Power Systems

PCI adapter placement for the 8233-E8B or 8236-E8C

Power Systems

PCI adapter placement for the 8233-E8B or 8236-E8C

Note

Before using this information and the product it supports, read the information in "Safety notices" on page v, "Notices" on page 39, 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:

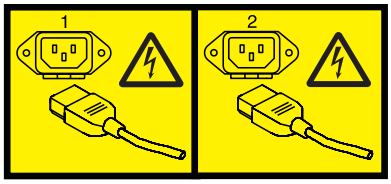
- **Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:**
  - **Remove 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 8233-E8B or 8236-E8C

Find information about the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters that are supported for the IBM Power® 750 Express (8233-E8B) and the IBM Power 755 (8236-E8C) system that contains 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

Related reference:

"Placement rules for the high-performance SCSI disk controller in an IBM i controlled system" on page 37
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.

Supported PCI adapters for the 8233-E8B or 8236-E8C

Find information about the placement rules and slot priorities for the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters that are supported for the 8233-E8B or 8236-E8C system.

This topic contains reference information that information technology (IT) personnel and service representatives can use in determining where to install the PCI, PCI-X, or PCIe adapters in the 8233-E8B or 8236-E8C system.

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

Table 2 and Table 3 on page 8 list adapters supported on the AIX, IBM i, and Linux operating systems. Not all adapters are supported on all operating systems. Exceptions are noted in the Description column.

Important:

- Not all adapters are supported on all system configurations. This document does not replace the latest sales and marketing publications and tools that document supported features.
- Before adding or rearranging adapters, use the System Planning Tool to validate the new adapter configuration. See the IBM System Planning Tool website.
- 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 PTF prerequisites to install. To do this, use the IBM Prerequisite website.

PCI and PCI-X adapters

The following table lists peripheral component interconnect (PCI) and peripheral component interconnect-X (PCI-X) adapters.

Table 2. PCI and PCI-X adapters supported on the AIX, IBM i, or Linux operating system

Supported system	Feature code	CCIN	Description
8233-E8B	2943	3-B	8-port Asynchronous EIA-232E/RS-422A PCI Adapter (FC 2943; CCIN 3-B) • PCI bus • 8 Async ports • OS support: AIX operating system
8233-E8B	5723	5723	2-port Asynchronous EIA-232 PCI Adapter (FC 5723; CCIN 5723) • PCI adapter • 2-port EIA-232 asynchronous serial communications • 16C850 UART equivalent • OS support: AIX and Linux operating systems
8233-E8B	1905	1910	4 Gb Single-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 1905; CCIN 1910) • PCI-X 2.0a, PCI 3.0, PCI-X Mode 2 - 266 MHz, PCI-X Mode 1 - 133 MHz, PCI - 66 MHz • High-speed data networking • OS support: AIX and Linux operating systems
8233-E8B	1910	1910	4 Gb Dual-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 1910; CCIN 1910) • PCI-X 2.0a, PCI 3.0, PCI-X Mode 2 - 266 MHz, PCI-X Mode 1 - 133 MHz, PCI - 66 MHz • High-speed data networking • OS support: AIX and Linux operating systems
8233-E8B	1977	197E	2 Gb Fibre Channel PCI-X Adapter (FC 1977; CCIN 197E) • PCI-X, 64-bit • High bandwidth • OS support: AIX and Linux operating systems

Table 2. PCI and PCI-X adapters supported on the AIX, IBM i, or Linux operating system (continued)

Supported system	Feature code	CCIN	Description
8233-E8B	5716	280B	2 Gb Fibre Channel PCI-X Adapter (FC 5716; CCIN 280B) • PCI-X, 64-bit • High bandwidth • OS support: AIX and Linux operating systems
8233-E8B	5749	576B	4 Gb Dual-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5749; CCIN 576B) • Short, 64-bit, 3.3 V • OS support: IBM i operating system • Extra-high bandwidth • 64-bit slot required • Recommended in DDR slot • Maximum of 24 adapters • Maximum of four per enclosure • Maximum of two per PCI host bridge • OS support: IBM i operating system
8233-E8B	5758	1910	4 Gb Single-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5758; CCIN 1910) • PCI-X 2.0a, PCI 3.0, PCI-X Mode 2 - 266 MHz, PCI-X Mode 1 - 133 MHz, PCI - 66 MHz • High-speed data networking • OS support: AIX and Linux operating systems
8233-E8B and 8236-E8C	5759	5759	4 Gb Dual-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5759; CCIN 5759) • Short, 64-bit, 3.3 V • High-speed data networking • Extra-high bandwidth • OS support: AIX and Linux operating systems
8233-E8B	1980 and 2849		POWER GXT135P Graphics Accelerator with digital support (FC 1980; CCIN 1980) • 32-bit PCI interface • 128-bit graphics processor • 8-bit or 24-bit color modes • OS support: AIX and Linux operating systems
8233-E8B	1954		4-port 10/100/1000 Base-TX PCI-X adapter (FC 1954) • PCI-X 1.0a • Full-height, 64-bit • OS support: AIX and Linux operating systems
8233-E8B	1978		IBM Gigabit Ethernet-SX PCI-X Adapter (FC 1978) • 64-bit PCI-X • One full-duplex 1000 Base-SX fiber connection to a gigabit Ethernet LAN • OS support: AIX and Linux operating systems

Table 2. PCI and PCI-X adapters supported on the AIX, IBM i, or Linux operating system (continued)

Supported system	Feature code	CCIN	Description
8233-E8B	1979		IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter (FC 1979) • 64-bit PCI-X • One full-duplex 10/100/1000 Base-TX UTP connection to a gigabit Ethernet • OS support: AIX and Linux operating systems
8233-E8B	1983	5706	2-port 10/100/1000 Base-TX Ethernet PCI-X Adapter (FC 1983; CCIN 5706) • Two full-duplex 10/100/1000 Base-TX UTP connections to gigabit Ethernet LANs • High bandwidth • OS support: AIX and Linux operating systems
8233-E8B	1986	573B	1-Gb iSCSI TOE PCI-X Adapter (FC 1986; CCIN 573B) • Copper media adapter • iSCSI TOE (TCP/IP offload engine) • OS support: AIX and Linux operating systems
8233-E8B	1987	573C	1-Gb iSCSI TOE PCI-X Adapter (FC 1987; CCIN 573C) • Optical media adapter • iSCSI TOE (TCP/IP offload engine) • OS support: AIX and Linux operating systems
8233-E8B	5700	5700	IBM Gigabit Ethernet-SX PCI-X Adapter (FC 5700; CCIN 5700) • One full-duplex 1000 Base-SX fiber connection to a gigabit Ethernet LAN • High bandwidth • OS support: AIX, IBM i, and Linux operating systems
8233-E8B	5701	5701	IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter (FC 5701; CCIN 5701) • One full-duplex 10/100/1000 Base-TX UTP connection to a gigabit Ethernet • OS support: AIX, IBM i, and Linux operating systems
8233-E8B and 8236-E8C	5706	5706	2-port 10/100/1000 Base-TX Ethernet PCI-X Adapter (FC 5706; CCIN 5706) • Short, 32-bit or 64-bit, 3.3 V or 5 V • High bandwidth • OS support: AIX, IBM i, and Linux operating systems
8233-E8B and 8236-E8C	5713	573B	1 Gb-TX iSCSI TOE PCI-X Adapter (FC 5713; CCIN 573B) • Short, 32-bit or 64-bit, 3.3 V or 5 V • High bandwidth • OS support: AIX, IBM i, and Linux operating systems
8233-E8B	5714	573C	1 Gb iSCSI TOE PCI-X on Optical Media Adapter (FC 5714; CCIN 573C) • Short, 32-bit or 64-bit, 3.3 V or 5 V • High bandwidth • OS support: AIX, IBM i, and Linux operating systems
8233-E8B	5721	573A	10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter (FC 5721; CCIN 573A) • High bandwidth • OS support: AIX, IBM i, and Linux operating system

