Power Systems

PCI adapter placement for the 8248-L4T, 8408-E8D, or 9109-RMD

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Note

Before using this information and the product it supports, read the information in "Safety notices" on page v, "Notices" on page 23, 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 POWER7 processor and to all associated models.

Contents

Safety notices

Safety notices may be printed throughout this guide:

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

World Trade safety information

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

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

German safety information

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

Laser safety information

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

Laser compliance

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

DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

DANGER

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

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

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

CAUTION

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

(R001)

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

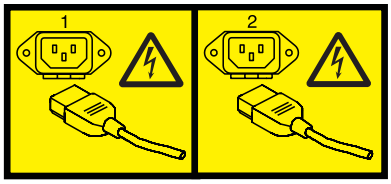
- **Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:**
  - **Remove all devices in the 32U position and above.**
  - **Ensure that the heaviest devices are installed in the bottom of the rack cabinet.**
  - **Ensure that there are no empty U-levels between devices installed in the rack cabinet below the 32U level.**
- **If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.**
- **Inspect the route that you plan to take to eliminate potential hazards.**
- **Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.**
- **Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).**
- **Ensure that all devices, shelves, drawers, doors, and cables are secure.**
- **Ensure that the four leveling pads are raised to their highest position.**
- **Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.**
- **Do not use a ramp inclined at more than 10 degrees.**
- **When the rack cabinet is in the new location, complete the following steps:**
  - **Lower the four leveling pads.**
  - **Install stabilizer brackets on the rack cabinet.**
  - **If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.**
- **If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.**

(R002)

(L001)

(L002)

(L003)



or

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

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

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

(C026)

CAUTION:
Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

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

CAUTION:
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

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

Do Not:
- **___ Throw or immerse into water**
- **___ Heat to more than 100°C (212°F)**
- **___ Repair or disassemble**

Exchange only with the 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)

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.

PCI adapter placement for the 8248-L4T, 8408-E8D, or 9109-RMD

Find information about the Peripheral Component Interconnect Express (PCIe) adapters that are supported for the IBM PowerLinux™ 7R4 (8248-L4T), the IBM Power® 750 (8408-E8D), and the IBM Power 760 (9109-RMD) systems that contain the POWER7® processor and the associated I/O expansion units.

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

Table 1. Electromagnetic compatibility (EMC) Class B features

Feature	Description
1912, 5736	PCI-X DDR 2.0 Dual Channel Ultra320 SCSI Adapter
1983, 5706	Port 10/100/1000 Base-TX Ethernet PCI-X Adapter
1986, 5713	1 Gb iSCSI TOE PCI-X Adapter
2728	4-port USB PCIe Adapter
4764	PCI-X Cryptographic Coprocessor
4807	PCIe Cryptographic Coprocessor
5717	4-port 10/100/1000 Base-TX PCI Express Adapter
5732	10 Gb Ethernet-CX4 PCI Express Adapter
5748	POWER® GXT145 PCI Express Graphics Accelerator
5767	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter
5768	2-port Gb Ethernet-SX PCI Express Adapter
5769	10 Gb Ethernet-SR PCI Express Adapter
5772	10 Gb Ethernet-LR PCI Express Adapter
5785	4 Port Async EIA-232 PCIe Adapter
EC2G and EL39	PCIe LP 2-Port 10 GbE SFN6122F Adapter
EC2H and EL3A	PCIe LP 2-Port 10 GbE SFN5162F Adapter
EC2J	PCIe 2-Port 10 GbE SFN6122F Adapter
EC2K	PCIe 2-Port 10 GbE SFN5162F Adapter

Supported PCI adapters for the 8248-L4T, 8408-E8D, or 9109-RMD

Find information about the placement rules and slot priorities for the Peripheral Component Interconnect Express (PCIe) adapters that are supported for the 8248-L4T, 8408-E8D, or 9109-RMD systems that contain the POWER7 processor and the associated I/O expansion units.

This section provides reference information that information technology (IT) personnel and service representatives can use in determining where to place PCIe adapters.

Adapters supported on the AIX®, IBM i, or Linux operating system

Table 2 on page 2 lists adapters supported in the system running the IBM AIX, IBM i, or Linux operating systems.

PCIe adapters

The following table lists PCIe adapters.

The adapters are listed with their feature codes (FC), customer card identification number (CCIN), along with their description, and the systems on which they are supported.

Table 2. PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems

Feature code	CCIN	Description
5289	57D4	PCIe 2-port Async EIA-232 PCIe 1X LPC Adapter (FC 5289; CCIN 57D4) • Short, x1 • PCIe 1.1 • Two ports through RJ45 by using the DB9 connector • EIA-232 Compatible • OS support: AIX, IBM i, and Linux operating systems
5785	57D2	4 Port Async EIA-232 PCIe Adapter (FC 5785; CCIN 57D2) • Short, x1 • OS support: AIX and Linux operating systems
5729	5729	PCIe2 FH 4-port 8 Gb Fibre Channel Adapter (FC 5729; CCIN 5729) • Full-height, full length adapter with standard-size bracket • PCIe 2.1, x8 • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems
5735	577D	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5735; CCIN 577D) • Short, x8 • Extra-high bandwidth: If only one port is planned to be active in normal operation, the adapter is counted as an extra-high bandwidth adapter. If both ports are planned to be active, the adapter must be treated as two extra-high bandwidth adapters. • OS support: AIX, IBM i, and Linux operating systems
5773	5773	4 Gb PCI Express Single Port Fibre Channel Adapter (FC 5773; CCIN 5773) • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems
5774	5774	4 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5774; CCIN 5774) • Short, x4 • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems
EN0A	577F	PCIe2 16 Gb 2-port Fibre Channel Adapter (FC EN0A; CCIN 577F) • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems
5748	5774	4 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5774; CCIN 5774) • Short, x4 • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems

