Power Systems

Installing an ESLL or ESLS storage enclosure

IBM

Note

Before using this information and the product it supports, read the information in "Safety notices" on page v, "Notices" on page 51, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125–5823.

Contents

Safety notices

Safety notices may be printed throughout this guide:

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

World Trade safety information

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

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

German safety information

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

Laser safety information

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

Laser compliance

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

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

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

- If IBM supplied the power cord(s), 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.
  - For AC power, disconnect all power cords from their AC power source.
  - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
  - For racks with AC power, 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.

- For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
  3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
  4. Remove the signal cables from the connectors.
  5. 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. For AC power, attach the power cords to the outlets.
  5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
  6. Turn on the devices.

  Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

(R001 part 1 of 2):

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 if provided, unless the earthquake option is to be installed..
- 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. In addition, do not lean on rack mounted devices and do not use them to stabilize your body position (for example, when working from a ladder).

- Stability hazard:

  - The rack may tip over causing serious personal injury.
  - Before extending the rack to the installation position, read the installation instructions.
  - Do not put any load on the slide-rail mounted equipment mounted in the installation position.
  - Do not leave the slide-rail mounted equipment in the installation position.

- Each rack cabinet might have more than one power cord.

  - For AC powered racks, be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
  - For racks with a DC power distribution panel (PDP), turn off the circuit breaker that controls the power to the system unit(s), or disconnect the customer's DC power source, 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. (R001 part 1 of 2)

(R001 part 2 of 2):

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 or if the rack is not bolted to the floor. 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 part 2 of 2)

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

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:
  - Remove all devices in the 32U position and above.
  - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.
  - Ensure that there are little-to-no empty U-levels between devices installed in the rack cabinet below the 32U level, unless the received configuration specifically allowed it.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- If the rack cabinet you are relocating was supplied with removable outriggers they must be reinstalled before the cabinet is relocated.
- Inspect the route that you plan to take to eliminate potential hazards.
- Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Verify that all door openings are at least 760 x 2083 mm (30 x 82 in.).
- Ensure that all devices, shelves, drawers, doors, and cables are secure.
- Ensure that the four leveling pads are raised to their highest position.
- Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
  - Lower the four leveling pads.
  - Install stabilizer brackets on the rack cabinet or in an earthquake environment bolt the rack to the floor.
  - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.
- If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.

(R002)

(L001)

⚠️ **DANGER:** Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)

(L002)

DANGER: Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices. In addition, do not lean on rack-mounted devices and do not use them to stabilize your body position (for example, when working from a ladder). Stability hazard:

- The rack may tip over causing serious personal injury.
- Before extending the rack to the installation position, read the installation instructions.
- Do not put any load on the slide-rail mounted equipment mounted in the installation position.
- Do not leave the slide-rail mounted equipment in the installation position.
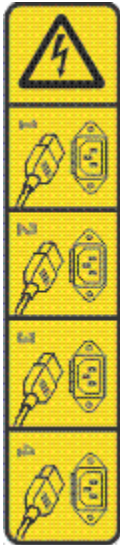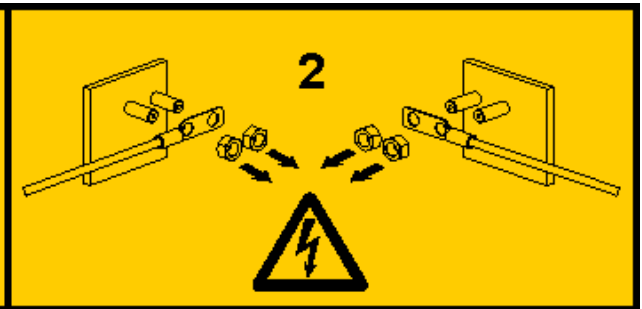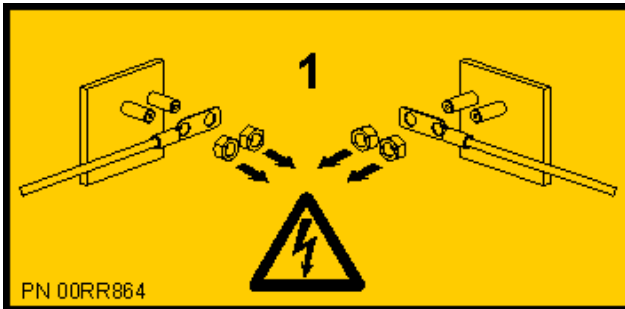
(L002)

(L003)
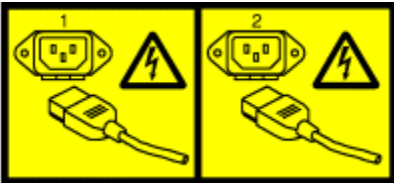
or

or

or

or

DANGER: Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

(L007)

CAUTION: A hot surface nearby. (L007)

(L008)

CAUTION: Hazardous moving parts nearby. (L008)

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. Although shining light into one end and looking into the other end of a disconnected optical fiber to verify the continuity of optic fibers may not injure the eye, this procedure is potentially dangerous. Therefore, verifying the continuity of optical fibers by shining light into one end and looking at the other end is not recommended. To verify continuity of a fiber optic cable, use an optical light source and power meter. (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)

(C030)

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

Do Not:

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

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

CAUTION: Regarding IBM provided VENDOR LIFT TOOL:

- Operation of LIFT TOOL by authorized personnel only.

- LIFT TOOL intended for use to assist, lift, install, remove units (load) up into rack elevations. It is not to be used loaded transporting over major ramps nor as a replacement for such designated tools like pallet jacks, walkies, fork trucks and such related relocation practices. When this is not practicable, specially trained persons or services must be used (for instance, riggers or movers).
- Read and completely understand the contents of LIFT TOOL operator's manual before using. Failure to read, understand, obey safety rules, and follow instructions may result in property damage and/or personal injury. If there are questions, contact the vendor's service and support. Local paper manual must remain with machine in provided storage sleeve area. Latest revision manual available on vendor's web site.
- Test verify stabilizer brake function before each use. Do not over-force moving or rolling the LIFT TOOL with stabilizer brake engaged.
- Do not raise, lower or slide platform load shelf unless stabilizer (brake pedal jack) is fully engaged. Keep stabilizer brake engaged when not in use or motion.
- Do not move LIFT TOOL while platform is raised, except for minor positioning.
- Do not exceed rated load capacity. See LOAD CAPACITY CHART regarding maximum loads at center versus edge of extended platform.
- Only raise load if properly centered on platform. Do not place more than 200 lb (91 kg) on edge of sliding platform shelf also considering the load's center of mass/gravity (CoG).
- Do not corner load the platforms, tilt riser, angled unit install wedge or other such accessory options. Secure such platforms -- riser tilt, wedge, etc options to main lift shelf or forks in all four (4x or all other provisioned mounting) locations with provided hardware only, prior to use. Load objects are designed to slide on/off smooth platforms without appreciable force, so take care not to push or lean. Keep riser tilt [adjustable angling platform] option flat at all times except for final minor angle adjustment when needed.
- Do not stand under overhanging load.
- Do not use on uneven surface, incline or decline (major ramps).
- Do not stack loads.
- Do not operate while under the influence of drugs or alcohol.
- Do not support ladder against LIFT TOOL (unless the specific allowance is provided for one following qualified procedures for working at elevations with this TOOL).
- Tipping hazard. Do not push or lean against load with raised platform.
- Do not use as a personnel lifting platform or step. No riders.
- Do not stand on any part of lift. Not a step.
- Do not climb on mast.
- Do not operate a damaged or malfunctioning LIFT TOOL machine.
- Crush and pinch point hazard below platform. Only lower load in areas clear of personnel and obstructions. Keep hands and feet clear during operation.
- No Forks. Never lift or move bare LIFT TOOL MACHINE with pallet truck, jack or fork lift.
- Mast extends higher than platform. Be aware of ceiling height, cable trays, sprinklers, lights, and other overhead objects.
- Do not leave LIFT TOOL machine unattended with an elevated load.
- Watch and keep hands, fingers, and clothing clear when equipment is in motion.
- Turn Winch with hand power only. If winch handle cannot be cranked easily with one hand, it is probably over-loaded. Do not continue to turn winch past top or bottom of platform travel. Excessive unwinding will detach handle and damage cable. Always hold handle when lowering, unwinding. Always assure self that winch is holding load before releasing winch handle.
- A winch accident could cause serious injury. Not for moving humans. Make certain clicking sound is heard as the equipment is being raised. Be sure winch is locked in position before releasing handle. Read instruction page before operating this winch. Never allow winch to unwind freely.

Freewheeling will cause uneven cable wrapping around winch drum, damage cable, and may cause serious injury.

- This TOOL must be maintained correctly for IBM Service personnel to use it. IBM shall inspect condition and verify maintenance history before operation. Personnel reserve the right not to use TOOL if inadequate. (C048)

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.

The dc-powered system is intended to be installed in a common bonding network (CBN) as described in GR-1089-CORE.

Installing an ESLL or ESLS storage enclosure

Find information about installing an ESLL storage enclosure (IBM EXP12SX SAS Storage Enclosure) or ESLS storage enclosure (IBM EXP24SX SAS Storage Enclosure) into a rack and how to cable it to a system or to an adapter in a system or an expansion unit.

Installing a storage enclosure into a rack is a customer task. You can complete this task yourself, or contact a service provider to complete the task for you. You might be charged a fee by the service provider for this service.

Complete the following tasks to install an ESLL or ESLS storage enclosure:

Preparing to install an ESLL or ESLS storage enclosure

To prepare to install an ESLL or ESLS storage enclosure, complete the steps in this procedure.

Procedure

1. Determine the level of software that you need to support the enclosure.

   For instructions, see the Power Systems Prerequisites website (https://www14.software.ibm.com/support/customercare/iprt/home).

2. Determine whether you can add your enclosure to a host system when the system power is turned on by reviewing the following information. You can add your enclosure when the system power is turned on and when logical partitions are active if you have one of the following configurations:

   • Your system is managed by an IBM Hardware Management Console (HMC).

   • Your system is not managed by an HMC, but has only one partition, and that partition is running the IBM i operating system.

   Note: If you do not have one of these configurations, you must power off the system to add an enclosure.

3. Choose one of the following options:

   • If your ESLL or ESLS storage enclosure arrived to your site preinstalled in a rack, continue with one of the following procedures:

     – If you want to install disk drives or solid-state drives (SSDs), continue with "Optional: Install disk drives or SSDs in an ESLL or ESLS storage enclosure" on page 11.

     – If you want to connect your ESLL or ESLS storage enclosure to your system, continue with "Connecting an ESLL or ESLS storage enclosure to your system" on page 14.

   • If your ESLL or ESLS storage enclosure needs to be installed into a rack, ensure that you have the following items before you start your installation:

     – Phillips screwdrivers

- Flat-head screwdriver
- Rack with two Electronic Industries Alliance (EIA) units of contiguous space.

    Note: If you do not have a rack that is installed, install the rack. For instructions, see Racks and rack features (http://www.ibm.com/support/knowledgecenter/POWER9/p9hbf/ p9hbf_9xx_kickoff.htm).

Completing inventory for an ESLL or ESLS storage enclosure

To complete inventory for an ESLL or ESLS storage enclosure, complete the steps in this procedure.

Procedure

1. Refer to the inventory list, and verify that you received all of the parts that you ordered. At a minimum, each order contains the following items:

   - Left and right rack-mounting hardware
   - Mounting screws
   - Power supply cables

2. If your shipment contains parts that are not required to complete the installation procedure, store those parts in case they are needed in the future.

3. If you have incorrect, missing, or damaged parts, consult any of the following resources:

   - Your IBM reseller.
   - IBM Rochester manufacturing automated information at 1-800-300-8751 (United States only).
   - See the Directory of worldwide contacts website (http://www.ibm.com/planetwide). Select your location to view the service and support contact information.

Determining and marking the location in the rack

To determine where to install the ESLL or ESLS storage enclosure into a rack, complete the steps in this procedure.

Before you begin

Read the Rack safety notices (http://www.ibm.com/support/knowledgecenter/POWER9/p9hbf/ p9hbf_racksafety.htm).

Procedure

1. Determine where in the rack to place the enclosure in relation to other system hardware. As you plan for installing the enclosure in a rack, keep in mind the following information:

   - Organize larger and heavier units into the lower part of the rack.
   - Plan to install units into the lower part of the rack first.
   - Record the Electronic Industries Alliance (EIA) locations in your plan.

   Note: The enclosure is two EIA units high. An EIA unit is 44.50 mm (1.75 in). The rack contains three mounting holes for each EIA unit of height. Therefore, this enclosure is 89 mm (3.5 in) high and covers six mounting holes in the rack.

2. If necessary, open or remove the front and rear rack doors.

3. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.

4. If necessary, remove the filler panels to allow access to the inside of the rack enclosure where you plan to place the enclosure or drawer.
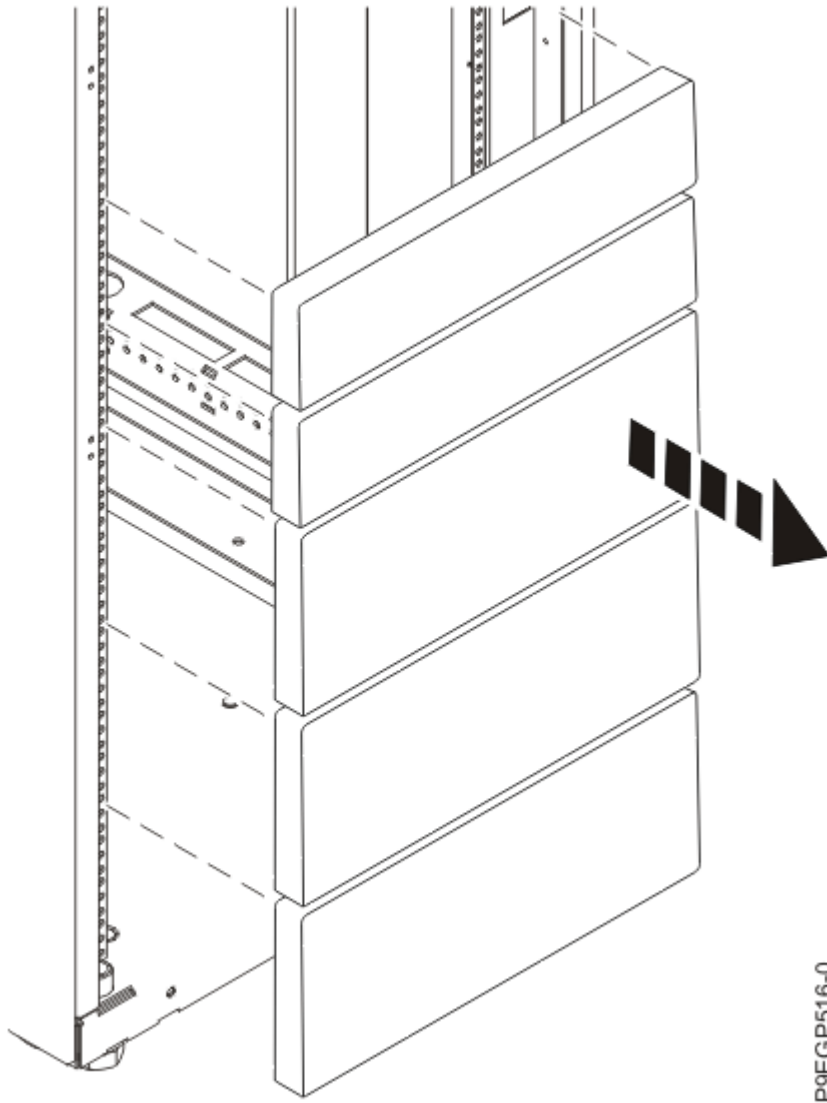
Figure 1. Removing the filler panels

5. Face the front of the rack and work from the left side to complete the following steps:

   a) Make a note of the lowest EIA unit to be used for the enclosure.

   b) Use tape, a marker, or a pencil to mark the top mounting hole **(A)** of the lowest EIA unit.

   Note: Mark the rack so that these marks can also be seen from the rear of the rack.

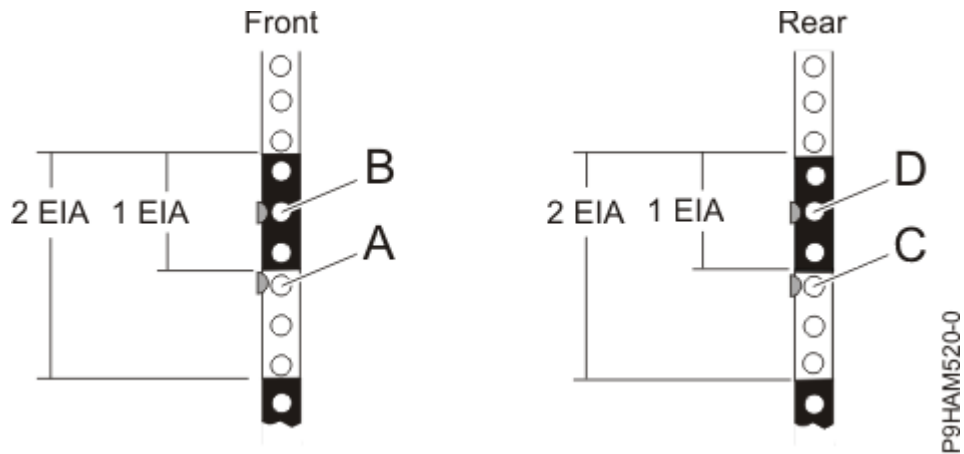   c) Count two holes up and place another mark beside that mounting hole **(B)**.

Figure 2. Marking the installation locations

6. Repeat step "5" on page 3 to place two marks on the corresponding mounting holes on the front-right side of the rack

7. Go to the rear of the rack and work from the left side to complete the following steps:

   a. Find the EIA unit that corresponds to the lowest EIA unit marked on the front of the rack.

   b. Use tape, a marker, or a pencil to mark the top mounting hole **(C)** of the lowest EIA unit.

   c. Count up two holes and place another mark beside that mounting hole **(D)**.

8. Repeat step "7" on page 4 to place two marks on the corresponding mounting holes on the rear-right side of the rack.

Installing support rails into the rack

To install support rails into the rack, complete the steps in this procedure.

About this task

⚠ **Attention:** To avoid rail failure and potential danger to yourself and to the unit, ensure that you have the correct rails and fittings for your rack. If your rack has square support flange holes or screw-thread support flange holes, ensure that the rails and fittings match the support flange holes that are used on your rack. Do not install mismatched hardware by using washers or spacers. If you do not have the correct rails and fittings for your rack, contact your IBM reseller.

Important: The rail installation can be completed by one person. However, the installation is easier if one person is positioned at the front of the rack and one person is positioned at the rear of the rack.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.

2. Select a rail and remove any parts that were taped to it for shipping.

3. Extend the rail to expose both circular standoffs.

4. Install the spring to the rail by hooking one end around one of the circular standoffs **(A)** and the other end around the other circular standoff **(B)** as shown in Figure 3 on page 5.

   Note: If your rack has the square mounting holes, remove the rail pins from the rail. Install the larger rail pins that are provided with the rack installation kit.
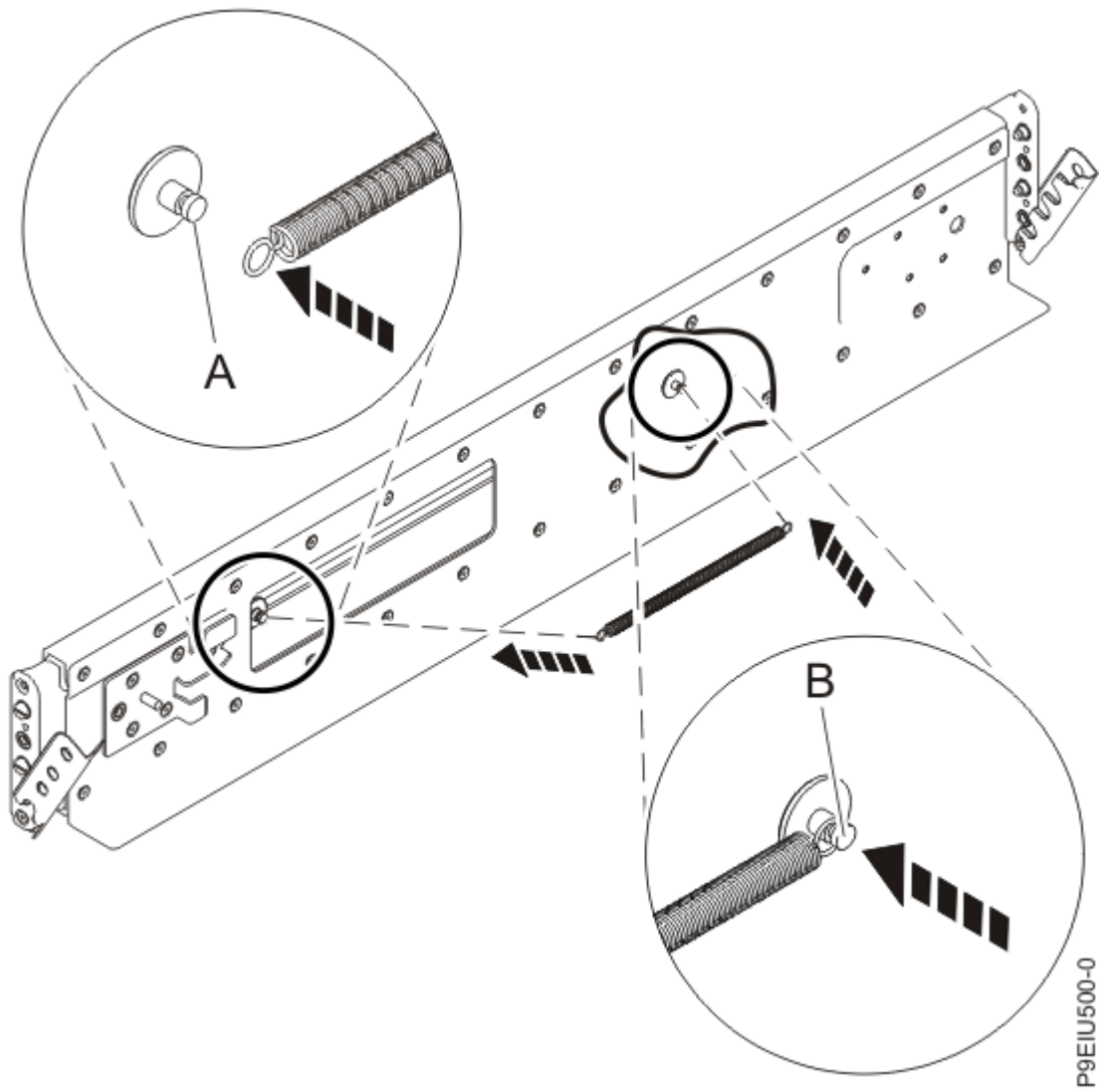
Figure 3. Installing the spring to the rail

