapter divider.
6. Slide the adapter latch **(A)** into the open position, as shown in the following figure.
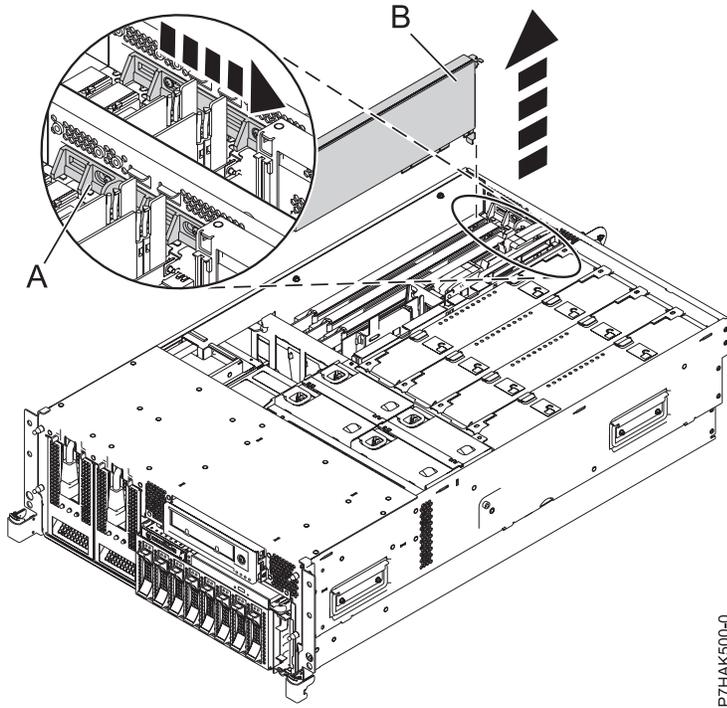
Figure 27. PCI adapter or filler plate removed from the rack-mounted system unit

7. Flex the front edge **(A)** of the PCI adapter divider out of the bracket and toward the rest of the divider.

8. Pull the back edge of the divider away from the retention notches **(B)**.
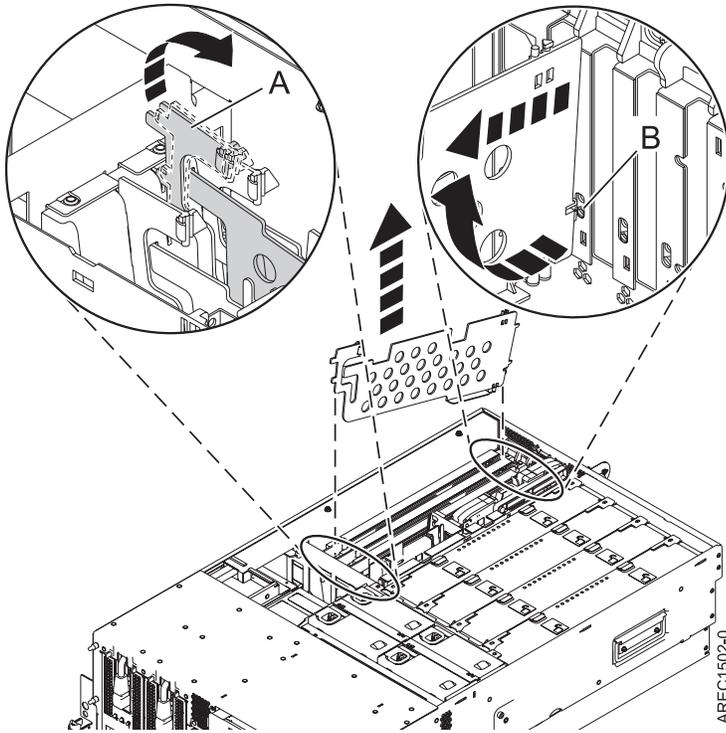
Figure 28. PCI-adapter divider removed from the system unit

9. If you are removing the PCI adapter divider as part of another procedure, return to that procedure now. To replace the divider, see "Installing a PCI adapter divider in the 33E/8B and 36E/8C server" on page 47. To close up the system, continue to the next step.
10. Slide the adapter latch **(B)** back into place as shown in the following figure.
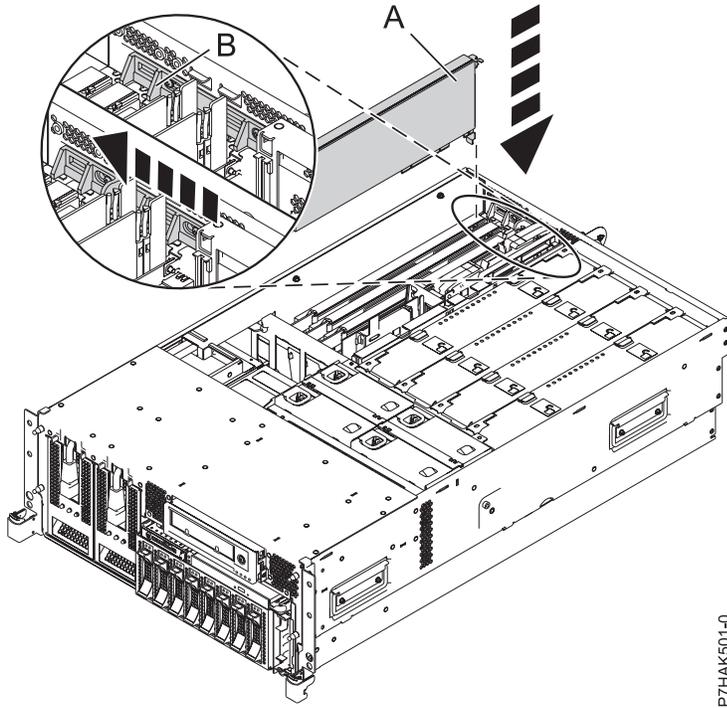
Figure 29. PCI adapter replaced in the rack-mounted system unit

11. Replace or close the service access cover and, if applicable, return the system to the operating position.
12. Reconnect the power source to the system.
13. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.

Installing a PCI adapter divider in the 33E/8B and 36E/8C server

You can install a PCI adapter divider.

About this task

The following procedure describes the installation of a PCI adapter divider with the system power off. This procedure can be done with the system power on by omitting the steps related to powering on the system.

To install a divider, do the following steps:

Procedure

1. Locate the PCI adapter divider slot that you want to use. To access the divider slots, see the first 6 steps in "Removing a PCI adapter divider from the 33E/8B and 36E/8C server" on page 44.
2. Slide the adapter latch (A) into the open position, as shown in the following figure.
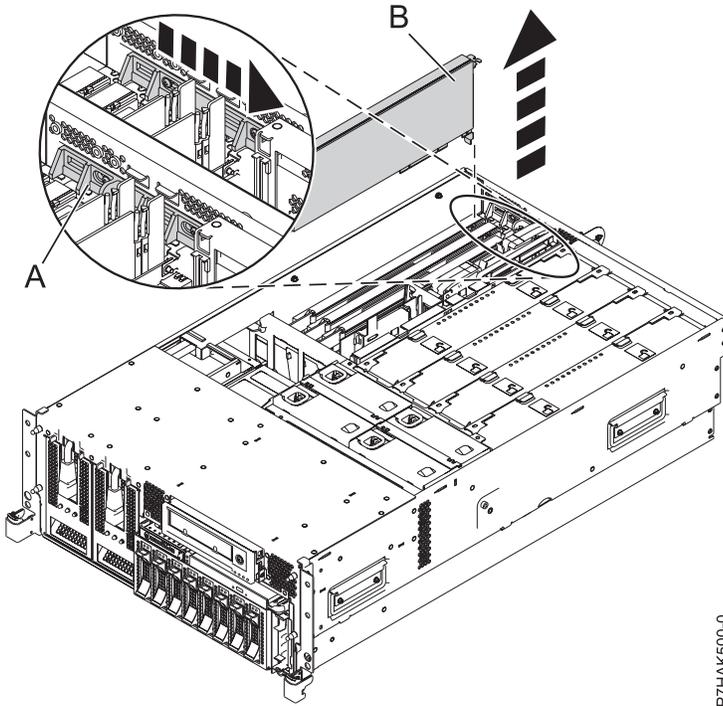
Figure 30. PCI adapter or filler plate removed from the rack-mounted system unit

3. Carefully grasp the PCI adapter divider by its top edge and align the back edge of the divider with the retention notches **(A)**.

4. Insert the front edge of the divider **(B)** into the slots and then press the divider into place.
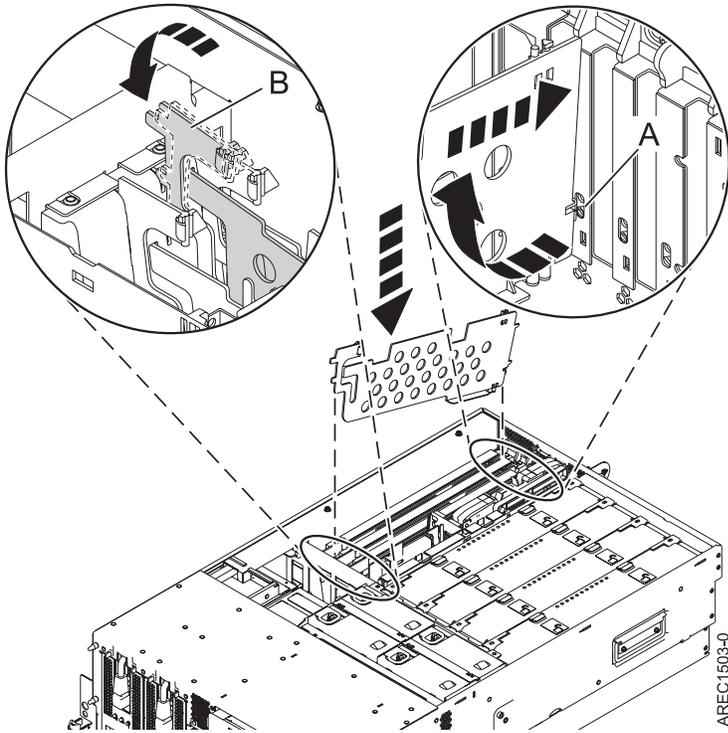
Figure 31. PCI-adapter divider replaced in the system unit

5. Slide the adapter latch **(B)** back into place as shown in the following figure.
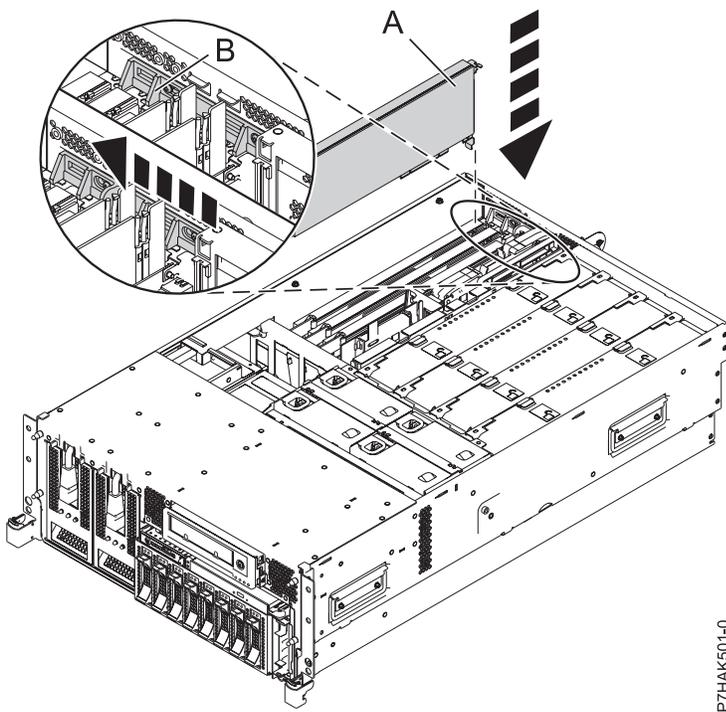
Figure 32. PCI adapter replaced in the rack-mounted system unit

6. Replace or close the service access cover and, if applicable, return the system to the operating position.
7. Reconnect the power source to the system.
8. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.

Model 57/96 expansion units, PCI adapters and cassettes

You can remove, replace, or install PCI adapter cassettes.

Important:
- Fibre Channel Adapters (5735 or 5774) installed in OS logical partitions will post errors at initial program load (IPL) if there is no device or wrap plug attached to each of the adapter's ports. Make sure that every Fibre Channel Adapter (5735 or 5774) that is installed in OS logical partition has either a wrap plug or a device attached to each of the adapter's ports. If you are exchanging a 5735 or 5774 Fibre Channel IOA, the external storage subsystem must be updated to use the worldwide port name of the new 5735 or 5774 IOA. For instructions, see "Updating the worldwide port name for a new 5735 or 5774 IOA." on page 143
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache might have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

Installing a PCI adapter contained in a cassette

You can install a PCI adapter.

Installing a PCI adapter contained in a cassette with the power off

You can install a PCI adapter.

About this task

Before installing or replacing a feature, ensure that the software required to support the feature is installed on your system. For information about software prerequisites, see the IBM Prerequisite website at add URL here. If the required software is not installed, see the following websites to download it, and then install it before continuing:
- To download firmware and software updates and fixes, see the Fix Central website at add URL here.
- To download Hardware Management Console (HMC) updates and fixes, see Hardware Management Console Support and downloads.

Notes:
- If the system is partitioned, you must determine the partition owning the I/O slot. Once the adapter is installed, the I/O slot must be powered on in the operating system.
- If an I/O slot on a partitioned system is not owned by a partition, then the I/O slot cannot be powered on.
- Adding an I/O slot to a partition using dynamic logical partitioning (DLPAR) will power on the I/O slot as part of the DLPAR add. For information about DLPAR, see Dynamic Logical Partitioning.
- To learn more about working in a partitioned environment, see Logical partitioning.

If you do not have an HMC or SDMC, complete this procedure to install a PCI adapter, complete the following steps to install a PCI adapter with the system power off:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. To determine in which slot to place the PCI adapter, refer to the placement guide for information regarding slot restrictions for the adapters that can be used in this system.
4. Stop the system or logical partition. For instructions, see "Stopping a system or logical partition" on page 154.
5. Disconnect the power source from the system by unplugging the system.
6. Determine the location of PCI adapter in the system.
7. Remove the PCI adapter cassette as described in the following substeps.

   a. Remove the PCI adapter EMC shield **(A)** as shown in the following figure.

Figure 33. Remove the EMC shield

   b. Lift up the lower cassette handle **(B)** as shown in the following figure. Pull the PCI cassette **(C)** out of the system.
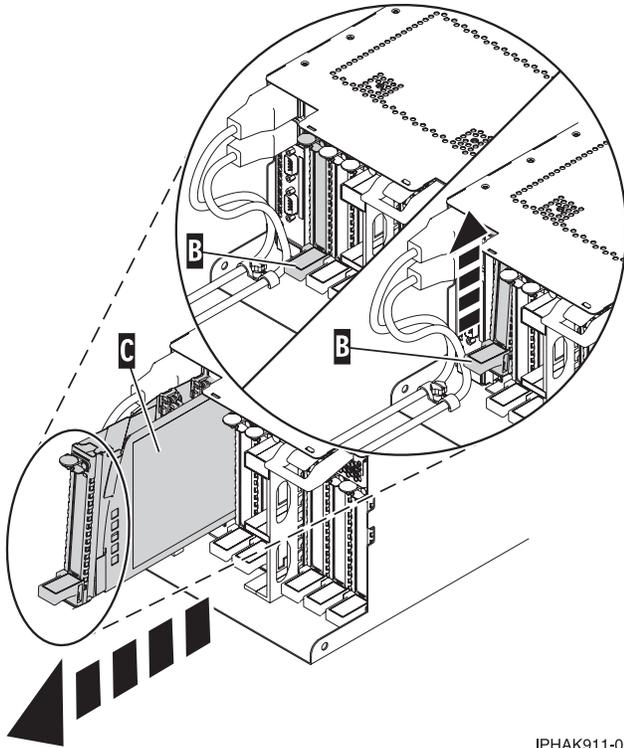
IPHAK911-0

Figure 34. PCI adapter cassette removed from the system unit

8. Install the adapter into the PCI adapter cassette. See the following topics:
   - "PCI adapter single-width, third generation cassette" on page 80
   - "PCI adapter double-wide cassette" on page 93
9. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be locked in the system.
10. Install the PCI adapter cassette as described in the following substeps:
    a. Slide the cassette **(B)** into the cassette slot as shown in the following figure. 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.

IPHAK912-0

Figure 35. PCI adapter cassette installed in the system unit

     b. Replace the EMC shield **(C)** as shown in the following figure.
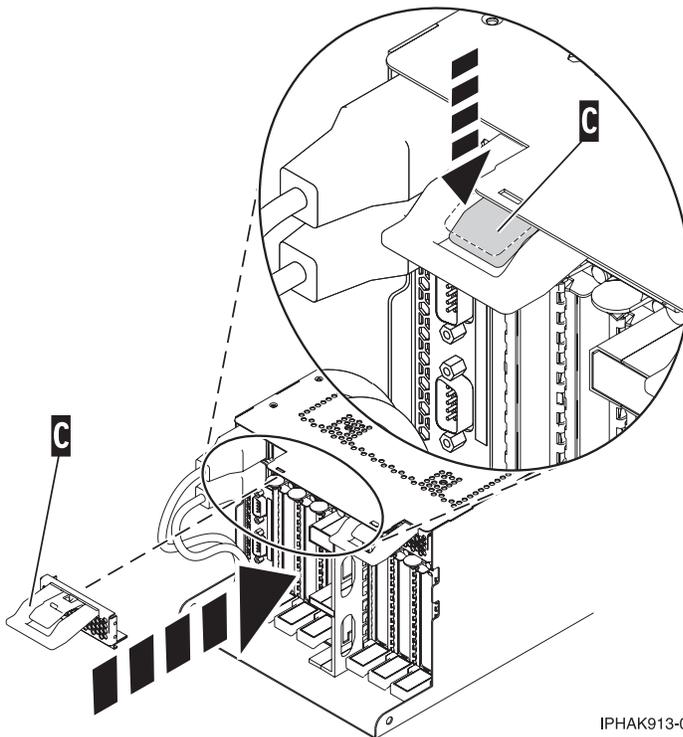
IPHAK913-0

Figure 36. PCI adapter EMC shield in the closed position

11. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.
12. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Installing a PCI adapter contained in a cassette with the power on in the AIX environment

You can install a PCI adapter with the power on in the AIX environment.

About this task

If your system is managed by an HMC, use the HMC to complete the steps for installing the part in the system. See "Installing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to install the server. For instructions, see Installing a part by using the Systems Director Management Console.

Notes:
- If the system is partitioned, you must determine the partition owning the I/O slot. Once the adapter is installed, the I/O slot must be powered on in the operating system.
- If an I/O slot on a partitioned system is not owned by a partition, then the I/O slot cannot be powered on.
- Adding an I/O slot to a partition using dynamic logical partitioning (DLPAR) will power on the I/O slot as part of the DLPAR add. For information about DLPAR, see Dynamic Logical Partitioning.
- To learn more about working in a partitioned environment, see Logical partitioning.

If you do not have an HMC or SDMC, complete the following steps to install a PCI adapter with the system power on in the AIX environment:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. To determine in which slot to place the PCI adapter, refer to the placement guide for information regarding slot restrictions for the adapters that can be used in this system.
4. Refer to "PCI hot-plug manager access for AIX" on page 139, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.
5. From the PCI Hot-Plug Manager menu, select **Add a PCI Hot-Plug Adapter** and press Enter. The Add a Hot-Plug Adapter window displays.
6. Select the appropriate PCI slot from the ones listed on the screen, and press Enter.
7. Locate the PCI adapter slot and cassette you want to use.
8. If the cassette you want to use does not contain a PCI adapter, continue to the next step. If the cassette you want to use does contain an active PCI adapter, see "Removing a PCI adapter contained in a cassette from the system with the power on in the AIX environment" on page 64.
9. Remove the PCI adapter cassette as described in the following substeps.
   a. Remove the PCI adapter EMC shield **(A)** as shown in the following figure.
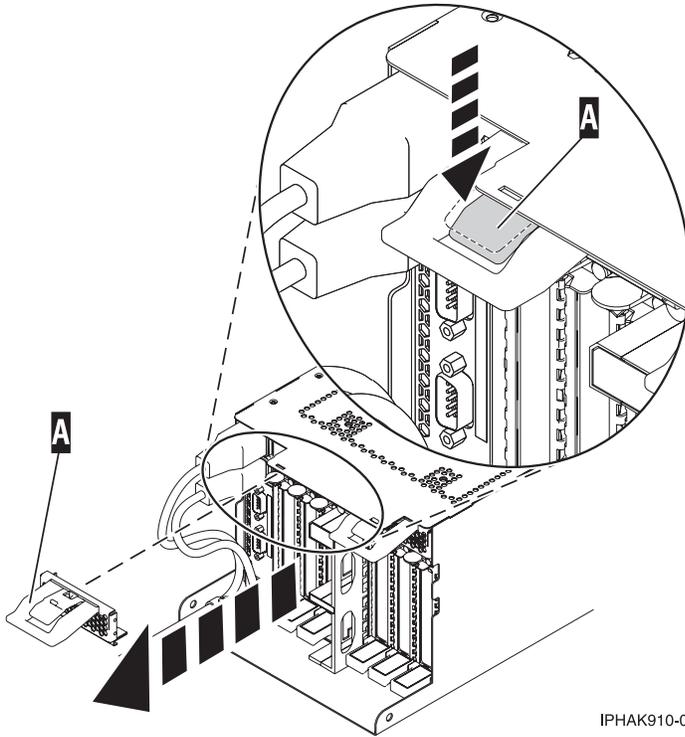
IPHAK910-0

Figure 37. Remove the EMC shield

b. Lift up the lower cassette handle **(B)** as shown in the following figure. Pull the PCI cassette **(C)** out of the system.
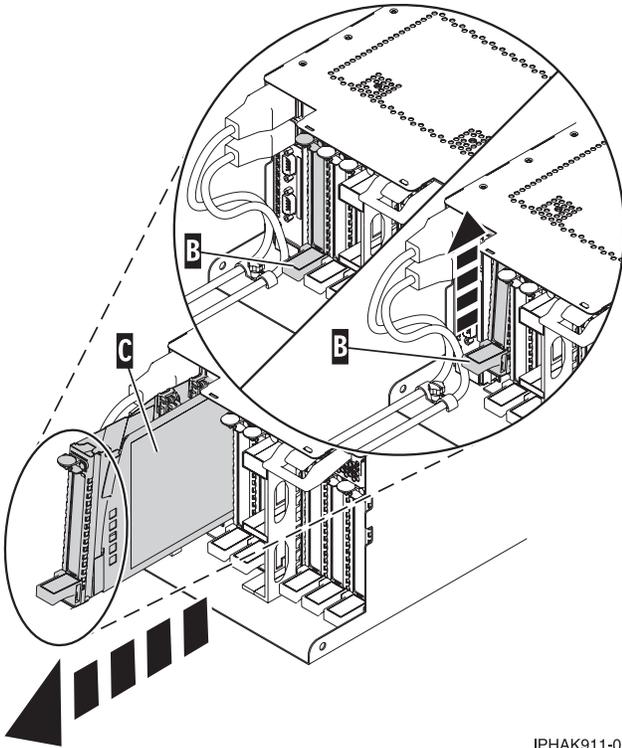
Figure 38. PCI adapter cassette removed from the system unit

10. Install the adapter into the PCI adapter cassette. See the following topics:
    - "PCI adapter single-width, third generation cassette" on page 80
    - "PCI adapter double-wide cassette" on page 93
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. Install the PCI adapter cassette as described in the following substeps:
    a. Slide the cassette **(B)** into the cassette slot as shown in the following figure. 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.

IPHAK912-0

Figure 39. PCI adapter cassette installed in the system unit

    b. Replace the EMC shield **(C)** as shown in the following figure.
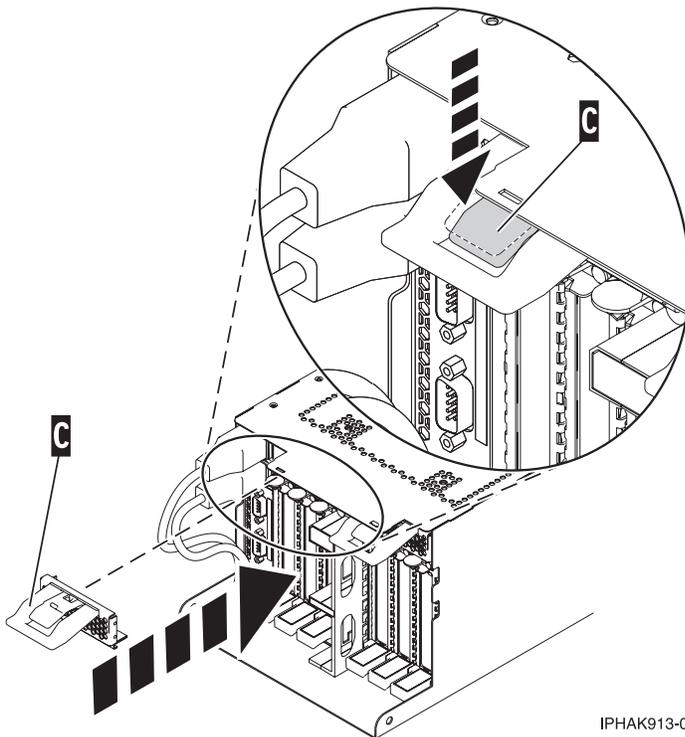
IPHAK913-0

Figure 40. PCI adapter EMC shield in the closed position

13. Enter `cfgmgr` to configure the adapter.
14. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Installing a PCI adapter contained in a cassette with the power on in the Linux environment

You can install a PCI adapter with the power on in the Linux environment.

About this task

If your system is managed by an HMC, use the HMC to complete the steps for installing the part in the system. See "Installing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to install the server. For instructions, see Installing a part by using the Systems Director Management Console.

Notes:
- If the system is partitioned, you must determine the partition owning the I/O slot. Once the adapter is installed, the I/O slot must be powered on in the operating system.
- If an I/O slot on a partitioned system is not owned by a partition, then the I/O slot cannot be powered on.
- Adding an I/O slot to a partition using dynamic logical partitioning (DLPAR) will power on the I/O slot as part of the DLPAR add. For information about DLPAR, see Dynamic Logical Partitioning.
- To learn more about working in a partitioned environment, see Logical partitioning.

If you do not have an HMC or SDMC, complete the following steps to install a PCI adapter with the system power on in the Linux environment:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. To determine in which slot to place the PCI adapter, refer to the placement guide for information regarding slot restrictions for the adapters that can be used in this system.
4. Log in to the system console as the root user.
5. Use the lsslot tool to list the hot-plug PCI slots that are available in the server or partition:

   `lsslot -c pci -a`

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

   ```
   # Slot            Description              Device(s)
   U7879.001.DQD014E-P1-C1 PCI-X capable, 64 bit, 133MHz slot Empty
   U7879.001.DQD014E-P1-C4 PCI-X capable, 64 bit, 133MHz slot Empty
   U7879.001.DQD014E-P1-C5 PCI-X capable, 64 bit, 133MHz slot Empty
   ```

   Select the appropriate empty PCI slot from the ones listed by the command.
6. Remove the PCI adapter cassette as described in the following substeps.
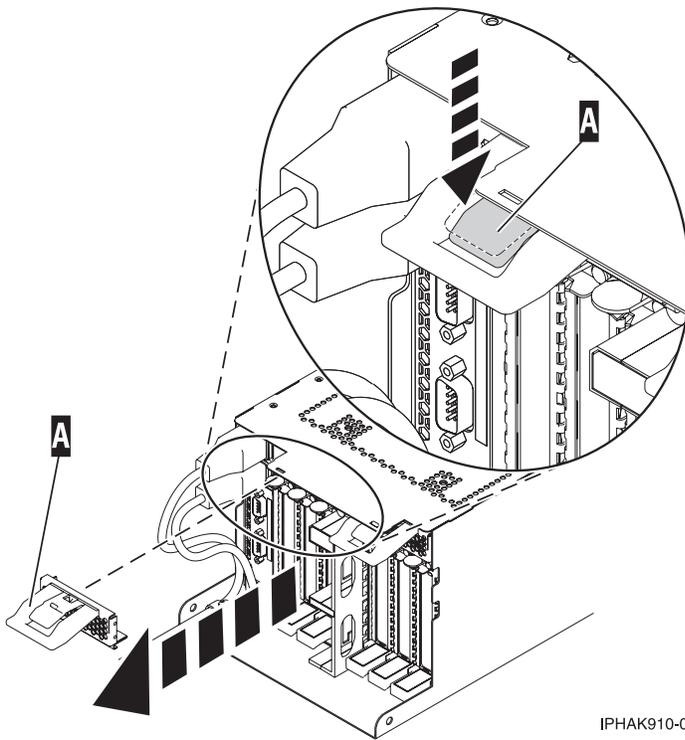   a. Remove the PCI adapter EMC shield **(A)** as shown in the following figure.
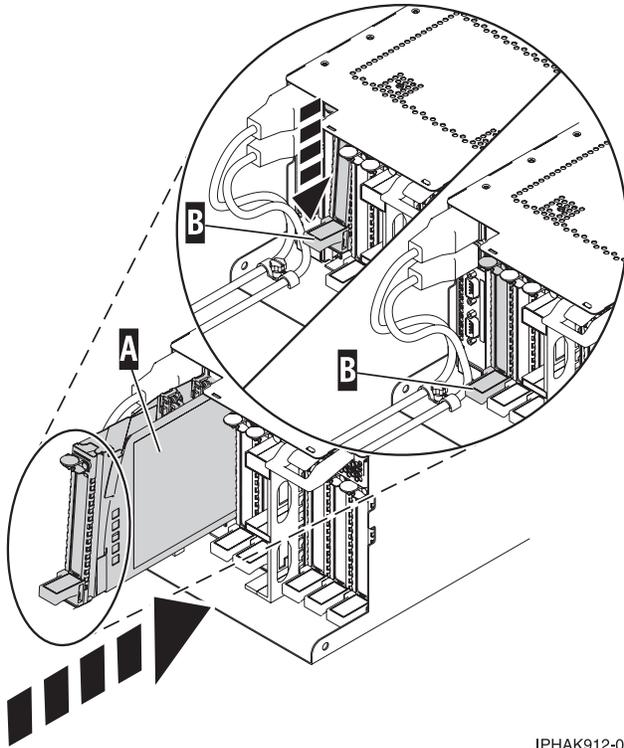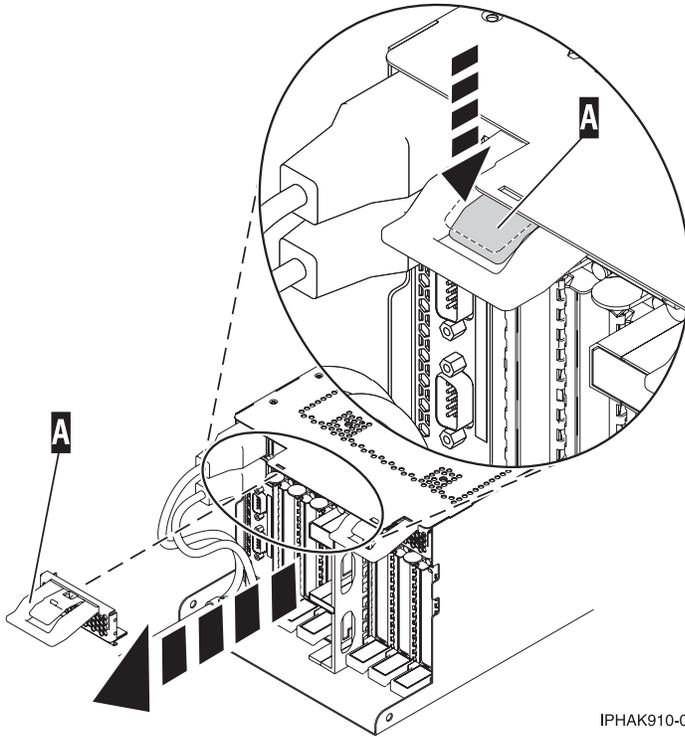
IPHAK910-0

Figure 41. Remove the EMC shield

b. Lift up the lower cassette handle **(B)** as shown in the following figure. Pull the PCI cassette **(C)** out of the system.
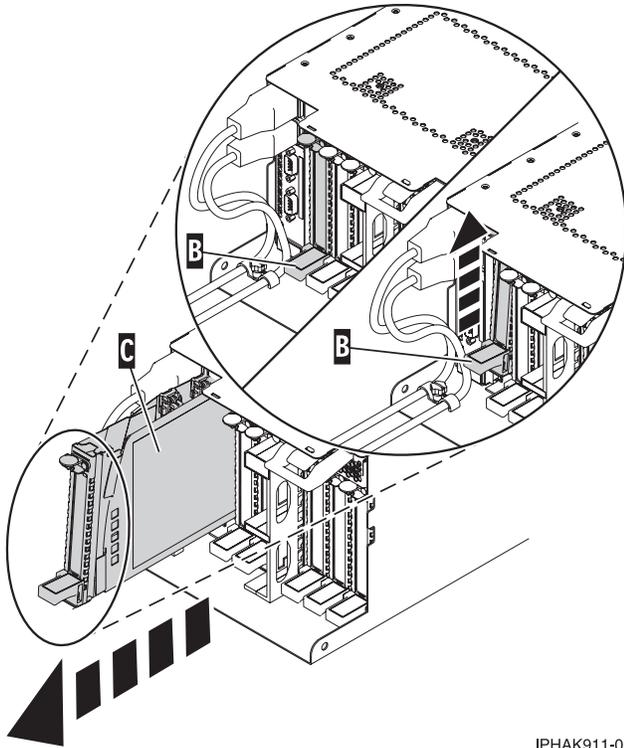
*Figure 42. PCI adapter cassette removed from the system unit*

7. Install the adapter into the PCI adapter cassette. See the following topics:
   - "PCI adapter single-width, third generation cassette" on page 80
   - "PCI adapter double-wide cassette" on page 93

8. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be locked in the system.

