

Power Systems

*Adapter placement for the 9040-MR9*



**Note**

Before using this information and the product it supports, read the information in [“Safety notices” on page v](#), [“Notices” on page 17](#), 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 POWER9™ processor and to all associated models.

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# Safety notices

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Safety notices may be printed throughout this guide:

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

## World Trade safety information

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

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

## German safety information

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

## Laser safety information

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

### Laser compliance

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



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

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard: If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product. Do not open or service any power supply assembly. Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.



- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. For AC power, disconnect all power cords from their AC power source. For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected. For racks with AC power, connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate. For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- Connect any equipment that will be attached to this product to properly wired outlets.

- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- When performing a machine inspection: 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 attempt to switch power to the machine until all possible unsafe conditions are corrected. Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect: 1) Turn off everything (unless instructed otherwise). 2) For AC power, remove the power cords from the outlets. 3) For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source. 4) Remove the signal cables from the connectors. 5) Remove all cables from the devices.

To Connect: 1) Turn off everything (unless instructed otherwise). 2) Attach all cables to the devices. 3) Attach the signal cables to the connectors. 4) For AC power, attach the power cords to the outlets. 5) For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP. 6) Turn on the devices.



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

**(R001 part 1 of 2):**



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

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet if provided, unless the earthquake option is to be installed.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices. In addition, do not lean on rack mounted devices and do not use them to stabilize your body position (for example, when working from a ladder).



- Stability hazard:
  - The rack may tip over causing serious personal injury.
  - Before extending the rack to the installation position, read the installation instructions.
  - Do not put any load on the slide-rail mounted equipment mounted in the installation position.
  - Do not leave the slide-rail mounted equipment in the installation position.
- Each rack cabinet might have more than one power cord.
  - For AC powered racks, be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.

- For racks with a DC power distribution panel (PDP), turn off the circuit breaker that controls the power to the system unit(s), or disconnect the customer's DC power source, when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (R001 part 1 of 2)

**(R001 part 2 of 2):**



**CAUTION:**

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



- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack. (R001 part 2 of 2)



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

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:
  - Remove all devices in the 32U position and above.
  - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.

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

(R002)

**(L001)**



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

**(L002)**



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

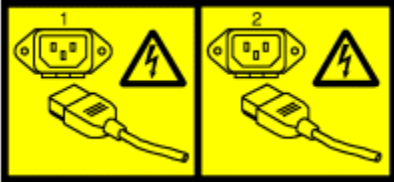
- The rack may tip over causing serious personal injury.
- Before extending the rack to the installation position, read the installation instructions.



- Do not put any load on the slide-rail mounted equipment mounted in the installation position.
- Do not leave the slide-rail mounted equipment in the installation position.

(L002)

(L003)



or



or

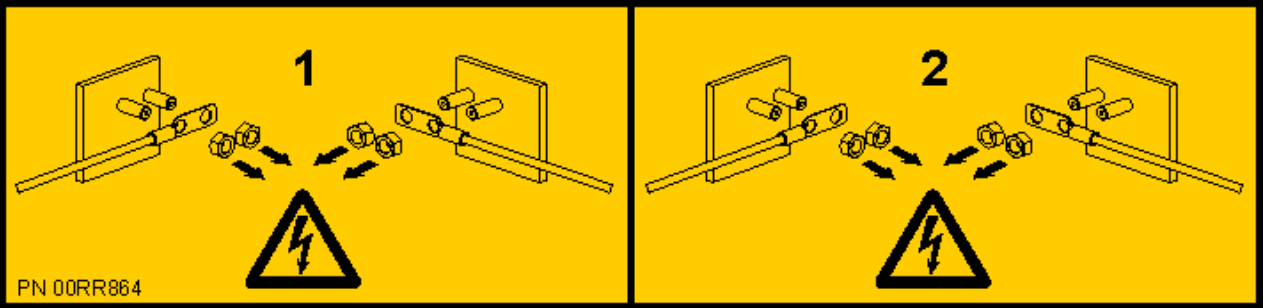



or



or






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


(L007)




 **CAUTION:** A hot surface nearby. (L007)

(L008)



 **CAUTION:** Hazardous moving parts nearby. (L008)

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

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

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

(C026)



**CAUTION:** Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. Although shining light into one end and looking into the other end of a disconnected optical fiber to verify the continuity of optic fibers may not injure the eye, this procedure is potentially dangerous. Therefore, verifying the continuity of optical fibers by shining light into one end and looking at the other end is not recommended. To verify continuity of a fiber optic cable, use an optical light source and power meter. (C027)



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



**CAUTION:** Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information:

- Laser radiation when open.
- Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

(C030)



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

*Do Not:*

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

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



**CAUTION:** Regarding IBM provided VENDOR LIFT TOOL:

- Operation of LIFT TOOL by authorized personnel only.
- LIFT TOOL intended for use to assist, lift, install, remove units (load) up into rack elevations. It is not to be used loaded transporting over major ramps nor as a replacement for such designated tools like pallet jacks, walkies, fork trucks and such related relocation practices. When this is not practicable, specially trained persons or services must be used (for instance, riggers or movers).
- Read and completely understand the contents of LIFT TOOL operator's manual before using. Failure to read, understand, obey safety rules, and follow instructions may result in property damage and/or personal injury. If there are questions, contact the vendor's service and support. Local paper manual must remain with machine in provided storage sleeve area. Latest revision manual available on vendor's web site.
- Test verify stabilizer brake function before each use. Do not over-force moving or rolling the LIFT TOOL with stabilizer brake engaged.
- Do not raise, lower or slide platform load shelf unless stabilizer (brake pedal jack) is fully engaged. Keep stabilizer brake engaged when not in use or motion.
- Do not move LIFT TOOL while platform is raised, except for minor positioning.
- Do not exceed rated load capacity. See LOAD CAPACITY CHART regarding maximum loads at center versus edge of extended platform.
- Only raise load if properly centered on platform. Do not place more than 200 lb (91 kg) on edge of sliding platform shelf also considering the load's center of mass/gravity (CoG).
- Do not corner load the platforms, tilt riser, angled unit install wedge or other such accessory options. Secure such platforms -- riser tilt, wedge, etc options to main lift shelf or forks in all four (4x or all other provisioned mounting) locations with provided hardware only, prior to use. Load objects are designed to slide on/off smooth platforms without appreciable force, so take care not

to push or lean. Keep riser tilt [adjustable angling platform] option flat at all times except for final minor angle adjustment when needed.