Table 2. PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	CCIN	Description
EJ0J	57B4	PCIe3 RAID SAS Adapter (FC EJ0J; CCIN 57B4) • Regular-height adapter • PCIe3, short, x8 • Transfer speed of 6 Gbps • No write cache • One PCIe x8 slot per adapter • Adapters can be installed singly or in pairs • OS support: AIX, IBM i, and Linux operating systems
EJ0L	57CE	PCIe3 12 GB Cache RAID SAS quad-port 6 Gb Adapter (FC EJ0L; CCIN 57CE) • Regular-height adapter, short • PCIe3 x8 • Transfer speed of 6 Gbps • 12 GB write cache • One PCIe x8 slot per adapter • Adapters are installed in pairs • OS support: AIX, IBM i, and Linux operating systems
EJ10	57B4	PCIe3 4 x8 SAS Port Adapter (FC EJ10; CCIN 57B4) • Regular-height adapter • PCIe3 x8 • Transfer speed of 6 Gbps • Supports DVD and tape drives • No write cache • One PCIe x8 slot per adapter • OS support: AIX, IBM i, and Linux operating systems
5287	5287	PCIe2 2-port 10 GbE SR Adapter (FC 5287; CCIN 5287) • Generation 2, x8 • Full-height adapter • Two 10 Gb Ethernet ports • 10 GBASE- Direct attach SFP+ twinax cable • OS support: AIX and Linux operating systems
5288	5288	PCIe2 LP 2-port 10 GbE SFP+ Copper Adapter (FC 5288; CCIN 5288) • Generation 2, full-height adapter • Two 10 Gb Ethernet ports • Requires available PCIe generation 2 slot • OS support: AIX and Linux operating systems
5708	2B3B	10 Gb FCoE PCIe Dual-port Adapter (FC 5708; CCIN 2B3B) • Low-profile capable • Extra-high bandwidth • PCIe 2.0 adapter with x8 generation 1 • Convergence enhanced Ethernet (CEE) supported • OS support: AIX, IBM i with VIOS, and Linux operating systems

Table 2. PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	CCIN	Description
5717	5717	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5717; CCIN 5717) • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems
5732	2B43	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5732; CCIN 2B43) • Short, x8 • Extra-high bandwidth • OS support: AIX and Linux operating systems
5744	2B44	PCIe2 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5744; CCIN 2B44) • Regular-height adapter • PCIe2, short, x8 • Extra-high bandwidth • PCIe generation 2 • OS support: Linux operating system
5745	2B43	PCIe2 2x10 GbE SFP+ Copper 2x1 GbE UTP Adapter (FC 5745; CCIN 2B43) • Short, x8 • PCIe 2 • Extra-high bandwidth • OS support: Linux operating system
5767	5767	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter (FC 5767; CCIN 5767) • Short, x4 • High bandwidth • OS support: AIX, IBM i, and Linux operating systems
5768	5768	2-port Gigabit Ethernet-SX PCI Express Adapter (FC 5768; CCIN 5768) • Short, x4 • High bandwidth • OS support: AIX, IBM i, and Linux operating systems
5769	2B44	10 Gb Ethernet-SR PCI Express Adapter (FC 5769; CCIN 2B44) • Short, full-high, x8 • Regular-height • Extra-high bandwidth • OS support: AIX and Linux operating systems
5772	576E	10 Gb Ethernet-LR PCI Express Adapter (FC 5772; CCIN 576E) • Short, x8 • Regular-height card • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems
5899	576F	PCIe2 4-port 1 GbE Adapter (FC 5899; CCIN 576F) • Regular-height adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, IBM i, and Linux operating systems

Table 2. PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	CCIN	Description
EC28	EC27	PCIe2 2-port 10 GbE RoCE SFP+ adapter (FC EC28; CCIN EC27) • Regular-height adapter • PCIe generation 2, x8 • Extra-high bandwidth, low latency 10 Gb Ethernet • OS support: AIX and Linux operating systems • Firmware level 7.6, or later
EC2J	EC2G	PCIe 2-Port 10 GbE SFN6122F Adapter (FC EC2J; CCIN EC2G) • High bandwidth • Regular-height adapter • Supports Solarflare OpenOnload • OS support: Linux operating system
EC2K	EC2H	PCIe 2-Port 10 GbE SFN5162F Adapter (FC EC2K; CCIN EC2H) • High bandwidth • Regular-height adapter • OS support: Linux operating system
EC30	EC29	PCIe2 2-port 10 GbE RoCE SR adapter (FC EC30; CCIN EC29) • Regular-height adapter • PCIe generation 2, x8 • Extra-high bandwidth, low latency 10 Gb Ethernet • OS support: AIX and Linux operating systems • Firmware level 7.6, or later
EN0H	2B93	PCIe2 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EN0H, CCIN 2B93) • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems
EN0K	2CC1	PCIe2 4-port (10Gb FCoE and1GbE) Copper and RJ45 Adapter (FC EN0K; CCIN 2CC1) • Regular-height adapter • Fibre Channel over Ethernet (FCoE) converged network adapter (CNA) • Provides network interface controller (NIC) • Single root I/O virtualization (SR-IOV) capable • OS support: AIX, IBM i, and Linux operating systems
EN0S	2CC3	PCIe2 4-port (10Gb+1GbE) SR+RJ45 Adapter (FC EN0S; CCIN 2CC3) • PCIe generation 2, x8 • Short, with full-height tailstock • two 10 Gb SR optical ports and two 1 Gb RJ45 ports • NIC network convergence adapter • Local are network (LAN) adapter • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems

Table 2. PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	CCIN	Description
EN0U	2CC3	PCIe2 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter (FC EN0U; CCIN 2CC3) • PCIe generation 2, x8 • Short, with full-height tailstock • Two 10 Gb copper twinax small form-factor pluggable (SFP+) ports • Two 1 Gb RJ45 ports • Ethernet network interface controller (NIC) function • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems
EN0W	2CC4	PCIe2 2-port 10 GbE BaseT RJ45 Adapter (FC EN0W; CCIN 2CC4) • PCIe generation 2, x8 • Short, with full-height tailstock • Two 10 Gb RJ45 ports • Local area network (LAN) adapter • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems
2728	57D1	4-port USB PCIe Adapter (FC 2728; CCIN 57D1) • Regular-height adapter • Single-slot, half-length PCIe adapter • PCIe 1.1 • OS support: AIX and Linux operating systems
4808	4765	PCIe Cryptographic Coprocessor (FC 4808; CCIN 4765) • Generation 3 blind-swap cassette • PCIe x4, full-height, half-length • OS support: AIX and IBM i operating systems
4809	4765	PCIe Cryptographic Coprocessor (FC 4809; CCIN 4765) • Generation 4 blind-swap cassette • PCIe x4, full-height, half-length • OS support: AIX and IBM i operating systems
5285	58E2	PCIe2 2-port 4X InfiniBand QDR Adapter (FC 5285; CCIN 58E2) • Generation 2 full-height adapter • Extra-high bandwidth • OS support: AIX and Linux operating systems
2055	57CD	PCIe RAID and SSD SAS Adapter 3 Gb with Blind-Swap Cassette (FC 2055; CCIN 57CD) • Short, x8 • Double-wide, low-profile adapter, requires two slots • OS support: AIX, IBM i, and Linux operating systems • VIOS attachment requires version 2.2, or later
5805	574E	PCIe 380 MB Cache Dual - x4 3 Gb SAS RAID Adapter (FC 5805; CCIN 574E) • Short, dual x4 • SAS RAID adapter • Installed in pairs • OS support: AIX, IBM i, and Linux operating systems

Table 2. PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	CCIN	Description
5901	57B3	PCIe Dual - x4 SAS Adapter (FC 5901; CCIN 57B3) • Short • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems
5903	574E	PCIe 380 MB Cache Dual x4 3 Gb SAS RAID Adapter (FC 5903; CCIN 574E) • Short • Extra-high bandwidth • Installed in pairs • OS support: AIX and Linux operating systems
5913	57B5	PCIe2 1.8 GB Cache RAID SAS Tri-port 6 Gb Adapter (FC 5913; CCIN 57B5) • Full-height, short, PCIe2 x8 • Transfer speed of 6 Gbps • Write cache backup of 1.8 GB • One PCIe x8 slot per adapter • Adapters are installed in pairs • OS support: AIX, IBM i, and Linux operating systems
ESA1	57B4	PCIe2 RAID SAS Adapter Dual-port 6 Gb (FC ESA1; CCIN 57B4) • Regular-height adapter • PCIe generation 2, x8 • OS support: AIX, IBM i, and Linux operating systems
ESA3	57BB	PCIe2 1.8 GB Cache RAID SAS Adapter Tri-port 6Gb (FC ESA3; CCIN 57BB) • Full-height, short, PCIe2 x8 • Transfer speed of 6 Gbps • Write cache backup of 1.8 GB • One PCIe x8 slot per adapter • Adapters are installed in pairs • OS support: AIX, IBM i, and Linux operating systems
2893	576C	PCI Express 2-Line WAN with Modem (FC 2893; CCIN 576C) • Short, x4 • Non-CIM • OS support: AIX, IBM i, and Linux operating systems
2894	576C	PCI Express 2-Line WAN with Modem (FC 2894; CCIN 576C) • Short, x4 • CIM • OS support: AIX, IBM i, and Linux operating systems
EN13	576C	PCI Express 2-Line WAN with Modem (FC EN13; CCIN 576C) • Short, x4 • Non-CIM • OS support: IBM i operating system
EN14	576C	PCI Express 2-Line WAN with Modem (FC EN14; CCIN 576C) • Short, x4 • CIM • OS support: IBM i operating system

Table 2. PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	CCIN	Description
ES09	578A	IBM Flash Adapter 90 (PCIe2 0.9TB) (FC ES09; CCIN 578A) • PCIe generation 2, x8 • 900 GB eMLC Flash storage • One PCIe x8 slot per adapter • Adapters are installed in pairs to enable mirroring • OS support: AIX and Linux operating systems

PCI slot priorities for the 8248-L4T, 8408-E8D, or 9109-RMD

Some adapters must be placed in specific Peripheral Component Interconnect (PCI), Peripheral Component Interconnect-X (PCI-X), or PCI Express (PCIe) slots to function correctly or to perform optimally. Learn how to determine where to install PCI adapters.