9. Run the **drmgr** command to enable an adapter to be installed.

   For example, to install an adapter in slot U7879.001.DQD014E-P1-C3, run:

   ```
   drmgr -c pci -r -s locationcode
   ```

   The following displays:

   ```
   The visual indicator for the specified PCI slot has been set to the
   identify state. Press Enter to continue or enter x to exit.
   ```

10. Press Enter.

    The following displays:

    ```
    The visual indicator for the specified PCI slot has been set to the
    action state. Insert the PCI card into the identified slot, connect any
    devices to be configured and press Enter to continue. Enter x to exit.
    ```

11. Install the PCI adapter cassette as described in the following substeps: If not, skip to step 12 on page 62.

    a. Slide the cassette **(B)** into the cassette slot as shown in the following figure. 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.
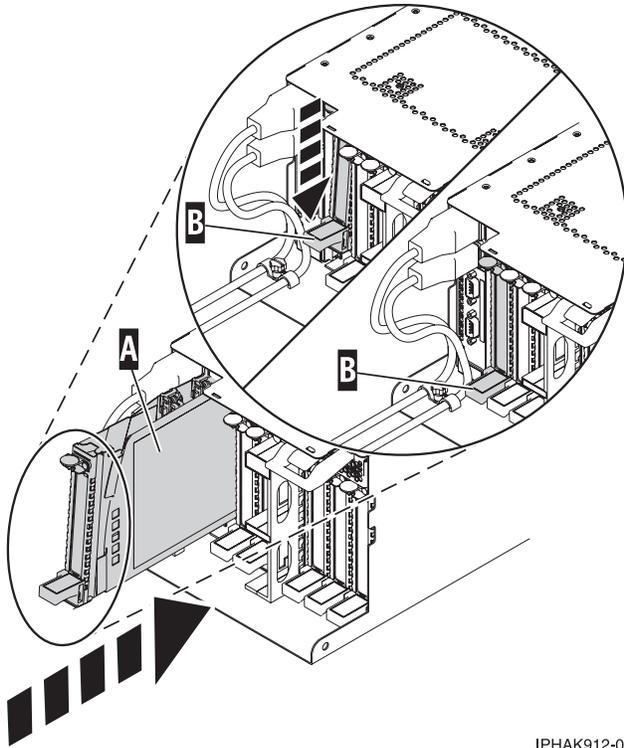
IPHAK912-0

Figure 43. PCI adapter cassette installed in the system unit

   b. Replace the EMC shield **(C)** as shown in the following figure.
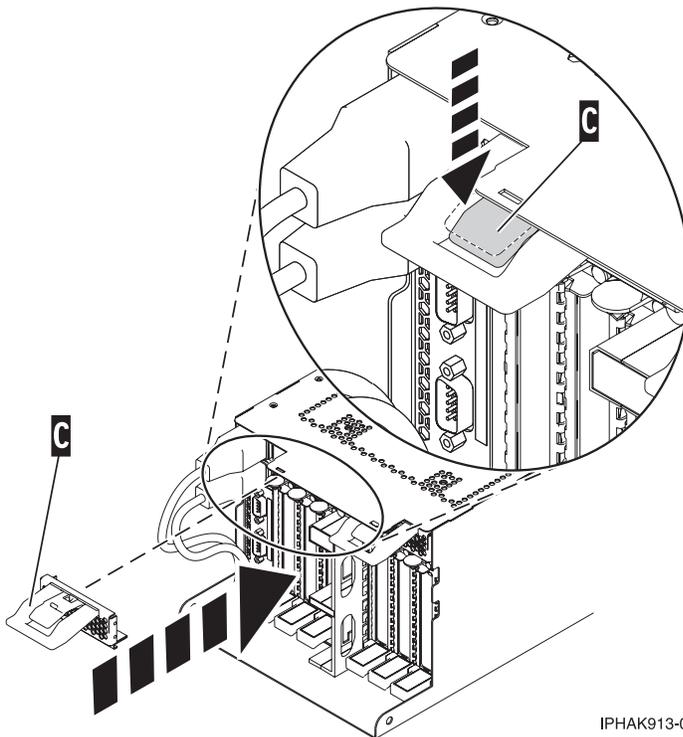
IPHAK913-0

Figure 44. PCI adapter EMC shield in the closed position

12. Use the **lsslot** command to verify that U7879.001.DQD014E-P1-C3 is occupied.

    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
    ```

Removing a PCI adapter contained in a cassette from the system

You can remove a PCI adapter.

Removing a PCI adapter contained in a cassette from the system with the power off

You can remove a PCI adapter with the system power off.

About this task

If your system is managed by a HMC, use the HMC to complete the steps for removing a part from the system. See "Removing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for removing a part from the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to remove a PCI adapter with the system power off:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. Stop the system or logical partition. For instructions, see "Stopping a system or logical partition" on page 154.
4. Disconnect the power source from the system by unplugging the system.
5. Determine the location of PCI adapter in the system.
6. Remove the PCI adapter cassette from the system. Follow these substeps:
   a. Remove the PCI adapter EMC shield **(A)** as shown in the following figure.
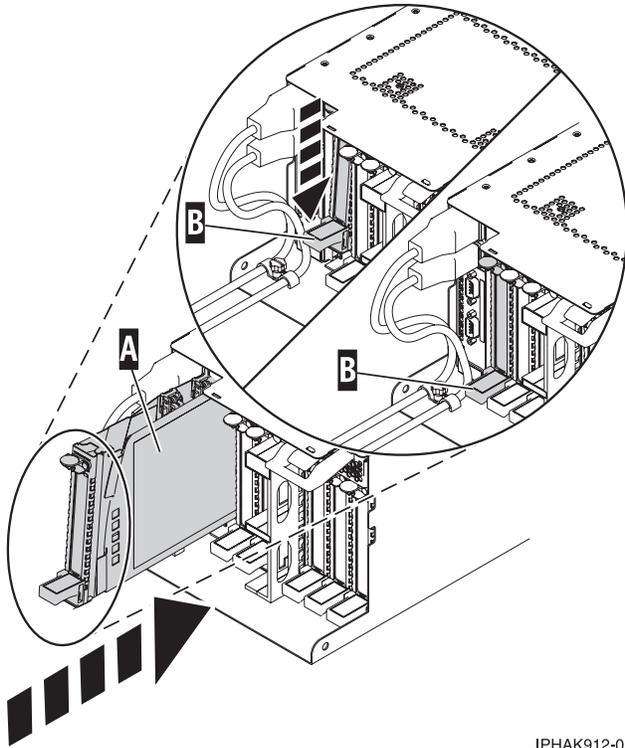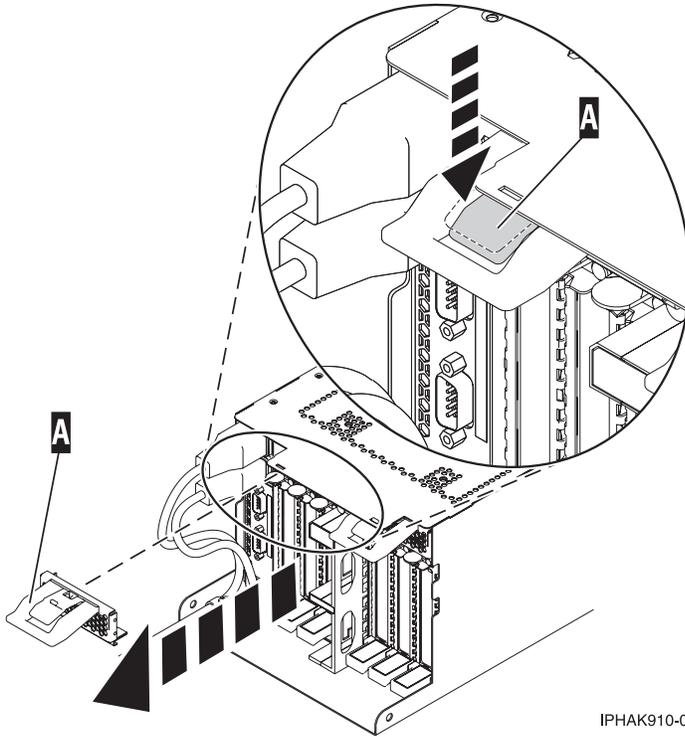
IPHAK910-0

Figure 45. Remove the EMC shield

b. Lift up the lower cassette handle **(B)** as shown in the following figure. Pull the PCI cassette **(C)** out of the system.
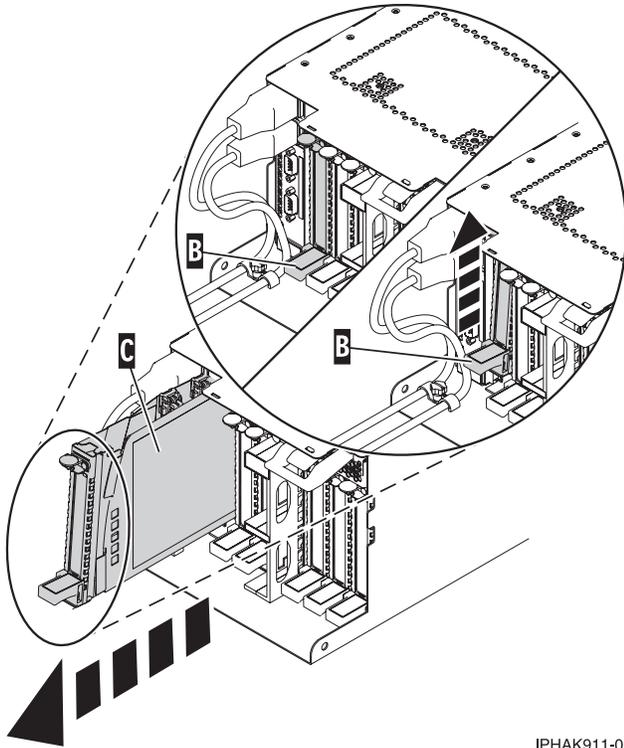
*Figure 46. PCI adapter cassette removed from the system unit*

7. Place the cassette with the cover facing up on an approved ESD surface.

   Note: The cover will have a label on it.

8. To remove the adapter from the cassette, refer to "PCI adapter single-width and double-width cassettes" on page 112.

Removing a PCI adapter contained in a cassette from the system with the power on in the AIX environment

You can remove a PCI adapter with the system power on in the AIX environment.

About this task

Notes:

1. Use this procedure to remove a PCI adapter and leave the slot in the system unit empty.
2. If the adapter that is removed will be placed into a different slot or system, complete this removal procedure, then install the adapter as described in "Installing a PCI adapter contained in a cassette with the power on in the AIX environment" on page 54.
3. Procedures performed on a PCI adapter with the system power on in AIX, 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.

If your system is managed by a HMC, use the HMC to complete the steps for removing a part from the system. See "Removing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for removing a part from the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to remove a PCI adapter with the system power on in the AIX environment:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Determine the location of PCI adapter in the system.
3. Record the slot number and location of each adapter being removed.

   Note: Adapter slots are numbered on the rear of the system unit.
4. Ensure that any processes or applications that might use the adapter are stopped.
5. Follow these steps to remove a PCI adapter using the PCI Hot-Plug Manager menu in the AIX Diagnostic tools:
   a. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at the AIX command line.
   b. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
   c. At the FUNCTION SELECTION menu, select **Task Selection**, then press Enter.
   d. At the Task Selection list, select **PCI Hot Plug Manager**.
   e. Select **Unconfigure a Device**, then press Enter.
   f. Press F4 (or Esc +4) to display the **Device Names** menu.
   g. Select the adapter you are removing in the **Device Names** menu.
   h. Use the Tab key to answer NO to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter. The ARE YOU SURE window displays.
   i. Press Enter to verify the information. Successful unconfiguration is indicated by the OK message displayed next to the Command field at the top of the screen.
   j. Press F4 (or Esc +4) twice to return to the Hot Plug Manager menu.
   k. Select **Replace/remove PCI Hot Plug adapter**.
   l. Select the slot that has the device to be removed from the system.
   m. Select **remove**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.
   n. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
6. Label, and then disconnect all cables attached to the adapter you plan to remove.
7. Before handling any PCI adapter, see "Handling static-sensitive devices" on page 135.
8. Remove the PCI adapter cassette from the system. Follow these substeps:
   a. Remove the PCI adapter EMC shield **(A)** as shown in the following figure.
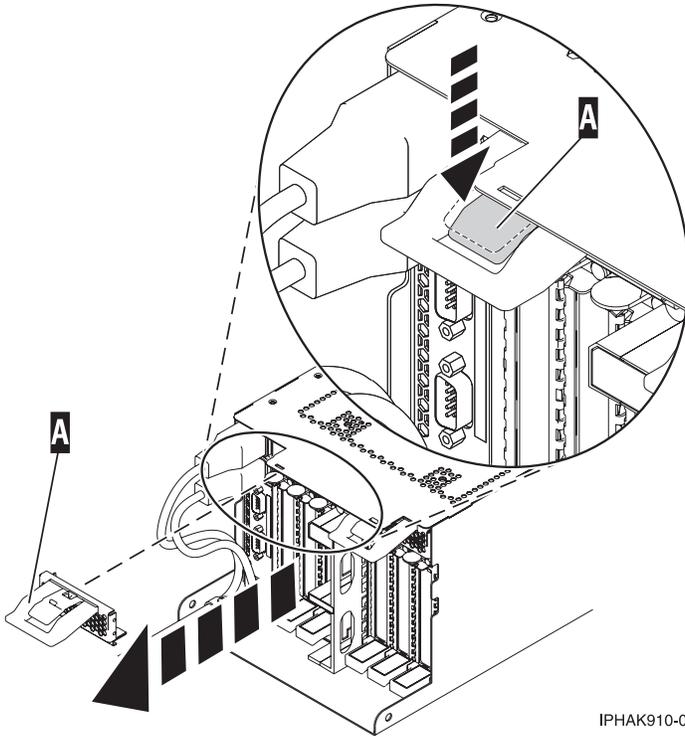
IPHAK910-0

Figure 47. Remove the EMC shield

b. Lift up the lower cassette handle **(B)** as shown in the following figure. Pull the PCI cassette **(C)** out of the system.
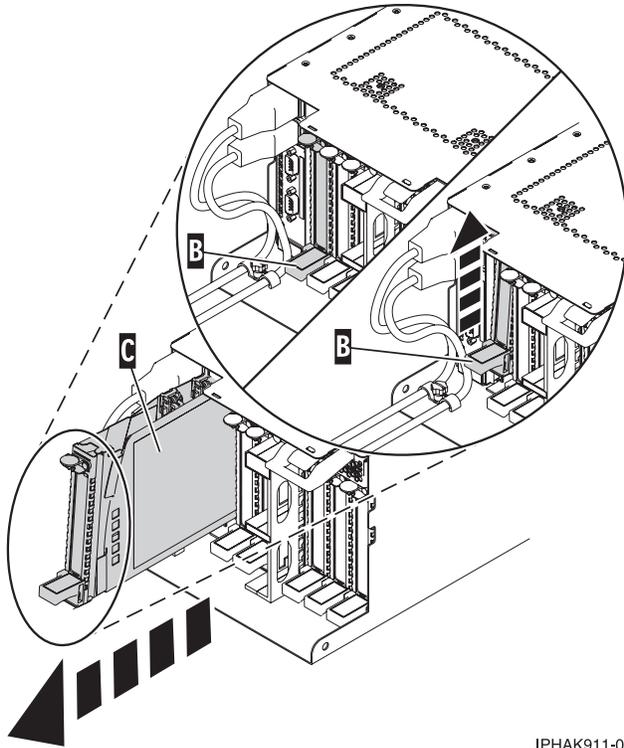
IPHAK911-0

Figure 48. PCI adapter cassette removed from the system unit

9. Place the cassette with the cover facing up on an approved ESD surface.

   Note: The cover will have a label on it.

10. Continue to follow the screen instructions until you receive a message that the adapter removal is successful. Successful removal is indicated by the OK message displayed next to the Command field at the top of the screen.

11. If you have other adapters to remove, press the F3 key to return to the PCI Hot-Plug Manager menu and then return to step 6 on page 65.

    or

    If you do not have other adapters to remove, continue with the next step.

12. Press F10 to exit the Hot-Plug Manager.

13. Run the **diag -a** command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.

14. Place an empty cassette into the unused PCI slot for proper air flow. The procedure is complete.
    - To install an adapter in the system, see "Installing a PCI adapter contained in a cassette with the power on in the AIX environment" on page 54.

Removing a PCI adapter contained in a cassette from the system with the power on in the Linux environment

You can remove a PCI adapter with the system power on in the Linux environment.

About this task

If your system is managed by a HMC, use the HMC to complete the steps for removing a part from the system. See "Removing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for removing a part from the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to remove a PCI adapter with the system power on in the Linux environment:

Procedure

1. Ensure that the system meets the "Prerequisites for hot-plugging PCI adapters in Linux" on page 142.
2. Verify that the Linux, hot-plug PCI tools are installed. See "Verifying that the hot-plug PCI tools are installed for Linux" on page 142.
3. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
4. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
5. Determine the location of PCI adapter in the system.
6. Label, and then disconnect all cables attached to the adapter you plan to remove.
7. Run the **drmgr** command to enable an adapter to be removed:

   For example, to remove the PCI adapter in slot U7879.001.DQD014E-P1-C3 run this command:

   ```
   drmgr -c pci -r -s locationcode
   ```

   Follow the instructions on the display to complete the task.
8. Remove the PCI adapter cassette from the system. Follow these steps:

   a. Remove the PCI adapter EMC shield **(A)** as shown in the following figure.
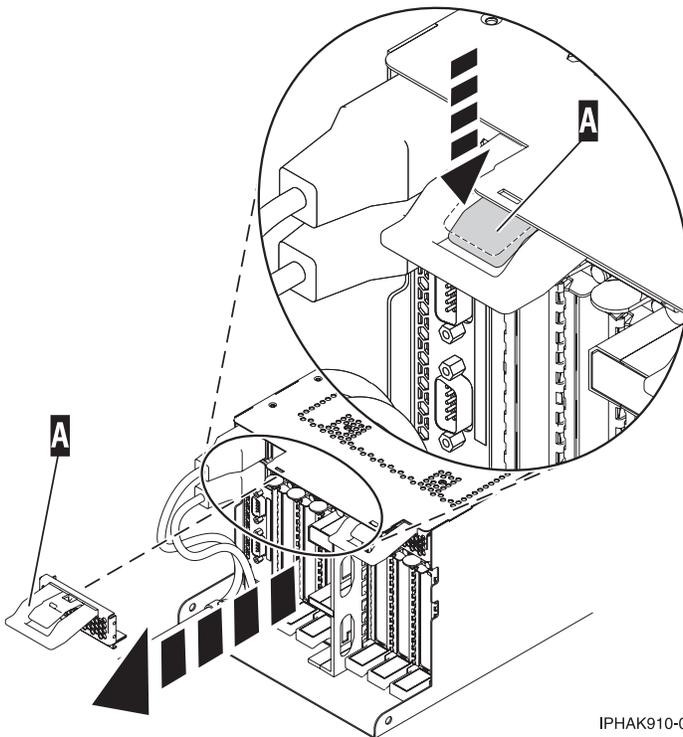
IPHAK910-0

Figure 49. Remove the EMC shield

   b. Lift up the lower cassette handle **(B)** as shown in the following figure. Pull the PCI cassette **(C)** out of the system.
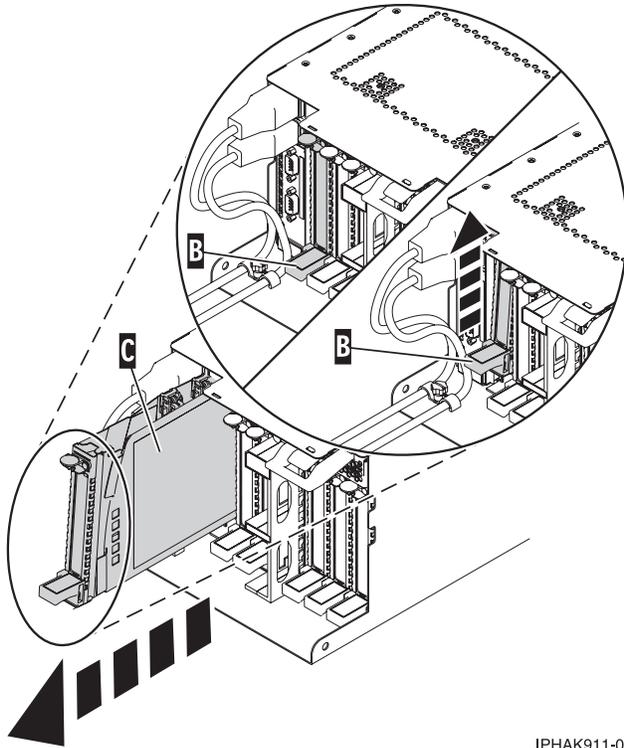
Figure 50. PCI adapter cassette removed from the system unit

9. Place the cassette with the cover facing up on an approved ESD surface.

   Note: The cover will have a label on it.

10. Remove the adapter from the PCI adapter cassette.

Results

To replace the adapter in the system, see "Replacing a PCI adapter contained in a cassette in the system with the power on in the Linux environment" on page 77.

Replacing a PCI adapter contained in a cassette in the system

You can replace a PCI adapter.

Important:
- Fibre Channel Adapters (5735 or 5774) installed in OS logical partitions will post errors at initial program load (IPL) if there is no device or wrap plug attached to each of the adapter's ports. Make sure that every Fibre Channel Adapter (5735 or 5774) that is installed in OS logical partition has either a wrap plug or a device attached to each of the adapter's ports. If you are exchanging a 5735 or 5774 Fibre Channel IOA, the external storage subsystem must be updated to use the worldwide port name of the new 5735 or 5774 IOA. For instructions, see "Updating the worldwide port name for a new 5735 or 5774 IOA." on page 143
- If you are replacing a 2748, 2757, 2763, 2767, 2778, 2780, 2782, 5702, 5709, or 570B storage IOA, take note of the following: Depending on the configuration of the system, the storage IOA cache might have been disabled to allow the attachment of OEM storage that emulates a load source drive. If you are replacing a storage IOA that has its cache disabled, configure the replacement IOA the same way as the IOA that you removed. If you remove hardware from the replacement IOA, return that hardware with the failed IOA.

Replacing a PCI adapter contained in a cassette in the system with the power off

You can replace a PCI adapter with the system power off.

About this task

Attention: You must have already completed the procedure "Removing a PCI adapter contained in a cassette from the system with the power off" on page 62 in order to have the slot powered off.

If your system is managed by an HMC, use the HMC to complete the steps for replacing the part in the system. See "Replacing a part by using the HMC" on page 147.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for replacing the part in the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to replace a PCI adapter with the system power off:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. If the adapter needs to be placed in a PCI adapter cassette, see one of the following topics:
    - "PCI adapter single-width, third generation cassette" on page 80
    - "PCI adapter double-wide cassette" on page 93
4. At the back of the system, identify the cassette slot you want to use.
5. 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.
6. Replace the PCI adapter cassette in the system. Follow these substeps:
    a. Remove the PCI adapter EMC shield **(A)** as shown in the following figure.
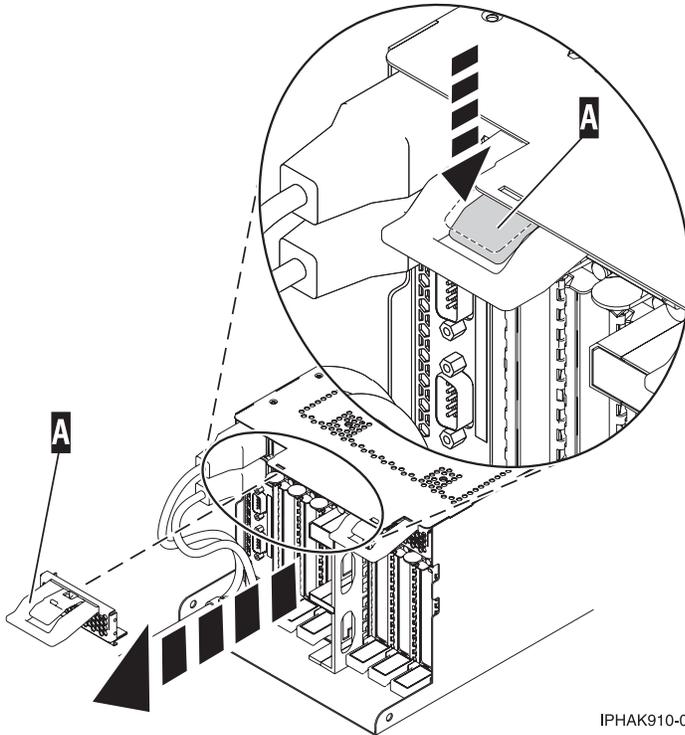
Figure 51. Remove the EMC shield

   b. Slide the cassette **(B)** into the cassette slot as shown in the following figure. 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.
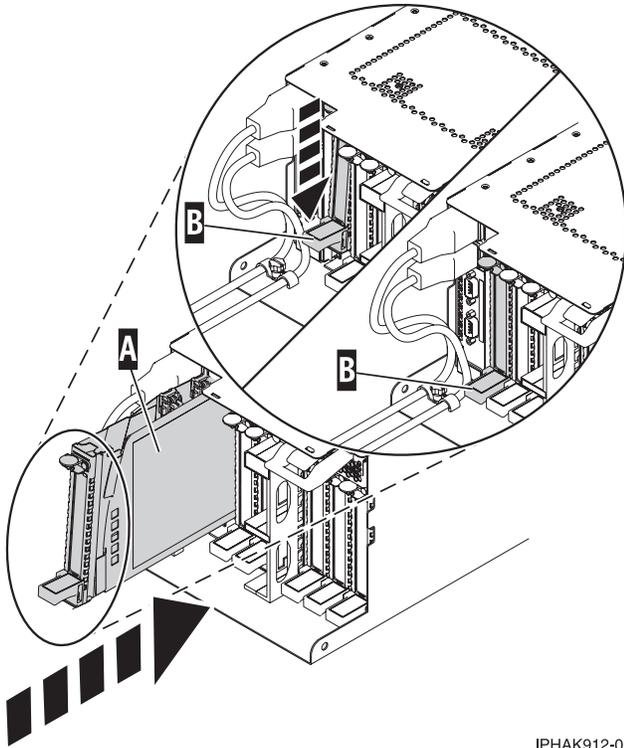
IPHAK912-0

Figure 52. PCI adapter cassette installed in the system unit

    c. Replace the EMC shield **(C)** as shown in the following figure.
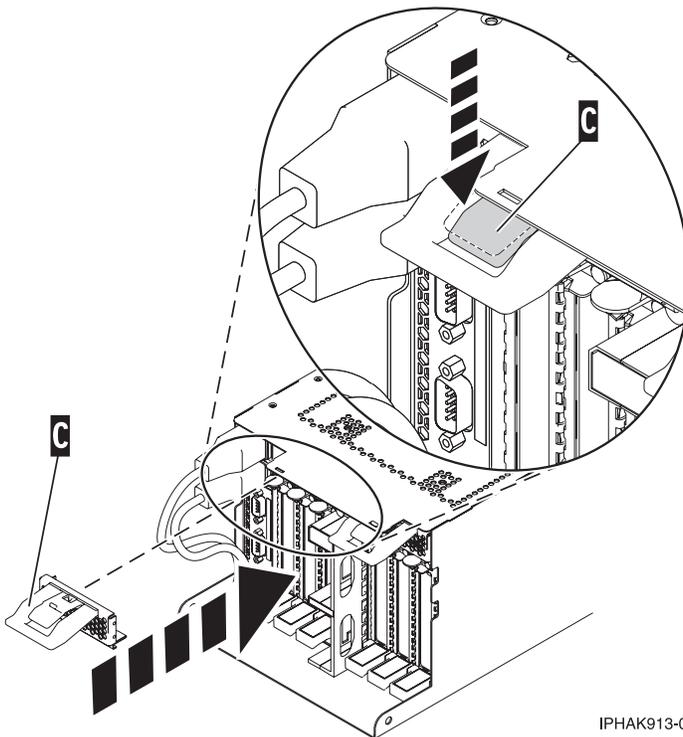
IPHAK913-0

Figure 53. PCI adapter EMC shield in the closed position

7. Reconnect the system to the power source.
8. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.
9. Verify the installed part.
   - If you replaced the part because of a service action, verify the installed part.
   - If you installed the part for any other reason, verify the installed part.

Removing and replacing a PCI adapter contained in a cassette in the system with the power on in the AIX environment

You can replace a PCI adapter with the system power on in the AIX environment.

About this task

Important:
1. Use this procedure if you intend to remove a failing PCI adapter and replace it with the same type of adapter.
2. If you plan to remove a failing adapter and leave the slot empty, see "Removing a PCI adapter contained in a cassette from the system with the power on in the AIX environment" on page 64.
3. This procedure should not be used to remove an existing adapter and install a different type of adapter. To install a different adapter, remove the existing adapter as described in "Removing a PCI adapter contained in a cassette from the system with the power on in the AIX environment" on page 64, and then install the new adapter as described in "Installing a PCI adapter contained in a cassette with the power on in the AIX environment" on page 54.
4. Procedures performed on a PCI adapter with the system power on in AIX, 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.