- Do not stand under overhanging load.
- Do not use on uneven surface, incline or decline (major ramps).
- Do not stack loads.
- Do not operate while under the influence of drugs or alcohol.
- Do not support ladder against LIFT TOOL (unless the specific allowance is provided for one following qualified procedures for working at elevations with this TOOL).
- Tipping hazard. Do not push or lean against load with raised platform.
- Do not use as a personnel lifting platform or step. No riders.
- Do not stand on any part of lift. Not a step.
- Do not climb on mast.
- Do not operate a damaged or malfunctioning LIFT TOOL machine.
- Crush and pinch point hazard below platform. Only lower load in areas clear of personnel and obstructions. Keep hands and feet clear during operation.
- No Forks. Never lift or move bare LIFT TOOL MACHINE with pallet truck, jack or fork lift.
- Mast extends higher than platform. Be aware of ceiling height, cable trays, sprinklers, lights, and other overhead objects.
- Do not leave LIFT TOOL machine unattended with an elevated load.
- Watch and keep hands, fingers, and clothing clear when equipment is in motion.
- Turn Winch with hand power only. If winch handle cannot be cranked easily with one hand, it is probably over-loaded. Do not continue to turn winch past top or bottom of platform travel. Excessive unwinding will detach handle and damage cable. Always hold handle when lowering, unwinding. Always assure self that winch is holding load before releasing winch handle.
- A winch accident could cause serious injury. Not for moving humans. Make certain clicking sound is heard as the equipment is being raised. Be sure winch is locked in position before releasing handle. Read instruction page before operating this winch. Never allow winch to unwind freely. Freewheeling will cause uneven cable wrapping around winch drum, damage cable, and may cause serious injury.
- This TOOL must be maintained correctly for IBM Service personnel to use it. IBM shall inspect condition and verify maintenance history before operation. Personnel reserve the right not to use TOOL if inadequate. (C048)

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

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

The equipment is suitable for installation in the following:

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

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

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

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

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

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



# Adapter placement for the 9040-MR9

Find information about the placement rules and slot priorities of adapters.

The following features are electromagnetic compatibility (EMC) Class B features. See the [Class B Notices](#) in the Hardware Notices section.

Feature	Description
ENOW	PCIe2 2-port 10 GbE BaseT RJ45 Adapter

## Adapter placement rules and slot priorities for the 9040-MR9

Find information about the placement rules and slot priorities for the adapters that are supported for the 9040-MR9 system.

### Slot descriptions for the 9040-MR9

The 9040-MR9 systems provide PCIe3 and PCIe4 slots. The 9040-MR9 systems offer two or four POWER9 processor modules. The PCIe slots are enabled to support the PCIe3 cable adapter (FC EJ08 or FC EJ20) that is used to attach the EMX0 PCIe Gen3 I/O expansion drawer.

Table 2 on page 1 provides information about the PCIe switches in the 9040-MR9 systems.

Two PCIe3 switches (24-port PLX PEX 8725) in the system backplane provide PCIe3 buses from the system processor modules that provide connectivity to the following features:

- PCIe slots
- PCIe local area network (LAN) controller
- PCIe3 internal SAS controller

Features provided	Switch 1 and Switch 2
Lanes and ports	24-lane, 10-ports, PCIe3 With integrated 8.0 gigatransfers per second (GT/s) Serializer/Deserializer (SerDes) speed negotiation for each port
Lane and polarity reversal	Supported
All ports support concurrent maintenance through I2C bus	Yes
End-to-end cyclic redundancy check (CRC) and poison bit error checking	Supported
Data path parity	Supported
Memory error correction	Supported
Advanced error reporting	Supported
Designate any port as the upstream port	Yes
19x19 mm, 324-pin FCBGA package	Yes
Power consumption	Typical power: 5.4 watts

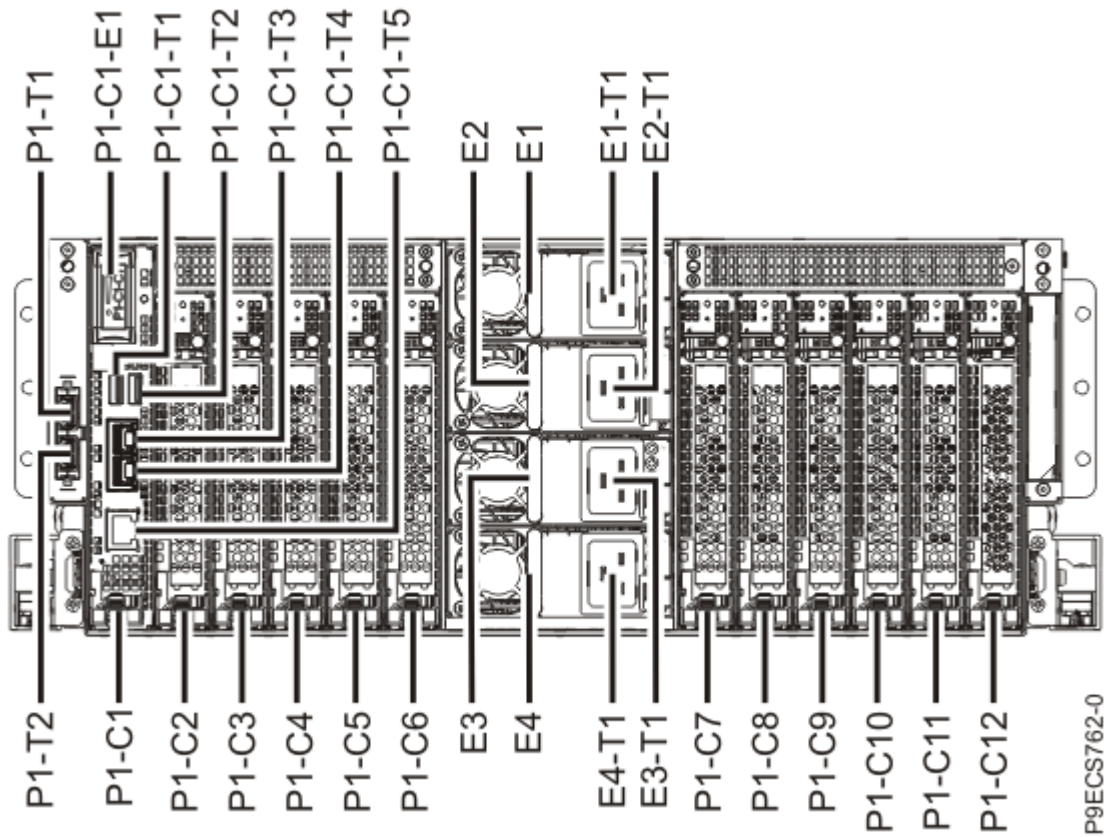


Figure 1. Rear view of a rack-mounted 9040-MR9 system with PCIe slots location codes

Table 3 on page 2 lists the adapter slot locations and details for the 9040-MR9 systems.