PCI slot descriptions

Figure 1 shows the rear view of the system with the location codes for the PCI and GX++ adapter slots. Table 3 describes the slots. Each PCI-X DDR or PCIe is a separate PCI host bridge (PHB).

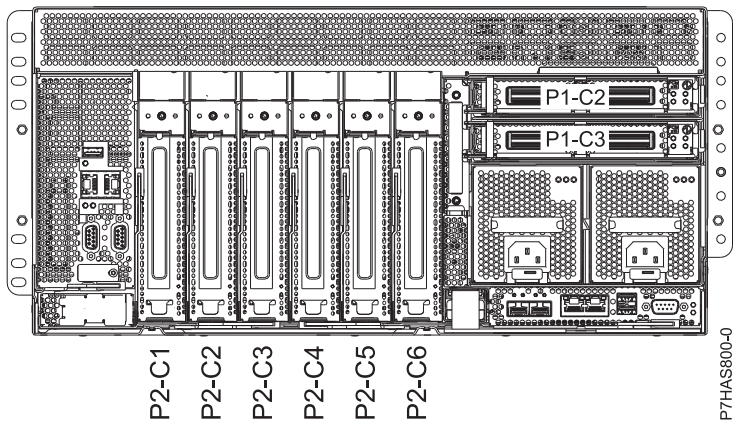


Figure 1. Rear view of system with location codes

Table 3. PCI slot locations and descriptions

Slot	Location code	Description	PHB	Slot size	Direct memory access (DMA) capable
		8248-L4T, 8408-E8D, or 9109-RMD system			
Slot 1	P2-C1	PCIe x8, generation-2	PCIe PHB5 module A	Long	32-bit
Slot 2	P2-C2	PCIe x8, generation-2	PCIe PHB4 module A	Long	64-bit
Slot 3	P2-C3	PCIe x8, generation-2	PCIe PHB3 module A	Long	32-bit
Slot 4	P2-C4	PCIe x8, generation-2	PCIe PHB2 module A	Long	64-bit
Slot 5	P2-C5	PCIe x8, generation-2	PCIe PHB5 module B	Long	64-bit
Slot 6	P2-C6	PCIe x8, generation-2	PCIe PHB4 module B	Long	64-bit
GX++	P1-C2	Location for GX++ adapter	NA	NA	NA

Table 3. PCI slot locations and descriptions (continued)

Slot	Location code	Description	PHB	Slot size	Direct memory access (DMA) capable
		8248-L4T, 8408-E8D, or 9109-RMD system			
GX++	P1-C3	Location for GX++ adapter	NA	NA	NA
• All slots support enhanced error handling (EEH). • The system uses generation-4, blind-swap cassettes to manage the installation and removal of adapters. Cassettes can be installed and removed without removing the drawer from the rack.					

PCIe expansion units

PCIe expansion unit 5877 and 5802 are supported on the system that are running IBM AIX, IBM i, or Linux. The system can be configured to support up to two I/O expansion units per GX adapter.

Restriction: A GX++ adapter that has one or two 5877 or 5802 expansion units or one of each 5877 and 5802 expansion units connected cannot have anything else connected to that adapter.

Note: For optimum performance, you might want to limit the total number of expansion units that contain high bandwidth and extra-high bandwidth adapters. See "Performance notes" on page 17.

The expansion units attach to a GX++ adapter installed in the GX slots available in the system.

The maximum number of attached remote I/O drawers depends on the number of processor units in the system. Systems with one processor unit support up to four 5802 or 5877 expansion units, two per GX++ adapter.

PCIe adapters

Use this information to identify slot placement priorities and the maximum number of specified adapters allowed. Verify whether the adapter is supported for your system. For details about the supported adapters, see "Supported PCI adapters for the 8248-L4T, 8408-E8D, or 9109-RMD" on page 1.

Table 4. Slot priorities and maximums for PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported per system
5289	PCIe 2-port Async EIA-232 PCIe 1X LPC Adapter (FC 5289; CCIN 57D4) • Short, x1 • PCIe 1.1 • Two ports through RJ45 by using the DB9 connector • EIA-232 Compatible • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	56
5785	4 Port Async EIA-232 PCIe Adapter (FC 5785; CCIN 57D2) • Short, x1 • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	184

Table 4. Slot priorities and maximums for PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported per system
5729[2, 4]	PCIe2 FH 4-port 8 Gb Fibre Channel Adapter (FC 5729; CCIN 5729) • Full-height, full length adapter with standard-size bracket • PCIe 2.1, x8 • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	24
5735[2]	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5735; CCIN 577D) • Short, x8 • Extra-high bandwidth: If only one port is planned to be active in normal operation, the adapter is counted as an extra-high bandwidth adapter. If both ports are planned to be active, the adapter must be treated as two extra-high bandwidth adapters. • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	184
5773[1]	4 Gb PCI Express Single Port Fibre Channel Adapter (FC 5773; CCIN 5773) • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	184
5774[2]	4 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5774; CCIN 5774) • Short, x4 • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	184
EN0A[2]	PCIe2 16 Gb 2-port Fibre Channel Adapter (FC EN0A; CCIN 577F) • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	24
5748	POWER GXT145 PCI Express Graphics Accelerator (FC 5748; CCIN 5748) • Short, x1 • Not hot-pluggable • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	8
EJ0J	PCIe3 RAID SAS Adapter (FC EJ0J; CCIN 57B4) • Regular-height adapter • PCIe3, short, x8 • Transfer speed of 6 Gbps • No write cache • One PCIe x8 slot per adapter • Adapters can be installed singly or in pairs • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	8