Table 2. PCI and PCI-X adapters supported on the AIX, IBM i, or Linux operating system (continued)

Supported system	Feature code	CCIN	Description
8233-E8B	5722	573A	10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter (FC 5722; CCIN 573A) • High bandwidth • OS support: AIX, IBM i, and Linux operating systems
8233-E8B	5740	1954	4-port 10/100/1000 Base-TX PCI-X adapter (FC 5740; CCIN 1954) • PCI-X 1.0a • Full-height, 64-bit • High bandwidth • OS support: AIX and Linux operating systems
8233-E8B	2738	28EF	2-port USB PCI Adapter (FC 2738; CCIN 28EF) • Short, 32-bit • 3.3 or 5 V • OS support: AIX and Linux operating systems
8233-E8B and 8236-E8C	4764	4764	PCI-X Cryptographic Coprocessor (FC 4764; CCIN 4764) • Short, 64-bit, 3.3 V • OS support: AIX, IBM i, and Linux operating systems
8233-E8B	5900	572A	PCI-X DDR Dual-x4 3 Gb SAS Adapter (FC 5900; CCIN 572A) • Short, 64-bit, 3.3 V • Extra-high bandwidth • Supports a dual controller mode in a multi-initiator configuration • OS support: AIX and Linux operating systems
8233-E8B	5902	572B	PCI-X DDR Ext Dual-x4 3 Gb SAS RAID Adapter (FC 5902; CCIN 572B) • Long, 64-bit, 3.3 V • Extra-high bandwidth • The adapter must be connected and configured in a dual controller mode in a multi-initiator configuration, and this configuration requires that the adapters are installed in pairs. • This adapter supports disk expansion units. This adapter does not support media expansion units. • OS support: AIX and Linux operating systems
8233-E8B	5904	572F and 575C	PCI-X DDR 1.5 GB cache SAS RAID Adapter (FC 5904; CCIN 572F, 575C) • Long, 64-bit, 3.3 V • Extra-high bandwidth • No blind-swap cassette • Double-wide adapter requires two adjacent slots: – 572F is the CCIN on the SAS controller side of the double-wide adapter. – 575C is the CCIN on the write-cache side of the double-wide adapter. • OS support: AIX, IBM i, and Linux operating systems

Table 2. PCI and PCI-X adapters supported on the AIX, IBM i, or Linux operating system (continued)

Supported system	Feature code	CCIN	Description
8233-E8B	5908	572F, 575C	PCI-X DDR 1.5 GB cache SAS RAID Adapter (FC 5908; CCIN 572F, 575C) • Long, 64-bit, 3.3 V • Extra-high bandwidth • Generation 3 blind-swap cassette • Double-wide adapter requires two adjacent slots: – 572F is the CCIN on the SAS controller side of the double-wide adapter. – 575C is the CCIN on the write-cache side of the double-wide adapter. • OS support: AIX, IBM i, and Linux operating systems
8233-E8B	5912	572A	PCI-X DDR Dual-x4 3 Gb SAS Adapter (FC 5912; CCIN 572A) • Short, 64-bit, 3.3 V • Extra-high bandwidth • Supports a dual controller mode in a multi-initiator configuration • OS support: AIX, IBM i, and Linux operating systems
8233-E8B	1912	571A	PCI-X DDR 2.0 Dual Channel Ultra320 SCSI Adapter (FC 1912; CCIN 571A) • Short, 64-bit, 3.3 V • High bandwidth • OS support: AIX, IBM i, and Linuxoperating systems
8233-E8B	5736	571A	PCI-X DDR 2.0 Dual Channel Ultra320 SCSI Adapter (FC 5736; CCIN 571A) • Short, 32-bit or 64-bit, 3.3 V • High bandwidth • OS support: AIX, IBM i, and Linux operating systems
8233-E8B	5778	571F and 575B	PCI-X Dual Channel Ultra320 SCSI RAID Adapter with Auxiliary Write Cache (double-wide) (FC 5778; CCIN 571F) • Long, 64-bit, 3.3 V, 266 MHz • Dual-mode capable adapter • Extra-high bandwidth • Double-wide adapter, requires two, adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. The controller side is the side with the external SCSI connectors. • When used in a logical partition (LPAR) environment, this double-wide adapter must have both slots of the adapter assigned to the same logical partition. When using DLPAR, both slots of the adapter must be managed together. • Because of the complexity of this adapter, concurrent maintenance is not supported through the HMC. Concurrent maintenance must be done from the Hardware Service Manager (HSM). • OS support: IBM i operating system

Table 2. PCI and PCI-X adapters supported on the AIX, IBM i, or Linux operating system (continued)

Supported system	Feature code	CCIN	Description
8233-E8B	5782	571F and 575B	PCI-X Dual Channel Ultra320 SCSI RAID Adapter with Auxiliary Write Cache (double-wide) (FC 5782; CCIN 571F and 575B) • Long, 64-bit, 3.3 V, 266 MHz • Dual-mode capable adapter • Extra-high bandwidth • Double-wide adapter, requires two adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. The controller side is the side with the external SCSI connectors. • OS support: IBM i operating system
8233-E8B	2947		IBM ARTIC960Hx 4-port Multiprotocol PCI Adapter (FC 2947) • 32-bit PCI • Provides 4-ports with different protocols, EIA-232, EIA530, RS-449, X.21, or V.35 • OS support: AIX operating system
8233-E8B	2962		2-port Multiprotocol PCI Adapter (FC 2962) • Provides a two-port connection to X.25 packet switched networks • Two high-speed WAN connections • OS support: AIX operating system
8233-E8B	6805	2742	PCI 2-Line WAN IOA (FC 6805; CCIN 2742) • Short, 32-bit, 66 MHz • No IOP • OS support: IBM i and Linux operating systems
8233-E8B and 8236-E8C	6808	2805	PCI Quad Modem IOA (FC 6808; CCIN 2805) • Long, 32-bit, 66 MHz • Non-CIM • OS support: IBM i operating system
8233-E8B and 8236-E8C	6809	2805	PCI Quad Modem IOA (FC 6809; CCIN 2805) • Long, 32-bit, 66 MHz • CIM • OS support: IBM i operating system
8233-E8B	6833	2793	PCI 2-Line WAN with Modem No IOP (FC 6833; CCIN 2793) • Two lines per port WAN with modem adapter • Non-CIM • OS support: IBM i and Linux operating systems
8233-E8B	6834	2793	PCI 2-Line WAN with Modem No IOP CIM (FC 6834; CCIN 2793) • Two lines per port WAN with modem adapter • CIM • OS support: IBM i and Linux operating systems

