Power Systems
Power supplies

This edition applies to IBM Power Systems servers that contain the POWER6® processor and to all associated models.

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Safety notices

Safety notices may be printed throughout this guide:

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

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, 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

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)

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.
Power supplies

Learn about installing, removing, and replacing a power supply in a server and about removing and replacing a power supply, fan, or input power distribution assembly in a 5802 or 5877 expansion unit.
Chapter 1. What's new in Power supplies

Read about new or significantly changed information in Power supplies since the previous update of this topic collection.

October 2009

Added information about installing, removing, and replacing power supplies in an IBM Smart Cube (8261-E4S) server.

May 2009

The following updates have been made to the content:
• Added information about installing, removing, and replacing power supplies, fans, and input power distribution assemblies in the 5802 and 5877 expansion units.

November 2008

The following updates have been made to the content:
• Added information about installing, removing, and replacing power supplies in an Power 560 Express® (8234-EMA) server.
Chapter 2. Removing or replacing 8234-EMA, 9117-MMA, or 9406-MMA power supplies

Learn about removing or replacing a power supply in an 8234-EMA, 9117-MMA, or 9406-MMA server to replace a failing power supply or as part of another service action.

Removing an 8234-EMA, 9117-MMA, or 9406-MMA power supply with power off

If your system is already powered off, or if you need to perform another service task with power off, learn how to remove a power supply with the system power off.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for removing a power supply. For instructions, see Removing a part using the Hardware Management Console.

To remove the power supply from a system that is not managed by an HMC while the system power is off, complete the following steps:

1. Complete the prerequisite tasks described in "Before you begin" on page 41.
2. Identify the power supply that needs to be replaced, as described in "Identifying a failing part" on page 43.
3. If the system is running, stop the system as described in "Stopping a system or logical partition" on page 49.
4. Open the back rack door.
5. Disconnect the power cable from the back of the power supply that you want to remove.

**Note:** This system might be equipped with a second power supply. Before continuing with this procedure, ensure that all power sources to the system have been completely disconnected. (L003)
6. Push the release latch (A) into the open position, and lift the handle (B) as shown in Figure 1.

7. Pull the power supply out of the system.

If you need to replace the power supply you removed, see "Replacing an 8234-EMA, 9117-MMA, or 9406-MMA power supply with power off" on page 8.
Removing an 8234-EMA, 9117-MMA, or 9406-MMA power supply with power on

Learn how to remove a power supply with the system power on if you need to replace a failing power supply or as a part of another service action.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for removing a power supply. For instructions, see Removing a part using the Hardware Management Console.

To remove a power supply from a system that is not managed by an HMC while the system power is on, complete the following steps:

1. Complete the prerequisite tasks described in “Before you begin” on page 41.
2. On a rack-mounted system unit, open the back rack door.
3. Identify the power supply that needs to be replaced, as described in “Identifying a failing part” on page 43.
4. Disconnect the power cable from the back of the power supply that you want to remove.
5. 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 prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
6. As shown in Figure 2 on page 8, push the release tab (A) into the open position and lift the handle (B).
7. Pull the power supply out of the system.

Note: When you remove a power supply with the system power on, an error is logged. No action is required for this error.

If you need to replace the power supply you removed, see “Replacing an 8234-EMA, 9117-MMA, or 9406-MMA power supply with power on” on page 9.

Replacinhg an 8234-EMA, 9117-MMA, or 9406-MMA power supply with power off

Learn how to replace a power supply with the system power off.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for replacing a power supply. For instructions, see Exchanging a part using the Hardware Management Console.

To replace a power supply in a system that is not managed by an HMC while the system power is off, complete the following steps:

1. To remove the power supply, see “Removing an 8234-EMA, 9117-MMA, or 9406-MMA power supply with power off” on page 5.
2. With the locking handle in the open position, place the new power supply in the power supply bay.
3. Push the power supply (A) into place as shown in Figure 3 on page 9.
4. Close the locking handle (B) until the locking tab (C) snaps into the closed position.
5. Reconnect the power cable to the back of the power supply by routing it through the ring, if provided.
6. Start the system, as described in "Starting the system or logical partition" on page 46.
7. Note the state of the light-emitting diodes (LEDs) on the power supply. For more information, see Chapter 4, "Power supply LEDs," on page 25. If the LEDs indicate that the power supply is operating normally, that is both of the green LEDs are on solid (not blinking), continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 2 on page 8. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.
8. Close the back rack door.

Repeating an 8234-EMA, 9117-MMA, or 9406-MMA power supply with power on

Learn how to replace a power supply with the system power on.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for replacing a power supply. For instructions, see Exchanging a part using the Hardware Management Console.

To replace a power supply in a system that is not managed by an HMC while the system power is on, complete the following steps:
1. To remove the power supply, see "Removing an 8234-EMA, 9117-MMA, or 9406-MMA power supply with power on" on page 7.
2. Complete the prerequisite tasks described in "Before you begin" on page 41.
3. 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 prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

4. With the locking handle in the open position, place the new power supply in the power supply bay.
5. Push the power supply (A) into place as shown in Figure 4.

![Figure 4. Replacing the power supply](image_url)

6. Close the locking handle (B) until the locking tab (C) locks into the closed position.
7. If your server is equipped with a retention ring, route the power cord through the ring before you plug it into the back of the server as shown in Cable routed through power supply ring.
8. Note the state of the light-emitting diodes (LEDs) on the power supply. For more information, see Chapter 4, “Power supply LEDs,” on page 25. If the LEDs indicate the power supply is operating normally, that is both of the green LEDs are on solid (not blinking), continue to the next step. If not, remove the power supply from the system and repeat the procedure starting with step 4 on page 10. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.