5. Open the hinge bracket on each end of the rail.
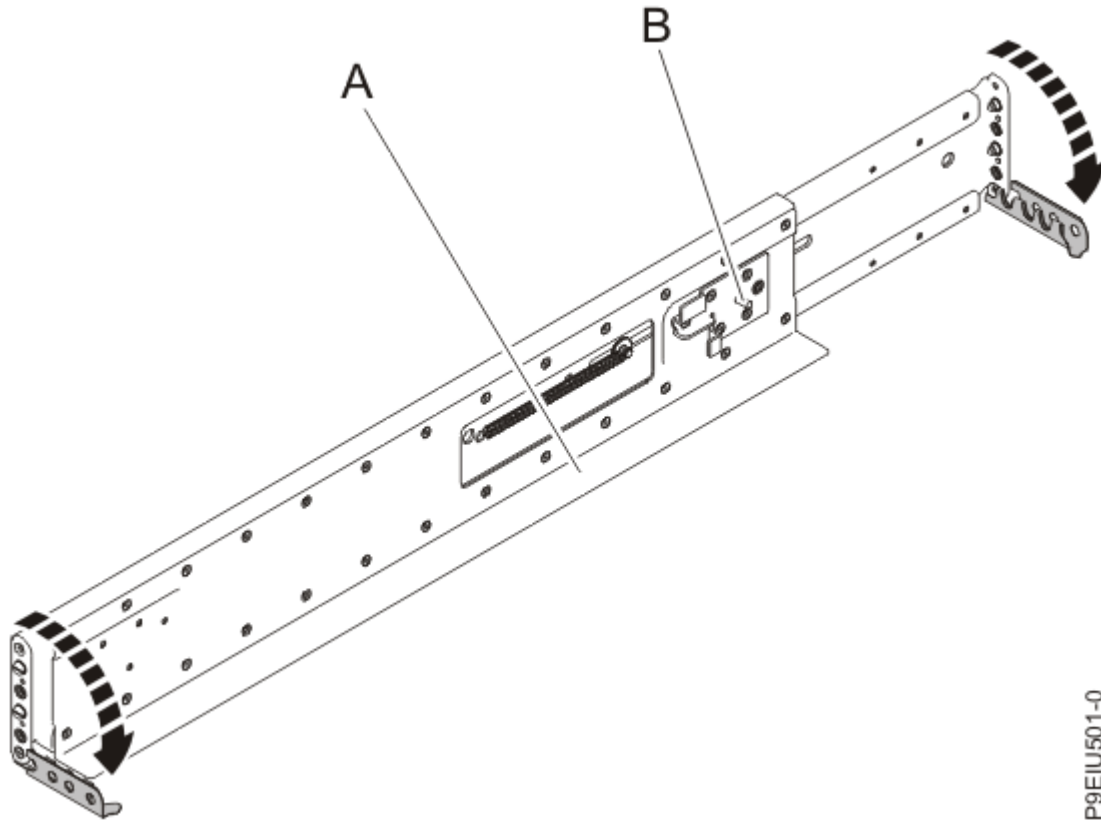
Figure 4. Opening the rail hinge bracket

6. Identify the side of the rack where the rail must be mounted by holding the rail inside of the open space of the rack as follows:

   - The rail points from front to rear.
   - The support ledge **(A)** is at the bottom and points toward the center of the open space inside the rack.
   - The enclosure stop **(B)** is located toward the rear of the rack.The drawer stop **(B)** is located toward the rear of the rack.
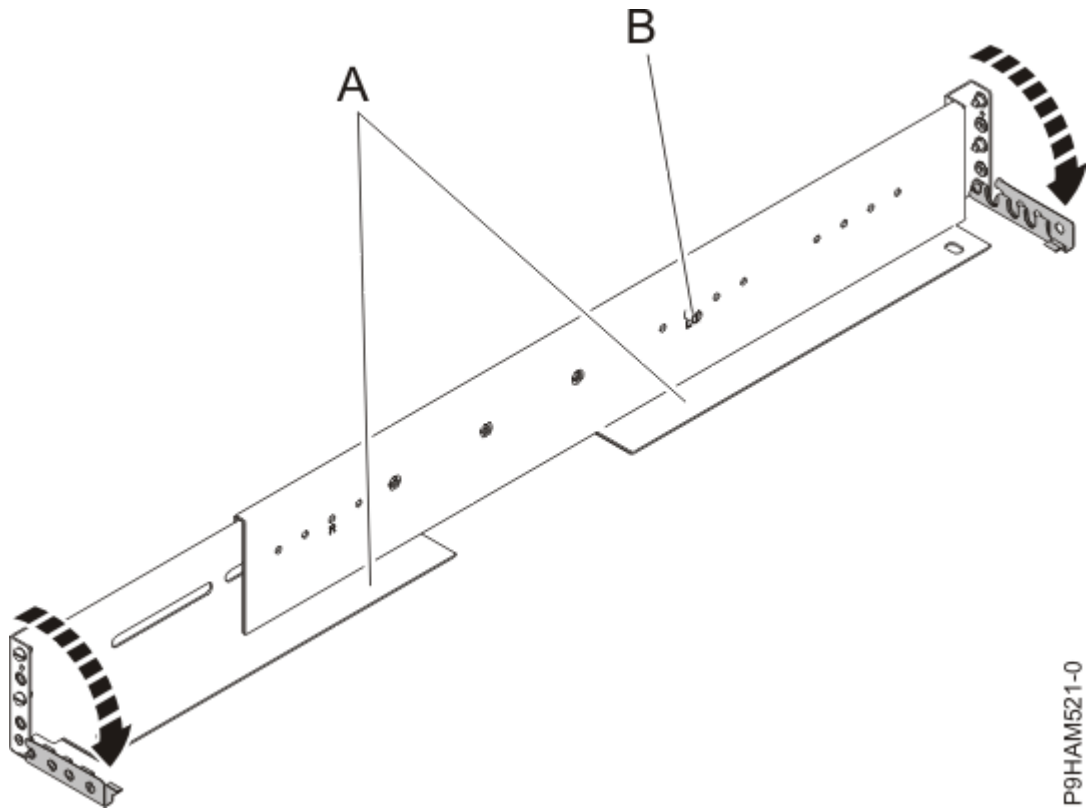
Figure 5. Opening the rail hinge bracket

7. Locate the two marks that were made previously on the Electronic Industries Alliances (EIA) strips.

8. Align the rail bracket inside the rack cabinet beside the marks, and seat the front of the support rail bracket pins in the mounting holes. The bottom of the rail support ledge appears slightly higher than the U mark on the rack flange.

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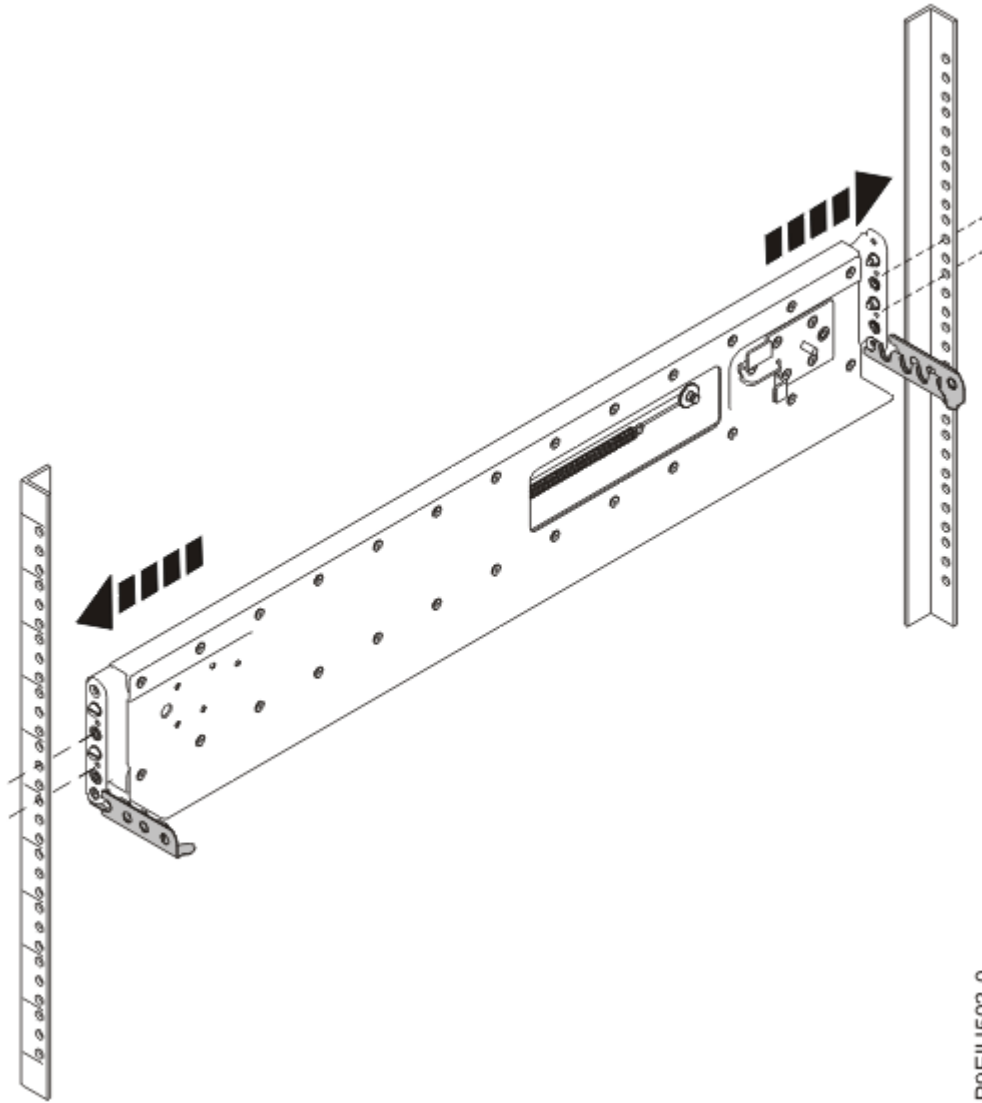
Figure 6. Mounting the rail on the rack

9. Close the front hinge bracket to secure the rail to the rack cabinet flange.
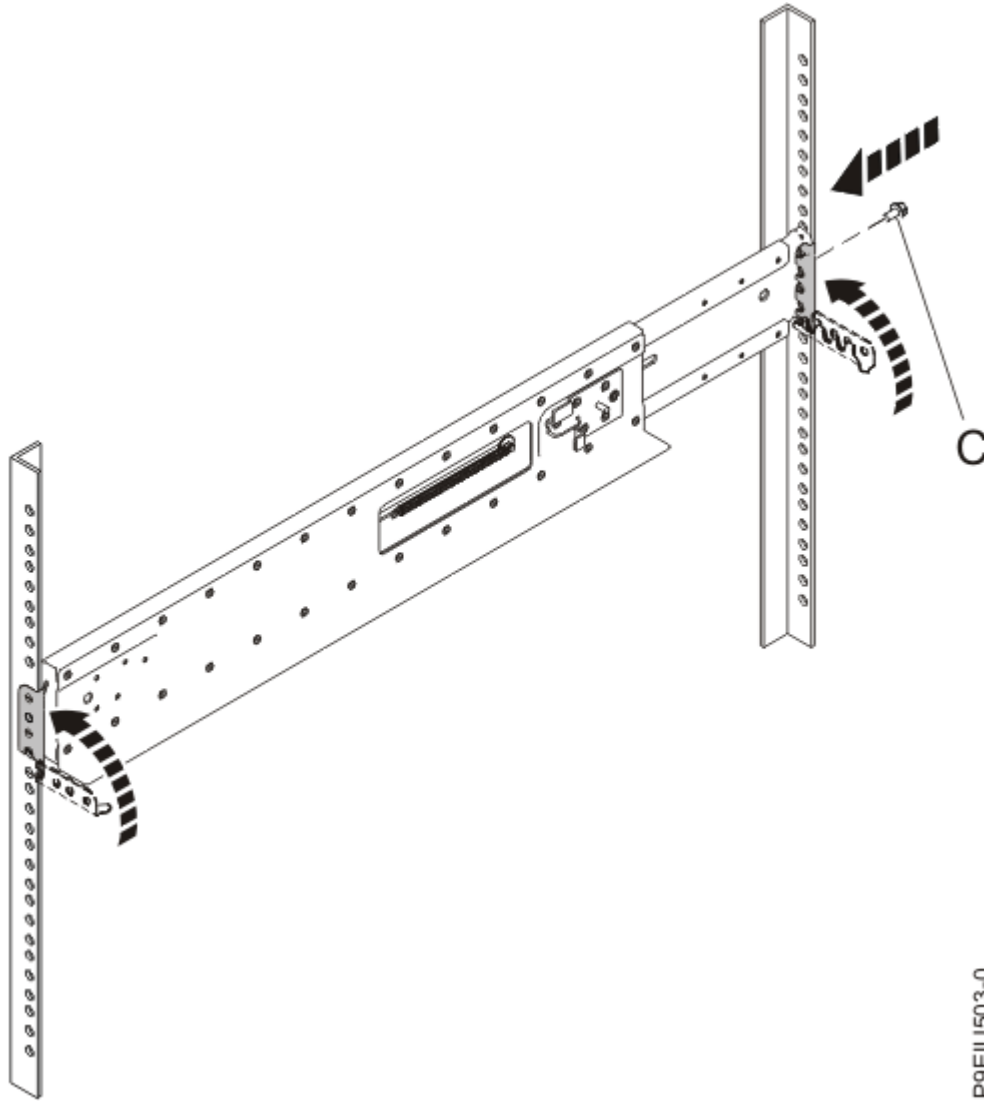
Figure 7. Securing the rail to the rack

10. At the rear of the rack, carefully retract the rail until it lines up with the rack flange and seat the pins in the marked mounting holes. Then, close the rear hinge bracket to secure the rail to the rack cabinet flange.

11. Install one M5 screw **(C)** in the open hole in the bracket between the two alignment pins at the rear of the rack.

12. Repeat this procedure for the other support rail.

Installing an ESLL or ESLS storage enclosure into a rack

To install an ESLL or ESLS storage enclosure into a rack, complete the steps in this procedure.

Before you begin

Important: Two people are required to safely lift the enclosure. Using fewer than two people to lift the enclosure can result in injury.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.

2. Remove the left side cover **(A)** and right side cover **(B)** to show the mounting brackets.

3. Using two people, lift the enclosure and position it over the front of the rails.

> ⚠️ **Attention:** Two people are required to safely lift the enclosure. Using fewer than two people to lift the enclosure can result in injury.

4. Slide the enclosure into the rack cabinet. Ensure that the rear guide on the enclosure is seated in the enclosure stop on the support rail.
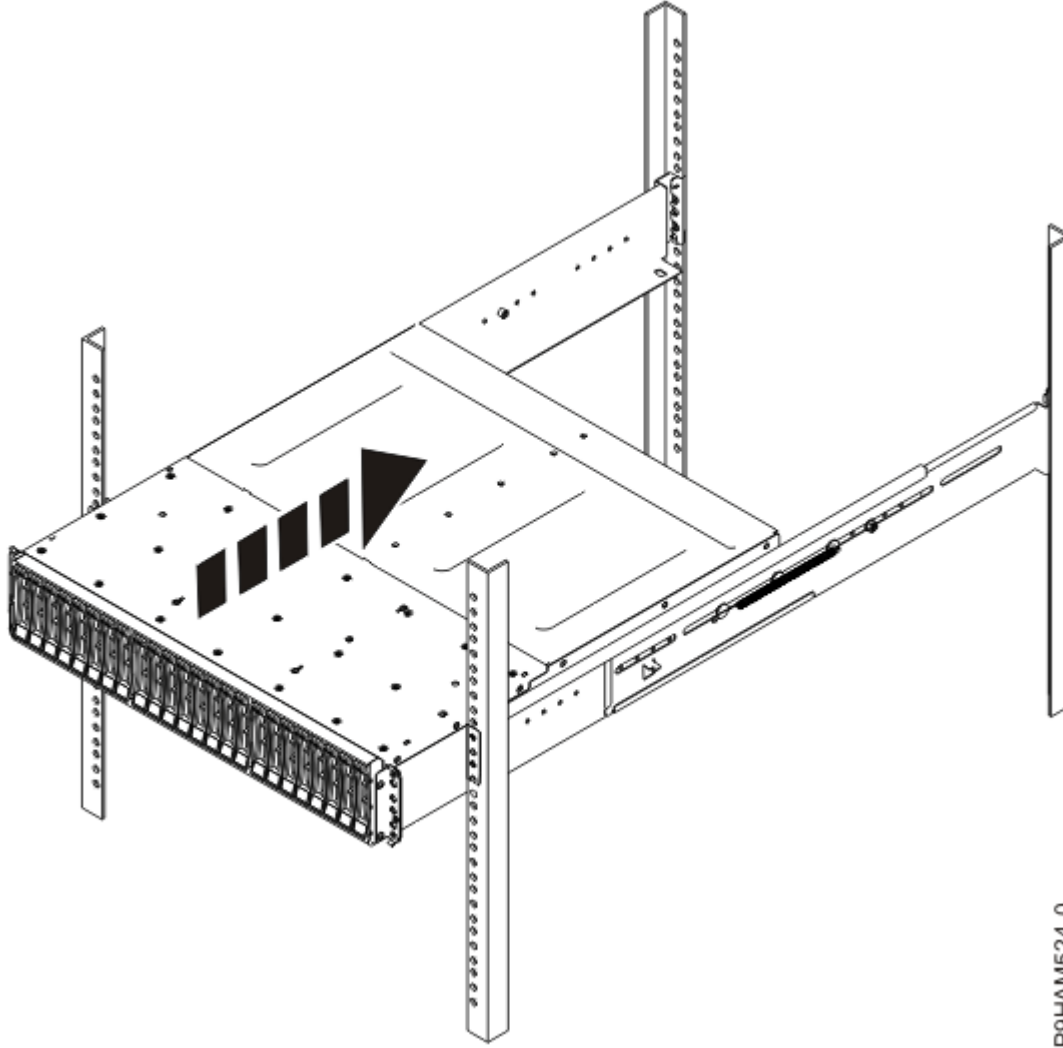
P9HAM524-0

Figure 8. Sliding the enclosure into the rack

5. Secure the front of the enclosure to the rack flanges with one M5 screw **(C)** in the top open hole in each bracket.
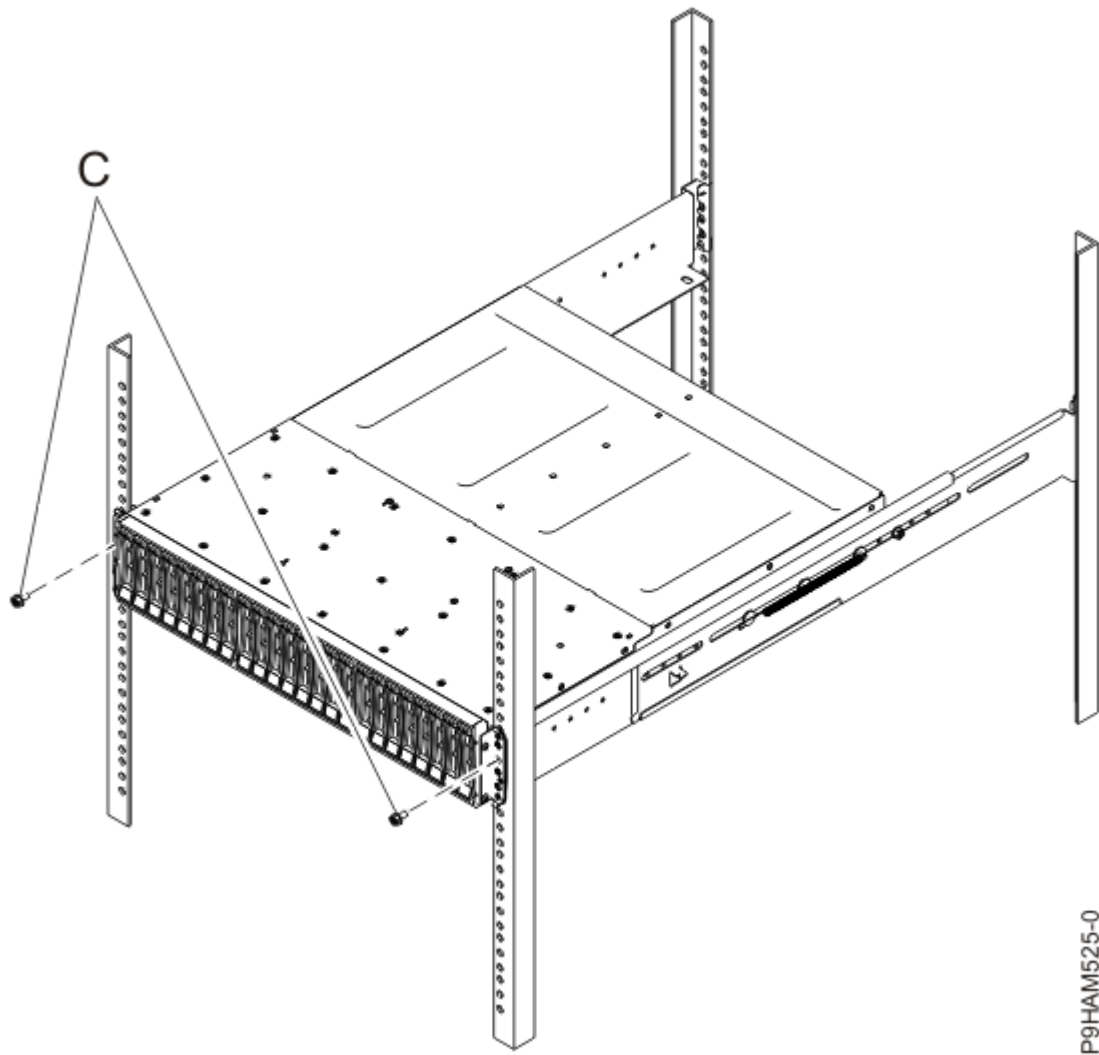
Figure 9. Securing the front of the enclosure to the rack

Optional: Install disk drives or SSDs in an ESLL or ESLS storage enclosure

To install disk drives or solid-state drives (SSDs) into the ESLL or ESLS storage enclosure, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Remove the drive from the static-protective package.

⚠️ **Attention:** Drives are fragile. Handle with care.

