

Power Systems

*Installing the System and Ordered
Parts for the IBM Power System
S812LC (8348-21C)*

IBM

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Parts for the IBM Power System
S812LC (8348-21C)*

IBM

Note

Before using this information and the product it supports, read the information in “Safety notices” on page v, “Notices” on page 81, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125-5823.

This edition applies to IBM Power Systems™ servers that contain the POWER8 processor and to all associated models.

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Safety notices

Safety notices may be printed throughout this guide:

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

World Trade safety information

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

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

German safety information

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

Laser safety information

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

Laser compliance

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

DANGER

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

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

- 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.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- 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.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

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

To Connect:

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

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)

DANGER

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

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



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

CAUTION

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



- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001)

CAUTION:

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

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:
 - Remove all devices in the 32U position (compliance ID RACK-001 or 22U (compliance ID RR001) 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 (compliance ID RACK-001 or 22U (compliance ID RR001) 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 230 mm (30 x 80 in.).
- Ensure that all devices, shelves, drawers, doors, and cables are secure.
- Ensure that the four leveling pads are raised to their highest position.
- Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
 - Lower the four leveling pads.
 - Install stabilizer brackets on the rack cabinet.
 - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.
- If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.

(R002)

(L001)



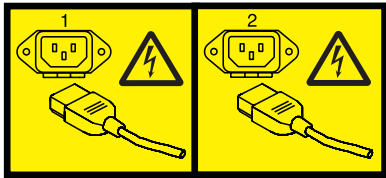
DANGER: Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)

(L002)



DANGER: Rack-mounted devices are not to be used as shelves or work spaces. (L002)

(L003)



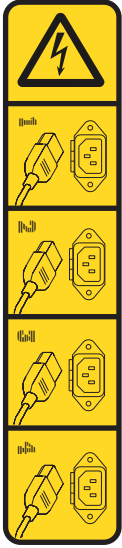
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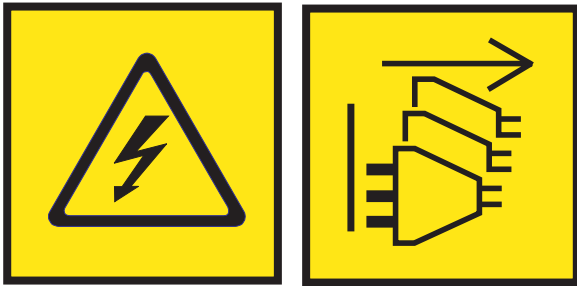
or



or



or



DANGER: Multiple power cords. The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. (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 many 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)

CAUTION:

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

Do Not:

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

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

(C048)

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 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 platform tilt riser accessory option. Secure platform riser tilt option to main shelf in all four (4x) 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 option flat at all times except for final minor 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**.
- 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. (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 and configuring POWER8 processor-based systems and system features

Use this information to install and configure POWER8[®] processor-based systems and to install customer-installable hardware features. This information also provides removal and replacement procedures for customer-replaceable hardware features, such as memory modules or fans.

Before you install a feature, ensure that the software required to support the feature is installed on the system. For information about software prerequisites, see the IBM Prerequisite website (http://www-912.ibm.com/e_dir/eServerPrereq.nsf). If the required software is not installed, go to the Fix Central website (<http://www.ibm.com/support/fixcentral/>) to download it, and then install it before you continue.

Installing these features 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. See the International Information Bulletin for Customers - Installation of IBM Machines (Publication number: SC27-6601-00) that is available from the IBM Publications Center (<http://www-05.ibm.com/e-business/linkweb/publications/servlet/pbi.wss>). This bulletin provides a list of the key IBM system installation activities and a list of activities that might be billable.

Installing the IBM Power System S812LC (8348-21C) system

Learn how to install, cable, and set up your system.

Prerequisites for installing the rack-mounted 8348-21C system

Use the information to understand the prerequisites that are required for installing the system.

About this task

You might need to read the following documents before you begin to install the server:

- The latest version of this document is maintained online, see *Installing the IBM Power System 8348-21C* (http://www.ibm.com/support/knowledgecenter/POWER8/p8eic/p8eic_installsys_kickoff.htm).
- To plan your server installation, see *Planning for the system* (http://www.ibm.com/support/knowledgecenter/POWER8/p8had/p8had_8xx_kickoff.htm).

Procedure

Ensure that you have the following items before starting your installation:

- Phillips screwdriver
- Flat-head screwdriver
- Box cutter
- Electrostatic discharge (ESD) wrist strap
- Rack with two Electronic Industries Association (EIA) units (2U) of 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/POWER8/p8hbf/p8hbf_8xx_kickoff.htm).

Completing inventory for your 8348-21C system

Use this information to complete inventory for your system.

Procedure

1. Verify that you received all the boxes you ordered.
2. Unpack the server components as needed.
3. Complete a parts inventory before you install each server component by following these steps:
 - a. Locate the inventory list for your server.
 - b. Ensure that you received all the parts that you ordered.

Note: Your order information is included with your product. You can also obtain order information from your marketing representative or the IBM Business Partner.

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

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

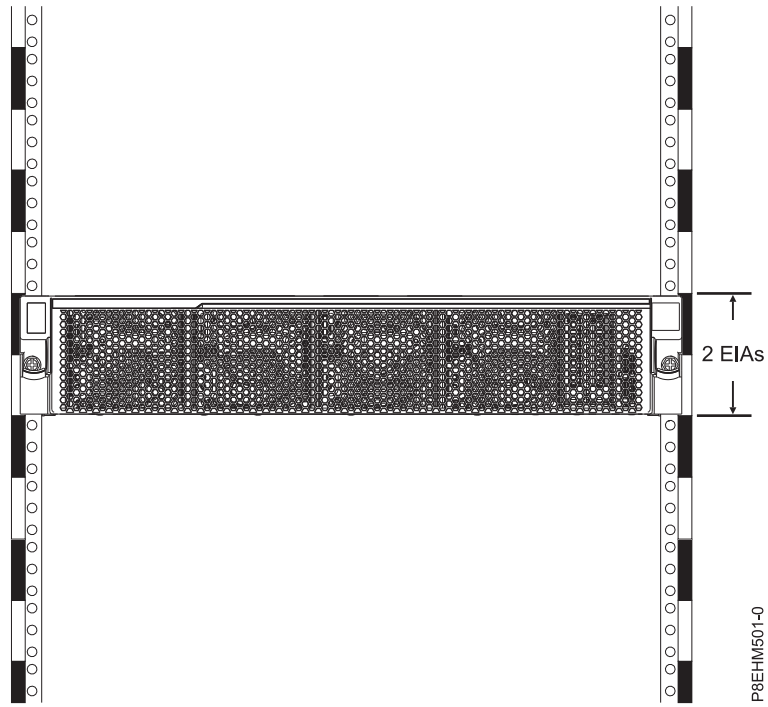
Determining and marking the location in the rack for the 8348-21C system

You might need to determine where to install the system unit into the rack.

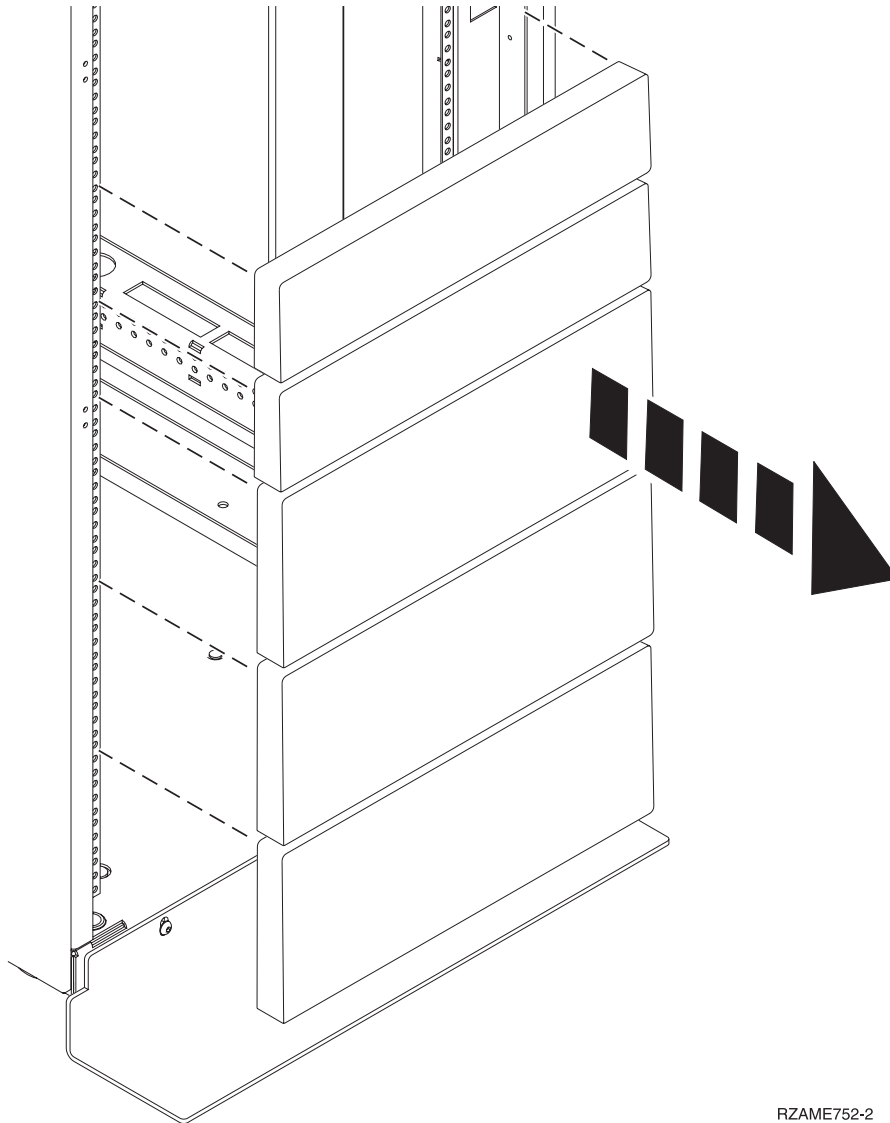
Procedure

1. Read the Rack safety notices (<http://www.ibm.com/support/knowledgecenter/POWER8/p8hbf/racksafety.htm>).
2. Determine where to place the system unit in the rack. As you plan for installing the system unit in a rack, consider 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 server is two EIA units high. An EIA unit is 44.55 mm (1.75 in.) in height. The rack contains three mounting holes for each EIA unit of height. This system unit, therefore, is 89 mm (3.5 in.) high and covers six mounting holes in the rack.



3. If necessary, remove the filler panels to allow access to the inside of the rack enclosure where you plan to place the unit, as shown in Figure 1 on page 4.



RZAME752-2

Figure 1. Removing the filler panels

4. Determine to place the system in the rack. Record the EIA location.
5. Facing the front of the rack and working from the right side, use tape, a marker, or pencil to mark the lower hole of each EIA unit.
6. Repeat step 5 for the corresponding holes located on the left side of the rack.
7. Go to the rear of the rack.
8. On the right side, find the EIA unit that corresponds to the bottom EIA unit marked on the front of the rack.
9. Mark the bottom EIA unit.
10. Mark the corresponding holes on the left side of the rack.

Installing the 8348-21C system by using slide rails

If you ordered the system with the slide rail option, read this section to install the system into the rack by using slide rails.

Attaching slide rails to the system and rack

Attach slide rails to the system and then to the rack.

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.

The slide rails arrive fully assembled. To install the slide rails into the rack, you must disassemble the slide rails into four pieces.

Procedure

1. Remove the lower DASD backplane screw on either side so that you can service the backplane at a later date without removing the system from the rack.

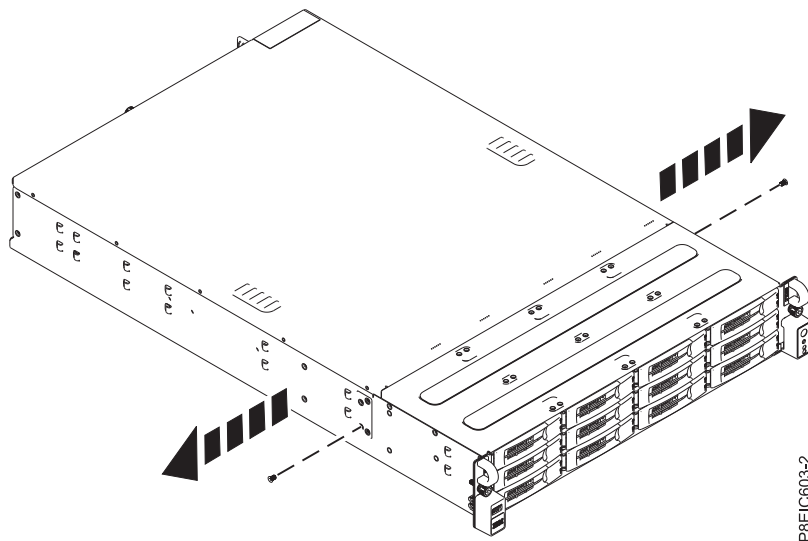
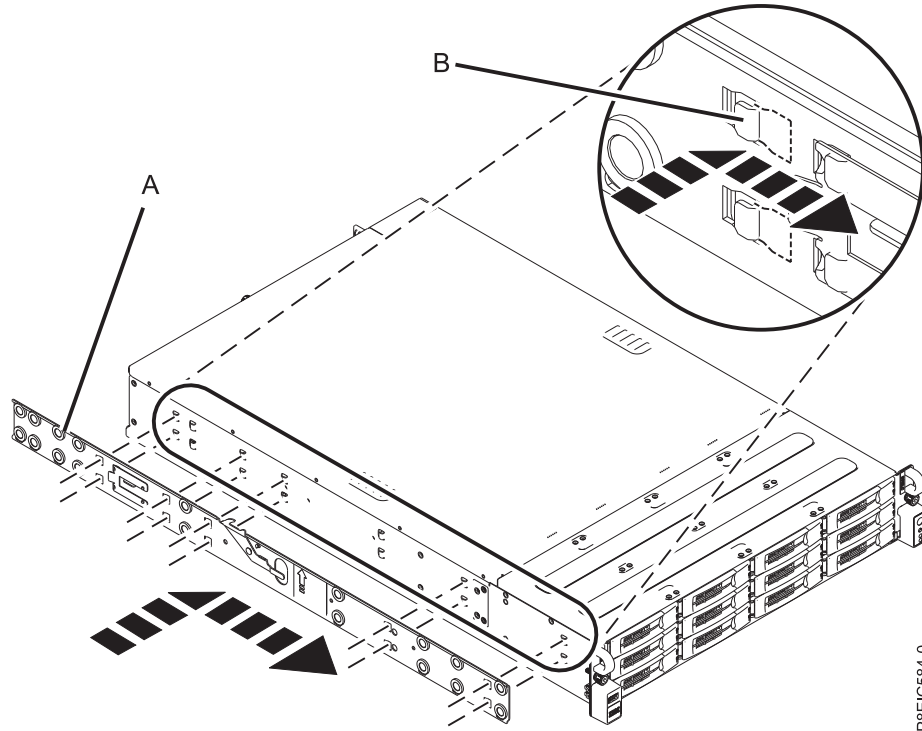


Figure 2. Removing the DASD backplane screws

2. Attach the system chassis slide rails to each side of the system chassis. At the rear of the system chassis, align the tabs on the system chassis (**B**) with the slots on the slide rail (**A**). Push the chassis slide rail forward so that the slam latch clicks into place.

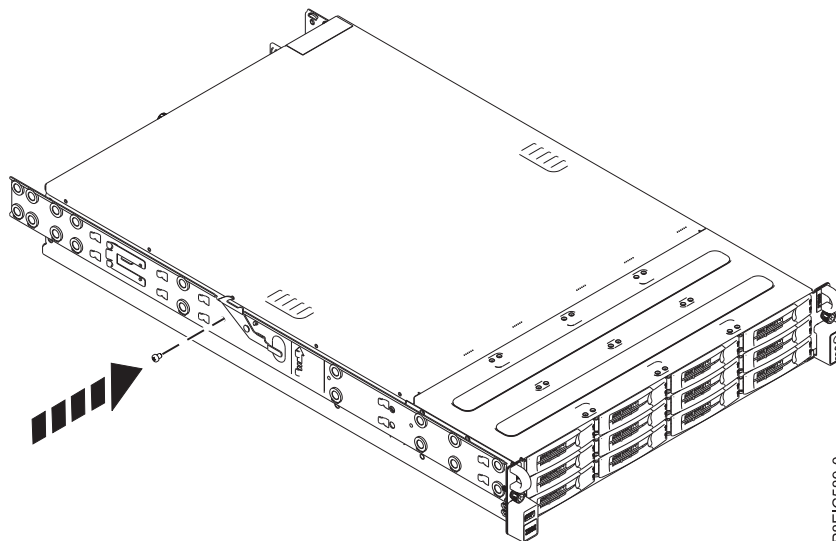
Note: The system rails are marked with an **L**, to designate the left system rail, and an **R**, to designate the right system rail from the front of the system.



P8EIC584-0

Figure 3. Attaching the left system chassis slide rail to the system chassis

3. Install the retention screw on each system chassis slide rail to further attach the slide rail to the system chassis.

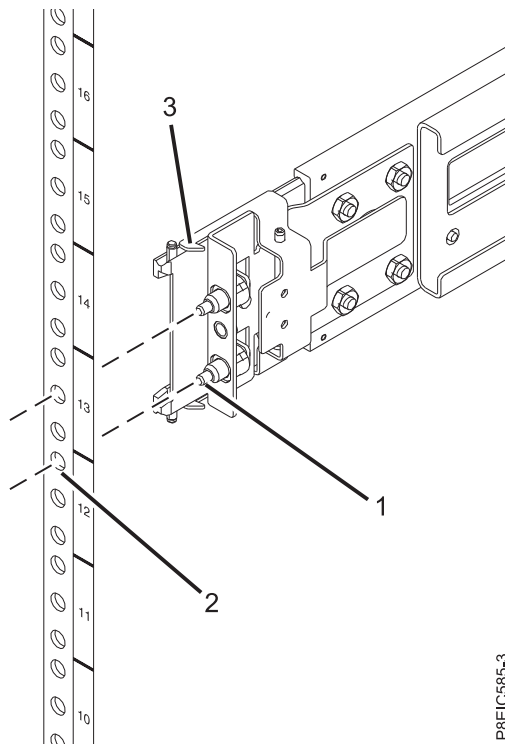


P8EIC589-0

Figure 4. Attaching the left system chassis rail retention screw to the system chassis

4. Next, install the rack slide rails into the rack. Each rack slide rail is marked with either an **R** (right) or an **L** (left), when you look from the front. Select the right slide rail, bring it to the front of the rack, and locate the selected EIA unit.
5. From the front of the rack, insert the pins on the front of the slide rail (1) into the holes on the front of the rack that you previously marked (2). Pull the rail forward so that the rail spring clip (3) latches

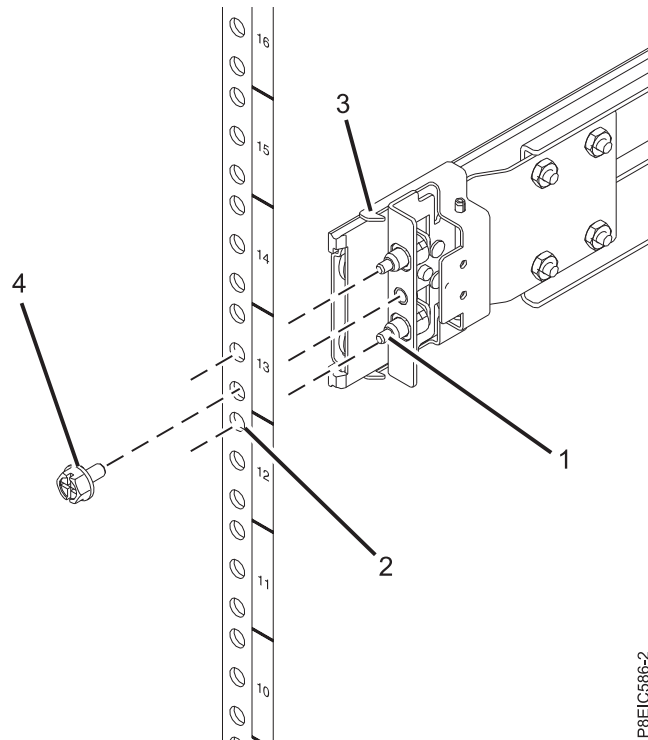
to the rail flanges and clicks into place.



P8EIC585-3

Figure 5. Installing the slide rail from the front of the rack

6. Repeat steps 3 and 4 for the left rail.
7. Move to the rear of the rack. Pull the slide rail toward you to insert the two pins (1) into the rack holes (2). Pull the rail until the rail spring clip (3) clicks into place. Install the screw (4) to secure the slide rail to the rack.



P8EIC586-2

Figure 6. Installing the slide rail at the rear of the rack

Installing the system into the rack by using the slide rails

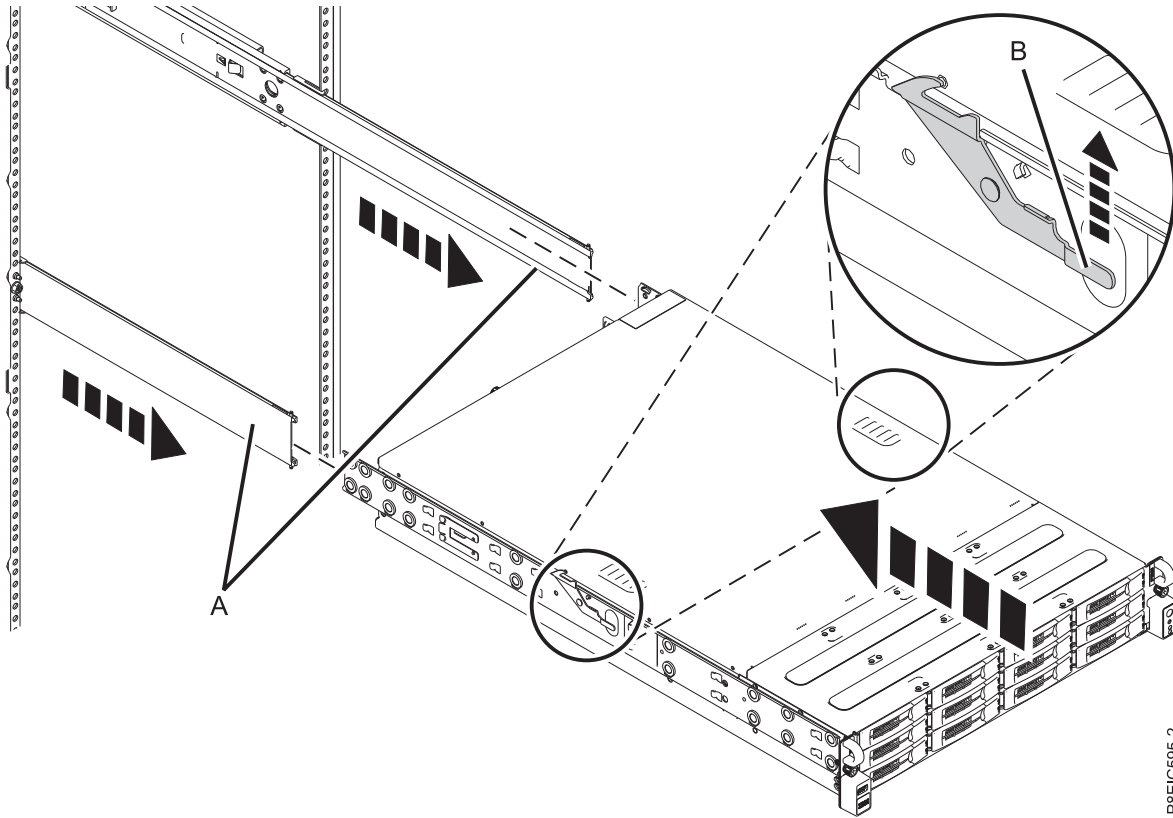
Learn how to install the system into the rack by using the slide rails.