Table 3. Slot locations and descriptions for the 9040-MR9 system

Location code	Description	SCM / PHB	Slot capabilities				Slot availability		
			OpenCAPI	PCIe3 cable adapter	Dynamic direct memory access (DMA) window	Enlarged capacity assign order <sup>1</sup>	2 processors	3 processors	4 processors
P1-C2	PCIe4 x16	3/3	No	Yes	Yes	8	No	No	Yes
P1-C3	PCIe4 x16	3/0	Yes	Yes	Yes	4	No	No	Yes
P1-C4	PCIe4 x16	2/3	No	Yes	Yes	7	No	Yes	Yes
P1-C5	PCIe4 x16	2/0	Yes	Yes	Yes	3	No	Yes	Yes
P1-C6	PCIe3 x8 (Base Ethernet adapter use only)	1/2	No	No	Yes	9	Yes	Yes	Yes
P1-C7	PCIe4 x16	1/3	No	Yes	Yes	6	N/A	N/A	N/A
P1-C8	PCIe4 x16	1/0	Yes	Yes	Yes	2	Yes	Yes	Yes
P1-C9	PCIe4 x 8 (SAS controller slot for controlling internal disk bays)	1/1	No	No	Yes	11	Yes	Yes	Yes
P1-C10	PCIe4 x16	0/3	Yes	Yes	Yes	5	Yes	Yes	Yes
P1-C11	PCIe4 x16	0/0	No	Yes	Yes	1	Yes	Yes	Yes
P1-C12	PCIe4 x8 (SAS controller slot for controlling internal disk bays)	0/1	No	No	Yes	10	Yes	Yes	Yes

<sup>1</sup>Assigned PCIe slot order when the I/O Adapter Enlarged Capacity option is enabled. For example, if the option was enabled with a value of 5, five slots are enabled with the I/O enlarged capacity.

**Note:** Enabling the I/O Adapter Enlarged Capacity option will only affect Linux® partitions. If your system does not have Linux partitions, the I/O Adapter Enlarged Capacity setting should be disabled. Note the following:

- The I/O cassettes that are used in the 9040-MR9 system can hold half length, full height and half length, half height PCIe adapters.
- All PCIe slots support the single root I/O virtualization (SR-IOV) function.



## Firmware slot capabilities

System PCIe slots are allocated direct memory access (DMA) space using the following algorithm:

- All slots are allocated a 2 GB default DMA window.
- All I/O adapter slots (except the embedded USB) are allocated Dynamic DMA Window (DDW) capability based on installed platform memory. DDW capability is calculated assuming 4K I/O mappings:
  - For systems with less than 64 GB of memory, slots are allocated 16 GB of DDW capability.
  - For systems with at least 64 GB of memory, but less than 128 GB of memory, slots are allocated 32 GB of DDW capability.
  - For systems with 128 GB or more of memory, slots are allocated 64 GB of DDW capability.
  - Slots can be enabled with Huge Dynamic DMA Window capability (HDDW) using the **I/O Adapter Enlarged Capacity** setting in ASMI.
  - HDDW enabled slots are allocated enough DDW capability to map all of installed platform memory using 64 K I/O mappings.
  - Minimum DMA window size for HDDW enabled slots is 32 GB.
  - Slots that are HDDW enabled are allocated the larger of the calculated DDW capability and HDDW capability.

## Adapter placement rules

Use this information while selecting slots for installing adapters in the 9040-MR9 system. Use [Table 4 on page 3](#) to identify adapter slot placement priorities and maximums for the system.

- P1-C9 and P1-C12 are general-purpose slots that are also designated as serial-attached SCSI (SAS) controller slots for controlling the internal disk bays.
- All of the x16 PCIe slots are coherent accelerator processor interface (CAPI) enabled.
- Four of the x16 PCIe slots support NVlink or OpenCAPI 25 Gbs cable cards. The OpenCAPI cable cards cannot be serviced with the system power turned on.
- P1-C1 is for the service processor card assembly. The P1-C1 slot cannot be serviced with the system power turned on.
- P1-C6 is designated for the Base Ethernet card.
- The four x4 PCIe3 buses from the two PLX 24-port PCIe3 switches go to the four Non-volatile Memory Express (NVMe) drives on the direct-access storage device (DASD) backplane at the front of the system.

Verify whether the adapter is supported for your system. The feature code (FC) column in the following table lists all of the supported adapters for systems. You can select the FC for more details. To view a list of adapters supported in the POWER9 processor-based systems and the EMX0 PCIe3 expansion drawer, see [Adapter information by feature code for the 9008-22L, 9009-22A, 9009-22G, 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9040-MR9, 9080-M9S, 9223-22H, 9223-22S, 9223-42H, 9223-42S system and EMX0 PCIe3 expansion drawers](#) ([http://www.ibm.com/support/knowledgecenter/POWER9/p9hcd/p9hcd\\_pcibyfeature.htm](http://www.ibm.com/support/knowledgecenter/POWER9/p9hcd/p9hcd_pcibyfeature.htm)).

The 9040-MR9 systems can have two, three, or four system processor modules.

**Note:** In the following table, the slot priority numbers 2 - 12 correspond to slot locations P1-C2 through P1-C12.

Feature code	Description	Slot priority			Maximum number of adapters supported
		2 processors	3 processors	4 processors	
5729	PCIe2 FH 4-port 8 Gb Fibre Channel adapter (FC 5729; CCIN 5729)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10

Table 4. Adapter slot priorities and maximum adapters supported in the 9040-MR9 (continued)