Table 4. Slot priorities and maximums for PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported per system
EJ0L	PCIe3 12 GB Cache RAID SAS quad-port 6 Gb Adapter (FC EJ0L; CCIN 57CE) • Regular-height adapter, short • PCIe3 x8 • Transfer speed of 6 Gbps • 12 GB write cache • One PCIe x8 slot per adapter • Adapters are installed in pairs • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	8
EJ10	PCIe3 4 x8 SAS Port Adapter (FC EJ10; CCIN 57B4) • Regular-height adapter • PCIe3 x8 • Transfer speed of 6 Gbps • Supports DVD and tape drives • No write cache • One PCIe x8 slot per adapter • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	8
5287[4]	PCIe2 2-port 10 GbE SR Adapter (FC 5287; CCIN 5287) • Generation 2, x8 • Full-height adapter • Two 10 Gb Ethernet ports • 10 GBASE- Direct attach SFP+ twinax cable • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	24
5288[4]	PCIe2 LP 2-port 10 GbE SFP+ Copper Adapter (FC 5288; CCIN 5288) • Generation 2, full-height adapter • Two 10 Gb Ethernet ports • Requires available PCIe generation 2 slot • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	24
5708[2]	10 Gb FCoE PCIe Dual-port Adapter (FC 5708; CCIN 2B3B) • Low-profile capable • Extra-high bandwidth • PCIe 2.0 adapter with x8 generation 1 • Convergence enhanced Ethernet (CEE) supported • OS support: AIX, IBM i with VIOS, and Linux operating systems	1, 5, 2, 6, 3, 4	• 184 • If only one port is planned to be active in normal operation, the adapter is counted as an extra-high bandwidth adapter. If both ports are planned to be active, the adapter needs to be treated as two extra-high bandwidth adapters.

Table 4. Slot priorities and maximums for PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported per system
5717[1]	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5717; CCIN 5717) • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	184
5732[2]	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5732; CCIN 2B43) • Short, x8 • Extra-high bandwidth • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	128
5744[2, 4]	PCIe2 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5744; CCIN 2B44) • Regular-height adapter • PCIe2, short, x8 • Extra-high bandwidth • PCIe generation 2 • OS support: Linux operating system	1, 5, 2, 6, 3, 4	184
5745[2, 4]	PCIe2 2x10 GbE SFP+ Copper 2x1 GbE UTP Adapter (FC 5745; CCIN 2B43) • Short, x8 • PCIe 2 • Extra-high bandwidth • OS support: Linux operating system	1, 5, 2, 6, 3, 4	24
5767[1]	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter (FC 5767; CCIN 5767) • Short, x4 • High bandwidth • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	• 184 • 64 for i
5768[1]	2-port Gigabit Ethernet-SX PCI Express Adapter (FC 5768; CCIN 5768) • Short, x4 • High bandwidth • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	• 184 • 64 for i
5769[2]	10 Gb Ethernet-SR PCI Express Adapter (FC 5769; CCIN 2B44) • Short, full-high, x8 • Regular-height • Extra-high bandwidth • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	128

Table 4. Slot priorities and maximums for PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported per system
5772[2]	10 Gb Ethernet-LR PCI Express Adapter (FC 5772; CCIN 576E) • Short, x8 • Regular-height card • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	48
5899[1, 4]	PCIe2 4-port 1 GbE Adapter (FC 5899; CCIN 576F) • Regular-height adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	184
EC28[2, 4]	PCIe2 2-port 10 GbE RoCE SFP+ adapter (FC EC28; CCIN EC27) • Regular-height adapter • PCIe generation 2, x8 • Extra-high bandwidth, low latency 10 Gb Ethernet • OS support: AIX and Linux operating systems • Firmware level 7.6, or later	1, 5, 2, 6, 3, 4	24
EC2J[1]	PCIe 2-Port 10 GbE SFN6122F Adapter (FC EC2J; CCIN EC2G) • High bandwidth • Regular-height adapter • Supports Solarflare OpenOnload • OS support: Linux operating system	1, 5, 2, 6, 3, 4	4
EC2K[1]	PCIe 2-Port 10 GbE SFN5162F Adapter (FC EC2K; CCIN EC2H) • High bandwidth • Regular-height adapter • OS support: Linux operating system	1, 5, 2, 6, 3, 4	4
EC30[2, 4]	PCIe2 2-port 10 GbE RoCE SR adapter (FC EC30; CCIN EC29) • Regular-height adapter • PCIe generation 2, x8 • Extra-high bandwidth, low latency 10 Gb Ethernet • OS support: AIX and Linux operating systems • Firmware level 7.6, or later	1, 5, 2, 6, 3, 4	24
EN0H[2]	PCIe2 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EN0H, CCIN 2B93) • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	24