3. With the handle in the unlocked position, support the bottom of the drive as you align it with the guide rails in the enclosure. See Figure 10 on page 12 or Figure 11 on page 13.
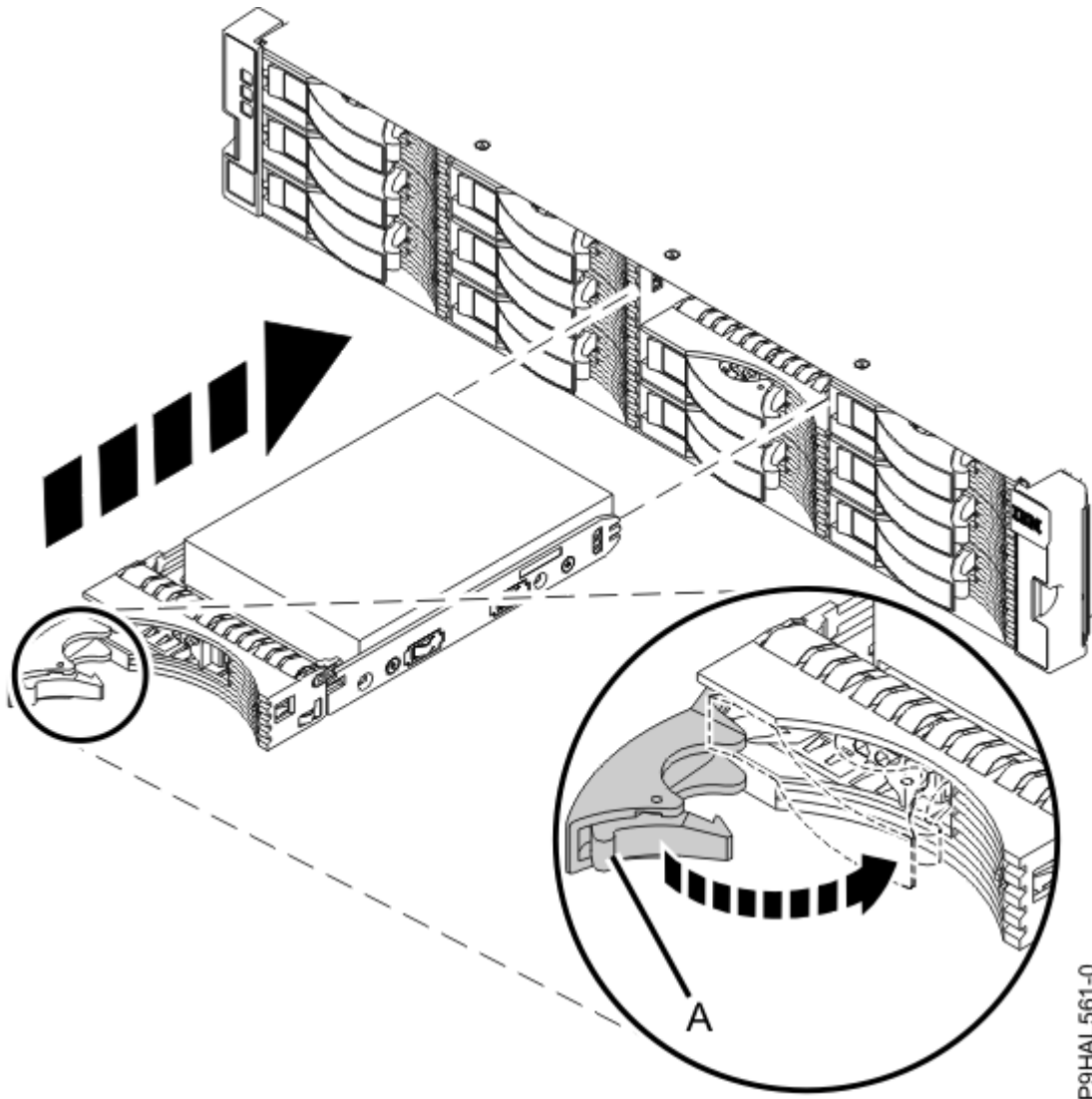
Figure 10. Installing a drive in the ESLL storage enclosure
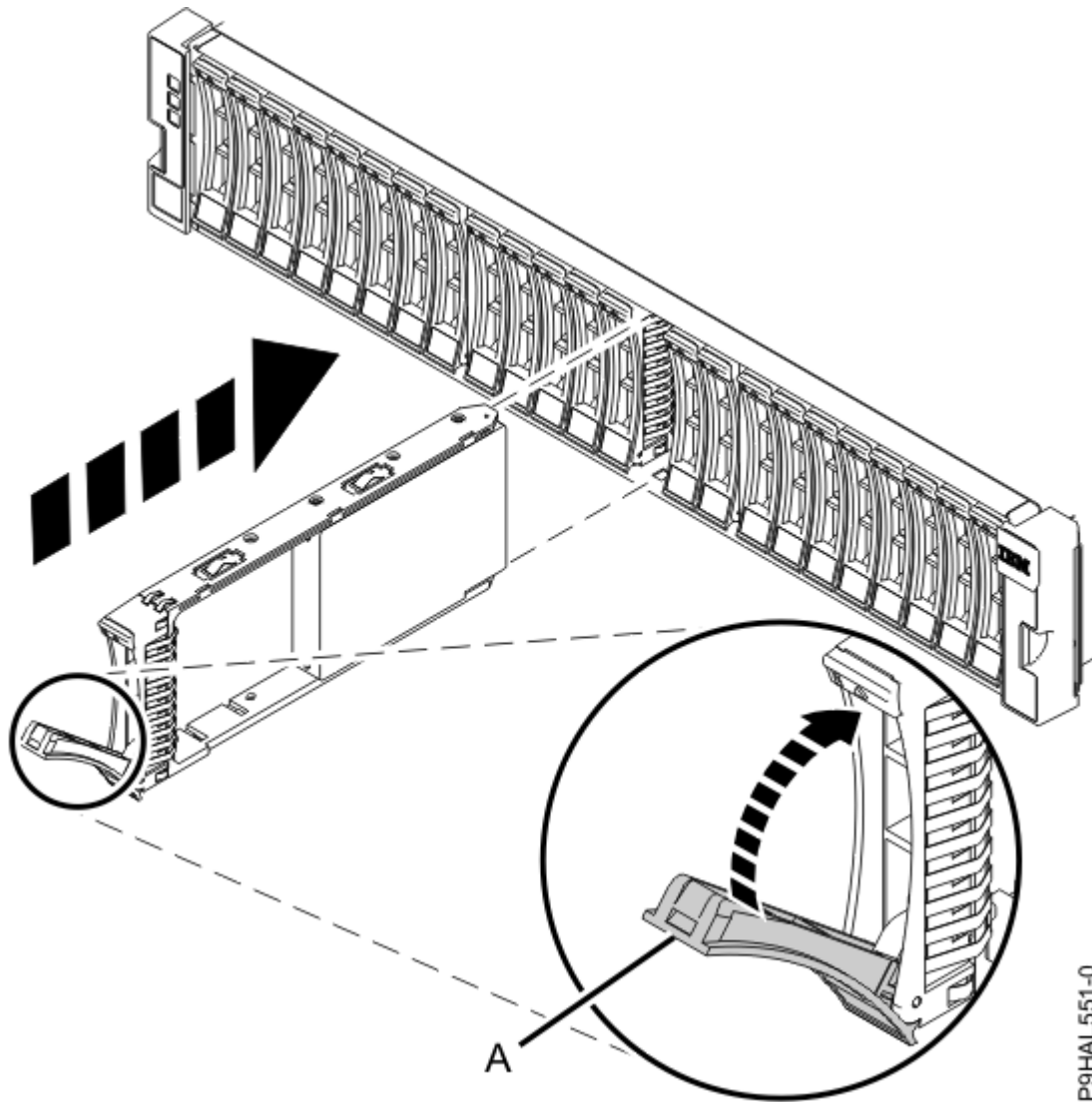
Figure 11. Installing a drive in the ESLS storage enclosure

Note: Do not hold the drive only by the handle.

4. Slide the drive into the storage enclosure until the drive stops.
5. Rotate the handle **(A)** to the locked position.
6. If you are installing more than one drive, repeat the steps in this procedure until all drives are installed.
7. Review the following information that is related to this device:

   • The ESLL storage enclosure can hold up to 12 large form factor disk drives.
   • The ESLS storage enclosure can hold up to 24 small form factor disk drives or SSDs.
   • The ESLL or ESLS storage enclosure can be split logically into one, two, or four independent groups.

   The ESLL and ESLS storage enclosures support the following operating systems:

   • AIX®
   • IBM i (Does not support the ESLL storage enclosure).
   • Linux®
   • VIOS

   If you are planning to configure RAID arrays, ensure that you have the minimum number of available disks for each RAID level:

RAID 0
    Minimum of one drive per array.

RAID 5
    Minimum of three drives per array.

RAID 6
    Minimum of four drives per array.

RAID 10
    Minimum of two drives per array.

Connecting an ESLL or ESLS storage enclosure to your system

To connect an ESLL or ESLS storage enclosure to your system that has support for a serial-attached SCSI (SAS) storage enclosure, complete the steps in this procedure.

About this task

Note: The cables that are used to connect an ESLL or ESLS storage enclosure to a server are different from the cables that are used with the 5887 disk drive enclosure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.

2. Confirm the factory-set mode of the enclosure by using information that is printed on stickers at the rear of the enclosure. Stickers are attached to the lower-left shelf of the chassis **(A)** and the center support between the enclosure services manager modules **(B)**. The stickers indicate whether the enclosure is set to mode 1, mode 2, or mode 4.
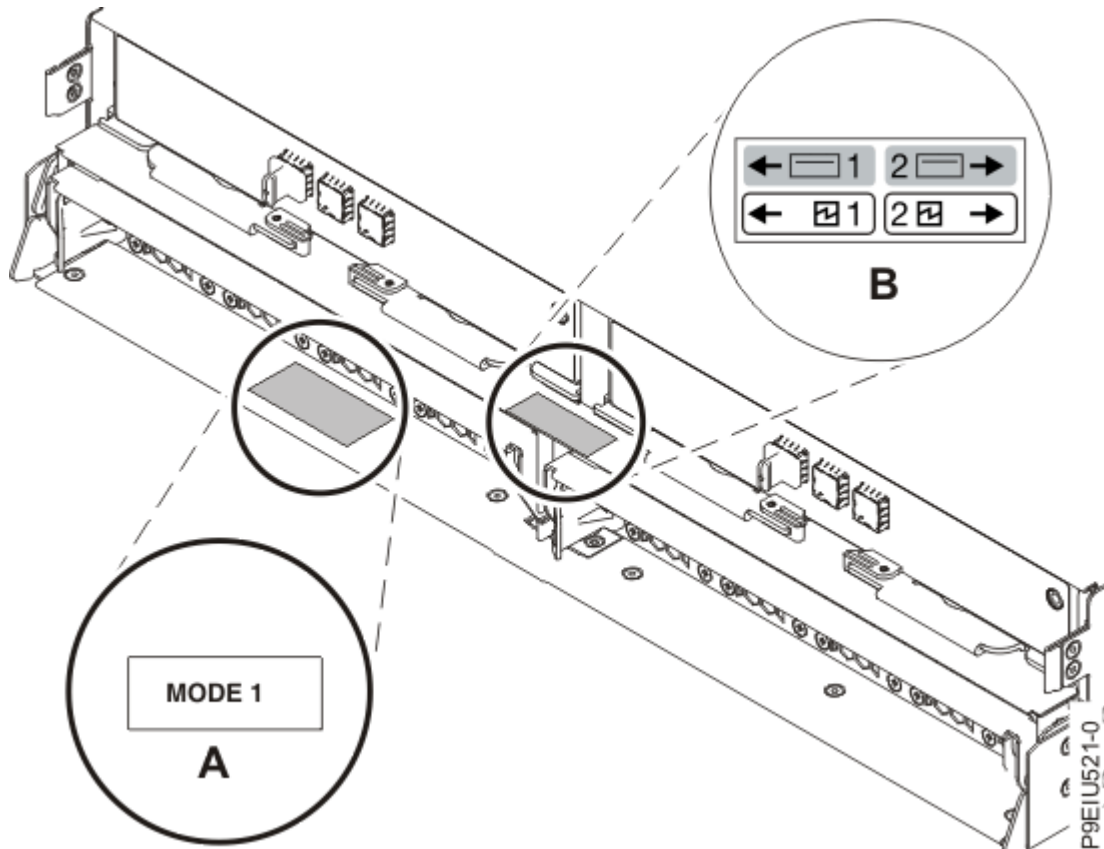

Figure 12. Mode sticker locations at the rear of the ESLL or ESLS storage enclosure

3. Ensure that all adapters that you need to connect to the ESLL or ESLS storage enclosure are installed in the system or expansion unit. If the adapters are not installed, complete the adapter installation procedure for your system or expansion unit before you continue with this task. For instructions, see PCIe adapters (http://www.ibm.com/support/knowledgecenter/POWER9/p9hak/pciadapters.htm).
4. If the system requires an internal cable to be installed to produce an external SAS port for connection with the enclosure, confirm that the installation was completed.

   Remember: When you install or confirm the use of an external SAS port, record the location of the external SAS port on the system. Later in this procedure, you are instructed to install the external SAS cable to this system connector location.
5. Determine the configuration that you use to cable the SAS adapter to the ESLL or ESLS storage enclosure. The following list shows some of the common connections, but not all possible connection options. For more configuration options, see Planning for serial-attached SCSI cables (http://www.ibm.com/support/knowledgecenter/POWER9/p9had/p9had_sascabling.htm).

   Notes:
   - If you have a 9040-MR9 system and plan to install an FC EJ0K in PCIe slots C9 and C12, a connection of mode 1 for the ESLL or ESLS storage enclosure is **not** supported.
   - If you use a YO12 cable to attach the ESLL or ESLS storage enclosure to the rear SAS ports of the POWER8® system model 8247-21L, 8247-22L, 8284-21A, 8284-22A, or POWER9 system model 5105-22E, 9008-22L, 9009-22A, 9009-22G, 9223-22H, or 9223-22S, the SAS YO12 cable must not exceed the maximum supported length of 3 m (9.8 ft).
   - A mode 1 connection of one ESLL or ESLS storage enclosure by using a YO12 cable to a single SAS adapter.
   - A mode 1 connection of two ESLL or ESLS storage enclosures by using YO12 cables to a single SAS adapter.
   - A mode 1 connection of one ESLL or ESLS storage enclosure by using YO12 cables to a SAS adapter pair.
   - A mode 1 connection of two ESLL or ESLS storage enclosures by using YO12 cables to a SAS adapter pair.
   - A mode 2 connection of one ESLL or ESLS storage enclosure by using YO12 cables to two independent SAS adapters.
   - A mode 2 connection of one ESLL or ESLS storage enclosure by using two YO12 cables to one FC EJ0K SAS adapter located in PCIe slot C12 in the 9040-MR9 system.

     Note: This option is only supported with the AIX or Linux operation system.
   - A mode 2 connection of one ESLL or ESLS storage enclosure by using two YO12 cables to two EJ0K SAS adapters located in PCIe slots C09 and C12 in the 9040-MR9 system.

     Note: This option is only supported with the AIX or Linux operation system.
   - A mode 2 connection of two ESLL or ESLS storage enclosures by using four YO12 cables to two FC EJ0K SAS adapters located in PCIe slots C09 and C12 in the 9040-MR9 system.

     Note: This option is only supported with the AIX or Linux operation system.
   - A mode 2 connection of one ESLL or ESLS storage enclosure by using X12 cables to two SAS adapter pairs.
   - A mode 4 connection of one ESLL or ESLS storage enclosure by using X12 cables to four independent SAS adapters.
6. Locate the connection for each adapter for which you are using an external SAS cable to connect the enclosure. Adapter cables attach to ports at the rear of the systems in which the adapters are installed.

   To identify the SAS port location for the system in your configuration, see "Connector locations" on page 38 and select the appropriate model.
7. Select from the following options:

- If the server or expansion unit that you are attaching your ESLL or ESLS storage enclosure to is powered off, continue with step "12" on page 16.
- If the system is powered on, you must complete one of the following actions, depending on the supported functions of your operating system:
  - Unconfigure the adapters to which you are connecting the enclosure.
  - Power off the adapters to which you are connecting the enclosure.
  - Power off the logical partitions or systems that own the adapters to which you are connecting the enclosure.

  To do one of these required actions, continue with step "8" on page 16.

8. Do the following conditions apply to your situation?
   - Your system model does not support slot power control.
   - Your adapters are not in an I/O enclosure that supports slot power control.
   - You are unable to tolerate a temporary loss of access to other disk devices that might exist on the same adapters.
     - **Yes**: Power off the system or the logical partitions that own the adapters. For instructions, see Stopping a system (www.ibm.com/support/knowledgecenter/POWER9/p9haj/crustopsys.htm). Then, continue with step "12" on page 16.
     - **No**: Continue with step "9" on page 16.

9. Select from the following options:
   - If you can unconfigure the SAS adapters, go to step "10" on page 16.
   - If you can not unconfigure the SAS adapters, you will need to power off the SAS adapters. Go to step "11" on page 16.

10. To unconfigure the SAS adapters, complete these steps:
    a) Unconfigure the SAS adapters.
    b) Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
    c) Connect the SAS cables from the enclosure to the SAS adapters.
    d) Reconfigure the SAS adapters.
    e) Continue with step "12" on page 16.

11. To power off the SAS adapters, complete these steps:
    a) Power off the SAS adapters.
    b) Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
    c) Connect the SAS cables from the enclosure to the SAS adapters.
    d) Power on the SAS adapters.
    e) Configure the SAS adapters and devices.
    f) Continue with the next step.

12. Choose one of the following options to cable the SAS adapter:

    Note: The configuration figures show the use of SAS adapters to represent the external server or expansion unit connections. The adapter can represent one of the following connection types:
    - The external port of an adapter that you confirmed in step "6" on page 15.
    - The external port of an internal adapter cable that you confirmed in step "4" on page 15.

    Note: Locate the connection for each adapter for which you are using an external SAS cable to connect the enclosure. Adapter cables attach to ports at the rear of the systems in which the adapters are installed. To identify the SAS port location for the system in your configuration, see "Connector locations" on page 38 and select the appropriate model.

- To complete a mode 1 connection of one ESLL or ESLS storage enclosure by using a YO12 cable to a single FC EJ0J, FC EJ0K, or FC EJ0M SAS adapter, go to step "13" on page 17.
- To complete a mode 1 connection of two ESLL or ESLS storage enclosures by using YO12 cables to a single FC EJ0L or FC EJ14 SAS adapter, go to step "14" on page 18.
- To complete a mode 1 connection of one ESLL or ESLS storage enclosure by using YO12 cables to an EJ0L SAS adapter pair or an FC EJ14 SAS adapter pair, go to step "15" on page 19.
- To complete a mode 1 connection of one enclosure by using two Y012 cables to an FC EJ14 SAS adapter pair located in PCIe slots C09 and C12 in the 9040-MR9 system with an adapter-to-adapter AA12 cable, go to step "17" on page 21.
- To complete a mode 1 connection of two ESLL or ESLS storage enclosures by using YO12 cables to an EJ0L SAS adapter pair or an FC EJ14 SAS adapter pair, go to step "16" on page 20.
- To complete a mode 2 connection of one ESLL or ESLS storage enclosure by using YO12 cables to two independent FC EJ0J, FC EJ0K, or FC EJ0M SAS adapters, go to step "18" on page 22.
- To complete a mode 2 connection of one ESLL or ESLS storage enclosure by using two YO12 cables to one FC EJ0K SAS adapter located in slot C12 in the 9040-MR9 system, go to step "19" on page 23.

  Note: This option is only supported with the AIX or Linux operation system.
- To complete a mode 2 connection of one ESLL or ESLS storage enclosure by using two YO12 cables to two FC EJ0K SAS adapters located in PCIe slots C09 and C12 in the 9040-MR9 system, go to step "20" on page 24.

  Note: This option is only supported with the AIX or Linux operation system.
- To complete a mode 2 connection of two ESLL or ESLS storage enclosures by using four YO12 cables to two FC EJ0K SAS adapters located in slots C09 and C12 in the 9040-MR9 system, go to step "21" on page 25.

  Note: This option is only supported with the AIX or Linux operation system.
- To complete a mode 2 connection of one ESLL or ESLS storage enclosure by using X12 cables to two FC EJ0L SAS adapter pairs or two FC EJ14 pairs, go to step "22" on page 26.
- To complete a mode 4 connection of one ESLL or ESLS storage enclosure by using X12 cables to four independent FC EJ0J, FC EJ0K, or FC EJ0M SAS adapters, go to step "23" on page 27.

  If your SAS configuration requirements are not supported by any of these options, go to step "24" on page 29.
13. Then, complete a mode 1 connection of one enclosure **(A)** by using a YO12 cable **(B)** to a single FC EJ0J, FC EJ0K, or FC EJ0M SAS adapter **(C)**, as shown in Figure 13 on page 18 and then continue with "Connecting cables, power cords, and installing covers" on page 29.

  Note: The single FC EJ0J, FC EJ0K, or FC EJ0M SAS adapter **(C)** has access to all 12 or 24 drive bays.

Figure 13. Mode 1 connection of one ESLL or ESLS storage enclosure by using a YO12 cable to a single FC EJ0J, FC EJ0K, or FC EJ0M SAS adapter

14. Then, complete a mode 1 connection of two enclosures **(A and B)** by using YO12 cables **(C and D)** to a single FC EJ0J, FC EJ0K, or FC EJ0M SAS adapter **(E)**, as shown in Figure 14 on page 19, and then continue with "Connecting cables, power cords, and installing covers" on page 29.