Feature code	Description	Slot priority			Maximum number of adapters supported
		2 processors	3 processors	4 processors	
<a href="#">5735</a>	8 Gb PCI Express dual-port Fibre Channel adapter (FC 5735 and EL58); CCIN 577D)	12, 9,11,8, 10, 7	12, 9, 11, 8, 5, 10, 7, 4	12, 9, 11, 8, 5, 3, 10, 7, 4, 2	6/8/10
<a href="#">5748</a>	POWER® GXT145 PCI Express Graphics Accelerator (FC 5748; CCIN 5269)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">5785</a>	4-port Async EIA-232 PCIe 1X adapter (FC 5277 and 5785; CCIN 57D2)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">5899</a>	PCIe2 4-port 1 GbE adapter (FC 5260, FC 5899, FC EL4L, and FC EL4M; CCIN 576F)	6, 12, 9, 11, 8, 10, 7	6, 12, 9, 11, 8, 5, 10, 7, 4	6, 12, 9, 11, 8, 5, 3, 10, 7, 4, 2	7/9/11
<a href="#">EC2S</a>	PCIe3 2-port 10 Gb NIC & RoCE SR/Cu adapter (FC EC2R and EC2S; CCIN 58FA)	6, 11, 8, 10, 7, 12, 9	6, 11, 8, 5, 10, 7, 4, 12, 9	6, 11, 8, 5, 3, 10, 7, 4, 2, 12, 9	7/9/11
<a href="#">EC2U</a>	PCIe3 2-port 25/10 Gb NIC & RoCE SFP28 Adapter (FC EC2U; CCIN 58FB)	6, 11, 8, 10, 7, 12, 9	6, 11, 8, 5, 10, 7, 4, 12, 9	6, 11, 8, 5, 3, 10, 7, 4, 2, 12, 9	7/9/11
<a href="#">EC3B</a>	PCIe3 2-Port 40 GbE NIC RoCE QSFP+ adapter (FC EC3B; CCIN 57BD); Adapter part number: 00FW105	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EC3M</a>	PCIe3 2-port 100 GbE NIC & RoCE QSFP28 adapter (FC EC3M; CCIN 2CEC); Adapter FRU number: 00WT078	11, 8, 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8
<a href="#">EC38</a>	PCIe3 2-port 10 GbE NIC & RoCE SFP+ Copper adapter (FC EC37, EC38, EL3X, and EL53; CCIN 57BC)	6, 11, 8, 10, 7, 12, 9	6, 11, 8, 10, 7, 12, 9	6, 11, 8, 10, 7, 12, 9	7/9/11
<a href="#">EC46</a>	PCIe2 4-port USB 3.0 adapter (FC EC45 and EC46; CCIN 58F9)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EC5B</a>	PCIe3 x8 Non-Volatile Memory 1.6 TB SSD NVMe adapter (FC EC5A, EC5B, EC5G, EC6U, and EC6V; CCIN 58FC)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EC5D</a>	PCIe3 x8 Non-Volatile Memory 3.2 TB SSD NVMe adapter (FC EC5C and EC5D; CCIN 58FD)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EC5E</a>	PCIe3 x8 Non-Volatile Memory 6.4 TB SSD NVMe adapter (FC EC5E, EC5F, EC6Y, and EC6Z; CCIN 58FE)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EC63</a>	PCIe4 x16 1-Port EDR 100 GB InfiniBand ConnectX-5 CAPI-capable adapter (FC EC62 and EC63; CCIN 2CF1)	11, 8, 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8

Table 4. Adapter slot priorities and maximum adapters supported in the 9040-MR9 (continued)

Feature code	Description	Slot priority			Maximum number of adapters supported
		2 processors	3 processors	4 processors	
<a href="#">EC65</a>	PCIe4 x16 2-Port EDR 100 GB IB ConnectX-5 CAPI Capable adapter (FC EC65; CCIN 2CF2)	11, 8, 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8
<a href="#">EC66</a>	2-port 100 GB RoCE En Connectx-5 PCIe4 x16 adapter (FC EC66; CCIN 2CF3)	11, 8, 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8
<a href="#">EC6J</a>	PCIe2 LP 2-Port USB 3.0 Adapter (FC EC6J and FC EC6K; CCIN 590F); Adapter part number: 02JD518	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EC76</a>	PCIe4 2-port 100 GbE RoCE x16 adapter (FC EC75 and FC EC76; CCIN 2CFB); Adapter part number: 02CM921	11, 8, 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8
<a href="#">EC7B</a>	PCIe4 x8 NVMe 1.6 TB SSD NVMe Adapter (FC EC7A, EC7B, EC7J, and EC7K; CCIN 594A)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EC7D</a>	PCIe4 x8 NVMe 3.2 TB SSD NVMe Adapter (FC EC7C, EC7D, EC7L, and EC7M; CCIN 594B)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EC7F</a>	PCIe4 x8 NVMe 3.2 TB SSD NVMe Adapter (FC EC7E, EC7F, EC7N, and EC7P; CCIN 594C)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EJ08</a>	PCIe3 cable adapter for the EMX0 PCIe3 expansion drawer (FC EJ08; CCIN 2CE2)	11, 8, 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8
<a href="#">EJ0J</a>	PCIe3 SAS RAID quad-port 6 Gb adapter (FC EJ0J and EL59); CCIN 57B4)	11, 8, 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8
<a href="#">EJ0K</a>	PCIe3 SAS RAID quad port 6 Gb x8, low-profile capable adapter (FC EJ0K; CCIN 57B4)	12, 9, 11, 8, 10, 7	12, 9, 11, 8, 5, 10, 7, 4	12, 9, 11, 8, 5, 3, 10, 7, 4, 2	6/8/10
<a href="#">EJ0L</a>	PCIe3 12 GB Cache RAID SAS quad-port 6 Gb adapter (FC EJ0L; CCIN 57CE)	11, 8, 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8
<a href="#">EJ10</a>	PCIe3 4 x8 SAS Port adapter (FC EJ10; CCIN 57B4)	11, 8, 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8
<a href="#">EJ14</a>	PCIe3 12 GB Cache RAID PLUS SAS adapter quad-port 6 Gb x8 (FC EJ14; CCIN 57B1)	12, 9, 11, 8, 10, 7	12, 9, 11, 8, 5, 10, 7, 4	12, 9, 11, 8, 5, 3, 10, 7, 4, 2	6/8/10
<a href="#">EJ1P</a>	PCIe1 SAS Tape/DVD dual-port 3 Gb x8 adapter (FC EJ1N and EJ1P; CCIN 57B3)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EJ20</a>	PCIe3 cable adapter for the EMX0 PCIe3 expansion drawer (FC EJ20; CCIN 2CF5)	11, 8, 10, 7	11, 8, 5, 10, 7, 4	11, 8, 5, 3, 10, 7, 4, 2	4/6/8
<a href="#">EJ27</a>	PCIe Crypto- graphic Coprocessor (FC EJ27 and EJ28; CCIN 476A)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10

Table 4. Adapter slot priorities and maximum adapters supported in the 9040-MR9 (continued)