9. Close the back rack door.
Chapter 3. Installing, removing, or replacing power supplies

Learn about installing, removing, or replacing a power supply in an 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50 server to replace a failing power supply or as part of another service action.

Removing a power supply with power off

If your system is already powered off or if you need to perform another service task, learn how to remove the power supply with the system power off.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for removing a power supply. For instructions, see Removing a part using the Hardware Management Console.

To remove a power supply from a system that is not managed by an HMC while the system power is off, complete the following steps:

1. Complete the prerequisite tasks described in “Before you begin” on page 41.
2. Identify the power supply that needs to be replaced, as described in “Identifying a failing part” on page 43.
3. If the system is running, stop the system as described in “Stopping a system or logical partition” on page 49.
4. Open the front rack door.
5. Remove the front cover, as described in “Removing the front cover from a rack-mounted 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50” on page 64 or “Removing the front cover from the stand-alone 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50” on page 66.
6. Disconnect the power cable from the back of the power supply that you want to remove.
Note: This system might be equipped with a second power supply. Before continuing with this procedure, ensure that all power sources to the system have been completely disconnected.

Figure 6. Disconnecting the power supply

Figure 7. Disconnecting the power supply

or
7. Disconnect the power cable (A) from the front of the power supply as shown in Figure 8.

8. Press the locking lever (B) down into the open position.

9. Pull the power supply out of the system.

If you need to replace the power supply that you removed, see "Replacing a power supply with power off" on page 17.
Removing a power supply with power on

Learn how to remove a power supply with the system power on to replace a failing power supply or as a part of another service action.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for removing a power supply. For instructions, see Removing a part using the Hardware Management Console.

To remove a power supply from a system that is not managed by an HMC while the system power is on, complete the following steps:

1. Complete the prerequisite tasks described in “Before you begin” on page 41.
2. On a rack-mounted system unit, open the front rack door.
3. Remove the front cover, as described in “Removing the front cover from a rack-mounted 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50” on page 44 or “Removing the front cover from the stand-alone 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50” on page 66.
4. Identify the power supply that needs to be replaced, as described in “Identifying a failing part” on page 43.
5. Disconnect the power cable (A) from the front of the power supply as shown in Figure 9 on page 17.
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 prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

7. Push down on the locking latch (B) as shown in Figure 9 on page 17 and then use the locking handle to pull the power supply out of the system.
Replacing a power supply with power off

Learn how to replace a power supply with the system power off.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for replacing a power supply. For instructions, see Exchanging a part using the Hardware Management Console.

To replace a power supply in a system that is not managed by an HMC while the system power is off, complete the following steps:
1. To remove the power supply, see Removing a power supply with power off on page 13.
2. Push the power supply (A) into the system until the latch locks in place as shown in Figure 10 on page 18.
3. Reconnect the power cable to the front of the power supply (B).
4. Reconnect the power cable to the back of the system.
5. Start the system, as described in “Starting the system or logical partition” on page 46.
6. Note the state of the light-emitting diodes (LEDs) on the power supply. For more information, see Chapter 4, “Power supply LEDs,” on page 25. If the LEDs indicate the power supply is operating normally, that is both of the green LEDs are on solid (not blinking), continue to the next step. If not, remove the power supply from the system and repeat the procedure. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.
8. Close the back rack door.

Figure 11. Reconnecting the power cable to the back of the system
Recovering the power supply with power on

Learn how to install a second power supply or replace a redundant power supply because of a failure with the system power on.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for replacing a power supply. For instructions, see Exchanging a part using the Hardware Management Console.

To replace a power supply in a system that is not managed by an HMC while the system power is on, complete the following steps.

**Important:** You must have a functioning power supply in the system to use the following steps.

1. If you are replacing a redundant power supply because of a failure, remove the failing power supply. For instructions, see "Removing a power supply with power on" on page 16.
2. Complete the prerequisite tasks described in "Before you begin" on page 41.
3. 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 prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
4. Push the power supply (A) into place until the locking latch snaps into place as shown in Figure 12 on page 21.
5. Reconnect the power cable (B) to the front of the power supply.

6. Replace the front cover, as described in "Installing the front cover on a rack-mounted 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50" on page 65 or "Installing the front cover on a stand-alone 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50" on page 67.

7. Close the front rack door.

**Installing the power supply with power on**

Learn how to install a second power supply while the system power is on.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for replacing a power supply. For instructions, see "Exchanging a part using the Hardware Management Console".

To install a power supply in a system that is not managed by an HMC while the system power is on, complete the following steps.

**Important:** You must have a functioning power supply in the system to complete the following steps.

1. Complete the prerequisite tasks described in "Before you begin" on page 41.
2. 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 prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

3. Remove the front cover, as described in “Removing the front cover from a rack-mounted 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50” on page 64 or “Removing the front cover from the stand-alone 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50” on page 66.

4. Remove the power supply filler by grasping the filler and pulling it out of the system.

5. Pull the power cable out of the slot. The power cable might be secured under the plate at the top of the power supply slot. If so, release the plate by completing the following steps:
   a. Release the plate by squeezing the two tabs on the top of the power supply slot.
   b. Remove the cable and pull it gently forward.
   c. Lift the plate back up and squeeze the two tabs until the plate is secure.

6. Push the power supply (A) into place until the locking latch snaps into place as shown in Figure 13.

   Note: Ensure that the power cable does not become pinched while installing the power supply.

7. Connect the power cable (B) to the front of the power supply.

9. Close the front rack door.
Chapter 4. Power supply LEDs

The different states of the light-emitting diodes (LEDs) on the power supply can be used to identify or verify a power supply that you are servicing.