PCI Express adapters

The following table lists PCI Express (PCIe) adapters.

Table 3. PCI Express adapters supported on the AIX, IBM i, or Linux operating system

Supported system	Feature code	CCIN	Description
8233-E8B and 8236-E8C	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
8233-E8B and 8236-E8C	5785	57D2	4 Port Async EIA-232 PCIe Adapter (FC 5785; CCIN 57D2) • Short, x1 • OS support: AIX and Linux operating systems
8233-E8B and 8236-E8C	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
8233-E8B	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
8233-E8B and 8236-E8C	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
8233-E8B and 8236-E8C	5748	5748	POWER GXT145 PCI Express Graphics Accelerator (FC 5748; CCIN 5748) • Short, x1 • Not hot-pluggable • OS support: AIX and Linux operating systems
8233-E8B and 8236-E8C	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
8233-E8B and 8236-E8C	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

Table 3. PCI Express adapters supported on the AIX, IBM i, or Linux operating system (continued)

Supported system	Feature code	CCIN	Description
8233-E8B and 8236-E8C	5732	5732	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5732; CCIN 2B43) • Short, x8 • Extra-high bandwidth • OS support: AIX and Linux operating systems
8233-E8B and 8236-E8C	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
8233-E8B and 8236-E8C	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
8233-E8B and 8236-E8C	5769	5769	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
8233-E8B and 8236-E8C	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
8233-E8B and 8236-E8C	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
8233-E8B and 8236-E8C	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
8233-E8B and 8236-E8C	4807	4765	PCIe Cryptographic Coprocessor (FC 4807; CCIN 4765) • PCIe x4, full-height, half-length • OS support: AIX, and IBM i operating systems
8233-E8B	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

Table 3. PCI Express adapters supported on the AIX, IBM i, or Linux operating system (continued)

Supported system	Feature code	CCIN	Description
8233-E8B and 8236-E8C	2054	57CD	PCIe RAID and SSD SAS Adapter 3 Gb Low-profile (FC 2054; 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
8233-E8B	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
8233-E8B and 8236-E8C	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
8233-E8B and 8236-E8C	5901	57B3	PCIe Dual - x4 SAS Adapter (FC 5901; CCIN 57B3) • Short • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems
8233-E8B and 8236-E8C	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
8233-E8B	5913	574E	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
8233-E8B and 8236-E8C	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
8233-E8B and 8236-E8C	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

Related reference:

"Placement rules for the high-performance SCSI disk controller in an IBM i controlled system" on page 37
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.

PCI adapter slot priorities for the 8233-E8B

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. Use this information to determine where to install PCI adapters.

PCI slot descriptions

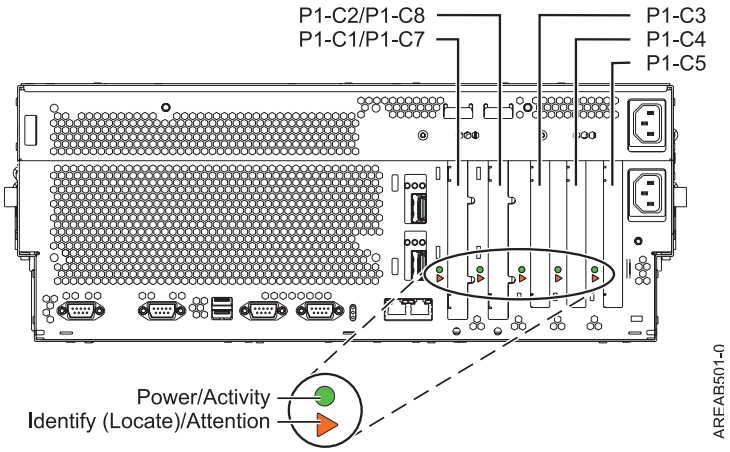


Figure 1. Rear view of system with location codes. Table 4 shows the rear view of the system with the location codes for the PCI and GX adapter slots.

Table 4. PCI slot locations and descriptions

Slot number	Location code	Description	PHB	Adapter size
Slot 1	P1-C1	PCIe x8	PCIe PHB0	Short
	P1-C7	GX++		
Slot 2	P1-C2	PCIe x8	PCIe PHB1	Short
	P1-C8	GX+		
Slot 3	P1-C3	PCIe x8	PCIe PHB3	Long
Slot 4	P1-C4	PCI-X DDR, 64-bit, 266 MHz	PCI-X PHB0	Long
Slot 5	P1-C5	PCI-X DDR, 64-bit, 266 MHz	PCI-X PHB1	Long

- Slot 1 can be used for either a PCIe x8 adapter in slot P1-C1, or a GX+ adapter in slot P1-C7.

  P1-C7 is not active on a single processor card system.

  P1-C7 provides higher bandwidth for a GX adapter than P1-C8. Use P1-C7 for the higher performance GX adapter or where the highest aggregate bandwidth is needed.
- Slot 2 can be used for either a PCIe x8 adapter in connector P1-C2, or a GX+ adapter in connector P1-C8.
- All slots support enhanced error handling (EEH).

PCI and PCI-X expansion units

I/O expansion units are used to increase the maximum number of adapters that the 8233-E8B server can support. The feature 5796 Expansion unit is supported on systems running AIX or Linux operating systems. The system can be configured to support up to eight I/O expansion units.

Note: For optimum performance, you must limit the total number of expansion units containing high-bandwidth and extra-high bandwidth adapters. See "Performance notes" on page 24.

5796 expansion units attach to a GX adapter installed in one or both of the two GX slots available in the system unit. A single processor system supports one 12X Channel Adapter with up to 4 drawers attached. A two processor or larger system supports two GX Adapters, with up to 4 drawers attached to each GX adapter.

PCIe expansion units

PCIe expansion units 5802 and 5877 are supported on the system running AIX, IBM i, or Linux operating systems. The system can be configured to support up to four I/O expansion units.