Table 4. Slot priorities and maximums for PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported per system
EN0K	PCIe2 4-port (10Gb FCoE and1GbE) Copper and RJ45 Adapter (FC EN0K; CCIN 2CC1) • Regular-height adapter • Fibre Channel over Ethernet (FCoE) converged network adapter (CNA) • Provides network interface controller (NIC) • Single root I/O virtualization (SR-IOV) capable • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	8
EN0S	PCIe2 4-port (10Gb+1GbE) SR+RJ45 Adapter (FC EN0S; CCIN 2CC3) • PCIe generation 2, x8 • Short, with full-height tailstock • two 10 Gb SR optical ports and two 1 Gb RJ45 ports • NIC network convergence adapter • Local are network (LAN) adapter • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems	1, 5, 2, 6, 3, 4	6
EN0U	PCIe2 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter (FC EN0U; CCIN 2CC3) • PCIe generation 2, x8 • Short, with full-height tailstock • Two 10 Gb copper twinax small form-factor pluggable (SFP+) ports • Two 1 Gb RJ45 ports • Ethernet network interface controller (NIC) function • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems	1, 5, 2, 6, 3, 4	6
EN0W	PCIe2 2-port 10 GbE BaseT RJ45 Adapter (FC EN0W; CCIN 2CC4) • PCIe generation 2, x8 • Short, with full-height tailstock • Two 10 Gb RJ45 ports • Local area network (LAN) adapter • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems	1, 5, 2, 6, 3, 4	6
2728	4-port USB PCIe Adapter (FC 2728; CCIN 57D1) • Regular-height adapter • Single-slot, half-length PCIe adapter • PCIe 1.1 • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	8
4808	PCIe Cryptographic Coprocessor (FC 4808; CCIN 4765) • Generation 3 blind-swap cassette • PCIe x4, full-height, half-length • OS support: AIX and IBM i operating systems	1, 5, 2, 6, 3, 4	10

Table 4. Slot priorities and maximums for PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported per system
4809	PCIe Cryptographic Coprocessor (FC 4809; CCIN 4765) • Generation 4 blind-swap cassette • PCIe x4, full-height, half-length • OS support: AIX and IBM i operating systems	1, 5, 2, 6, 3, 4	10
5285[2, 4]	PCIe2 2-port 4X InfiniBand QDR Adapter (FC 5285; CCIN 58E2) • Generation 2 full-height adapter • Extra-high bandwidth • OS support: AIX and Linux operating systems	1, 5	2
2055	PCIe RAID and SSD SAS Adapter 3 Gb with Blind-Swap Cassette (FC 2055; CCIN 57CD) • Short, x8 • Double-wide, low-profile adapter, requires two slots • OS support: AIX, IBM i, and Linux operating systems • VIOS attachment requires version 2.2, or later	1, 5, 2, 6, 3, 4	80
5805	PCIe 380 MB Cache Dual - x4 3 Gb SAS RAID Adapter (FC 5805; CCIN 574E) • Short, dual x4 • SAS RAID adapter • Installed in pairs • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	184
5901[2]	PCIe Dual - x4 SAS Adapter (FC 5901; CCIN 57B3) • Short • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	184
5903[2]	PCIe 380 MB Cache Dual x4 3 Gb SAS RAID Adapter (FC 5903; CCIN 574E) • Short • Extra-high bandwidth • Installed in pairs • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	184
5913[4]	PCIe2 1.8 GB Cache RAID SAS Tri-port 6 Gb Adapter (FC 5913; CCIN 57B5) • Full-height, short, PCIe2 x8 • Transfer speed of 6 Gbps • Write cache backup of 1.8 GB • One PCIe x8 slot per adapter • Adapters are installed in pairs • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	136

Table 4. Slot priorities and maximums for PCIe adapters supported for the 8248-L4T, 8408-E8D, and 9109-RMD systems (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported per system
ESA1[4]	PCIe2 RAID SAS Adapter Dual-port 6 Gb (FC ESA1; CCIN 57B4) • Regular-height adapter • PCIe generation 2, x8 • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	184
ESA3[4]	PCIe2 RAID SAS Adapter Dual-port 6 Gb (FC ESA1; CCIN 57B4) • Regular-height adapter • PCIe generation 2, x8 • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	34
2893	PCI Express 2-Line WAN with Modem (FC 2893; CCIN 576C) • Short, x4 • Non-CIM • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	184
2894	PCI Express 2-Line WAN with Modem (FC 2894; CCIN 576C) • Short, x4 • CIM • OS support: AIX, IBM i, and Linux operating systems	1, 5, 2, 6, 3, 4	184
EN13	PCI Express 2-Line WAN with Modem (FC EN13; CCIN 576C) • Short, x4 • Non-CIM • OS support: IBM i operating system	1, 5, 2, 6, 3, 4	184
EN14	PCI Express 2-Line WAN with Modem (FC EN14; CCIN 576C) • Short, x4 • CIM • OS support: IBM i operating system	1, 5, 2, 6, 3, 4	184
ES09	IBM Flash Adapter 90 (PCIe2 0.9TB) (FC ES09; CCIN 578A) • PCIe generation 2, x8 • 900 GB eMLC Flash storage • One PCIe x8 slot per adapter • Adapters are installed in pairs to enable mirroring • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	20

[1]High-bandwidth adapter. See the "Performance notes" on page 17 before installing this adapter.