The power supply has three LEDs that indicate the power supply status: an ac power LED (green), a dc power LED (green), and an error and identify function LED (amber).

To locate the power supply LEDs, look on the top or at the back of an exposed power supply. You might have to remove covers or panels to expose the power supply. Follow the instructions to remove covers or panels for the power supply you are working with, and then return here.

To activate the identify function LED, see “Identifying a failing part” on page 43.

Descriptions for the states of the power supply LEDs follow:

- If both the ac power and dc power (green) LEDs are on solid (not blinking) and the error and identify function (amber) LED is off, the power supply is operating correctly.
- If the ac power LED is on, the dc power LED is blinking, and the error and identify function (amber) LED is off, then the system is turned off, but the power supply is still connected to the power source.
- If the error and identify function (amber) LED is blinking, the power supply is not operating correctly or the identify function has been selected.
Chapter 5. Power supplies, fans, and input power distribution assemblies in a 5802 or 5877 expansion unit with power off

Learn about removing and replacing a power supply, fan, or input power distribution assembly to replace a failing part or as part of another service action in a 5802 or 5877 expansion unit.

The power supply is located in an Offline Converter Assembly (OCA) in the 5802 and 5877 expansion units. The expansion units have two OCAs, with each OCA consisting of a power supply and two fans. To remove or replace a failing fan, you must remove the affected power supply.

Removing a power supply or fan from a 5802 or 5877 expansion unit with power on

Learn how to remove a power supply or power-supply fan from a 5802 or 5877 expansion unit if you must replace a failing part with the power on.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for removing a power supply. For instructions, see Removing a part using the Hardware Management Console.

Attention: Two power supplies must be present in the expansion unit. If one power supply fails, the expansion unit continues to operate.

To remove a power supply or fan from an expansion unit in a system that is not managed by the HMC while the system power is on, complete the following steps:

1. Complete the prerequisite tasks described in “Before you begin” on page 41.
2. Open the front rack door.
3. Identify the power supply that needs to be replaced, as described in “Identifying a failing part” on page 43.
4. At the front of the expansion unit, identify the power supply that must be replaced. To identify the power supply, observe the state of the amber field-replaceable unit (FRU) fault and identify light-emitting diode (LED) (A) as shown in Figure 14 on page 28. A lit (flashing or on solid) LED indicates the failing power supply.
5. Remove the plastic baffle cover from the front of the IO drawer, by first removing the two screws and use the touch points to take off the cover.

6. For the power supply that you want to remove, slide the cable retention bracket to the open position (A), and then disconnect the power cable (B) as shown in Figure 15. By moving the bracket to the open position, you turn the power supply off.

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 prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

8. Rotate the power-supply locking handle (A) to the open position as shown in Figure 16, and then pull the power supply out of the expansion unit.

9. Optional: If you must remove a failing power-supply fan, complete the following steps:

   **Note:** If a fan fails, the amber fan fault LED (B) on the front of the Offline Converter Assembly (OCA), as shown in Figure 17 on page 30 is on solid.
a. Identify the failing fan by pressing the fan identify button (A) shown in Figure 17. An amber left or right fan-fault LED (C) on solid, as shown in Figure 18, indicates the faulty fan.

b. Loosen the thumbscrew (A) that holds the fan in the power-supply assembly, as shown in Figure 18.
c. Use the recessed fan handle (B) to pull the fan out of the power-supply assembly, as shown in Figure 18 on page 30.

If you removed the power supply or fan as part of another service action, or if you must replace the power supply or fan that you removed from an expansion unit, see “Replacing a power supply or fan in a 5802 or 5877 expansion unit with power on.”

Replacing a power supply or fan in a 5802 or 5877 expansion unit with power on

Learn how to replace a power supply or power-supply fan in a 5802 or 5877 expansion unit if you removed a failing part and need to replace the power-supply assembly with the power on.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for replacing a power supply. For instructions, see Exchanging a part using the Hardware Management Console.

Attention: Two power supplies must be present in the expansion unit. If one power supply fails, the expansion unit continues to operate.

To replace the power supply in an expansion unit for a system that is not managed by the HMC while the system power is on, complete the following steps:

1. If you are replacing a power supply or power-supply fan because of a failure, remove the failing part as described in “Removing a power supply or fan from a 5802 or 5877 expansion unit with power on” on page 27.

2. Complete the prerequisite tasks described in “Before you begin” on page 41.

3. Open the front rack door if it is not already open.

4. 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 prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

5. Optional: If you need to replace a failing power-supply fan, complete the following steps:
   a. Align the new fan with the opening in the power-supply assembly.
   b. Press the fan (A) into its connector in the assembly as shown in Figure 19 on page 32.
   c. Tighten the thumbscrew (D) as shown in Figure 19 on page 32.
6. To replace the power supply, with the locking handle (A) in the open position, push the power supply into the expansion unit as shown in Figure 20.

Figure 19. Replacing a fan

7. Close the locking handle (A) until the power supply locks into position.
8. Reconnect the power cable (A) to the front of the power supply, and then slide the cable retention bracket (B) to the closed position to secure the cable as shown in Figure 21. When the bracket is moved to the closed position, the power supply is turned on.