Feature code	Description	Slot priority			Maximum number of adapters supported
		2 processors	3 processors	4 processors	
<a href="#">EJ32</a>	4767-001 Cryptographic Coprocessor (FC EJ32; CCIN 4767)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EJ37</a>	4769-001 Cryptographic Coprocessor (FC EJ35 and EJ37 for BSC; CCIN C0AF)	6	6	6	1/1/1
<a href="#">EN0A</a>	PCIe3 16 Gb 2-port Fibre Channel adapter (FC EL5B and FC EN0A; CCIN 577F)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EN0G</a>	PCIe2 8 Gb 2-port Fibre Channel adapter (FC EN0F and EN0G; CCIN 578D)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EN0H</a>	PCIe3 4-port (10 Gb FCoE and 1 GbE) (FC EL38, FC EL56, FC EN0H, and FC EN0J; CCIN 2B93)	6, 11, 8, 10, 7, 12, 9	6, 11, 8, 5, 10, 7, 4, 12, 9	6, 11, 8, 5, 3, 10, 7, 4, 2, 12, 9	7/9/11
<a href="#">EN0K</a>	PCIe3 4-port (10 Gb FCoE and 1 GbE) copper and RJ45 adapter (FC EL57 and EN0K; CCIN 2CC1)	6, 11, 8, 10, 7, 12, 9	6, 11, 8, 5, 10, 7, 4, 12, 9	6, 11, 8, 5, 3, 10, 7, 4, 2, 12, 9	7/9/11
<a href="#">EN0M</a>	PCIe3 4-port (10 Gb FCoE and 1 GbE) LR and RJ45 adapter (FC EN0M and EN0N; CCIN 2CC0)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EN0S</a>	PCIe2 4-port (10 Gb + 1 GbE) SR+RJ45 adapter (FC EN0S; CCIN 2CC3)	6, 11, 8, 10, 7, 12, 9	6, 11, 8, 5, 10, 7, 4, 12, 9	6, 11, 8, 5, 3, 10, 7, 4, 2, 12, 9	7/9/11
<a href="#">EN0U</a>	PCIe2 4-port (10 Gb + 1 GbE) Copper SFP+RJ45 adapter (FC EN0U; CCIN 2CC3)	6, 11, 8, 10, 7, 12, 9	6, 11, 8, 5, 10, 7, 4, 12, 9	6, 11, 8, 5, 3, 10, 7, 4, 2, 12, 9	7/9/11
<a href="#">EN0W</a>	PCIe2 2-port 10 GbE BaseT RJ45 adapter (FC EN0W; CCIN 2CC4)	6, 11, 8, 10, 7, 12, 9	6, 11, 8, 5, 10, 7, 4, 12, 9	6, 11, 8, 5, 3, 10, 7, 4, 2, 12, 9	7/9/11
<a href="#">EN12</a>	PCIe2 FH 4-port 8 Gb Fibre Channel adapter (FC EN12; CCIN EN0Y)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EN15</a>	PCIe3 4-port 10 GbE SR adapter (FC EN15 and EN16; CCIN 2CE3)	6, 11, 8, 10, 7, 12, 9	6, 11, 8, 5, 10, 7, 4, 12, 9	6, 11, 8, 5, 3, 10, 7, 4, 2, 12, 9	7/9/11
<a href="#">EN1A</a>	PCIe3 8x 2-port Fibre Channel (32 Gb/s); (FC EL5U, EL5V, EN1A, and EN1B); CCIN 578F)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EN1C</a>	PCIe3 8x 4-port Fibre Channel (16 Gb/s); (FCs EL5W, EL5X, EN1C, and EN1D; CCIN 578E)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EN1E</a>	PCIe3 x8 4-port Fibre Channel (16 Gb/s); (FC EN1E and EN1F; CCIN 579A); Adapter part number: 02JD586	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10

Table 4. Adapter slot priorities and maximum adapters supported in the 9040-MR9 (continued)

Feature code	Description	Slot priority			Maximum number of adapters supported
		2 processors	3 processors	4 processors	
<a href="#">EN1G</a>	PCIe3 8x 2-port Fibre Channel (16 Gb/s) (EN1G and EN1H; CCIN 579B); Adapter part number: 02CM900 and 02CM903	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EN1J</a>	PCIe4 x8 2-port Fibre Channel (32 Gb/s); (FC EN1J and EN1K; CCIN 579C); Adapter part number: 02CM909	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10
<a href="#">EN2A</a>	PCIe3 16 Gb 2-port Fibre Channel adapter (FC EN2A and FC EN2B; CCIN 579D)	11, 8, 10, 7, 12, 9	11, 8, 5, 10, 7, 4, 12, 9	11, 8, 5, 3, 10, 7, 4, 2, 12, 9	6/8/10

## Adapter placement rules and slot priorities for the EMX0 PCIe Gen3 I/O expansion drawer

Find information about the placement rules and slot priorities for the adapters that are supported for the EMX0 PCIe Gen3 I/O expansion drawer (EMX0 PCIe3 expansion drawer).

### Slot descriptions for the EMX0 PCIe3 expansion drawer

The number of PCIe slots that are provided in the EMX0 PCIe3 expansion drawer depends on the I/O module configuration of the EMX0 PCIe3 expansion drawer. Your configuration might have one or two PCIe3 6-slot fanout modules installed in the rear of the EMX0 PCIe3 expansion drawer. Each PCIe3 6-slot fanout module provides six full-length, full-height, PCIe3 slots. The PCIe3 slots are compatible with PCIe1 and PCIe2 adapters. The PCIe slots use generation 3, single-wide, blind-swap cassettes.

The I/O module in the EMX0 PCIe3 expansion drawer is connected to the system with an expansion drawer cable pair. Each cable pair must be the same length and are attached to the T1 and T2 ports in the I/O module and to the corresponding ports in the PCIe3 cable adapter in the system.

Figure 2 on page 8 shows the rear view of the EMX0 PCIe3 expansion drawer with the location codes for the adapter slots in the PCIe3 6-slot fanout module.

Table 5 on page 8 lists the adapter slot locations and details for the EMX0 PCIe3 expansion drawer.

**Note:**

The left I/O module bay is configured with the first PCIe3 6-slot fanout module slot location codes P1-C1 through P1-C6.

The right I/O module bay is configured with the second PCIe3 6-slot fanout module slot location codes P2-C1 through P2-C6.