Restriction: A single GX adapter that connects one, two, or both of the 5802 or 5877 expansion units cannot have anything else connected to that adapter.

Note: For optimum performance, you must limit the total number of expansion units containing high-bandwidth and extra-high bandwidth adapters. See "Performance notes" on page 24.

The expansion units attach to a GX adapter installed in one or both of the two GX slots available in the system unit.

A single processor system supports one GX adapter with up to two drawers attached.

A 2 - 4 processor system supports two GX adapters, with up to two drawers attached to each adapter for a total of four drawers.

Maximum number of supported adapters

The 8233-E8B server supports up to four POWER7 processor cards with 8-core, 16-core, 24-core and 32-core configurations. Unless otherwise noted in the tables that follow this list, the maximum number of adapters allowed are shown in this list:

- One processor system:
  - No I/O expansion unit: 3 PCIe and 2 PCI-X DDR
  - System with four 5796 I/O expansion units: 2 PCIe and 26 PCI-X DDR
  - System with two 5802 or 5877 expansion units: 22 PCIe and 2 PCI-X DDR
- Two to four processor system:
  - No I/O expansion unit: 3 PCIe and 2 PCI-X DDR
  - System with eight 5796 I/O expansion units: 1 PCIe and 50 PCI-X DDR
  - System with four 5802 or 5877 expansion units: 41 PCIe and 2 PCI-X DDR

Note: For optimum performance, you must limit the total number of expansion units containing high-bandwidth and extra-high bandwidth adapters. See "Performance notes" on page 24.

PCI and PCI-X adapters

Use this information to identify slot placement priorities. Unless otherwise noted in the table, the maximum number of adapters supported is listed in "Maximum number of supported adapters."

Table 5. Adapter slot priorities and maximums for PCI and PCI-X adapters

Feature code	Description	System unit slot priority	Maximum number of adapters supported
2943	8-port Asynchronous EIA-232E/RS-422A PCI Adapter (FC 2943; CCIN 3-B) • PCI bus • 8 Async ports • OS support: AIX operating system	4, 5	18 per system
5723	2-port Asynchronous EIA-232 PCI Adapter (FC 5723; CCIN 5723) • PCI adapter • 2-port EIA-232 asynchronous serial communications • 16C850 UART equivalent • OS support: AIX and Linux operating systems	4, 5	18 per system
1905	4 Gb Single-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 1905; CCIN 1910) • PCI-X 2.0a, PCI 3.0, PCI-X Mode 2 - 266 MHz, PCI-X Mode 1 - 133 MHz, PCI - 66 MHz • High-speed data networking • OS support: AIX and Linux operating systems	4, 5	50 per system
1910	4 Gb Dual-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 1910; CCIN 1910) • PCI-X 2.0a, PCI 3.0, PCI-X Mode 2 - 266 MHz, PCI-X Mode 1 - 133 MHz, PCI - 66 MHz • High-speed data networking • OS support: AIX and Linux operating systems	4, 5	50 per system
1977[1]	2 Gb Fibre Channel PCI-X Adapter (FC 1977; CCIN 197E) • PCI-X, 64-bit • High bandwidth • OS support: AIX and Linux operating systems	4, 5	50 per system
5716[1]	2 Gb Fibre Channel PCI-X Adapter (FC 5716; CCIN 280B) • PCI-X, 64-bit • High bandwidth • OS support: AIX and Linux operating systems	4, 5	50 per system

Table 5. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
5749[2]	4 Gb Dual-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5749; CCIN 576B) • Short, 64-bit, 3.3 V • OS support: IBM i operating system • Extra-high bandwidth • 64-bit slot required • Recommended in DDR slot • Maximum of 24 adapters • Maximum of four per enclosure • Maximum of two per PCI host bridge • OS support: IBM i operating system	4, 5	50 per system
5758	4 Gb Single-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5758; CCIN 1910) • PCI-X 2.0a, PCI 3.0, PCI-X Mode 2 - 266 MHz, PCI-X Mode 1 - 133 MHz, PCI - 66 MHz • High-speed data networking • OS support: AIX and Linux operating systems	4, 5	50 per system
5759[2]	4 Gb Dual-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5759; CCIN 5759) • Short, 64-bit, 3.3 V • High-speed data networking • Extra-high bandwidth • OS support: AIX and Linux operating systems	4, 5	50 per system
1980	POWER GXT135P Graphics Accelerator with digital support (FC 1980; CCIN 1980) • 32-bit PCI interface • 128-bit graphics processor • 8-bit or 24-bit color modes • OS support: AIX and Linux operating systems	4, 5	8 per system
2849[1]	GXT135P Graphics Accelerator with digital support (FC 2849; CCIN 2849) • Short, 32 or 64-bit, 3.3 V • High bandwidth • Not hot-pluggable • OS support: AIX and Linux operating systems	4, 5	8 per system
1954	4-port 10/100/1000 Base-TX PCI-X adapter (FC 1954) • PCI-X 1.0a • Full-height, 64-bit • OS support: AIX and Linux operating systems	4, 5	32 per system

Table 5. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
1978	IBM Gigabit Ethernet-SX PCI-X Adapter (FC 1978) • 64-bit PCI-X • One full-duplex 1000 Base-SX fiber connection to a gigabit Ethernet LAN • OS support: AIX and Linux operating systems	4, 5	50 per system
1979	IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter (FC 1979) • 64-bit PCI-X • One full-duplex 10/100/1000 Base-TX UTP connection to a gigabit Ethernet • OS support: AIX and Linux operating systems	4, 5	50 per system
1983[1]	2-port 10/100/1000 Base-TX Ethernet PCI-X Adapter (FC 1983; CCIN 5706) • Two full-duplex 10/100/1000 Base-TX UTP connections to gigabit Ethernet LANs • High bandwidth • OS support: AIX and Linux operating systems	4, 5	50 per system
1986	1-Gb iSCSI TOE PCI-X Adapter (FC 1986; CCIN 573B) • Copper media adapter • iSCSI TOE (TCP/IP offload engine) • OS support: AIX and Linux operating systems	4, 5	27 per system
1987	1-Gb iSCSI TOE PCI-X Adapter (FC 1987; CCIN 573C) • Optical media adapter • iSCSI TOE (TCP/IP offload engine) • OS support: AIX and Linux operating systems	4, 5	27 per system
5700	IBM Gigabit Ethernet-SX PCI-X Adapter (FC 5700; CCIN 5700) • One full-duplex 1000 Base-SX fiber connection to a gigabit Ethernet LAN • High bandwidth • OS support: AIX, IBM i, and Linux operating systems	4, 5	• 64 per system • When the adapter is used with i, see “Determining the best place to install your adapter” on page 36.
5701	IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter (FC 5701; CCIN 5701) • One full-duplex 10/100/1000 Base-TX UTP connection to a gigabit Ethernet • OS support: AIX, IBM i, and Linux operating systems	4, 5	• 64 per system • When the adapter is used with i, see “Determining the best place to install your adapter” on page 36.