About this task

Note: This system requires two people to install the system into the rack.

Procedure

1. Fully extend the slide rails until the rails click into the service position **(A)**.
2. Using two people, lift the system and align the lower roller pins on the chassis rails with the grooves in the rack slide rails on both sides.



P8E1C595-2

Figure 7. Aligning the lower roller pins on the chassis rails with the grooves in the rack slide rails

3. Simultaneously lift the latches on either side of the rack (**B**) that are marked with a green arrow.
4. Push the system into the rack.
5. Tighten the thumbscrews on either side of the system to secure the system to the rack.

Connecting and routing power cables

Learn how to connect and route power cables in the IBM Power System S812LC (8348-21C) system.

Procedure

1. To connect the power cables, complete the following steps:
 - a. Plug the power cords into the power supplies.
 - b. Attach all cables to the rear of the server.

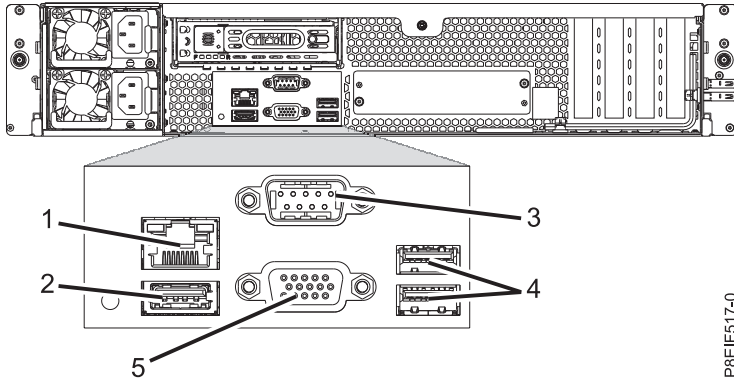


Figure 8. Rear view of the system with ports displayed

Table 1. Input and output ports

Identifier	Description
1	Ethernet
2	USB 1.1 Baseboard management controller (BMC) - not enabled
3	Serial Intelligent Platform Management Interface (IPMI)
4	USB 3.0 used for keyboard and mouse
5	Video Graphics Array (VGA) used for monitor. Only the 1024 x 768 at 60 Hz VGA setting is supported. Only up to a 3-meter cable is supported.

- c. Plug the system power cords and the power cords for any other attached devices into the alternating current (ac) power source.
2. Continue with “Completing server setup.”

Completing server setup

Learn how to complete server setup.

Procedure

1. Connect your server to a VGA terminal and keyboard or a console. Only the 1024 x 768 at 60 Hz VGA setting is supported. Only up to a 3-meter cable is supported.
2. Go to Getting fixes(http://www.ibm.com/support/knowledgecenter/POWER8/p8ei8/p8ei8_fixes_kickoff.htm) and update the system firmware with the most recent level of firmware.
3. You can receive important technical information and updates for specific IBM Support tools and resources by subscribing to receive updates. To subscribe to receive updates, complete the following steps:
 - a. Go to the IBM Support Portal.
 - b. Log in by using your IBM ID and password and click **Sign in**.
 - c. Click **Support notifications**.
 - d. Click **Browse for a product**.
 - e. Select **Power > Firmware**, find your machine type and model and click **Subscribe**.
 - f. Exit the **Browse for a product** screen.
 - g. Click **Delivery preferences** to set email preferences and click **Submit**.
 - h. Click **Edit** to select the types of documentation updates that you want to receive and click **Submit**.

4. You can install the Linux operating system on bare metal systems, or on non-virtualized systems. For these systems, the operating system runs directly on the Open Power Abstraction Layer (OPAL) firmware. For more information about installing the Linux operating system on bare metal systems, see [Installing Linux on bare metal systems](http://www.ibm.com/support/knowledgecenter/linuxonibm/liabw/liabwkickoff.htm)(<http://www.ibm.com/support/knowledgecenter/linuxonibm/liabw/liabwkickoff.htm>).

Installing a disk drive in the 8348-21C

Learn how to install a disk drive in the IBM Power[®] System S812LC (8348-21C) system.

About this task

The drive might be a hard disk drive (HDD) or a solid-state drive (SSD).

Installing a front drive in the 8348-21C

Learn how to install a front drive in the IBM Power System S812LC (8348-21C) system.

About this task

You can install front disks with the system is powered on and running.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

Attention:

- Attach an electrostatic discharge (ESD) wrist strap to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
 - When using an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. Unlock the drive tray handle by pushing the handle release (**A**) in the direction shown. The handle (**B**) snaps out towards you. If the handle does not snap out all the way, the drive tray does not slide out of the system, as shown in Figure 9 on page 12.

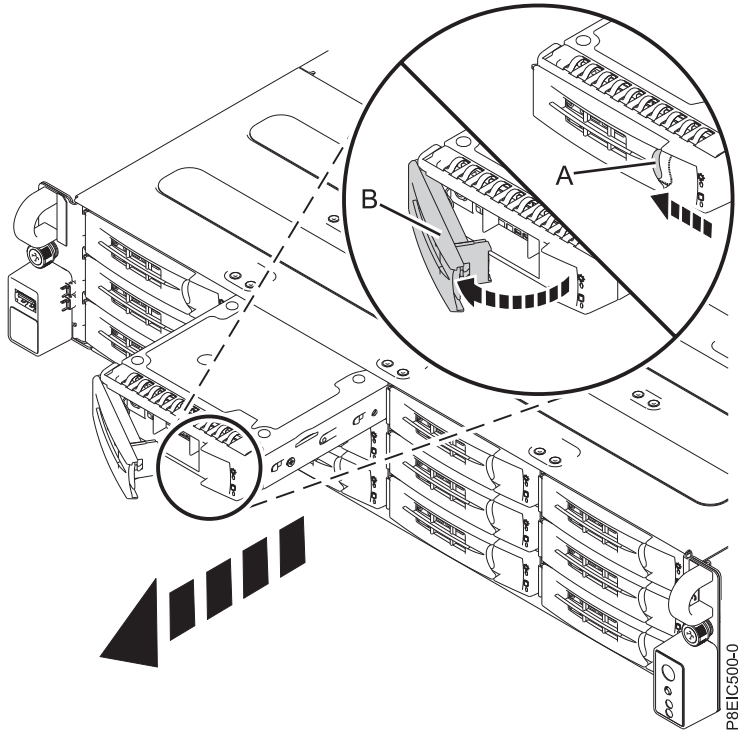


Figure 9. Removing a front drive tray

3. Support the bottom of the drive tray as you slide it out of the system. Do not hold the drive tray by the handle.
4. If you are installing more than one drive, remove additional drive trays.
5. Install a drive into the tray. Orient the drive such that the connectors are pointing to the rear of the drive.
 - A 3.5 inch drive fills the tray, as shown in Figure 10 on page 13. Fasten the drive to the sides of the tray with four screws (2 on each side).

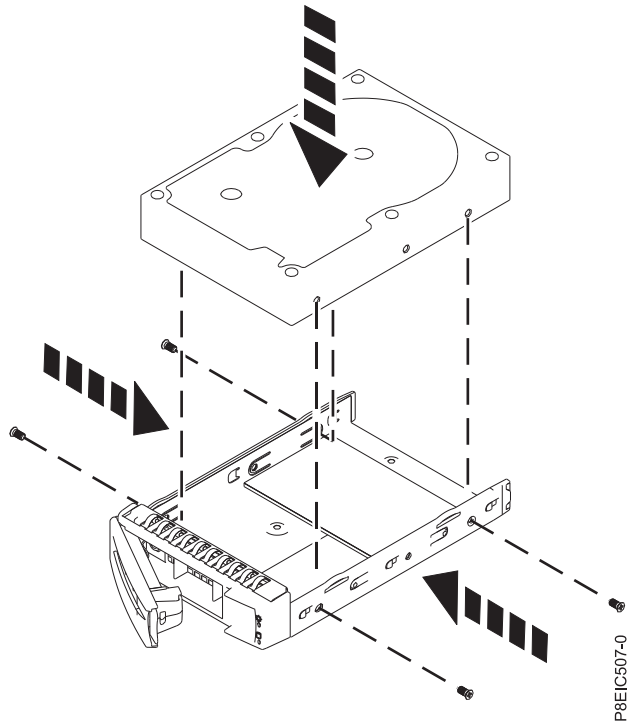


Figure 10. Mounting the 3.5 inch drive in the tray

- A 2.5 inch drive must be positioned at the rear of the tray. While you hold both the drive and the tray, turn the tray over. Fasten the drive to the bottom of the tray with four screws, as shown in Figure 11.

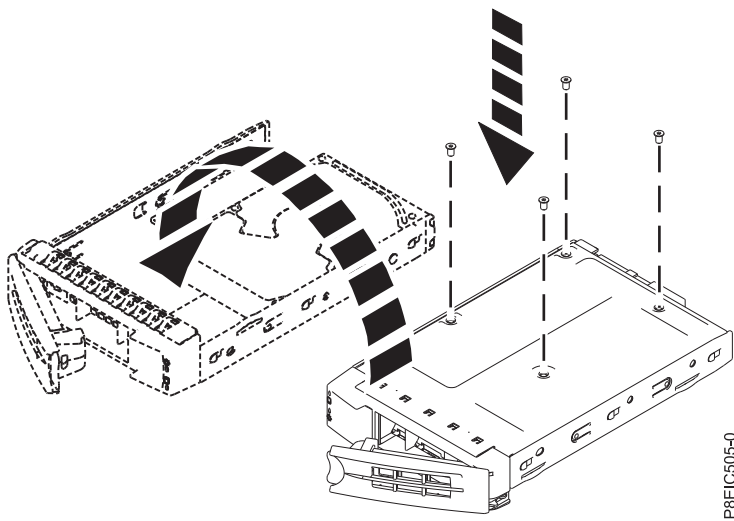


Figure 11. Mounting the 2.5 inch drive in the tray

6. Hold the drive tray by the bottom as you position the drive tray. Slide the drive tray all the way into the system. Push the drive tray in until the drive tray handle (A) starts to close, then push the handle in until it locks, as shown in Figure 12 on page 14.

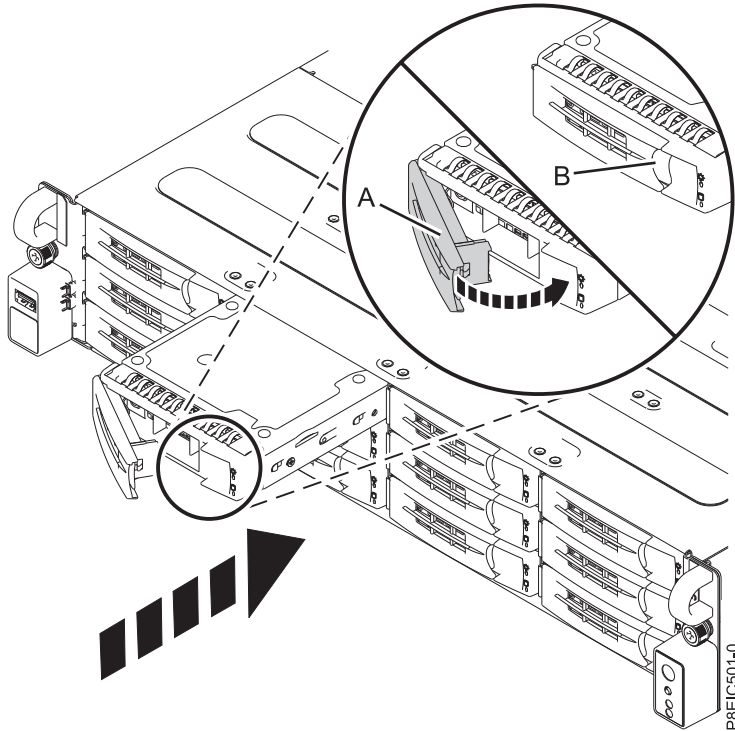


Figure 12. Locking the drive tray handle

7. Lock the drive tray handle (A) by pushing the handle in until it clicks into place.
8. Configure the installed or replaced drive for your environment.
 - a. After you insert a new drive, you must rescan for the device.
 - **Ubuntu:** To run the rescan command in Ubuntu, log into the system as the root user, and run the command:
`rescan-scsi-bus`
 This tool is provided in the *scsitools* package, which can be installed by using the command:
`sudo apt-get install scsitools`
 - **REHL 7.2:** To run the rescan command in Red Hat Linux, log into the system as the root user, and run the command:
`rescan-scsi-bus -a`
 This tool is provided in the *sg3_utils* package, which can be installed by using the command:
`yum install sg3_utils`
 - b. Load or restore data from your backup media. If a drive failed, refer to Recovering from a Disk Drive Failure (www.adaptec.com/en-us/support/infocenter/release-2015-1/index.jsp?topic=/RAID_IUG.xml/Topics/Recovering_from_a_Disk_Drive_Failure.html).

Installing a rear drive in the 8348-21C

Learn how to install a rear drive in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Shut down the system for this procedure. For instructions, see “Stopping the 8348-21C system” on page 63.
2. Attach the electrostatic discharge (ESD) wrist strap.

Attention:

- Attach an electrostatic discharge (ESD) wrist strap to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
 - When using an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
3. Unlock the rear drive tray handle by pushing in the handle release (A). The handle then snaps out towards you. Pull the handle out all the way; if the handle is not fully open, the drive tray does not slide out of the system, as shown in Figure 13.

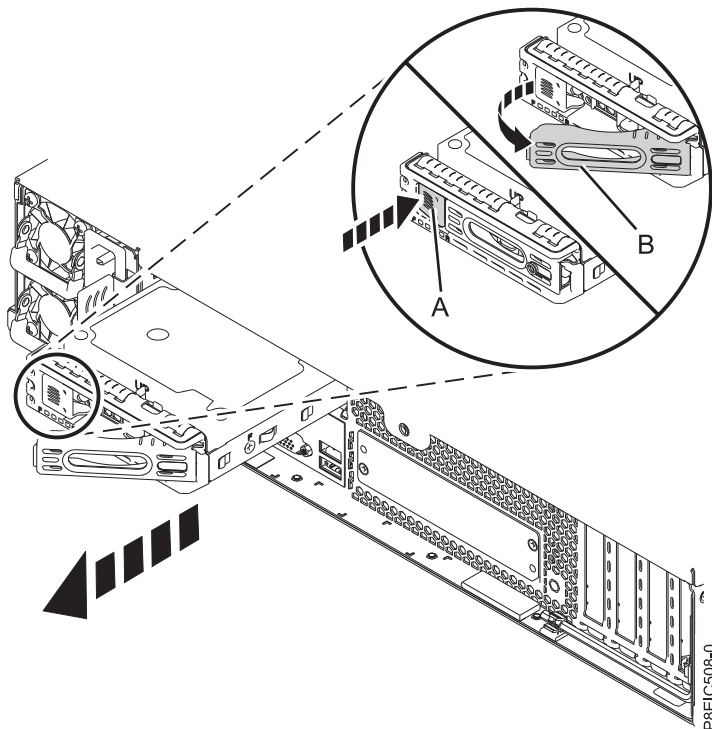


Figure 13. Removing a rear drive

4. Support the bottom of the drive tray as you slide it out of the system. Do not hold the drive tray by the handle.
5. Install a drive into the tray.
- For a 3.5 inch drive:
 - a. Place the drive in the tray, then slide the drive into the socket, as shown in Figure 14 on page 16.

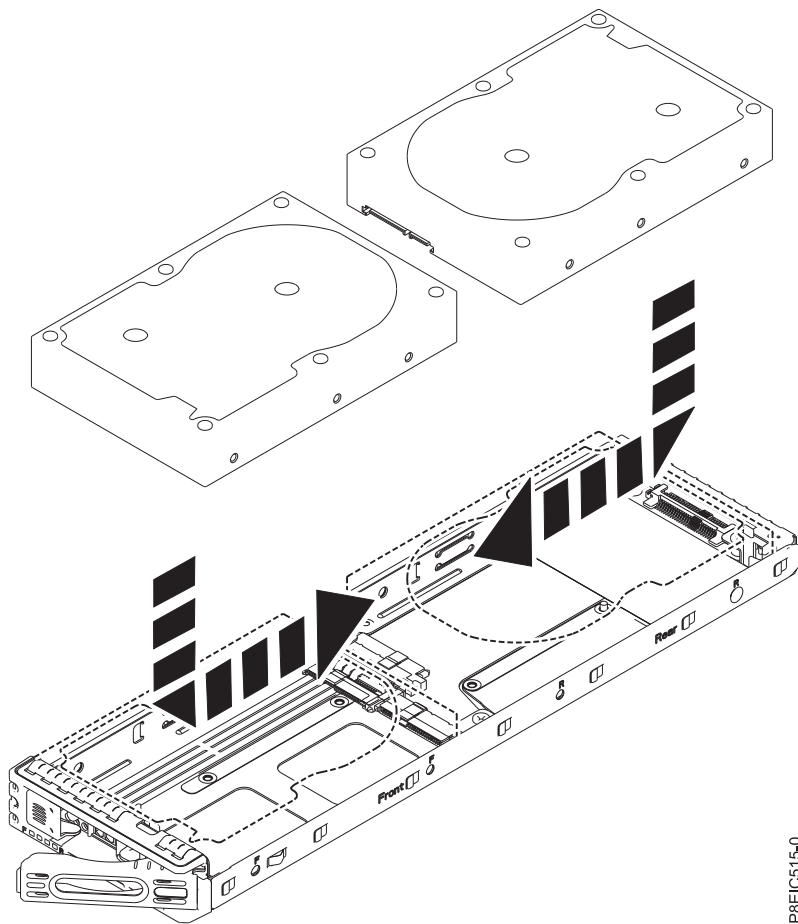


Figure 14. Installing the 3.5 inch drive into the tray

- b. Fasten the drive to the sides of the tray by using four screws (2 on each side), as shown in Figure 15 on page 17.

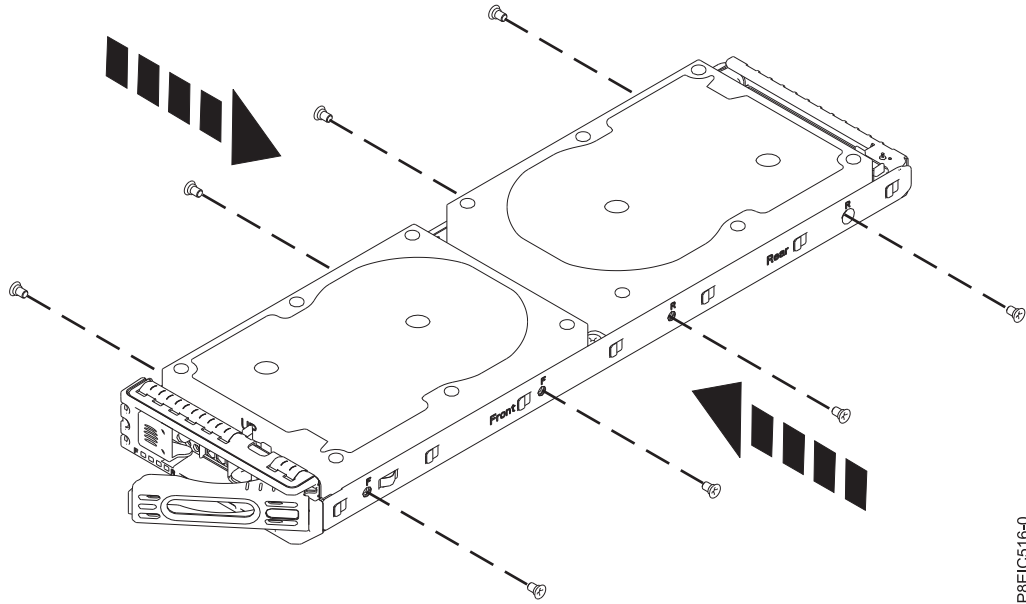


Figure 15. Fastening the 3.5 inch drive to the tray

- For a 2.5 inch drive:
 - a. Place the drive in the tray, then slide the drive into the socket, as shown in Figure 16.

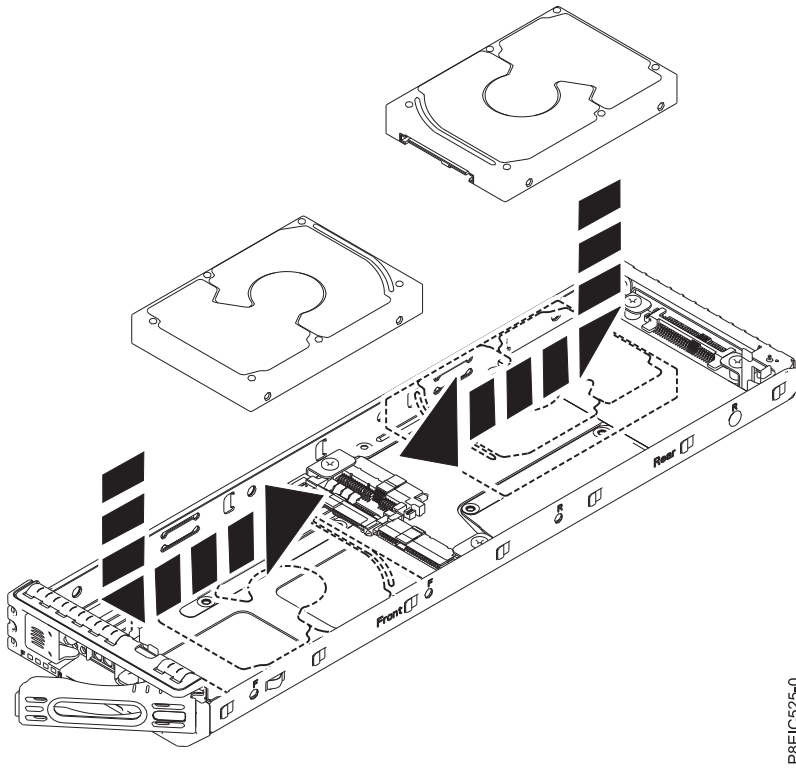
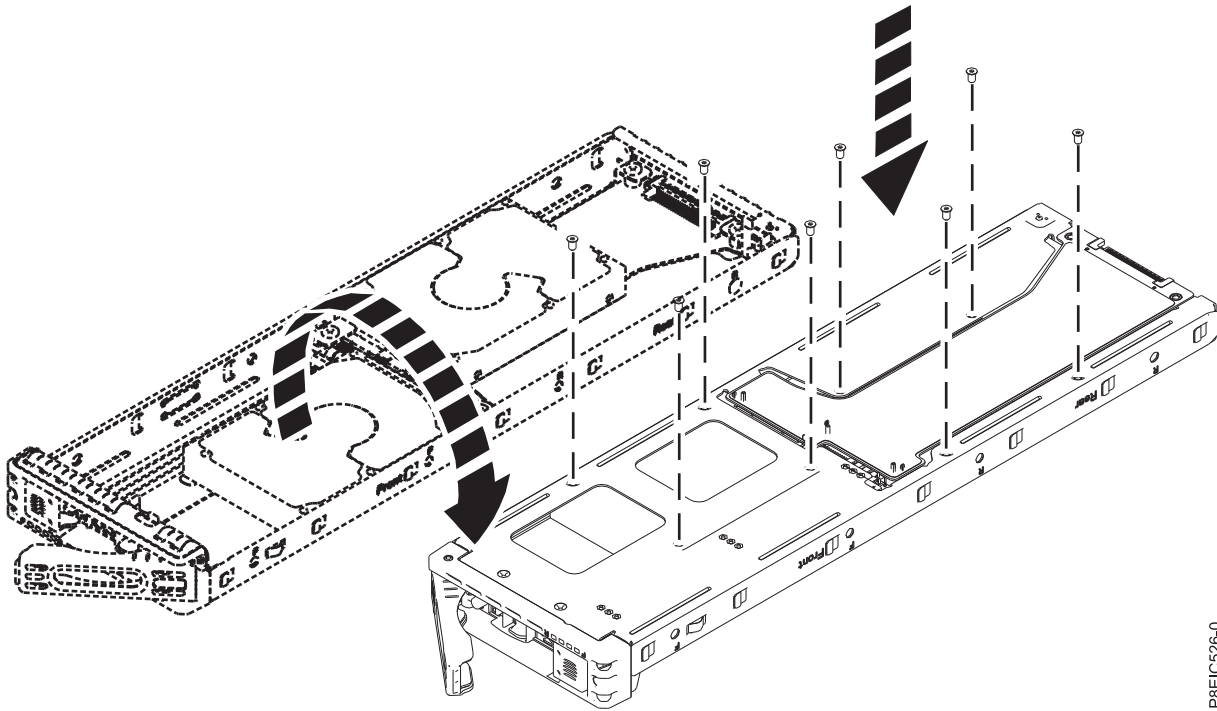


Figure 16. Installing the 2.5 inch drive into the tray

- b. While you hold both the drive and the tray, turn the tray over such that the drive is facing down.