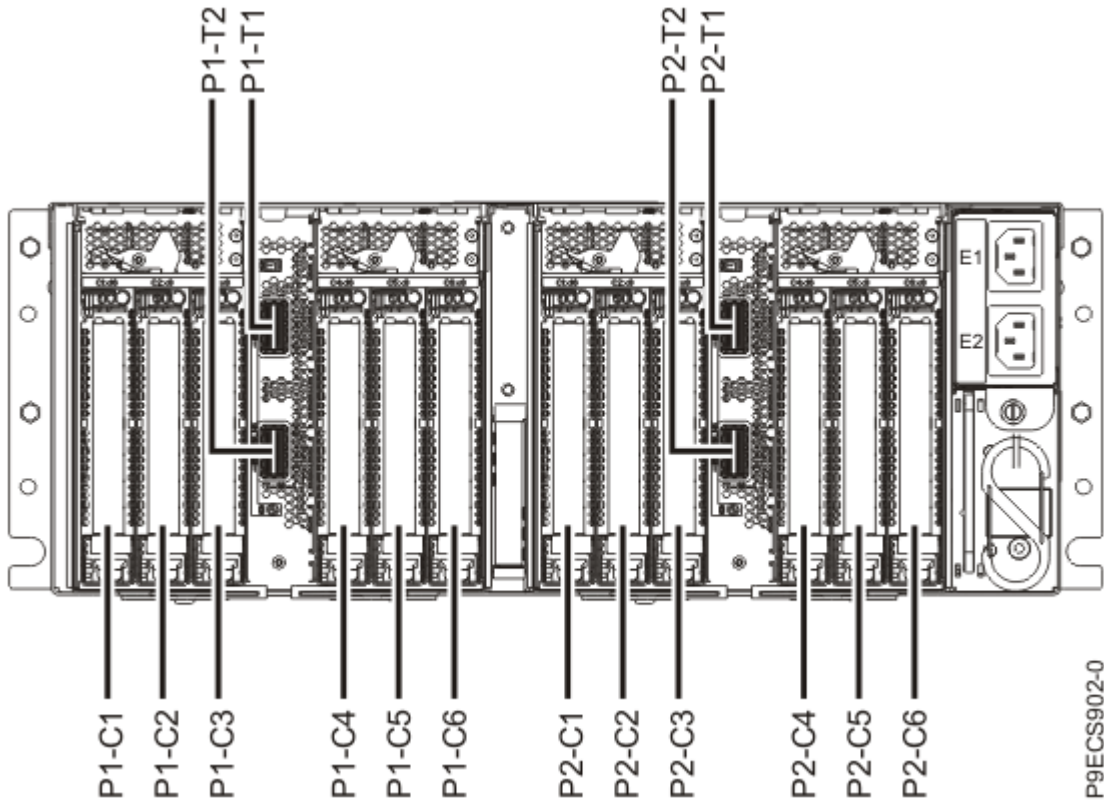


Figure 2. Rear view of a EMX0 PCIe3 expansion drawer with PCIe slot location codes

Table 5. Slot locations and descriptions for the EMX0 PCIe3 expansion drawer				
Location code	Description	Slot capabilities		
		SR-IOV	Dynamic direct memory access (DMA) window	I/O adapter enlarged capacity enablement order
P1-C1	PCIe3 x16	Yes	Yes	Yes <sup>1</sup>
P1-C2	PCIe3 x8	Yes	Yes	No
P1-C3	PCIe3 x8	Yes	Yes	No
P1-C4	PCIe3 x16	Yes	Yes	No
P1-C5	PCIe3 x8	Yes	Yes	No
P1-C6	PCIe3 x8	Yes	Yes	No
P2-C1	PCIe3 x16	Yes	Yes	Yes <sup>1</sup>
P2-C2	PCIe3 x8	Yes	Yes	No
P2-C3	PCIe3 x8	Yes	Yes	No
P2-C4	PCIe3 x16	Yes	Yes	No
P2-C5	PCIe3 x8	Yes	Yes	No

Table 5. Slot locations and descriptions for the EMX0 PCIe3 expansion drawer (continued)

Location code	Description	Slot capabilities		
		SR-IOV	Dynamic direct memory access (DMA) window	I/O adapter enlarged capacity enablement order
P2-C6	PCIe3 x8	Yes	Yes	No

<sup>1</sup>Slots P1-C1 and P2-C1 inherit the I/O Adapter Enlarged Capacity attribute from the slot in the system that connects to the EMX0 PCIe3 expansion drawer.

**Notes:**

- All slots are PCIe3 slots.
- All slots support full-length, full-height adapters or short form-factor with a full-height tailstock in single-wide, generation 3, blind-swap cassettes.
- Slots C1 and C4 in each PCIe3 6-slot fanout module are PCIe3 x16 buses and slots C2, C3, C5, and C6 are PCIe x8 buses.
- All slots support enhanced error handling (EEH).
- All PCIe slots are hot swappable and can be serviced with the power on.
- All six adapters in a PCIe3 6-slot fanout module can be in SR-IOV shared mode.
- If you have a CCIN 50CB PCIe3 6-slot fanout module, the FC EC2S and FC EC2U adapters are only supported in slots C2 and C5. If you have a CCIN 50CD PCIe3 6-slot fanout module, the FC EC2S and FC EC2U adapters are supported in slots C1 through C6, but only four FC EC2S and FC EC2U adapters can be in SR-IOV mode at a time.

**Firmware slot capabilities**

System PCIe slots are allocated direct memory access (DMA) space using the following algorithm:

- All slots are allocated a 2 GB default DMA window.
- Slots P1-C1 and P2-C1 inherit the I/O Adapter Enlarged Capacity attribute from the slot in the system that connects to the EMX0 PCIe3 expansion drawer.
- All other I/O adapter slots are allocated Dynamic DMA Window (DDW) capability based on installed platform memory. DDW capability is calculated assuming 4K I/O mappings:
  - For systems with less than 64 GB of memory, slots are allocated no DDW capability.
  - For systems with at least 64 GB of memory, but less than 128 GB of memory, slots are allocated 16 GB of DDW capability.
  - For systems with at least 128 GB of memory, but less than 256GB of memory, slots are allocated 32 GB of DDW capability.
  - For systems with 256 GB or more of memory, slots are allocated 64 GB of DDW capability.

**Adapters placement rules**

Use this information while selecting slots for installing adapters in the EMX0 PCIe3 expansion drawer attached to the system. Use [Table 6 on page 10](#) to identify slot placement priorities and the maximum number of adapters that can be installed in the EMX0 PCIe3 expansion drawer based on the operating system.

**Note:** You can click the link that appears in the feature code column for more technical information specific to the adapter.

- If the EMX0 PCIe3 expansion drawer is configured with two PCIe3 6-slot fanout modules, distribute the adapters across both I/O modules whenever possible.

- If FC EC46 is driving the internal DVD, it must be installed in the I/O expansion drawer that is closest to the system. The system and IO expansion drawer must be in the same rack.

**Note:** If slot P1-C2 of the first node contains a controller adapter (CC), it must be the first option to consider for wiring the module with the USB adapter driving the internal DVD. If it is a PCIe3 6-slot fanout module, install FC EC46 in slot Px-C3 of the PCIe3 6-slot fanout module.

- Do not attempt to install x16 adapters in x8 slots. Doing so can damage the x16 connectors in the EMX0 PCIe3 expansion drawer.

*Table 6. Adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer*

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX®	Linux	IBM i
<a href="#">2893 or 2894</a>	PCIe 2-line WAN with modem (FC 2893, 2894, EN13, EN14; CCIN 576C); Part number: 44V5323	P1-C6, P2-C6	0	1	1
<a href="#">5729</a>	PCIe2 FH 4-port 8 Gb Fibre Channel adapter (FC 5729; CCIN 5729); Adapter part number: 74Y3467	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6	6	0
<a href="#">5735</a>	8 Gb PCI Express dual-port Fibre Channel adapter (FC 5273, 5735, EL2N, and EL58); CCIN 577D); Adapter part number: 10N9824	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6 (EL58 - 0)	6	6 (EL58 - 0)
<a href="#">5785</a>	4-port Async EIA-232 PCIe 1X adapter (FC 5277 and 5785; CCIN 57D2); Adapter part number: 46K6734	P1-C6, P2-C6	1	1	1
<a href="#">5899</a>	PCIe2 4-port 1 GbE adapter (FC 5260, 5899, EL4L, and EL4M; CCIN 576F); Adapter part number: 74Y4064	P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6	6	6
<a href="#">EC2N</a>	PCIe3 2-port 10 GbE NIC & RoCE SR adapter (FC EC2M, EC2N, and EL54; CCIN 57BE); Adapter part number: full-height tailstock: 00RX875, low-profile tailstock: 00RX872	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6 (EL54 - 0)	6	0
<a href="#">EC2S</a>	PCIe3 2-port 10 Gb NIC & RoCE SR/Cu adapter (FC EC2R and EC2S; CCIN 58FA); Adapter part number: 01FT759	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6, P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	2 or 6 <sup>3</sup>	2 or 6 <sup>3</sup>	2 or 6 <sup>3</sup>