Table 5. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
5706[1]	2-port 10/100/1000 Base-TX Ethernet PCI-X Adapter (FC 5706; CCIN 5706) • Short, 32-bit or 64-bit, 3.3 V or 5 V • High bandwidth • OS support: AIX, IBM i, and Linux operating systems	4, 5	50 per system
5713[1]	1 Gb-TX iSCSI TOE PCI-X Adapter (FC 5713; CCIN 573B) • Short, 32-bit or 64-bit, 3.3 V or 5 V • High bandwidth • OS support: AIX, IBM i, and Linux operating systems	4, 5	42 per system
5714[1]	1 Gb iSCSI TOE PCI-X on Optical Media Adapter (FC 5714; CCIN 573C) • Short, 32-bit or 64-bit, 3.3 V or 5 V • High bandwidth • OS support: AIX, IBM i, and Linux operating systems	4, 5	42 per system
5721[1]	10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter (FC 5721; CCIN 573A) • High bandwidth • OS support: AIX, IBM i, and Linux operating system	4, 5	32 per system
5722[1]	10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter (FC 5722; CCIN 573A) • High bandwidth • OS support: AIX, IBM i, and Linux operating systems	4, 5	32 per system
5740	4-port 10/100/1000 Base-TX PCI-X adapter (FC 5740; CCIN 1954) • PCI-X 1.0a • Full-height, 64-bit • High bandwidth • OS support: AIX and Linux operating systems	4, 5	32 per system
2738	2-port USB PCI Adapter (FC 2738; CCIN 28EF) • Short, 32-bit • 3.3 or 5 V • OS support: AIX and Linux operating systems	4, 5	8 per system
4764	PCI-X Cryptographic Coprocessor (FC 4764; CCIN 4764) • Short, 64-bit, 3.3 V • OS support: AIX, IBM i, and Linux operating systems	4, 5	32 per system

Table 5. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
5900	PCI-X DDR Dual-x4 3 Gb SAS Adapter (FC 5900; CCIN 572A) • Short, 64-bit, 3.3 V • Extra-high bandwidth • Supports a dual controller mode in a multi-initiator configuration • OS support: AIX and Linux operating systems	4, 5	50 per system
5902[2]	PCI-X DDR Ext Dual-x4 3 Gb SAS RAID Adapter (FC 5902; CCIN 572B) • Long, 64-bit, 3.3 V • Extra-high bandwidth • The adapter must be connected and configured in a dual controller mode in a multi-initiator configuration, and this configuration requires that the adapters are installed in pairs. • This adapter supports disk expansion units. This adapter does not support media expansion units. • OS support: AIX and Linux operating systems	4, 5	50 per system
5904[2]	PCI-X DDR 1.5 GB cache SAS RAID Adapter (FC 5904; CCIN 572F, 575C) • Long, 64-bit, 3.3 V • Extra-high bandwidth • No blind-swap cassette • Double-wide adapter requires two adjacent slots: – 572F is the CCIN on the SAS controller side of the double-wide adapter. – 575C is the CCIN on the write-cache side of the double-wide adapter. • OS support: AIX, IBM i, and Linux operating systems	4	1 per system
5908[2]	PCI-X DDR 1.5 GB cache SAS RAID Adapter (FC 5908; CCIN 572F, 575C) • Long, 64-bit, 3.3 V • Extra-high bandwidth • Generation 3 blind-swap cassette • Double-wide adapter requires two adjacent slots: – 572F is the CCIN on the SAS controller side of the double-wide adapter. – 575C is the CCIN on the write-cache side of the double-wide adapter. • OS support: AIX, IBM i, and Linux operating systems	4	16 per system

Table 5. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
5912[2]	PCI-X DDR Dual-x4 3 Gb SAS Adapter (FC 5912; CCIN 572A) • Short, 64-bit, 3.3 V • Extra-high bandwidth • Supports a dual controller mode in a multi-initiator configuration • OS support: AIX, IBM i, and Linux operating systems	4, 5	50 per system
1912	PCI-X DDR 2.0 Dual Channel Ultra320 SCSI Adapter (FC 1912; CCIN 571A) • Short, 64-bit, 3.3 V • High bandwidth • OS support: AIX, IBM i, and Linuxoperating systems	4, 5	50 per system
5736[1]	PCI-X DDR 2.0 Dual Channel Ultra320 SCSI Adapter (FC 5736; CCIN 571A) • Short, 32-bit or 64-bit, 3.3 V • High bandwidth • OS support: AIX, IBM i, and Linux operating systems	4, 5	50 per system
5778[2]	PCI-X Dual Channel Ultra320 SCSI RAID Adapter with Auxiliary Write Cache (double-wide) (FC 5778; CCIN 571F) • Long, 64-bit, 3.3 V, 266 MHz • Dual-mode capable adapter • Extra-high bandwidth • Double-wide adapter, requires two, adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. The controller side is the side with the external SCSI connectors. • When used in a logical partition (LPAR) environment, this double-wide adapter must have both slots of the adapter assigned to the same logical partition. When using DLPAR, both slots of the adapter must be managed together. • Because of the complexity of this adapter, concurrent maintenance is not supported through the HMC. Concurrent maintenance must be done from the Hardware Service Manager (HSM). • OS support: IBM i operating system	4	1

Table 5. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
5782[2]	PCI-X Dual Channel Ultra320 SCSI RAID Adapter with Auxiliary Write Cache (double-wide) (FC 5782; CCIN 571F and 575B) • Long, 64-bit, 3.3 V, 266 MHz • Dual-mode capable adapter • Extra-high bandwidth • Double-wide adapter, requires two adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. The controller side is the side with the external SCSI connectors. • OS support: IBM i operating system	4	1 per system
2947	IBM ARTIC960Hx 4-port Multiprotocol PCI Adapter (FC 2947) • 32-bit PCI • Provides 4-ports with different protocols, EIA-232, EIA530, RS-449, X.21, or V.35 • OS support: AIX operating system	4, 5	8 per system
2962	2-port Multiprotocol PCI Adapter (FC 2962) • Provides a two-port connection to X.25 packet switched networks • Two high-speed WAN connections • OS support: AIX operating system	4, 5	20 per system
6805	PCI 2-Line WAN IOA (FC 6805; CCIN 2742) • Short, 32-bit, 66 MHz • No IOP • OS support: IBM i and Linux operating systems	4, 5	81 per system
6808	PCI Quad Modem IOA (FC 6808; CCIN 2805) • Long, 32-bit, 66 MHz • Non-CIM • OS support: IBM i operating system	4, 5	50 per system
6809	PCI Quad Modem IOA (FC 6809; CCIN 2805) • Long, 32-bit, 66 MHz • CIM • OS support: IBM i operating system	4, 5	50 per system
6833	PCI 2-Line WAN with Modem No IOP (FC 6833; CCIN 2793) • Two lines per port WAN with modem adapter • Non-CIM • OS support: IBM i and Linux operating systems	4, 5	81 per system

Table 5. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
6834	PCI 2-Line WAN with Modem No IOP CIM (FC 6834; CCIN 2793) • Two lines per port WAN with modem adapter • CIM • OS support: IBM i and Linux operating systems	4, 5	81 per system
[1] High-bandwidth adapter. See the "Performance notes" on page 24 before installing this adapter. [2]Extra-high bandwidth adapter. See the "Performance notes" on page 24 before installing this adapter.			