Note: The single SAS adapter **(E)** has access to all 24 or 48 drive bays.
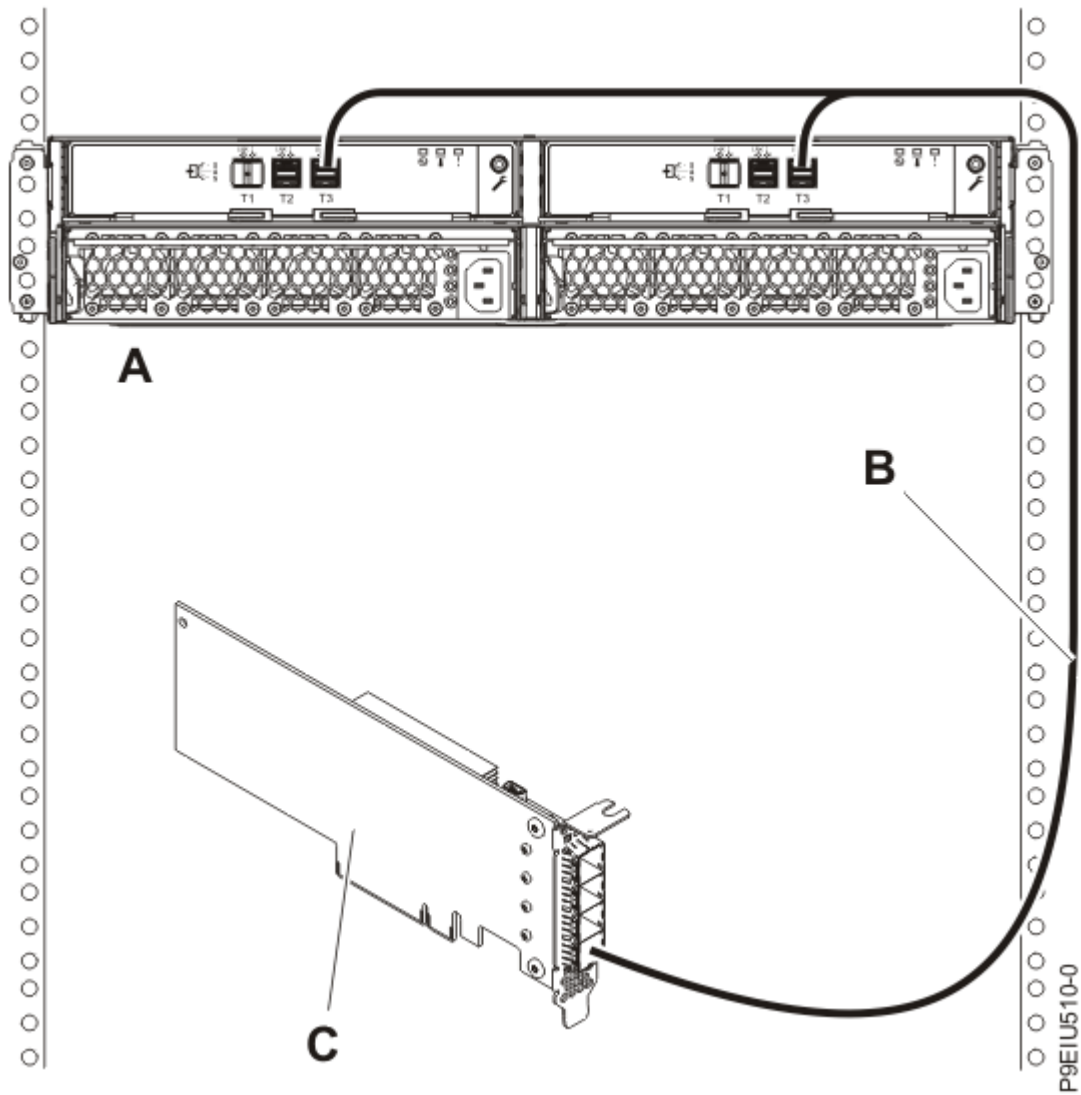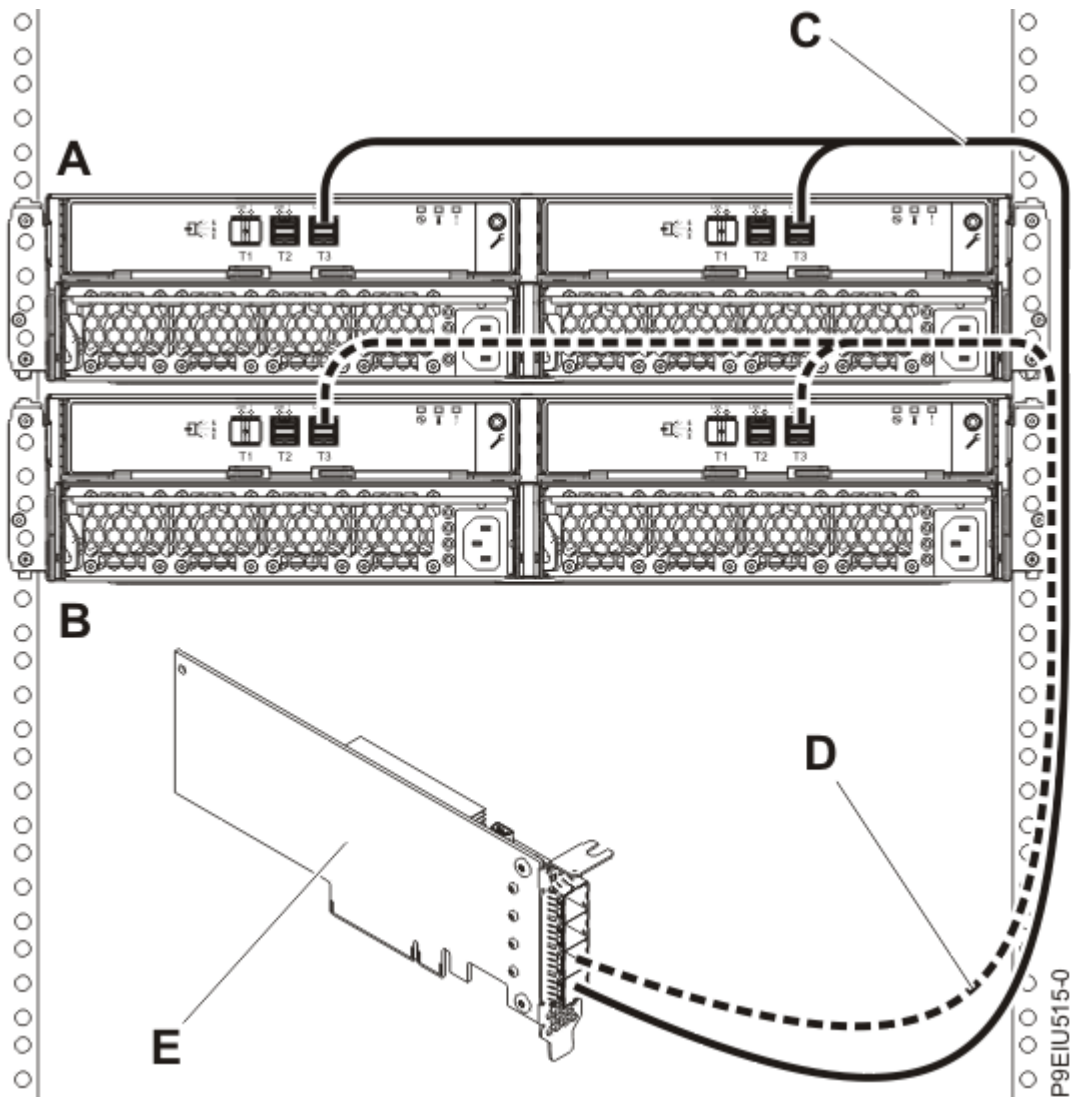
Figure 14. Mode 1 connection of two ESLL or ESLS storage enclosures by using YO12 cables to a single FC EJ0J, FC EJ0K, or FC EJ0M SAS adapter

15. Then, complete a mode 1 connection of one enclosure **(A)** by using YO12 cables **(B)** to an FC EJ0L SAS adapter pair or an FC EJ14 SAS adapter pair **(C)** with adapter-to-adapter (AA) cables **(D)**, as shown in Figure 15 on page 20, and then continue with "Connecting cables, power cords, and installing covers" on page 29.

Notes:

• Each adapter in the SAS adapter pair **(C)** has access to the other adapter and to all 12 or 24 drive bays.

• For SAS adapter pairs, you must attach the cables to the same port on both adapters.

• Both short legs of the cables must attach to the same side of the enclosure and both long legs of the cable must attach to the other side of the enclosure.
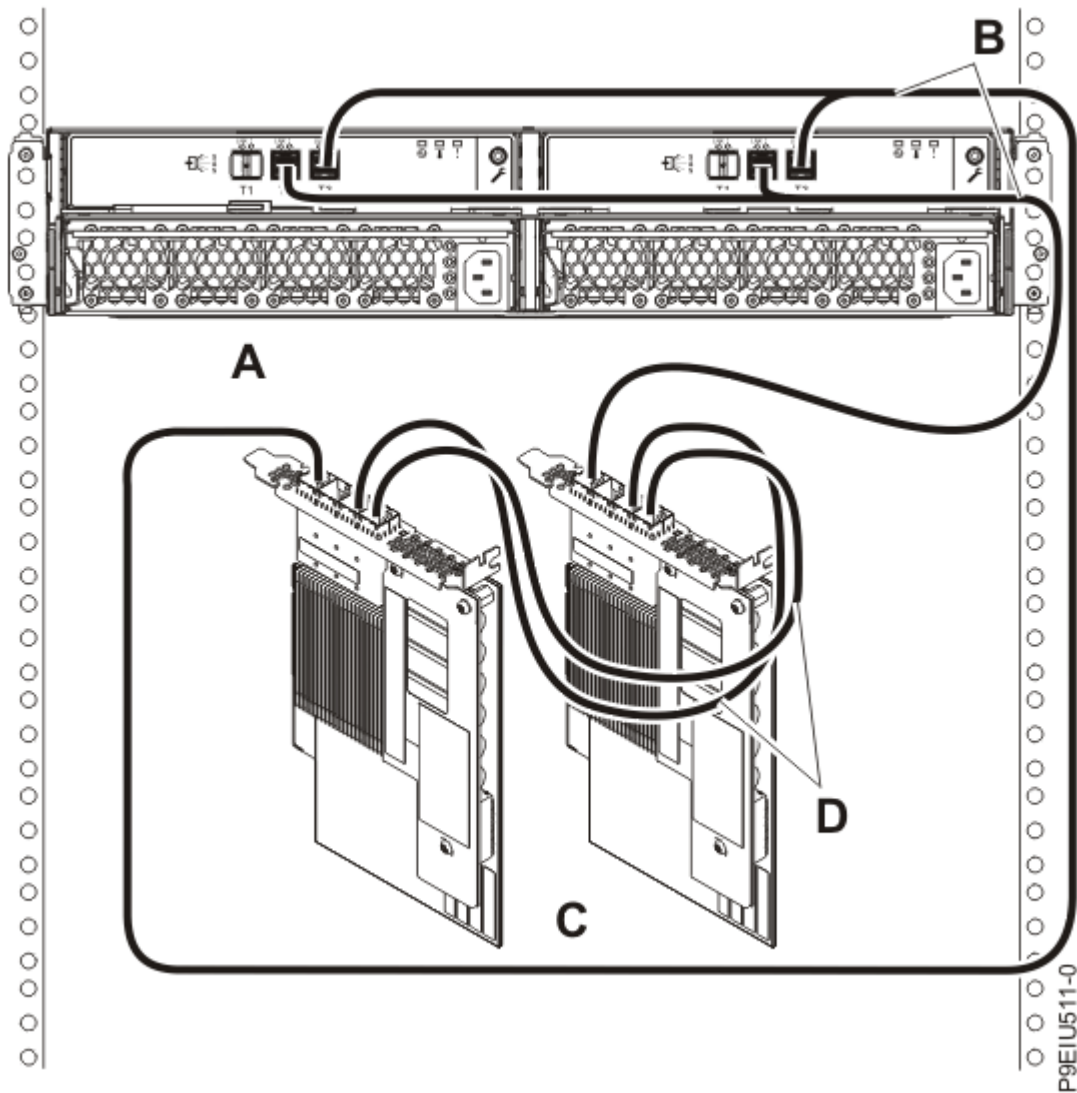
Figure 15. Mode 1 connection of one ESLL or ESLS storage enclosure by using YO12 cables to an FC EJ0L SAS adapter pair or an FC EJ14 SAS adapter pair with AA cables

16. Then, complete a mode 1 connection of two enclosures **(A and B)** by using YO12 cables **(C and D)** to an FC EJ0L SAS adapter pair or an FC EJ14 SAS adapter pair **(E)** with AA cables **(F)**, as shown in and then continue with "Connecting cables, power cords, and installing covers" on page 29.

Notes:

- Each adapter in the SAS adapter pair **(E)** has access to the other adapter and to all 24 or 48 drive bays.
- For SAS adapter pairs, you must attach the cables to the same port on both adapters.
- Both short legs of the cables must attach to the same side of the enclosure and both long legs of the cable must attach to the other side of the enclosure.
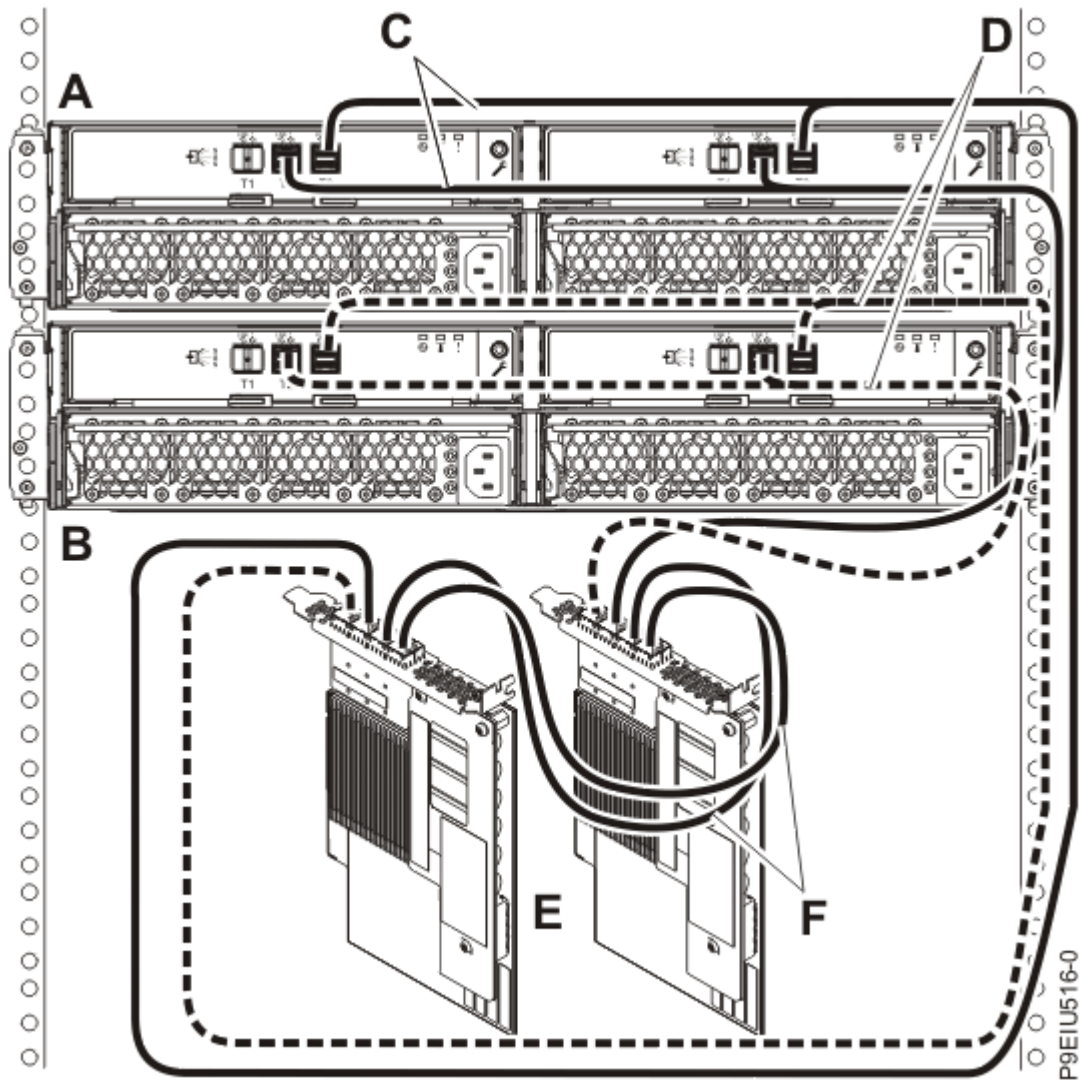
Figure 16. Mode 1 connection of two ESLL or ESLS storage enclosures by using YO12 cables to an FC EJ0L SAS adapter pair or an FC EJ14 SAS adapter pair with AA cables

17. Then, complete a mode 1 connection of one enclosure **(A)** by using two Y012 cables **(B)** to an FC EJ14 SAS adapter pair **(C)** located in PCIe slots C09 and C12 in the 9040-MR9 system with adapter-to-adapter AA12 cable **(D)** as shown in Figure 17 on page 22, and then continue with "Connecting cables, power cords, and installing covers" on page 29.

Notes:

- Each adapter in the SAS adapter pair **(C)** has access to the other adapter and to all 12 or 24 drive bays.
- For SAS adapter pairs, you must attach the cables to the same port on both adapters.
- Both short legs of the cables must attach to the same side of the enclosure and both long legs of the cable must attach to the other side of the enclosure.
- The two bottom ports on the adapters **(T0, T1)** are dedicated to the cable connections for the internal drive bays.
- This option is only supported with the AIX or Linux operation system.
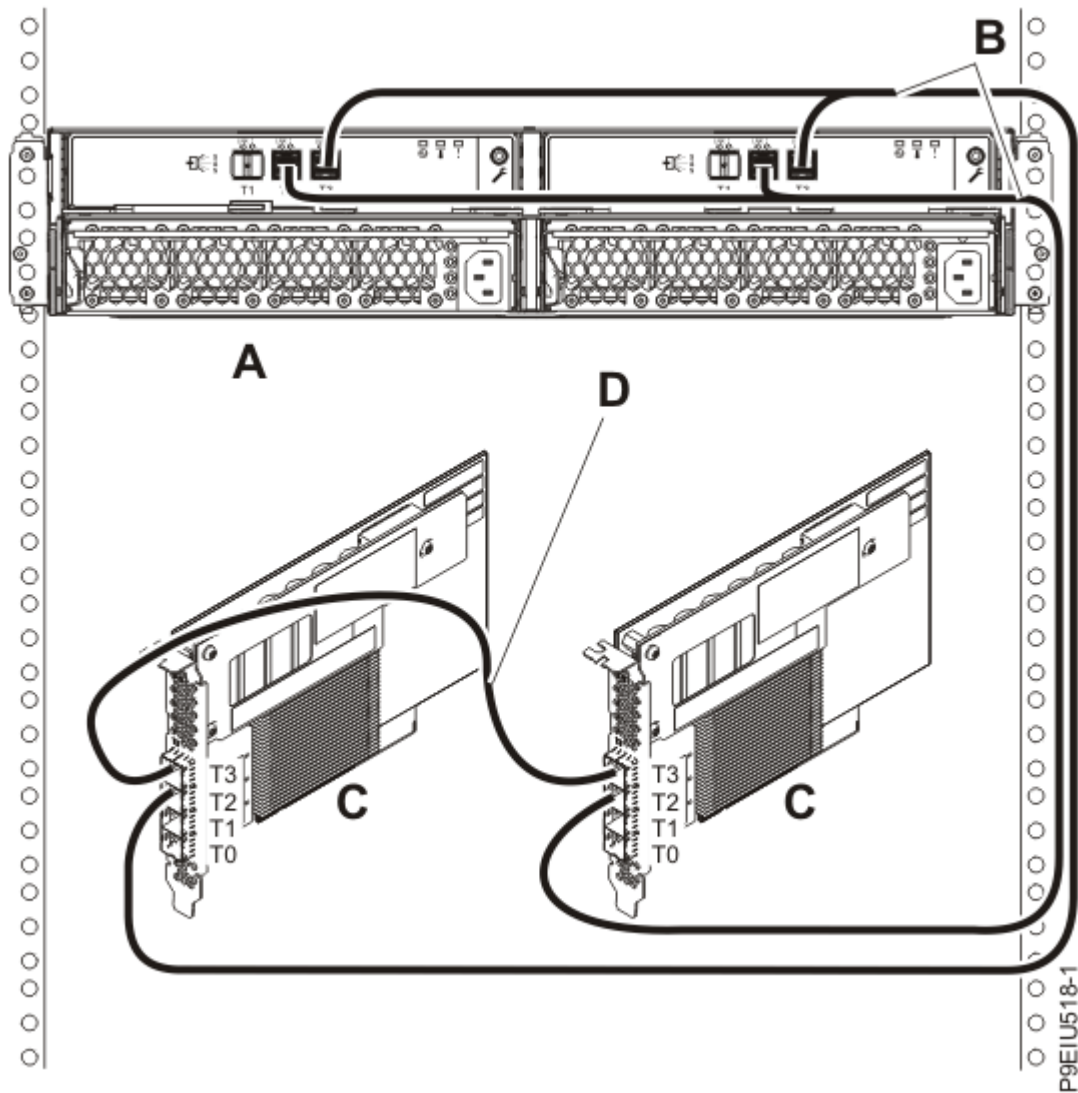
Figure 17. Mode 1 connection of one ESLL or ESLS storage enclosure by using YO12 cables to an FC EJ14 SAS adapter pair located in PCIe slots C09 and C12 in the 9040-MR9 system with an adapter-to-adapter AA12 cable

18. Complete a mode 2 connection of one enclosure **(A)** by using YO12 cables **(B)** to two independent FC EJ0J, FC EJ0K, or FC EJ0M SAS adapters **(C and D)**, as shown in . Then, continue with .

   Notes:

   - Independent SAS adapter 1 **(C)** does not have access to the other independent adapter and only has access to drive bays D1 - D12.
   - Independent SAS adapter 2 **(D)** does not have access to the other independent adapter and only has access to drive bays D13 - D24.
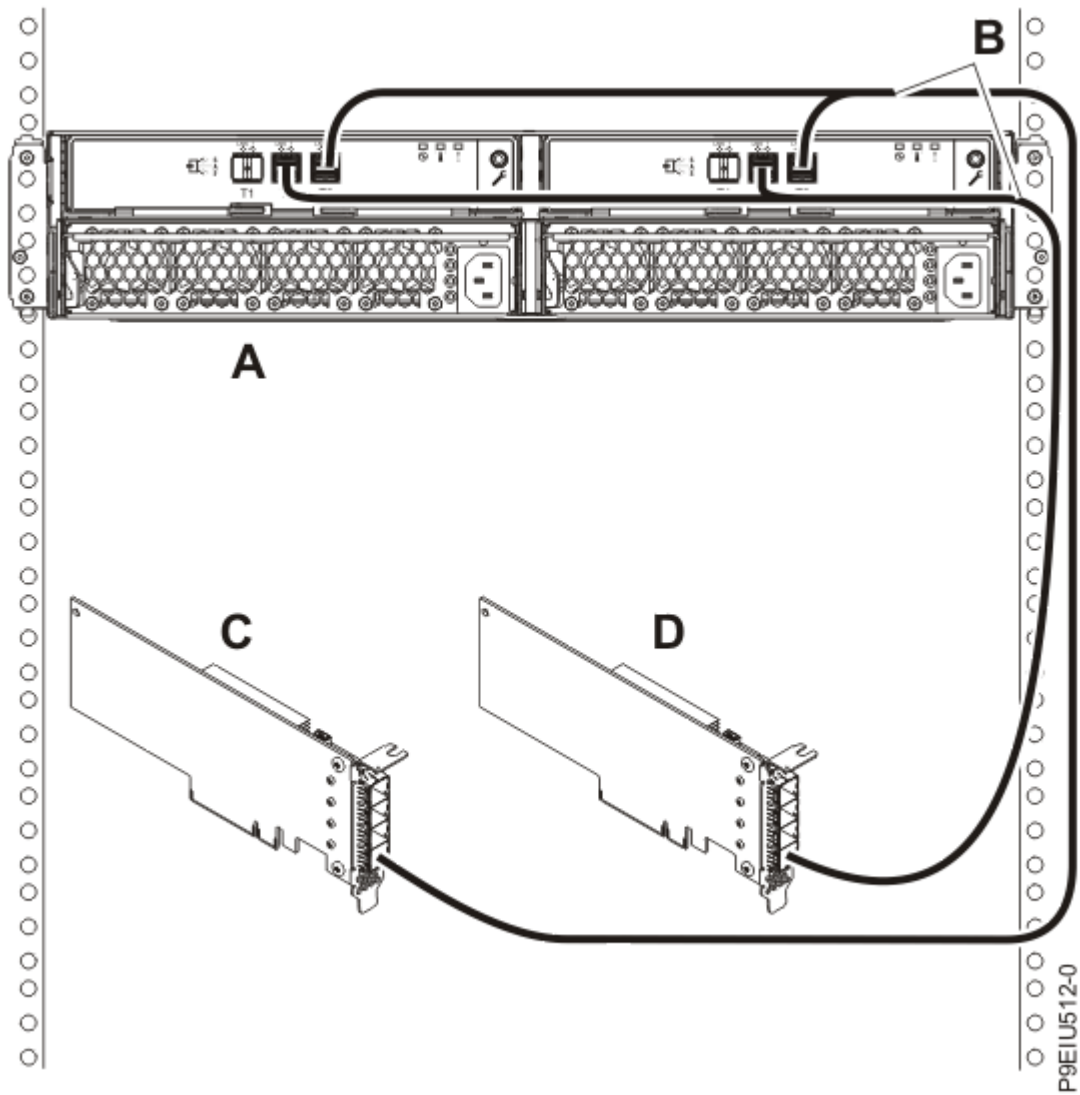
Figure 18. Mode 2 connection of one ESLL or ESLS storage enclosure by using YO12 cables to two independent FC EJ0J, FC EJ0K, or FC EJ0M SAS adapters

19. Complete a mode 2 connection of one enclosure **(A)** by using two YO12 cables **(B)** to an FC EJ0K adapter **(C)** located in PCIe slot C12 in the 9040-MR9 system, as shown in . Then, continue with "Connecting cables, power cords, and installing covers" on page 29.