- c. Fasten the drive to the bottom of the tray by using four screws, as shown in Figure 17.



P8E1C526-0

Figure 17. Screw locations for the 2.5 inch drive

- d. Turn the tray over so that the drive is facing up.
6. Hold the drive tray by the bottom as you position the drive. Slide the drive tray all the way into the system. Push the drive tray in until the handle starts to close, then push the handle in until it locks, as shown in Figure 18 on page 19.

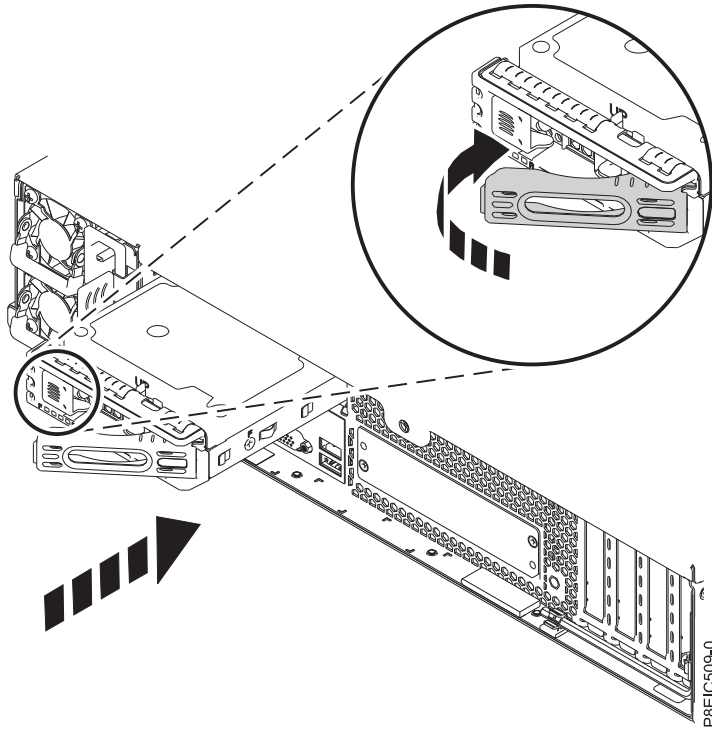


Figure 18. Locking the rear drive tray handle

7. Start the system. For instructions, see “Starting the 8348-21C system” on page 63.
8. Configure the installed or replaced drive for your environment.
 - a. After you insert a new drive, you must rescan for the device.
 - **Ubuntu:** To run the rescan command in Ubuntu, log into the system as the root user, and run the command:
`rescan-scsi-bus`
 This tool is provided in the *scsitools* package, which can be installed by using the command:
`sudo apt-get install scsitools`
 - **REHL 7.2:** To run the rescan command in Red Hat Linux, log into the system as the root user, and run the command:
`rescan-scsi-bus -a`
 This tool is provided in the *sg3_utils* package, which can be installed by using the command:
`yum install sg3_utils`
 - b. Load or restore data from your backup media. If a drive failed, refer to Recovering from a Disk Drive Failure (www.adaptec.com/en-us/support/infocenter/release-2015-1/index.jsp?topic=/RAID_IUG.xml/Topics/Recovering_from_a_Disk_Drive_Failure.html).

Installing memory in the 8348-21C

Learn how to install memory in the IBM Power System S812LC (8348-21C) system.

Placement rules for memory in the 8348-21C system

Learn about the configurations and rules that apply to adding memory to the IBM Power System S812LC (8348-21C) system.

Table 2 lists the supported memory DIMM feature codes and Table 3 shows the allowable memory capacity points for the 8348-21C system. Mixing of memory feature codes is not allowed.

Table 2. Memory DIMM feature codes

Supported feature codes (FC)	Size
EM5A	4 GB IS DIMMS, 1333 MHZ, 4 GBIT DDR3 DRAM
EM5C	16 GB IS DIMMS, 1333 MHZ, 16 GBIT DDR3 DRAM
EM5D	32 GB IS DIMMS, 1333 MHZ, 32 GBIT DDR3 DRAM
EM5E	8 GB IS DIMMS, 1066 MHZ, 8 GBIT DDR3 DRAM

Table 3. 8348-21C memory configuration as a function of the number of DIMMs. You read this table by selecting the individual DIMM size row in the leftmost column, then move to the right and select the columns for the memory capacity. The value that is listed is the quantity of the memory feature code that can be ordered, which corresponds to the DIMM size in the leftmost column.

	32 GB	64 GB	128 GB	256 GB	512 GB	1024 GB
DIMM Size	DIMMs	DIMMs	DIMMs	DIMMs	DIMMs	DIMMs
4 GB	8 ¹	16	32			
8 GB			16 ¹	32		
16 GB				16 ¹	32	
32 GB					16 ¹	32

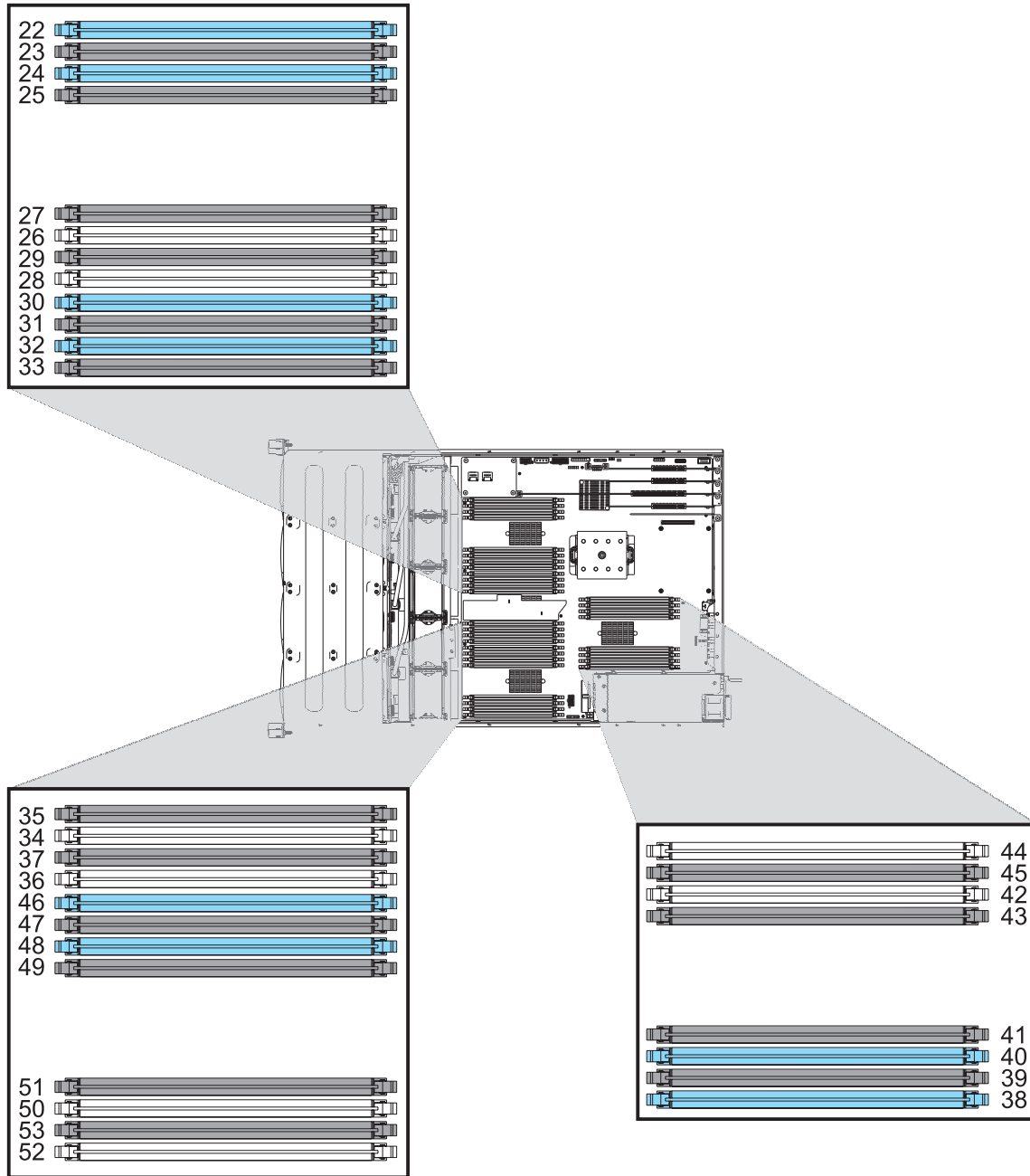
Notes:

1. Default configurations for the listed memory capacity

Use Table 4 and Figure 19 on page 21 to determine the memory placement. The memory needs to be plugged in a sequence: Slots with blue connectors are plugged first. Slots with ivory connectors are plugged second. Slots with black connectors are plugged last.

Table 4. Memory plugging sequence

Slot latch color	Slot number	Sequence
Blue	22, 24, 30, 32, 38, 40, 46, 48	Fill these DIMM slots first
Ivory	26, 28, 34, 36, 42, 44, 50, 52	Fill these DIMM slots second
Black	23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53	Fill these DIMM slots last



P8E1C550-0

Figure 19. 8348-21C memory slot locations

Installing memory in the 8348-21C

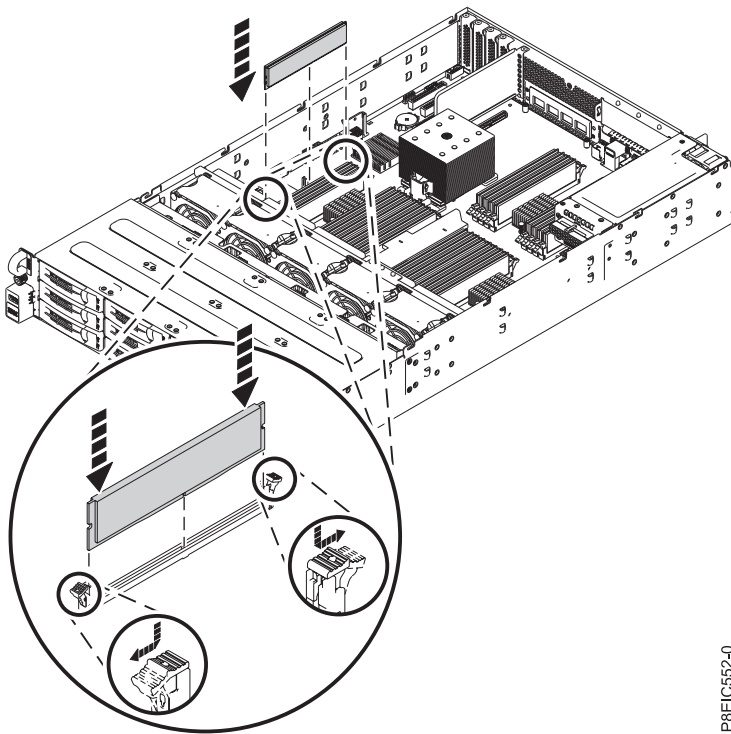
Learn how to install memory in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

Attention:

- Attach an electrostatic discharge (ESD) wrist strap to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
 - When using an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. Determine the slot in which you want to install the memory. See “Placement rules for memory in the 8348-21C system” on page 19 to understand the plugging rules and ensure that the memory are plugged in the correct sequence.
 3. Push the locking tabs away from the socket, in the direction that is shown in Figure 20.



P8E1C552-0

Figure 20. Opening the DIMM locking tabs and inserting memory

4. Install the memory DIMM.
 - a. Grasp the memory DIMM along its edges and align it with the slot on the system backplane.
Attention: Memory is keyed to prevent it from being installed incorrectly. Note the location of the key tab within the memory connector before you attempt to install it.
 - b. Press firmly on each side of the memory DIMM until the locking tab locks in place with an audible click.
5. Repeat steps 3 and 4 for any additional memory to be installed.

Installing a PCIe adapter in the 8348-21C

Learn how to install a PCIe adapter in the IBM Power System S812LC (8348-21C) system.

PCIe adapter placement rules and slot priorities for the 8348-21C

Find information about the placement rules and slot priorities for the Peripheral Component Interconnect (PCI) Express (PCIe) adapters that are supported for the 8348-21C system.

PCIe slot descriptions for the 8348-21C

The 8348-21C system provides PCIe generation 3 slots. Figure 21 shows the rear view of the system with the PCIe adapter slots. Table 5 lists the PCIe adapter slot locations and details for the 8348-21C system.

- The half-height, half-length or short (low-profile) adapters can be installed in slots 1, 2, and 4.
- The half-height, full-length adapters can be installed only in slot 3.

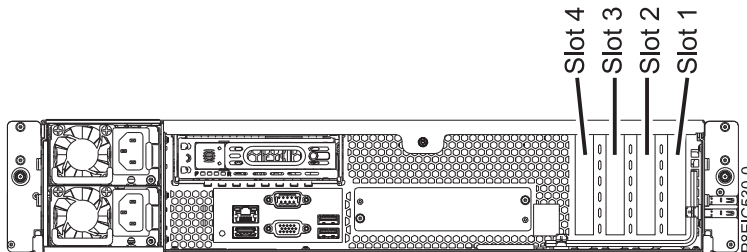


Figure 21. Rear view of an 8348-21C system with PCIe slots indicated

Table 5. PCIe slot locations and descriptions for the 8348-21C system

Slot	Description	PCI host bridge (PHB)	Adapter size	Coherent Accelerator Processor Interface (CAPI)
1 ¹	PCIe3, x8	Processor Module 1, S2P17	Half-height, half-length	No
2 ¹	PCIe3, x8	Processor Module 1, S2P16	Half-height, half-length	No
3	PCIe3, x16	Processor Module 1, PHB0	Half-height, full-length	Yes
4 ¹	PCIe3, x8	Processor Module 2, PHB2	Half-height, half-length	Yes

¹Slots 1, 2, and 4 are x8 slots. The adapter priority for these slots is for the high-performance adapters followed by any other adapter.

PCIe adapter placement rules

Use this information to select slots for installing PCIe adapters in the 8348-21C system. Table 6 on page 24 provides information about the adapters, the slot priorities in the system they are supported on, and the maximum number of adapters that can be installed in the supported system. You can click the link that appears in the feature code column for more technical information specific to the PCIe adapter.

Table 6. PCIe adapter slot priorities and maximum adapters supported in the systems. This table shows the PCIe adapter slot priorities and maximum adapters that are supported in the systems

Feature code	Description	8348-21C	
		Slot priorities	Maximum number of adapters supported
5260	<p>PCIe2 LP 4-port 1 GbE Adapter (FC 5260; CCIN 576F); Adapter FRU number: 74Y4064</p> <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet <p>OS support: Red Hat Linux, Ubuntu, and PowerKVM operating systems</p>	4, 3, 2, 1	4
EC3A	<p>PCIe3 LP 2-Port 40 GbE NIC RoCE QSFP+ Adapter (FC EC3A; CCIN 57BD); Adapter FRU number: 000FW105</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 3, x8 • Extra-high bandwidth, low latency 40 Gb Ethernet • Supports NIC and RoCE services <p>OS support: Red Hat Linux, Ubuntu, and PowerKVM operating systems</p>	4, 3, 2, 1	4
EC3S	<p>PCIe Gen3 SAS/SATA RAID adapter with 16 internal native ports, 12 Gbs, low-profile, short form factor (FC EC3S); Adapter FRU number: 00WV555</p> <ul style="list-style-type: none"> • Supported RAID levels: 0, 1, 1E, 5, 6, 10, 50, 60 and Hybrid RAID 1 and 10 • Cache memory = 1024 MB <p>OS support: Red Hat Linux, Ubuntu, and PowerKVM operating systems</p>	4 ¹	1 ¹
EC3Y	<p>PCIe Gen3 x8, LP adapter, SAS/SATA/RAID controller (FC EC3Y); Adapter FRU number: 00WV553</p> <ul style="list-style-type: none"> • Supported RAID levels: 0, 1, 1E, 10, and Hybrid RAID 1 and 10 • Volatile cache memory = 256 MB <p>OS support: Red Hat Linux, Ubuntu, and PowerKVM operating systems</p>	4	1
EL2N	<p>8 Gb PCI Express Dual-port Fibre Channel Adapter (FC EL2N; CCIN 577D); Adapter FRU number: 10N9824</p> <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 <p>OS support: Red Hat Linux, Ubuntu, and PowerKVM operating systems</p>	4, 3, 2, 1	4
EL3Z	<p>PCIe2 LP 2-port 10 GbE BaseT RJ45 Adapter (FC EL3Z; CCIN 2CC4); Adapter FRU number: 00E2714; regular-height tailstock part number: 00E2862; low-profile tailstock part number: 00E2721</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Two 10 Gb RJ45 ports • Local area network (LAN) adapter <p>OS support: Red Hat Linux, Ubuntu, and PowerKVM operating systems</p>	4, 3, 2, 1	4

Table 6. PCIe adapter slot priorities and maximum adapters supported in the systems (continued). This table shows the PCIe adapter slot priorities and maximum adapters that are supported in the systems

Feature code	Description	8348-21C	
		Slot priorities	Maximum number of adapters supported
EN0T	<p>PCIe2 LP 4-port (10 Gb + 1 GbE) SR+RJ45 Adapter (FC EN0T; CCIN 2CC3); Adapter FRU number: 00E2715; low-profile tailstock part number: 00E2720</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Two 10 Gb SR optical ports and two 1 Gb RJ45 ports • NIC network convergence adapter • Local area network (LAN) adapter <p>OS support: Red Hat Linux, Ubuntu, and PowerKVM operating systems</p>	4, 3, 2	3 ²
<p>¹PCIe tailstock bracket to mount supercap pack for this adapter utilizes PCIe slot 1.</p> <p>²Physical interference in slot 1 reduces maximum to 3.</p>			

Installing PCIe adapters in the 8348-21C

Learn how to install Peripheral Component Interconnect (PCI) Express (PCIe) adapters in the IBM Power System S812LC (8348-21C).

Before you begin

Power off the system and place it in the service position. For instructions, see “Preparing the system to remove and replace internal parts in the 8348-21C” on page 59.

About this task

See “PCIe adapter placement rules and slot priorities for the 8348-21C” on page 23 for information and capabilities of the PCIe slots.

Attention: For safety and airflow purposes, if you remove parts from the system, you must ensure that PCIe tailstock fillers are present.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Pick the correct slot for the PCIe adapter. See Figure 22.

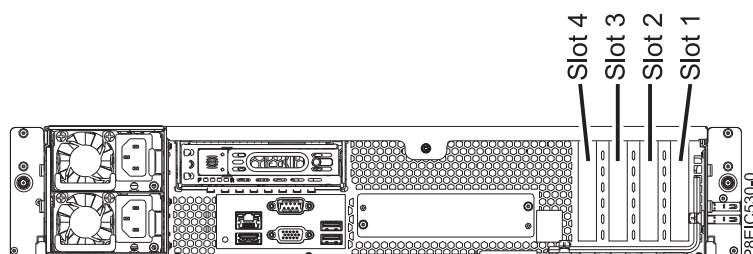
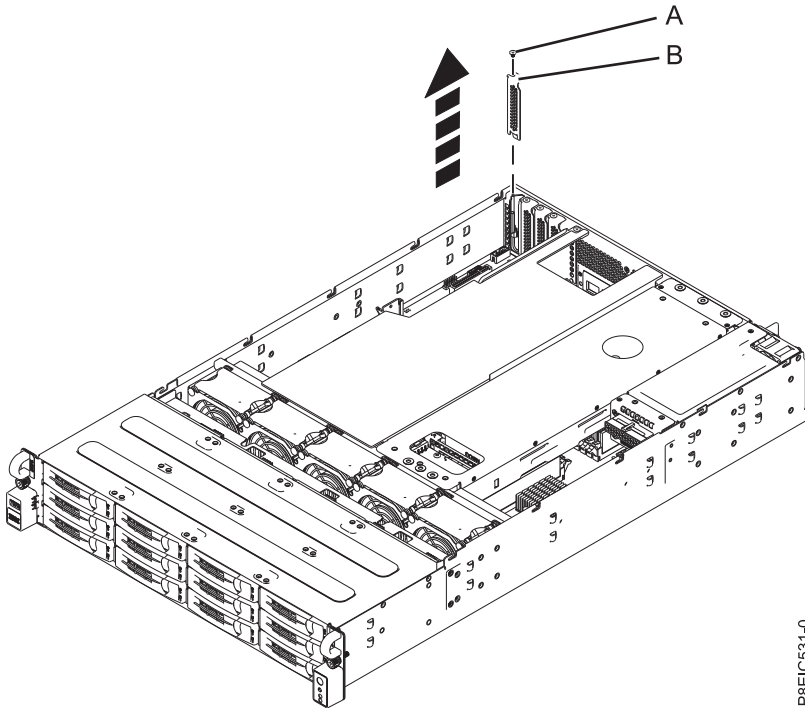


Figure 22. 8348-21C PCIe adapter slots

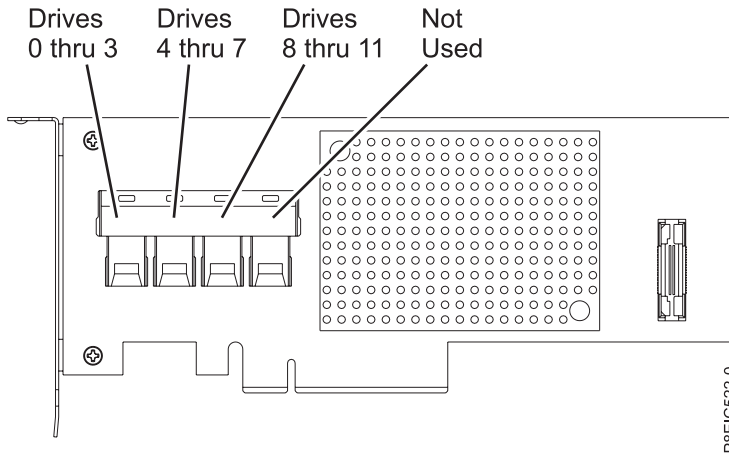
3. Remove the retaining screw (A) and remove the PCIe slot cover (B). See Figure 23 on page 26. Keep the retaining screw.



P8EIC531-0

Figure 23. Removing the PCIe slot cover

4. If you are installing a (FC EC3Y) PCIe Gen3 x8, LP adapter, SAS/SATA/RAID adapter, complete this step. Otherwise skip this step and go to step 5 on page 28.
 - a. Connect the disk drive signal cables to the adapter before installing the adapter. See Figure 24.