Figure 21. Connecting the power cable to the front of an expansion unit

9. Note the state of the green ac power in (A) and Offline Converter Assembly (OCA) power light-emitting diodes (LEDs) (B) shown in Figure 22 on page 34 and do one of the following actions, as applicable:
   - If the LEDs indicate that the power supply is operating normally, that is, that the ac power in LED (A) is on solid and the OCA power (B) LED is on solid or blinking, continue to the next step.
   - If not, remove the power supply from the expansion unit and repeat the procedure starting with step 6 on page 32. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.
Note: If you replaced a power-supply fan as part of this procedure, note the state of the fan fault LED (B) shown in Figure 23. If the LED is off, indicating that both fans are operating normally, continue to the next step. If not, remove the power-supply assembly from the expansion unit and repeat the procedure starting with step 5 on page 31. If, after repeating the procedure, the power-supply fan is not operating normally, contact your service provider.

10. Verify the installed part, as described in “Hardware service manager Verify option” on page 71.
11. Close the front rack door.

Continue with any other service actions you need to perform.
Removing an input power distribution assembly from a 5802 or 5877 expansion unit

Learn how to remove an input power distribution assembly from a 5802 or 5877 expansion unit if you need to replace a failing assembly.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for removing an input power distribution assembly. For instructions, see Removing a part using the Hardware Management Console.

To remove an input power distribution assembly from an expansion unit for a system that is not managed by the HMC, complete the following steps:

1. Complete the prerequisite tasks described in “Before you begin” on page 41.
2. Identify the failing part as described in “Identifying a failing part” on page 43.
3. If the system is running, stop the system as described in “Stopping a system or logical partition” on page 49.
4. Open the back rack door.
5. At the rear of the expansion unit, disconnect both of the power cables as shown in Figure 24.

6. Attach the wrist strap.

Figure 24. Disconnecting the power cables from the rear of an expansion unit
Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) from damaging your hardware.
- When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
- If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

7. On the input power distribution assembly cover, loosen the thumbscrew (A), and then remove the cover as shown in Figure 25.

8. Loosen the thumbscrew (B) on the input power distribution assembly, and then pull the assembly out of the expansion unit as shown in Figure 26 on page 37.
To replace an input power distribution assembly, see “Replacing an input power distribution assembly in a 5802 or 5877 expansion unit with power off.”

Replacing an input power distribution assembly in a 5802 or 5877 expansion unit with power off

Learn how to replace an input power distribution assembly in a 5802 or 5877 expansion unit if you removed a failing assembly and need to replace it.

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for replacing an input power distribution assembly. For instructions, see Exchanging a part using the Hardware Management Console.

To replace an input power distribution assembly in an expansion unit for a system that is not managed by the HMC, complete the following steps:

1. If you are replacing an input power distribution assembly because of a failure, remove the failing part as described in “Removing an input power distribution assembly from a 5802 or 5877 expansion unit” on page 35.

2. Complete the prerequisite tasks described in “Before you begin” on page 41.

3. Open the back rack door if it is not already open.

4. 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 prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

5. Push the input power distribution assembly into the expansion unit until it latches into place, and then tighten the thumbscrew (A) to secure the assembly in place as shown in Figure 27.

6. Replace the input power distribution assembly cover, and then tighten the thumbscrew (A) as shown in Figure 28 on page 39.
7. At the rear of the expansion unit, connect both of the power cables as shown in Figure 29.

8. Close the back rack door.
9. Start the system, as described in “Starting the system or logical partition” on page 46.
10. Verify the installed part, as described in “Hardware service manager Verify option” on page 71.

Continue with any other service actions you need to perform.
Chapter 6. Common procedures for installable features

This section contains all the common procedures that are related to installing, removing, and replacing features.

Before you begin

Understand prerequisites for installing, removing, or replacing features and parts.

DANGER

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

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

• Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
• Do not open or service any power supply assembly.
• Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
• The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
• Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
• Connect any equipment that will be attached to this product to properly wired outlets.
• When possible, use one hand only to connect or disconnect signal cables.
• Never turn on any equipment when there is evidence of fire, water, or structural damage.
• Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
• Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

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

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

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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.

Before you begin a replacement or installation procedure, perform these tasks:

1. If you are installing a new feature, ensure that you have the software required to support the new feature.

   To do this, go to the following Web site: http://www-912.ibm.com/e_dir/eServerPrereq.nsf

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.
     - In the United States, the IBM Rochester Manufacturing Automated Information Line (R–MAIL) at 1–800–300–8751.

   In countries and regions outside of the United States, use the following Web site to locate your service and support telephone numbers:

7. If you encounter difficulties during the installation, contact your service provider, your IBM reseller, 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](#).

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### 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 on 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 on 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.

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.

Use the location information for the failing part to activate the indicator light that identifies the failing part. "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.

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.

Identifying a failing part on an IBM i system or logical partition
You can activate or deactivate the indicator light by using IBM i to assist in locating a failing part.

Activating the failing-part indicator light
You can search the service action log for an entry that matches the time, reference code, or resource of a problem, and then activate the indicator light for a failing part.
1. Sign on to an IBM i session, with at least service level authority.
2. On the command line of the session, type strsst and press Enter.

   **Note:** If you cannot get to the System Service Tools display, use function 21 from the control panel. Alternatively, if the system is managed by a Hardware Management Console (HMC), use the Service Focal Point™ utilities to get to the Dedicated Service Tools (DST) display.
3. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.

   **Remember:** The service tools password is case-sensitive.
4. Select Start a service tool from the System Service Tools (SST) display and press Enter.
5. Select Hardware service manager from the Start a Service Tool display and press Enter.
6. Select Work with service action log from the Hardware Service Manager display and press Enter.
7. On the Select Timeframe display, change the From: Date and Time field to a date and time prior to when the problem occurred.
8. Search for an entry that matches one or more conditions of the problem:
   - System Reference code
   - Resource
   - Date and time
   - Failing item list
9. Select option 2 (Display failing item information) to display the service action log entry.
10. Select option 2 (Display details) to display location information for the failing part to be replaced.
    The information displayed in the date and time fields is the date and time for the first occurrence of the specific System reference code for the resource displayed during the time range selected.
11. If location information is available, select option 6 (Indicator on) to turn on the failing part's indicator light.