    Notes:

    - The two bottom ports on the adapter (T0, T1) are dedicated to the cable connections for the internal drive bays.
   - This option is only supported with the AIX or Linux operation system.

Figure 19. Mode 2 connection of one ESLL or ESLS storage enclosure by using two YO12 cables to an FC EJ0K SAS adapter located in PCIe slot C12 in the 9040-MR9 system

20. Complete a mode 2 connection of one enclosure **(A)** by using two Y012 cables **(B)** to two independent FC EJ0K adapters **(C)** located in PCIe slots C09 and C12 in the 9040-MR9 system, as shown in Figure 20 on page 25. Then, continue with "Connecting cables, power cords, and installing covers" on page 29.

Notes:

- The two bottom ports on the adapter (T0, T1) are dedicated to the cable connections for the internal drive bays.
- This option is only supported with the AIX or Linux operation system.

Figure 20. Mode 2 connection of one ESLL or ESLS storage enclosure by using two YO12 cables to two FC EJ0K SAS adapters located in PCIe slots C09 and C12 in the 9040-MR9 system

21. Complete a mode 2 connection of two enclosures **(A)** by using four YO12 cables **(B)** to two independent FC EJ0K adapters **(C)** located in PCIe slots C09 and C12 in the 9040-MR9 system, as shown in Figure 21 on page 26. Then, continue with "Connecting cables, power cords, and installing covers" on page 29.

    Notes:

    - The two bottom ports on the adapter (T0, T1) are dedicated to the cable connections for the internal drive bays.
    - This option is only supported with the AIX or Linux operation system.
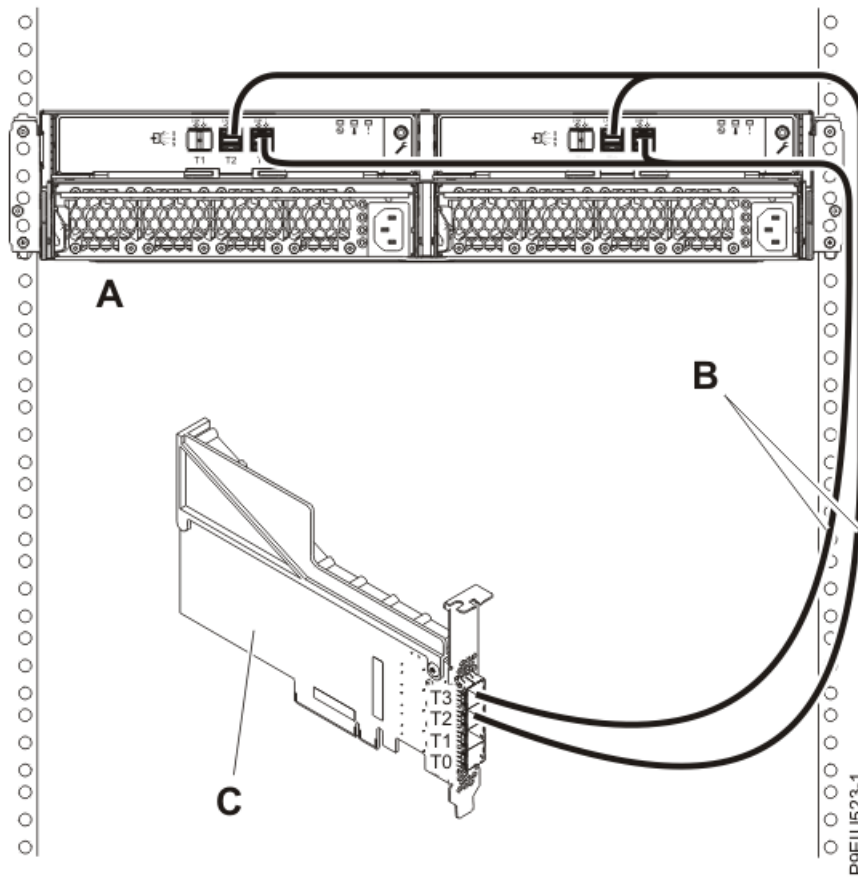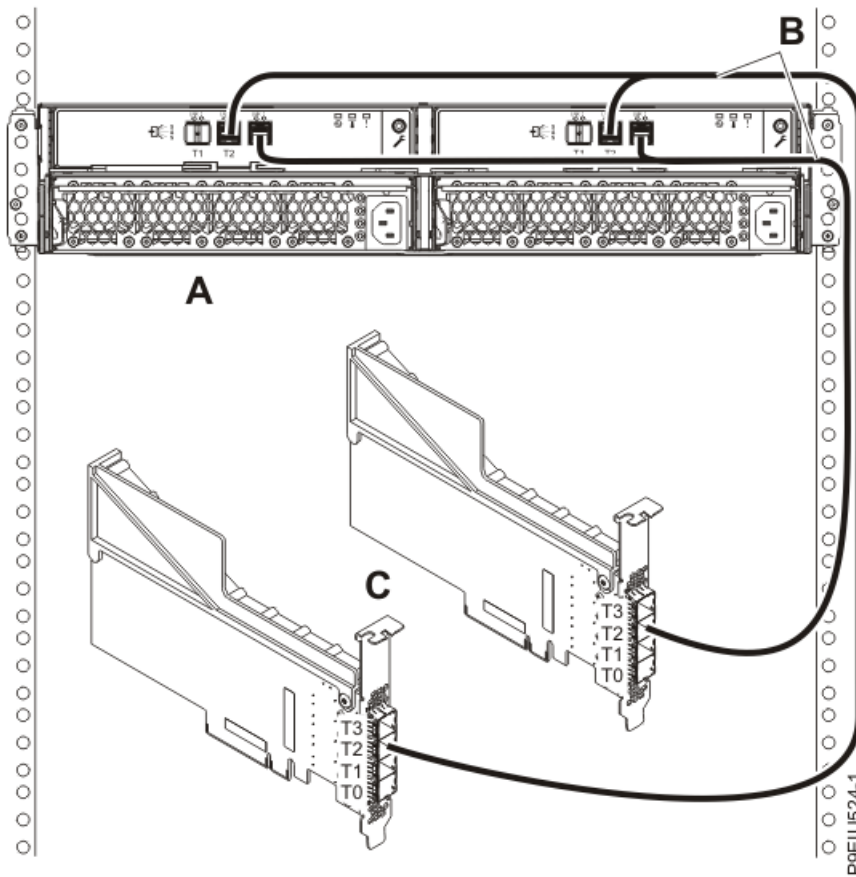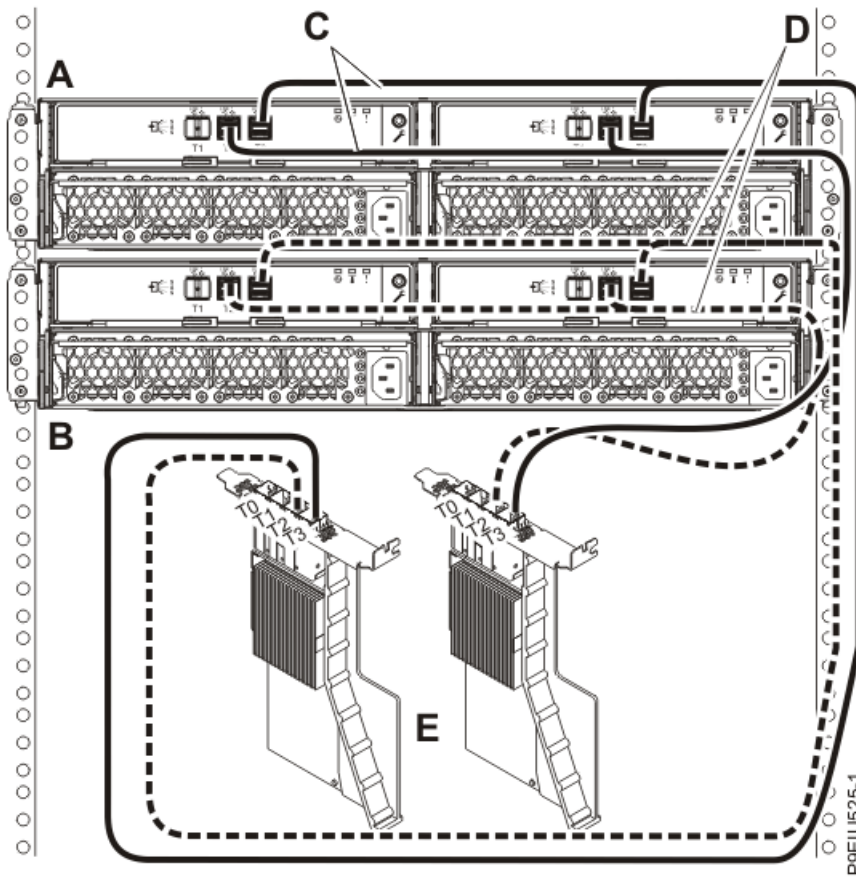
Figure 21. Mode 2 connection of two ESLL or ESLS storage enclosures by using four YO12 cables to two FC EJ0K SAS adapters located in PCIe slots C09 and C12 in the 9040-MR9 system

22. Complete a mode 2 connection of one enclosure **(A)** by using X12 cables **(B)** to two FC EJ0L SAS adapter pairs or two FC EJ14 SAS adapter pairs **(C and D)** with AA cables **(E)**, as shown in Figure 22 on page 27. Then, continue with "Connecting cables, power cords, and installing covers" on page 29.

Notes:

- Each adapter in the SAS adapter pair 1 **(C)** has access to the other adapter in pair 1 and to drive bays D1 - D12.
- Each adapter in the SAS adapter pair 2 **(D)** has access to the other adapter in pair 2 and to drive bays D13 - D24.
- For SAS adapter pairs, you must attach the cables to the same port on both adapters.
- Both short legs of the cables must attach to the same side of the enclosure and both long legs of the cable must attach to the other side of the enclosure.
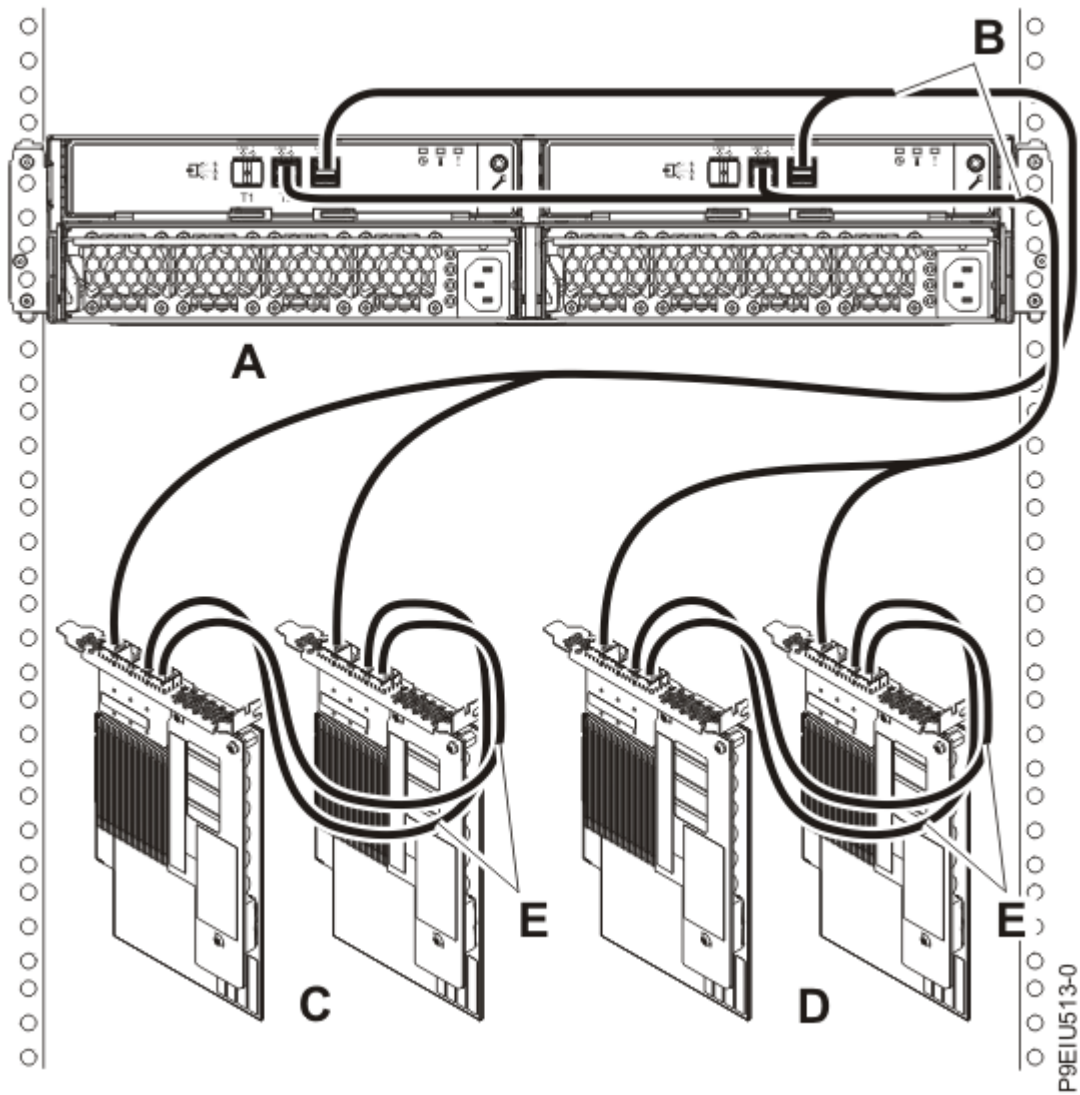
Figure 22. Mode 2 connection of one ESLS by using X12 cables to two FC EJ0L SAS adapter pairs or two FC EJ14 SAS adapter pairs with AA cables

23. Complete a mode 4 connection of one enclosure **(A)** by using X12 cables **(B)** to four independent FC EJ0J or FC EJ0M SAS adapters as shown in Figure 23 on page 28. Then, continue with "Connecting cables, power cords, and installing covers" on page 29.

    Note: Refer to Figure 24 on page 29 for label examples of these cable identifiers.

    - The cable that plugs into independent SAS adapter 1 **(C)** contains a label with the P1 identifier **(G)**. This adapter does not have access to any other independent adapter and only has access to drive bays D1 - D6 (D1 - D3 for the ESLL).

    - The cable that plugs into independent SAS adapter 2 **(D)** contains a label with the P2 identifier **(G)**. This adapter does not have access to any other independent adapter and only has access to drive bays D7 - D12 (D4 - D6 for the ESLL).

    - The cable that plugs into independent SAS adapter 3 **(E)** contains a label with the P1 identifier **(G)**. This adapter does not have access to any other independent adapter and only has access to drive bays D13 - D18 (D7 - D9 for the ESLL).

    - The cable that plugs into independent SAS adapter 4 **(F)** contains a label with the P2 identifier **(G)**. This adapter does not have access to any other independent adapter and only has access to drive bays D19 - D24 (D10 - D12 for the ESLL).

    Note: Partial mode 4 configurations are supported with less than 4 adapters leaving an adapter end of the X12 cable not connected.
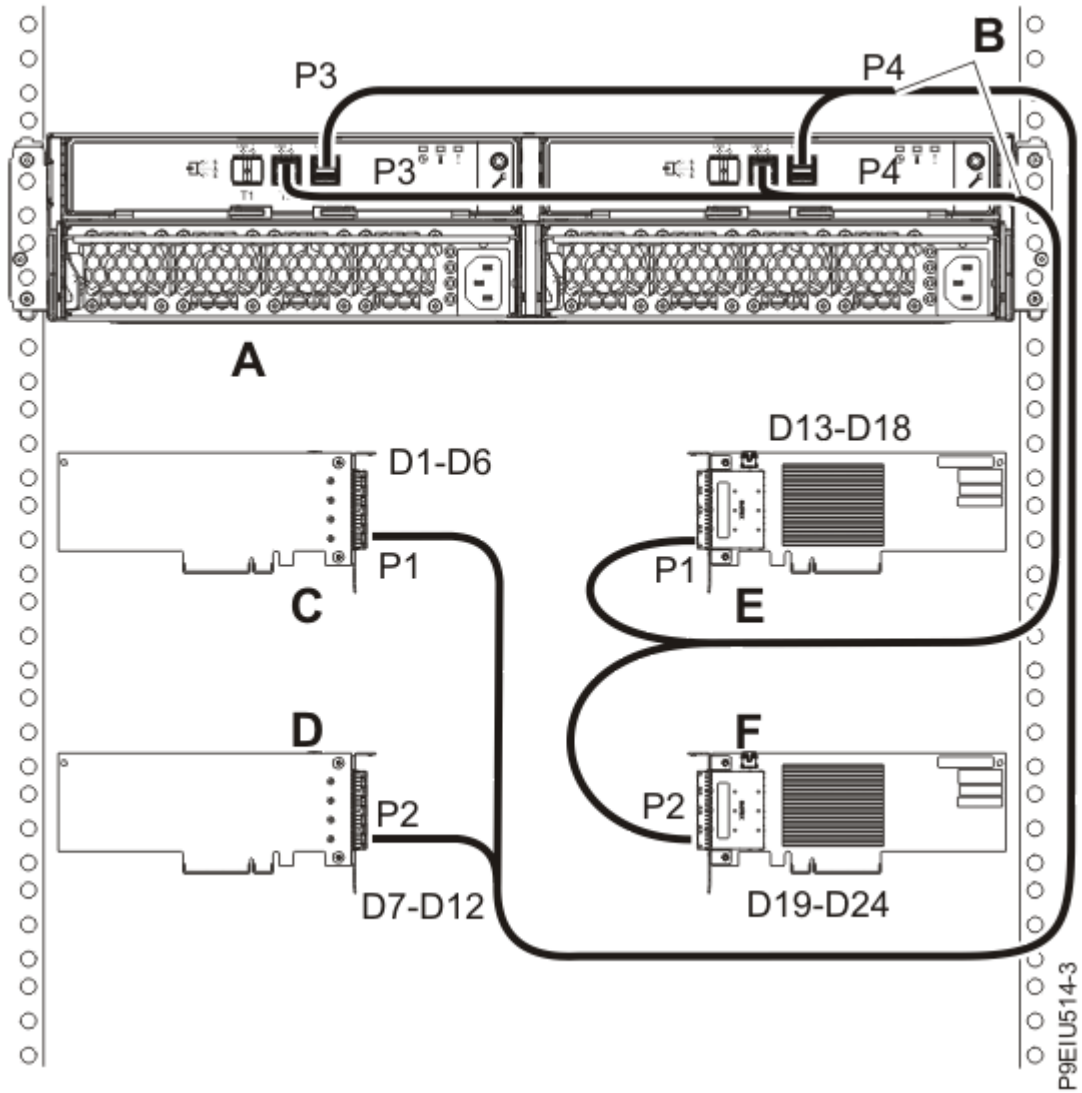
Figure 23. Mode 4 connection of one ESLL or ESLS storage enclosure by using X12 cables to four independent FC EJ0J or FC EJ0M SAS adapters
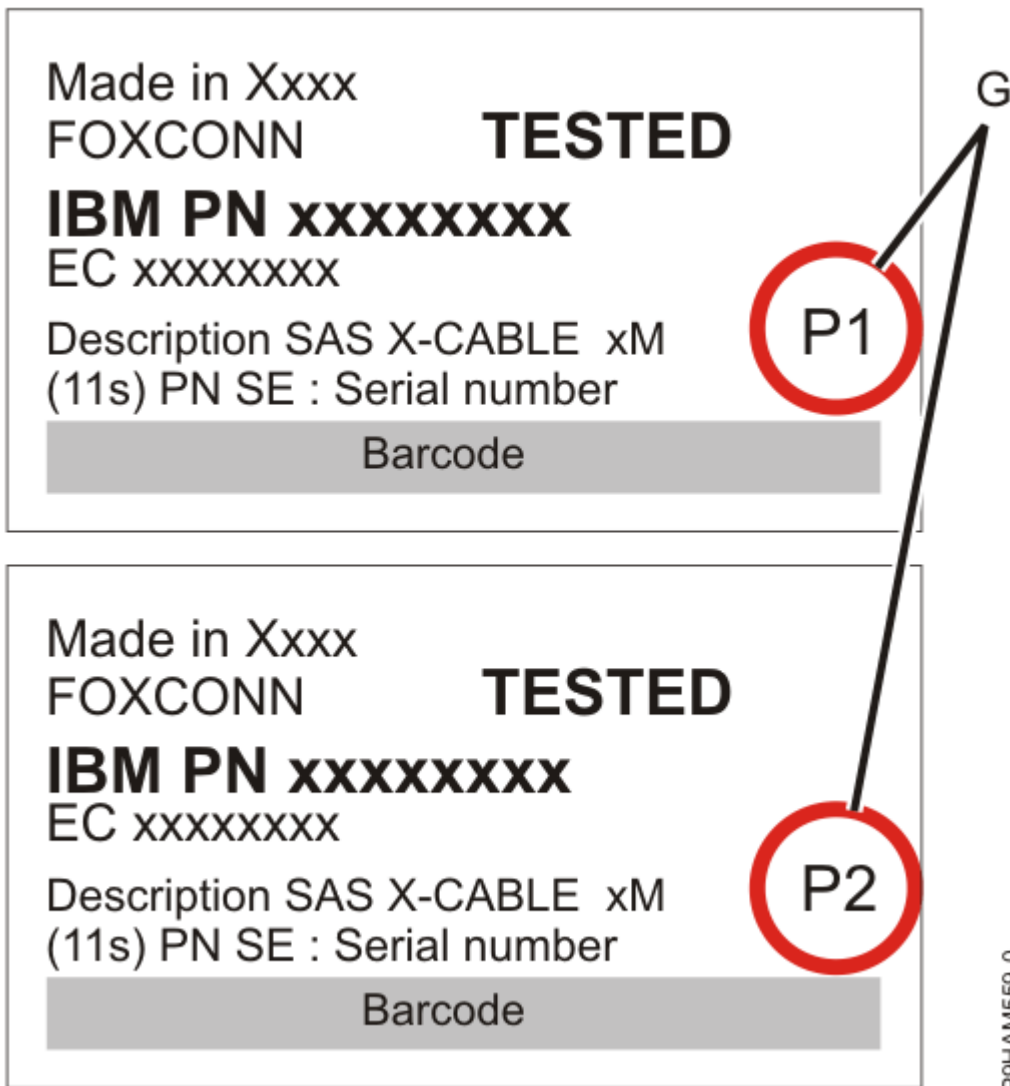
Figure 24. Labels for SAS adapter cables that show P1 and P2 identifiers

24. For more information about SAS cabling and cabling configurations, see Cable management (www.ibm.com/support/knowledgecenter//POWER9/p9had/p9had_cablemanagement.htm).

Connecting cables, power cords, and installing covers

To reconnect cables, attach power cords, and install the side covers, complete the steps in this procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.

2. If your installation requirements included the removal of the SAS cables from the ESMs, review the labeling that you completed and reinstall the cables.

   Note: Do not apply power until instructed to do so.