P8EIC522-0

Figure 24. Cabling the (FC EC3Y) PCIe Gen3 x8, LP adapter

- b. Insert the (FC EC3Y) PCIe Gen3 x8, LP adapter into the system backplane PCIe adapter slot, aligning it properly and inserting it fully into the slot.
- c. Insert the retaining screw **(B)** and tighten it to secure the (FC EC3Y) PCIe Gen3 x8, LP adapter **(A)** in the system, as shown in Figure 25 on page 27.

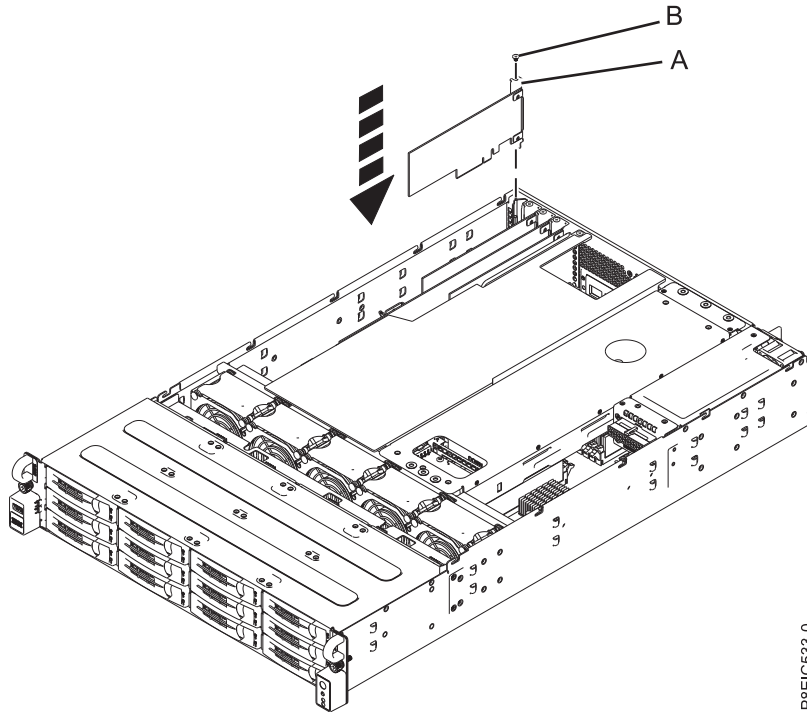


Figure 25. Installing the (FC EC3Y) PCIe Gen3 x8, LP adapter (A) and screw (B) in the system

- d. Do not damage the adapters or cables.

Note: Remove any existing cable ties as they can prevent proper cable layout and interfere with the top cover.

- Do not tie the cables together.
- Route the disk drive signal cables along the top of the PCIe adapters to keep the cables from damaging the adapters.
- Do not route the cables between the adapters.
- Spread the cables to ensure that the service access cover can be closed without pinching the cables. See Figure 26 on page 28.

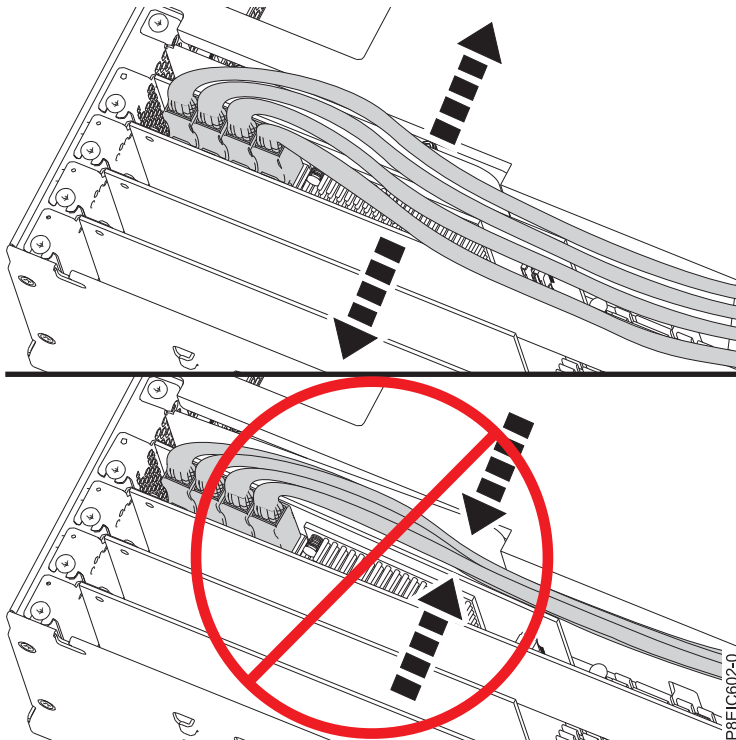
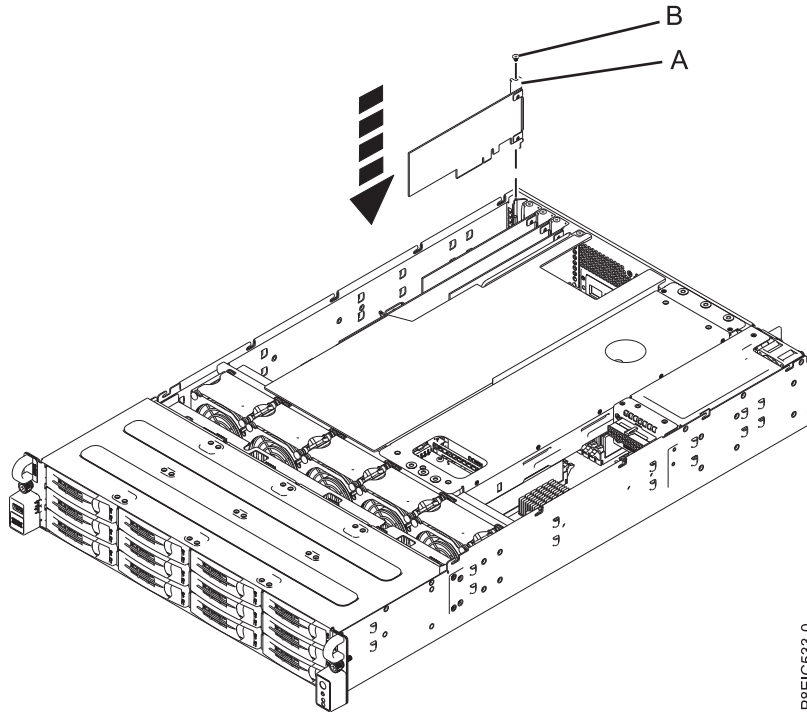


Figure 26. Disk drive signal cable routing

- e. Go to step 10 on page 32.
5. If you are installing a (FC EC3S) PCIe Gen3 SAS/SATA RAID adapter, complete this step. Otherwise skip this step and go to step 6 on page 31.

Note: The supercapacitor module card is shipped together with the (FC EC3S) PCIe Gen3 SAS/SATA RAID adapter as a single FRU and therefore must also be installed when the SAS RAID adapter is installed.

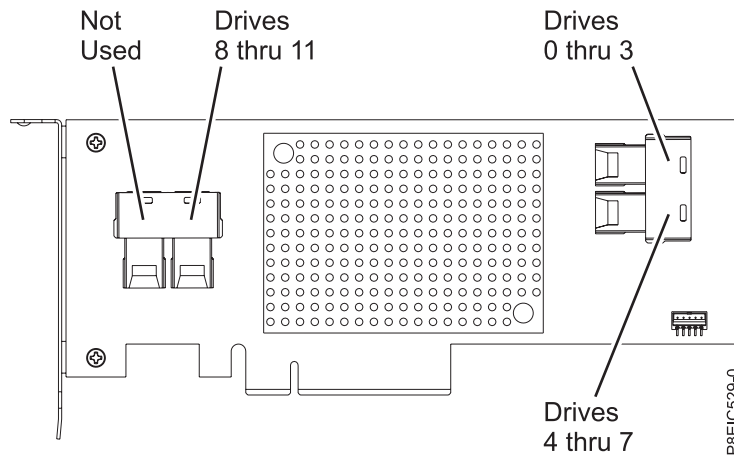
- a. Insert the supercapacitor module card into the system backplane PCIe adapter slot, aligning it properly and inserting it fully into the slot.
- b. Insert the retaining screw and tighten it to secure the supercapacitor module card in the system, as shown in Figure 27 on page 29.



P8EIC533-0

Figure 27. Installing the supercapacitor module card (A) and screw (B)

- c. Connect the disk drive signal cables to the (FC EC3S) PCIe Gen3 SAS/SATA RAID adapter before installing the adapter. See Figure 28.



P8EIC529-0

Figure 28. Cabling the (FC EC3S) PCIe Gen3 SAS/SATA RAID adapter

- d. Connect the cable that is attached to the supercapacitor module card.
- e. Insert the (FC EC3S) PCIe Gen3 SAS/SATA RAID adapter (A) into the system backplane PCIe adapter slot, aligning it properly and inserting it fully into the slot.
- f. Insert the retaining screw (B) and tighten it to secure the PCIe adapter in the system, as shown in Figure 29 on page 30.

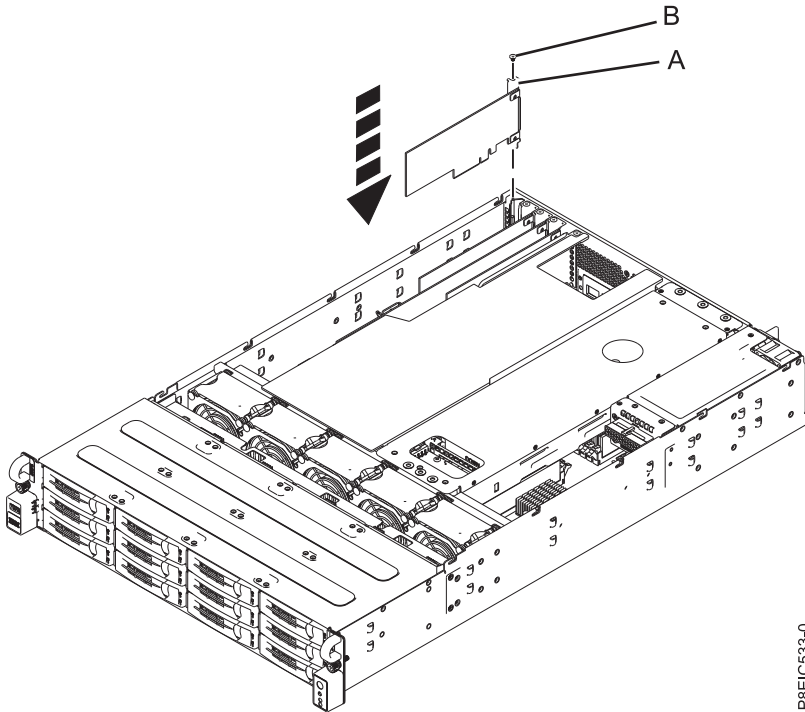


Figure 29. Installing the (FC EC3S) PCIe Gen3 SAS/SATA RAID adapter (A) and screw (B)

- g. Route the disk drive signal cables along the top of the PCIe adapters to keep the cables from damaging the adapters. Do not route the cables between the adapters. Spread the cables to ensure that the service access cover can be closed without pinching the cables. See Figure 30 on page 31 for an example of how to route the cables along the top of the PCIe adapters. Your cable connections may differ from Figure 30 on page 31, but how the cable is routed along the top of the PCIe adapters will not differ.

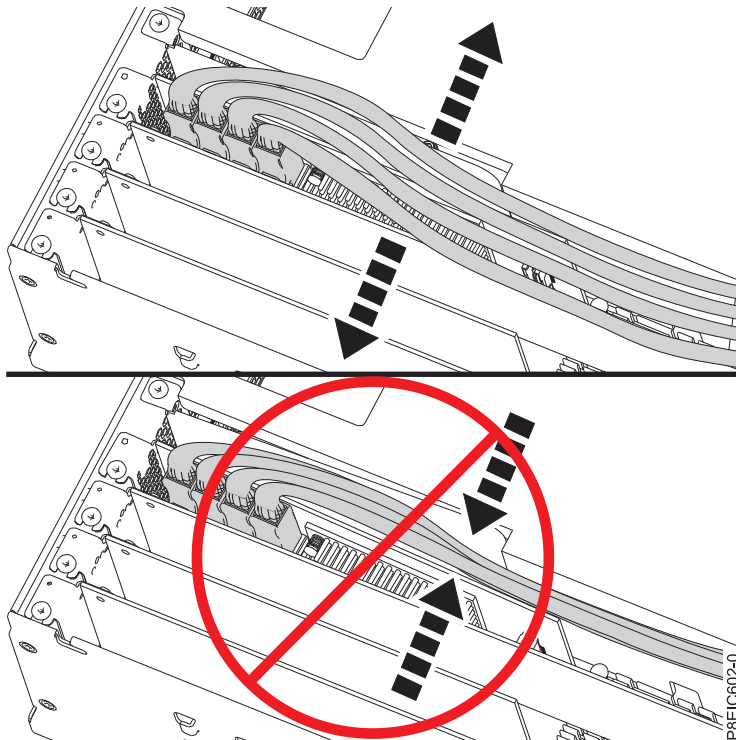
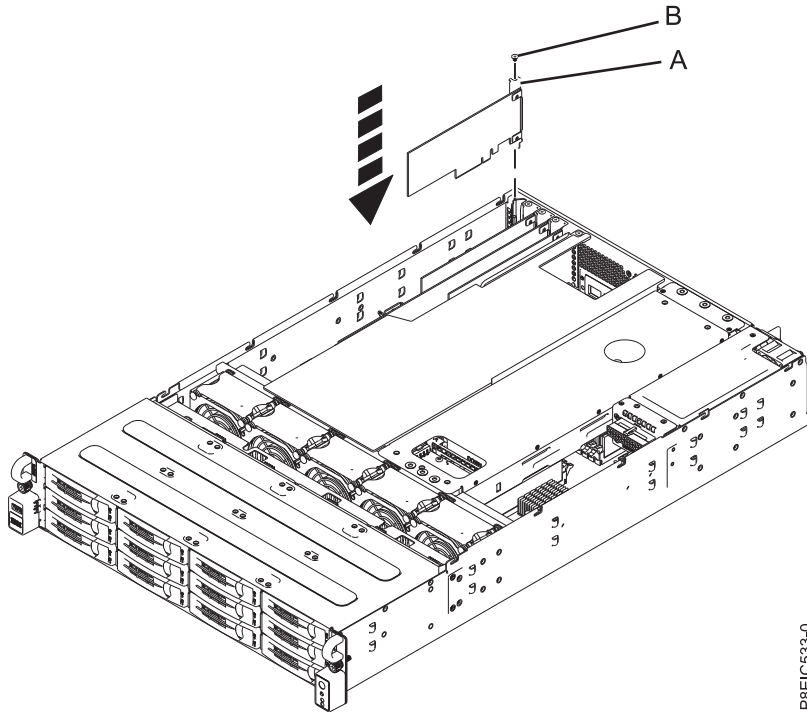


Figure 30. Disk drive signal cable routing

- h. Go to step 10 on page 32.
6. If needed, label and remove any plugs that extend out of the PCIe adapter.
7. Insert the PCIe adapter (A) into the PCIe slot in the system backplane, aligning it properly and inserting it fully into the slot.
8. Insert the retaining screw (B) and tighten it to secure the PCIe adapter in the system, as shown in Figure 31 on page 32.



P8E1C533-0

Figure 31. Installing the PCIe adapter (A) and screw (B)

9. Using your labels, replace any plugs that you removed from the PCIe adapter. Insert the cables into the PCIe adapter.
10. The procedure is complete.

What to do next

Prepare the system for operation. For instructions, see “Preparing the system for operation after removing and replacing internal parts for the 8348-21C” on page 61.

PCIe adapters feature code list

Find information about using and managing the Peripheral Component Interconnect (PCI) Express (PCIe) adapters for the 8348-21C system. Also, find information about specifications and installation notes for specific adapters.

PCIe2 LP 4-port 1GbE Adapter (FC 5260; CCIN 576F)

Learn about the specifications and operating system requirements for the feature code (FC) 5260 adapters.

Overview

FC 5260 and FC 5899 are both the same adapter with different feature codes. FC 5260 is a low-profile adapter and the FC 5899 is a full-height adapter. The names of these two adapters are:

- FC 5260: PCIe2 LP 4-port 1GbE Adapter
- FC 5899: PCIe2 4-port 1GbE Adapter

The PCIe2 LP 4-port 1GbE Adapter is a short, low-profile, generation-2 PCIe adapter. This adapter provides four 1-Gb Ethernet ports that can be configured to run at 1000 megabits per second (Mbps) (or 1 gigabit per second (Gbps)), 100 Mbps, or 10 Mbps. The adapter connects to a network that uses unshielded twisted pair (UTP) cable for distances of up to 100 meters (328.08 feet). The adapter supports

AIX® Network Installation Management (NIM) boot capability. The adapter conforms to the IEEE 802.3ab 1000Base-T standard. The adapter supports jumbo frames when running at the 1000 Mbps speed.

Each of the Ethernet ports can be connected by using:

- CAT5e (or later) UTP cables for 1000 Mbps network attachment
- CAT5 or CAT3 UTP cables for 100 Mbps or 10 Mbps network attachment

The cables are attached to the copper RJ45 connectors. Each port is independent of one another and supports full-duplex or half-duplex. The half-duplex mode does not support a speed of 1000 Mbps.

The adapter provides the following features:

- Supports interrupt moderation to deliver increased performance while significantly reducing processor utilization
- Supports dual port operation in almost any PCIe slot, except x1
- Supports auto-negotiation, full-duplex only
- Supports integrated media-access control (MAC) and physical layer (PHY)
- Supports Fast EtherChannel (FEC) with the existing software
- Supports gigabit EtherChannel (GEC) with the existing software
- Supports IEEE 802.3ad (Link Aggregation control protocol)
- Supports IEEE 802.1Q VLANs
- Supports IEEE 802.3 z, ab, u, x flow control support
- Supports IEEE 802.1p
- Supports IEEE 802.3ab for TX
- Supports TCP checksum offload transmission control protocol (TCP), user datagram protocol (UDP), Internet Protocol (IP) for IPv4 and IPv6
- Supports TCP segmentation or large send offload
- Supports EEPROM-SPI and single EEPROM
- Supports interrupt levels INTA and MSI
- Hardware certifications FCC B, UL, CE, VCCI, BSMI, CTICK, MIC
- Network Controller (MAC) Intel 82571EB
- Compliant with European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment

Specifications

Item Description

Adapter FRU number

74Y4064 (Designed to comply with RoHS requirement)

Wrap plug

10N7405

I/O bus architecture

PCIe2.0 x4

Slot requirement

One PCIe x4 (low-profile) slot.

Cables

4-pair, CAT5e, UTP cables are connected to copper RJ45 connectors.

Voltage

3.3 V

Form factor

short, low-profile

Maximum number

For details about the maximum number of adapters that are supported, see PCIe adapter

placement rules and slot priorities(http://www.ibm.com/support/knowledgecenter/POWER8/p8eab/p8eab_mtm_pciplacement.htm) and select the system you are working on.

Connector information

- Two RJ-45 ports
- Two LED adapter status indicators per port, for link activity and speed

Attributes provided

- PCIe x4, generation-1 or generation-2
- 4-Port machine access code (MAC)
- High performance IPV4/IPV6 checksum offload
- Supports large send and large receive
- Multiple queues
- VIOS

The following figure shows the adapter.

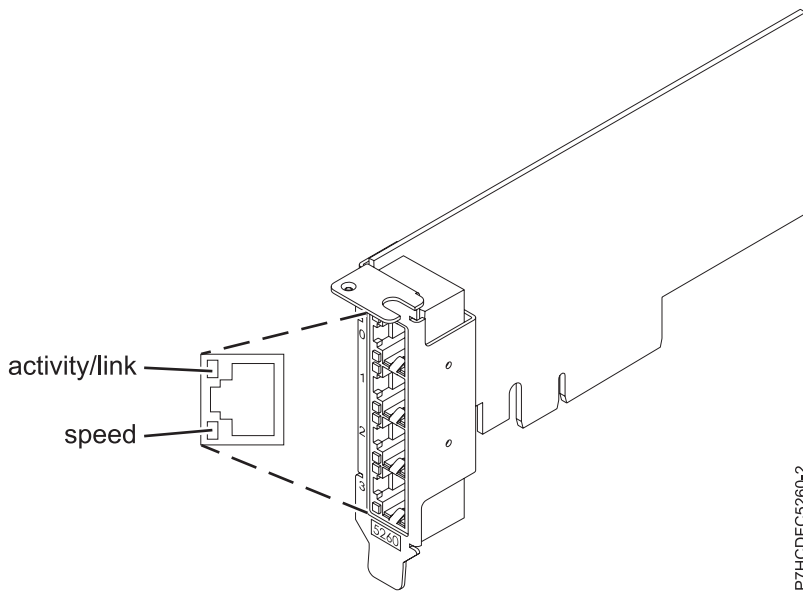


Figure 32. Adapter

Adapter LED states

The LEDs on the adapter provide information about the operation status of the adapter. The LEDs are visible through the mounting bracket. Figure 32 shows the location of the LEDs. Table 7 describes the different LED states and what those states indicate.

Table 7. Adapter LEDs and descriptions

LED	Light	Description
Speed	Yellow	10 Mbps or 100 Mbps
	Green	1000 Mbps or 1 Gbps
Activity/link	Green flashing	Active link or data activity
	Off	No link The absence of a link can indicate a defective cable, defective connector, or a configuration mismatch.

For details about slot priorities and placement rules, see PCIe adapter placement rules and slot priorities(<http://www.ibm.com/support/knowledgecenter/POWER8/p8eab/>)

p8eab_mtm_pciplacement.htm) and select the system you are working on.

Operating system or partition requirements

The adapter is supported on the following versions of the operating systems, depending on the system you are using:

- AIX
 - AIX 7.1, Technology Level 3, Service Pack 2, or later
 - AIX 6.1, Technology Level 8, Service Pack 3, or later
 - AIX Version 5.3, Technology Level 12, or later
- Linux
 - Red Hat Enterprise Linux Version 7, or later, with current maintenance updates available from Red Hat.
 - Red Hat Enterprise Linux Version 6.4, or later, with current maintenance updates available from Red Hat.
 - SUSE Linux Enterprise Server Version 12, or later
 - SUSE Linux Enterprise Server 11, Service Pack 2, or later, with current maintenance updates available from SUSE.
 - Ubuntu Server 14.04.3, or later
 - For support details, see the Linux Alert website (www14.software.ibm.com/webapp/set2/sas/f/lopdiags/info/LinuxAlerts.html).
 - The latest version of the device driver or iprutils can be downloaded from IBM Service and Productivity Tools website (<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html>).
- IBM i
 - IBM i Version 7.2 or later
 - IBM i Version 7.1, or later
- VIOS
 - VIOS support requires VIOS 2.2.1.4, or later.
- PowerKVM
 - IBM PowerKVM 2.1.1, or later

PCIe3 LP 2-Port 40 GbE NIC RoCE QSFP+ Adapter (FC EC3A; CCIN 57BD)

Learn about the specifications and operating system requirements for the feature code (FC) EC3A adapter.

Overview

The PCIe3 LP 2-Port 40 GbE NIC RoCE QSFP+ Adapter is a low-profile, PCIe generation-3 (PCIe3), dual port, 40-Gigabit Ethernet (GbE) adapter with a PCIe 3.0 host bus interface. The adapter acts as a network interface controller (NIC) and uses the IBTA RDMA over Converged Ethernet (RoCE) protocols to provide efficient Remote Direct Memory Access (RDMA) services. The adapter delivers high-bandwidth and low-latency 40 GbE connectivity, reducing the load on the processor and efficiently using the memory access. This action off-loads the processor from networking tasks which improves the performance and scalability of the processor.