PCIe adapters

Use this information to identify slot placement priorities. Unless otherwise noted in the table, the maximum number of adapters supported is listed in "Maximum number of supported adapters" on page 12.

Table 6. Adapter slot priorities and maximums for PCIe adapters

Feature code	Description	System unit slot priority	Maximum number of adapters supported
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, 2, 3	12 per system
5785	4 Port Async EIA-232 PCIe Adapter (FC 5785; CCIN 57D2) • Short, x1 • OS support: AIX and Linux operating systems	1, 2, 3	18 per system
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, 2, 3	• 41 per system • 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 6. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
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, 2, 3	41 per system
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, 2, 3	41 per system
5748	POWER GXT145 PCI Express Graphics Accelerator (FC 5748; CCIN 5748) • Short, x1 • Not hot-pluggable • OS support: AIX and Linux operating systems	1, 2, 3	8 per system
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, 2, 3	• 32 per system • 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.
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, 2, 3	32 per system
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, 2, 3	32 per system
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, 2, 3	41 per system

Table 6. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
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, 2, 3	41 per system
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, 2, 3	32 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, 2, 3	32 per system
5899	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	4, 5	41 per system
2738	2-port USB PCI Adapter (FC 2738; CCIN 28EF) • Short, 32-bit • 3.3 or 5 V • OS support: AIX and Linux operating systems	1, 2, 3	8 per system
4807	PCIe Cryptographic Coprocessor (FC 4807; CCIN 4765) • PCIe x4, full-height, half-length • OS support: AIX, and IBM i operating systems	1, 2, 3	2 per system
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, 2, 3	10 per system

Table 6. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
2054	PCIe RAID and SSD SAS Adapter 3 Gb Low-profile (FC 2054; 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	1 per system
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	20 per system
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, 2, 3	41 per system
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, 2, 3	41 per system
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, 2, 3	41 per system
5913[2]	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, 2, 3	34 per system

Table 6. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
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, 2, 3	41 per system
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, 2, 3	41 per system
[1] High-bandwidth adapter. See the "Performance notes" before installing this adapter. [2]Extra-high bandwidth adapter. See the "Performance notes" before installing this adapter.			

Performance notes

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

The section "Maximum number of supported adapters" on page 12 shows maximum number adapters allowed for connectivity. However, for optimum performance, you might want to further limit the total number of high-bandwidth and extra-high bandwidth adapters.

The following four tables provide guidelines on the maximum number of high-bandwidth and extra-high-bandwidth adapters 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 tables 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 an IBM representative for additional guidelines.

Extra-high bandwidth storage adapters

Table 7. Maximum number of extra-high bandwidth storage adapters for best performance

System configuration	Adapters in system unit including both PCI-X DDR and PCIe slots	Adapters in any expansion unit connected to a 5616 adapter in slot P1-C8	Adapters in a 5796 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	Adapters in a 5802 or 5877 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	System maximum[1]
1-processor card	5	3			6
2-processor card	5	3	6	9	10 for 5796 12 for 5802 or 5877

Table 7. Maximum number of extra-high bandwidth storage adapters for best performance (continued)

System configuration	Adapters in system unit including both PCI-X DDR and PCIe slots	Adapters in any expansion unit connected to a 5616 adapter in slot P1-C8	Adapters in a 5796 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	Adapters in a 5802 or 5877 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	System maximum[1]
3-processor card	5	3	6	9	10 for 5796 12 for 5802 or 5877
4-processor card	5	3	6	9	10 for 5796 12 for 5802 or 5877
[1]If 5708 or 5735 adapters are used in an application with both ports active, each adapter counts as two extra-high bandwidth adapters.					

High-bandwidth storage adapters

Table 8. Maximum number of high-bandwidth storage adapters for best performance

System configuration	Adapters in system unit including both PCI-X DDR and PCIe slots	Adapters in any expansion unit connected to a 5616 adapter in slot P1-C8	Adapters in a 5796 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	Adapters in a 5802 or 5877 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	System maximum[1]
1-processor card	5	8			12
2-processor card	5	8	12	18	20 for 5796 24 for 5802 or 5877
3-processor card	5	8	12	18	20 for 5796 24 for 5802 or 5877
4-processor card	5	8	12	18	20 for 5796 24 for 5802 or 5877

Extra-high bandwidth Ethernet adapters

Table 9. Maximum number of extra-high bandwidth Ethernet adapters for best performance

System configuration	Adapters in system unit including both PCI-X DDR and PCIe slots	Adapters in any expansion unit connected to a 5616 adapter in slot P1-C8	Adapters in a 5796 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	Adapters in a 5802 or 5877 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	System maximum[1]
1-processor card	1	0[1]	NA	NA	1
2-processor card	2	0	1	2	2
3-processor card	2	0	2	3	3

Table 9. Maximum number of extra-high bandwidth Ethernet adapters for best performance (continued)

System configuration	Adapters in system unit including both PCI-X DDR and PCIe slots	Adapters in any expansion unit connected to a 5616 adapter in slot P1-C8	Adapters in a 5796 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	Adapters in a 5802 or 5877 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	System maximum[1]
4-processor card	2	0	2	4	4

Notes:

1. Extra-high bandwidth adapters are not recommended in expansion units connected to GX controllers in P1-C8.
2. For optimum performance, no more than one 10 Gb Ethernet port per one processor (of 8 cores) should be used in a system.
3. If 5708 adapter is used and both ports are used by the application, then each 5708 counts as two extra-high bandwidth adapters.
4. For optimum performance, place PCIe 10 Gigabit Ethernet adapters in the 5802 or 5877 expansion drawer if it exists and not in the system unit internal slots. Follow the I/O expansion unit adapter placement guidelines if multiple adapters are used.
5. For optimum performance, only connect a single I/O expansion drawer to the 5609 GX controller. Do not chain expansion drawers on the same 5609 GX controller.