If your system is managed by an HMC, use the HMC to complete the steps for replacing the part in the system. See "Replacing a part by using the HMC" on page 147.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for replacing the part in the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to replace a PCI adapter with the system power on in the AIX environment:

Procedure
1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. Determine the location of the PCI adapter in the system.
4. Record the slot number and location of each adapter being removed.

   Note: Adapter slots are numbered on the rear of the system unit.
5. Ensure that any processes or applications that might use the adapter are stopped.
6. Follow these steps to replace a PCI adapter using the PCI Hot-Plug Manager menu in the AIX Diagnostic tools:
   a. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at the AIX command line.
   b. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.

c. At the FUNCTION SELECTION menu, select **Task Selection**, then press Enter.

d. At the Task Selection list, select **PCI Hot Plug Manager**.

e. Select **Unconfigure a Device**, then press Enter.

f. Press F4 (or Esc +4) to display the **Device Names** menu.

g. Select the adapter you are removing in the **Device Names** menu.

h. Use the Tab key to answer YES to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter. The ARE YOU SURE window displays.

i. Press Enter to verify the information. Successful unconfiguration is indicated by the 0K message displayed next to the Command field at the top of the screen.

j. Press F3 (or Esc +3) twice to return to the Hot Plug Manager menu.

k. Select **Replace/remove PCI Hot Plug adapter**.

l. Select the slot that has the device to be removed from the system.

m. Select **Replace**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.

n. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.

7. Label, and then disconnect all cables attached to the adapter you plan to remove.

8. Remove the PCI adapter cassette from the system. Follow these substeps:

   a. Remove the PCI adapter EMC shield **(A)** as shown in the following figure.
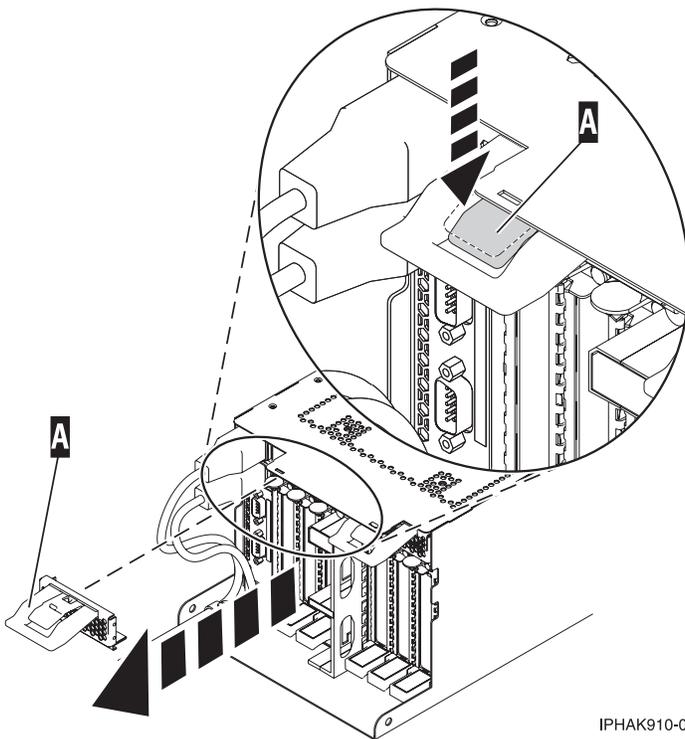
IPHAK910-0

Figure 54. Remove the EMC shield

   b. Lift up the lower cassette handle **(B)** as shown in the following figure. Pull the PCI cassette **(C)** out of the system.
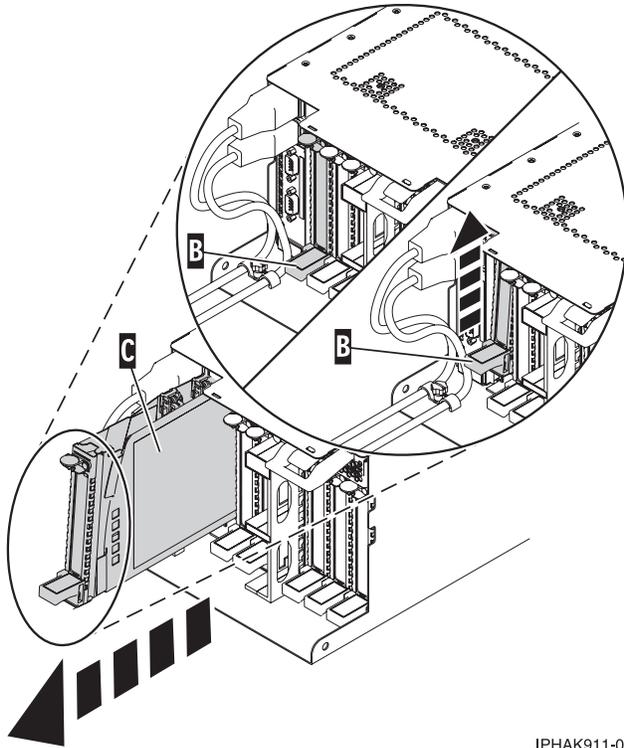
IPHAK911-0

Figure 55. PCI adapter cassette removed from the system unit

9. Place the cassette with the cover facing up on an approved ESD surface.

   Note: The cover will have a label on it.

10. Install the adapter into the PCI adapter cassette. See the following topics:
    - "PCI adapter single-width, third generation cassette" on page 80
    - "PCI adapter double-wide cassette" on page 93

11. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.

12. 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.

13. Install the PCI adapter cassette as described in the following substeps:

    a. Slide the cassette **(B)** into the cassette slot as shown in the following figure. 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.
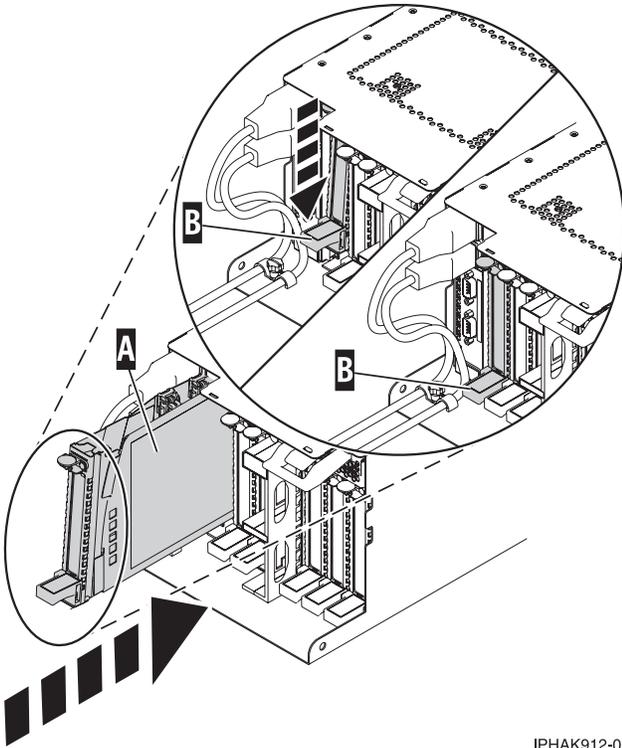
IPHAK912-0

Figure 56. PCI adapter cassette installed in the system unit

     b. Replace the EMC shield **(C)** as shown in the following figure.
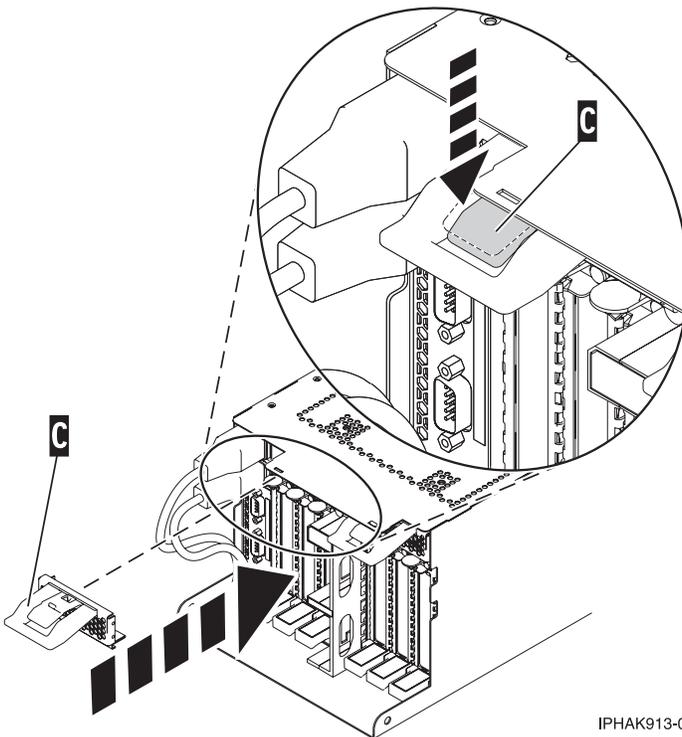
IPHAK913-0

Figure 57. PCI adapter EMC shield in the closed position

14. Follow these steps to complete the PCI Hot Plug menus in the AIX Diagnostic tools and configure the device:

    a. Press enter and continue to follow the instructions in the system diagnostics until you receive a message that the replacement is successful. Successful replacement is indicated by the OK message displayed next to the **Command** field at the top of the menu.

    b. Press the F3 (or Esc+3) key to return to the **PCI Hot-Plug Manager** menu.

    c. Press the F3 (or Esc+3) key to return to the **TASK** selection list.

    d. Select **Log Repair Action**.

    e. Select the resource just replaced, press Enter, press Commit (F7 or ESC 7), then press Enter.

    f. Press F3 (or Esc+3) to return to **TASK Selection List**.

    g. Select **Hot Plug Task**, press enter.

    h. Select **PCI Hot Plug Manager**, then select **Configure a defined device**, then press Enter.

    i. Select the device just replaced from the list, then press Enter. The device is now configured.

    j. Press the F10 key to exit the diagnostic program.

    Note: If you are running the stand-alone diagnostics, do not exit the program completely.

15. Verify the PCI adapter by using the following instructions:

    a. Did you replace the adapter with the system power on?
       - Yes - Go to the next step.
       - No - Load the diagnostic program by doing the following:
         – If AIX is available, boot AIX, log in as root or CELOGIN, and then enter the **diag** command.

    b. Type the **diag** command if you are not already displaying the diagnostic menus

    c. Select **Advance Diagnostic Routines**, and then select **Problem Determination**.

    d. Select the name of the resource just replaced from the menu. If the resource just replaced is not shown, choose the resource associated with it. Press Enter, and then press **Commit** ((F7 or Esc+7)).

    e. Did the Problem Determination identify any problems?
       - No: Continue to the next step.
       - Yes: A problem is identified
         – If you are a customer, record the error information, and then contact your service provider.
         – If you are an authorized service provider, return to map 210-5.

16. Press the F10 key to exit the diagnostic program.

Replacing a PCI adapter contained in a cassette in the system with the power on in the Linux environment

You can replace a PCI adapter.

About this task

You must have already completed the procedure "Removing a PCI adapter contained in a cassette from the system with the power on in the Linux environment" on page 67 in order to have the slot powered off.

Note: Use this procedure only when you are replacing an adapter with an identical adapter. If you are replacing an adapter with an adapter that is not identical to the adapter removed, go to "Removing a PCI adapter contained in a cassette from the system with the power on in the Linux environment" on page 67 and "Installing a PCI adapter contained in a cassette with the power on in the Linux environment" on page 58.

If your system is managed by an HMC, use the HMC to complete the steps for replacing the part in the system. See "Replacing a part by using the HMC" on page 147.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to complete the steps for replacing the part in the system. See Removing a part by using the SDMC.

If you do not have an HMC or SDMC, complete the following steps to replace a PCI adapter with the system power on in the Linux environment:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. If the adapter needs to be placed in the PCI adapter cassette, see "PCI adapter single-width and double-width cassettes" on page 112..
4. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
5. 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.
6. Run the **drmgr** 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:

   `drmgr -c pci -r -s locationcode`

   Follow the instructions on the display to complete the task.
7. Remove the PCI adapter cassette from the system. Follow these substeps.

   a. Remove the PCI adapter EMC shield **(A)** as shown in the following figure.
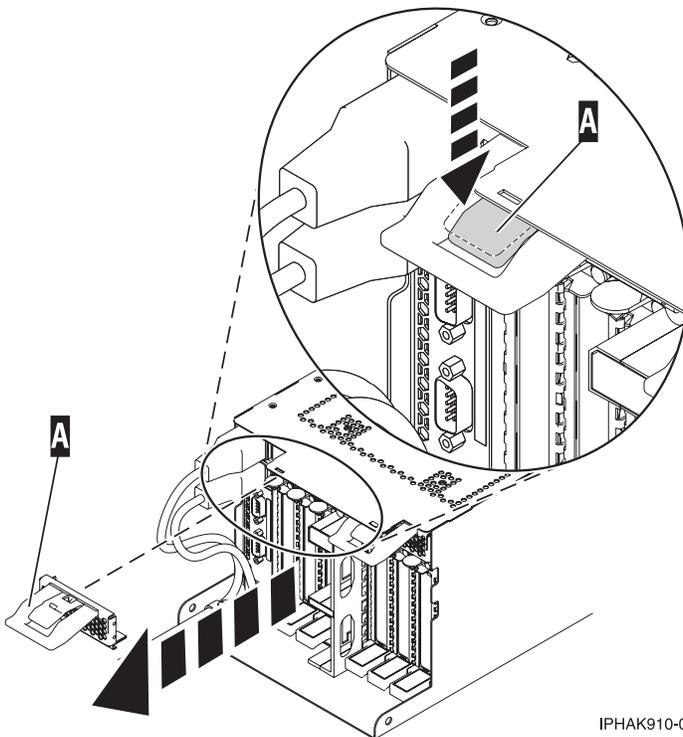
Figure 58. Remove the EMC shield

   b. Slide the cassette **(B)** into the cassette slot as shown in the following figure. 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.
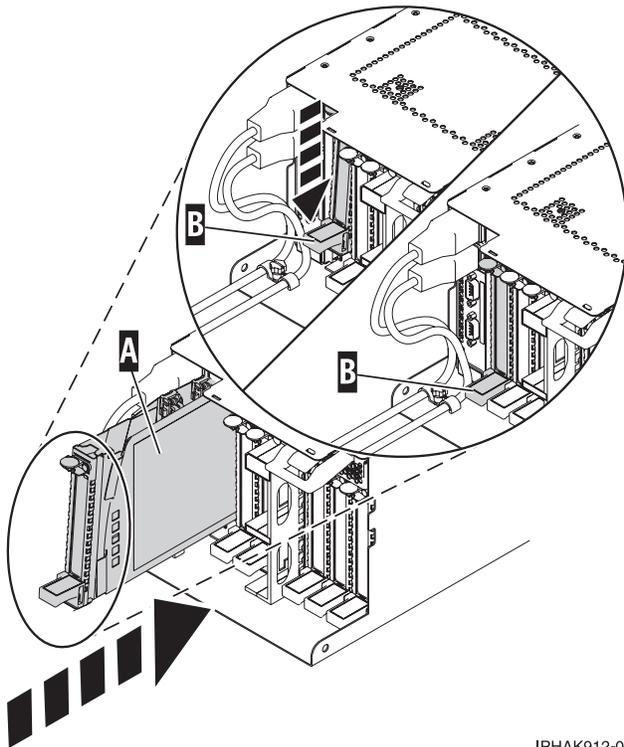
IPHAK912-0

Figure 59. PCI adapter cassette installed in the system unit

   c. Replace the EMC shield **(C)** as shown in the following figure.
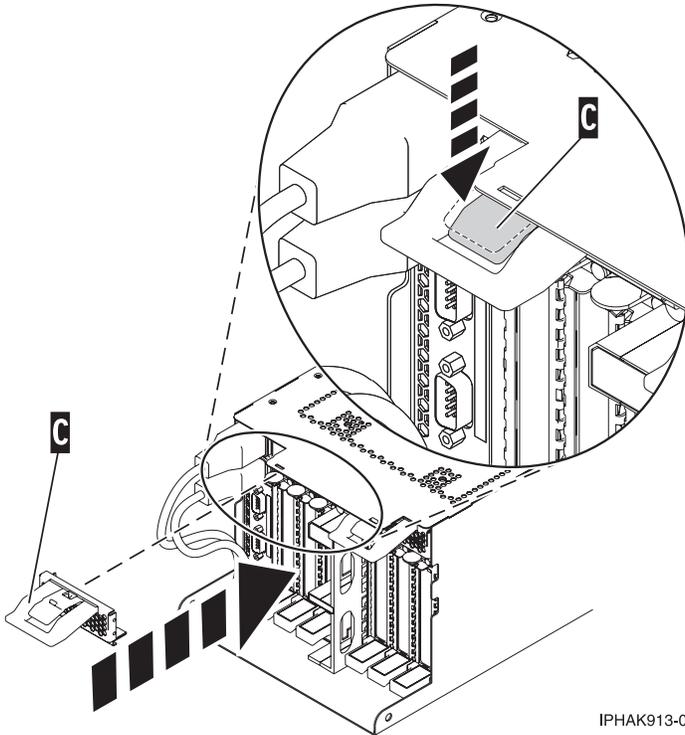
Figure 60. PCI adapter EMC shield in the closed position