The adapter is optimized for enterprise data centers, high-performance computing, transaction databases, cloud computing, virtualization, storage, and other embedded environments. The adapter improves network performance by increasing available bandwidth to the processor and by providing enhanced performance. The adapter provides dedicated adapter resources and protection for virtual machines (VM). The link aggregation and failover features of the adapter are ideal for critical network applications that require redundancy and high availability.

The two 40 Gb quad (4-channel) small form-factor pluggable (QSFP+) transceiver ports are used for connectivity with other servers or switches in the network. Each QSFP+ port provides Ethernet connectivity with a nominal data rate of 40 gigabits per second (Gbps).

The adapter does not include transceivers. Use copper cables with QSFP+ 40G BASE-SR transceivers for short distances. See “Cables” on page 37 for more information about the cables.

For details about slot priorities and placement rules, see PCIe adapter placement rules and slot priorities(http://www.ibm.com/support/knowledgecenter/POWER8/p8eab/p8eab_mtm_pciplacement.htm) and select the system you are working on.

The adapter provides the following features:

- Data center bridging support (IEEE standard version CEE)
- T11.3 FC-BB-5 FCoE
- TCP/IP stateless offload in hardware
- Traffic steering across multiple cores
- Hardware-based Single root I/O virtualization (SR-IOV) capable
- Intelligent interrupt coalescence
- Advanced Quality of Service (QoS)
- RoHS-R6 compliant
- RDMA over Ethernet using uDAPL

The adapter provides Ethernet NIC support with the following features:

- 64-bit kernel environments
- multi-processor safe
- AIX Common Data Link Interface (CDLI) compliant
- Concurrent operation of NIC and RoCE device drivers while sharing the same physical port
- Standard frames (1518 bytes + 4 bytes for VLAN tag)
- Jumbo frames (9018 bytes + 4 bytes for VLAN tag)
- IPV4 or IPV6 transmit/receive TCP checksum offload
- IPV4 transmit TCP segmentation offload (commonly known as large send)
- IPV4 receive TCP segmentation aggregation (commonly known as large receive)
- Enhanced Error Handling (EEH) from PCI bus errors

Figure 33 on page 37 shows the adapter.

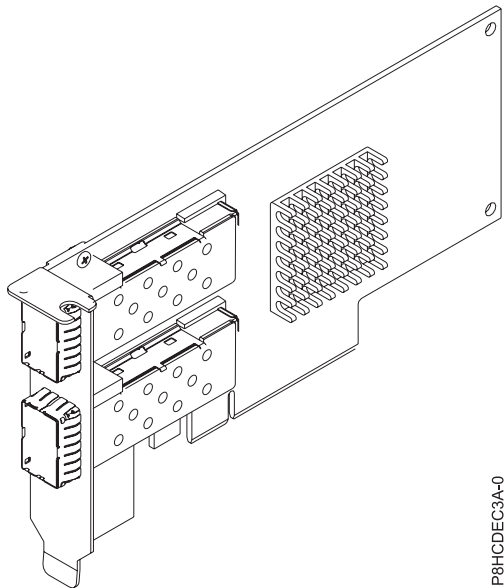


Figure 33. FC EC3A adapter

Specifications

Item Description

Adapter FRU number

000FW105 (Designed to comply with RoHS requirement)

I/O bus architecture

PCIe3 x8

Slot requirement

For details about slot priorities and placement rules, see PCIe adapter placement rules and slot priorities(http://www.ibm.com/support/knowledgecenter/POWER8/p8eab/p8eab_mtm_pciplacement.htm) and select the system you are working on.

Cables

See “Cables” for details.

Voltage

3.3 V

Form factor

Short

Maximum number

For details about the maximum number of adapters that are supported, see PCIe adapter placement rules and slot priorities(http://www.ibm.com/support/knowledgecenter/POWER8/p8eab/p8eab_mtm_pciplacement.htm) and select the system you are working on.

Cables

This adapter feature requires the use of compatible QSFP+, 40 Gbps, copper, twinaxial, active, Ethernet cables for cabling over short distances. See Figure 34 on page 38 for different views of the QSFP+ copper cable. For distances over 5 meters, use two optical QSFP+ SR transceivers (FC EB27) that attach to optical cables FC EB2J or FC EB2K. See Table 8 on page 38 for details about the feature codes.

Do not mix copper and optical cables on the same adapter.

These cables are compliant with industry standard specifications SFF-8431 Rev 4.1 and SFF-8472 Rev 10.4, and all applicable IBM requirements.

Note: These cables are EMC Class A compliant.

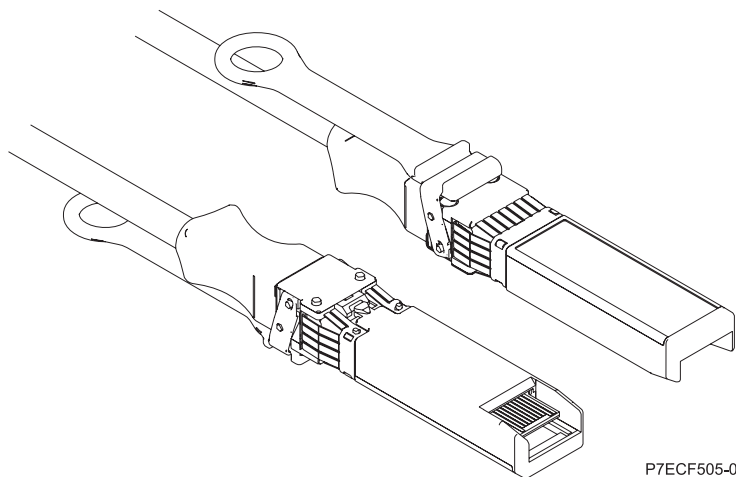


Figure 34. Top and bottom view of the cable

Table 8. Feature code and part number for varying lengths of the cable

Cable length	Feature code	CCIN	Part number
Copper cables			
1 m (3.28 ft)	EB2B		49Y7934
3 m (9.84 ft)	EB2H		49Y7935
5 m (16.4 ft)	ECBN		000D5809
Optical cables			
10 m (32.8 ft)	EB2J		41V2458
30 m (98.4 ft)	EB2K		45D6369
QSFP+ 40G BASE-SR transceiver	EB27		49Y7928

Operating system or partition requirements

If you are installing a new feature, ensure that you have the software that is required to support the new feature and that you determine whether there are any prerequisites for this feature and attaching devices. To check for the prerequisites, see IBM Prerequisite website (www-912.ibm.com/e_dir/eServerPrereq.nsf).

The adapter is supported on the following versions of the operating systems, depending on the system you are using:

- AIX
 - AIX 7.1, or later
 - AIX Version 6.1, or later
- Linux
 - Red Hat Enterprise Linux Version 7, or later, with current maintenance updates available from Red Hat.
 - Red Hat Enterprise Linux Version 6.5, or later, with current maintenance updates available from Red Hat.
 - SUSE Linux Enterprise Server Version 12, or later
 - SUSE Linux Enterprise Server 11, Service Pack 3, or later, with current maintenance updates available from SUSE.
 - Ubuntu Server 14.04.3, or later

- For support details, see the Linux Alert website (www14.software.ibm.com/webapp/set2/sas/f/lopdiags/info/LinuxAlerts.html).
- The latest version of the device driver or iprutils can be downloaded from IBM Service and Productivity Tools website (<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html>).
- Supported on Firmware level 8.1
- PowerKVM
 - IBM PowerKVM 2.1.1, or later

PCIe3 low profile 12 Gb SAS/SATA RAID adapter with 1 GB protected write cache (FC EC3S - PMC 81605Z)

Learn about the specifications and operating system requirements for the feature code (FC EC3S - PMC 81605Z) adapter.

Overview

The PCIe Gen3 SAS/SATA RAID Adapter is a low-profile, PCIe generation-3 (PCIe3) x8 adapter with a 1 GB protected write cache. The adapter has four internal connections each of which has four x1 ports, allowing it to support up to 16 drives. The adapter supports RAID (0, 1, 1E, 5, 6, 10, 50, 60), Hybrid RAID (1, 10), and the hot plug of its attached drives. The adapter's super capacitors provide protection of the write cache in case of power loss.

Note: The adapter can connect to the 12 internal (front) disk bays on the 8348-21C. SATA devices are supported at up to 6 Gb/s per port.

For details about slot priorities and placement rules, see “PCIe adapter placement rules and slot priorities for the 8348-21C” on page 23.

The adapter provides the following RAID features:

- Flexible Configuration: HBA Mode and Auto Volume Mode for automatic deployment
- Optimized Disk Utilization (multiple arrays per disk)
- Supports up to 256 SAS or SATA devices that use SAS expanders
- Support for native 4 K sector SAS and SATA devices in addition to 512-byte sector devices
- Hybrid RAID 1 and 10
- Quick initialization
- Online Capacity Expansion
- Copyback Hot Spare
- Dynamic caching algorithm
- Native Command Queuing (NCQ)
- Background initialization
- Hot-plug drive support
- RAID Level Migration
- Hot spares - global, dedicated, and pooled
- Automatic and manual rebuild of hot spares
- SES and SAF-TE enclosure management
- Configurable stripe size
- S.M.A.R.T. support
- Multiple arrays per disk drive
- Dynamic sector repair
- Staggered drive spin-up

- Bootable array support
- Support for tape devices, autoloaders
- MSI-X support for all device driver for all supported operating systems
- Secure boot support for the uEFI host BIOS
- USB image available to boot maxView Storage Manager
- GUI from any USB device for enhanced GUI-based setup and offline maintenance
- Offline maintenance

Utilities

The adapter can use the following management utilities:

- Adaptec(r) maxView Storage Manager
IBM highly recommends that you use the maxView Storage Manager utility to configure and manage the storage that is controlled by a PMC adapter or adapters. Once the maxView Storage Manager utility is installed and running, it can be configured to automatically monitor and report issues such as disk failures. If you do not install the maxView Storage Manager utility, you need to use manual tools such as the ARCCONF command line utility. ARCCONF does not offer the automatic monitoring and reporting of issues such as disk failures.

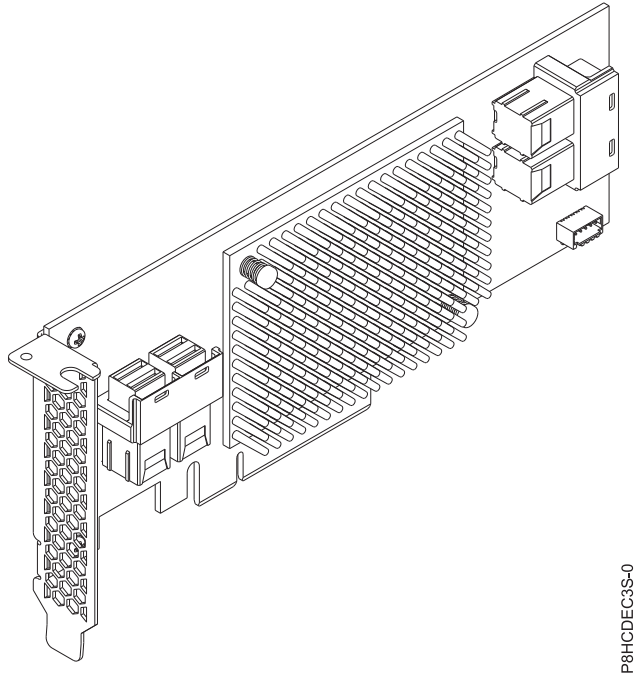
The maxView Storage Manager includes the following options:

- Web-based GUI Management utility
- Remote configuration, monitoring, and notification
- Remote firmware updates including adapter and FW updates
- SMI-S Support
- SMTPARCCONF

Important:

- It is recommended that you install the maxView Storage Manager utility if you are using the Red Hat Enterprise Linux or IBM PowerKVM operating systems.
- The maxView Storage Manager utility is not currently supported on Ubuntu.
- To download the maxView Storage Manager utility, see the PMC Adaptec(<http://i.adaptec.com/power>) website.
- Arccconf:
 - Command Line Interface
 - SMI-S support for VMware

Figure 35 on page 41 shows the adapter.



P8HCDEC3S-0

Figure 35. FC EC3S adapter (PMC 81605Z)

Specifications

Item Description

Adapter FRU number

00WV554 (Designed to comply with RoHS requirement)

I/O bus architecture

PCIe3 x8

Slot requirement

For details about slot priorities and placement rules, see “PCIe adapter placement rules and slot priorities for the 8348-21C” on page 23.

Cables

Internal mini-SAS cables are included with the system and can be connected to the adapter SAS HD connectors as needed.

Voltage

3.3 V

Form factor

Short

Maximum number

For details about the maximum number of adapters that are supported, see “PCIe adapter placement rules and slot priorities for the 8348-21C” on page 23.

Operating system or partition requirements

If you are installing a new feature, ensure that you have the software that is required to support the new feature and that you determine whether there are any prerequisites for this feature and attaching devices. To check for the prerequisites, see IBM Prerequisite website (www-912.ibm.com/e_dir/eServerPrereq.nsf).

The adapter is supported on the following versions of the operating systems, depending on the system you are using:

- Bare Metal Systems (FC EC16):
 - Linux:

- Ubuntu Server 14.04.3 or later with aacraid device driver X.Y.Z
- Red Hat Enterprise Linux 7.2, little endian, for Power, or later with aacraid device driver X.Y.Z
- For support details, see the Linux Alert website (www14.software.ibm.com/webapp/set2/sas/f/lopdiags/info/LinuxAlerts.html).
- The latest version of the device driver or iprutils can be downloaded from IBM Service and Productivity Tools website (<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html>).
- PowerKVM 3.1 Systems (FC EC40):
 - Virtualized resources served to guest partitions
 - PCI pass-through direct to guests not supported

PCIe3 low profile 6 Gb SAS/SATA RAID adapter (FC EC3Y - PMC 71605E)

Learn about the specifications and operating system requirements for the feature code (FC EC3Y - PMC 71605E) adapter.

Overview

The PCIe Gen3 SAS/SATA RAID Adapter is a low-profile, PCIe generation-3 (PCIe3) x8 adapter with a 256 MB volatile write cache. The adapter has four internal connections each of which has four x1 ports, allowing it to support up to 16 drives. The adapter supports RAID (0, 1, 1E, 10) and the hot plug of its attached drives.

Note: Cache content is lost if a problem such as a power failure occurs.

The adapter provides the following RAID features:

- Optimized Disk Utilization
- Hybrid RAID levels: 0, 1, 1E, 10
- HBA Mode and Simple Volume Mode for automatic deployment
- Supports up to 256 SAS or SATA devices that use SAS expanders
- Support for native 4 K sector SAS and SATA devices in addition to 512-byte sector devices
- Hybrid RAID 1 and 10
- Quick initialization
- Online Capacity Expansion
- Copyback Hot Spare
- Dynamic caching algorithm
- Native Command Queuing (NCQ)
- Background initialization
- Hot-plug drive support
- RAID Level Migration
- Hot spares - global, dedicated, and pooled
- Automatic and manual rebuild of hot spares
- SES and SAF-TE enclosure management
- Configurable stripe size
- S.M.A.R.T. support
- Multiple arrays per disk drive
- Dynamic sector repair
- Staggered drive spin-up
- Bootable array support
- Support for tape devices and autoloaders

Utilities

The adapter can use the following management utilities:

- Adaptec(r) maxView Storage Manager

IBM highly recommends that you use the maxView Storage Manager utility to configure and manage the storage that is controlled by a PMC adapter or adapters. Once the maxView Storage Manager utility is installed and running, it can be configured to automatically monitor and report issues such as disk failures. If you do not install the maxView Storage Manager utility, you need to use manual tools such as the ARCCONF command line utility. ARCCONF does not offer the automatic monitoring and reporting of issues such as disk failures.

The maxView Storage Manager includes the following options:

- Web-based GUI Management utility
- Remote configuration, monitoring, and notification
- Remote firmware updates including adapter and device FW updates
- SMI-S Support
- SMTPARCCONF

Important:

- It is recommended that you install the maxView Storage Manager utility if you are using the Red Hat Enterprise Linux or IBM PowerKVM operating systems.
- The maxView Storage Manager utility is not currently supported on Ubuntu.
- To download the maxView Storage Manager utility, see the PMC Adaptec(<http://i.adaptec.com/power>) website.

- Arconf:

- Command Line Interface
- SMI-S support for VMware

Figure 36 on page 44 shows the adapter.

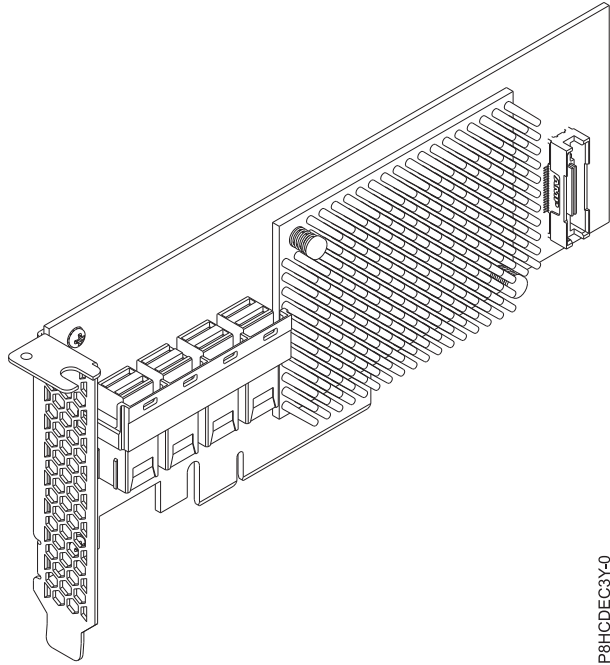


Figure 36. FC EC3Y adapter (PMC 71605E)

Specifications

Item Description

Adapter FRU number

00WV552 (Designed to comply with RoHS requirement.)

I/O bus architecture

PCIe3 x8

Slot requirement

For details about slot priorities and placement rules, see “PCIe adapter placement rules and slot priorities for the 8348-21C” on page 23.

Cables

Internal mini-SAS cables are included with the system and can be connected to the adapter SAS HD connectors as needed.

Voltage

3.3 V

Form factor

Short

Maximum number

For details about the maximum number of adapters that are supported, see “PCIe adapter placement rules and slot priorities for the 8348-21C” on page 23.

Operating system or partition requirements

If you are installing a new feature, ensure that you have the software that is required to support the new feature and that you determine whether there are any prerequisites for this feature and attaching devices. To check for the prerequisites, see IBM Prerequisite website (www-912.ibm.com/e_dir/eServerPrereq.nsf).

The adapter is supported on the following versions of the operating systems, depending on the system you are using:

- Bare Metal Systems (FC EC16):
 - Linux:

- Ubuntu Server 14.04.3 or later with aacraid device driver X.Y.Z
 - Red Hat Enterprise Linux 7.2, little endian, for Power, or later with aacraid device driver X.Y.Z
 - For support details, see the Linux Alert website (www14.software.ibm.com/webapp/set2/sas/f/lopdiags/info/LinuxAlerts.html).
 - The latest version of the device driver or iprutils can be downloaded from IBM Service and Productivity Tools website (<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html>).
- PowerKVM 3.1 Systems (FC EC40):
 - Virtualized resources served to guest partitions
 - PCI pass-through direct to guests not supported

PCIe LP 8 Gb 2-Port Fibre Channel Adapter (FC EL2N; CCIN 577D)

Learn about the specifications and operating system requirements for the feature code (FC) EL2N adapter.

Overview

The FC EL2N is a low-profile adapter. The PCIe LP 8 Gb 2-Port Fibre Channel Adapter is a high-performance adapter based on the Emulex LPe12002 PCIe Host Bus Adapter (HBA). Each port provides single initiator capability over a fiber link. The ports have LC type connectors that use shortwave laser optics. The adapter connects to Fibre Channel switches and operates at link speeds of 2, 4, and 8 Gbps. The adapter automatically negotiates with the switch to the highest speed that the switch is capable of. LEDs on each port provide information about the status and link speed of the port.

N_Port ID Virtualization (NPIV) capability is supported through Virtual I/O Server (VIOS).

Figure 37 shows the adapter:

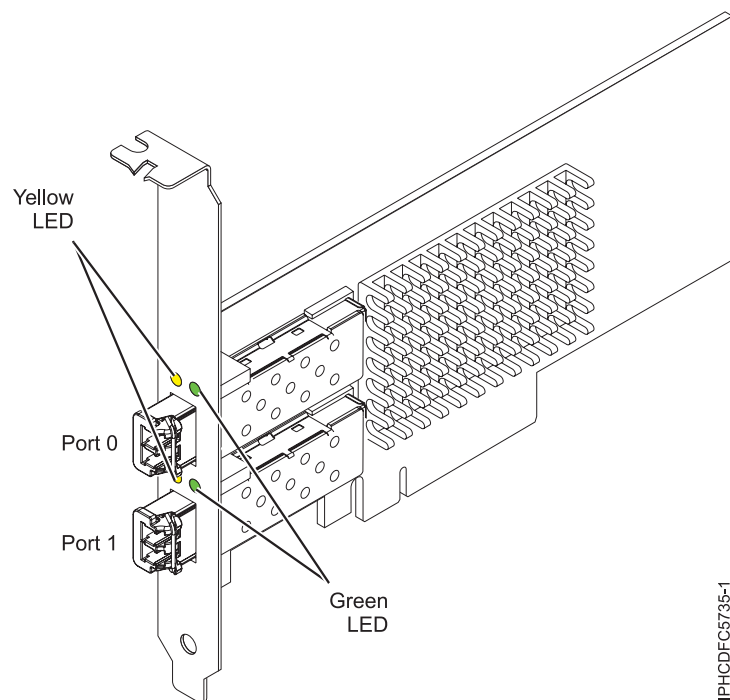


Figure 37. EL2N adapter

For details about slot priorities and placement rules, see PCIe adapter placement rules and slot priorities (http://www.ibm.com/support/knowledgecenter/POWER8/p8eab/p8eab_mtm_pciplacement.htm) and select the system you are working on.

Adapter specifications

Item Description

FRU number

10N9824 (Designed to comply with RoHS requirement)

Wrap plug FRU number

12R9314 (Designed to comply with RoHS requirement)

11P3847 (Not designed to comply with RoHS requirement)

I/O bus architecture

PCI Express (PCIe) Base and Card Electromechanical (CEM) 2.0 x8 PCIe bus interface

Slot requirement

One available PCIe x8 or x16 slot

Voltage

3.3 V

Form factor

Short, low-profile

FC compatibility

2, 4, 8 Gigabit

Cables

Cables are the responsibility of the customer.

Use multimode fiber optic cables with shortwave lasers that adhere to the following specifications:

- OM3: Multimode 50/125 micron fiber, 2000 MHz x km bandwidth
- OM2: Multimode 50/125 micron fiber, 500 MHz x km bandwidth
- OM1: Multimode 62.5/125 micron fiber, 200 MHz x km bandwidth

Because core sizes are different, OM1 cables can only be connected to other OM1 cables. For best results, OM2 cables should not be connected to OM3 cables. However, if an OM2 cable is connected to an OM3 cable, the characteristics of the OM2 cable apply to the entire length of the cables. The following table shows the supported distances for the different fiber optic cable types at different link speeds.

Table 9. Supported distances for multimode fiber optic cables

Header	Cable Type and Distance		
Rate	OM1	OM2	OM3
2.125 Gbps	0.5 meters to 150 meters (1.64 feet to 492.12 feet)	0.5 meters to 300 meters (1.64 feet to 984.25 feet)	0.5 meters to 500 meters (1.64 feet to 1640.41 feet)
4.25 Gbps	0.5 meters to 70 meters (1.64 feet to 229.65 feet)	0.5 meters to 150 meters (1.64 feet to 492.12 feet)	0.5 meters to 380 meters (1.64 feet to 1246.71 feet)
8.5 Gbps	0.5 meters to 21 meters (1.64 feet to 68.89 feet)	0.5 meters to 50 meters (1.64 feet to 164.04 feet)	0.5 meters to 150 meters (1.64 feet to 492.12 feet)

Maximum number

For details about the maximum number of adapters that are supported, see PCIe adapter placement rules and slot priorities(http://www.ibm.com/support/knowledgecenter/POWER8/p8eab/p8eab_mtm_pciplacement.htm) and select the system you are working on.