    **Tip:** If the failing part does not contain a physical indicator light, a higher-level indicator light is activated. For example, the indicator light for the backplane or unit that contains the failing part might be lit. In this case, use the location information to locate the actual failing part.
12. Look for the enclosure indicator light to locate the enclosure that contains the failing part.

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.

To deactivate the indicator light, follow these steps:
1. Select option 7 (Indicator off) to turn off the indicator light.
2. Select the Acknowledge all errors function at the bottom of the Service Action Log display, if all problems have been resolved.
3. Close the log entry by selecting option 8 (Close new entry) on the Service Action Log Report display.
Identifying a failing part on 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 compete a service action.

Locating a failing part on 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.

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.

To locate the failing part in a system or logical partition follow these steps:
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.

To activate the indicator light, follow these steps:
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.

To deactivate the indicator light, follow these steps:
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.
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. 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.

Use the location information for the failing part to activate the indicator light that identifies the failing part. For instructions, see Identifying a part using the Virtual I/O Server.
Identifying a part using the Virtual I/O Server

Use these instructions to turn on the indicator light to help you physically locate a part using the Virtual I/O Server (VIOS).

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. Press Enter.
4. From the Task Selection menu, select Identify and Attention Indicators. 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.

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 a Hardware Management Console

You can use the power button or the Advanced System Management Interface to start a system that is not managed by a Hardware Management Console.

To start a system that is not managed by a Hardware Management Console (HMC), follow these steps:

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

   **Tip:** The system attention light, as shown in the following figure, does not appear on the control panel on the model 9117-MMA.
3. Press the power button (A), as shown in the following figure, on the control panel.
• A: Power-on button
• B: On/off power symbol
• C: Serial number label
• D: Function/Data display
• E: System port (S1)
• F: Power LED
  – A flashing light indicates standby power to the unit.
  – A constant light indicates full system 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, you might observe the flashing intervals speed up.

• G: Decrement button
• H: Enter button
• I: Increment button

*Figure 31. Control panel for the 8203-E4A, 8261-E4S, 8204-E8A, 9407-M15, 9408-M25, and 9409-M50.*
• E: Pinhole reset button
• F: Function/Data display
• G: Decrement button
• H: Enter button
• I: Increment button

4. Observe the following 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 system power is on.

Tip: If pressing the power button does not start the system, do the following steps to start the system using the Advanced System Management Interface (ASMI):
1. Set up access to the ASMI. For instructions, see Accessing the ASMI.
2. Start the system using the ASMI. For instructions, see Powering the system on and off.

Starting a system or logical partition using the Hardware Management Console

You can use the Hardware Management Console (HMC) user interface to start the system or logical partition after the required cables are installed and the power cables are connected to a power source.

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 with the Systems Director Management Console

You can use the IBM Systems Director Management Console (SDMC) user interface to start the system or virtual server after the required cables are installed and the power cables are connected to a power source.

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.
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.

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 a Hardware Management Console

You might need to stop the system to perform another task. Use these instructions to stop the system using the power button or Advanced System Management Interface.

Before you stop the system, follow these steps:
1. If an Integrated xSeries Adapter (IXA) is present on the system, shut it down using IBM i options.
2. Ensure that all jobs are completed and end all applications.
3. Ensure that the operating system is stopped.
   Attention: Failure to do so can result in the loss of data.
4. Record the IPL type and IPL mode from the control panel display to help you return the system to this state when the installation or replacement procedure is completed.

The following procedure describes how to stop a system that is not managed by a Hardware Management Console (HMC).

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 IBM i operating system, type pwrdownsys. If your system is partitioned, use the pwrdownsys command to power down each of the secondary partitions. Then, use the pwrdownsys 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 blink, and the system goes into a standby state.
3. Set the power switches of any devices connected to the system to off.
4. 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 might be equipped with a second power supply. Before continuing with this procedure, ensure that all power sources to the system have been completely disconnected.

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Stopping a system by using the Hardware Management Console

You can use the Hardware Management Console (HMC) user interface to stop the system or a logical partition. Use the following steps to accomplish 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

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, then Operations, and then Power Off.
5. Select the appropriate power-off mode and click OK.

Related information:

Shutting down and restarting logical partitions

Stopping a system with the Systems Director Management Console

You can use the IBM Systems Director Management Console (SDMC) user interface to stop the system or a virtual server. Use the following steps to accomplish 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

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.

Placing the rack-mounted system or expansion unit in the service position or operating position

Use these procedures to place a system or expansion unit into the service position or operating position to perform service or to gain access to internal components.

Placing the rack-mounted system or expansion unit in the service position

Use this procedure to perform service or gain access to internal components by placing the rack-mounted system or expansion unit in the service position.

Note: Some of the figures in these procedures might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.
DANGER

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

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

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

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

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

(D005)
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)

To place a rack-mounted system or expansion unit into the service position, follow these steps:

1. If necessary, open the front rack door.
2. Remove the two thumbscrews *(A)* that secure the system or expansion unit *(B)* to the rack as shown in the following figure.
3. Release the rack latches (A) on both the left and right sides as shown in the following figure.

Figure 33. Releasing the rack latches
4. Read the following note, and then slowly pull the system or expansion unit out from the rack until the rails are fully extended and locked.