Table 6. Adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer (continued)

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX <sup>®</sup>	Linux	IBM i
<a href="#">EC2U</a>	PCIe3 2-port 25/10 Gb NIC & RoCE SFP28 adapter (FC EC2T and EC2U; CCIN 58FB); Adapter part number: 01FT753	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6, P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	2 or 6 <sup>3</sup>	2 or 6 <sup>3</sup>	2 or 6 <sup>3</sup>
<a href="#">EC38</a>	PCIe3 LP 2-port 10 GbE NIC & RoCE SFP+ Copper adapter (FC EC37, EC38, EL3X, and EL53; CCIN 57BC); Adapter part number: 00RX859	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6 (EL53 - 0)	6	0
<a href="#">EC3B</a>	PCIe3 2-Port 40 GbE NIC RoCE QSFP+ Adapter	P1-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C5, P2-C5	4	4	0
<a href="#">EC46</a>	PCIe2 4-Port USB 3.0 Adapter	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6, P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6	6	6
<a href="#">EC6K</a>	PCIe2 LP 2-Port USB 3.0 Adapter	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6, P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6	6	6
<a href="#">EJ0J</a>	PCIe3 SAS RAID quad-port 6 Gb adapter (FC EJ0J and EL59); CCIN 57B4); Adapter part number: 00FX846	P1-C1, P2-C1, P1-C4, P2-C4, P1-C3, P2-C3, P1-C6, P2-C6	4	4	4
<a href="#">EJ0L</a>	PCIe3 12 GB Cache RAID SAS quad-port 6 Gb adapter (FC EJ0L; CCIN 57CE); Adapter part number: 00FX840	P1-C1, P2-C1, P1-C4, P2-C4, P1-C3, P2-C3, P1-C6, P2-C6	4	4	4
<a href="#">EJ10</a>	PCIe3 4 x8 SAS Port adapter (FC EL60, EL65, EJ10, and EJ11; CCIN 57B4); Adapter part number: 00MH959	P1-C1, P2-C1, P1-C4, P2-C4, P1-C3, P2-C3, P1-C6, P2-C6	4	4	4
<a href="#">EJ14</a>	PCIe3 12 GB Cache RAID PLUS SAS adapter quad-port 6 Gb x8 (FC EJ14; CCIN 57B1); Adapter part number 01DH742	P1-C1, P2-C1, P1-C4, P2-C4, P1-C3, P2-C3, P1-C6, P2-C6	4	4	4

Table 6. Adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer (continued)

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX®	Linux	IBM i
<a href="#">EJ1P</a>	PCIe1 SAS Tape/DVD dual-port 3 Gb x8 adapter (FC EJ1N and EJ1P; CCIN 57B3); Adapter part number: 44V4852	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6 P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6	6	6
<a href="#">EJ28</a>	PCIe Crypto- graphic Coprocessor (FC EJ27 and EJ28; CCIN 476A); Adapter part number: 45D7948	P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6	0	6
<a href="#">EJ33</a>	4767-001 Crypto- graphic Coprocessor (FC EJ32 and EJ33; CCIN 4767); Adapter part number: 00LV501	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6 P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6	6	6
<a href="#">EJ37</a>	4769-001 Cryptographic Coprocessor (FC EJ35 and EJ37 for BSC; CCIN C0AF); Adapter part number: 02JD572	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6 P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6	0	6
<a href="#">EL4L</a>	PCIe2 4-port 1 GbE adapter (FC 5260, 5899, EL4L, and EL4M; CCIN 576F); Adapter part number: 74Y4064	P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	0	6	0
<a href="#">EL54</a>	PCIe3 2-port 10 GbE NIC & RoCE SR adapter (FC EC2M, EC2N, and EL54; CCIN 57BE); Adapter part number: full-height tailstock: 00RX875, low-profile tailstock: 00RX872	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	0	6	0
<a href="#">EL59</a>	PCIe3 SAS RAID quad-port 6 Gb adapter (FC EJ0J and EL59; CCIN 57B4); Adapter part number: 000E9284	P1-C1, P2-C1, P1-C4, P2-C4, P1-C3, P2-C3, P1-C6, P2-C6	0	4	0
<a href="#">EL5B</a>	PCIe3 16 Gb 2-port Fibre Channel adapter (FC EL5B and EN0A; CCIN 577F); Adapter part number: 00E3496	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6 (EL5B - 0)	6	6 (EL5B - 0)

Table 6. Adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer (continued)

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX®	Linux	IBM i
<a href="#">EN0A</a>	PCIe3 16 Gb 2-port Fibre Channel adapter (FC EL43, EL5B, EN0A, and EN0B; CCIN 577F); Adapter part number: 00E3496	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6	6	6
<a href="#">EN0G</a>	PCIe2 8 Gb 2-port Fibre Channel adapter	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6 P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6 (EL5Z - 0)	6	6 (EL5Z - 0)
<a href="#">EN0H</a>	PCIe3 4-port (10 Gb FCoE and 1 GbE) (FC EL38, FC EL56, FC EN0H, and FC EN0J; CCIN 2B93); Adapter part number: 00E3498	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6 (EL56 - 0)	6	0
<a href="#">EN0K</a>	PCIe3 4-port (10 Gb FCoE and 1 GbE) copper and RJ45 adapter (FC EL3C, EL57, EN0K, and EN0L; CCIN 2CC1); Adapter part number: 00E8140 (FC EN0K) and 00E3502 (FC EN0L)	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6 (EL57 - 0)	6	0
<a href="#">EN0M</a>	PCIe3 4-port (10 Gb FCoE and 1 GbE) LR and RJ45 adapter (FC EN0M and FC EN0N)	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6	6	0
<a href="#">EN0S</a>	PCIe2 4-port (10 Gb + 1 GbE) SR+RJ45 adapter (FC EN0S, FC EN0T, FC EN0U, and FC EN0V; CCIN 2CC3); Adapter part number: 00E2715	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6	6	0s
<a href="#">EN0U</a>	PCIe2 4-port (10 Gb + 1 GbE) Copper SFP+RJ45 adapter (FC EN0U; CCIN 2CC3); Adapter part number: 00E2715; low-profile tailstock: 00E2720	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6	6	0
<a href="#">EN0W</a>	PCIe2 2-port 10 GbE BaseT RJ45 Adapter	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6 (EL55 - 0)	6	0