Operating system or partition requirements

If you are installing a new feature, ensure that you have the software that is required to support the new feature and that you determine whether there are any prerequisites for this feature and attaching devices. To check for the prerequisites, see IBM Prerequisite website (www-912.ibm.com/e_dir/eServerPrereq.nsf).

The adapter is supported on the following versions of the operating systems, depending on the system you are using:

- Linux
 - Red Hat Enterprise Linux Version 7, or later, with current maintenance updates available from Red Hat.
 - Red Hat Enterprise Linux Version 6, or later
 - Red Hat Enterprise Linux Version 5.6, or later
 - SUSE Linux Enterprise Server Version 12, or later
 - SUSE Linux Enterprise Server 11, Service Pack 1, or later, with current maintenance updates available from SUSE.
 - Ubuntu Server 14.04.3, or later
 - For support details, see the Linux Alert website (www14.software.ibm.com/webapp/set2/sas/f/lopdiags/info/LinuxAlerts.html).
- PowerKVM
 - IBM PowerKVM 2.1 SP1, or later

Adapter LED

Green and yellow LEDs can be seen through openings in the mounting bracket of the adapter. Green indicates firmware operation and yellow signifies port activity. Table 10 summarizes the link rate conditions. There is a 1-second pause when the LED is off between each group of fast flashes (2, 3, or 4). Observe the LED sequence for several seconds to be sure that you have correctly identified the state.

Table 10. Normal LED states

Green LED	Yellow LED	State
Slow flash	Off	Normal, link inactive or not started
On	2 fast flashes	2 Gbps link rate - normal, link active
On	3 fast flashes	4 Gbps link rate - normal, link active
On	4 fast flashes	8 Gbps link rate - normal, link active

Power-on self test (POST) conditions and results are summarized in Table 11. These states can be used to identify abnormal states or problems. Follow the action to be taken for each condition.

Table 11. POST conditions and results

Green LED	Yellow LED	State	Action to be taken
Off	Off	Wake-up failure (dead board)	Perform AIX, IBM i, or Linux operating system diagnostics procedure.
Off	On	POST failure (dead board)	Perform AIX, IBM i, or Linux operating system diagnostics procedure.
Off	Slow flash	Wake-up failure monitor	Perform AIX, IBM i, or Linux operating system diagnostics procedure.
Off	Fast flash	POST failure	Perform AIX, IBM i, or Linux operating system diagnostics procedure.
Off	Flashing	POST processing in progress	None
On	Off	Failure while functioning	Perform AIX, IBM i, or Linux operating system diagnostics procedure.
On	On	Failure while functioning	Perform AIX, IBM i, or Linux operating system diagnostics procedure.
Slow flash	Slow flash	Offline for download	None
Slow flash	Fast flash	Restricted offline mode, waiting for restart	None

Table 11. POST conditions and results (continued)

Green LED	Yellow LED	State	Action to be taken
Slow flash	Flashing	Restricted offline mode, test active	None
Fast flash	Off	Debug monitor in restricted mode	None
Fast flash	On	Not defined	None
Fast flash	Slow flash	Debug monitor in test fixture mode	None
Fast flash	Fast flash	Debug monitor in remote debug mode	None
Fast flash	Flashing	Not defined	None

Replacing Fibre Channel adapters by using hot swap

When hot swapping Fibre Channel adapters, be aware that device-related software for the storage devices might have extra devices (for example, the disk array router (dar) device that is associated with the fiber array storage technology (FAST) or DS4800) that need to be removed. See the specific storage device documentation for information about how to remove these additional devices.

The new adapter has a unique worldwide port name (WWPN). Check the zoning and logical unit number (LUN) assignments to ensure that the new adapter functions as expected.

PCIe2 LP 2-port 10 GbE BaseT RJ45 Adapter (FC EL3Z; CCIN 2CC4)

Learn about the specifications and operating system requirements for the feature code (FC) EL3Z adapter.

Overview

The PCIe2 LP 2-port 10 GbE BaseT RJ45 Adapter is a PCI Express (PCIe) generation 2, x8, short form-factor, low-profile adapter. The adapter provides two 10 Gb RJ45 ports. This adapter provides a PCIe 2.0 host bus interface. The adapter supports the Ethernet network interface controller (NIC) function. The adapter is a high-performance adapter that consolidates traffic for networking. The link aggregation and failover features of the adapter make it suitable for critical network applications that require redundancy and high availability. Figure 38 on page 49 shows the FC EL3Z adapter.

The ports default to auto negotiate the highest speed either at 10 Gb (10G BaseT), 1Gb (1000 BaseT), or 100 Mb (100 BaseT) full duplex. Each RJ45 port can be configured independent of the other port. Each RJ45 port is connected with a 4-pair, CAT-6A cable, and is supported for distances of up to 100 meters.

The adapter provides the following features:

- The adapter is a PCIe2 NIC network convergence adapter.
- The 10 Gb RJ45 ports can function in the NIC mode.
- The adapter can be used as the host local area network (LAN) adapter.
- The adapter supports interrupt moderation to deliver increased performance while significantly reducing processor utilization
- The adapter supports dual port operation in any PCIe3 or PCIe2 slot.
- The adapter supports auto-negotiation, full-duplex only.
- The adapter supports multiple media-access control (MAC) per interface.
- The adapter supports integrated media-access control (MAC) and physical layer (PHY).
- The adapter supports the following standards for the different ports and functions:
 - IEEE 802.3ae in the 10 GbE ports

- 802.3ab in the 1 GbE ports
- Ether II and IEEE 802.3 for encapsulated frames
- 802.1p for setting up priority levels in tagged VLAN frames
- 802.1Q for VLAN tagging
- 802.3x for flow control
- 802.3ad for load-balancing and failover
- IEEE 802.3ad and 802.3 for link aggregation
- The adapter provides message signal interrupts (MSI), MSI-X, and support of legacy pin interrupts.
- The adapter supports jumbo frames up to 9.6 KB.
- The adapter supports gigabit EtherChannel (GEC) with the existing software.
- The adapter supports TCP checksum offload transmission control protocol (TCP), user datagram protocol (UDP), TCP segmentation Offload (TSO) for IPv4 and IPv6.
- Supports TCP segmentation or large send offload
- Supports EEPROM-SPI and single EEPROM
- Compliant with European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment

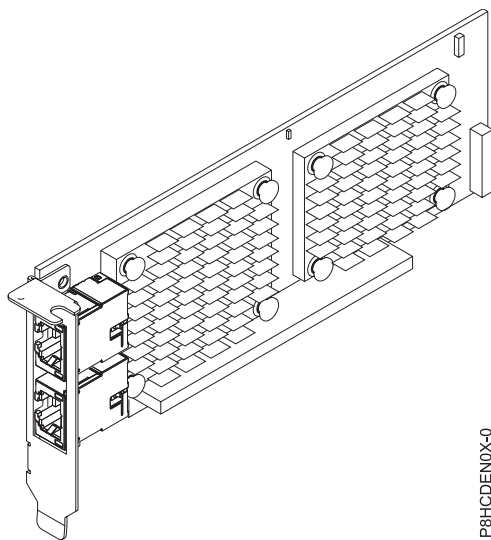


Figure 38. FC EL3Z adapter

Specifications

Item Description

Adapter FRU number

00E2714 (Designed to comply with RoHS requirement)

Regular-height tailstock part number: 00E2862

Low-profile tailstock part number: 00E2721

Wrap plug FRU number

10N7405 (RJ45 wrap plug)

I/O bus architecture

PCIe2 x8

Slot requirement

For details about slot priorities and placement rules, see PCIe adapter placement rules and slot

priorities(http://www.ibm.com/support/knowledgecenter/POWER8/p8eab/p8eab_mtm_pciplacement.htm) and select the system you are working on.

Cables

CAT-6A cable

Voltage

3.3 V

Form factor

Short, low-profile

Maximum number

For details about the maximum number of adapters that are supported, see PCIe adapter placement rules and slot priorities(http://www.ibm.com/support/knowledgecenter/POWER8/p8eab/p8eab_mtm_pciplacement.htm) and select the system you are working on.

Operating system or partition requirements

If you are installing a new feature, ensure that you have the software that is required to support the new feature and that you determine whether there are any prerequisites for this feature and attaching devices. To check for the prerequisites, see IBM Prerequisite website (www-912.ibm.com/e_dir/eServerPrereq.nsf).

The adapter is supported on the following versions of the operating systems, depending on the system you are using:

- Linux
 - Red Hat Enterprise Linux Version 7, or later, with current maintenance updates available from Red Hat.
 - Red Hat Enterprise Linux Version 6.5, or later, with current maintenance updates available from Red Hat.
 - SUSE Linux Enterprise Server Version 12, or later
 - SUSE Linux Enterprise Server 11, Service Pack 3, or later, with current maintenance updates available from SUSE.
 - Ubuntu Server 14.04.3, or later
 - For support details, see the Linux Alert website (www14.software.ibm.com/webapp/set2/sas/f/lopdiags/info/LinuxAlerts.html).
- PowerKVM
 - IBM PowerKVM 2.1.1, or later

This adapter requires the following driver in the Linux operating system:

- bnx2x driver
- The latest version of the device driver or iprutils can be downloaded from IBM Service and Productivity Tools website (<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html>).

PCIe2 LP 4-Port (10Gb+1GbE) SR+RJ45 Adapter (FC EN0T; CCIN 2CC3)

Learn about the specifications and operating system requirements for the feature code (FC) EN0T adapter.

Overview

The PCIe2 LP 4-Port (10Gb+1GbE) SR+RJ45 Adapter is a PCI Express (PCIe) generation 2, x8, short form-factor, low-profile adapter. The adapter provides two 10 Gb SR optical ports and two 1 Gb RJ45 ports. This adapter provides a PCIe 2.0 host bus interface. The adapter supports the Ethernet network interface controller (NIC) function. The adapter is a high-performance adapter that consolidates traffic for networking. The link aggregation and failover features of the adapter make it suitable for critical network applications that require redundancy and high availability.

The four-port adapter provides two 10 Gb small form-factor pluggable (SFP+) optical SR transceiver ports and two 1 Gb RJ45 Ethernet ports. The two 10 Gb SR ports have little connector (LC) duplex-type connectors. The optical transceiver uses shortwave laser optics and is attached with MMF-850nm fiber cabling with LC connectors. See “Cables” on page 53 for more information about the optical cables. Each 10 Gb port provides Ethernet connectivity with a nominal data rate of 10 Gbps (gigabits per second). Figure 39 on page 52 shows the FC EN0T adapter.

Each of the 1 Gb RJ45 port provides Ethernet connectivity at a data rate of 1 Gbps. Each of the 1 Gb ports is connected with a 4-pair, CAT-5 unshielded twisted pair (UTP) cable or with a cable of higher specification, and is supported for distances of up to 100 meters. In addition to 1 Gb (1000 Mb) networks, 100 Mb networks are also supported.

The adapter provides the following features:

- The adapter is a PCIe2 NIC network convergence adapter.
- The 10 Gb SR ports can function in the NIC mode.
- The adapter can be used as the host local area network (LAN) adapter.
- The adapter supports interrupt moderation to deliver increased performance while significantly reducing processor utilization
- The adapter supports dual port operation in any PCIe3 or PCIe2 slot.
- The adapter supports auto-negotiation, full-duplex only.
- The adapter supports multiple media-access control (MAC) per interface.
- The adapter supports integrated media-access control (MAC) and physical layer (PHY).
- The adapter supports the following standards for the different ports and functions:
 - IEEE 802.3ae in the 10 GbE ports
 - 802.3ab in the 1 GbE ports
 - Ether II and IEEE 802.3 for encapsulated frames
 - 802.1p for setting up priority levels in tagged VLAN frames
 - 802.1Q for VLAN tagging
 - 802.3x for flow control
 - 802.3ad for load-balancing and failover
 - IEEE 802.3ad and 802.3 for link aggregation
- The adapter provides message signal interrupts (MSI), MSI-X, and support of legacy pin interrupts.
- The adapter supports jumbo frames up to 9.6 KB.
- The adapter supports gigabit EtherChannel (GEC) with the existing software.
- The adapter supports TCP checksum offload transmission control protocol (TCP), user datagram protocol (UDP), TCP segmentation Offload (TSO) for IPv4 and IPv6.
- Supports TCP segmentation or large send offload
- Supports EEPROM-SPI and single EEPROM
- Compliant with European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment

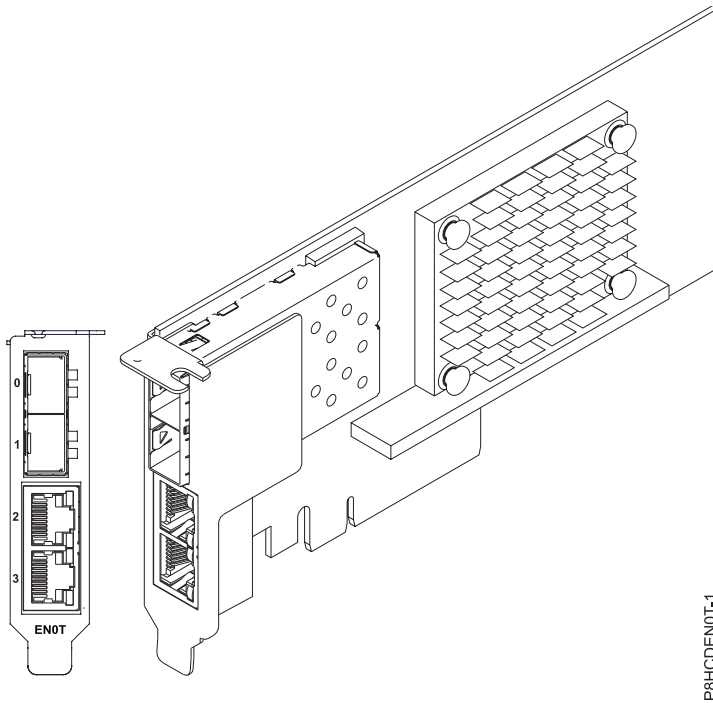


Figure 39. FC EN0T adapter

Specifications

Item Description

Adapter FRU number

00E2715 (Designed to comply with RoHS requirement)

Low-profile tailstock part number: 00E2720

Wrap plug FRU number

12R9314 (SFP+ SR wrap plug)

74Y7010 (Twinax wrap plug)

10N7405 (1 Gb UTP wrap plug)

I/O bus architecture

PCIe2 x8

Slot requirement

For details about slot priorities and placement rules, see PCIe adapter placement rules and slot priorities(http://www.ibm.com/support/knowledgecenter/POWER8/p8eab/p8eab_mtm_pciplacement.htm) and select the system you are working on.

Cables

See “Cables” on page 53 for details.

Voltage

3.3 V

Form factor

Short, low-profile

Maximum number

For details about the maximum number of adapters that are supported, see PCIe adapter placement rules and slot priorities(http://www.ibm.com/support/knowledgecenter/POWER8/p8eab/p8eab_mtm_pciplacement.htm) and select the system you are working on.

Cables

Use multimode fiber optic cables with shortwave lasers that adhere to the following specifications:

- OM3 or OM4: Multimode 50/125 micron fiber, 2000 MHz x km bandwidth
- OM2: Multimode 50/125 micron fiber, 500 MHz x km bandwidth
- OM1: Multimode 62.5/125 micron fiber, 200 MHz x km bandwidth

Because core sizes are different, OM1 cables only can be connected to other OM1 cables. For best results, OM2 cables must not be connected to OM3 or OM4 cables. However, if an OM2 cable is connected to an OM3 or OM4 cable, the characteristics of the OM2 cable apply to the entire length of the cables. The following table shows the supported distances for the different fiber optic cable types at different link speeds.

Table 12. Supported distances for multimode fiber optic cables

Header	Cable Type and Distance		
	OM1	OM2	OM3
Rate			
10 Gbps	0.5 meters to 33 meters (1.64 feet to 108.26 feet)	0.5 meters to 82 meters (1.64 feet to 269.02 feet)	0.5 meters to 300 meters (1.64 feet to 984.25 feet)

Operating system or partition requirements

If you are installing a new feature, ensure that you have the software that is required to support the new feature and that you determine whether there are any prerequisites for this feature and attaching devices. To check for the prerequisites, see IBM Prerequisite website (www-912.ibm.com/e_dir/eServerPrereq.nsf).

The adapter is supported on the following versions of the operating systems, depending on the system you are using:

- AIX
 - AIX 7.1 with the 7100-03 Technology Level and Service Pack 3, or later
 - AIX 6.1, Technology Level 9, Service Pack 2, or later
- Linux
 - Red Hat Enterprise Linux Version 6.5, or later, with current maintenance updates available from Red Hat.
 - Red Hat Enterprise Linux Version 7, or later, with current maintenance updates available from Red Hat.
 - SUSE Linux Enterprise Server Version 12, or later
 - SUSE Linux Enterprise Server 11, Service Pack 3, or later, with current maintenance updates available from SUSE.
 - Ubuntu Server 14.04.3, or later
 - For support details, see the Linux Alert website (www14.software.ibm.com/webapp/set2/sas/f/lopdiags/info/LinuxAlerts.html).
- IBM i
 - IBM i is supported only with VIOS

This adapter requires the following drivers:

- AIX: `devices.pciex.e4148a1614109304` for SFP+ optical ports and `devices.pciex.e4148a1614109404` for RJ45 ports
- Linux: `bnx2x` driver
- The latest version of the device driver or `iprutils` can be downloaded from IBM Service and Productivity Tools website (<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html>).

Common procedures for servicing or installing features in the 8348-21C

This section contains all the common procedures related to installing, removing, and replacing features in the IBM Power System S812LC (8348-21C) system.

Before you begin

Observe these precautions when you are installing, removing, or replacing features and parts.

About this task

These precautions are intended to create a safe environment to service your system and do not provide steps for servicing your system. The installation, removal, and replacement procedures provide the step-by-step processes required to service your system.

DANGER

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

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

- 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.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- 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.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

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

To Connect:

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

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)

DANGER

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

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



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

CAUTION

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



- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001)

Procedure

1. If you are installing a new feature, ensure that you have the software required to support the new feature. See IBM Prerequisite.
2. If you are performing an installation or replacement procedure that might put your data at risk, ensure, wherever possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).
3. Review the installation or replacement procedure for the feature or part.
4. Note the significance of color on your system.

Blue or terra-cotta on a part of the hardware indicates a touch point where you can grip the hardware to remove it from or install it in the system, open or close a latch, and so on. Terra-cotta might also indicate that the part can be removed and replaced with the system or logical partition power on.
5. Ensure that you have access to a medium flat-blade screwdriver, a Phillips screwdriver, and a pair of scissors.
6. If parts are incorrect, missing, or visibly damaged, do the following:
 - If you are replacing a part, contact the provider of your parts or next level of support.
 - If you are installing a feature, contact one of the following service organizations:
 - The provider of your parts or next level of support.
 - In the United States, the IBM Rochester Manufacturing Automated Information Line (R-MAIL) at 1-800-300-8751.

In countries and regions outside of the United States, use the following website to locate your service and support telephone numbers:
<http://www.ibm.com/planetwide>
7. If you encounter difficulties during the installation, contact your service provider, your IBM reseller, or your next level of support.
8. Ensure that the top cover is on when running for thermal performance.
9. If you are installing new hardware in a logical partition, you need to understand and plan for the implications of partitioning your system. For information, see Logical Partitioning.

LEDs on the 8348-21C system

Use this information as a guide to the LEDs on the IBM Power System S812LC (8348-21C) system.

The LEDs indicate various system status. If the part does not have a problem indicator LED, you can use a troubleshooting program such as **impitool** to identify the issue.

These LEDs are located at the front (as shown in Figure 40 on page 58).

- The green LED and power button (**A**) indicates the power status.
 - A constant light indicates full system power to the unit.
 - A flashing light indicates standby power to the unit.
- The blue LED (**B**) is used to identify the system that requires service.
- The amber LED (**C**) indicates a problem in the system. After a part is repaired, the amber LED takes a minute to turn off.

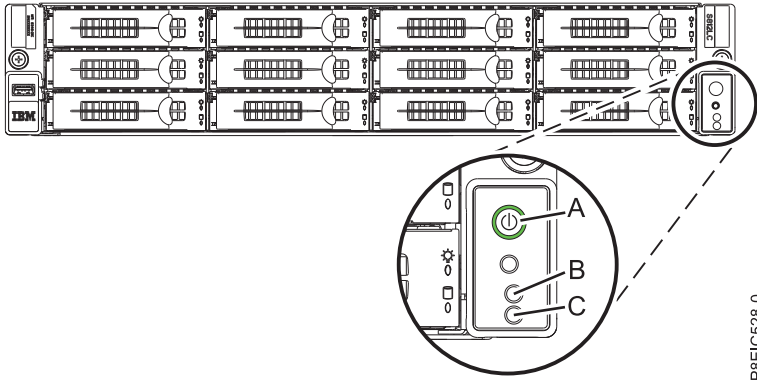


Figure 40. LEDs on the front of the 8348-21C system

LEDs are also located on the rear of the system; see Figure 41. The identify LED is at (A).

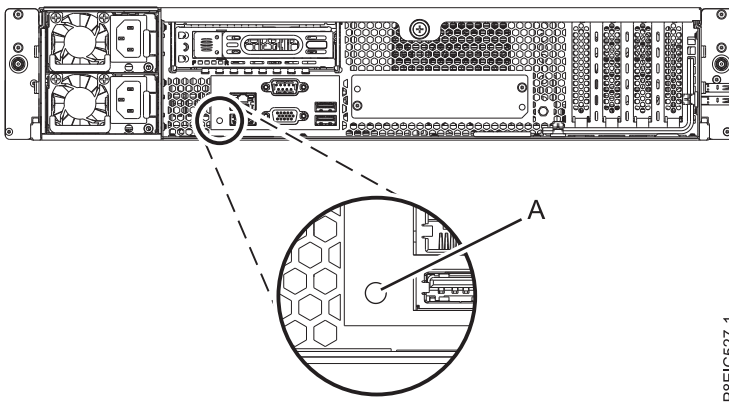


Figure 41. LEDs on the rear of the 8348-21C system

LEDs are located on the following parts:

- At the front of the system:
 - Disk drives:
 - Steady green LED indicates that the drive is present but has no activity
 - Blinking green LED indicates activity
 - Steady amber LED indicates a problem
 - 1 Hz blinking amber LED indicates identifier
 - 4 Hz blinking amber LED indicates that drive is rebuilding
- At the rear of the system:
 - LAN connectors
 - Power supplies: green LED indicates that power is on and functioning properly; amber LED indicates a problem with the power supply
 - PCIe adapters

Identifying the 8348-21C system that needs servicing

Use the blue identify LEDs on the front and rear panels to help you find the system that needs servicing.

Procedure

- You can press the identify LED button on the front panel to turn the blue identify LEDs on the front and rear panels on or off.

- You can use the **ipmitool** command to activate the blue identify LEDs.

For in-band networks, run the following chassis identify command:

```
ipmitool -I <interface> chassis identify <interval>
```

Where:

interface

The interface you are using to connect to the system. For example: usb.m

interval

The time to turn on the identify LED, in seconds. The default value is 15. This means that the LED is on for 15 seconds and then it turns off. A value of zero (0) turns off the LED. A value of force turns on the LED and leaves it on until turned off.