**Remember:**
- If the procedure you are performing requires you to unplug cables from the back of the system or expansion unit, do so before you pull the unit out from the rack.
- Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you pull the unit out from the rack.
- Ensure the rails are fully extended. When the rails are fully extended, the rail safety latches lock into place. This action prevents the system or expansion unit from being pulled out too far.

**Placing the rack-mounted system or expansion unit in the operating position**

Use this procedure to place the rack-mounted system or expansion unit in the operating position to make the unit available for use.

**Tip:** Some of the figures in these procedures might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.

To place the rack-mounted system or expansion unit into the operating position, follow these steps:

1. Simultaneously release the blue rail safety latches (A), located near the front of each rail, and push the system or expansion unit into the rack as shown in the following figure.

   **Note:** Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you push the unit back into the rack.

   ![Figure 34. Releasing the rail safety latches](image-url)
2. Replace and tighten the two thumbscrews (C) that secure the system or expansion unit (A) to the rack as shown in the following figure.

![Diagram of system in rack]

Figure 35. Pushing the system into the rack and attaching the thumbscrews

3. Close the front rack door.

**Placing a rack-mounted 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50 in the service position**

Use this procedure to perform service or gain access to internal components by placing the rack-mounted system or expansion unit in the service position.

*Note:* Some of the figures in these procedures might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.
DANGER

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

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

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

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

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

(D005)

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

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

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

CAUTION

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

To place the rack-mounted system or expansion unit into the service position, follow these steps:

1. If necessary, open the front rack door.
2. Remove the two thumbscrews (A) that secure the system unit to the rack as shown in the following figure.
3. Release the rack latches (B) on both the left and right sides as shown in the following figure.
4. Read the following note, and then slowly pull the system or expansion unit out from the rack until the rails are fully extended and locked.

**Remember:**
- If the procedure you are performing requires you to unplug cables from the back of the system or expansion unit, do so before you pull the unit out from the rack.
- Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you pull the unit out from the rack.
- Ensure the rails are fully extended. When the rails are fully extended, the rail safety latches lock into place. This action prevents the system or expansion unit from being pulled out too far.

**Placing the rack-mounted 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50 in the operating position**

Use this procedure to place the rack-mounted system or expansion unit in the operating position to make the unit available for use.

To place the rack-mounted model into the operating position follow these steps:

**Tip:** Some of the figures in these procedures might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.

1. Simultaneously release the blue rail safety latches (B), located near the front of each rail, and push the system or expansion unit into the rack as shown in the following figure.

   **Note:** Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you push the unit back into the rack.
2. Replace and tighten the two thumbscrews (C) that secure the system or expansion unit (A) to the rack as shown in the following figure.

Figure 37. Releasing the rail safety latches

Figure 38. Replacing the thumbscrews
3. Close the front rack door.

Removing and replacing covers and doors

Use these instructions to remove, replace, or install covers to access components or perform service.

Removing the service access cover from a rack-mounted 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to remove the service access cover to perform service or to gain access to internal components.

1. Place the system into the service position. For instructions, see “Placing a rack-mounted 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50 in the service position” on page 56.
2. Loosen the two thumbscrews (A) located at the back of the cover.
3. Slide the cover (B) toward the back of the system unit. When the front of the service access cover clears the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and airflow, install the cover before starting the system. Operating the system without the cover for more than 30 minutes could damage the system components.

Installing the service access cover on a rack-mounted 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to install the service access cover after performing service or accessing internal components.

1. Place the service access cover (A) on the top of the system unit, approximately 25 mm (1 in.) from the front of the system unit.
2. Hold the service access cover against the system unit, and slide it toward the front of the system.
The tabs on the service access cover slide beneath the upper chassis ledge, and the two thumbscrews align with the screw holes at the back of the system unit.

3. Tighten the thumbscrews (B) located at the back of the cover.

---

Removing the service access cover from a stand-alone 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to remove the service access cover to perform service or to gain access to internal components.

To remove the service access cover from a stand-alone model, do the following steps:

1. Loosen the two thumbscrews (A) located at the back of the service access cover as shown in the following figure.

2. Slide the service access cover (B) toward the back of the system. When the front of the cover clears the front frame ledge, lift the cover off the system.

Attention: For proper cooling and airflow, install the cover before starting the system. Operating the system without the cover for more than 30 minutes might damage the system components.
Installing the service access cover on a stand-alone 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to install the service access cover after performing service or accessing internal components.

1. Align the service access cover pins with the slots in the system. The flanges on the top and bottom of the cover wrap around the system frame.
2. Hold the service access cover against the system unit (A) and slide it toward the front of the system.
3. Tighten the two thumbscrews (B) located at the back of the cover.
Removing the front cover from a rack-mounted 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to remove the cover to access components or perform service.

1. Remove the two thumbscrews (A) that secure the system to the rack (B) as shown in the following figure.

2. Push in the release latches (C) and pull the cover away from the system.
Installing the front cover on a rack-mounted 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50

Use this procedure to install the cover after accessing components or performing service.

1. Push in the release latches (B) and push the cover onto the system.
2. Gently push the cover in until the two cover-release latches (B) are seated in their respective slots as shown in the following figure.
3. Replace the two thumbscrews (C) that secure the system to the rack (A).
Removing the door from the 8204-E8A or 9409-M50
Use this procedure to remove the door to access components or perform service.
1. Open the front door by grasping the door handle and pulling the door out and away from the system unit.
2. To remove the door, press down on the top back edge of the door.
3. Gently swivel the top back edge of the door forward and out past the top of the system unit.
4. Lift the door up to release it from the lower retaining post.