8. 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
   ```

PCI adapter single-width, third generation cassette

You might need to remove, replace, or install PCI adapters in a single-width cassette. Use the procedures in this section to perform these tasks.

Placing a PCI adapter in a single-width, third generation cassette

You can place a PCI adapter in a single-width cassette.

About this task

To place a PCI adapter in a cassette, do the following steps:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. Remove any shipping handles or brackets attached to the adapter.
4. Remove the cassette cover by doing the following:
   a. Slide the cover latch **(A)** to disengage it from the pivot pin **(C)** as shown in the following figure.
   b. Lift the cover **(B)** off of the pivot pin.
   c. Slide the cover off of the cassette.

Figure 61. PCI adapter single-width cassette cover removed

5. Ensure the cassette is prepared to receive an adapter by doing the following:

   a. Ensure the cassette is empty by doing one of the following:

     • "Removing an adapter from the PCI adapter single-width, third generation cassette" on page 90.

     • Remove the adapter filler panel from the cassette.

   b. Ensure that all of the adapter retainers **(A)** have been pushed out to the edges of the cassette to allow the placement of the adapter. See Figure 62 on page 82.
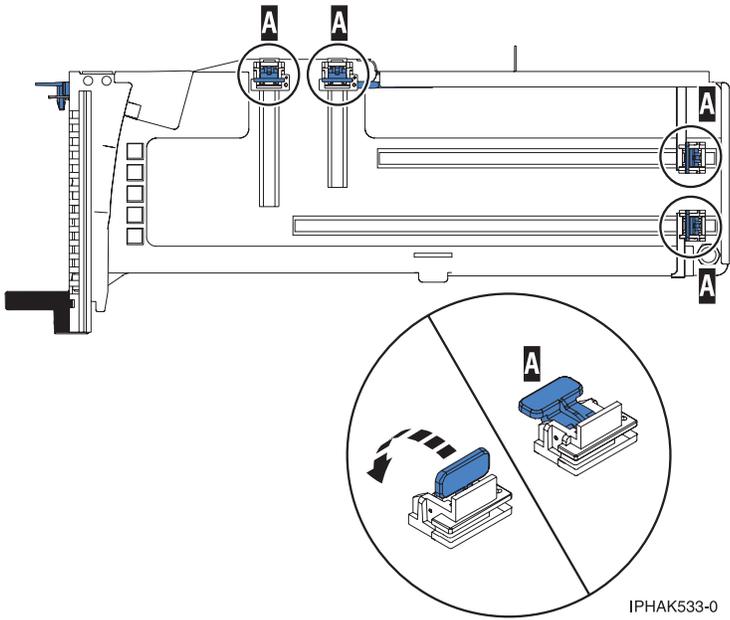
Figure 62. Adapter retainers

    c. Rotate the tailstock clamp into the open position.
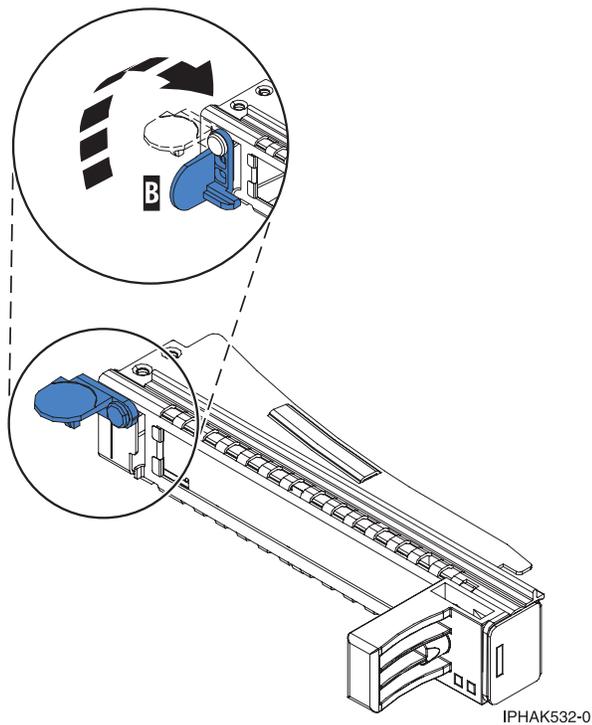
Figure 63. Tailstock clamp in the open position

6. Place the adapter in the cassette by completing the following steps:

    a. With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **(A)**. See Figure 64 on page 83.

    b. Rotate the adapter toward the top of the cassette and into place.

c. Close the tailstock clamp **(B)**. See Figure 64.
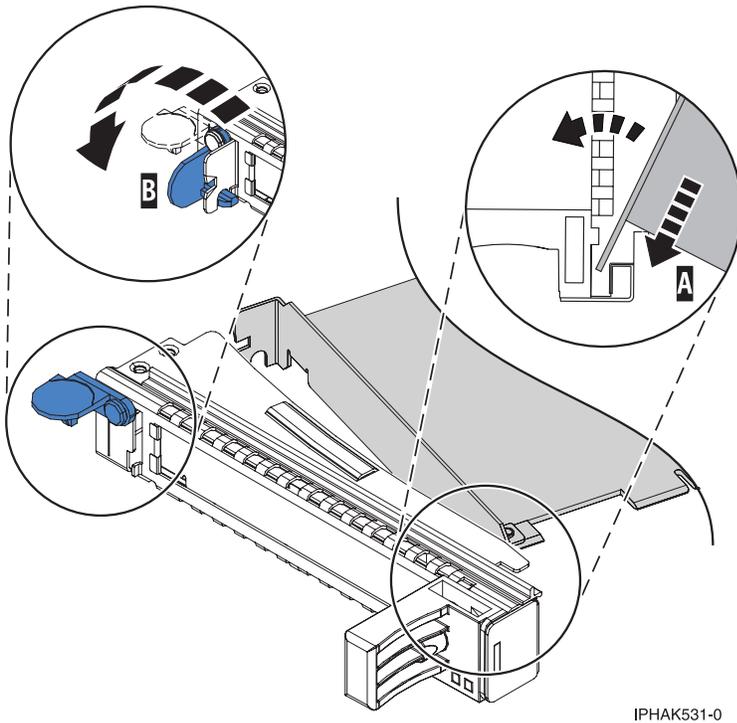
Figure 64. Adapter removed from the PCI adapter single-width cassette

d. Position the adapter retainers to support the adapter, and then rotate the retainer clip into the closed position.

Notes:

1) 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.

2) When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter.

3) 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

   a) Place and lock the retainers **(B)**. See Figure 65 on page 84.

      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.

   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.
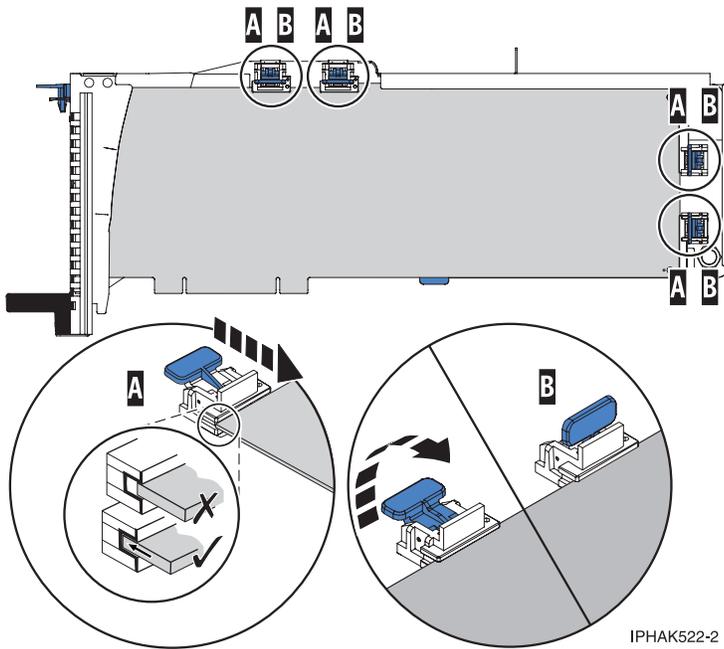
Figure 65. Large adapter in the PCI adapter cassette with the supports and stabilizer in place

Adapter-cassette retainer placement for medium-length adapters

a) Remove the adapter stabilizer **(C)**. See Figure 66 on page 85.

b) Place and lock the retainers **(B)**.

c) 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.
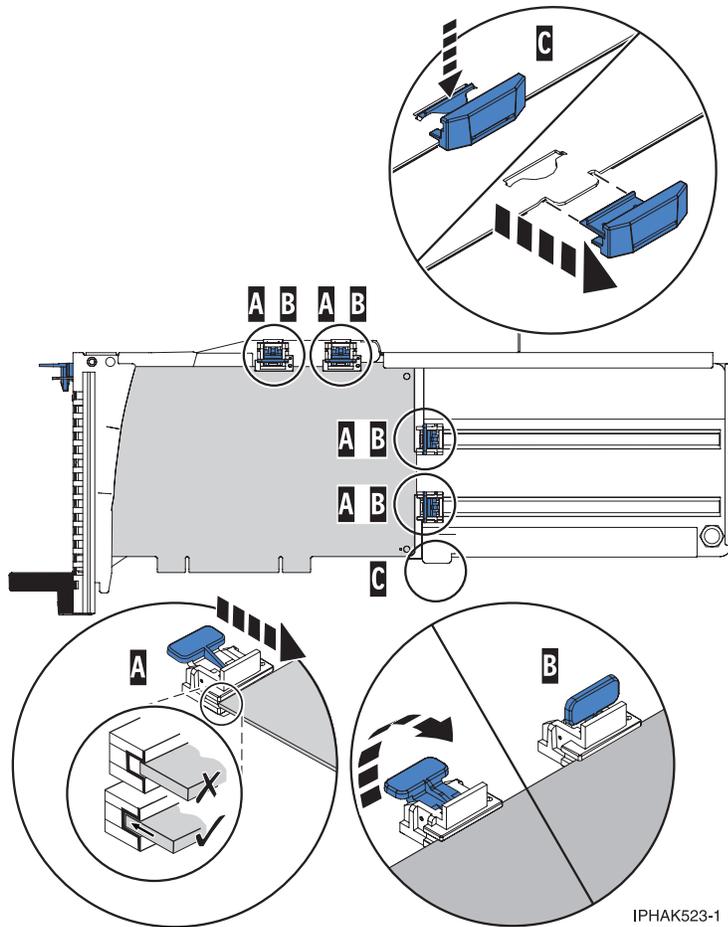
Figure 66. Medium-length adapter in the PCI adapter cassette with the supports in place

Adapter-cassette retainer placement for small adapters

a) Remove the adapter stabilizer **(C)**. See Figure 67 on page 86.

b) 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.

c) Place and lock the retainers **(B)**.

d) 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.
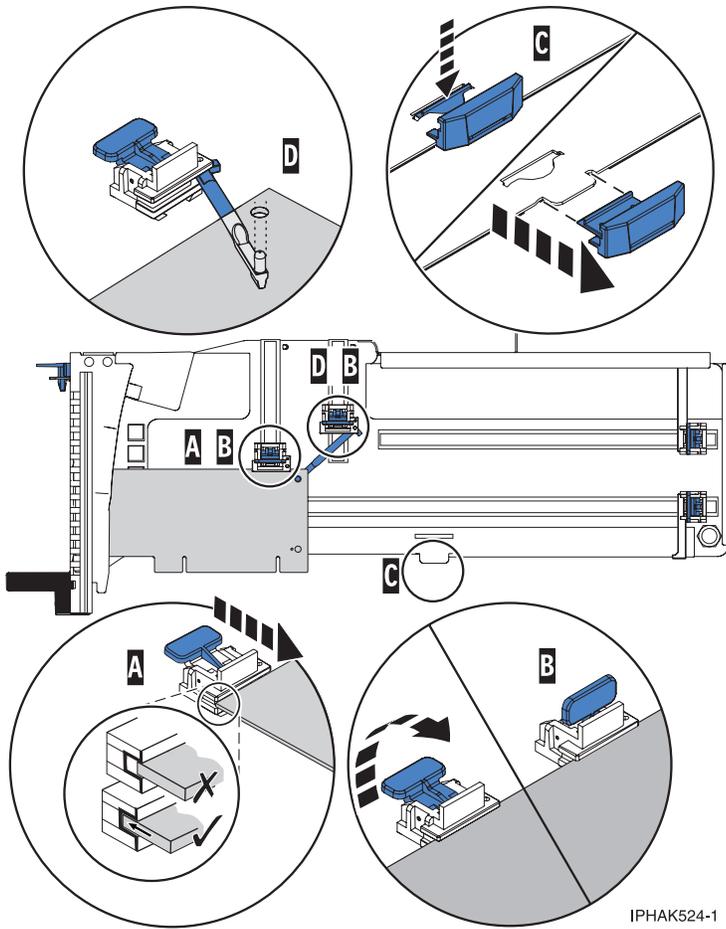
Figure 67. Small adapter in the PCI adapter cassette with the supports and the hookarm in place

7. Replace the cassette cover by doing the following:

   a. Slide the cover **(B)** into position on the cassette as shown in the following figure.

   b. While holding the cover latch **(A)** in the open position, place the cover over the pivot pin **(C)**.

   c. Release the cover latch to lock the cover into place.
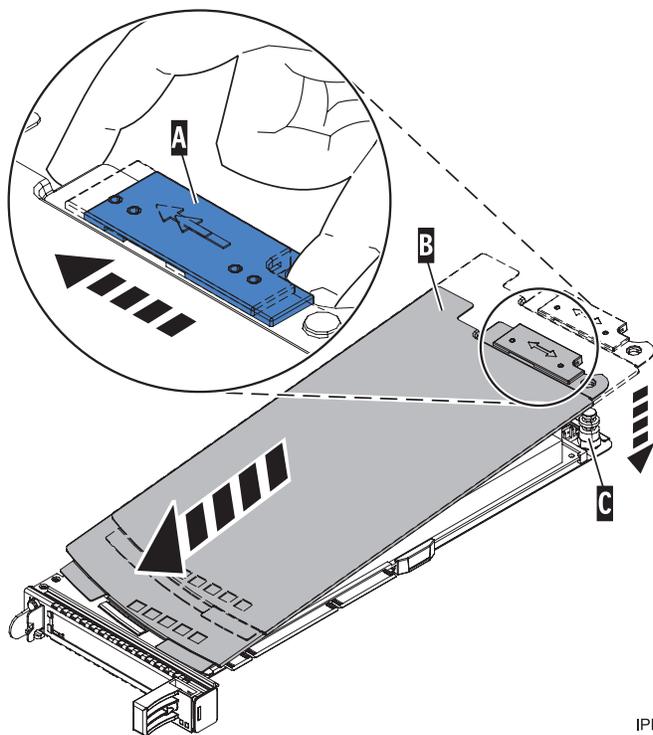
Figure 68. PCI adapter cassette cover replaced

Placing a 4-Port USB PCI Express Adapter in a single-width, third generation cassette

You can place a 4-Port USB PCI Express Adapter (FC 2728; CCIN 57D1) in a single-width cassette.

About this task

To place a PCI adapter in a cassette, do the following steps:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. Remove the cassette from the system.
4. Remove the cassette cover by doing the following steps:
   a. Slide the cover latch **(A)** to disengage it from the pivot pin **(C)** as shown in the following figure.
   b. Lift the cover **(B)** off of the pivot pin.
   c. Slide the cover off of the cassette.

Figure 69. PCI adapter single-width cassette cover removed

5. Ensure that the cassette is empty.

6. Place the adapter in the cassette by doing the following steps:

   a. With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **(A)**. See Figure 70 on page 89.

   b. Rotate the adapter toward the top of the cassette and into place.

   c. Close the tailstock clamp **(B)**. See Figure 70 on page 89.
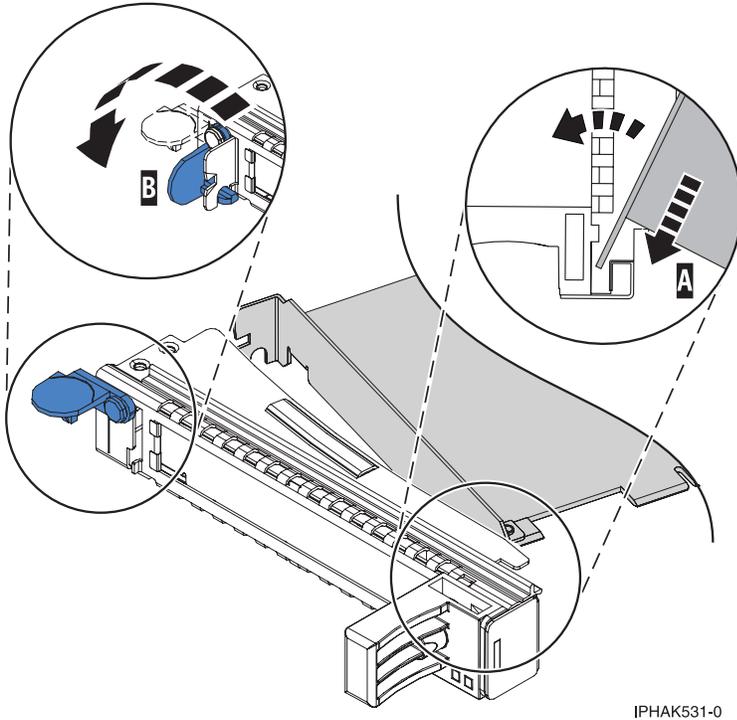
Figure 70. Placing the PCI adapter single-width cassette

  d. Position the adapter retainer to support the adapter.
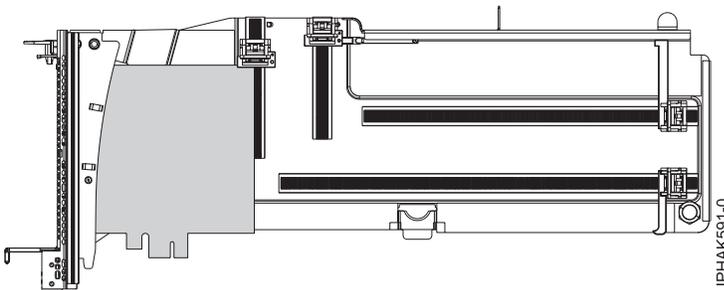
Figure 71. Side view of adapter in cassette

7. Replace the cassette cover by doing the following steps:

  a. Slide the cover **(B)** into position on the cassette as shown in the following figure.

  b. While holding the cover latch **(A)** in the open position, place the cover over the pivot pin **(C)**.

  c. Release the cover latch to lock the cover into place.
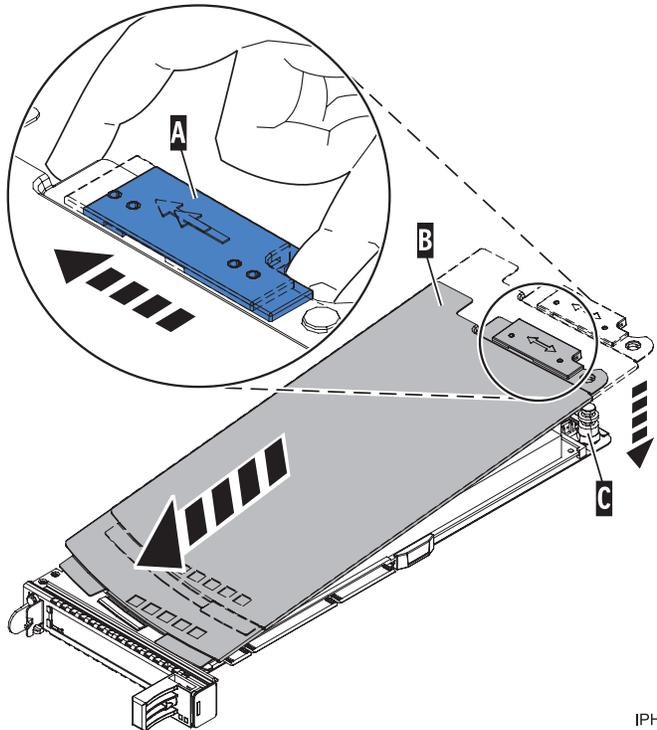
Figure 72. PCI adapter cassette cover replaced

8. Replace the PCI adapter cassette **(B)** in the system. See the following figure.
9. Install the EMC grill **(A)**.
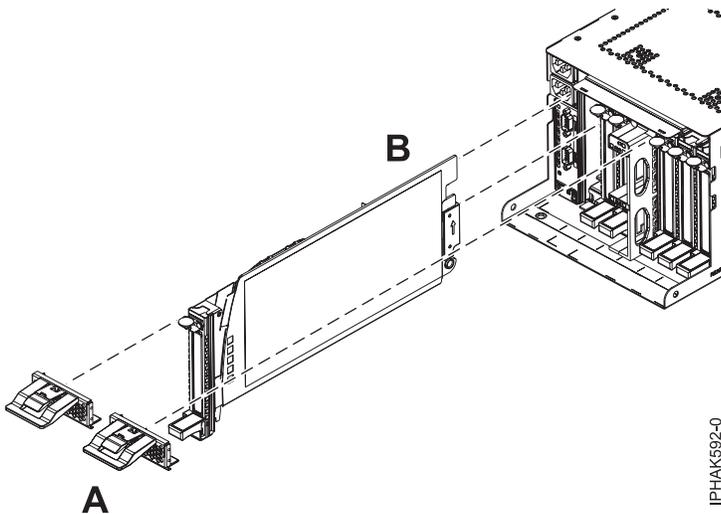
Figure 73. Replace the cassette and install the EMC grill

Removing an adapter from the PCI adapter single-width, third generation cassette

You can remove a PCI adapter from a single-width cassette.

About this task

To remove an adapter from the single-width cassette, do the following steps:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. Remove the cassette from the system.
4. Remove the cassette cover by doing the following:
   a. Slide the cover latch **(A)** to disengage it from the pivot pin **(C)** as shown in the following figure.
   b. Lift the cover **(B)** off the pivot pin.
   c. Slide the cover off the cassette.

IPHAK520-0

Figure 74. PCI adapter cassette cover removed

5. Remove the adapter from the cassette by completing the following steps:
   a. Unlock the adapter retainers by rotating the retainer clip **(A)** into the horizontal position. See Figure 75 on page 92.

   Notes:
   1) The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter **tailstock**.
   2) 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.
   3) When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.
   4) If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.

   b. Push the adapter retainers **(B)** away from the adapter.
   c. Unlock the adapter tailstock clamp **(C)**.

d. 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.

e. Lift the adapter out of the tailstock retaining channel.

Figure 75. Adapter removed from the PCI adapter cassette

f. Put the adapter in a safe place.

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.

g. Place a PCI adapter or filler panel in the cassette. See "Placing a PCI adapter in a single-width, third generation cassette" on page 80.

h. Replace the cassette cover by completing the following steps:

   1) Slide the cover **(B)** into position on the cassette.

   2) While you hold 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.
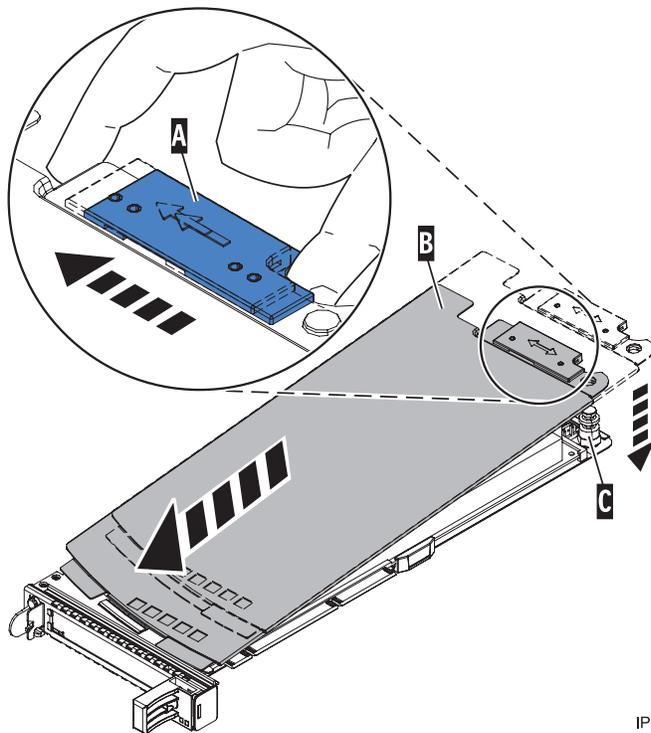
IPHAK530-0

Figure 76. PCI adapter cassette cover replaced

PCI adapter double-wide cassette

You might need to remove, replace, or install PCI adapters in a double-wide cassette. Use the procedures in this section to perform these tasks.

Removing an adapter from the PCI adapter double-wide cassette

You might need to remove a PCI adapter from a double-wide cassette.

About this task

To remove an adapter from the cassette, do the following:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. Remove the PCI adapter contained in a cassette from the system.
4. Remove any shipping handles or brackets attached to the adapter.
5. Remove the cassette cover by doing the following:
   a. Slide the cover latch **A** to disengage it from the pivot pin **C** as shown in the following figure.
   b. Lift the cover **B** off of the pivot pin.
   c. Slide the cover off of the cassette.

Figure 77. PCI adapter cassette cover removed

    d. Unscrew pivot pin **C** and put it in a safe place

6. Remove the adapter from the cassette by doing the following:

    a. Unlock the adapter retainers by rotating the retainer clip **A** into the horizontal position. See Figure 78 on page 95.

        Notes:

        1) The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter *tailstock*.

        2) 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.

        3) When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.

        4) If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.

    b. Push the adapter retainers **B** away from the adapter.

    c. Unlock the adapter tailstock clamp **C**.

    d. Rotate the adapter out of the cassette by grasping the edge of the adapter opposite the tailstock and then firmly rotating the adapter toward the bottom of the cassette.

    e. Lift the adapter out of the tailstock retaining channel.
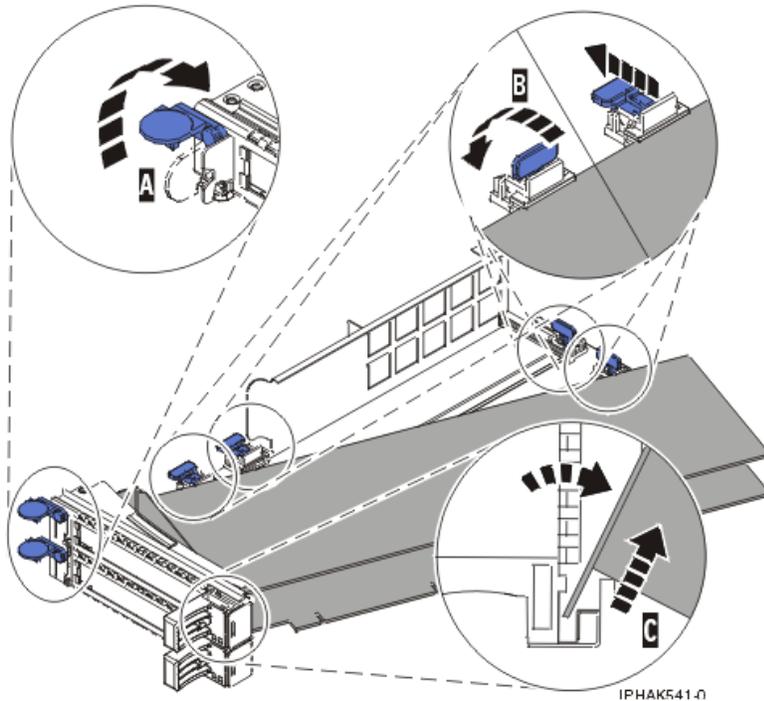
Figure 78. Adapter removed from the PCI adapter cassette

   f. Put the adapter in a safe place.

   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.

   g. Place the adapter in the PCI adapter double-wide cassette. For information, see "Placing an adapter in the PCI adapter double-wide cassette" on page 96.

   Note: If the cassette is not going to contain a PCI adapter, use this same procedure to place an adapter filler panel in the cassette.

   h. Replace the cassette cover by doing the following:

      1) Screw pivot pin **C** into place.

      2) Slide the cover **B** into position on the cassette.

      3) While holding the cover latch **A** in the open position, place the cover over the pivot pin **C**.

      4) Release the cover latch to lock the cover into place.
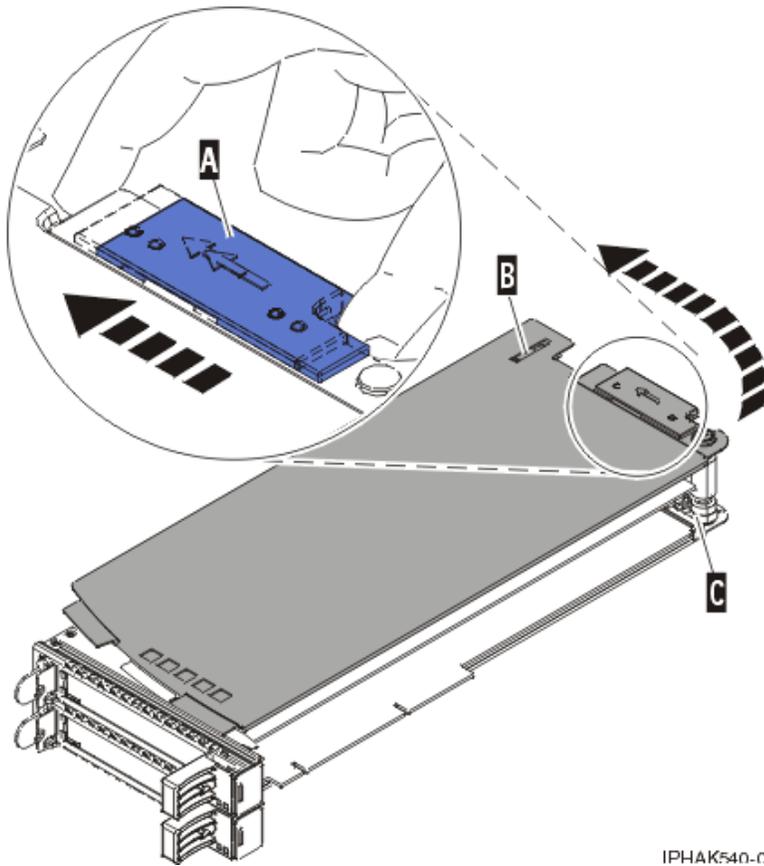
Figure 79. PCI adapter cassette cover replaced

Placing an adapter in the PCI adapter double-wide cassette

You might need to place a PCI adapter in a double-wide cassette.

About this task

To place an adapter in a cassette, perform the following steps:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Remove the PCI adapter contained in a cassette from the system.
3. Remove the cassette cover by doing the following:
   a. Slide the cover latch **A** to disengage it from the pivot pin **C** as shown in the following figure.
   b. Lift the cover **B** off of the pivot pin.
   c. Slide the cover off of the cassette.
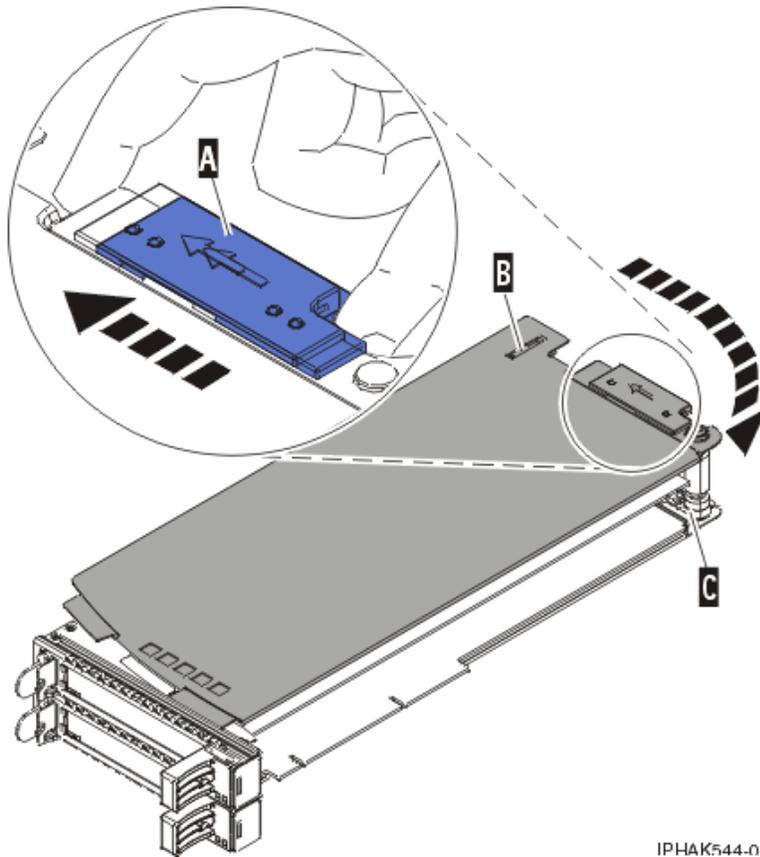
Figure 80. PCI adapter cassette cover removed

    d. Unscrew pivot pin **C** and put it in a safe place

4. Ensure the cassette is prepared to receive an adapter by doing the following:

    a. Ensure the cassette is empty by doing one of the following:

       • Remove the adapter from the PCI adapter double-wide cassette. For information, see "Removing an adapter from the PCI adapter double-wide cassette" on page 93.

       • Remove the adapter filler panel from the cassette.

    b. Ensure that all of the adapter retainers have been pushed out to the edges of the cassette to allow the placement of the adapter.

    c. Place the tailstock clamp in the open position by pressing the cassette handle towards the retainer clip.

5. Place the adapter in the cassette by doing the following:

    a. With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **A**. See Figure 81 on page 98.

    b. Rotate the adapter toward the top of the cassette and into place.

    c. Close the tailstock clamp.
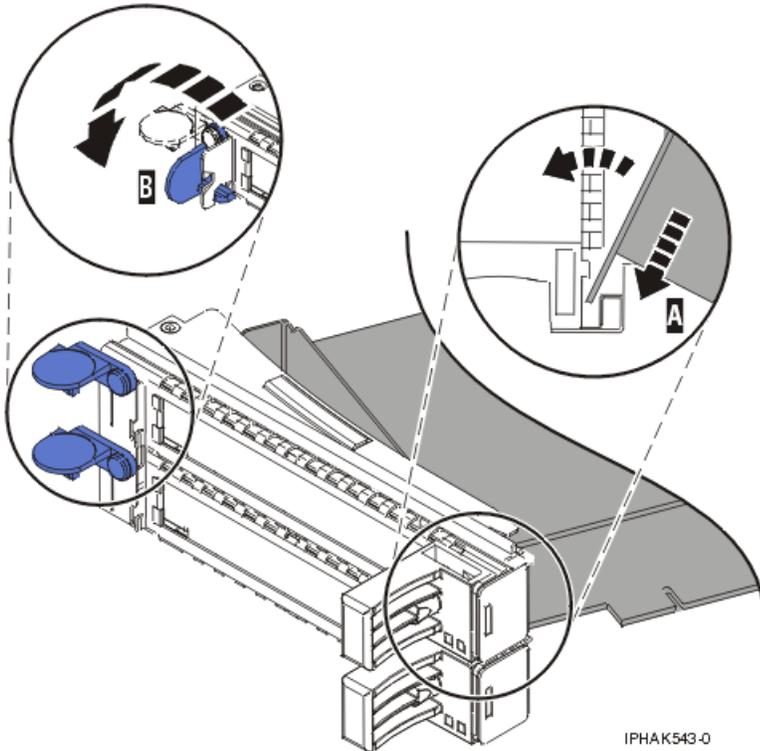
Figure 81. Adapter replaced in the PCI adapter cassette

d. Position the adapter retainers to support the adapter, and then rotate the retainer clip **B** into the closed position. See Figure 81.

Notes:

1) 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.

2) When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter.

3) Place and lock the retainers **B**. See Figure 82 on page 99.

   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.

4) 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.
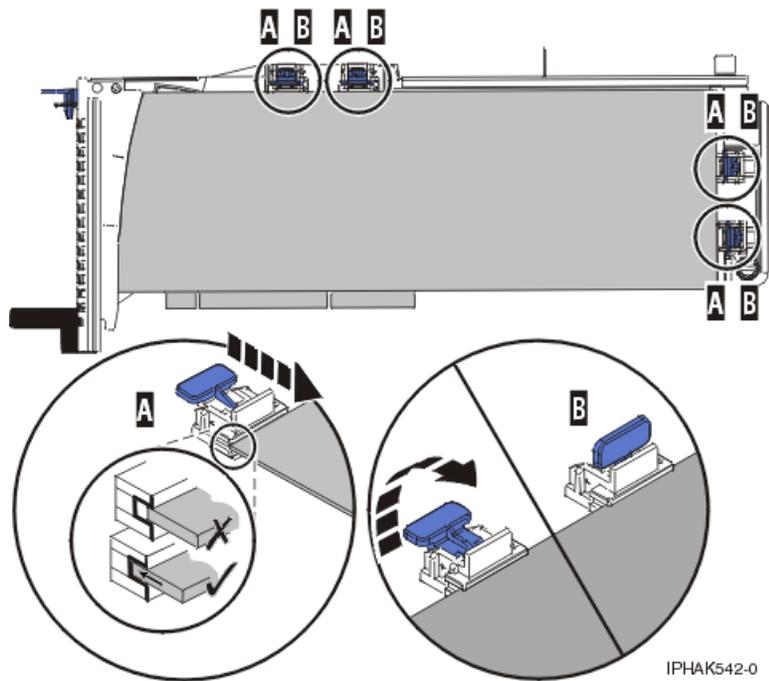
Figure 82. Long adapter in the PCI adapter cassette with the supports and stabilizer in place

6. After the retainers are placed, replace the cassette cover by doing the following:
   a. Screw pivot pin **C** into place.
   b. Slide the cover **B** into position on the cassette as shown in the following figure.
   c. While holding the cover latch **A** in the open position, place the cover over the pivot pin **C**.
   d. Release the cover latch to lock the cover into place.
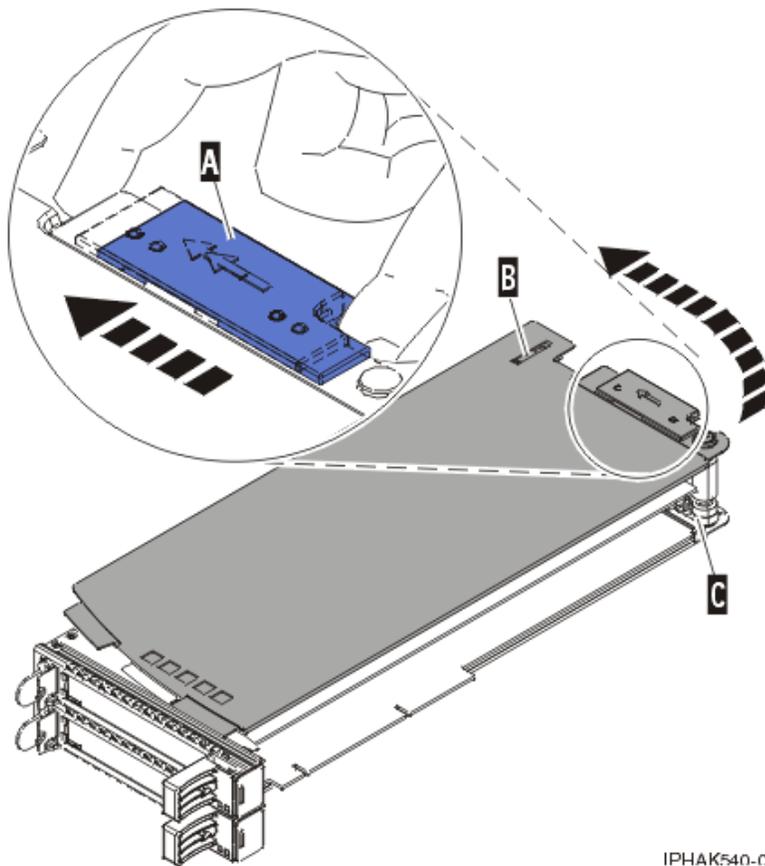
Figure 83. PCI adapter cassette cover replaced

7. Replace the PCI adapter contained in a cassette in 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.

Model 58/02 and 58/77 expansion units, PCI adapters, and cassettes

You can install, remove, replace PCI adapter cassettes in the 58/02 and 58/77 expansion units.

Preparing to install, remove, or replace a PCI adapter cassette

Learn about steps you must do before you install, remove, or replace a PCI adapter cassette in a 58/02 or 58/77 expansion unit.

About this task

If your system is managed by an HMC, use the HMC to complete the steps for installing the part in the system. See "Installing a part by using the HMC" on page 146.

If your system is managed by the Systems Director Management Console (SDMC), use the SDMC to install the server. For instructions, see Installing a part by using the Systems Director Management Console.

Notes:

- If the system is partitioned, you must determine the partition owning the I/O slot. Once the adapter is installed, the I/O slot must be powered on in the operating system.

- If an I/O slot on a partitioned system is not owned by a partition, then the I/O slot cannot be powered on.
- Adding an I/O slot to a partition using dynamic logical partitioning (DLPAR) will power on the I/O slot as part of the DLPAR add. For information about DLPAR, see Dynamic Logical Partitioning.
- To learn more about working in a partitioned environment, see Logical partitioning.

If you do not have an HMC or SDMC, complete the following steps to install, remove or replace a PCI adapter:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. If you are installing a new adapter, determine in which slot to place the new adapter. See the PCI adapter placement.
4. If you are removing a failing PCI adapter, see Identifying a failing part.
5. If you are installing a PCI adapter in a rack-mounted system or expansion unit, open the rear rack door.
6. Determine the location of PCI adapter cassette in the system.

Installing a PCI adapter contained in a cassette

You can install a PCI adapter cassette in a 58/02 or 58/77 expansion unit.

Installing a PCI adapter cassette

You can install a PCI adapter cassette in a 58/02 or 58/77 expansion unit.

About this task

Procedure

1. Ensure that the lower cassette handle **(C)** is pressed up toward the retainer clip as shown in Figure 84 on page 102. This places the adapter in the correct position to be docked in the system.
2. Slide the cassette into the cassette slot.
3. When the cassette is fully inserted into the system, firmly press downward on the lower cassette handle **(C)** to lock the adapter in its connector.
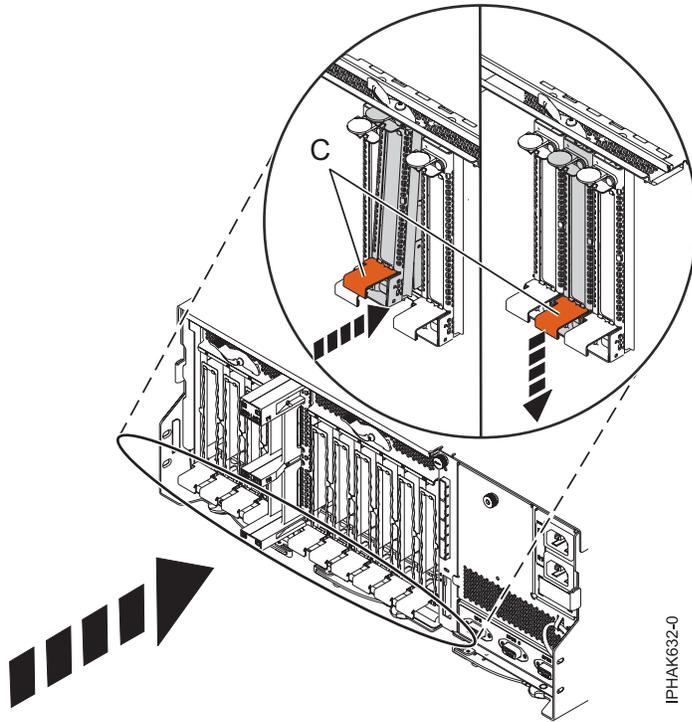
Figure 84. Installing the PCI adapter cassette

4. Lower the access door **(B)** into the closed position. Latch **(A)** automatically latches to hold the access door closed.
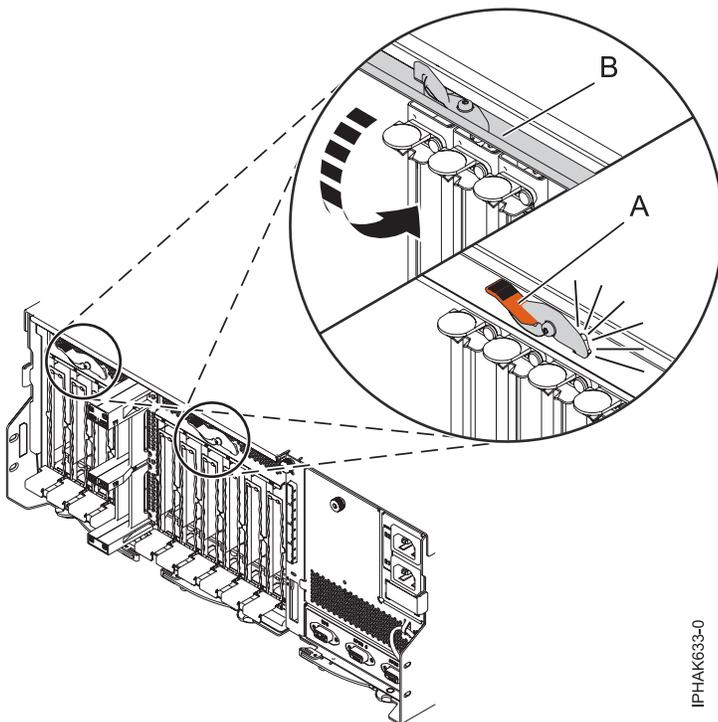
Figure 85. Closing the access door

5. Return to the procedure that sent you here.

Installing a PCI adapter cassette with the power off

You can install a PCI adapter cassette in a 58/02 or 58/77 expansion unit with the power off.

Before you begin

Before you begin: Prepare to install a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette" on page 100.

About this task

To install an adapter with the system power off, do the following steps:

Procedure
1. Stop the system or logical partition. For instructions, see "Stopping a system or logical partition" on page 154.
2. Disconnect the power source from the system by unplugging the system.
3. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit" on page 105.
4. Install the adapter into the PCI adapter cassette. Refer to "PCI adapter single-width and double-width cassettes" on page 112.
5. Install the PCI adapter cassette in the system. Refer to "Installing a PCI adapter contained in a cassette" on page 101.
6. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.
7. Verify the installed part.
   - If you replaced the part because of a service action, verify the installed part.
   - If you installed the part for any other reason, verify the installed part.

Installing a PCI adapter contained in a cassette with the power on in the AIX environment

You can install a PCI adapter cassette in a 58/02 or 58/77 expansion unit that is running the AIX environment with the system power on.

Before you begin

Before you begin: Prepare to install a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette" on page 100.

About this task

To install an adapter with the system power on in the AIX environment, do the following steps:

Procedure
1. Refer to "PCI hot-plug manager access for AIX" on page 139, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.
2. From the PCI Hot-Plug Manager menu, select **Add a PCI Hot-Plug Adapter** and press Enter. The Add a Hot-Plug Adapter window displays.
3. Select the appropriate PCI slot from the ones listed on the screen, and press Enter.
4. Locate the PCI adapter slot and cassette you want to use.

5. If the cassette you want to use does not contain a PCI adapter, continue to the next step. If the cassette you want to use does contain an active PCI adapter, see "Removing a PCI adapter contained in a cassette from the expansion unit with the power on in AIX" on page 107.

6. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit" on page 105.

7. Install the adapter into the PCI adapter cassette. Refer to "PCI adapter single-width and double-width cassettes" on page 112.

8. Follow the instructions on the screen to install the adapter until the LED for the specified PCI slot is set to the Action state. See "Component LEDs" on page 141.

9. Install the PCI adapter cassette in the system. Refer to "Installing a PCI adapter contained in a cassette" on page 101.

10. Enter `cfgmgr` to configure the adapter.

11. Verify the installed part.
    - If you replaced the part because of a service action, verify the installed part.
    - If you installed the part for any other reason, verify the installed part.

Installing a PCI adapter contained in a cassette with the power on in the Linux environment

You can install a PCI adapter cassette in a 58/02 or 58/77 expansion unit that is running the Linux environment with the system power on.

Before you begin

Before you begin: Prepare to install a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette" on page 100.

About this task

To install an adapter with the system power on in the Linux environment, do the following steps:

Procedure

1. Log in to the system console as the root user.

2. Use the lsslot tool to list the hot-plug PCI slots that are available in the server or logical partition:

   ```
   lsslot -c pci -a
   ```

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

   ```
   Slot                     Description                          Devices
   U7879.001.DQD014E-P1-C1 PCI-X capable, 64 bit, 133MHz slot Empty
   U7879.001.DQD014E-P1-C4 PCI-X capable, 64 bit, 133MHz slot Empty
   U7879.001.DQD014E-P1-C5 PCI-X capable, 64 bit, 133MHz slot Empty
   ```

   Select the appropriate empty PCI slot from the ones listed by the command.

3. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit" on page 105.

4. Install the adapter into the PCI adapter cassette. Refer to "PCI adapter single-width and double-width cassettes" on page 112.

5. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be locked in the system.

6. Enter `drmgr` to enable an adapter to be installed.

   For example, to install an adapter in slot U7879.001.DQD014E-P1-C3, enter:

   ```
   drmgr -c pci -r -s locationcode
   ```

   The following displays:

```
The visual indicator for the specified PCI slot has been set to the
identify state. Press Enter to continue or enter x to exit.
```

7. Press Enter.

   The following displays:

   ```
   The visual indicator for the specified PCI slot has been set to the
   action state. Insert the PCI card into the identified slot, connect any
   devices to be configured and press Enter to continue. Enter x to exit.
   ```

8. Install the PCI adapter cassette in the system. Refer to "Installing a PCI adapter contained in a cassette" on page 101.

9. Use the **lsslot** command to verify that U7879.001.DQD014E-P1-C3 is occupied.

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

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

   ```
   Slot                     Description                      Devices
   U7879.001.DQD014E-P1-C3 PCI-X capable, 64 bit, 133MHz slot 0001:40:01.0
   ```

Removing a PCI adapter contained in a cassette from the expansion unit

You can remove a PCI adapter cassette from the 58/02 or 58/77 expansion unit.

Removing a PCI adapter contained in a cassette from the expansion unit with the system power off

You can remove a PCI adapter cassette from the 58/02 or 58/77 expansion unit with the system power off.

Before you begin

Before you begin: Prepare to remove a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette" on page 100.

About this task

To remove an adapter, do the following steps:

Procedure

1. Stop the system or logical partition. For instructions, see "Stopping a system or logical partition" on page 154.
2. Disconnect the power source from the system by unplugging the system.
3. Determine the location of PCI adapter in the system.
4. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit."
5. Place the cassette with the cover facing up on an approved ESD surface.
6. To remove the adapter from the cassette, refer to "PCI adapter single-width and double-width cassettes" on page 112.

Removing a PCI adapter cassette from the expansion unit

You can remove a PCI adapter cassette from the 58/02 or 58/77 expansion unit.

About this task

To remove a PCI adapter cassette, do the following steps:

Procedure

1. Press down on latch **(A)** to release the access door. The access door is spring loaded, which causes it to rotate up into the open position **(B)**.
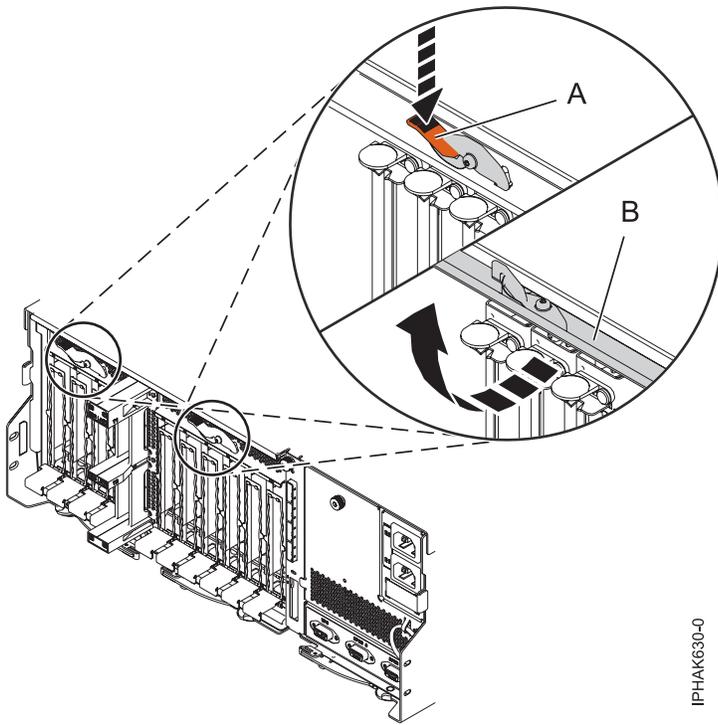
Figure 86. Opening the access door

2. Lift up the lower cassette handle **(C)** and pull the cassette out of the unit.
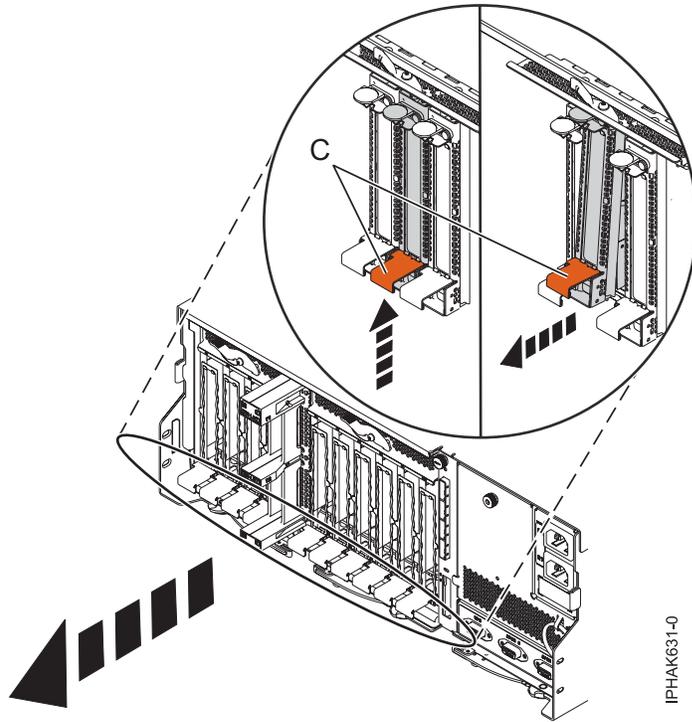
Figure 87. Removing a PCI adapter cassette

> **Attention:** A cassette that contains 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.

3. Return to the procedure that sent you here.

Removing a PCI adapter contained in a cassette from the expansion unit with the power on in AIX

You can remove or replace a PCI adapter cassette from the 58/02 or 58/77 expansion unit that is running the AIX operating system with the system power on.

Before you begin

Before you begin: Prepare to remove a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette" on page 100.

About this task

Notes:

1. Use this procedure to remove a PCI adapter and leave the slot in the system unit empty.
2. If the adapter that is removed will be placed into a different slot or system, complete this removal procedure, and then install the adapter as described in "Installing a PCI adapter contained in a cassette with the power on in the AIX environment" on page 103.
3. Procedures performed on a PCI adapter with the system power on in AIX, 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.

To remove an adapter, do the following steps:

Procedure

1. If you are removing a failing PCI adapter, see "Identifying a part" on page 149. If you are removing the PCI adapter for other reasons, continue to the next step.
2. Determine the location of PCI adapter in the system.
3. Record the slot number and location of each adapter being removed.

   Note: Adapter slots are numbered on the rear of the system unit.
4. Ensure that any processes or applications that might use the adapter are stopped.
5. Follow these steps to remove a PCI adapter using the PCI Hot-Plug Manager menu in the AIX Diagnostic tools:
   a. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at the AIX command line.
   b. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
   c. At the FUNCTION SELECTION menu, select **Task Selection**, then press Enter.
   d. At the Task Selection list, select **PCI Hot Plug Manager**.
   e. Select **Unconfigure a Device**, then press Enter.
   f. Press F4 (or Esc +4) to display the **Device Names** menu.
   g. Select the adapter you are removing in the **Device Names** menu.
   h. Use the Tab key to answer NO to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter. The ARE YOU SURE window displays.
   i. Press Enter to verify the information. Successful unconfiguration is indicated by the OK message displayed next to the Command field at the top of the screen.
   j. Press F4 (or Esc +4) twice to return to the Hot Plug Manager menu.
   k. Select **Replace/remove PCI Hot Plug adapter**.
   l. Select the slot that has the device to be removed from the system.
   m. Select **remove**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.
   n. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
6. Label, and then disconnect all cables attached to the adapter you plan to remove.
7. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit" on page 105.
8. Place the cassette with the cover facing up on an approved ESD surface.
9. Continue to follow the screen instructions until you receive a message that the adapter removal is successful. Successful removal is indicated by the message OK, which is displayed next to the **Command** field at the top of the screen.
10. If you have other adapters to remove, press the F3 key to return to the PCI Hot-Plug Manager menu, and then return to step 6.

    If you do not have other adapters to remove, continue with the next step.
11. Press F10 to exit the Hot-Plug Manager.
12. Enter **diag -a**. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.
13. To remove the adapter from the cassette, see "PCI adapter single-width and double-width cassettes" on page 112.
14. Place an empty cassette into the unused PCI slot for proper air flow.

Removing a PCI adapter contained in a cassette from the expansion unit with the power on in Linux

You can remove a PCI adapter cassette from the 58/02 or 58/77 expansion unit that is running the Linux operating system with the system power on.

Before you begin

Do the following actions before beginning the procedure:
* Follow the steps in "Preparing to install, remove, or replace a PCI adapter cassette" on page 100.
* Ensure that the system meets the "Prerequisites for hot-plugging PCI adapters in Linux" on page 142.
* Verify that the Linux, hot-plug PCI tools are installed. See "Verifying that the hot-plug PCI tools are installed for Linux" on page 142

About this task

To remove an adapter, do the following steps:

Procedure

1. Determine the location of the PCI adapter in the system.
2. Label and then disconnect all cables attached to the adapter you plan to remove.
3. Enter `drmgr` to enable an adapter to be removed:

   For example, to remove the PCI adapter in slot U7879.001.DQD014E-P1-C3 enter:

   `drmgr -c pci -r -s locationcode`

   Follow the instructions on the display to complete the task.
4. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit" on page 105.
5. Place the cassette with the cover facing up on an approved ESD surface.
6. To remove an adapter from the cassette, refer to "PCI adapter single-width and double-width cassettes" on page 112.

Replacing a PCI adapter contained in a cassette from the expansion unit

You can replace a PCI adapter cassette from the 58/02 or 58/77 expansion unit.

Replacing a PCI adapter contained in a cassette from the expansion unit with the power off

You can replace a PCI adapter cassette from the 58/02 or 58/77 expansion unit with the system power off.

Before you begin

You must have already completed the procedure "Removing a PCI adapter contained in a cassette from the expansion unit with the system power off" on page 105 to have the slot powered off.

About this task

To replace an adapter with the system power off, do the following steps:

Procedure

1. If the adapter needs to be placed in a PCI adapter cassette, see "PCI adapter single-width and double-width cassettes" on page 112.
2. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.

3. 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.

4. Install the PCI adapter cassette in the system. Refer to "Installing a PCI adapter contained in a cassette" on page 101.

5. Reconnect the system to the power source.

6. Start the system or logical partition. For instructions, see "Starting the system or logical partition" on page 157.

7. Verify the installed part.
   - If you replaced the part because of a service action, verify the installed part.
   - If you installed the part for any other reason, verify the installed part.

Replacing a PCI adapter contained in a cassette from the expansion unit with the power on in AIX

You can remove or replace a PCI adapter cassette from the 58/02 or 58/77 expansion unit that is running the AIX operating system with the system power on.

Before you begin

Before you begin: Prepare to replace a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette" on page 100.

About this task

Important:
- Use this procedure if you intend to remove a failing PCI adapter and replace it with the same type of adapter. If you plan to remove a failing adapter and leave the slot empty, see "Removing a PCI adapter contained in a cassette from the expansion unit with the power on in AIX" on page 107.
- Do not use this procedure to remove an existing adapter and install a different type of adapter. To install a different adapter, remove the existing adapter as described in "Removing a PCI adapter contained in a cassette from the expansion unit with the power on in AIX" on page 107, and then install the new adapter as described in "Installing a PCI adapter contained in a cassette with the power on in the AIX environment" on page 103.
- Procedures performed on a PCI adapter with the system power on in AIX, 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.

To replace an adapter, do the following steps:

Procedure

1. Determine the location of the PCI adapter in the system.
2. Record the slot number and location of each adapter being removed.

   Note: 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. Follow these steps to replace a PCI adapter using the PCI Hot-Plug Manager menu in the AIX Diagnostic tools:
   a. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at the AIX command line.
   b. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
   c. At the FUNCTION SELECTION menu, select **Task Selection**, then press Enter.

d. At the Task Selection list, select **PCI Hot Plug Manager**.

e. Select **Unconfigure a Device**, then press Enter.

f. Press F4 (or Esc +4) to display the **Device Names** menu.

g. Select the adapter you are removing in the **Device Names** menu.

h. Use the Tab key to answer YES to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, then press Enter. The ARE YOU SURE window displays.

i. Press Enter to verify the information. Successful unconfiguration is indicated by the OK message displayed next to the Command field at the top of the screen.

j. Press F3 (or Esc +3) twice to return to the Hot Plug Manager menu.

k. Select **Replace/remove PCI Hot Plug adapter**.

l. Select the slot that has the device to be removed from the system.

m. Select **Replace**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.

n. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.

5. Label, and then disconnect all cables attached to the adapter you plan to remove.

6. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit" on page 105.

7. Place the cassette with the cover facing up on an approved ESD surface.

8. Install the adapter into the PCI adapter cassette. Refer to "PCI adapter single-width and double-width cassettes" on page 112.

9. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.

10. 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.

11. Install the PCI adapter cassette in the system. Refer to "Installing a PCI adapter contained in a cassette" on page 101.

12. Follow these steps to complete the PCI Hot Plug menus in the AIX Diagnostic tools and configure the device:

a. Press enter and continue to follow the instructions in the system diagnostics until you receive a message that the replacement is successful. Successful replacement is indicated by the OK message displayed next to the **Command** field at the top of the menu.

b. Press the F3 (or Esc+3) key to return to the **PCI Hot-Plug Manager** menu.

c. Press the F3 (or Esc+3) key to return to the **TASK** selection list.

d. Select **Log Repair Action**.

e. Select the resource just replaced, press Enter, press Commit (F7 or ESC 7), then press Enter.

f. Press F3 (or Esc+3) to return to **TASK Selection List**.

g. Select **Hot Plug Task**, press enter.

h. Select **PCI Hot Plug Manager**, then select **Configure a defined device**, then press Enter.

i. Select the device just replaced from the list, then press Enter. The device is now configured.

j. Press the F10 key to exit the diagnostic program.

   Note: If you are running the stand-alone diagnostics, do not exit the program completely.

13. Verify the PCI adapter by using the following instructions:

a. Did you replace the adapter with the system power on?
   - Yes: Go to the next step.
   - No: Load the diagnostic program by doing the following steps:
     – If AIX is available, boot AIX, log in as root or CELOGIN, and then enter the **diag** command.

b. Enter **diag** if you are not already displaying the diagnostic menus.

   c. Select **Advance Diagnostic Routines**, and then select **Problem Determination**.

   d. Select the name of the resource just replaced from the menu. If the resource just replaced is not shown, choose the resource associated with it. Press Enter, and then press **Commit** (F7 or Esc+7).

   e. Did the Problem Determination identify any problems?

      - No: Continue to the next step.
      - Yes: A problem is identified

        – If you are a customer, record the error information, and then contact your service provider.

        – If you are an authorized service provider, return to map 210-5.

14. Press the F10 key to exit the diagnostic program.

Replacing a PCI adapter contained in a cassette from the expansion unit with the power on in Linux

You can replace a PCI adapter cassette from the 58/02 or 58/77 expansion unit that is running the Linux operating system with the system power on.

Before you begin

You must have already completed the procedure "Removing a PCI adapter contained in a cassette from the expansion unit with the power on in Linux" on page 109 to have the slot powered off.

About this task

Note: Use this procedure only when you are replacing an adapter with an identical adapter. If you are replacing an adapter with an adapter that is not identical to the adapter removed, follow the steps in "Installing a PCI adapter contained in a cassette with the power on in the Linux environment" on page 104.

To replace an adapter with the power on in Linux, do the following steps:

Procedure

1. If the adapter needs to be placed in the PCI adapter cassette, see "PCI adapter single-width and double-width cassettes."

2. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.

3. 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.

4. Enter drmgr to enable an adapter to be replaced:

   For example, to replace the PCI adapter in slot U7879.001.DQD014E-P1-C3 enter:

   `drmgr -c pci -r -s locationcode`

5. Follow the instructions on the display to complete the task. When you are instructed to insert the adapter in the adapter slot, see "Installing a PCI adapter cassette" on page 101.

6. Enter lsslot 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                    Devices
   U7879.001.DQD014E-P1-C3 PCI-X capable, 64 bit, 133MHz slot 0001:40:01.0
   ```

PCI adapter single-width and double-width cassettes

You can remove, replace, or install PCI adapters in a cassette.

Removing an adapter from the PCI adapter single-width cassette

You can remove a PCI adapter from a single-width cassette.

About this task

To remove an adapter from the single-width cassette, do the following steps:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. Remove the cassette from the system.
4. Remove the cassette cover by doing the following steps:
   a. Slide the cover latch **(A)** to disengage the lug and pivot pin **(C)** as shown in the following figure.
   b. Lift the cover **(B)** off the pivot pin.
   c. Slide the cover off the cassette.

Figure 88. PCI adapter cassette cover removed

5. Remove the adapter from the cassette by doing the following steps:
   a. Unlock the adapter retainers by rotating the retainer clip **(A)** into the horizontal position. See Figure 89 on page 114.

   Notes:
   1) The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter **tailstock**.
   2) 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.

3) When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.

4) If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.

b. Push the adapter retainers **(B)** away from the adapter.

c. Unlock the adapter tailstock clamp **(C)**.

d. 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.

e. Lift the adapter out of the tailstock retaining channel.

Figure 89. Adapter removed from the PCI adapter cassette

f. Put the adapter in a safe place.

   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.

g. Place a PCI adapter or filler panel in the cassette. See "Placing a PCI adapter in a single-width cassette" on page 115.

h. 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.
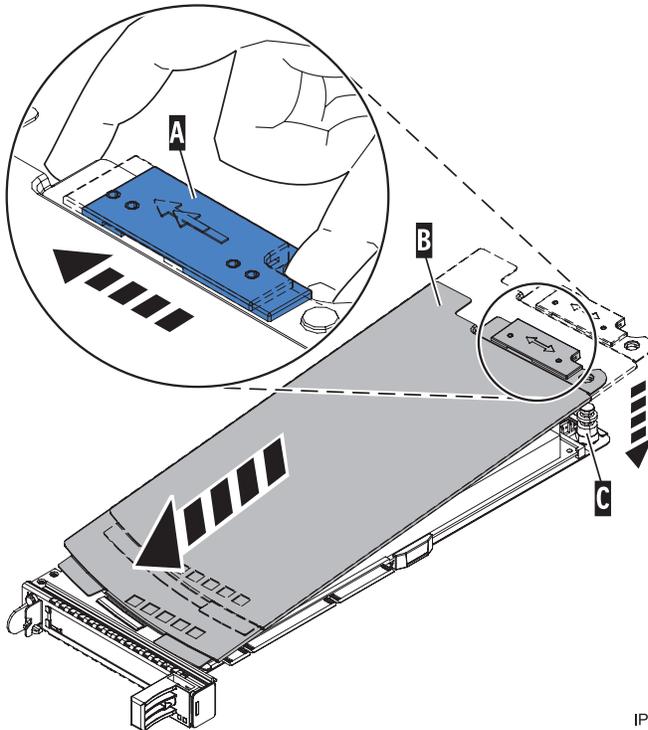
IPHAK530-0

Figure 90. PCI adapter cassette cover replaced

Placing a PCI adapter in a single-width cassette

You can place a PCI adapter in a single-width cassette.

About this task

To place a PCI adapter in a cassette, do the following steps:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. Remove any shipping handles or brackets attached to the adapter.
4. Remove the cassette cover by doing the following steps:
   a. Slide the cover latch **(A)** to disengage the lug and pivot pin **(C)** as shown in the following figure.
   b. Lift the cover **(B)** off of the pivot pin.
   c. Slide the cover off of the cassette.

IPHAK520-0

Figure 91. PCI adapter single-width cassette cover removed

5. Ensure the cassette is prepared to receive an adapter by doing the following steps:
   a. Ensure the cassette is empty by doing one of the following steps:
      - "Removing an adapter from the PCI adapter single-width cassette" on page 113.
      - Remove the adapter filler panel from the cassette.
   b. Ensure that all of the adapter retainers **(A)** have been pushed out to the edges of the cassette to allow the placement of the adapter. See Figure 92 on page 117.

Figure 92. Adapter retainers

   c. Rotate the tailstock clamp into the open position.
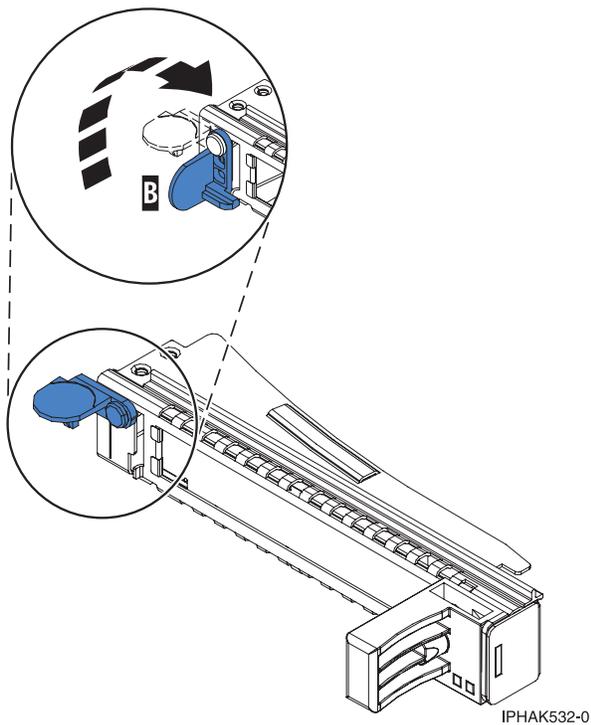
Figure 93. Tailstock clamp in the open position

6. Place the adapter in the cassette by doing the following steps:

   a. With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **(A)**. See Figure 94 on page 118.

   b. Rotate the adapter toward the top of the cassette and into place.

c. Close the tailstock clamp **(B)**. See Figure 94.
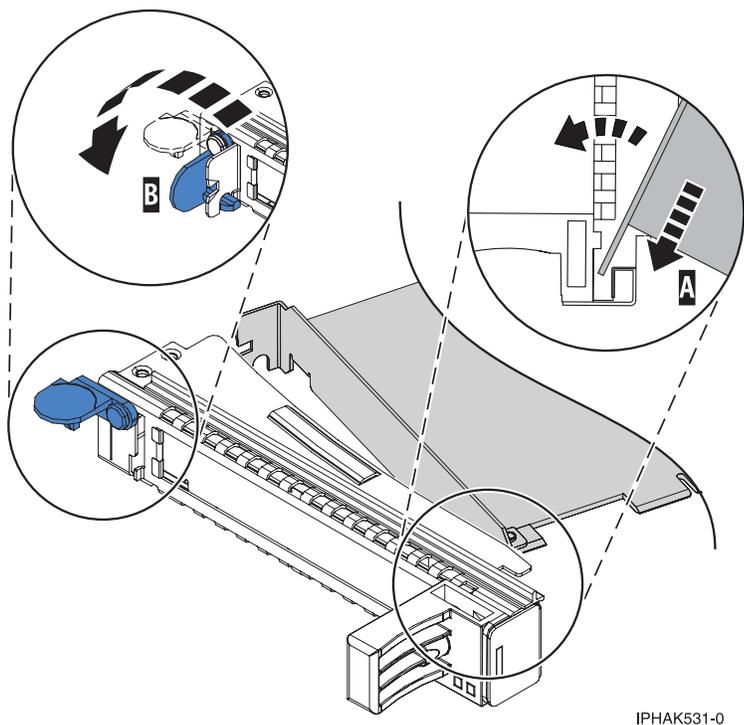
IPHAK531-0

Figure 94. Adapter removed from the PCI adapter single-width cassette

d. Position the adapter retainers to support the adapter, and then rotate the retainer clip into the closed position.

   Notes:

   1) 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.
   2) When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter.
   3) 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

   a) Place and lock the retainers **(B)**. See Figure 95 on page 119.

      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.

   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.
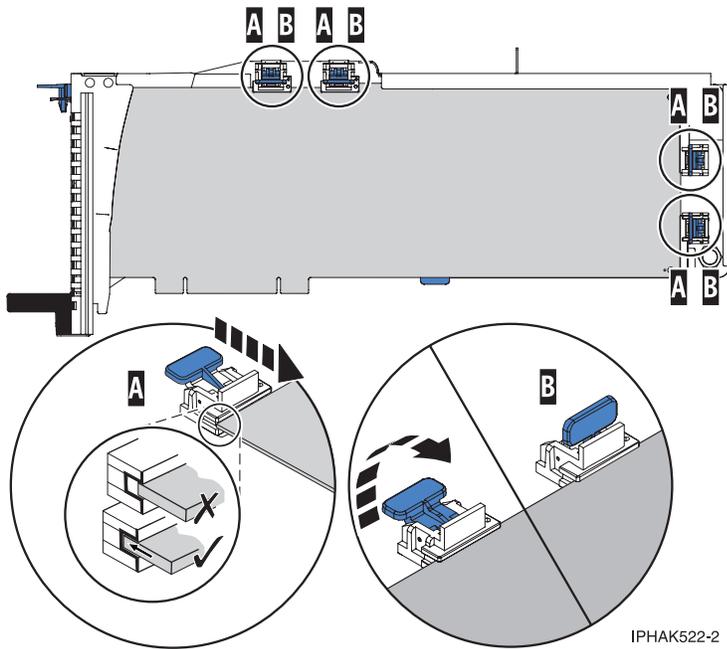
Figure 95. Large adapter in the PCI adapter cassette with the supports and stabilizer in place

Adapter-cassette retainer placement for medium-length adapters

a) Remove the adapter stabilizer **(C)**. See Figure 96 on page 120.

b) Place and lock the retainers **(B)**.

c) 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.

Figure 96. Medium-length adapter in the PCI adapter cassette with the supports in place

Adapter-cassette retainer placement for small adapters

a) Remove the adapter stabilizer **(C)**. See Figure 97 on page 121.

b) 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.

c) Place and lock the retainers **(B)**.

d) 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.
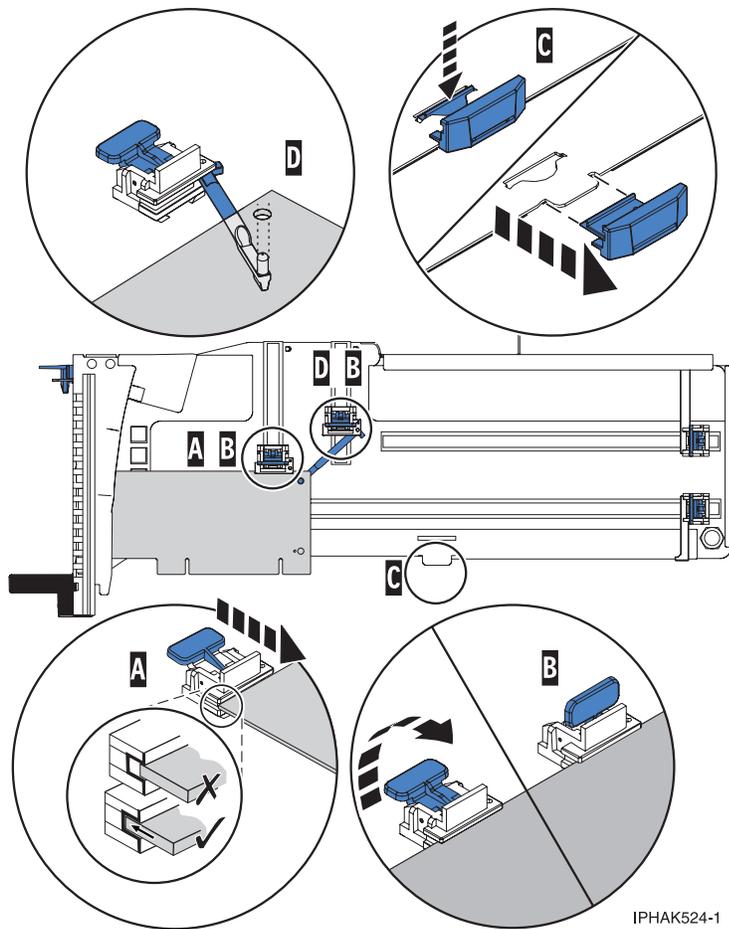
Figure 97. Small adapter in the PCI adapter cassette with the supports and the hookarm in place

7. Replace the cassette cover by doing the following steps:

   a. Slide the cover **(B)** into position on the cassette as shown in the following figure.

   b. While holding the cover latch **(A)** in the open position, place the cover over the pivot pin **(C)**.

   c. Release the cover latch to lock the cover into place.
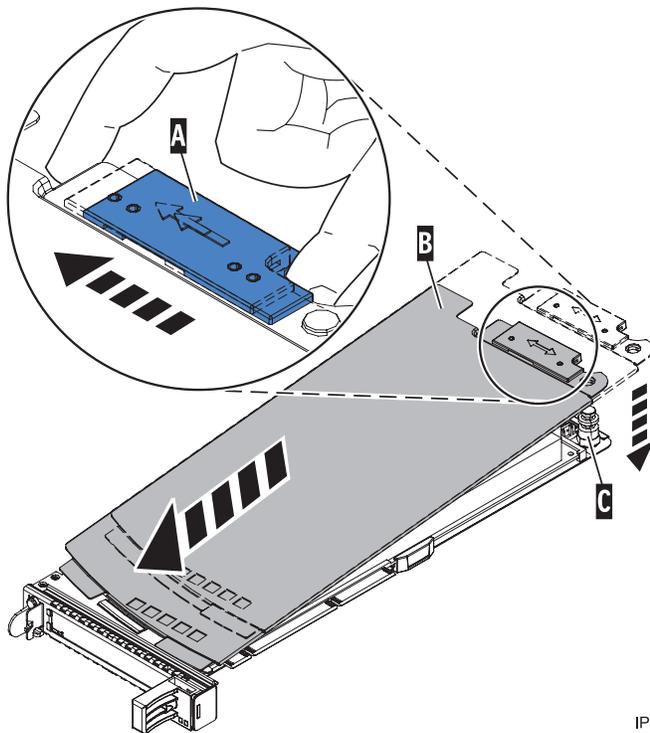
IPHAK530-0

Figure 98. PCI adapter cassette cover replaced

Removing an adapter from the PCI adapter double-wide cassette

You can remove a PCI adapter from a double-wide cassette.