3. Route the power cords through the power cord retention brackets **(D)** for strain relief, as shown in the following figure.
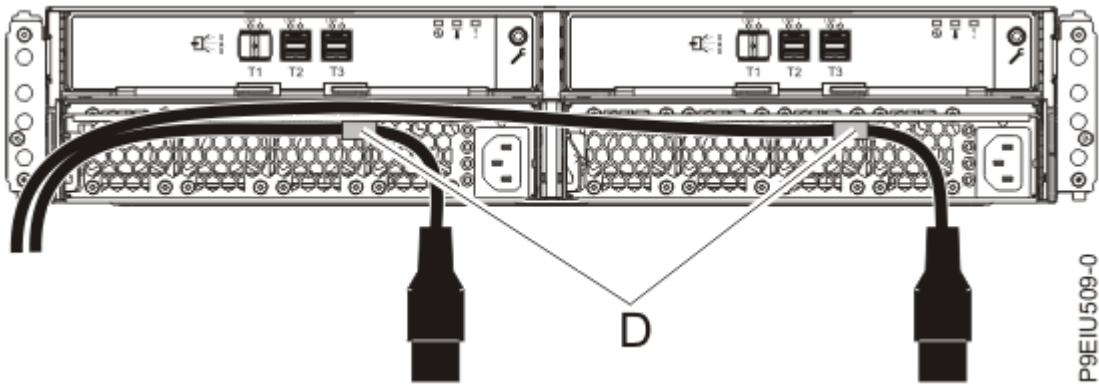
Figure 25. Routing the power cords through the cord retention brackets

4. Connect the power cords to the left and right power supplies.
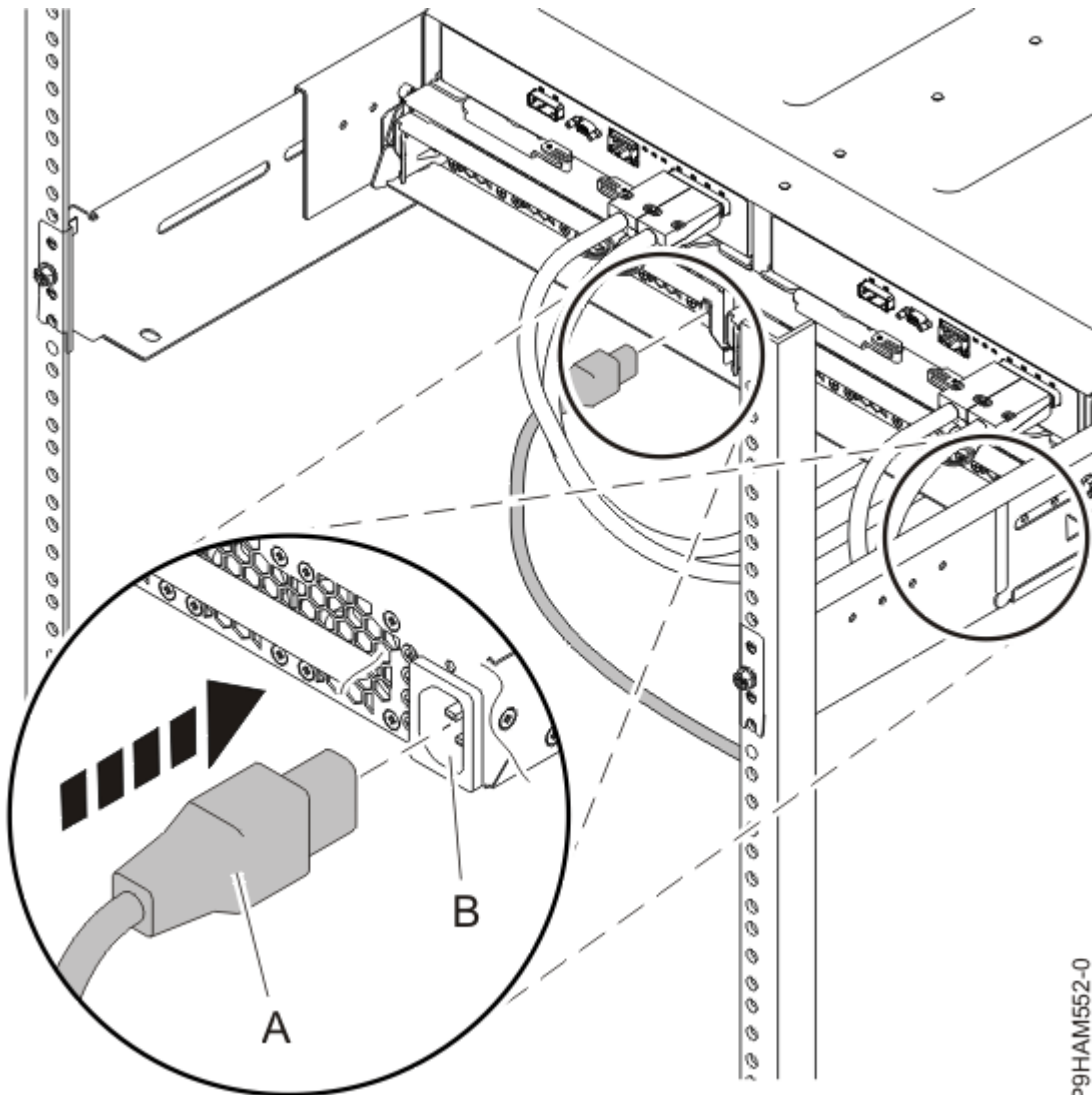
Figure 26. Connecting the power supply cords

5. Reinstall the left cover **(A)**, which contains the service indicators, and the right cover **(B)**.

   a. Fit the slot on the top of the cover over the tab on the chassis flange.

   b. Rotate the cover down until it snaps into place. Ensure that the inside surface of the cover is flush with the chassis.
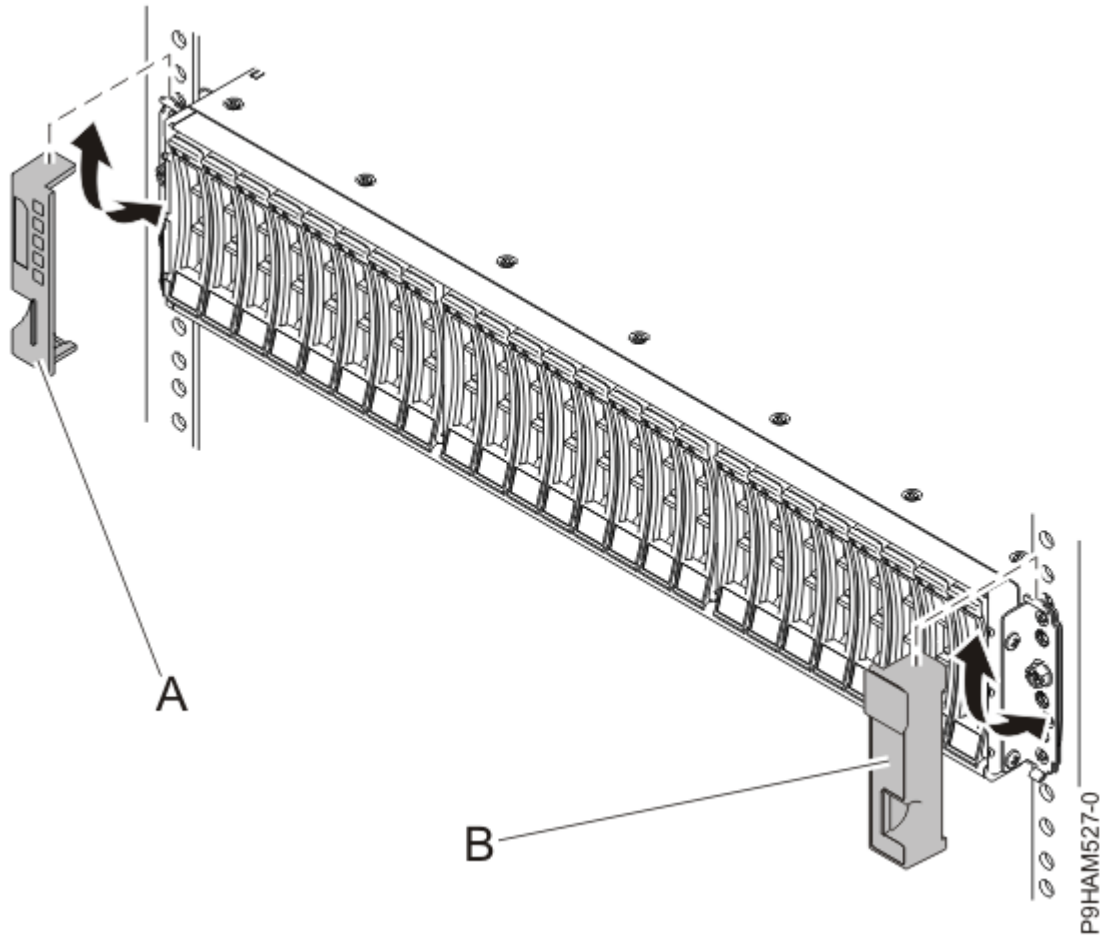
Figure 27. Attaching the side covers

6. Choose from the following options:

    a) If you powered down either the system or the logical partition before you connected the storage enclosure cables to it, power on the system or partition.

    b) If you did not power down the system or partition, depending on the option you chose in the beginning of this procedure, you might need to reconfigure the adapters.

7. Connect the other end of the power cables to the power distribution units (PDUs).

8. Choose from the following options:

    a) If you powered down either the system or the logical partition before you connected the storage enclosure cables to it, power on the system or partition.

    b) If you did not power down the system or partition, depending on the option you chose in the beginning of this procedure, you might need to reconfigure the adapters.

Completing an ESLL or ESLS storage enclosure installation

To complete the installation process, complete the steps in this procedure.

Procedure

1. If you installed disk drives or SSDs into your enclosure, configure the drives for use by your operating system, by referring to the following information:

    • To configure a disk drive or SSD for use by AIX, see Configuring a disk drive or solid-state drive for use in an AIX system or AIX logical partition (http://www.ibm.com/support/knowledgecenter/POWER9/p9hal/pxhal_configdrive_aix.htm).

- To configure a disk drive or SSD for use by IBM i, see Configuring a disk drive or solid-state drive for use in an IBM i system or IBM i logical partition (http://www.ibm.com/support/knowledgecenter/POWER9/p9hal/pxhal_configdrive_ibmi.htm).

- To configure a disk drive or SSD for use by Linux, see Configuring a disk drive or solid-state drive for use in an Linux system or Linux logical partition (http://www.ibm.com/support/knowledgecenter/POWER9/p9hal/pxhal_configdrive_linux.htm).

2. To verify that the system or logical partition recognizes the disk drive enclosure, see Verifying the installed part (www.ibm.com/support/knowledgecenter/POWER9/p9haj/pxhaj_hsmverify.htm).

3. You have completed the steps to install an ESLL or ESLS storage enclosure.

   If you were directed here from another procedure, return to that procedure now.

Reference information

Use the information in this section as needed to complete the storage enclosure installation and configuration tasks.

Starting a system

Learn how to start a system after performing a service action or upgrading a system.

About this task

Note: If the system is an IBM Elastic Storage Server, work with the customer to start the system.

Starting a system that is not managed by an HMC

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

Starting a system by using the control panel
You can use the power button on the control panel to start a system that is not managed by a Hardware Management Console (HMC).

Procedure

1. Open the front rack door, if necessary.
2. Before you press the power button on the control panel, ensure that power is connected to the system unit as follows:

   - All system power cables are connected to a power source.
   - The power LED **(A)**, as shown in the following figure, is flashing.

3. Press the power button **(A)** on the control panel, as shown in .
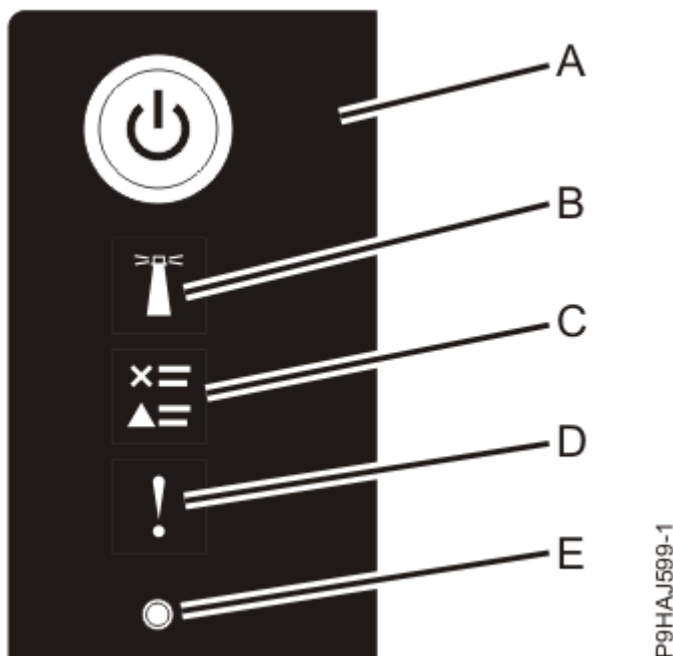

Figure 28. Control panel LEDs

4. Observe the following aspects after pressing the power button:

- A constant green light indicates full system power to the unit.
- A flashing green light indicates standby power to the unit.
- After the power-on button is pressed, the system takes approximately 30-seconds for the power LED to change from flashing to solid. During the transition period, the LED might flash faster.

5. Choose from the following options:

- If your partitions does start, this ends the procedure.
- If your partitions does not start, continue with step .

6. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.

7. In the navigation area, click **Power/Restart Control** > **Power On/Off System**.

8. Click **Save settings and continue system server firmware boot**.

Starting a system by using the ASMI
You can use the Advanced System Management Interface (ASMI) to start a system that is not managed by a Hardware Management Console (HMC).

Procedure

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.

2. In the navigation area, click **Power/Restart Control** > **Power On/Off System**.

   The power state of the system is displayed.

3. Specify the settings as required and click **Save setting and power on**.

   Choose from the following options:

   - If the Server firmware start policy is set to **Running (Auto-Start Always)**, your partitions start. This ends the procedure.
   - If the **Server firmware start policy** is set to **Standby (User-Initiated)** or **Auto-Start (Automatic Restarts Only)**, the system begins to power on, but your partitions do not automatically start. Continue with step .

4. Wait for the system to power on.

5. In the navigation area, click **Power/Restart Control** > **Power On/Off System**.

   The system power setting is displayed. The **Current system server firmware state** should now be at **Standby**.

6. Click **Save settings** and continue with the system server firmware boot operation to start the partitions.

Starting a system or logical partition by using the HMC

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

Procedure

- To power on the managed system, complete the following steps:

  a) In the navigation area, click the **Resources** icon , and then click **All Systems**.

  b) Select the system that you want to power on.

  c) In the content pane, click **Actions** > **View All Actions** > **Power On**.

  d) Click **Finish**.

- To activate a logical partition, complete the following steps:

  a) In the navigation area, click the **Resources** icon , and then click **All Partitions**.

b) Click the logical partition name that you want to activate.

c) In the navigation area, click **Partition Actions** > **Operations** > **Activate**.

d) Click **Finish**.

- To activate a logical partition for a specific system, complete the following steps:

a) In the navigation area, click the **Resources** icon , and then click **All Systems**.

b) Click the system name in which you want to activate the logical partition.

c) Select logical partitions that you want to activate.

d) In the content pane, click **Actions** > **Activate**.

e) Click **Finish**.

- To verify that the logical partition start policy is set to **User-Initiated**, complete the following steps:

a) In the navigation area, click the **Resources** icon , and then click **All Systems**.

b) Click the system name to view details.

c) In the navigation area, click **Properties** > **Other Properties**.

d) Click the **Power-On Parameters** tab.

Ensure that the **Partition start policy** field is set to **User-Initiated**.

Stopping a system

Learn how to stop a system as a part of a system upgrade or service action.

About this task

⚠ **Attention:** Using either the power-on button on the control panel or entering commands at the Hardware Management Console (HMC) to stop the system can cause unpredictable results in data files. Also, the next time you start the system, it might take longer if all applications are not ended before stopping the system.

Note: If the system is an IBM Elastic Storage Server, work with the customer to stop the system.

Stopping a system that is not managed by an HMC

You might need to stop the system to complete another task. If your system is not managed by the Hardware Management Console (HMC), use these instructions to stop the system by using the power button or the Advanced System Management Interface (ASMI).

Before you begin

Before you stop the system, follow these steps:

1. Ensure that all jobs are completed and end all applications.
2. If a Virtual I/O Server (VIOS) logical partition is running, ensure that all clients are shut down or that the clients have access to their devices by using an alternative method.

Stopping a system by using the control panel

You might need to stop the system to complete another task. If your system is not managed by the Hardware Management Console (HMC), use the instructions in this topic to stop the system by using the power button.

Procedure

1. Log in to the host partition as a user with the authority to run the **shutdown** or **pwrdwnsys** (Power Down System) command.
2. On 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 PWRDWNSYS. If your system is partitioned, use the **PWRDWNSYS** command to power off each of the secondary partitions. Then, use the **PWRDWNSYS** command to power off the primary partition.

   The command stops the operating system. Choose from the following options:
   - If the system power turns off, the power-on light begins to slowly flash, and the system goes into a standby state, continue with step "5" on page 36.
   - If your system does not power off when the last partition powers off, continue with step "3" on page 36.
3. Open the front rack door, if necessary.
4. Hold the power button **(A)** on the control panel, as shown in the following figure. The control panel shows a countdown from 4 to 0. After the countdown is complete, release the power button.

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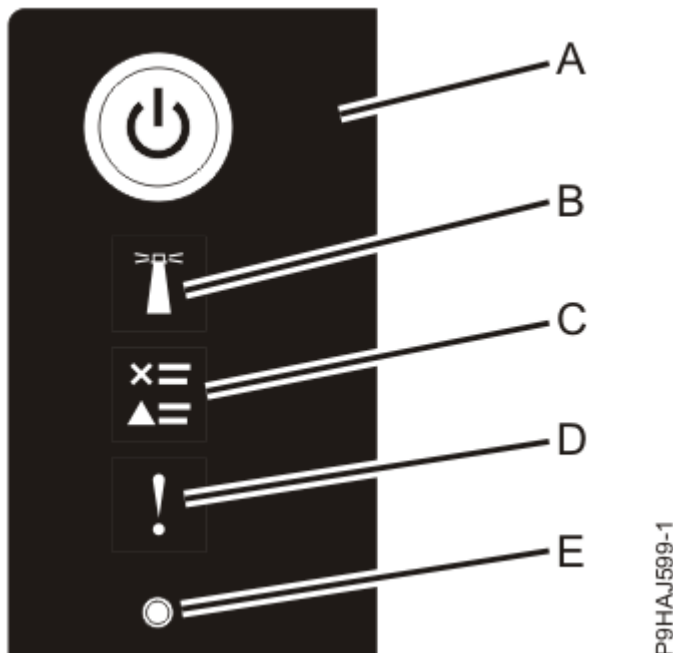

Figure 29. Control panel LEDs

5. Record the IPL type and the IPL mode from the control panel display to help you return the system to this state when the installation or replacement procedure is completed.
6. Set the power switches of any devices that are connected to the system to off.

Stopping a system by using the ASMI

You might need to stop the system to complete another task. If your system is not managed by the Hardware Management Console (HMC), use these instructions to stop the system by using the Advanced System Management Interface (ASMI).

Procedure

1. Log in to the host partition as a user with the authority to run the **shutdown** or **pwrdwnsys** (Power Down System) command.
2. On 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 PWRDWNSYS. If your system is partitioned, use the **PWRDWNSYS** command to power off each of the secondary partitions. Then, use the **PWRDWNSYS** command to power off the primary partition.

   The command stops the operating system. Choose from the following options:

   - If the system power turns off, the power-on light begins to slowly flash, and the system goes into a standby state, continue with step .
   - If your system does not power off when the last partition powers off, continue with step .
3. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
4. In the navigation area, click **Power/Restart Control** > **Power On/Off System**.

   The system power setting is displayed.
5. Specify the settings as required and click **Save settings and power off**.

   The system power turns off, the power-on light begins to slowly flash, and the system goes into a standby state.
6. Set the power switches of any devices that are connected to the system to off.

Stopping a system by using the HMC

You can use the Hardware Management Console (HMC) to stop the system or logical partition.

About this task

By default, the managed system is set to power off automatically when you shut down the last running logical partition on the managed system. If you set the managed system properties on the HMC such that the managed system does not power off automatically, you must use this procedure to power off your managed system.

⚠️ **Attention:** Ensure that you shut down the running logical partitions on the managed system before you power 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 by using an alternative 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

   Note: If you are a product engineer, verify that the customer has shut down all active partitions and has powered off the managed system. Continue with the procedure only after the status of the server changes to **Power Off**.

Procedure

1. You must shut down all the active logical partitions before powering off the system. To shut down logical partitions for a specific system, complete the following steps:

    a) In the navigation area, click the **Resources** icon , and then click **All Systems**.

    b) Click the system name for which you want to shut down partitions.

    c) Select the logical partitions that you want to shut down.

    d) In the content pane, click **Actions** > **Shutdown**.

    e) Click **Finish**.

2. To power off the system, complete the following steps:

    a) In the navigation area, click the **Resources** icon , and then click **All Systems**.

    b) Select the system that you want to power off.

    c) In the content pane, click **Actions** > **View All Actions** > **Power Off**.

    d) Click **Finish**.

Connector locations

Learn about connector locations for the ESLL and ESLS storage enclosures and the servers that they connect to.

Choose from the following options:

- "Connector locations for the ESLL and ESLS storage enclosures" on page 38
- Connector locations for the 247-21L, 8247-22L, and 8284-22A systems
- Connector locations for the 8286-41A systemConnector locations for the 8286-42A system
- "Connector locations for the 8247-42L and 8286-42A systems" on page 46
- Connector locations for the 8408-44E and 8408-E8E systems
- Connector locations for the 9080-MHE, 9080-MME, 9119-MHE, and 9119-MME systems

Connector locations for the ESLL and ESLS storage enclosures

Learn about connector locations for the ESLL and ESLS storage enclosures.

Note: The T1 connectors are not used.
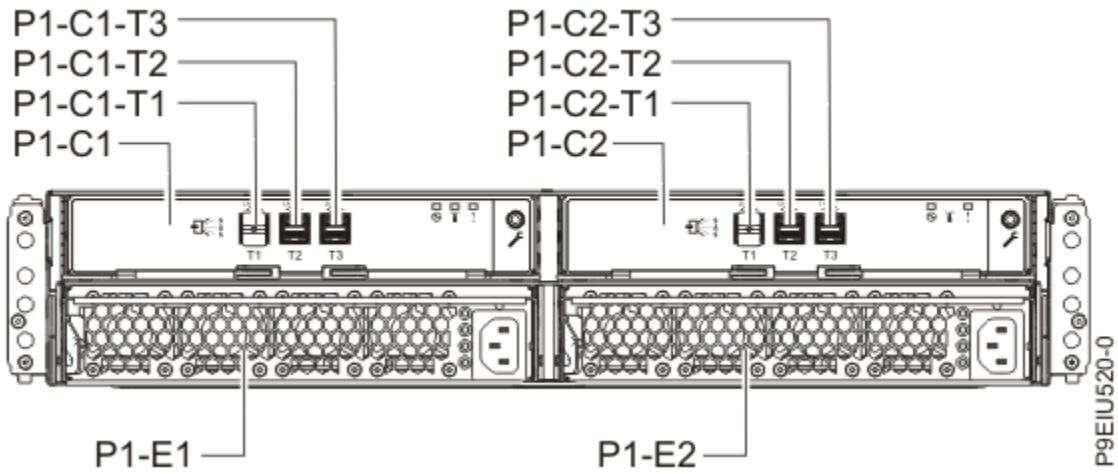
Figure 30. Connector locations for the ESLL and ESLS storage enclosures

For more information about the locations for the ESLL and ESLS storage enclosures, see ESLL and ESLS storage enclosures locations (http://www.ibm.com/support/knowledgecenter/POWER9/p9ecs/p9ecs_esll_esls_loccodes.htm).