Installing or replacing the door on the 8204-E8A or 9409-M50
Use this procedure to install the door after accessing components or performing service.
1. Set the door on the lower retaining post.
2. Rotate the door toward the top of the system unit.
3. Press down on the lower back edge of the door, and seat the top post into its matching slot.
4. Close and secure the door.

Removing the front cover from the stand-alone 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50
Use this procedure to remove the cover to access components or perform service.
1. Open the door that covers the disk drives by unlocking and pulling the door open.
2. Press down on the cover-release tab (A) as shown in the following figure.
3. Pull the top of the cover (B) out and away from the system.

Figure 44. Installing the front cover on a rack-mounted model
4. Gently pull the cover up and off the base.

**Installing the front cover on a stand-alone 8203-E4A, 8204-E8A, 8261-E4S, 9407-M15, 9408-M25, or 9409-M50**

Use this procedure to install the cover after accessing components or performing service.

1. Place the two lower cover-locking tabs into the retaining slots located on the base of the system unit as shown in the following figure.
2. Push the cover up toward the top of the system (A), ensuring that the aligning pins are aligned with their matching slots (B) located on the system.
3. Gently push the cover in until the cover-release tab snaps into place.
4. Close and secure the door.

**Removing and replacing the front cover for the 8234-EMA, 9117-MMA, or 9406-MMA**

Use these procedures to remove and replace the cover to access components or perform service.

**Removing the front cover from the 8234-EMA, 9117-MMA, or 9406-MMA**

Use this procedure to remove the cover to access components or perform service.

To remove the front cover follow these steps:
1. If necessary, open the front rack door.
2. Loosen the thumbscrew on the right side of the cover as shown in the following figure.
3. Slide the cover to the right, and remove it from the system unit.

**Installing the front cover on the 8234-EMA, 9117-MMA, or 9406-MMA**

Use this procedure to install the cover after accessing components or performing service.

To install the front cover follow these steps:

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot on the left side of the system unit as shown in the following figure.

---

*Figure 47. Removing the front cover*
2. Tighten the thumbscrew on the right side of the cover.
3. Close the front rack door.

**Installing a feature using the Hardware Management Console**

You can use the Hardware Management Console to perform many service actions, including the installation of a new feature or part.

To use the Hardware Management Console user interface to install a feature or part into a system or expansion unit that is managed by an HMC, follow these steps:

1. In the navigation area, expand **Systems Management > Servers**.
2. Select the managed system you will install the part in.
3. In the Tasks area expand **Serviceability > Hardware**.
4. Select **Add FRU** (field replaceable unit).
5. In the Add/Install/Remove Hardware window select the system or enclosure into which you are installing the feature.
6. Select the type of feature you are installing from the menu and click **Next**
7. Select the location code for where you will install the feature, and click **Add**.
8. After the FRU is placed in the **pending actions** category 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.
Hardware service manager Verify option

Use the hardware service manager to verify communications or devices.

To verify communications or devices on any System i® model using the hardware service manager Verify option, perform the following procedure:

Note: Before running a verification test, ensure that the customer is not using the resource you want to test and that all communication jobs on the resource to be tested are ended.
1. From the Start a Service Tool display, select the Hardware Service Manager option.
2. From the Hardware Service Manager display, select the Logical hardware resources option.
3. From the Logical Hardware Resources display, select the System bus resources option.
   This display lists all the I/O processors.
4. Select the Resources associated with IOP option for the attached IOP in the list.
5. Select the Verify option for the communications, tape, optical storage unit, or File Server adapter that you want to test.
6. When the test completes, the system responds with either a Test is successful message or a Test failed message.
   This ends the procedure.

Notes:
1. Hardware units might perform automatic self-tests when they are powered on.
2. You can test some workstations by using the Test Request function key while the operating system Sign On display is shown.
3. See the specific device information for possible off-line tests that you can run.

Verifying an installed feature or replaced part on an AIX system or logical partition

If you installed feature or replaced a part, you might want to use the tools in AIX to verify that the feature or part is recognized by the system or logical partition.

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 using AIX:
1. Log in as root user.
2. At the command line, type diag 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...
Verify the replacement part using AIX:

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 3

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 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 line, 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:
   - At the command line, type `diag` and press Enter.
   - From the Function Selection menu, select Advanced Diagnostics Routines and press Enter.
   - From the Diagnostic Mode Selection menu, select System Verification and press Enter.
   - 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 on page 73
     - Yes: Go to step 7 on page 73
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.

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 an installed part on an IBM i system or logical partition

If you have installed a new feature or part, verify the feature or part by using the IBM i system service tools.

To verify the installed part follow these steps:
1. **Deactivate the failing item indicator light.** For instructions, see “Deactivating the failing-part indicator light” on page 44.
2. **Sign on with at least service level authority.**
3. On the command line of the IBM i session, type `strsst` and press Enter.
   
   **Note:** If you cannot get to the System Service Tools display, use function 21 from the control panel. Alternatively, if the system is managed by Hardware Management Console (HMC), use the Service Focal Point Utilities to get to the Dedicated Service Tools (DST) display.
4. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display and press Enter.
   
   **Note:** The service tools password is case-sensitive.
5. Select **Start a service tool** from the System Service Tools (SST) display and press Enter.
6. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
7. Select **Logical hardware resources (buses, IOPs, controllers)** from the Hardware Service Manager display and press Enter. This option allows you to display and work with logical resources. Logical hardware resources are the functional resources of the system used by the operating system.

With the Logical Hardware Resources display, you can show logical hardware resource status or information, and associated packaging hardware resources. Use the online Help information to better understand specific functions, fields, or symbols.

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.