Table 6. Adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer (continued)

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX <sup>®</sup>	Linux	IBM i
<a href="#">EN12</a>	PCIe2 FH 4-port 8 Gb Fibre Channel adapter (FC EN12; CCIN EN0Y); Adapter part number 00WT107	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6	6	0
<a href="#">EN13</a>	PCIe Binary Synchro- nous adapter (FC EN13 and EN14; CCIN 576C)	P1-C6, P2-C6	0	0	1
<a href="#">EN15</a>	PCIe3 4-port 10 GbE SR adapter (FC EN15 and EN16; CCIN 2CE3); Adapter part number: 00ND466	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6	6	6
<a href="#">EN17</a>	PCIe3 4-port 10 GbE SFP+ copper adapter (FC EN17 and EN18, CCIN 2CE4); Adapter part number: 00ND463	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6	6	6
<a href="#">EN1A</a>	PCIe3 x8 2-port Fibre Channel (32 Gb/s)	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6, P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6 (EL5U - 0)	6	6 (EL5U-0)
<a href="#">EN1C</a>	PCIe3 x8 4-port Fibre Channel (16 Gb/s); (FC EL5W, EL5X, EN1C, and EN1D; CCIN 578E); Adapter part number: 01FT698	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6, P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6 (EL5W - 0)	6	6 (EL5W - 0)
<a href="#">EN1E</a>	PCIe3 x8 4-port Fibre Channel (16 Gb/s); (FC EN1E and EN1F; CCIN 579A); Adapter part number: 02JD586	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6, P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6	6	6
<a href="#">EN1G</a>	PCIe3 x8 2-port Fibre Channel (16 Gb/s) (EN1G and EN1H; CCIN 579B); Adapter part number: 02CM900 and 02CM903	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6	6	6
<a href="#">EN1J</a>	PCIe4 x8 2-port Fibre Channel (32 Gb/s); (FC EN1J and EN1K; CCIN 579C); Adapter part number: 02CM909	P1-C2, P2-C2, P1-C5, P2-C5, P1-C3, P2-C3, P1-C6, P2-C6, P1-C1, P2-C1, P1-C4, P2-C4	6	6	6

Table 6. Adapter slot priorities and maximum adapters supported in the EMX0 PCIe3 expansion drawer (continued)

Feature code	Description	EMX0 PCIe3 expansion drawer			
		Slot priorities <sup>1</sup>	Maximum number of adapters supported <sup>2</sup>		
			AIX <sup>®</sup>	Linux	IBM i
EN2A	PCIe3 16 Gb 2-port Fibre Channel adapter (FC EN2A and FC EN2B; CCIN 579D); Adapter part number: 02JD564	P1-C1, P2-C1, P1-C4, P2-C4, P1-C2, P2-C2, P1-C3, P2-C3, P1-C5, P2-C5, P1-C6, P2-C6	6	6	6

<sup>1</sup>The slot priority sequence is based on a EMX0 PCIe3 expansion drawer configured with two PCIe3 6-slot fanout modules.

<sup>2</sup>The maximum number of adapters supported per PCIe3 6-slot fanout module.

<sup>3</sup>If you have a CCIN 50CB PCIe3 6-slot fanout module, the FC EC2S and FC EC2U adapters are only supported in slots C2 and C5. If you have a CCIN 50CD PCIe3 6-slot fanout module, the FC EC2S and FC EC2U adapters are supported in slots C1 through C6, but only four FC EC2S and FC EC2U adapters can be in SR-IOV mode at a time.

## Related procedures for adapter placement

Find procedures that are related to adapter placement rules and slot priorities.

### Finding the current system configuration in IBM i

You can use the System Service Tools in the IBM i operating system to find the current system configuration.

#### Before you begin

Before you begin, you must know the location codes of the PCI adapter slots in the system with which you are working.

#### About this task

To find the current system configuration, start an IBM i session and sign on. If you have more than one system, start a session on the system that is being upgraded and for which you have service tools authority.

To find the current system configuration, complete the following steps:

#### Procedure

1. Type **strsst** on the command line of the Main Menu and then press **Enter**.
2. Type your service tools user ID and service tools password on the **Start Service Tools (STRSST) Sign On** display and then press **Enter**.
3. Select **Start a service tool** from the **System Service Tools (SST)** display and then press **Enter**.
4. Select **Hardware service manager** from the **Start a Service Tool** display and then press **Enter**.
5. Select **Packaging hardware resources (system, frames, cards)** from the **Hardware Service Manager** display and then press **Enter**.
6. Type **9** on the **System Unit** line and then press **Enter**.
7. Select **Include empty positions**.

8. Look for the PCI adapter location codes in the **Location** column.
9. Write down the Type-Model number for each PCI adapter location.  
Some adapters can show multiple, virtual ports. It is not necessary to write down these virtual locations.
10. Write down any PCI adapter locations that are listed in the **Description** column as an Empty Position.  
The Type-Model number is blank for empty positions.
11. Press **F12** to return to the previous window.
12. Do you have an expansion unit attached?
  - **No:** Go to “Adapter placement rules and slot priorities for the 9040-MR9” on page 1.
  - **Yes:** Do the following tasks:
    - a. Type **9** for the **System Expansion Unit** field and press Enter.
    - b. Repeat steps 7-11 for each expansion unit.
    - c. Select an available slot in the expansion unit.

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### Overview

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

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

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VCCI-A

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이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

## People's Republic of China Notice

### 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。

## Russia Notice

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

## Taiwan Notice

### 警告使用者：

此為甲類資訊技術設備，  
於居住環境中使用時，可  
能會造成射頻擾動，在此  
種情況下，使用者會被要  
求採取某些適當的對策。

### IBM Taiwan Contact Information:

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

## United States Federal Communications Commission (FCC) Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM-authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

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

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

## Class B Notices

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

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

### Canada Notice

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

### European Community and Morocco Notice

This product is in conformity with the protection requirements of Directive 2014/30/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

### German Notice

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022/ EN 55032 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 2014/30/EU in der Bundesrepublik Deutschland.

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

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

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

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

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

Generelle Informationen:

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

## **Japan Electronics and Information Technology Industries Association (JEITA) Notice**

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

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

高調波電流規格 JIS C 61000-3-2 適合品

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

高調波電流規格 JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。

- 回路分類：6（単相、PFC回路付）
- 換算係数：0

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

高調波電流規格 JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」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

## **Japan Voluntary Control Council for Interference (VCCI) Notice**

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取扱説明書に従って正しい取り扱いをして下さい。

VCCI-B

## Taiwan Notice

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

## United States Federal Communications Commission (FCC) Notice

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

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM-authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

International Business Machines Corporation  
New Orchard Road  
Armonk, New York 10504  
Contact for FCC compliance information only: [fccinfo@us.ibm.com](mailto:fccinfo@us.ibm.com)

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