High-bandwidth Ethernet adapters

Table 10. Maximum number of high-bandwidth Ethernet adapters for best performance

System configuration	Adapters in system unit including both PCI-X DDR and PCIe slots	Adapters in any expansion unit connected to a 5616 adapter in slot P1-C8	Adapters in a 5796 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	Adapters in a 5802 or 5877 I/O expansion unit connected to a 5609 GX adapter in slot P1-C7	System maximum[1]
1-processor card	5	3	NA	NA	8
2-processor card	5	3	6	10	14
3-processor card	5	3	6	10	14
4-processor card	5	3	6	10	14

Each adapter might be single port, dual port, or quad port. For optimum performance, no more than two 1 Gb Ethernet ports per POWER7 core must be used in a system. Each POWER7 processor might have up to eight cores. Assign enough cores to your logic partition (LPAR) to meet the sizing (one core per two high-bandwidth ports).

PCI adapter slot priorities for the 8236-E8C

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. Use this information to determine where to install PCI adapters.

PCI slot descriptions

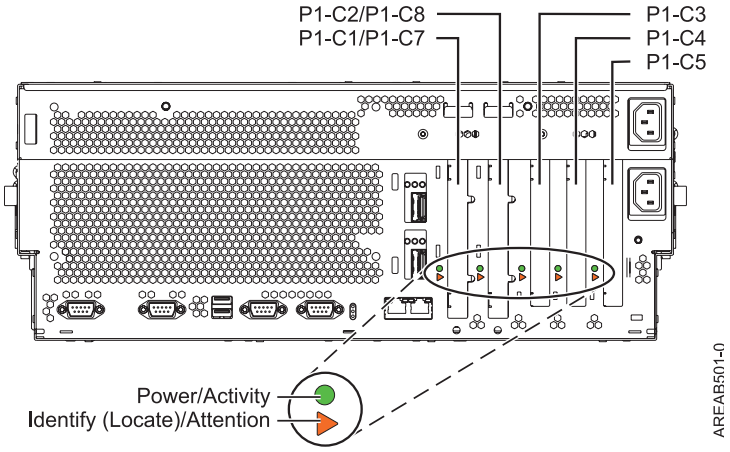


Figure 2. Rear view of enclosure with location codes. Table 11 shows the rear view of the system unit with the location codes for the PCI and GX+ slots.

Table 11. PCI slot locations and descriptions

Slot number	Location code	Description	PHB	Adapter size
Slot 1	P1-C1	PCIe x8	PCIe PHB0	Short
	P1-C7	GX++		
Slot 2	P1-C2	PCIe x8	PCIe PHB1	Short
Slot 3	P1-C3	PCIe x8	PCIe PHB3	Long
Slot 4	P1-C4	PCI-X DDR, 64-bit, 266 MHz	PCI-X PHB0	Long
Slot 5	P1-C5	PCI-X DDR, 64-bit, 266 MHz	PCI-X PHB1	Long

- Slot 1 can be used for either a PCIe x8 adapter in slot P1-C1, or a GX++ adapter in slot P1-C7.

  P1-C7 is not active on a single processor card system.

  P1-C7 provides higher bandwidth for a GX adapter than P1-C8. Use P1-C7 for the higher performance GX adapter or where the highest aggregate bandwidth is needed.
- All slots support enhanced error handling (EEH).

Maximum number of supported adapters

The 8236-E8C system supports up to four POWER7 processor cards with 32-core configurations. Unless otherwise noted in the tables that follow this list, the maximum number of adapters allowed are shown in this list:

- The 8236-E8C system supports a maximum of 3 PCIe and 2 PCIx adapters if no switches are attached.
- A GX adapter is required to support switches. When the GX adapter is installed, the maximum quantity of PCIe and PCIx cards is 2 and 2.

PCI and PCI-X adapters

Use this information to identify slot placement priorities. Unless otherwise noted in the table, the maximum number of adapters supported is listed in "Maximum number of supported adapters." In the following table, adapters are sorted in descending order by priority. The highest priority adapters are first in the table.

Table 12. Adapter slot priorities and maximums for PCI and PCI-X adapters

Feature code	Description	System unit slot priority	Maximum number of adapters supported
5759[2]	4 Gb Dual-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5759; CCIN 5759) • Short, 64-bit, 3.3 V • High-speed data networking • Extra-high bandwidth • OS support: AIX and Linux operating systems	4, 5	2 per system
5706[1]	2-port 10/100/1000 Base-TX Ethernet PCI-X Adapter (FC 5706; CCIN 5706) • Short, 32-bit or 64-bit, 3.3 V or 5 V • High bandwidth • OS support: AIX, IBM i, and Linux operating systems	4, 5	2 per system
5713[1]	1 Gb-TX iSCSI TOE PCI-X Adapter (FC 5713; CCIN 573B) • Short, 32-bit or 64-bit, 3.3 V or 5 V • High bandwidth • OS support: AIX, IBM i, and Linux operating systems	4, 5	2 per system
4764	PCI-X Cryptographic Coprocessor (FC 4764; CCIN 4764) • Short, 64-bit, 3.3 V • OS support: AIX, IBM i, and Linux operating systems	4, 5	2 per system
6808	PCI Quad Modem IOA (FC 6808; CCIN 2805) • Long, 32-bit, 66 MHz • Non-CIM • OS support: IBM i operating system	4, 5	2 per system
6809	PCI Quad Modem IOA (FC 6809; CCIN 2805) • Long, 32-bit, 66 MHz • CIM • OS support: IBM i operating system	4, 5	2 per system
[1] High-bandwidth adapter. See the “Performance notes” on page 32 before installing this adapter. [2]Extra-high bandwidth adapter. See the “Performance notes” on page 32 before installing this adapter.			

PCIe adapters

Use this information to identify slot placement priorities. Unless otherwise noted in the table, the maximum number of adapters supported is listed in “Maximum number of supported adapters” on page 27. In the following table, adapters are sorted in descending order by priority. The highest priority adapters are first in the table.

Table 13. Adapter slot priorities and maximums for PCIe adapters

Feature code	Description	System unit slot priority	Maximum number of adapters supported
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, 2, 3	3 per system
5785	4 Port Async EIA-232 PCIe Adapter (FC 5785; CCIN 57D2) • Short, x1 • OS support: AIX and Linux operating systems	1, 2, 3	3 per system
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, 2, 3	• 3 per system • 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.
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, 2, 3	3 per system
5748	POWER GXT145 PCI Express Graphics Accelerator (FC 5748; CCIN 5748) • Short, x1 • Not hot-pluggable • OS support: AIX and Linux operating systems	1, 2, 3	3 per system
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, 2, 3	• 3 per system • 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 13. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
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, 2, 3	3 per system
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, 2, 3	3 per system
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, 2, 3	3 per system
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, 2, 3	3 per system
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, 2, 3	3 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, 2, 3	3 per system
5899	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, 2, 3	3 per system

Table 13. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
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, 2, 3	3 per system
4807	PCIe Cryptographic Coprocessor (FC 4807; CCIN 4765) • PCIe x4, full-height, half-length • OS support: AIX, and IBM i operating systems	1, 2, 3	3 per system
2054	PCIe RAID and SSD SAS Adapter 3 Gb Low-profile (FC 2054; 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, 2, 3	1 per system
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, 2, 3	3 per system
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, 2, 3	3 per system
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, 2, 3	3 per system
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, 2, 3	3 per system

Table 13. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority	Maximum number of adapters supported
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, 2, 3	3 per system
[1] High-bandwidth adapter. See the "Performance notes" before installing this adapter. [2]Extra-high bandwidth adapter. See the "Performance notes" before installing this adapter.			