About this task

To remove an adapter from the cassette, do the following steps:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Safety notices" on page 130 and "Handling static-sensitive devices" on page 135.
3. Remove the PCI adapter contained in a cassette from the system.
4. Remove any shipping handles or brackets attached to the adapter.
5. Remove the cassette cover by doing the following steps:
   a. Slide the cover latch **(A)** to disengage it from the pivot pin **(C)** as shown in the following figure.
   b. Lift the cover **(B)** off of the pivot pin.
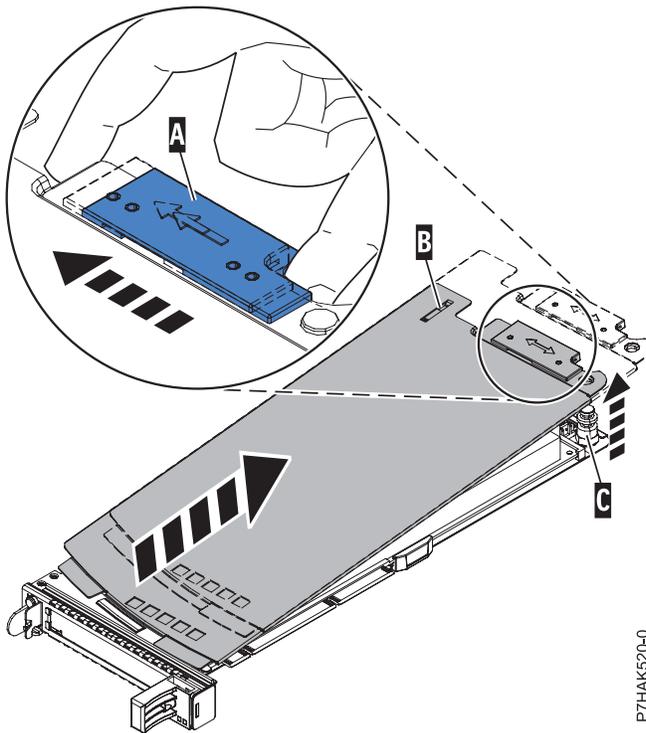   c. Slide the cover off of the cassette.

Figure 99. PCI adapter cassette cover removed

    d. Unscrew pivot pin **(C)** and put it in a safe place

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

    a. Unlock the adapter retainers **(B)** by rotating the retainer clips **(A)** into the horizontal position. See Figure 100 on page 124. If you are removing a PCIe RAID and SSD SAS adapter, see Figure 101 on page 124.

    Notes:

    1) The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter *tailstock*.

    2) 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.

    3) When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.

    4) If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.

    b. Push the adapter retainers **(B)** away from the adapter.

    c. Unlock the adapter tailstock clamp **(A)**.

    d. 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.

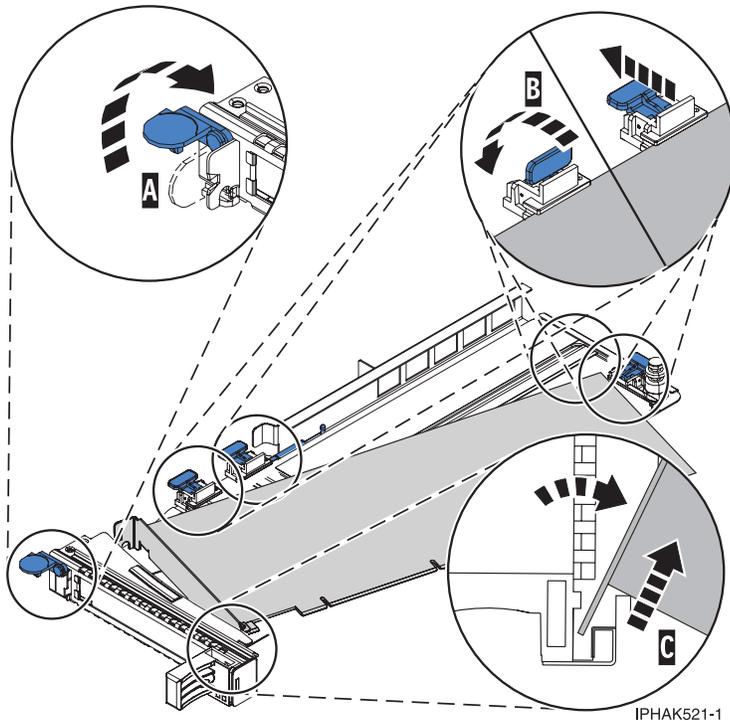   e. Lift the adapter out of the tailstock retaining channel **(C)**.
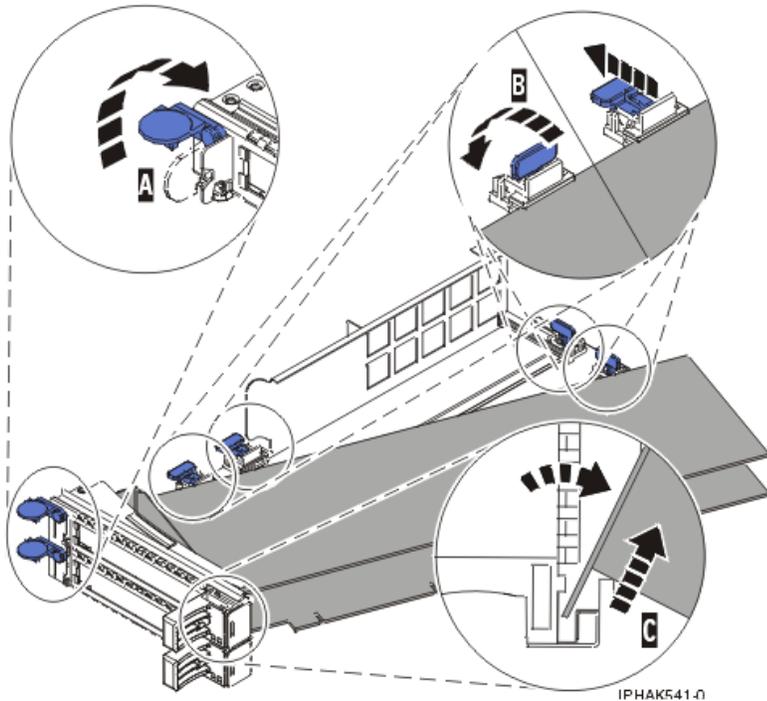
Figure 100. Adapter removed from the PCI adapter cassette
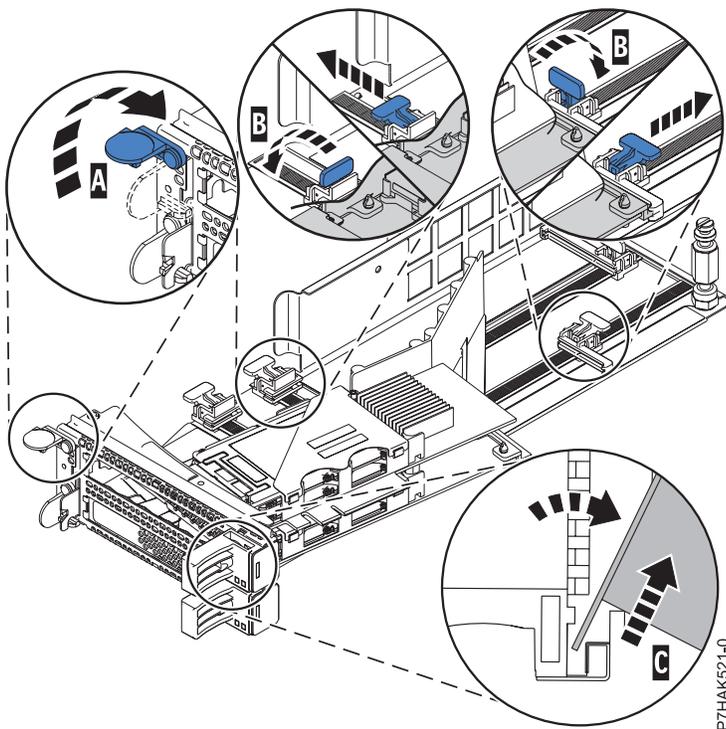
Figure 101. PCIe RAID and SSD SAS adapter removed from the PCI adapter cassette

    f. Put the adapter in a safe place.

    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.

g. Place the adapter in the PCI adapter double-wide cassette. For information, see "Placing an adapter in the PCI adapter double-wide cassette."

   Note: If the cassette is not going to contain a PCI adapter, use this same procedure to place an adapter filler panel in the cassette.

h. Replace the cassette cover by doing the following steps:

   1) Screw pivot pin **(C)** into place.

   2) Slide the cover **(B)** into position on the cassette.

   3) While holding the cover latch **(A)** in the open position, place the cover over the pivot pin **(C)**.

   4) Release the cover latch to lock the cover into place.
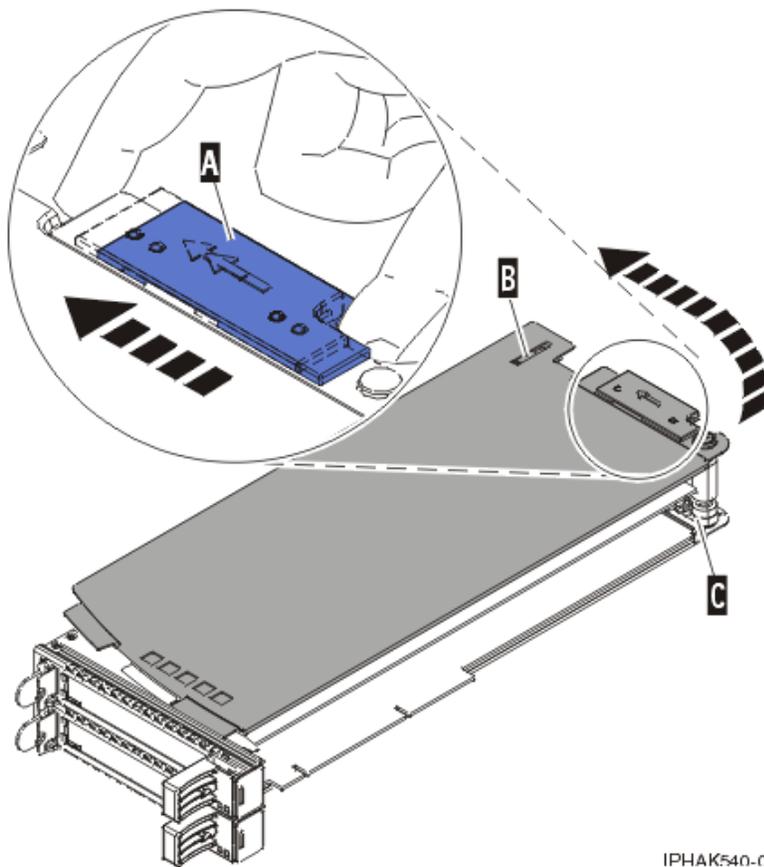
Figure 102. PCI adapter cassette cover replaced

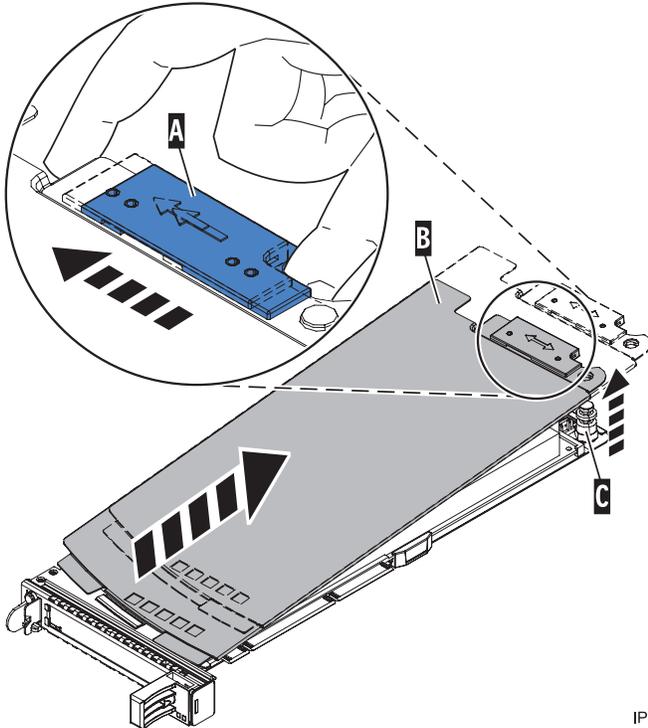## Placing an adapter in the PCI adapter double-wide cassette

You can place a PCI adapter in a double-wide cassette.

About this task

To place an adapter in a cassette, do the following steps:

Procedure

1. Complete the prerequisite tasks that are described in "Before you begin" on page 143.
2. Remove the PCI adapter contained in a cassette from the system.
3. Remove the cassette cover by doing the following steps:
   a. Slide the cover latch **(A)** to disengage it from the pivot pin **(C)** as shown in the following figure.

b. Lift the cover **(B)** off of the pivot pin.

c. Slide the cover off of the cassette.
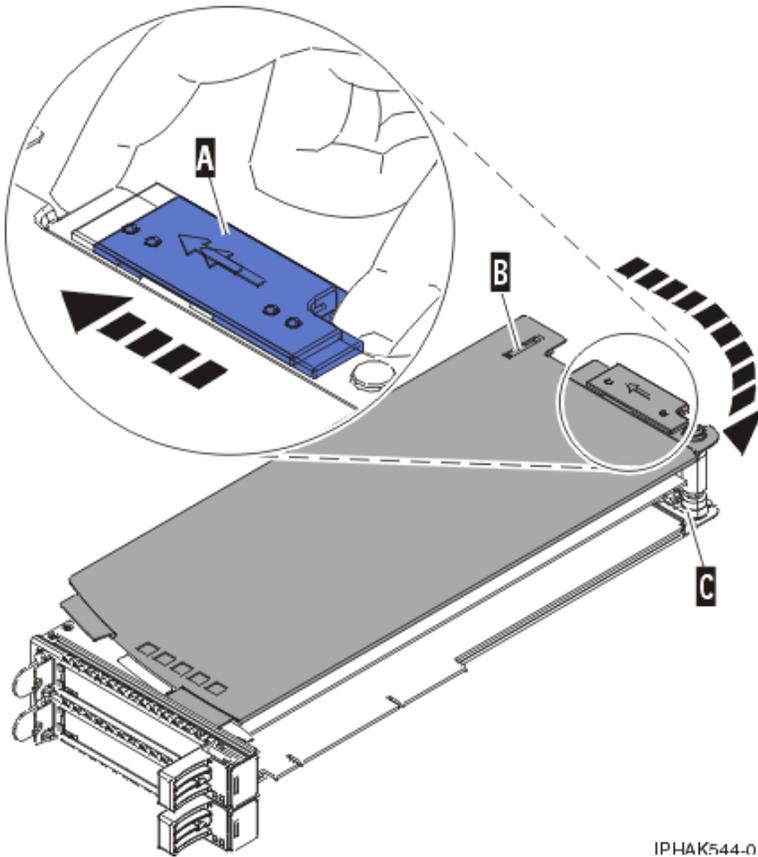
Figure 103. PCI adapter cassette cover removed

d. Unscrew pivot pin **(C)** and put it in a safe place.

4. Ensure the cassette is prepared to receive an adapter by doing the following steps:

a. Ensure the cassette is empty by doing one of the following steps:

- Remove the adapter from the PCI adapter double-wide cassette. For information, see "Removing an adapter from the PCI adapter double-wide cassette" on page 122.

- Remove the adapter filler panel from the cassette.

b. Ensure that all of the adapter retainers have been pushed out to the edges of the cassette to allow the placement of the adapter.

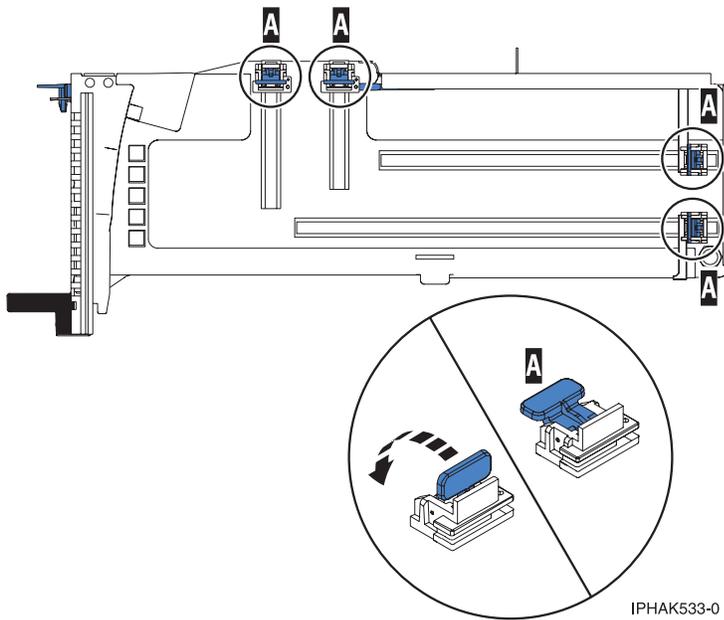c. Place the tailstock clamp in the open position by pressing the cassette handle towards the retainer clip.

5. If necessary, remove the new adapter from the antistatic package.

Attention: Avoid touching the components and gold connectors on the adapter.

6. Place the new adapter, component-side up, on a flat, static-protective surface.

7. For PCIe RAID and SSD SAS adapters, install the new air dam onto the new adapter.

a. Slide the air dam **(A)** between the two cards and align the three holes in the air dam with the three holes on the card edges. See the following figure.

b. Insert the three plastic rivets **(B)** into the card and air dam holes.

c. Insert the three plastic push pins **(C)** into the three plastic rivets.

d. Label the location of each solid state disk (SSD) while you transfer the SSDs from the replaced adapter to the same location on the new adapter you are installing. For information about replacing SSDs, see Replacing an SSD module on the PCIe RAID and SSD SAS adapter. Repeat this step for each SSD.
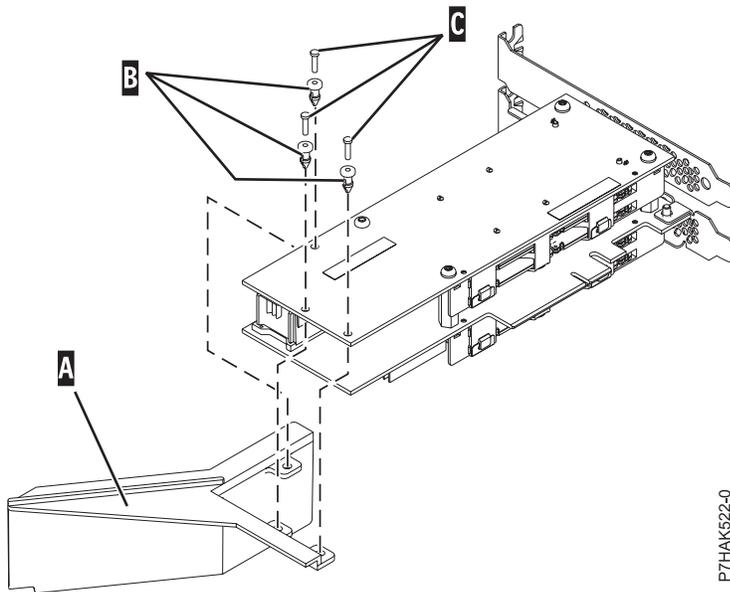
P7HAK522-0

Figure 104. Installing an air dam onto the new PCIe RAID and SSD SAS adapter

8. Place the adapter in the cassette by doing the following steps:
   a. With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **(A)**. For a typical PCI adapter, see Figure 105 on page 128. For a PCIe RAID and SSD SAS adapter, see Figure 106 on page 128.
   b. Rotate the adapter toward the top of the cassette and into place.
   c. Close the tailstock clamp **(C)**.
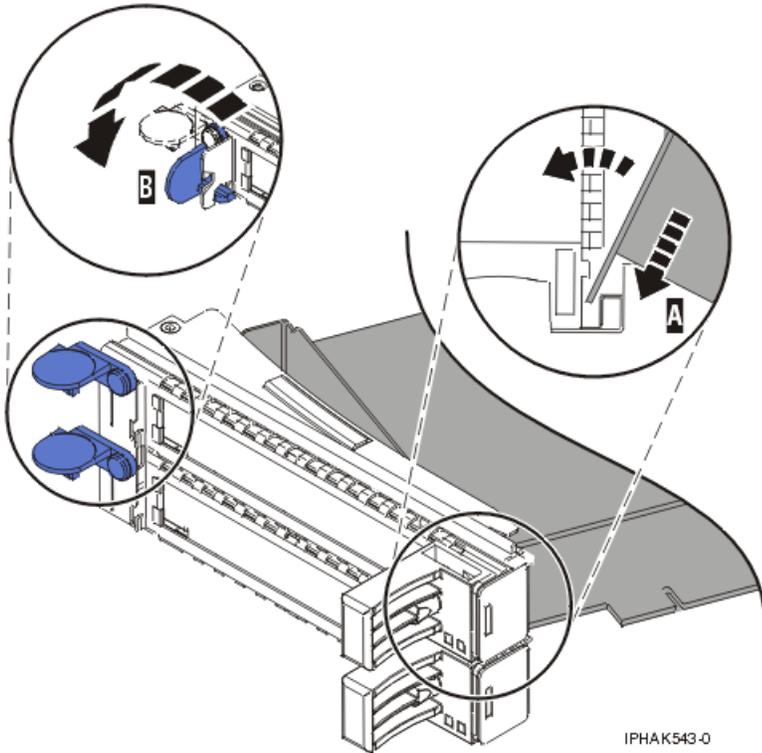
Figure 105. Adapter replaced in the PCI adapter cassette
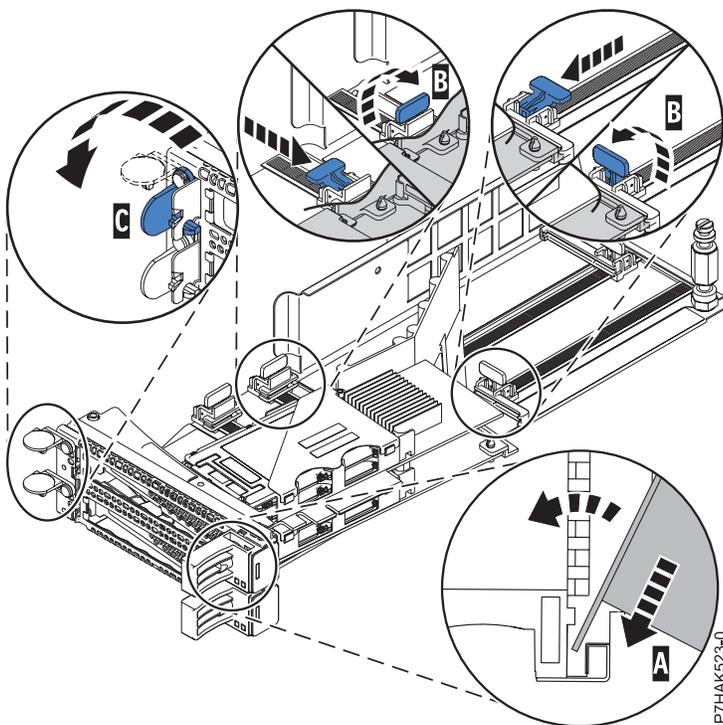
Figure 106. Replacing a PCIe RAID and SSD SAS adapter into the PCI adapter cassette

    d. Position the adapter retainers to support the adapter, and then rotate the retainer clip **(B)** into the closed position.

Notes:

1) 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.

2) When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter.

3) Place and lock the retainers **(B)**. See Figure 107.

    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.

4) 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.
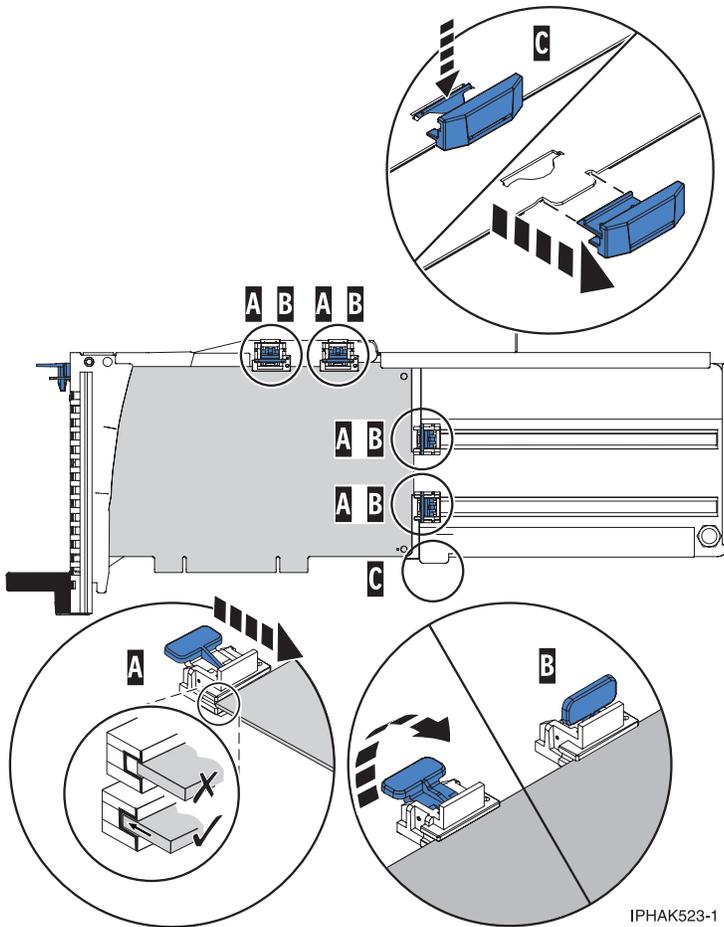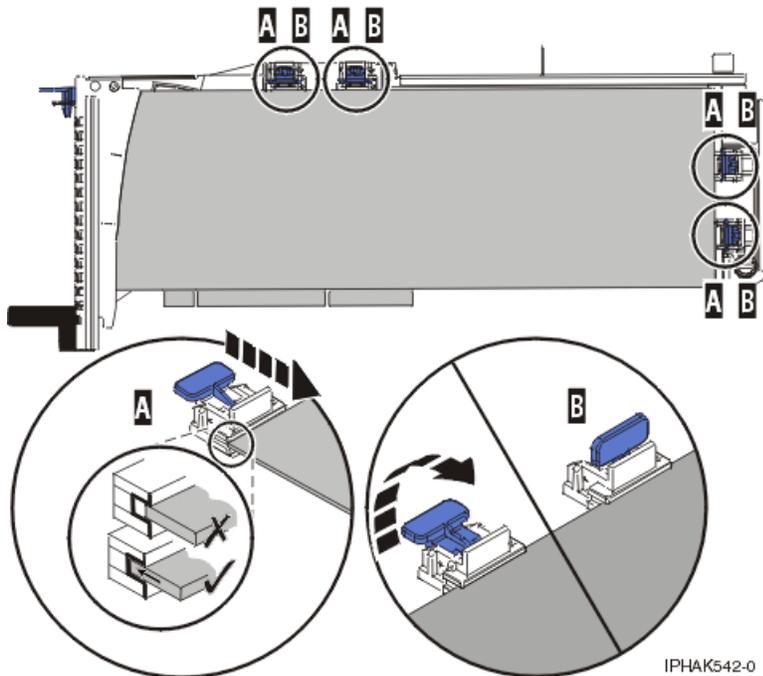

Figure 107. Long adapter in the PCI adapter cassette with the supports and stabilizer in place

9. After the retainers are placed, replace the cassette cover by doing the following steps:
    a. Screw pivot pin **(C)** into place.
    b. Slide the cover **(B)** into position on the cassette as shown in the following figure.
    c. While holding the cover latch **(A)** in the open position, place the cover over the pivot pin **(C)**.
    d. Release the cover latch to lock the cover into place.
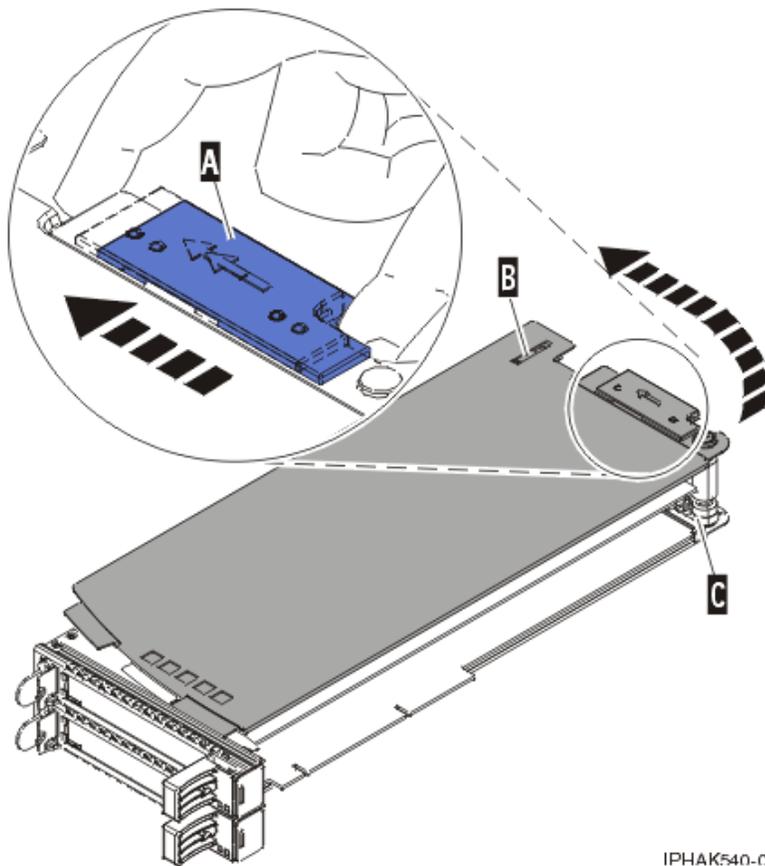
Figure 108. PCI adapter cassette cover replaced

10. Replace the PCI adapter contained in a cassette in 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.

Related procedures for installing and removing PCI adapters

These procedures are related to installing and removing PCI adapters.