For more information about the server locations, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER9/p9ecs/p9ecs_locations.htm).

Connector locations for POWER9 servers

Learn about connector locations for POWER9 servers.

Connector locations for the 5105-22E, 9008-22L, 9009-22A, 9009-22G, 9223-22H, and 9223-22S systems

Learn about connector locations for the 5105-22E, 9008-22L, 9009-22A, 9009-22G, 9223-22H, and 9223-22S systems.
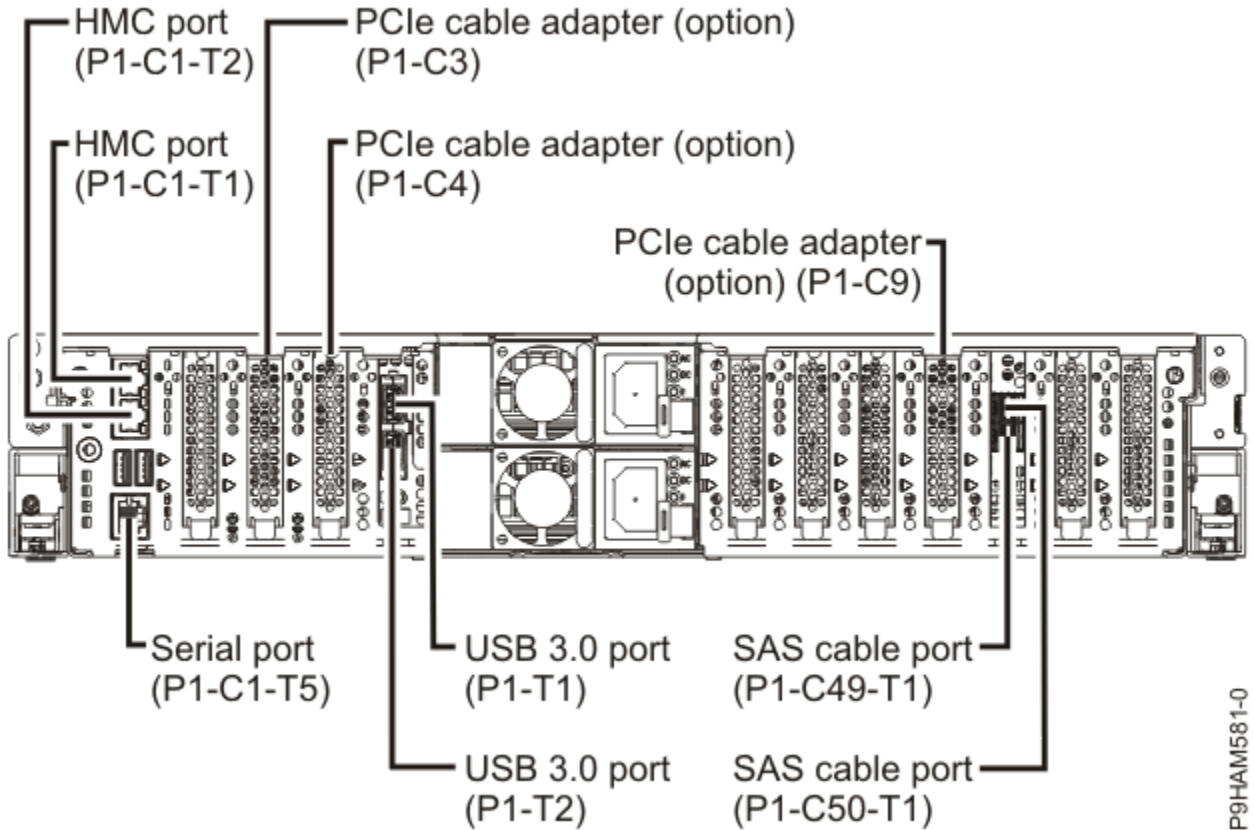
Figure 31. Connector locations for the 5105-22E, 9008-22L, 9009-22A, 9009-22G, 9223-22H, and 9223-22S systems

Connector locations for the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, and 9223-42S systems

Learn about connector locations for the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, and 9223-42S systems.

USB 3.0 port (P1-T2)

PCIe cable adapter (option) (P1-C3)

USB 3.0 port (P1-T1)

PCIe cable adapter (option) (P1-C4)

PCIe cable adapter (option) (P1-C9)

Serial port (P1-C1-T5)

HMC port (P1-C1-T1)

HMC port (P1-C1-T2)

SAS cable port (P1-C49-T1)

SAS cable port (P1-C50-T1)
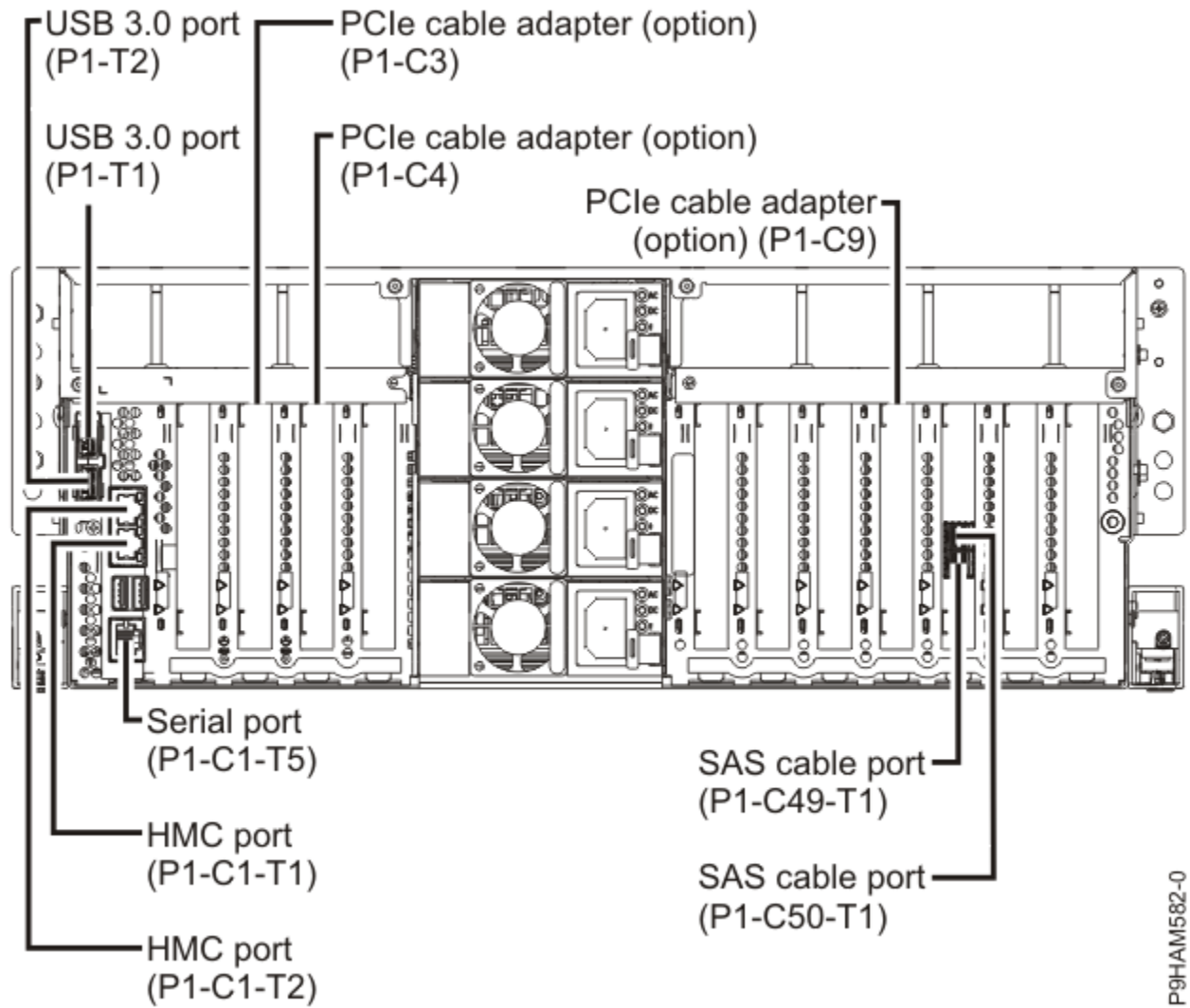
P9HAM582-0

Figure 32. Connector locations for 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, and 9223-42S systems

Connector locations for the 9040-MR9 systems

Learn about connector locations for the 9040-MR9 systems.
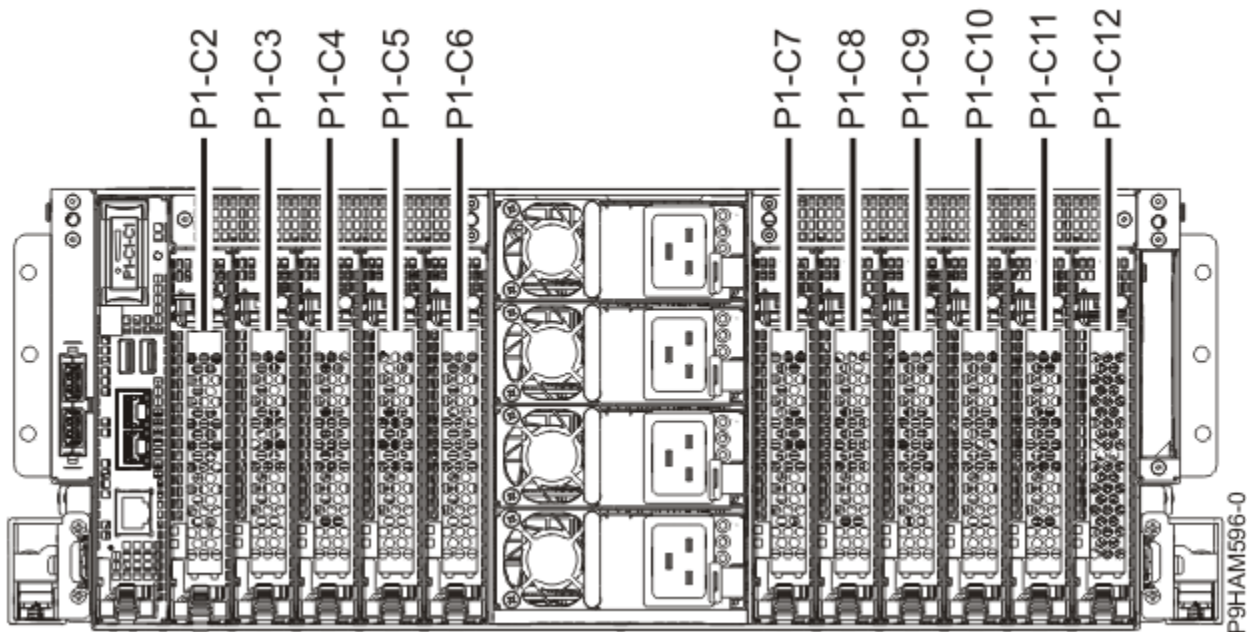
Figure 33. Rear view of the 9040-MR9 system

Table 1 on page 42 shows the slots that must be used to install a SAS RAID controller in the 9040-MR9 system for controlling the internal SAS disk drive bays.

Table 1. SAS RAID controller slots for the 9040-MR9 system	
SAS RAID controller	**Slot**
PCIe3 SAS RAID quad-port 6 Gb x8, low-profile capable adapter (FC EJ0K; CCIN 57B4)	P1-C12
PCIe3 SAS RAID quad-port 6 Gb x8, low-profile capable adapter (two FC EJ0K; two CCIN 57B4)	P1-C9 and P1-C12
Note: The C9 and C12 slots are used for controlling the internal SAS disk drive bays and have limited availability for attaching a 5887 disk drive enclosure or an ESLL or ESLS storage enclosure.	

For more information about FC EJ0K, see PCIe3 RAID SAS quad-port 6 Gb adapter (FC EJ0K; CCIN 57B4) (http://www.ibm.com/support/knowledgecenter/POWER9/p9hcd/fcej0k.htm).

Table 2 on page 42 shows the slot priorities for the FC EJ0K adapter in the 9040-MR9 system.

Table 2. Slot priorities for the FC EJ0K					
Feature code	**Description**	**Slot priorities for two processors**	**Slot priorities for three processors**	**Slot priorities for four processors**	**Maximum number of adapters supported**
EJ0K	PCIe3 SAS RAID quad-port 6 Gb x8, low-profile capable adapter (FC EJ0K; CCIN 57B4)	12, 9, 11, 8, 10, 7	12, 9, 11, 8, 5, 10, 7, 4	12, 9, 11, 8, 5, 3, 10, 7, 4, 2	6/8/10

Table 2. Slot priorities for the FC EJ0K (continued)					
Feature code	**Description**	**Slot priorities for two processors**	**Slot priorities for three processors**	**Slot priorities for four processors**	**Maximum number of adapters supported**
Note: The C9 and C12 slots are used for controlling the internal disk drive bays and have limited availability for attaching a 5887 disk drive enclosure or an ESLL or ESLS storage enclosure.					

shows the PCIe3 cable adapter slots and priorities for the 9040-MR9 system. The PCIe3 cable adapter is used to connect your system to the PCIe3 6-slot fanout module in your EMX0 PCIe Gen3 I/O expansion drawer.

Table 3. PCIe3 cable adapter slots and priorities					
Feature code	**Description**	**Slot priorities for two processors**	**Slot priorities for three processors**	**Slot priorities for four processors**	**Maximum number of adapters supported**
EJ08	PCIe to optical CXP converter adapter (FC EJ08; CCIN 2CE2); Adapter part number: 041T9901	11, 8 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8

Connector locations for the 9080-M9S system
Learn about connector locations for the 9080-M9S system.

Figure 34. Rear view of the 9080-M9S system
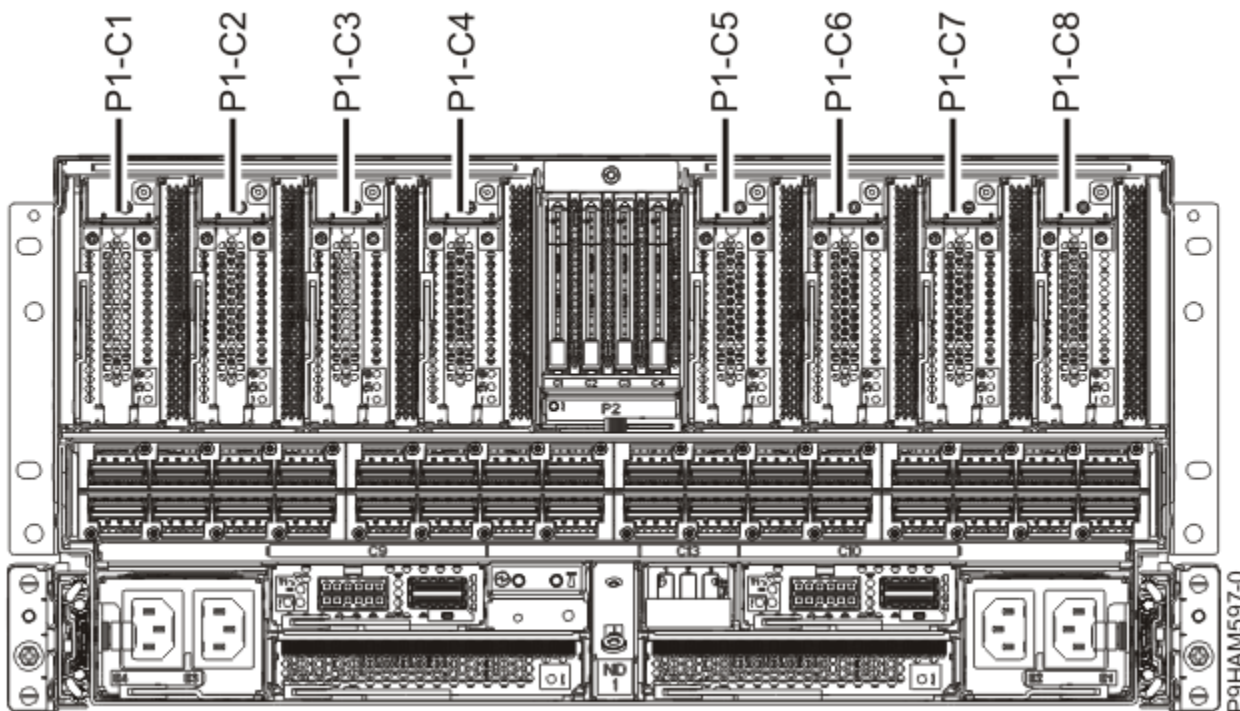
shows the slot priorities for the FC EJ0M and EJ14 adapters, which support the attachment of SAS hard disk drives (HDDs) and solid-state devices (SSDs) in the 9080-M9S system.

Table 4. Slot priorities for FC EJ0M and FC EJ14 adapters			
Feature code	**Description**	**Slot priorities**	**Node max**
EJ0M	PCIe3 SAS RAID quad-port 6 Gb LP adapter (FC EJ0M and FC EL3B; CCIN 57B4); Adapter part number: 000MH910	2, 4, 6, 3, 5, 7, 1, 8	8
EJ14	PCIe3 12 GB Cache RAID PLUS SAS adapter quad-port 6 Gb x8 (FC EJ14; CCIN 57B1); Adapter part number 01DH742	1, 3, 5, 7, 2, 4, 6, 8	8

shows the PCIe cable adapter slots and priorities for the 9080-M9S system.

Table 5. PCIe3 cable adapter slots and priorities			
Feature code	**Description**	**Slot priorities**	**Node max**
EJ07	PCIe3 cable adapter for the PCIe3 expansion drawer (FC EJ07; CCIN 6B52); Adapter part number: 00TK704	1, 7, 3, 5, 2, 8, 4, 6	8

Connector locations for POWER8 servers
Learn about connector locations for POWER8 servers.

Connector locations for the 8247-21L, 8247-22L, 8284-21A, and 8284-22A systems
Learn about connector locations for the 8247-21L, 8247-22L, 8284-21A, and 8284-22A systems.

The expanded function 8247-21L, 8247-22L, 8284-21A, and 8284-22A servers provide cable connector locations via a SAS port for disk drive enclosures.
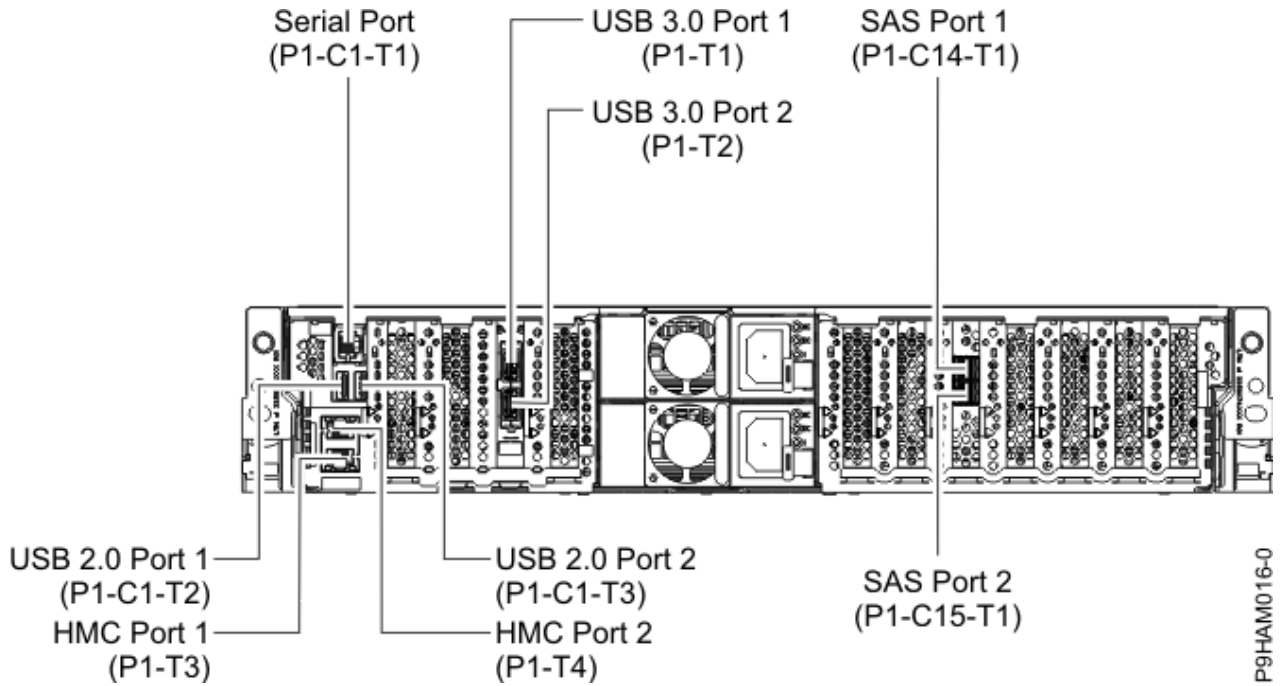
Figure 35. Connector locations for the expanded function 8247-21L, 8247-22L, 8284-21A, and 8284-22A systems

Connector locations for the 8286-41A system

Learn about connector locations for the 8286-41A rack-mounted and stand-alone models.