To deactivate the indicator light, follow these steps:
1. Select option 7 (Indicator off) to turn off the indicator light.
2. Select the **Acknowledge all errors** function at the bottom of the Service Action Log display, if all problems have been resolved.
3. Close the log entry by selecting option 8 (Close new entry) on the Service Action Log Report display.

Verifying the installed part on a Linux system or logical partition

If you have installed a new part, learn how to verify that the system recognizes the part.

To verify the newly installed or replaced part, continue with Verifying an installed part using stand-alone diagnostics.

Verifying an installed part 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 a Linux system, expansion unit, or logical partition.

- If this server is directly attached to another server or attached to a network, ensure communications with the other servers has 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.
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 Network Installation Management (NIM) server, see Running stand-alone diagnostics from a Network Installation Management server.

To use stand-alone diagnostics, follow these steps:

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 the boot device on the server or logical partition on which you are working, follow these steps:
   a. Access the ASMI. See Accessing the ASMI for information on using the ASMI.
   b. On the ASMI main menu, click on 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. As soon as the optical drive has power, insert the standalone diagnostic CD-ROM.
4. 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 should be initiated using the default-service mode boot list.
5. Enter any requested password.
6. 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.
7. If the terminal type is requested, select the Initialize Terminal option on the Function Selection menu to initialize the operating system.
8. From the Function Selection menu, select Advanced Diagnostics Routines and press Enter.
9. From the Diagnostic Mode Selection menu, select System Verification and press Enter.
10. 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.
11. Did the Testing Complete, No trouble was found message appear?
   • No: There is still a problem. Contact your service provider.
   • Yes: Go to step 12.
12. 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.
13. 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.
Verifying an installed part using Hardware Management Console

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.

To verify an installed part, complete these steps:

1. At the HMC, examine the service action event log for any open service action events. See Viewing serviceable events for details.

2. Are there any service action events that are open?
   - **No**: If the system attention or identify LED is still on, use the HMC to turn off the LED. See Activating and Deactivating LEDs. 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

Use this procedure to activate or deactivate LEDs using Service Focal Point for the HMC.

Choose from the following:
- “Deactivating a system attention LED or partition LED”
- “Activating or deactivating identify LED” on page 77

Deactivating a system attention LED or partition LED:

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.

1. In the navigation area, open Systems Management.
2. Open Servers and select the appropriate system.
3. In the content area, check the box for the appropriate Partition.
4. Select Tasks, then Operations, and then Manage Attention LED.
5. Select the appropriate Partition.
6. Select Deactivate System Attention LED from the Action menu. A confirmation window is displayed that provides the following information:
   • A verification that the system attention LED was deactivated.
   • An indication that there still might be open problems within the system.
   • An indication that you cannot activate the system attention LED.
7. Select one of the logical partitions in the lower table, and select Deactivate partition LED from the Partition Operations menu. A confirmation window is displayed that provides the following information:
   • A verification that the logical partition LED was deactivated.
   • An indication that there still might be open problems within the logical partition.
   • An indication that you cannot activate the logical partition LED.

Activating or deactivating identify LED:
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 in 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:
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, then Operations, then LED Status, and then 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, select Selected > 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**
Use this procedure to view a serviceable event, including details, comments, and service history.

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
To view serviceable events, follow these steps:

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 Systems Director Management Console

If you installed or replaced a part, use the IBM 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.

To verify the installed part, complete these steps:

1. From the SDMC, examine the service action event log for any open service action events. See "Viewing serviceable events by using the IBM Systems Director Management Console" on page 80 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 79. 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 IBM Systems Director Management Console (SDMC).

Choose from the following:
- "Deactivating a system attention LED or partition LED"
- "Activating or deactivating identify LED by using the SDMC"

Deactivating a system attention LED or partition LED:
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.

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 identify LED by using the SDMC:
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:
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 select 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 IBM Systems Director Management Console

Use this procedure to view a serviceable event, including details, comments, and service history.

To view serviceable events, follow these steps:
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 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 feature or replaced part on a system or logical partition using Virtual I/O Server tools

If you installed feature or replaced a part, you might want to use the tools in Virtual I/O Server (VIOS) to verify that the feature or part is recognized by the system or logical partition.

To verify the operation of a newly installed feature or replacement part, select the appropriate procedure:
- **Verify the installed feature using VIOS**
- **Verifying the replaced part using VIOS**

Verify the installed feature using VIOS:
1. Log in as root user.
2. At the command line, type `diagmenu` 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 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 using VIOS:

To verify the operation of a newly installed feature or replacement part, follow these steps:
1. Did you replace the part 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 81
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.
   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.

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 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 82

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 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 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 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.

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. For instructions, see Changing service indicators.
Appendix. Notices

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**Electronic emission notices**

**Class A Notices**

The following Class A statements apply to the IBM servers that contain the POWER6 processor.

**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**

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

**European Community Compliance Statement**

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class 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.

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E-mail: tjahn@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.

**VCCI Statement - Japan**

この装置は、クラスA 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

**VCCI-A**

The following is a summary of the VCCI Japanese statement in the box above:

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.
Japanese Electronics and Information Technology Industries Association (JEITA)
Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)

高調波ガイドライン適合品

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

高調波ガイドライン準用品

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

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.

Electromagnetic Interference (EMI) Statement - Taiwan

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

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.

IBM Taiwan Contact Information:
Electromagnetic Interference (EMI) Statement - Korea

Please note that this equipment has obtained EMC registration for commercial use. In the event that it has been mistakenly sold or purchased, please exchange it for equipment certified for home use.

Germany Compliance Statement

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


Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden: "Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

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

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

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

Verantwortlich für die Konformitätserklärung nach des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.
Generelle Informationen:

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

Electromagnetic Interference (EMI) Statement - Russia

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

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