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, a safety information booklet is included in the publications package shipped with the product. The booklet 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 in the booklet. You should also refer to the booklet any time you do not clearly understand

any safety information in the U.S. English publications.

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 provided power cord. Do not use the 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.**

  (D005a)

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 approved part. Recycle or discard the battery as instructed by local regulations. (C003a)

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.

Handling static-sensitive devices

Learn about precautions you should take to prevent damage to electronic components from static electricity discharge.

Electronic boards, adapters, media drives, and disk drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags to prevent this damage. Take the following precautions to prevent damage to these devices from static electricity discharge.

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge 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 before 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.
- Do not remove the device from the antistatic bag until you are ready to install the device in the system.
- With the device still in its antistatic bag, touch it to the metal frame of the system.
- Grasp cards and boards by the edges. Avoid touching the components and gold connectors on the adapter.
- If you need to lay the device down while it is out of the antistatic bag, lay it on the antistatic bag. Before picking it up again, touch the antistatic bag and the metal frame of the system at the same time.
- Handle the devices carefully to prevent permanent damage.

Installing or replacing a PCI adapter with the system power on in Virtual I/O Server

You can install or replace a PCI adapter in the Virtual I/O Server logical partition or in the Integrated Virtualization Manager management partition.

Before you begin

The Virtual I/O Server includes a PCI Hot Plug Manager that is similar to the PCI Hot Plug Manager in the AIX operating system. The PCI Hot Plug Manager allows you to hot plug PCI adapters into the server and then activate them for the logical partition without having to reboot the system. Use the PCI Hot Plug Manager for adding, identifying, or replacing PCI adapters in the system that are currently assigned to the Virtual I/O Server.

Getting started
Before you begin

Prerequisites:
- If you are installing a new adapter, an empty system slot must be assigned to the Virtual I/O Server logical partition. This task can be done through dynamic logical partitioning (DLPAR) operations.
  - If you are using a Hardware Management Console (HMC), you must also update the logical partition profile of the Virtual I/O Server so that the new adapter is configured to the Virtual I/O Server after you restart the system.
  - If you are using the Integrated Virtualization Manager, an empty slot is probably already assigned to the Virtual I/O Server logical partition because all slots are assigned to the Virtual I/O Server by default. You only need to assign an empty slot to the Virtual I/O Server logical partition if you previously assigned all empty slots to other logical partitions.
- If you are installing a new adapter, ensure that you have the software required to support the new adapter and determine whether there are any existing PTF prerequisites to install.
- If you need help determining the PCI slot in which to place a PCI adapter, see the PCI adapter placement.

About this task

Follow these steps to access the Virtual I/O Server, PCI Hot Plug Manager:

Procedure

1. If you are using the Integrated Virtualization Manager, connect to the command-line interface.
2. Use the **diagmenu** command to open the Virtual I/O Server diagnostic menu. The menus are similar to the AIX diagnostic menus.
3. Select **Task Selection**, then press Enter.
4. At the Task Selection list, select **PCI Hot Plug Manager**.

Installing a PCI adapter
About this task

To install a PCI adapter with the system power on in Virtual I/O Server, do the following steps:

Procedure

1. From the PCI Hot Plug Manager, select **Add a PCI Hot Plug Adapter**, then press Enter. The Add a Hot-Plug Adapter window is displayed.
2. Select the appropriate empty PCI slot from those listed, and press Enter. A fast-blinking amber LED located at the back of the server near the adapter indicates that the slot has been identified.
3. Follow the instructions on the screen to install the adapter until the LED for the specified PCI slot is set to the Action state.
   a. Set the adapter LED to the action state so that the indicator light for the adapter slot flashes
   b. Physically install the adapter
   c. Finish the adapter installation task in **diagmenu**.
4. Enter **cfgdev** to configure the device for the Virtual I/O Server.

Results

If you are installing a PCI, Fibre Channel adapter, it is now ready to be attached to a SAN and have LUNs assigned to the Virtual I/O Server for virtualization.

Replacing a PCI adapter
Before you begin

Prerequisite: Before you can remove or replace a storage adapter, you must unconfigure that adapter. See "Unconfiguring storage adapters" on page 138 for instructions.

About this task

To replace a PCI adapter with the system power on in Virtual I/O Server, do the following steps:

Procedure

1. From the PCI Hot Plug Manager, select **Unconfigure a Device**, then press Enter.
2. Press F4 (or Esc +4) to display the **Device Names** menu.
3. Select the adapter you are removing in the **Device Names** menu.
4. In the **Keep Definition** field, use the Tab key to answer Yes. In the **Unconfigure Child Devices** field, use the Tab key again to answer YES, then press Enter.
5. Press Enter to verify the information on the **ARE YOU SURE** screen. Successful unconfiguration is indicated by the OK message displayed next to the Command field at the top of the screen.
6. Press F4 (or Esc +4) twice to return to the Hot Plug Manager.
7. Select **replace/remove PCI Hot Plug adapter**.
8. Select the slot that has the device to be removed from the system.

9. Select **replace**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.
10. Press Enter which places the adapter in the action state, meaning it is ready to be removed from the system.

Unconfiguring storage adapters
About this task

Before you can remove or replace a storage adapter, you must unconfigure that adapter. Storage adapters are generally parent devices to media devices, such as disk drives or tape drives. Removing the parent requires that all attached child devices either be removed or placed in the define state.

Unconfiguring a storage adapter involves the following tasks:
* Closing all applications that are using the adapter you are removing, replacing, or moving
* Unmounting file systems
* Ensuring that all devices connected to the adapter are identified and stopped
* Listing all slots that are currently in use or a slot that is occupied by a specific adapter
* Identifying the adapter's slot location
* Making parent and child devices unavailable
* Making the adapter unavailable

If the adapter supports physical volumes that are in use by a client logical partition, then You can perform steps on the client logical partition before unconfiguring the storage adapter. For instructions, see "Preparing the client logical partitions." For example, the adapter might be in use because the physical volume was used to create a virtual target device, or it might be part of a volume group used to create a virtual target device.

Follow these steps to unconfigure SCSI, SSA, and Fibre Channel storage adapters:

Procedure

1. Connect to the Virtual I/O Server command-line interface.
2. Enter `oem_setup_env` to close all applications that are using the adapter you are unconfiguring.
3. Type `lsslot-c pci` to list all the hot plug slots in the system unit and display their characteristics.
4. Type `lsdev -C` to list the current state of all the devices in the system unit.
5. Type `unmount` to unmount previously mounted file systems, directories, or files using this adapter.
6. Type `rmdev -l adapter -R` to make the adapter unavailable.

   Attention: Do not use the -d flag with the `rmdev` command for hot plug operations because this action removes your configuration.

Preparing the client logical partitions
About this task

If the virtual target devices of the client logical partitions are not available, the client logical partitions can fail or they might be unable to perform I/O operations for a particular application. If you use the HMC to manage the system, you might have redundant Virtual I/O Server logical partitions, which allow for Virtual I/O Server maintenance and avoid downtime for client logical partitions. If you are replacing an adapter on the Virtual I/O Server and your client logical partition is dependent on one or more of the physical volumes accessed by that adapter, then You can take action on the client before you unconfigure the adapter.

The virtual target devices must be in the define state before the Virtual I/O Server adapter can be replaced. Do not remove the virtual devices permanently.

Procedure

To prepare the client logical partitions so that you can unconfigure an adapter, complete the following steps depending on your situation.

Table 1. Situations and steps for preparing the client logical partitions

Situation	Steps
You have redundant hardware on the Virtual I/O Server for the adapter.	No action is required on the client logical partition.
HMC-managed systems only: You have redundant Virtual I/O Server logical partitions that, in conjunction with virtual client adapters, provide multiple paths to the physical volume on the client logical partition.	No action is required on the client logical partition. However, path errors might be logged on the client logical partition.
HMC-managed systems only: You have redundant Virtual I/O Server logical partitions that, in conjunction with virtual client adapters, provide multiple physical volumes that are used to mirror a volume group.	See the procedures for your client operating system.
You do not have redundant Virtual I/O Server logical partitions.	Shut down the client logical partition. For instructions, see the following topics about shutting down logical partitions: • For systems that are managed by the HMC, see "Shutting down AIX logical partitions using the HMC", and "Shutting down Linux logical partitions using the HMC" in the Logical partitioning.[1] • For systems that are managed by the Integrated Virtualization Manager, see Shutting down logical partitions.
[1]The Logical partitioning can be found on the Hardware Information website at add URL here.	

PCI hot-plug manager access for AIX

You might need to service PCI adapters with the system power on in AIX. Use the procedures in this section to perform this task.

The instructions for servicing PCI adapters with the system power on in AIX refer you to these procedures when it is appropriate to perform them.

Note: For an adapter to be serviced with the system power on, both the adapter and the system unit must support hot-plug procedures. To identify adapters that are hot-pluggable in the system you are servicing, refer to the following placement information: PCI adapter placement.

Accessing hot-plug management functions

You can use PCI Hot Plug Manager to service PCI adapters with the system power on in AIX. Use the procedures in this section to perform this task.

About this task

Note: Procedures performed on a PCI adapter with the system power on in AIX, 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.

To access the hot-plug menus, do the following:

1. Log in as root user.
2. At the command line, type `smitty`.
3. Select **Devices**.
4. Select **PCI Hot Plug Manager** and press Enter.
5. The PCI Hot-Plug Manager menu displays. Return to the procedure that directed you here. The following section describes the menu options.

PCI hot-plug manager menu

You can use PCI Hot Plug Manager to service PCI adapters with the system power on in AIX. The following options are available from the PCI Hot Plug Manager menu.

Note: For information about the PCI slot LED states, see "Component LEDs" on page 141.

List PCI hot-plug slots

Provides a descriptive list of all slots that support PCI hot-plug capability. If the listing for a slot indicates it holds an unknown device, select the **Install/configure Devices added after IPL** to configure the adapter in that slot.

Add a PCI hot-plug adapter

Allows the user to add a new PCI hot-plug-capable adapter to the slot with the system turned on. You will be asked to identify the PCI slot that you have selected prior to the actual operation. The selected PCI slot will go into the Action state and finally into the On state.

Note: The system will indicate the slot holds an unknown device until you perform the **Install/configure devices added after IPL** option to configure the adapter.

Replace/remove a PCI hot-plug adapter

Allows the user to remove an existing adapter, or replace an existing adapter with an identical one. For this option to work, the adapter must be in the Defined state (see the "Unconfigure a Device" option).

You will be asked to identify the PCI slot prior to the actual operation. The selected PCI slot will go into the Action state.

Identify a PCI hot-plug slot

Allows the user to identify a PCI slot. The selected PCI slot will go into the Identify state. See "Component LEDs" on page 141.

Unconfigure a device

Allows the user to put an existing PCI adapter into the Defined state if the device is no longer in use.

This step must be completed successfully before starting any removal or replacement operation. If this step fails, the customer must take action to release the device.

Configure a defined device

Allows a new PCI adapter to be configured into the system if software support is already available for the adapter. The selected PCI slot will go into the On state.

Install/configure devices added after IPL

The system attempts to configure any new devices and tries to find and install any required software from a user-selected source.

The add, remove, and replace functions return information to the user indicating whether the operation was successful. If additional instructions are provided on the screen, complete the recommended actions. If the instructions do not resolve the problem, do the following:

- If the adapter is listed as Unknown, perform the **Install/configure devices Added After IPL** option to configure the adapter.
- If you receive a warning indicating that needed device packages are not installed, the system administrator must install the specified packages before you can configure or diagnose the adapter.
- If you receive a failure message indicating a hardware error, the problem might be either the adapter or the PCI slot. Isolate the problem by retrying the operation in a different PCI slot, or trying a different adapter in the slot. If you determine that you have failing hardware, call your service representative.
- *Do not* use **Install/configure devices added after IPL** if your system is set up to run HACMP™ clustering. Consult with your system administrator or software support to determine the correct method to configure the replacement device.

Component LEDs

Individual LEDs are located on or near the failing components. Use the information in this section to interpret the LEDs.

The LEDs are located either on the component itself or on the carrier of the component (for example, memory card, fan, memory module, or processor). LEDs are either green or amber.

Green LEDs indicate either of the following:

- Electrical power is present.
- Activity is occurring on a link. (The system could be sending or receiving information.)

Amber LEDs indicate a fault or identify condition. If your system or one of the components on your system has an amber LED turned on or blinking, identify the problem and take the appropriate action to restore the system to normal.

Resetting the LEDs in AIX:

Individual LEDs are located on or near the failing components. You can use this procedure to reset the LEDs after you have completed a repair action.

About this task

After the repair action is completed, do the following:

Procedure

1. Log in as root user.
2. At the command line, type `diag`.
3. Select **Task Selection**.
4. Select **Log Repair Action**.
5. Select the device that was repaired.
6. Press F10 to exit diagnostics.

Results

If the Attention LED remains on after you have completed the repair action and reset the LEDs, call for service support.

Prerequisites for hot-plugging PCI adapters in Linux

In the course of installing, removing, or replacing a PCI adapter with the system powered on in aLinux operating system, you might need to complete some prerequisite tasks. Use the information in this section to identify those prerequisites.

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 that the file systems on those devices are unmounted. After hot-plugging adapters for storage devices, ensure that 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 2.6 or later).

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

If you are using a Linux on POWER distribution with Linux kernel version 2.6 or later, 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 on POWER Web site.

Verifying that the hot-plug PCI tools are installed for Linux

In the course of installing, removing, or replacing a PCI adapter with the system power on in Linux operating system you might need use the hot-plug PCI tools. Use the procedure in this section to verify that you have the hot-plug PCI tools installed.

Procedure

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.

Updating the worldwide port name for a new 5735 or 5774 IOA.

If you have exchanged a 5735 or 5774 Fibre Channel Input/Output Adapter (IOA), the external storage subsystem must be updated to use the worldwide port name (WWPN) of the new 5735 or 5774 IOA. Any SAN hardware using WWPN zoning might also need updating.

For instructions on how to update the external storage subsystem or SAN hardware configurations, see the documentation for those systems.

The WWPN for the Fibre Channel IOA can be found using the Hardware Service Manager in SST or DST. Display detail on the 5735 or 5774 IOA Logical Hardware Resource information, and use the port worldwide name field.

The 16-digit WWPN can also be determined by appending the digits 1000 to the beginning of the 12-digit IEEE address found on the tailstock label of the Fibre Channel IOA.

Common procedures for installable features

Use these procedures to help you remove and replace PCI adapters.

Before you begin

Observe these precautions when you are installing, removing, or replacing features and parts.

About this task

These precautions are intended to create a safe environment to service your system and do not provide steps for servicing your system. The installation, removal, and replacement procedures provide the step-by-step processes required to service your system.

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 provided power cord. Do not use the 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.

(D005a)

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)

Before you begin a replacement or installation procedure, perform these tasks:

Procedure

1. If you are installing a new feature, ensure that you have the software required to support the new feature. See IBM Prerequisite.
2. If you are performing an installation or replacement procedure that might put your data at risk, ensure, wherever possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).
3. Review the installation or replacement procedure for the feature or part.
4. Note the significance of color on your system.

Blue or terra-cotta on a part of the hardware indicates a touch point where you can grip the hardware to remove it from or install it in the system, open or close a latch, and so on. Terra-cotta might also indicate that the part can be removed and replaced with the system or logical partition power on.

5. Ensure that you have access to a medium flat-blade screwdriver, a Phillips screwdriver, and a pair of scissors.

6. If parts are incorrect, missing, or visibly damaged, do the following:
   - If you are replacing a part, contact the provider of your parts or next level of support.
   - If you are installing a feature, contact one of the following service organizations:
     – The provider of your parts or next level of support.

7. If you encounter difficulties during the installation, contact your service provider, or your next level of support.

8. If you are installing new hardware in a logical partition, you need to understand and plan for the implications of partitioning your system. For information, see Logical Partitioning.

Removing a part by using the HMC

You can use the Hardware Management Console (HMC) to perform many service actions, including the removal of a field replaceable unit (FRU) or part.

About this task

To remove a part in a system or expansion unit that is managed by HMC Version 7, or later, complete the following steps:

Procedure

1. In the navigation area, expand **Systems Management** > **Servers**.
2. Select the managed system from which you are removing a part.
3. In the **Tasks** area, expand **Serviceability** > **Hardware** > **MES Tasks** > **Remove FRU**
4. In the Add/Install/Remove Hardware - Remove FRU, Select FRU Type window, select the system or enclosure from which you are removing the part.
5. Select the type of part that you are removing, and click **Next**.
6. Select the location of the part that you are removing, and click **Add**.
7. After the part is listed in the **Pending Actions** section, click **Launch Procedure** and follow the instructions to remove the part.

   Note: The HMC might open the information center instructions for removing the part. If so, follow those instructions to remove the part.

Installing a part by using the HMC

You can use the Hardware Management Console (HMC) to perform many service actions, including the installation of a new feature or part.

Before you begin

To install a feature or part into a system or expansion unit that is managed by HMC Version 7, or later, complete the following steps:

Procedure

1. In the navigation area, expand **Systems Management** > **Servers**.
2. Select the managed system on which you will install the part.

Note: If your part is in a miscellaneous equipment specification (MES), continue with step 3. If your part is contained in the install done by the system services representative (SSR) or in a ship group, go to step 8.

3. In the Tasks area, expand **Serviceability** > **Hardware** > **MES Tasks** > **Open MES**.

4. Click **Add MES Order Number**.

5. Enter the number, and click **OK**.

6. Click the newly created order number, and click **Next**. The details of the order number are displayed.

7. Click **Cancel** to close the window.

8. In the Tasks area, expand **Serviceability** > **Hardware** > **MES Tasks**.

9. Select **Add FRU** (field replaceable unit).

10. In the Add/Install/Remove Hardware-Add FRU, Select FRU Type window, select the system or enclosure into which you are installing the feature.

11. Select the type of feature you are installing, and click **Next**.

12. Select the location code where you will install the feature, and click **Add**.

13. After the part is listed in the **Pending Actions** section, click **Launch Procedure** and follow the instructions to install the feature.

    Note: The HMC might open external instructions for installing the feature. If so, follow those instructions to install the feature.

Replacing a part by using the HMC

You can use the Hardware Management Console (HMC) to perform many service actions, including exchanging a field replaceable unit (FRU) or part.

About this task

If you are exchanging a part to repair a serviceable event, follow those instructions. If you are exchanging a part as a part of any other procedure by using HMC Version 7, or later, complete the following steps:

Procedure

1. In the navigation area, expand **Systems Management** > **Servers**.

2. Select the managed system in which you are exchanging a part.

3. In the **Tasks** area, expand **Serviceability** > **Hardware** > **Exchange FRU**.

4. Select the system or enclosure from which you want to exchange the part.

5. In the Replace Hardware - Replace FRU, Select FRU Type window, select the type of part that you will exchange from the menu, and click **Next**.

6. Select the location code of the part that you will exchange, and click **Add**.

7. After the part is listed in the **Pending Actions** section, click **Launch Procedure** and follow the instructions to exchange the part.

    Note: The HMC might open external instructions for replacing the part. If so, follow those instructions to replace the part.

Removing a part by using the SDMC

You can use the Systems Director Management Console (SDMC) to perform many service actions, including the removal of a field-replaceable unit (FRU) or part.

About this task

To remove a part in a system or expansion unit that is managed by an SDMC, complete the following steps:

Procedure
1. In the Power Systems Resources area, select the managed system from which you are removing a part.
2. From the **Actions** menu, expand **Service and Support** > **Hardware** > **MES Tasks** > **Remove FRU**.
3. On the Remove FRU page, select the enclosure from which you want to remove the part from the **Installed Enclosures** list.
4. Select the type of the part that you are removing, and click **Next**.
5. Select the location of the part that you are removing, and click **Add**.
6. After the part is listed in the **Pending Actions** section, click **Launch Procedure** and follow the instructions to remove the part.

   Note: The SDMC might open external instructions for removing the part. If so, follow those instructions to remove the part.

Installing a part by using the SDMC

You can use the Systems Director Management Console (SDMC) to perform many service actions, including the installation of a new field-replaceable unit (FRU) or part.

Before you begin

To install a part into a system or expansion unit that is managed by an SDMC, complete the following steps:

Procedure
1. In the Power Systems Resources area, select the system on which you want to install a part.
2. From the **Actions** menu, expand **Service and Support** > **Hardware** > **MES Tasks** > **Add FRU**.
3. On the Add FRU page, select the system or enclosure type from the **Enclosure type** list.
4. Select the FRU type that you are installing, and click **Next**.
5. Select the location code for the location to install, and click **Add**.
6. After the part is placed in the **Pending Actions** section, click **Launch Procedure** and follow the instructions to install the part.

   Note: The SDMC might open external instructions for installing the feature. If so, follow those instructions to install the part.

Replacing a part by using the SDMC

You can use the Systems Director Management Console (SDMC) to perform many service actions, including exchanging a field-replaceable unit (FRU) or part.

About this task

To replace a part by using the SDMC, complete the following steps:

Procedure
1. In the Power Systems Resource area, select the managed system in which you are exchanging a part.
2. Select one of the following options:

- If you are replacing a part that is not part of a serviceable event from the **Actions** menu, expand **Service and Support** > **Hardware** > **Exchange FRU**.
- If you are exchanging a part to repair a serviceable event, see Starting a repair action.

3. On the Exchange FRU page, select the enclosure from which you want to replace the part from the **Installed Enclosure Types** list.

4. Select the type of part that you want to exchange, and click **Next**.

5. Select the location code of the part that you want to exchange, and click **Add**.

6. After the part is listed in the **Pending Actions** section, click **Launch Procedure** and follow the instructions to exchange the part.

   Note: The SDMC might open external instructions for replacing the part. If so, follow those instructions to replace the part.

Identifying a part

Use these instructions to learn how to identify the location of a failed part, the location of a part to be removed, or the location to install a new part on your system or expansion unit using the appropriate method for your system.

About this task

For systems servers that contain the POWER7® processor, the light-emitting diodes (LEDs) can be used to identify or verify the location of a part that you are removing, servicing, or installing.

The combination identify and fault LED (amber color) shows the location of a field replaceable unit (FRU). When removing a FRU, first verify whether you are working on the correct FRU by using the identify function in the management console or other user interface. When removing a FRU by using the hardware management console, the identify function is activated and deactivated automatically at the correct times.

The identify function causes the amber LED to flash. When you turn off the identify function, the LED returns to the state it was previously. For parts that have a blue service button, the identify function sets LED information for the service button so that when the button is pressed, the correct LEDs on that part flash.

If you need to use the identify function, use the following procedures.

Control panel LEDs
Use this information as a guide to the control panel LEDs and buttons.

The control panel has LEDs that indicate various system status.
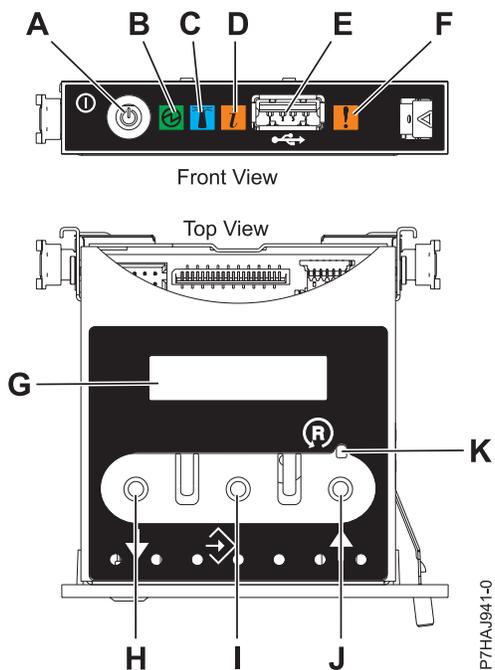
Figure 109. Control panel

- **A**: Power-on button
- **B**: Power LED
  - A constant light indicates full system power to the unit.
  - A flashing light indicates standby power to the unit.

  Note: There is approximately a 30-second transition period from the time the power-on button is pressed to when the power LED goes from flashing to solid. During the transition period, the LED might flash faster.
- **C**: Enclosure identify light
  - A constant light indicates the identify state, which is used to identify a part.
  - No light indicates that the system is operating normally.
- **D**: System information light
  - No light indicates that the system is operating normally.
  - Light on indicates that the system requires attention.
- **E**: USB port
- **F**: Enclosure fault roll-up light
  - A constant light indicates a fault in the system unit.
  - No light indicates that the system is operating normally.
- **G**: Function/Data display
- **H**: Decrement button
- **I**: Enter button
- **J**: Increment button
- **K**: Pinhole reset button

Related concepts:

Identifying a failing part

Use these instructions to learn how to locate and identify a failing part on your system or expansion unit using the appropriate method for your system.

Identifying a failing part in an AIX system or logical partition

Use these instructions to learn how to locate a failing part, and then activate the indicator light for that part on a system or logical partition running the AIX operating system.

Locating a failing part in an AIX system or logical partition:

You might need to use AIX tools, before activating the indicator light, to locate a part that is failing.

Procedure

1. Log in as root user or `celogin-`.
2. At the command line, type `diag` and press Enter.
3. From the Function Selection menu, select **Task Selection** and press Enter.
4. Select **Display Previous Diagnostic Results** and press Enter.
5. From the Display Previous Diagnostic Results display, select **Display Diagnostic Log Summary**. The Display Diagnostic Log display shows a chronological list of events.
6. Look in the **T** column for the most recent **S** entry. Select this row in the table and press Enter.
7. Select **Commit**. The details of this log entry are shown.
8. Record the location information and the SRN value shown near the end of the entry.
9. Exit to the command line.

What to do next

Use the location information for the failing part to activate the indicator light that identifies the failing part. See "Activating the indicator light for the failing part."

Activating the indicator light for the failing part:

Use these instructions to help physically identify the location of a part you are servicing.

About this task

To activate the indicator light for a failing part, complete the following steps:

Procedure

1. Log in as root user.
2. At the command line, type `diag` and press Enter.
3. From the **Function Selection** menu, select **Task Selection** and press Enter.
4. From the **Task Selection** menu, select **Identify and Attention Indicators** and press Enter.
5. From the list of lights, select the location code for the failing part and press Enter.
6. Select **Commit**. This turns on the system attention and indicator light for the failing part.
7. Exit to the command line.

Deactivating the failing-part indicator light:

Use this procedure to turn off any indicator light that you turned on as a part of a service action.

About this task

To deactivate the indicator light, complete the following steps:

Procedure

1. Log in as root user.
2. At the command line, type diag and press Enter.
3. From the **Function Selection** menu, select **Task Selection** and press Enter.
4. From the **Task Selection** menu, select **Identify and Attention Indicators** and press Enter.
5. From the list of lights, select the location code for the failing part and press Enter. When a light is activated for a failing part, an I character precedes the location code.
6. Select **Commit**. This turns off the system attention and indicator light for the failing part.
7. Exit to the command line.

Identifying a failing part in a Linux system or logical partition

If the service aids have been installed on a system or logical partition, you can activate or deactivate the indicator lights to locate a part or complete a service action.

Locating a failing part in a Linux system or logical partition:

If the service aids have been installed on a system or logical partition, you need to activate the indicator lights to locate a part.

About this task

To activate the indicator light, follow these steps:

Procedure

1. Log in as root user.
2. At the command line, type /usr/sbin/usysident -s identify -l *location_code* and press Enter.
3. Look for the system attention light to identify the enclosure that contains the failing part.

Finding the location code of a failing part in a Linux system or logical partition:

To retrieve the location code of the failing part, if you do not know the location code, use the procedure in this topic.

About this task

To locate the failing part in a system or logical partition, follow these steps:

Procedure

1. Log in as root user.
2. At the command line, type grep diagela /var/log/platform and press Enter.
3. Look for the most recent entry that contains a system reference code (SRC).
4. Record the location information.

Activating the indicator light for the failing part:

If you know the location code of the failing part, activate the indicator light to help you locate which part to replace.

About this task

To activate the indicator light, follow these steps:

Procedure
1. Log in as root user.
2. At the command line, type /usr/sbin/usysident -s identify -l *location_code* and press Enter.
3. Look for the system attention light to identify the enclosure that contains the failing part.

Deactivating the failing-part indicator light:

After you complete a removal and replacement procedure, you must deactivate the failing-part indicator light.

About this task

To deactivate the indicator light, follow these steps:

Procedure
1. Log in as root user.
2. At the command line, type /usr/sbin/usysident -s normal -l *location_code* and press Enter.

Locating a failing part in a Virtual I/O Server system or logical partition

You can use Virtual I/O Server (VIOS) tools, before activating the indicator light, to locate a part that is failing.

About this task

To locate the failing part, follow these steps:

Procedure
1. Log in as root user or celogin-.
2. At the command line, type diagmenu and press Enter.
3. From the **Function Selection** menu, select **Task Selection** and press Enter.
4. Select **Display Previous Diagnostic Results** and press Enter.
5. From the **Display Previous Diagnostic Results** display, select **Display Diagnostic Log Summary**. A **Display Diagnostic Log** display appears. This display contains a chronological list of events.
6. Look in the **T** column for the most recent **S** entry. Select this row in the table and press Enter.
7. Choose **Commit**. The details of this log entry are shown.
8. Record the location information and the SRN value shown near the end of the entry.
9. Exit to the command line.

Results

Use the location information for the failing part to activate the indicator light that identifies the failing part. For instructions, see "Identifying a part by using the Virtual I/O Server."

Identifying a part by using the Virtual I/O Server:

You can use Virtual I/O Server (VIOS) tools to physically locate a part.

About this task

To turn on the indicator light for identifying a part, follow these steps:

Procedure

1. Log in as root user.
2. At the command line, type `diagmenu` and press Enter.
3. From the **Function Selection** menu, select **Task Selection** and press Enter.
4. From the **Task Selection** menu, select **Identify and Attention Indicators** and press Enter.
5. From the list of lights, select the location code for the failing part and press Enter.
6. Select **Commit**. This turns on the system attention and indicator light for the failing part.
7. Exit to the command line.

Stopping a system or logical partition

Learn how to stop a system or logical partition as a part of a system upgrade or service action.

About this task

Attention: Using either the power-on button on the control panel or entering commands at the Hardware Management Console (HMC) to stop the system can cause unpredictable results in the data files. Also, the next time you start the system, it might take longer if all applications are not ended before stopping the system.

To stop the system or logical partition, select the appropriate procedure.

Stopping a system that is not managed by an HMC or an SDMC

You might need to stop the system to perform another task. If your system is not managed by the Hardware Management Console (HMC) or the Systems Director Management Console (SDMC), use these instructions to stop the system by using the power button or the Advanced System Management Interface (ASMI).

Before you begin

Before you stop the system, follow these steps:

1. Ensure that all jobs are completed and end all applications.
2. Ensure that the operating system is stopped.

   Attention: Failure to do so can result in the loss of data.
3. If a Virtual I/O Server (VIOS) logical partition is running, ensure that all clients are shut down or that the clients have access to their devices by using an alternate method.