To run the command remotely over the LAN, run the following chassis identify command:

```
ipmitool -I lanplus -H <hostname> -U <username> -P <password> chassis identify <interval>
```

Preparing the system to remove and replace internal parts in the 8348-21C

Learn how to prepare the IBM Power System S812LC (8348-21C) system to remove and replace internal parts.

About this task

The front disks can be removed and replaced when the system is running and the system power is on.

Procedure

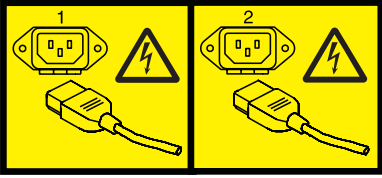
1. Complete the prerequisite tasks. For instructions, see “Before you begin” on page 54.
2. Identify the system that you need to work on. For instructions, see “Identifying the 8348-21C system that needs servicing” on page 58.
3. If applicable, open the rack front door.
4. Attach the electrostatic discharge (ESD) wrist strap.

Attention:

- Attach an electrostatic discharge (ESD) wrist strap to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
 - When using an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
5. Stop the system. For instructions, see “Stopping the 8348-21C system” on page 63.
 6. If applicable, open the rack door at the rear of the system.
 7. Disconnect the power source from the system by unplugging the system. For instructions, see “Disconnecting the power cords from an 8348-21C system” on page 64.

Note: The system might be equipped with redundant power supply. Before you continue with this procedure, ensure that all power to your system is disconnected.

(L003)



OR



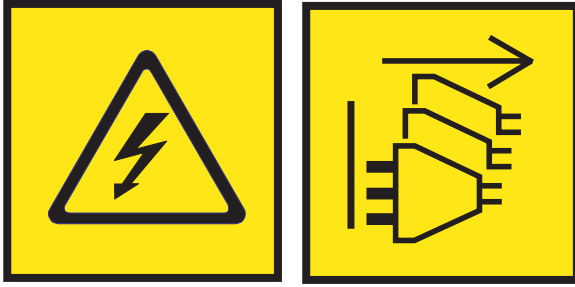
OR



OR



OR



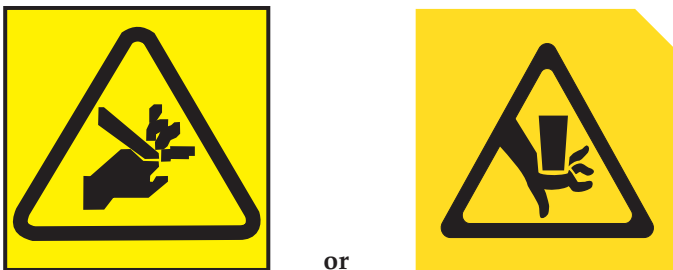
DANGER: Multiple power cords. The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. (L003)

8. Place the system into the service position. For instructions, see “Placing an 8348-21C system into the service position” on page 65.

(R008)

CAUTION: Do not place any object on top of a rack-mounted device unless that rack-mounted device is intended for use as a shelf. (R008)

(L012)



CAUTION: Pinch hazard. (L012)

9. Remove the service access cover. For instructions, see “Removing the service access cover from an 8348-21C system” on page 67.

Preparing the system for operation after removing and replacing internal parts for the 8348-21C

Learn how to prepare the IBM Power System S812LC (8348-21C) system for operation after removing and replacing internal parts.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Replace the service access cover. For instructions, see “Installing the service access cover on an 8348-21C system” on page 68.
3. Place the system into the operating position. For instructions, see “Placing an 8348-21C system into the operating position” on page 66.

(L012)



or



CAUTION: Pinch hazard. (L012)

4. Reconnect the power cords to the system. For instructions, see “Connecting the power cords to an 8348-21C system” on page 64.
5. If applicable, close the rack door at the rear of the system.
6. Start the system. For instructions, see “Starting the 8348-21C system” on page 63.
7. If applicable, close the rack front door.
8. Did you install or replace one of the following PCIe3 adapters?
 - PCIe3 low profile 6 Gb SAS/SATA RAID adapter (FC EC3Y)
 - PCIe3 low profile 12 Gb SAS/SATA RAID adapter with 1 GB protected write cache (FC EC3S)

Option	Description
Yes	Continue with the next step.
No	Go to step 14 on page 63.

9. Is your operating system stored on a front drive?

Option	Description
Yes	Continue with the next step.
No	Go to step 12 on page 63.

10. From another system that is running, go to the PMC Adaptec downloads website <http://i.adaptec.com/power> and copy the following two files to a portable USB device:
 - **Arconf-1.0n-21nnn.pb-plugin**
 - Latest firmware
 - If you have a Series 7 adapter copy (EC3Y - PMC 71605E) **as716E01.ufi**.
 - If you have a Series 8 adapter copy (EC3S - PMC 81605Z) **AS816Z01.ufi**.
11. From the system where the adapter was replaced, plug the portable USB device into the front USB port and complete the following steps:
 - a. From the Petitboot menu select **Exit to shell**.
 - b. Locate the USB device in the subdirectory `/var/petitboot/mnt/dev/sdnn`.
 - c. Type the following command to load the arconf tool:
 - `pb-plugin install /var/petitboot/mnt/dev/sdnn/Arconf-1.0n-21nnn.pb-plugin` where `sdnn` is the portable USB device, and `Arconf-1.0n-21nnn.pb-plugin` is the arconf file that you copied in step 10.
 - d. Copy the firmware file for your adapter that was copied in step 10 to the `/var` directory by entering the following command:
 - `cp /var/petitboot/mnt/dev/<sdnn>/<latest firmware>.ufi /var`
 - e. Download the latest firmware to your adapter by entering the following command:
 - `arconf romupdate 1 /var/<latest firmware>.ufi`

- f. Reboot the system.
- g. Go to step 13.
12. Update the adapter firmware. See Getting firmware fixes for vendor I/O adapters by using the vendor website.
13. Set the **BACKPLANEMODE BIOS** parameter by entering the following command:
 - `arcconf setbiosparams 1 backplanemode 1`
14. Verify the installed part. For instructions, see Verifying a repair (www.ibm.com/support/knowledgecenter/POWER8/p8ei3/p8ei3_verifyrepair.htm).

Starting the 8348-21C system

You can use the power button to start the IBM Power System S812LC (8348-21C) system.

About this task

Attention: For safety, airflow purposes and thermal performance, the service access cover must be installed and fully seated before you power on the system.

Procedure

1. Open the front rack door, if necessary.
2. Before you press the power button, ensure that the power supplies are connected to the system unit and verify the following items:
 - All system power cables are connected to a power source.
 - The power-on LED, as shown in Figure 42, is flashing. A flashing light indicates standby power to the unit.
3. Press the power button (A) shown in Figure 42. The power-on light stops flashing and remains on, indicating that the system power is turned on. The system cooling fans operate at a high speed, and after approximately 30 seconds, return to operating speed.

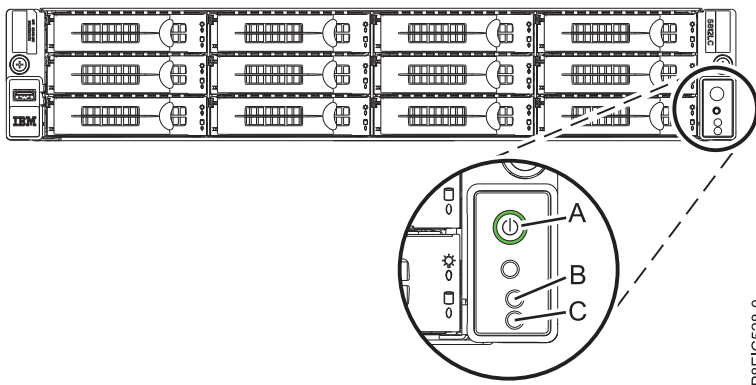


Figure 42. Power button

What to do next

If pressing the power button does not start the system, then contact your next level of support or your service provider.

Stopping the 8348-21C system

Learn how to stop the IBM Power System S812LC (8348-21C) system to complete another task.

Procedure

You can use the Linux **shutdown** command to stop and power down the system. From a Linux command prompt, run the following command to shut down the system in 10 minutes and send the message "System shutdown in 10 minutes; repairs coming." to the users.

```
shutdown -P +10 "System shutdown in 10 minutes; repairs coming."
```

The -P setting instructs the system to shut down and then power off.

Disconnecting the power cords from an 8348-21C system

Learn how to disconnect the power cords from an IBM Power System S812LC (8348-21C) system.

Procedure

1. Open the rear rack door on the system unit that you are servicing.
2. Identify the system unit that you are servicing in the rack.
3. Disconnect the power cords from the power supply handle.
4. Label and disconnect the power cords from the system unit. See figure Figure 43.

Note: This system is equipped with two power supplies. If the removing and replacing procedures require the system power to be turned off, ensure that all the power sources to the system have been completely disconnected.

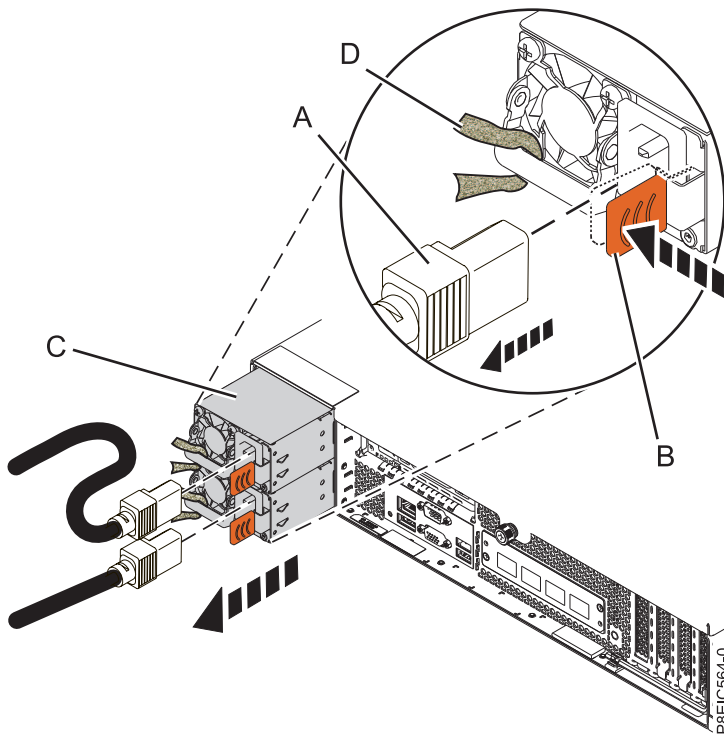


Figure 43. Removing the power cords from the system

Connecting the power cords to an 8348-21C system

Learn how to connect the power cords to an IBM Power System S812LC (8348-21C) system.

Procedure

1. Open the rear rack door on the system unit that you are servicing.

- Using your labels, reconnect the power cords to the system unit. See figure Figure 44.

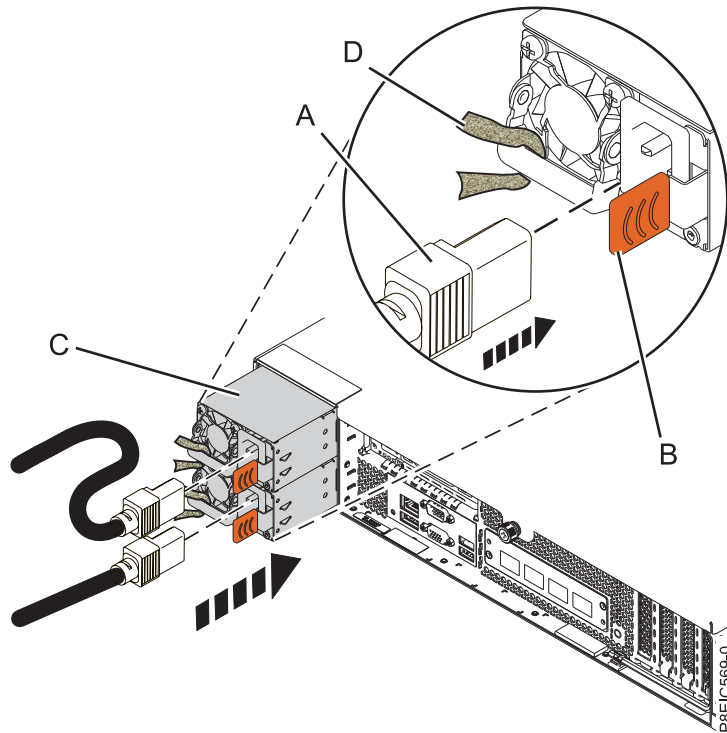


Figure 44. Connecting the power cords to the system

- Loop and attach the power cords to the power supply handle.
- Close the rack door at the rear of the system.

Placing an 8348-21C system into the service position

Learn how to place an IBM Power System S812LC (8348-21C) system into the service position.

Before you begin

Notes:

- When you place the system into the service position, ensure that all stability plates are firmly installed to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
- Ensure that the cables at the rear of the system unit do not catch or bind as you pull the system unit forward in the rack.
- When the rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

Procedure

- Remove the front screws that secure the system to the rack from both sides of the system.

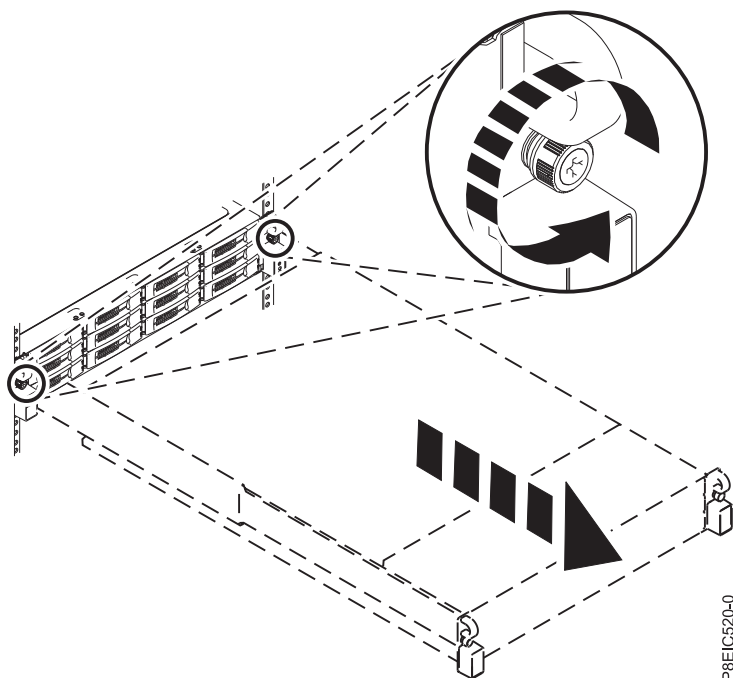


Figure 45. Removing the front screws and removing the system from the rack

2. Pull the system unit out of the rack.
3. If you are working on the front USB and cable, you must remove the system from the rails. You must also remove the left rail holder to access the mounting screws on the side of the system.
4. If you are working on the power switch and cable, you must remove the system from the rails. You must also remove the right rail holder to access the mounting screws on the side of the system.
5. If you are working on the disk drive backplane, and did not remove the lower side screws during installation, you must remove the system from the rails. You must also remove both rail holders to access the lower mounting screws on the side of the system.

If you did remove the lower side screws during installation, you can service the system while it remains in the rails.

6. If you are working on the system backplane, the recommendation is to remove the system from the rails.
7. If you need to remove the system from the rails, use a lift tool or seek the help of a second person. If a second person is not available, you can also make the system lighter by doing the following steps:
 - a. Remove the power supplies. For instructions, see "Removing a power supply from the 8348-21C" on page 73.
 - b. Label and remove the front drives, keeping track of their locations. For instructions, see "Removing a front drive in the 8348-21C" on page 75.

Placing an 8348-21C system into the operating position

Learn how to place an IBM Power System S812LC (8348-21C) system into the operating position.

Before you begin

When you place the system in the operating position, ensure that the cables at the rear of the system do not catch or bind as you push the system unit back into the rack.

Procedure

1. If you removed the rail holders from the side of the system, reattach the rail holders. Replace the screws that secure the rail holders to the system.
2. If you removed the system from the rails, reattach the system to the rails. Depending on the weight of the system, you need two people to lift the system, carry it, and replace it in the rack.
3. If you removed the power supplies, replace them. For instructions, see “Replacing a power supply in the 8348-21C” on page 74.
4. If you removed the front drives, replace them in their proper locations. For instructions, see “Replacing a front drive in the 8348-21C” on page 78.
5. Release the rail safety latches (A) by lifting them upward, as shown in Figure 46, then push the system fully into the rack.

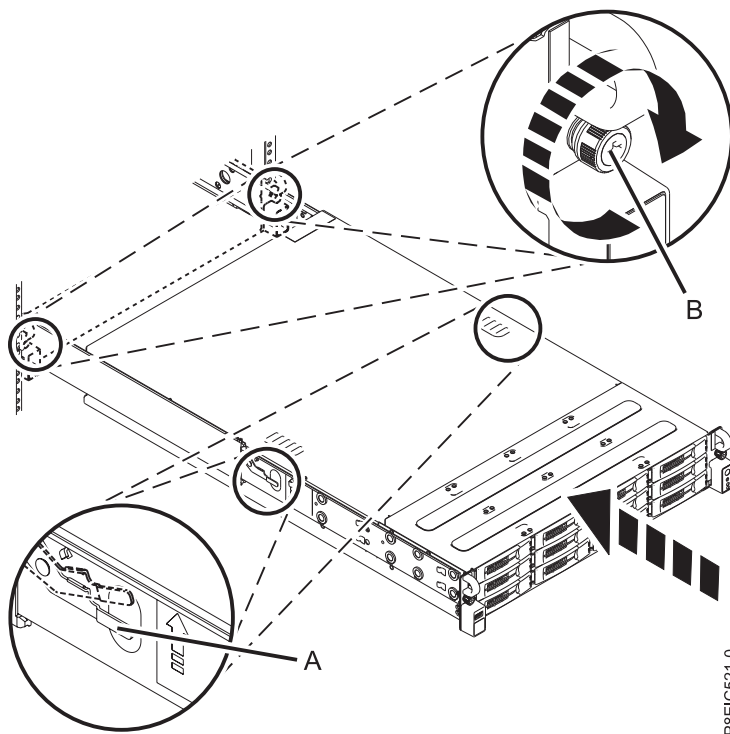


Figure 46. Placing the system into the operating position

6. Fasten the two front screws (B) to secure the system to the rack.

Removing the service access cover from an 8348-21C system

Learn how to remove the service access cover from an IBM Power System S812LC (8348-21C) system.

Before you begin

Ensure that the power plugs are removed from the power supplies.

Procedure

1. At the rear of the system, loosen the cover screw (A) that fastens the cover to the chassis. See Figure 47 on page 68.

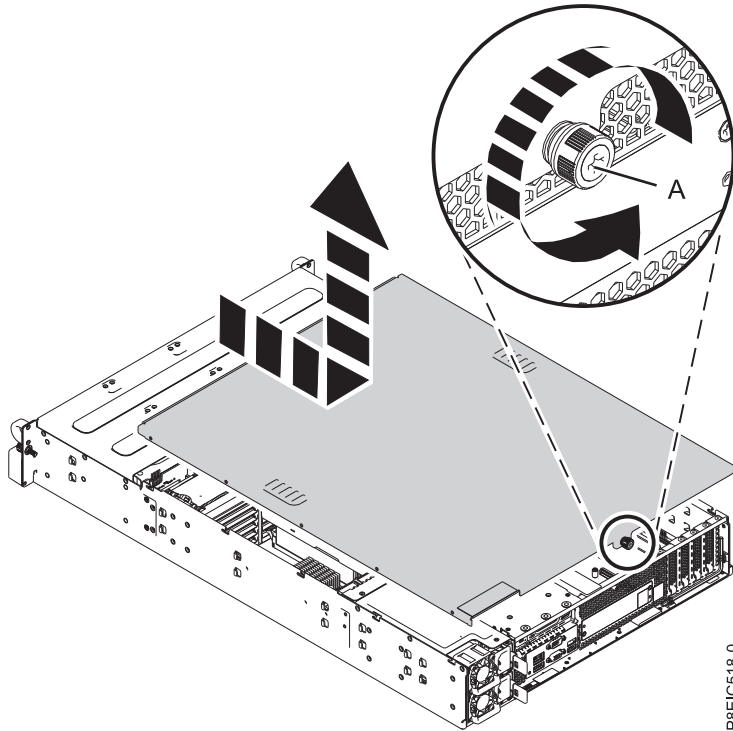


Figure 47. Removing the service cover

2. Slide the cover toward the rear of the system unit. When the front of the service access cover clears the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and airflow, replace the cover before powering on the system.

Installing the service access cover on an 8348-21C system

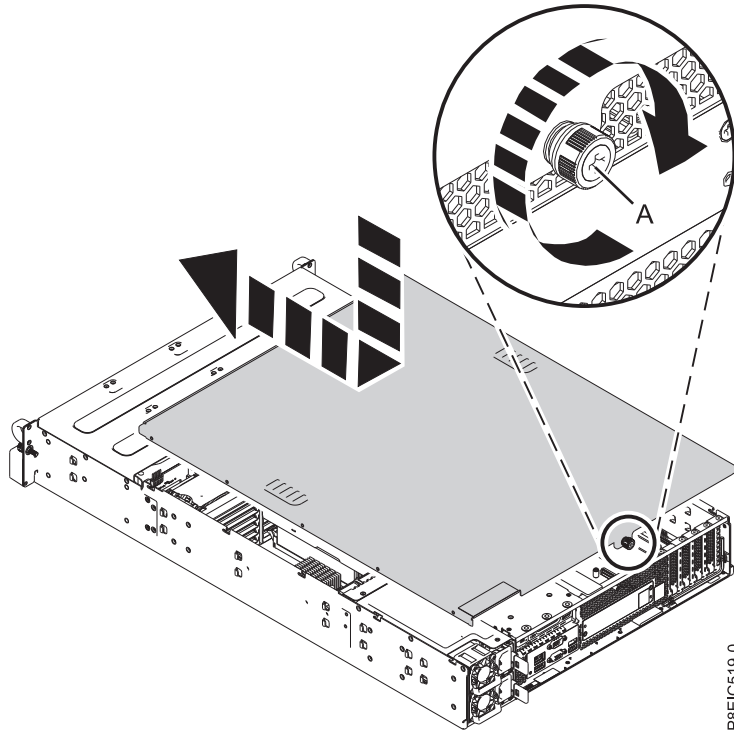
Learn how to install the service access cover on a rack-mounted IBM Power System S812LC (8348-21C) system.

About this task

Attention: For safety, airflow purposes and thermal performance, the service access cover must be installed and fully seated before you power on the system.

Procedure

1. Place the cover on the system unit such that the alignment pins on the cover are aligned to the slots on the chassis. Slide the cover forward. See Figure 48 on page 69.
2. Fasten the cover with the cover screw (A). See Figure 48 on page 69.



P8E1C519-0

Figure 48. Replacing the service cover

Removing the processor baffle from an 8348-21C system

Learn how to remove the processor baffle from an IBM Power System S812LC (8348-21C) system.

Procedure

Remove the processor baffle as shown in Figure 49 on page 70.