[2]Extra-high bandwidth adapter. See the "Performance notes" on page 17 before installing this adapter.

[3]The adapters are spread across the system unit and the slot in this order for the best performance.

[4]PCIe2 adapters must only be installed in generation-2 PCIe slots. The PCIe2 adapters are not supported in the 5802 and 5877 expansion units.

Performance notes

Use the information in this section to help determine the maximum number of adapters that can be placed in a system while still maintaining optimum performance.

Performance notes for GX++ adapters and I/O expansion units

Note: Feature codes (FC) 1808 (GX++ 12X DDR Dual-port IB adapter) and FC 1914 (GX++ 2-port PCIe2 x8 adapter) are supported for the 8248-L4T, 8408-E8D, or 9109-RMD system.
When using extra-high bandwidth adapters, the I/O expansion units must be limited to one expansion unit per GX++ adapter. Do not connect multiple expansion units to the same GX++ adapter.

Table 4 on page 9 identifies the slot placement priorities and the maximum number of specified adapters allowed for connectivity. However, for optimum performance, you can further limit the total number of high bandwidth and extra-high bandwidth adapters. If you must expand the I/O capacity of the system for extra-high bandwidth adapters, consider attaching high-performance I/O expansion units like the 5802 or 5877.

Table 5 provides guidelines about the maximum number of high bandwidth and extra-high bandwidth adapters that you can use and still maintain optimum performance.

Note: Because of the many types of application workloads, these guidelines cannot cover all cases. The numbers in the following table are suggestions for single types of adapters that are running exclusively. For systems with mixed adapter types or that have high aggregate bandwidth requirements, consult with an IBM representative for additional guidelines.

Table 5. Maximum number of adapters for best performance

Adapters	PCIe adapters in system units	PCIe adapters in 5802 or 5877 I/O Expansion units	System maximum
Extra-high bandwidth storage adapters	6	4	10
High-bandwidth storage adapters	6	8	20
Extra-high bandwidth Ethernet adapters	4	2	6
High-bandwidth Ethernet adapters	6	6	8

Related reference:

"Placement rules for the high-performance SCSI disk controller in an IBM i controlled system" on page 20
Determine which PCI slots can accommodate the 5746, 5778, 5781, and 5782 SCSI disk controllers on IBM Power Systems™ running the IBM i operating system.

I/O expansion units

Find information about the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters supported in the I/O expansion units that are supported for the IBM Power Systems servers that contain the POWER7 processor.

PCI slot priorities for the 5802 and 5877 expansion units

Learn about the PCI Express (PCIe) slots in the 5802 and 5877 expansion units.

System description

The 5802 and 5877 expansion units are 19-inch, rack-mountable, I/O expansion drawers that are designed to be attached to the system by using 12X double data rate (DDR) cables.

The expansion units can accommodate 10 generation-3 cassettes. These cassettes can be installed and removed without removing the drawer from the rack. The expansion units do not support I/O processor (IOP) adapters.

Notes:

- PCIe2 adapters that provide extra-high bandwidths aren't supported in the 5802 and 5877 expansion units.
- If a PCI adapter with CCIN 577D is installed in location P1-C4 of a 5802 or 5877 expansion unit, do not complete the install procedure for the PCI adapter in location P1-C5 with the system power on. The install action with the power on might cause the PCI adapter in location P1-C4 to fail.
- If a PCI adapter with CCIN 577D is installed in location P1-C4 of a 5802 or 5877 expansion unit, you can complete the remove and replace procedures for the PCI adapter in location P1-C5 with the system power on. The remove action and the replace action of the PCI adapter in location P1-C5 with the power on does not cause the PCI adapter in location P1-C4 to fail.

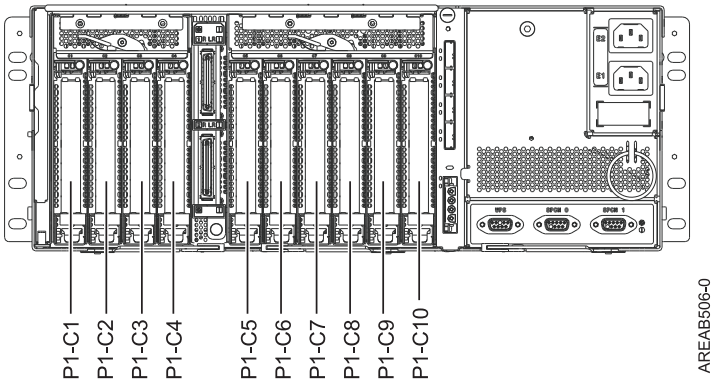


Figure 2. Rear view. This figure shows the rear view of the expansion unit.

Table 6. Location code descriptions

Location code	I/O chip	PCI host bridge (PHB)	Description
P1-C1	I/O chip 1	PHB1	PCIe x8 slot
P1-C2		PHB2	
P1-C3		PHB3	
P1-C4	I/O chip 2	PHB4	
P1-C5		PHB5	
P1-C6		PHB6	
P1-C7	I/O chip 3	PHB7	
P1-C8		PHB8	
P1-C9		PHB9	
P1-C10		PHB10	

Slot priority

The slot priority for all adapters is P1-C1, P1-C4, P1-C2, P1-C5, P1-C3, P1-C6, P1-C7, P1-C8, P1-C9, and P1-C10.