About this task

The following procedure describes how to stop a system that is not managed by the HMC or the SDMC.

Procedure

1. Log in to the system as a user with the authority to run the **shutdown** or **pwrdwnsys** (Power Down System) command.
2. At the command line, enter one of the following commands:
   - If your system is running the AIX operating system, type **shutdown**.
   - If your system is running the Linux operating system, type `shutdown -h now`.

- If your system is running the operating system, type `PWRDWNSYS`. If your system is partitioned, use the PWRDWNSYS command to power down each of the secondary partitions. Then, use the PWRDWNSYS command to power down the primary partition.

  The 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.

3. At the Linux 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 a standby state.

4. Record the IPL type and the IPL mode from the control panel display to help you return the system to this state when the installation or replacement procedure is completed.

5. Set the power switches of any devices connected to the system to off.

6. Unplug any power cables that are attached to the unit from electrical outlets. Ensure that you unplug power cables from peripheral devices, such as printers and expansion units.

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

   (L003)
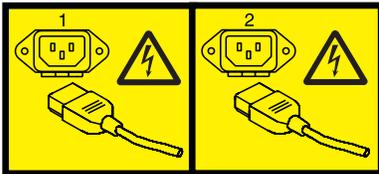
or

Stopping a system by using the HMC

You can use the Hardware Management Console (HMC) to stop the system or a logical partition.

About this task

By default, the managed system is set to power off automatically when you shut down the last running logical partition on the managed system. If you set the managed system properties on the HMC so that the managed system does not power off automatically, you must use this procedure to power off your managed system.

Attention: If possible, shut down the running logical partitions on the managed system before powering off the managed system. Powering off the managed system without shutting down the logical partitions first causes the logical partitions to shut down abnormally and can cause data loss. If you use a Virtual I/O Server (VIOS) logical partition, ensure that all clients are shut down or that the clients have access to their devices using an alternate method.

To power off a managed system, you must be a member of one of the following roles:
- Super administrator
- Service representative
- Operator
- Product engineer

Use the following steps to stop the system by using the HMC:

Procedure

1. In the navigation area, expand the **Systems Management** folder.
2. Click the **Servers** icon.
3. In the Contents area, select the managed system.
4. Select **Tasks** > **Operations** > **Power Off**.
5. Select the appropriate power-off mode and click **OK**.

Related information:

Shutting down and restarting logical partitions

Stopping a system by using the SDMC

You can use the Systems Director Management Console (SDMC) to stop the system or a virtual server.

About this task

By default, the managed system is set to power off automatically when you shut down the last running virtual server on the managed system. If you set the managed system properties on the SDMC so that the managed system does not power off automatically, you must use this procedure to power off your managed system.

Attention: If possible, shut down the running virtual servers on the managed system before powering off the managed system. Powering off the managed system without shutting down the virtual servers first causes the virtual servers to shut down abnormally and can cause data loss. If you use a Virtual I/O Server (VIOS) logical partition, ensure that all clients are shut down or that the clients have access to their devices with an alternate method.

To power off a managed system, you must be a member of one of the following roles:
- Super administrator
- Service representative
- Operator
- Product engineer

Use the following steps to stop the system by using the SDMC.

Procedure

1. In the Power Systems™ Resource area, select the managed system you want to power off.
2. From the **Actions** menu, select **Operations** > **Power Off**.
3. Select the appropriate power-off mode and click **OK**.

Shutting down logical partitions

You can use the Integrated Virtualization Manager to shut down the logical partitions or to shut down the entire managed system.

Before you begin

Use any role other than View Only to perform this task.

About this task

The Integrated Virtualization Manager provides the following types of shutdown options for logical partitions:
* Operating System (recommended)
* Delayed
* Immediate

The recommended shutdown method is to use the client operating systems shutdown command. Use the immediate shutdown method only as a last resort because using this method causes an abnormal shutdown which might result in data loss.

If you choose the Delayed shutdown method, then be aware of the following considerations:
* Shutting down the logical partitions is equivalent to pressing and holding the white control-panel power button on a server that is not partitioned.
* Use this procedure only if you cannot successfully shut down the logical partitions through operating system commands. When you use this procedure to shut down the selected logical partitions, the logical partitions wait a predetermined amount of time to shut down. This allows the logical partitions time to end jobs and write data to disks. If the logical partition is unable to shut down within the predetermined amount of time, it ends abnormally, and the next restart might take a long time.

If you plan to shut down the entire managed system, shut down each client logical partition, then shut down the Virtual I/O Server management partition.

To shut down a logical partition, complete the following steps in the Integrated Virtualization Manager:

Procedure

1. In the navigation area, select **View/Modify Partitions** under **Partition Management**. The View/Modify Partitions page is displayed.
2. Select the logical partition that you want to shut down.
3. From the Tasks menu, click **Shutdown**. The Shutdown Partitions page is displayed.
4. Select the shutdown type.
5. Optional: Select **Restart after shutdown completes** if you want the logical partition to start immediately after it shuts down.
6. Click **OK** to shut down the partition. The View/Modify Partitions page is displayed, and the logical partition state has a value of shutdown.

Starting the system or logical partition

Learn how to start a system or logical partition after performing a service action or system upgrade.

Starting a system that is not managed by an HMC or an SDMC

You can use the power button or the Advanced System Management Interface (ASMI) to start a system that is not managed by a Hardware Management Console (HMC) or an Systems Director Management Console (SDMC).

About this task

To start a system that is not managed by a HMC or SDMC, follow these steps:

Procedure

1. Open the front rack door, if necessary.
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 LED, as shown in the following figure, is slowly flashing.
   - The top of the display, as shown in the following figure, shows 01 V=F.
3. Press the power button **(A)**, as shown in the following figure, on the control panel.
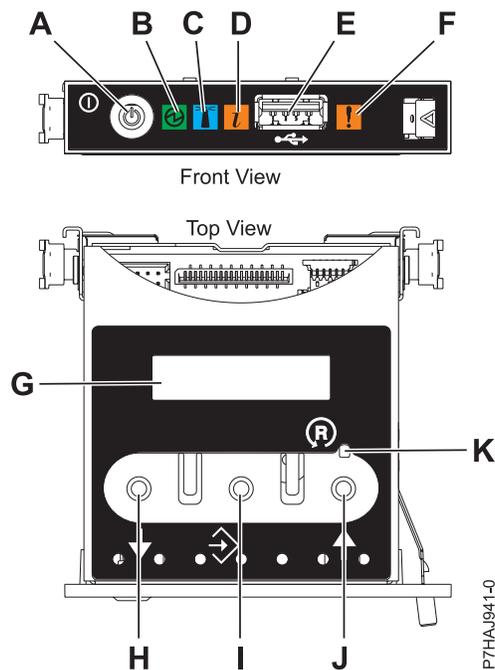
Figure 110. Control panel

- **A**: Power-on button
- **B**: Power LED
  - A constant light indicates full system power to the unit.
  - A flashing light indicates standby power to the unit.

  Note: There is approximately a 30-second transition period from the time the power-on button is pressed to when the power LED goes from flashing to solid. During the transition period, the LED might flash faster.
- **C**: Enclosure identify light
  - A constant light indicates the identify state for the enclosure or for a resource within the enclosure.
  - No light indicates that no resources in the enclosure are being identified.
- **D**: Attention light
  - No light indicates that the system is operating normally.
  - A solid light indicates that the system requires attention.

- **E**: USB port
- **F**: Enclosure fault roll-up light
  - A constant light indicates a fault indicator active in the system.
  - No light indicates that the system is operating normally.
- **G**: Function/Data display
- **H**: Decrement button
- **I**: Enter button
- **J**: Increment button
- **K**: Pinhole reset button

4. Observe the following aspects after pressing the power button:
   - The power-on light begins to flash faster.
   - 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 the system power is on.

What to do next

Tip: If pressing the power button does not start the system, do the following steps to start the system by using the Advanced System Management Interface (ASMI):

1. Access the ASMI. For instructions, see Accessing the ASMI without an HMC.
2. Start the system by using the ASMI. For instructions, see Powering the system on and off.

Starting a system or logical partition by using the HMC

You can use the Hardware Management Console (HMC) to start the system or logical partition after the required cables are installed and the power cables are connected to a power source.

About this task

For instructions on working with the HMC, see Managing the Hardware Management Console. For instructions on starting a logical partition, see Logical partitioning. For instructions on starting the system, see Powering on the managed system.

Progress indicators, also referred to as checkpoints, appear on the control panel display while the system is being started. When the power-on light on the control panel stops blinking and remains on, the system power is on.

Starting a system or virtual server by using the SDMC

You can use the Systems Director Management Console (SDMC) to start the system or virtual server after the required cables are installed and the power cables are connected to a power source.

About this task

For instructions on working with the SDMC, see Managing and configuring the SDMC. For instructions on starting a virtual server, see Managing virtual servers. For instructions on shutting down and restarting virtual servers, see Shutting down and restarting virtual servers.

Progress indicators, also known as checkpoints, display on the control panel while the system is being started. When the power-on light on the control panel stops flashing and remains on, the system power is on.

Verifying the installed part

You can verify a newly installed or replaced part on your system, logical partition, or expansion unit by using the operating system, stand-alone diagnostics, or the Hardware Management Console (HMC).

Verifying an installed feature or replaced part in an AIX system or logical partition

If you installed feature or replaced a part, you might want to use the tools in the AIX operating system to verify that the feature or part is recognized by the system or logical partition.

About this task

To verify the operation of a newly installed feature or replacement part, select the appropriate procedure:
- Verify the installed feature using AIX
- Verifying the replaced part using AIX

Verify the installed feature by using the AIX operating system:

1. Log in as root user.
2. At the command line, type `diag` and press Enter.
3. Select **Advanced Diagnostics Routines** and press Enter.
4. From the **Diagnostic Mode Selection** menu, select **System Verification** and press Enter.
5. When the **Advanced Diagnostic Selection** menu appears, do one of the following:
   - To test a single resource, select the resource that you just installed from the list of resources and press Enter.
   - To test all the resources available to the operating system, select **All Resources** and press Enter.
6. Select **Commit**, and wait until the diagnostic programs run to completion, responding to any prompts that appear.
7. Did the diagnostics run to completion and display the message `No trouble was found`?
   - **No:** If a service request number (SRN) or other reference code is displayed, suspect a loose adapter or cable connection. Review the installation procedures to ensure that the new feature is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system is running in logical partitioning (LPAR) mode, note the logical partition in which you installed the feature. Contact your service provider for assistance.
   - **Yes:** The new device is installed correctly. Exit the diagnostic programs and return the system to normal operations.

Verify the replacement part by using the AIX operating system:

To verify the operation of a newly installed feature or replacement part, follow these steps:

1. Did you use either the AIX operating system or the online diagnostics service aid concurrent (hot-swap) service to replace the part?

   No: Go to step 2.

   Yes: Go to step 5 on page 161.

2. Is the system powered off?

   No: Go to step 4 on page 161.

   Yes: Continue with the next step.

3. Start the system and wait until the AIX operating system login prompt is displayed or until apparent system activity on the operator panel or display has stopped.

   Did the AIX login prompt display?

   - **No:** If a service request number (SRN) or other reference code is displayed, suspect a loose adapter or cable connection. Review the procedures for the part that you replaced to ensure that the new part is installed correctly. If you cannot correct the problem, collect all SRNs or any other

reference code information that you see. If the system does not start or you have no login prompt, see: Problems with loading and starting the operating system.

If the system is partitioned, note the logical partition in which you replaced the part. Contact your service provider for assistance.

- **Yes:** Go to step 4.

4. At the command prompt, type `diag –a` and press Enter to check for missing resources. If you see a command prompt, go to step 5.

   If the **Diagnostic selection** menu is shown with **M** appearing next to any resource, follow these steps:

   a. Select the resource and press Enter.

   b. Select **Commit**.

   c. Follow any instructions that are shown.

   d. If the *Do you want to review the previously displayed error?* message is shown, select **Yes** and press Enter.

   e. If an SRN is shown, suspect a loose card or connection. If no obvious problem is shown, record the SRN and contact your service provider for assistance.

   f. If no SRN is shown, go to step 5.

5. Test the part by doing the following steps:

   a. At the command line, type `diag` and press Enter.

   b. From the **Function Selection** menu, select **Advanced Diagnostics Routines** and press Enter.

   c. From the **Diagnostic Mode Selection** menu, select **System Verification** and press Enter.

   d. Select **All Resources**, or select the diagnostics for the individual part to test only the part you replaced and any devices that are attached to the part you replaced and press Enter.

      Did the **Resource Repair Action** menu appear?

      No: Go to step 6.

      Yes: Go to step 7.

6. Did the *Testing Complete, No trouble was found* message appear?

   - **No:** There is still a problem. Contact your service provider. **This ends the procedure.**

   - **Yes:** Select **Log Repair Action**, if not previously logged, from the **Task Selection** menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the resource list, select **sysplanar0** and press Enter.

     Tip: This action changes the indicator light for the part from the fault state to the normal state.

     Go to step 9 on page 162.

7. Select the resource for the replaced part from the **Resource Repair Action** menu. When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the **Resource Repair Action** menu appears. Complete the following steps to update the AIX error log to indicate that a system-detectable part has been replaced.

   Note: On systems with an indicator light for the failing part, this action changes the indicator light to the normal state.

   a. Select the resource that has been replaced from the **Resource Repair Action** menu. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action does not appear on the resource list, select **sysplanar0** and press Enter.

   b. Select **Commit** after you make your selections. Did another **Resource Repair Action** display appear?

No: If the **No Trouble Found** display appears, go to step 9

Yes: Go to step 8.

8. Select the parent or child of the resource for the replaced part from the **Resource Repair Action** menu if necessary. When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the **Resource Repair Action** menu appears. Complete the following steps to update the AIX error log to indicate that a system-detectable part has been replaced.

   Note: This action changes the indicator light for the part from the fault state to the normal state.

   a. From the **Resource Repair Action** menu, select the parent or child of the resource that has been replaced. If the repair action was to reseat a cable or adapter, select the resource associated with that repair action. If the resource associated with your action does not appear on the resource list, select **sysplanar0** and press Enter.

   b. Select **Commit** after you make your selections.

   c. If the **No Trouble Found** display appears, go to step 9.

9. If you changed the service processor or network settings, as instructed in previous procedures, restore the settings to the values they had prior to servicing the system.

10. Did you do any hot-plug procedures before doing this procedure?

    No: Go to step 11.

    Yes: Go to step 12.

11. Start the operating system, with the system or logical partition in normal mode. Were you able to start the operating system?

    No: Contact your service provider. **This ends the procedure.**

    Yes: Go to step 12.

12. Are the indicator lights still on?

    - **No. This ends the procedure.**
    - **Yes.** Turn off the lights. See the following for instructions: Changing service indicators.

Verifying the installed part in a Linux system or logical partition

If you have installed a new part, learn how to verify that the system recognizes the part.

About this task

To verify the newly installed or replaced part, continue with "Verifying an installed part by using stand-alone diagnostics."

Verifying an installed part by using stand-alone diagnostics

If you have installed or replaced a part, verify that the system recognizes the new part. You can use stand-alone diagnostics to verify an installed part in an AIX or Linux system, expansion unit, or logical partition.

Before you begin

- If this server is directly attached to another server or attached to a network, ensure communications with the other servers have stopped.
- The stand-alone diagnostics require use of all of the logical partition resources. No other activity can be running on the logical partition.
- The stand-alone diagnostics require access to the system console.

About this task

You access these diagnostics from a CD-ROM or from the Network Installation Management (NIM) server. This procedure describes how to use the diagnostics from a CD-ROM. For information on running diagnostics from the NIM server, see Running stand-alone diagnostics from a Network Installation Management server.

To use stand-alone diagnostics, follow these steps:

Procedure

1. Stop all jobs and applications and then stop the operating system on the system or logical partition.
2. Remove all tapes, diskettes, and CD-ROM.
3. Turn off the system unit power. The next step boots the server or logical partition from the stand-alone diagnostics CD-ROM. If the optical drive is not available as a boot device on the server or logical partition on which you are working, follow these steps:
    a. Access the ASMI. For information on using the ASMI, see Accessing the ASMI.
    b. On the ASMI main menu, click **Power/Restart Control**.
    c. Click **Power On/Off System**.
    d. Select the **Service mode boot from default boot list** option in the AIX or Linux logical partition mode boot drop-down menu.
    e. Click **Save settings and power on**. When the optical drive is powered on, insert the stand-alone diagnostic CD-ROM.
    f. Go to step 5.
4. Turn on the system unit power and immediately insert the diagnostics CD-ROM into the optical drive.
5. After the **keyboard** POST indicator displays on the system console and before the last POST indicator (**speaker**) displays, press the numeric 5 key on the system console to indicate that a service mode boot must be initiated by using the default-service mode boot list.
6. Enter any requested password.
7. At the **Diagnostic Operating Instructions** display, press Enter.

    Tip: If a service request number (SRN) or other reference code is displayed, suspect a loose adapter or cable connection.

    Note: If you received an SRN or any other reference code when you attempted to start the system, contact your service provider for assistance.
8. If the terminal type is requested, select the **Initialize Terminal** option on the Function Selection menu to initialize the operating system.
9. From the Function Selection menu, select **Advanced Diagnostics Routines** and press Enter.
10. From the Diagnostic Mode Selection menu, select **System Verification** and press Enter.
11. When the Advanced Diagnostic Selection menu appears, select **All Resources**, or test only the part you replaced, and any devices that are attached to the part you replaced, by selecting the diagnostics for the individual part and press Enter.
12. Did the `Testing Complete, No trouble was found` message appear?
    - **No:** There is still a problem. Contact your service provider.
    - **Yes:** Go to step 13.
13. If you changed the service processor or network settings, as instructed in previous procedures, restore the settings to the value they had prior to servicing the system.
14. If the indicator lights are still on, follow these steps:

a. Select **Identify and Attention Indicators** from the Task Selection menu to turn off the system attention and indicator lights and press Enter.

b. Select **Set System Attention Indicator to NORMAL** and press Enter.

c. Select **Set All Identify Indicators to NORMAL** and press Enter.

d. Choose **Commit**.

Note: This changes the system attention and identify indicators from the *Fault* state to the *Normal* state.

e. Exit to the command line.

Verifying the installed part by using the HMC

If you have installed or replaced a part, use the Hardware Management Console (HMC) to update your HMC records after you have completed a service action on your server. If you have reference codes, symptoms, or location codes that you used during the service action, locate the records for use during this procedure.

About this task

To verify the installed part, complete these steps:

Procedure

1. At the HMC, examine the service action event log for any open service action events. See "Viewing serviceable events by using the HMC" on page 165 for details.

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

   No: If the system attention LED is still on, use the HMC to turn off the LED. See "Activating and deactivating LEDs by using the HMC." **This ends the procedure.**

   Yes: Continue with the next step.

3. Record the list of open service action events.

4. Examine the details of the open service action event. Is the error code associated with this service action event the same as you gathered earlier.

   • **No**: Select one of the following options:

     – Review the other serviceable events, find one that does match, and continue with the next step.

     – If the log does not match what you had gathered earlier, contact your service provider.

   • **Yes**: Continue with the next step.

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

6. Click **Close Event**.

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

8. Did you replace, add, or modify a field replaceable unit (FRU) of the open service action event?

   • **No**: Select the **No FRU Replaced for this Serviceable Event** option, and click **OK** to close the service action event.

   • **Yes**: Perform the following steps:

     a. From the FRU list, select a FRU that you need to update.

     b. Double-click the FRU and update the FRU information.

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

9. If you continue to have problems, contact your service provider.

Activating and deactivating LEDs by using the HMC:

Use this procedure to activate or deactivate LEDs by using Service Focal Point™ from the Hardware Management Console (HMC).

Deactivating a system attention LED or partition LED by using the HMC:
About this task

You can deactivate the attention LED for a system or logical partition if you decide that a problem is not a high priority and you decide to repair the problem at a later time. The deactivation also allows the LED to be activated again when another problem occurs.

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

Procedure
1. In the navigation area, open **Systems Management**.
2. Open **Servers** and select the required system.
3. In the content area, select the required partition.
4. Select **Tasks** > **Operations** > **Deactivate Attention LED**. A confirmation window is displayed with an indication that there still might be open problems with the system.
5. Click **OK** to continue with the deactivation. A window is displayed that provides the details of the system or partition, and a confirmation that the system or logical partition attention LED was deactivated.

Activating or deactivating an identify LED by using the HMC:
About this task

The system provides several LEDs that help identify various components, such as enclosures or field replaceable units (FRUs), in the system. 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 hook up 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, follow these steps:

Procedure
1. In the navigation area, open **Systems Management**.
2. Select **Servers**.
3. In the content area, check the box for the appropriate System.
4. Select **Tasks** > **Operations** > **LED Status** > **Identify LED**.
5. 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.
6. To activate or deactivate an identify LED for a FRU, select an enclosure from the table and click **List FRUs**.
7. 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.

Viewing serviceable events by using the HMC:

Use this procedure to view a serviceable event, including details, comments, and service history.

About this task

To view serviceable events and other information about the events, you must be a member of one of the following roles:
- Super administrator
- Service representative
- Operator
- Product engineer
- Viewer

To view serviceable events, follow these steps:

Procedure
1. In the navigation area, select **Service Management**.
2. Select **Manage Serviceable Events**.
3. Select the criteria for the serviceable events that you want to view, and click **OK**. The Serviceable Event Overview window opens. The list shows all serviceable events that match your selection criteria. You can use the menu options to perform actions on the serviceable events.
4. Select a line in the Serviceable Event Overview window, and select **Selected** > **View Details**. The Serviceable Event Details window opens, showing detailed information about the serviceable event. The upper table shows information, such as problem number and reference code. The lower table shows the field replaceable units (FRUs) associated with this event.
5. Select the error for which you want to view comments and history, and follow these steps:
   a. Select **Actions** > **View Comments**.
   b. When you are finished viewing the comments, click **Close**.
   c. Select **Actions** > **View Service History**. The Service History window opens, showing service history associated with the selected error.
   d. When you are finished viewing the service history, click **Close**.
6. When you are finished, click **Cancel** twice to close the Serviceable Event Details window and the Serviceable Event Overview window.

Verifying the installed part by using the SDMC
If you installed or replaced a part, use the Systems Director Management Console (SDMC) to update your SDMC records after you have completed a service action on your server. If you have reference codes, symptoms, or location codes that you used during the service action, locate the records for use during this procedure.

About this task

To verify the installed part, complete these steps:

Procedure
1. From the SDMC, examine the service action event log for any open service action events. See "Viewing serviceable events by using the SDMC" on page 168 for details.
2. Are there any service action events that are open?

   No: If the system attention LED is still on, use the SDMC to turn off the LED. See "Activating and deactivating LEDs by using the SDMC" on page 167. **This ends the procedure.**

   Yes: Continue with the next step.
3. Record the list of open service action events.

4. Examine the details of the open service action event. Is the error code associated with this service action event the same as you gathered earlier.
   - **No**: Select one of the following options:
     - Review the other serviceable events, find one that does match, and continue with the next step.
     - If the log does not match what you had gathered earlier, contact your service provider.
   - **Yes**: Continue with the next step.
5. Select and highlight the service action event from the Error Associated With This Serviceable Event window.
6. Click **Delete** or **Ignore**.

   Note: These options are only available from the problem event log.

Activating and deactivating LEDs by using the SDMC:

Use this procedure to activate or deactivate LEDs by using the Systems Director Management Console (SDMC).

Deactivating a system attention LED or partition LED by using the SDMC:
About this task

You can deactivate a system attention LED or a logical partition LED. For example, you might determine that a problem is not a high priority and decide to repair the problem at a later time. However, you want to be alerted if another problem occurs, so you must deactivate the system attention LED so that it can be activated again if another problem occurs.

To deactivate the system attention LED, complete the following steps:

Procedure
1. On the Resources tab, select the appropriate host or virtual server.
2. Select **Actions** > **Service and Support** > **Hardware** > **System Attention LED**.
3. Select **Deactivate System Attention LED**. 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.
4. Select one of the virtual servers, and select **Deactivate System Attention LED**. 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 logical partition.
   - An indication that you cannot activate the virtual server LED.

Activating or deactivating an identify LED by using the SDMC:
About this task

The system provides several LEDs that help identify various components, 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 hook up 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, follow these steps:

Procedure

1. On the Resources tab, select the appropriate host or virtual server.
2. Select **Actions** > **Service and Support** > **Hardware** > **Identify LED**.
3. In the Identify LED, Select Enclosure window, select the system unit or enclosure.
4. To activate or deactivate an identify LED, 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 a system or enclosure from the table, and then click **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.

Viewing serviceable events by using the SDMC:

Use this procedure to view a serviceable event, including details, comments, and service history.

About this task

To view serviceable events, follow these steps:

Procedure

1. On the Resources tab, select the appropriate host or virtual server.
2. Select **Actions** > **System Status and Health** > **Event Log**.
3. Optional: You can narrow the event criteria by using the Event filter menu.
4. Select a line in the Events window, and select **Actions** > **Properties**. The Properties window opens, showing detailed information about the serviceable event. The table shows information, such as problem number, reference code, and the field replaceable units (FRUs) associated with this event.

Verifying an installed part or replaced part on a system or logical partition by using Virtual I/O Server tools

If you installed or replaced a part, you might want to use the tools in Virtual I/O Server (VIOS) to verify that the part is recognized by the system or logical partition.

Verifying the installed part by using VIOS:

You can verify the operation of a newly installed part or a replacement part.

About this task

Perform the following steps to verify an installed or replaced part:

Procedure

1. Log in as root user.
2. At the command line, type `diagmenu` and press Enter.
3. Select **Advanced Diagnostics Routines** and press Enter.
4. From the **Diagnostic Mode Selection** menu, select **System Verification** and press Enter.

5. When the **Advanced Diagnostic Selection** menu appears, do one of the following steps:
   - To test a single resource, select the resource that you just installed from the list of resources and press Enter.
   - To test all the resources available to the operating system, select **All Resources** and press Enter.
6. Select **Commit**, and wait until the diagnostic programs run to completion, responding to any prompts that appear.
7. Did the diagnostics run to completion and display the message `No trouble was found`?
   - **No:** If a service request number (SRN) or other reference code is displayed, suspect a loose adapter or cable connection. Review the installation procedures to ensure that the new part is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system is running in LPAR mode, note the logical partition in which you installed the part. Contact your service provider for assistance.
   - **Yes:** The new device is installed correctly. Exit the diagnostic programs and return the system to normal operations.

Verify the replacement part by using VIOS:

To verify the operation of a newly installed part or replacement part, complete the following steps:

Procedure
1. Did you replace the part by using either VIOS or the online diagnostics service aid's concurrent (hot-swap) service operation?
   - **No:** Go to step 2.
   - **Yes:** Go to step 5 on page 170.
2. Is the system powered off?
   - **No:** Go to step 4.
   - **Yes:** If the system supports slow boot, set the system to perform a slow boot. For information, see Performing a slow boot.
3. Start the system and wait until the VIOS operating system login prompt displays or until apparent system activity on the operator panel or display has stopped. Did the VIOS login prompt display?
   - **No:** If an SRN or other reference code is displayed, suspect a loose adapter or cable connection. Review the procedures for the part that you replaced to ensure that the new part is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system does not start or you have no login prompt, see Problems with loading and starting the operating system.

     If the system is partitioned, note the logical partition in which you replaced the part. Contact your service provider for assistance.
   - **Yes:** Go to step 4.
4. At the command prompt, type `diag −a` and press Enter to check for missing resources. If you see a command prompt, go to step 5 on page 170.

   If the **Diagnostic selection** menu is shown with **M** appearing next to any resource, follow these steps:
   a. Select the resource and press Enter.
   b. Select **Commit**.
   c. Follow any instructions that are shown.
   d. If a *Do you want to review the previously displayed error?* message is shown, select **Yes** and press Enter.
   e. If an SRN is shown, suspect a loose card or connection. If no obvious problem is shown, record the SRN and contact your service provider for assistance.
   f. If no SRN is shown, go to 5 on page 170.

5. Test the part by doing the following:

   a. At the command line, type `diagmenu` and press Enter.

   b. From the **Function Selection** menu, select **Advanced Diagnostics Routines** and press Enter.

   c. From the **Diagnostic Mode Selection** menu, select **System Verification** and press Enter.

   d. Select **All Resources**, or select the diagnostics for the individual part to test only the part you replaced, and any devices that are attached to the part you replaced and press Enter.

   Did the **Resource Repair Action** menu appear?

   - **No:** Go to step 6.
   - **Yes:** Go to step 7.

6. Did the *Testing Complete, No trouble was found* message appear?

   - **No:** There is still a problem. Contact your service provider. **This ends the procedure.**
   - **Yes:** Select **Log Repair Action**, if not previously logged, from the **Task Selection** menu to update the error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0** and press Enter.

     Tip: This action changes the indicator light for the part from the fault state to the normal state. Go to step 9.

7. Select the resource for the replaced part from the **Resource Repair Action** menu. When a test is run on a resource in system verification mode, and that resource has an entry in the error log, if the test on the resource was successful, the **Resource Repair Action** menu appears. Complete the following steps to update the error log to indicate that a system-detectable part has been replaced. On systems with a indicator light for the failing part, this changes the indicator light to the normal state.

   a. Select the resource that has been replaced from the **Resource Repair Action** menu. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action does not appear on the Resource List, select **sysplanar0**. Press Enter.

   b. Select **Commit** after you make your selections. Did another **Resource Repair Action** display appear?

   - **No:** If the **No Trouble Found** display appears, go to step 9.
   - **Yes:** Go to step 8.

8. Select the parent or child of the resource for the replaced part from the **Resource Repair Action** menu if necessary. When a test is run on a resource in system verification mode, and that resource has an entry in the error log, if the test on the resource was successful, the **Resource Repair Action** menu appears. Complete the following steps to update the error log to indicate that a system-detectable part has been replaced. This changes the indicator light for the part from the fault state to the normal state.

   a. From the **Resource Repair Action** menu, select the parent or child of the resource that has been replaced. If the repair action was to reseat a cable or adapter, select the resource associated with that repair action. If the resource associated with your action does not appear on the Resource List, select **sysplanar0**. Press Enter.

   b. Select **Commit** after you make your selections.

   a. If the **No Trouble Found** display appears, go to step 9.

9. If you changed the service processor or network settings, as instructed in previous procedures, restore the settings to the values they had prior to servicing the system.

10. Did you do any hot-plug procedures before doing this procedure?

   - **No:** Go to step 11.
   - **Yes:** Go to step 12 on page 171.

11. Start the operating system, with the system or logical partition in normal mode. Were you able to start the operating system?

- **No:** Contact your service provider. **This ends the procedure.**
- **Yes:** Go to step 12.

12. Are the indicator lights still on?
    - **No:** This ends the procedure.
    - **Yes.** Turn off the lights. For instructions, see Changing service indicators.

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Electronic emission notices

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

Class A Notices

The following Class A statements apply to the servers.

Federal Communications Commission (FCC) statement

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

equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

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

Industry Canada Compliance Statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

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

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

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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)

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

声　明

此为 A 级产品，在生活环境中、
该产品可能会造成无线电干扰。
在这种情况下，可能需要用户对其
干扰采取切实可行的措施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

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警告使用者：
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居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

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

Electromagnetic Interference (EMI) Statement - Korea

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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:
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Technical Regulations, Abteilung M372
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Tel: +49 7032 15 2941
email: lugi@de.ibm.com

Generelle Informationen:

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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.

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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

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Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
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Tel: 914-499-1900

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

Generelle Informationen:

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