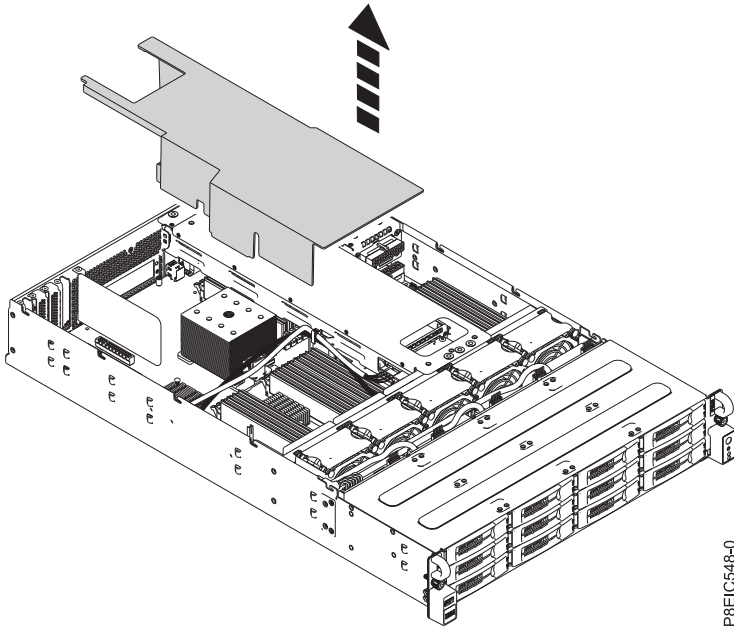


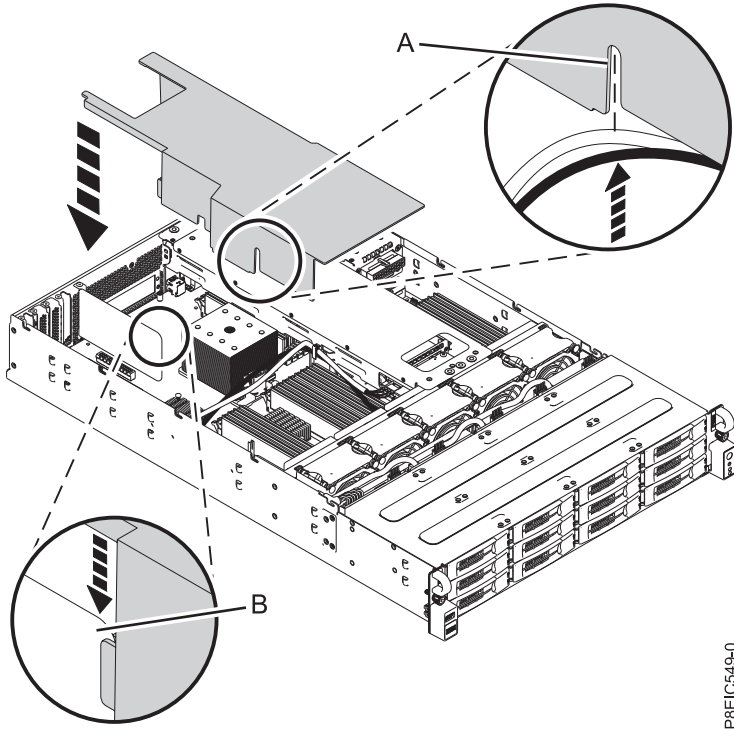
Figure 49. Removing processor baffle

Replacing the processor baffle in an 8348-21C system

Learn how to replace the processor baffle in an IBM Power System S812LC (8348-21C) system.

Procedure

1. Route the drive signal cable and drive power cable through the cable slot (A) in the baffle, as shown in Figure 50 on page 71.



P8E1C549-0

Figure 50. Replacing the processor baffle. Route the drive signal cable and drive power cable through (A); align the air divider at (B).

2. Align the air divider (B) into the air divider slot in the baffle, as shown in Figure 50.
3. Carefully press the baffle fully into the system.

Additional procedures

Removing a power supply from the 8348-21C

Learn how to remove a power supply in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see “Preparing the system to remove and replace internal parts in the 8348-21C” on page 59.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

Attention:

- Attach an electrostatic discharge (ESD) wrist strap to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
 - When using an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
2. Label and disconnect the power cord from the failed power supply. For instructions, see “Disconnecting the power cords from an 8348-21C system” on page 64.
 3. Remove the power supply from the system.
 - a. To unseat the power supply from its position in the system, push the locking-tab **(B)** in the direction shown. See Figure 51 on page 74.
 - b. Grasp the power supply handle with one hand, and pull the power supply **(C)** out of the system about 5 cm (2 in).
 - c. Place your other hand underneath the power supply, pull the power supply completely out of the system, and place it on an ESD mat.

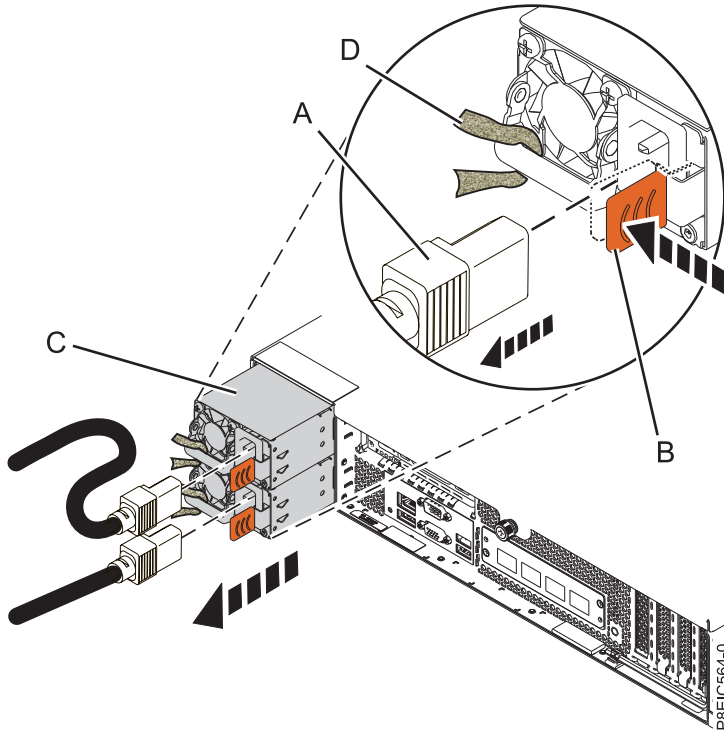


Figure 51. Removing a power supply from the system

Replacing a power supply in the 8348-21C

Learn how to replace the power supply in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Align the power supply (C) with the bay and slide the power supply into the system until the latch (B) locks in place. See Figure 52 on page 75.

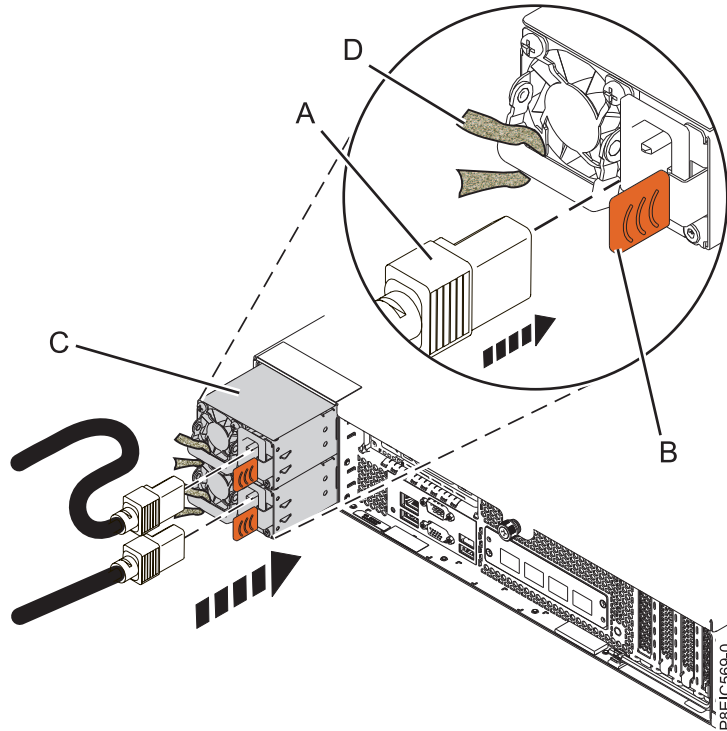


Figure 52. Replacing a power supply in the system

2. Connect and fasten the power cord to the power supply.
 - a. Connect the power cord to the power supply, as shown in Figure 52.
 - b. Use the hook-and-loop fastener and tie the power cord to the power supply handle.

Attention: This system is equipped with two power supplies. Before you continue with this procedure, connect all power cords to the power supplies and strap them.
 - c. Loop the power cables. For instructions, see “Connecting the power cords to an 8348-21C system” on page 64.

What to do next

See “Preparing the system for operation after removing and replacing internal parts for the 8348-21C” on page 61.

Removing a front drive in the 8348-21C

Learn how to remove a front drive in the IBM Power System S812LC (8348-21C) system. The front disks can be removed and replaced when the system is running and the system power is on.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

Attention:

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

2. If the device is part of a fault tolerant logical drive, the OS will continue to access the logical drive. Continue to step 3.

If the device falls into any of the following categories, make sure that the OS is not actively using the device before continuing to step 3.

- A raw disk
- A member of a simple volume
- A member of a raid 0 logical drive

3. Identify device and prepare it for removal.

- a. Run the **arconf** command to list the logical drives and device configurations. For additional information on the arconf tool, refer to <http://i.adaptec.com/power>

```
arconf getconfig 1
```

- b. Note the Channel and Device numbers of the desired drive. In this example, the channel number is 0 and the device number is 11.

```
Reported Channel,Device(T:L)      : 0,11(11:0)
```

- c. Take the drive off line. Run the following **arconf setstate** command, using the Channel and Device numbers from the **arconf getconfig** command: This will also activate the Fault LED on the drive.

```
arconf setstate 1 device 0 11 ddd
```

- d. You can now physically remove the drive from the system.

4. Unlock the drive tray handle by pushing the handle release (**A**) in the direction shown. The handle (**B**) snaps out towards you. If the handle does not snap out all the way, the drive tray does not slide out of the system, as shown in Figure 53 on page 77.

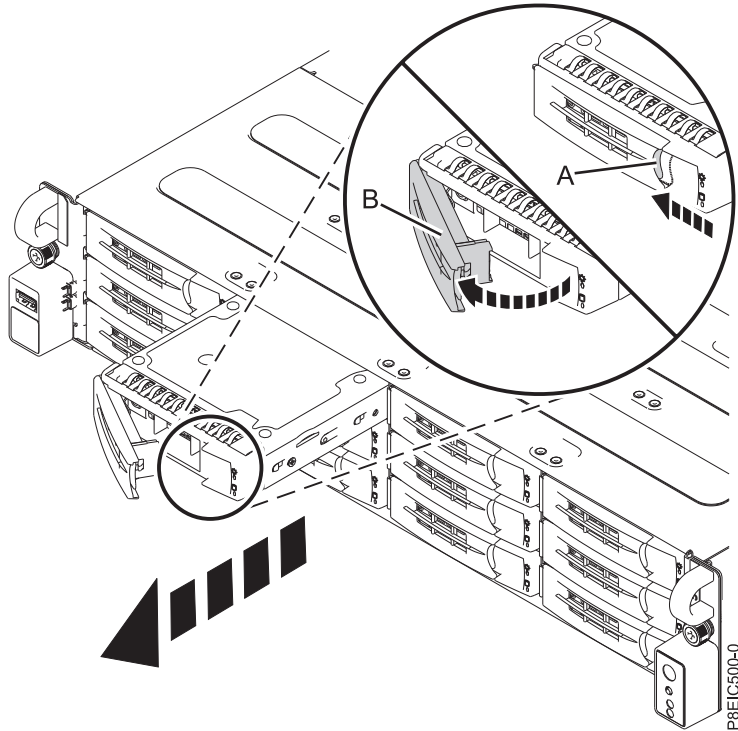


Figure 53. Removing a front drive tray

5. Support the bottom of the drive tray as you slide it out of the system. Do not hold the drive tray by the handle.
6. If you are removing more than one drive, repeat the steps 3 on page 76 to 5 in this procedure until all drives are removed.
7. Remove a drive from the tray.
 - For a 3.5 inch drive, unfasten the drive from the sides of the tray by removing four screws (2 on each side), as shown in Figure 54 on page 78.

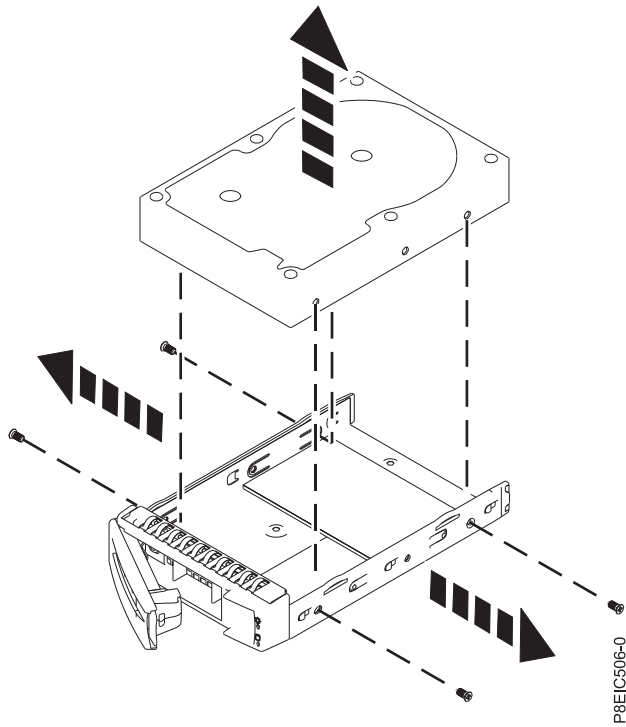


Figure 54. Removing the 3.5 inch drive from the tray

- For a 2.5 inch drive, turn the tray over. Unfasten the drive from the bottom of the tray by removing four screws, as shown in Figure 55.

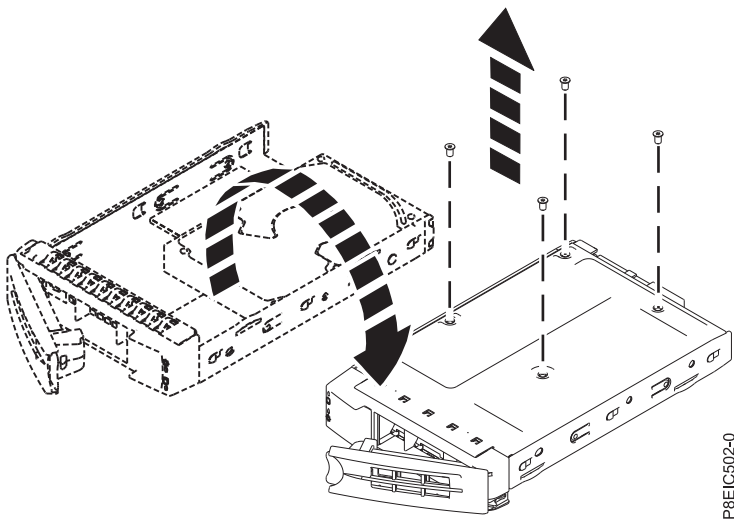


Figure 55. Removing the 2.5 inch drive from the tray

Replacing a front drive in the 8348-21C

Learn how to remove a front drive in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.

2. Install a drive into the tray. Orient the drive such that the connectors are pointing to the rear of the drive.
 - A 3.5 inch drive fills the tray, as shown in Figure 56. Fasten the drive to the sides of the tray with four screws (2 on each side).

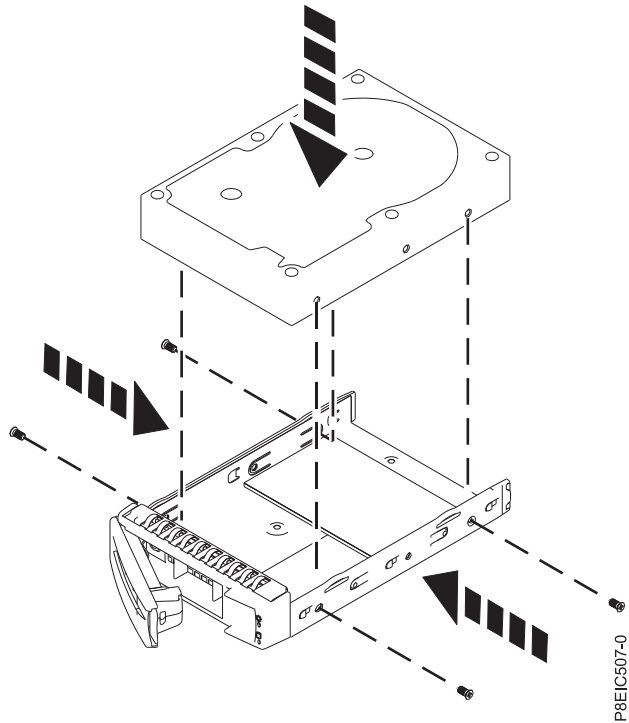


Figure 56. Mounting the 3.5 inch drive in the tray

- A 2.5 inch drive must be positioned at the rear of the tray. While you hold both the drive and the tray, turn the tray over. Fasten the drive to the bottom of the tray with four screws, as shown in Figure 57.

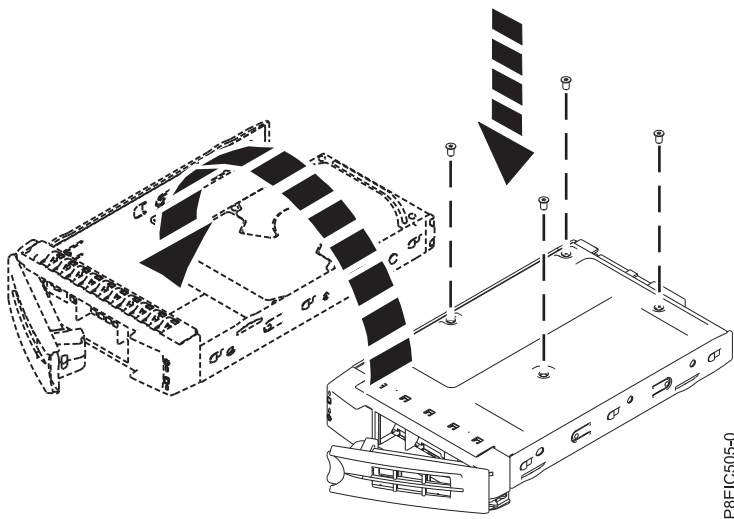


Figure 57. Mounting the 2.5 inch drive in the tray

3. Hold the drive tray by the bottom as you position the drive tray. Slide the drive tray all the way into the system. Push the drive tray in until the drive tray handle (A) starts to close, then push the handle in until it locks, as shown in Figure 58.

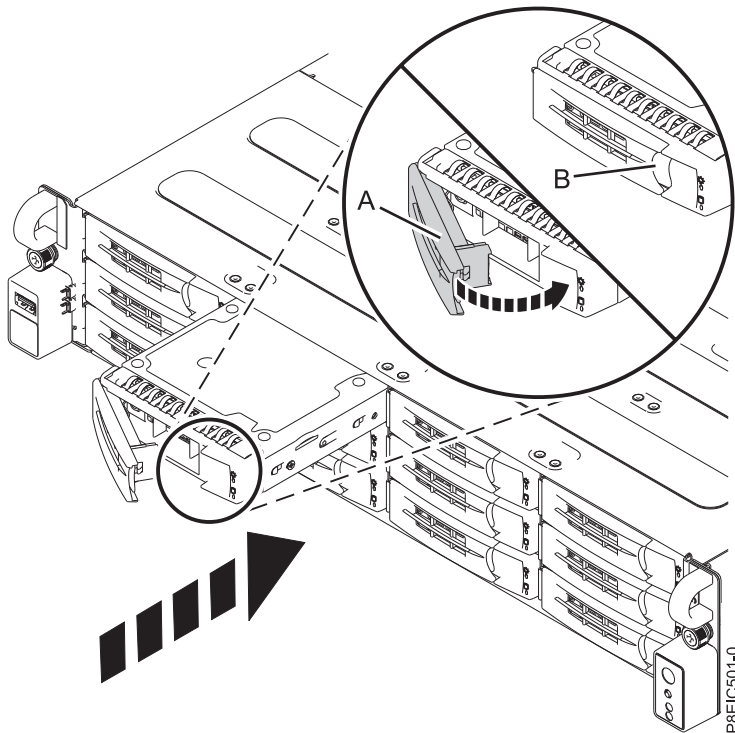


Figure 58. Locking the drive tray handle

4. Lock the drive tray handle (A) by pushing the handle in until it clicks into place.
5. Configure the installed or replaced drive for your environment.
 - a. After you insert a new drive, you must rescan for the device.
 - **Ubuntu:** To run the rescan command in Ubuntu, log into the system as the root user, and run the command:

```
rescan-scsi-bus
```

This tool is provided in the *scsitools* package, which can be installed by using the command:

```
sudo apt-get install scsitools
```
 - **REHL 7.2:** To run the rescan command in Red Hat Linux, log into the system as the root user, and run the command:

```
rescan-scsi-bus -a
```

This tool is provided in the *sg3_utils* package, which can be installed by using the command:

```
yum install sg3_utils
```
 - b. Load or restore data from your backup media. If a drive failed, refer to Recovering from a Disk Drive Failure (www.adaptec.com/en-us/support/infocenter/release-2015-1/index.jsp?topic=/RAID_IUG.xml/Topics/Recovering_from_a_Disk_Drive_Failure.html).

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European Community Compliance Statement

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

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

European Community contact:
IBM Deutschland GmbH
Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Tele: +49 (0) 800 225 5423 or +49 (0) 180 331 3233
email: halloibm@de.ibm.com

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

VCCI Statement - Japan

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

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

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

Japan JIS C 61000-3-2 Compliance

(一社) 電子情報技術産業会 高調波電流抑制対策実施
要領に基づく定格入力電力地 : See Knowledge Center

For products less than or equal to 20 A per phase the following statement applies:

高周波電流規格 JIS C 61000-3-2 適合品

For products greater than 20 A, single-phase, the following statements apply:

高周波電流規格 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

For products greater than 20 A per phase, three-phase, the following statements apply:

高周波電流規格 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 : 5 (3相、PFC回路付)
- 換算係数 : 0

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

声 明

此为 A 级产品, 在生活环境中, 该产品可能会造成无线电干扰。在这种情况下, 可能需要用户对其干扰采取切实可行的措施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

Electromagnetic Interference (EMI) Statement - Taiwan

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

The following is a summary of the EMI Taiwan statement above.

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

IBM Taiwan Contact Information:

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

Electromagnetic Interference (EMI) Statement - Korea

이 기기는 업무용(A급)으로 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Germany Compliance Statement

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

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

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

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

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

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

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

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

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Regulations, Abteilung M372
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 (0) 800 225 5423 or +49 (0) 180 331 3233
email: halloibm@de.ibm.com

Generelle Informationen:

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

Electromagnetic Interference (EMI) Statement - Russia

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

Class B Notices

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

Federal Communications Commission (FCC) statement

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

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

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

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

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

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

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

Industry Canada Compliance Statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

European Community Compliance Statement

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

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

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email: halloibm@de.ibm.com

VCCI Statement - Japan

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

Japan JIS C 61000-3-2 Compliance

**(一社) 電子情報技術産業会 高調波電流抑制対策実施
要領に基づく定格入力電力地 : See Knowledge Center**

For products less than or equal to 20 A per phase the following statement applies:

高周波電流規格 JIS C 61000-3-2 適合品

For products greater than 20 A, single-phase, the following statements apply:

高周波電流規格 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

For products greater than 20 A per phase, three-phase, the following statements apply:

高周波電流規格 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 : 5 (3相、PFC回路付)
- 換算係数 : 0

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

Electromagnetic Interference (EMI) Statement - Korea

이 기기는 가정용(B급)으로 전자과적합기기로
서 주로 가정에서 사용하는 것을 목적으로 하
며, 모든 지역에서 사용할 수 있습니다.

Germany Compliance Statement

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

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

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.

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

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

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

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

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

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Regulations, Abteilung M372
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 (0) 800 225 5423 or +49 (0) 180 331 3233
email: halloibm@de.ibm.com

Generelle Informationen:

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

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