There are three I/O chips. Each I/O chip controls three or four PCI host bridges (PHBs) and each PCIe slot connects directly to a PHB.

- One I/O chip controls slots P1-C1, P1-C2, and P1-C3.
- A second I/O chip controls slots P1-C4, P1-C5, and P1-C6.
- A third I/O chips controls slots P1-C7, P1-C8, P1-C9, and P1-C10.

For best performance, fill P1-C1, P1-C4, P1-C2, P1-C5, P1-C3, and P1-C6 first with the highest bandwidth adapters. Then, fill the remaining slots.

Determining the best place to install your adapter

You can use the placement guidelines and reference tables in this section to determine the best place in which to install your adapter on systems running the IBM i operating system.

Finding the current system configuration in IBM i

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

Before you begin, you must know the location codes used for the PCI adapter slots on the system with which you are working.

To find the current system configuration, start an 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. Follow these steps:

1. Type **strsst** on the command line of the Main Menu and press Enter.
2. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display and press Enter.
3. Select **Start a service tool** from the System Service Tools (SST) display and press Enter.
4. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
5. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display and press Enter.
6. Type **9** on the **System Unit** line and 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 "PCI slot priorities for the 8248-L4T, 8408-E8D, or 9109-RMD" on page 8
    - **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.

Placement rules for the high-performance SCSI disk controller in an IBM i controlled system

Determine which PCI slots can accommodate the 5746, 5778, 5781, and 5782 SCSI disk controllers on IBM Power Systems running the IBM i operating system.

Overview and prerequisites

This section provides special placement information for the SCSI disk controllers and auxiliary-write cache adapters listed in Table 7.

If you are installing a new feature, ensure that you have the software required to support the new feature and determine whether there are any existing program temporary fix (PTF) prerequisites to install. To do this, use the IBM Prerequisite website (www-912.ibm.com/e_dir/eServerPrereq.nsf).

Use the list in Table 7 to cross-reference adapter feature codes with their customer card identification numbers (CCIN) and descriptions.

Note: Not all adapters may be supported for your system. See tables in the topic about Supported PCI adapters for your system, for more detailed descriptions, notes, and restrictions for these adapters.

Then go to "5796 expansion unit" to determine which PCI slots can accommodate these adapters.

Attention: Place these adapters only in an allowed slot. Placing these adapters in an unsupported slot may result in early-life adapter failure.

Table 7. High performance SCSI controllers

Feature codes	CCIN numbers	Description	Variables
5778	571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache Double-wide adapter. 571F is the controller. 575B is the auxiliary-write cache.	No IOP
5782	571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache Double-wide adapter. 571F is the controller. 575B is the auxiliary-write cache.	No IOP

5796 expansion unit

The 5583 adapter is not supported on the 5796.

The double-wide 571F/575B adapter is supported in the slots shown in the Allowed slots column.

Table 8. 5796 expansion unit

Feature codes	CCIN numbers	Description	Variables	Allowed slots
5782	571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOPless double-wide[1]	1, 4[2] 2, 5[3] 3, 6[4]

Table 8. 5796 expansion unit (continued)

Feature codes	CCIN numbers	Description	Variables	Allowed slots
[1]Double-wide adapter, requires 2 adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot.				
[2]These slots can be used for the SCSI controller side (571F) of the adapter.				
[3]These slots can be used for either side of the adapter.				
[4]These slots can be used for the cache side (575B) of the adapter.				

Related reference:

"PCI slot priorities for the 8248-L4T, 8408-E8D, or 9109-RMD" on page 8
Some adapters must be placed in specific Peripheral Component Interconnect (PCI), Peripheral Component Interconnect-X (PCI-X), or PCI Express (PCIe) slots to function correctly or to perform optimally. Learn how to determine where to install PCI adapters.

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The manufacturer's prices shown are the manufacturer's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

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Homologation statement

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

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Electronic emission notices

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

Class A Notices

The following Class A statements apply to the IBM servers that contain the POWER7 processor and its features unless designated as electromagnetic compatibility (EMC) Class B in the feature information.

Federal Communications Commission (FCC) statement

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

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

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

Industry Canada Compliance Statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

European Community Compliance Statement

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

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

European Community contact:
IBM Deutschland GmbH
Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Tele: +49 7032 15 2941
email: lugi@de.ibm.com

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

VCCI Statement - Japan

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

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

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

Japanese Electronics and Information Technology Industries Association (JEITA) Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)

高調波ガイドライン適合品

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

高調波ガイドライン準用品

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

声 明

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

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

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者：
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 7032 15 2941
email: lugi@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.

European Community contact:
IBM Deutschland GmbH
Technical Regulations, Department M372
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Tele: +49 7032 15 2941
email: lugi@de.ibm.com

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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

Japanese Electronics and Information Technology Industries Association (JEITA) Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)

高調波ガイドライン適合品

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高調波ガイドライン準用品

IBM Taiwan Contact Information

台灣IBM 產品服務聯絡方式：
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台北市松仁路7號3樓
電話：0800-016-888

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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.

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Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 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
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Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Regulations, Abteilung M372
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 7032 15 2941
email: lugi@de.ibm.com

Generelle Informationen:

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

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