The 8286-41A server provides cable connector locations via a SAS port for disk drive enclosures.
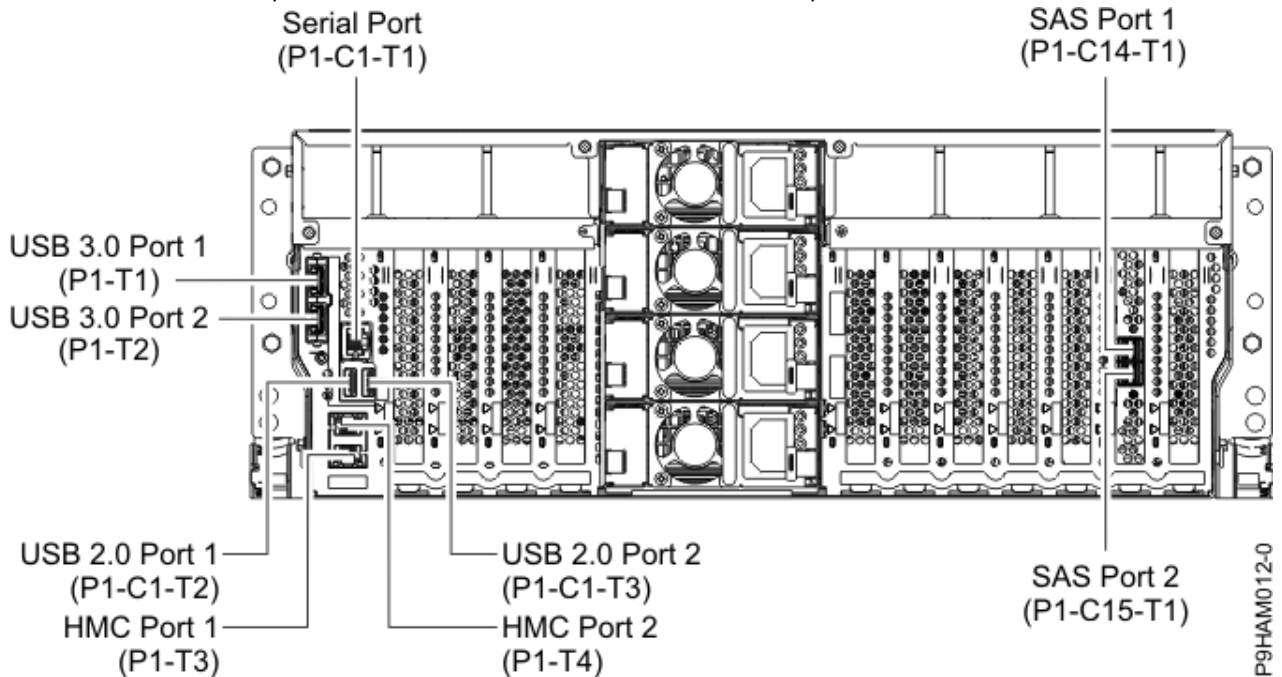
Figure 36. Connector locations for the rack-mounted 8286-41A (expanded function) system

USB 3.0 Port 2
(P1-T2)

USB 3.0 Port 1
(P1-T1)

USB 2.0 Port 1
(P1-C1-T2)

HMC Port 1
(P1-T3)

HMC Port 2
(P1-T4)

USB 2.0 Port 2
(P1-C1-T3)

Serial Port
(P1-C1-T1)

SAS Port 2
(P1-C15-T1)

SAS Port 1
(P1-C14-T1)

P9HAM014-0
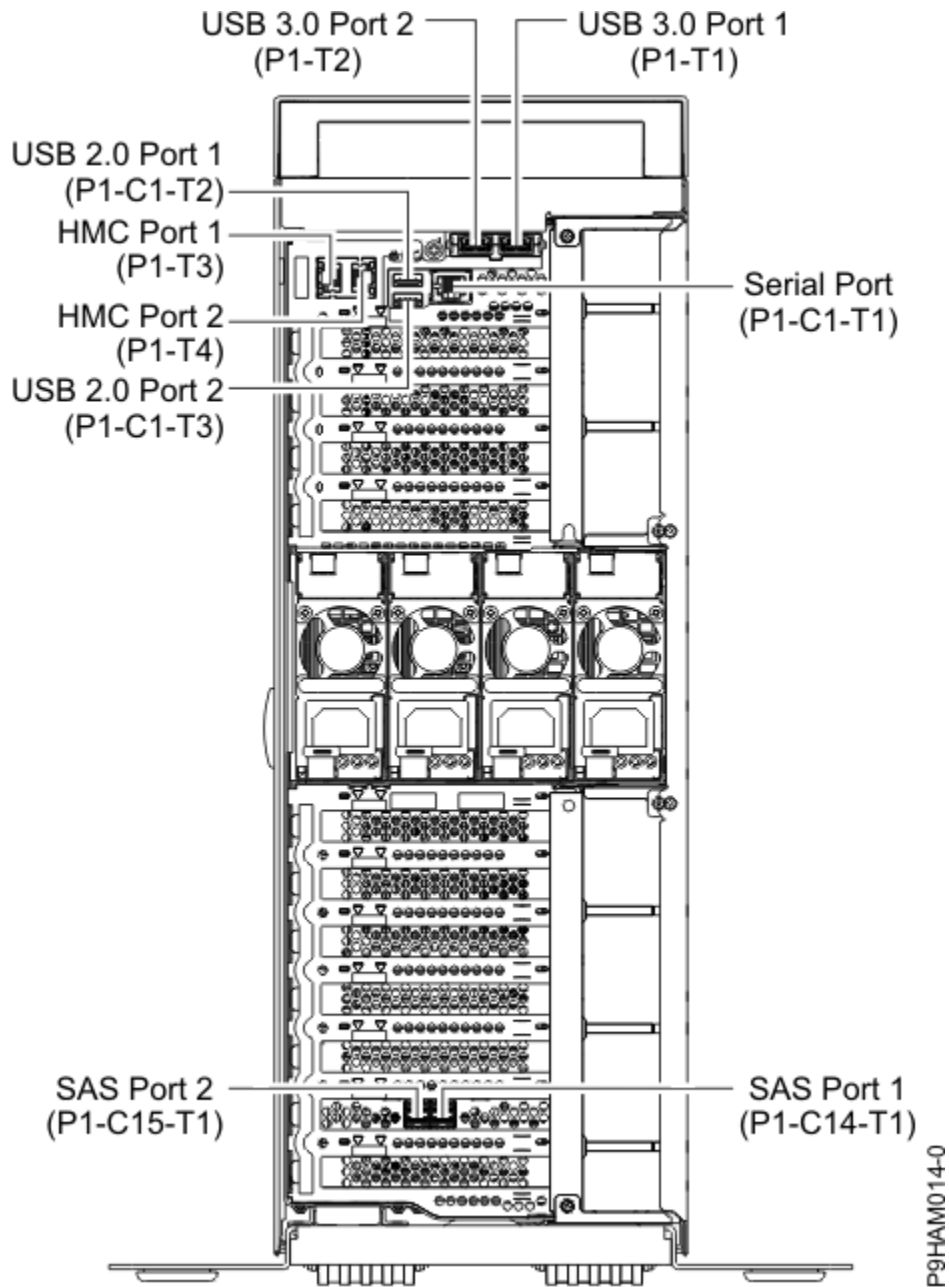
Figure 37. Connector locations for the stand-alone 8286-41A (expanded function) system

Connector locations for the 8247-42L and 8286-42A systems
Learn about connector locations for the 8247-42L and 8286-42A rack-mounted models.

The 8247-42L and 8286-42A (expanded function) servers provide cable connector locations via a SAS port for disk drive enclosures.

Serial Port
(P1-C1-T1)

SAS Port 1
(P1-C14-T1)

USB 3.0 Port 1
(P1-T1)

USB 3.0 Port 2
(P1-T2)

USB 2.0 Port 1
(P1-C1-T2)

HMC Port 1
(P1-T3)

USB 2.0 Port 2
(P1-C1-T3)

HMC Port 2
(P1-T4)

SAS Port 2
(P1-C15-T1)

P9HAM012-0
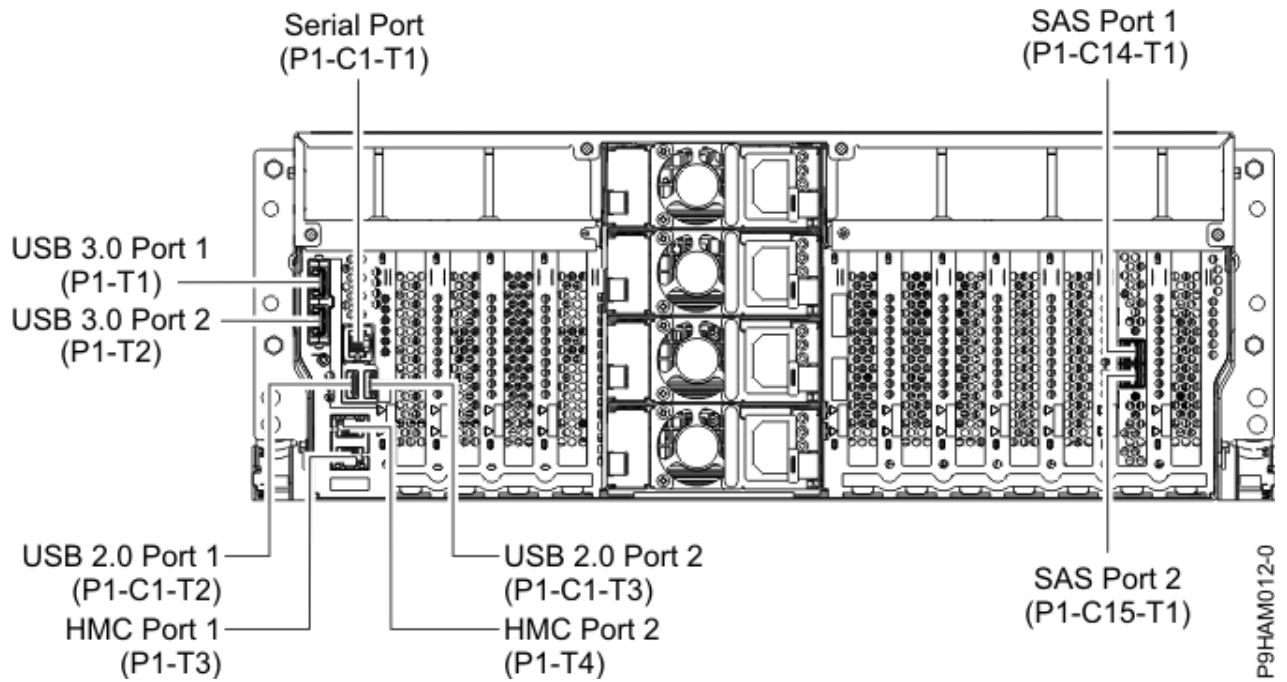
Figure 38. Connector locations for the 8247-42L and 8286-42A (expanded function) systems

Connector locations for the 8408-44E and 8408-E8E systems

Learn about connector locations for the 8408-44E and 8408-E8E systems.

The 8408-44E and 8408-E8E systems provide cable connector locations via a SAS port (P1-C5-T3) for disk drive enclosures and cable ports (P1-C5-T1 and P1-C5-T2) for the EMX0 PCIe3 expansion drawer
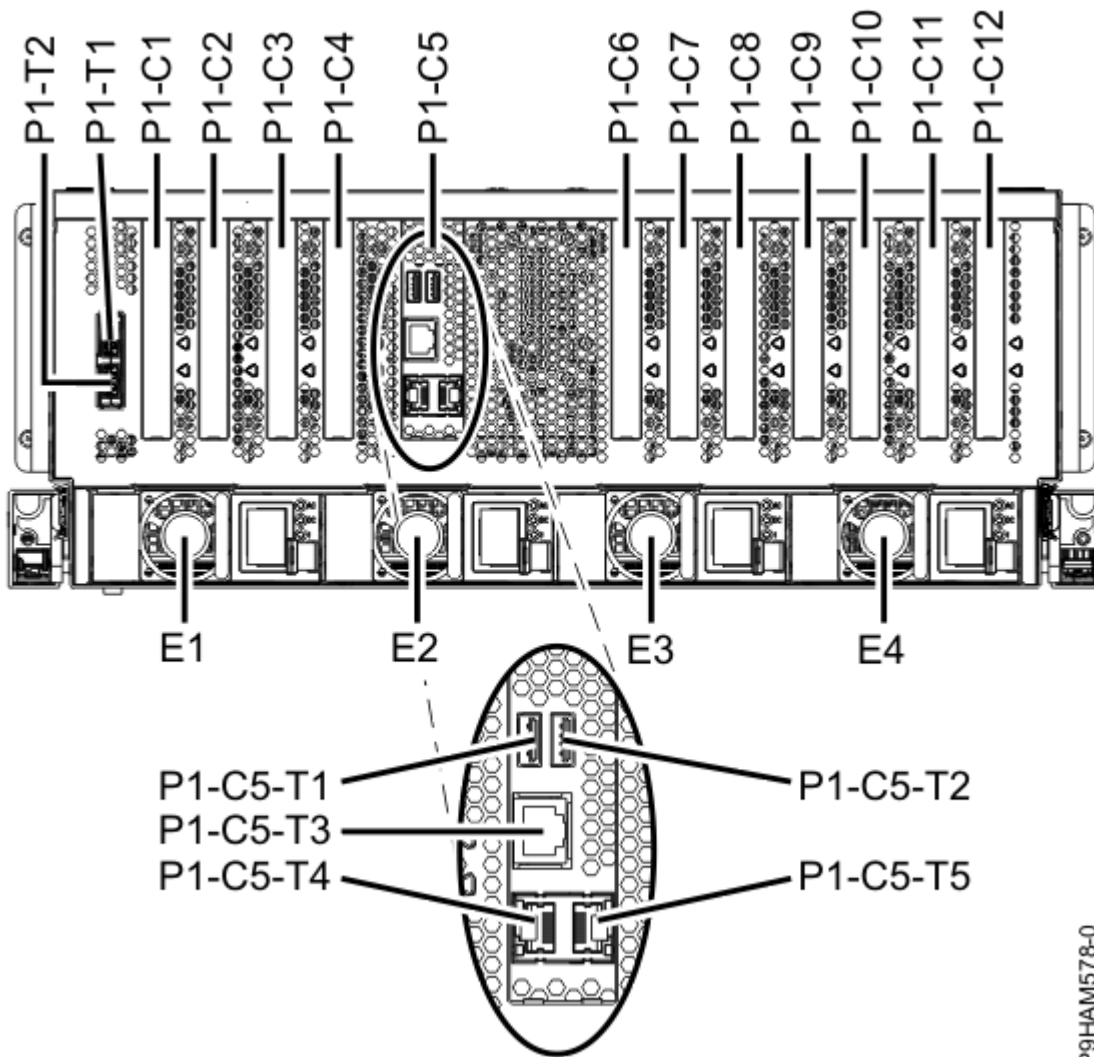
Figure 39. Connector locations for the 8408-44E and 8408-E8E systems

Connector locations for the 9080-MHE, 9080-MME, 9119-MHE, and 9119-MME systems
Learn about connector locations for the 9080-MHE, 9080-MME, 9119-MHE, and 9119-MME systems.

The 9080-MHE, 9080-MME, 9119-MHE, and 9119-MME servers provide cable connector locations via a SAS port for disk drive enclosures and cable ports for the EMX0 PCIe3 expansion drawer.
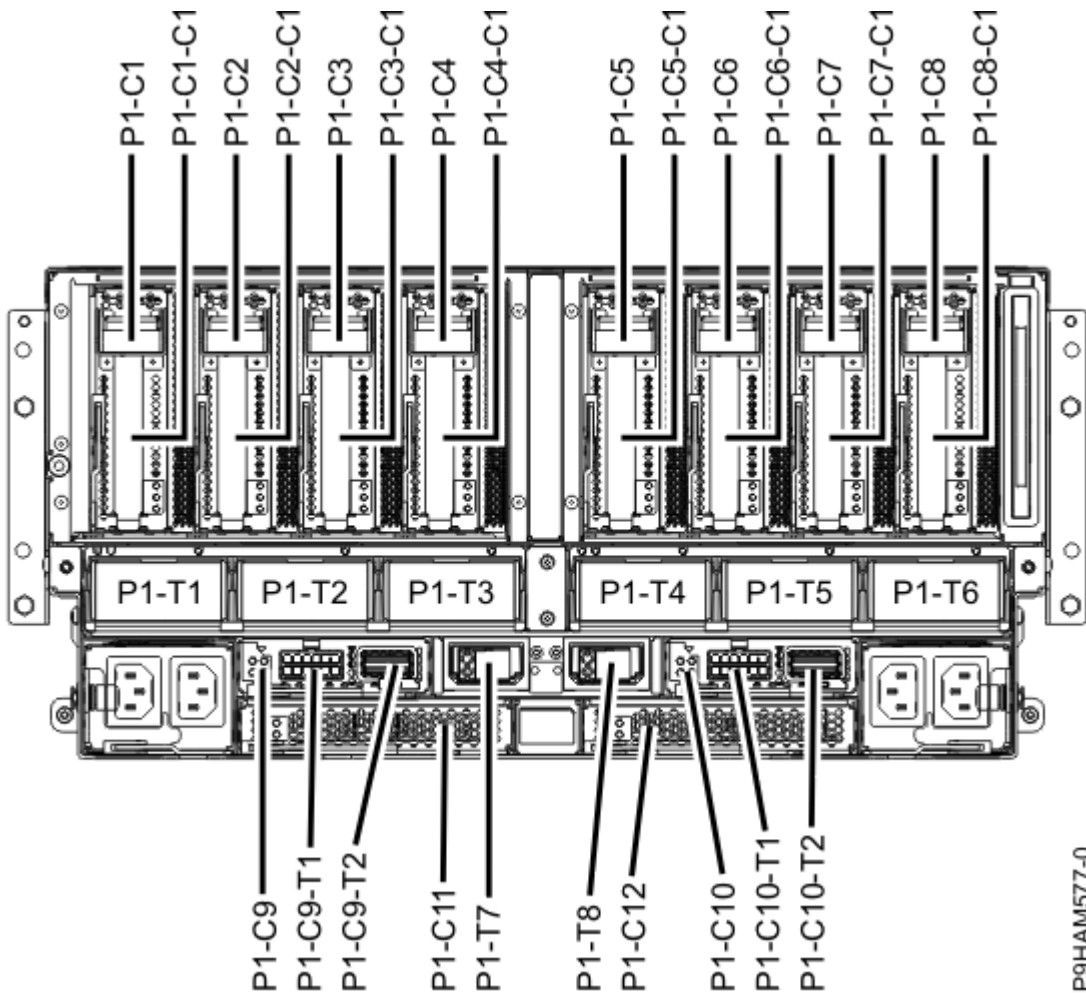
Figure 40. Connector locations for the 9080-MHE, 9080-MME, 9119-MHE, and 9119-MME systems

P9HAM577-0

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IBM's computer systems contain mechanisms designed to reduce the possibility of undetected data corruption or loss. This risk, however, cannot be eliminated. Users who experience unplanned outages, system failures, power fluctuations or outages, or component failures must verify the accuracy of operations performed and data saved or transmitted by the system at or near the time of the outage or failure. In addition, users must establish procedures to ensure that there is independent data verification before relying on such data in sensitive or critical operations. Users should periodically check IBM's support websites for updated information and fixes applicable to the system and related software.

Homologation statement

This product may not be certified in your country for connection by any means whatsoever to interfaces of public telecommunications networks. Further certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions.

Accessibility features for IBM Power Systems servers

Accessibility features assist users who have a disability, such as restricted mobility or limited vision, to use information technology content successfully.

Overview

The IBM Power Systems servers include the following major accessibility features:

- Keyboard-only operation
- Operations that use a screen reader

The IBM Power Systems servers use the latest W3C Standard, WAI-ARIA 1.0 (www.w3.org/TR/wai-aria/), to ensure compliance with US Section 508 (www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards) and Web Content Accessibility Guidelines (WCAG) 2.0 (www.w3.org/TR/WCAG20/). To take advantage of accessibility features, use the latest release of your screen reader and the latest web browser that is supported by the IBM Power Systems servers.

The IBM Power Systems servers online product documentation in IBM Knowledge Center is enabled for accessibility. The accessibility features of IBM Knowledge Center are described in the Accessibility section of the IBM Knowledge Center help (www.ibm.com/support/knowledgecenter/doc/kc_help.html#accessibility).

Keyboard navigation

This product uses standard navigation keys.

Interface information

The IBM Power Systems servers user interfaces do not have content that flashes 2 - 55 times per second.

The IBM Power Systems servers web user interface relies on cascading style sheets to render content properly and to provide a usable experience. The application provides an equivalent way for low-vision users to use system display settings, including high-contrast mode. You can control font size by using the device or web browser settings.

The IBM Power Systems servers web user interface includes WAI-ARIA navigational landmarks that you can use to quickly navigate to functional areas in the application.

Vendor software

The IBM Power Systems servers include certain vendor software that is not covered under the IBM license agreement. IBM makes no representation about the accessibility features of these products. Contact the vendor for accessibility information about its products.

Related accessibility information

In addition to standard IBM help desk and support websites, IBM has a TTY telephone service for use by deaf or hard of hearing customers to access sales and support services:

TTY service
800-IBM-3383 (800-426-3383)
(within North America)

For more information about the commitment that IBM has to accessibility, see IBM Accessibility (www.ibm.com/able).

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Electronic emission notices

Class A Notices

The following Class A statements apply to the IBM servers that contain the POWER9 processor and its features unless designated as electromagnetic compatibility (EMC) Class B in the feature information.

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

Canada Notice

CAN ICES-3 (A)/NMB-3(A)

European Community and Morocco Notice

This product is in conformity with the protection requirements of Directive 2014/30/EU of the European Parliament and of the Council on the harmonization 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 may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

Warning: This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

Germany Notice

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaatenund hält die Grenzwerte der EN 55022 / EN 55032 Klasse A ein.

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 von IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung von IBM gesteckt/eingebaut werden.

EN 55032 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 2014/30/EU in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse A

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

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

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Relations Europe, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany

Tel: +49 (0) 800 225 5426
email: HalloIBM@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 / EN 55032 Klasse A.

Japan Electronics and Information Technology Industries Association (JEITA) Notice

（一社）電子情報技術産業協会　高調波電流抑制対策実施
要領に基づく定格入力電力値：Knowledge Centerの各製品の
仕様ページ参照

This statement applies to products less than or equal to 20 A per phase.

高調波電流規格　JIS C 61000-3-2 適合品

This statement applies to products greater than 20 A, single phase.

高調波電流規格　JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対
策ガイドライン」対象機器（高調波発生機器）です。
・回路分類　：6（単相、ＰＦＣ回路付）
・換算係数　：0

This statement applies to products greater than 20 A per phase, three-phase.

高調波電流規格　JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対
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・回路分類　：5（3相、ＰＦＣ回路付）
・換算係数　：0

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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。

Russia Notice

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

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IBM Taiwan Contact Information:

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

United States Federal Communications Commission (FCC) Notice

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. Proper cables and connectors are available from IBM-authorized dealers. 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.

Responsible Party:
International Business Machines Corporation
New Orchard Road
Armonk, NY 10504
Contact for FCC compliance information only: fccinfo@us.ibm.com

Class B Notices

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

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

Canada Notice

CAN ICES-3 (B)/NMB-3(B)

European Community and Morocco Notice

This product is in conformity with the protection requirements of Directive 2014/30/EU of the European Parliament and of the Council on the harmonization 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.

German Notice

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaatenund hält die Grenzwerte der EN 55022/ EN 55032 Klasse B ein.

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Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) ". Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse B

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

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
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Technical Relations Europe, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany

Tel: +49 (0) 800 225 5426
email: HalloIBM@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55032 Klasse B

Japan Electronics and Information Technology Industries Association (JEITA) Notice

（一社）電子情報技術産業協会　高調波電流抑制対策実施
要領に基づく定格入力電力値：Knowledge Centerの各製品の
仕様ページ参照

This statement applies to products less than or equal to 20 A per phase.

高調波電流規格　JIS C 61000-3-2 適合品

This statement applies to products greater than 20 A, single phase.

高調波電流規格　JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対
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・回路分類　：６（単相、ＰＦＣ回路付）
・換算係数　：０

This statement applies to products greater than 20 A per phase, three-phase.

高調波電流規格　JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対
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・回路分類　：５（３相、ＰＦＣ回路付）
・換算係数　：０

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台北市松仁路7號3樓
電話：0800-016-888

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

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

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

Responsible Party:

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New Orchard Road
Armonk, New York 10504
Contact for FCC compliance information only: fccinfo@us.ibm.com

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