Performance notes

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

The section "Maximum number of supported adapters" on page 27 shows maximum number adapters allowed for connectivity. However, for optimum performance, you might want to further limit the total number of high bandwidth and extra-high bandwidth adapters.

The following four tables provide guidelines on the maximum number of high bandwidth and extra-high bandwidth adapters 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 tables 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 an IBM representative for additional guidelines.

Extra-high bandwidth storage adapters

Table 14. Maximum number of extra-high bandwidth storage adapters for best performance

System configuration	Adapters in system unit including both PCI-X DDR and PCIe slots	System maximum[1]
4-processor card	5	
[1]If 5708 or 5735 adapters are used in an application with both ports active, each adapter counts as two extra-high bandwidth adapters.		

High bandwidth storage adapters

Table 15. Maximum number of high-bandwidth storage adapters for best performance

System configuration	Adapters in system unit including both PCI-X DDR and PCIe slots	System maximum
4-processor card	5	

Extra-high bandwidth Ethernet adapters

Table 16. Maximum number of extra-high bandwidth Ethernet adapters for best performance

System configuration	Adapters in system unit including both PCI-X DDR and PCIe slots	System maximum
4-processor card	4	4
For optimum performance, no more than one 10 Gb Ethernet port per two processors should be used in a system. If one 10 Gb Ethernet port is present per two processors, no other 10 Gb or 1 Gb ports should be used.		

High bandwidth Ethernet adapters

Table 17. Maximum number of high bandwidth Ethernet adapters for best performance

System configuration	Adapters in system unit including both PCI-X DDR and PCIe slots	System maximum
4-processor card	55	5
For optimum performance, no more than two 1 Gb Ethernet ports per processor should be used in a system. If two 1 Gb Ethernet ports are present per processor, no other 1 Gb or 10 Gb ports should be used.		

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 5796 expansion unit

Find information about the Peripheral Component Interconnect (PCI) slots in the 5796 expansion unit.

System description

The 5796 expansion unit is a 19-inch, rack-mountable, I/O expansion drawer that is designed to be attached to the system unit by using the 12X channel bus and 12X cables.

The 5796 can accommodate six generation-3 blind-swap adapter cassettes. Cassettes can be installed and removed without removing the drawer from the rack.

Figure 3 on page 34 shows the rear view of the expansion unit.

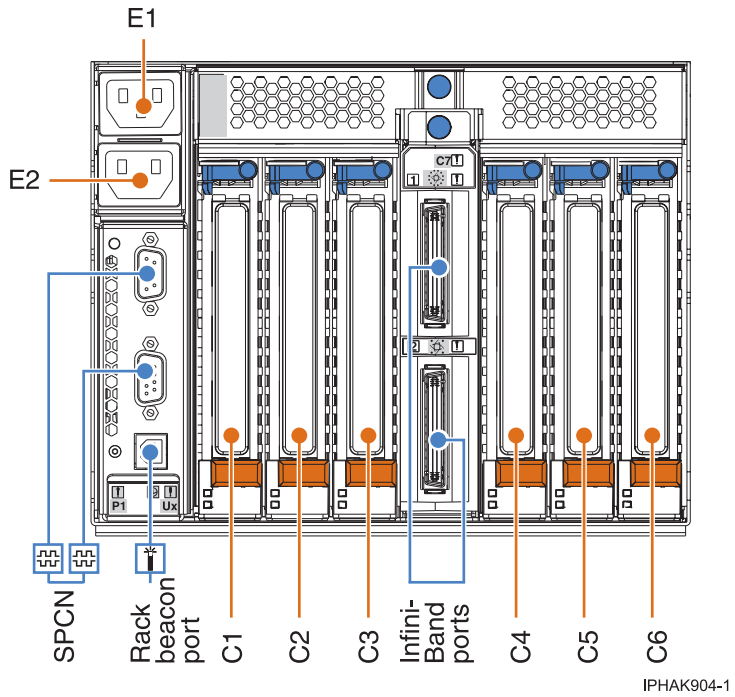


Figure 3. Rear view

Table 18. Location code descriptions

Location code	Description
C1, C2, C3, C4, C5, and C6	PCI-X DDR slots. See also "PCI slot descriptions."
C7-T1 and C7-T2	12X Channel remote I/O ports.
C8-T1 and C8-T2	Dual port system power control network (SPCN) connectors.
E1 and E2	Power supply connectors.

PCI slot descriptions

Table 19. Slot properties

PHB2 A	PHB3 A	PHB4 A	PHB1 B	PHB2 B	PHB3 B
Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
Long	Long	Long	Long	Long	Long
64 bit 3.3V, 266 MHz	64 bit 3.3V, 266 MHz	64 bit 3.3V, 266 MHz	64 bit 3.3V, 266 MHz	64 bit 3.3V, 266 MHz	64 bit 3.3V, 266 MHz
C1	C2	C3	C4	C5	C6
• Each PCI-X DDR slot is a separate PCI host bridge (PHB). • All slots are compatible with PCI and PCI-X DDR adapters. • Short adapters can go in long slots.					

Slot priorities

Slot priority for all adapters is 1, 4, 2, 5, 3, and 6. For a list of supported adapters, see the placement information for the base system unit to which the expansion unit is attached.

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.

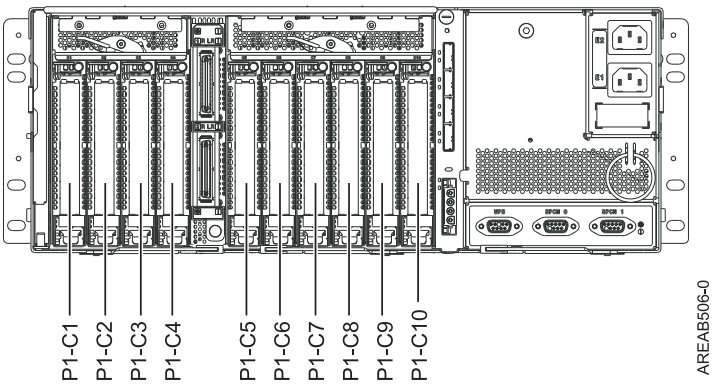


Figure 4. Rear view. This figure shows the rear view of the expansion unit.

Table 20. 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 adapter slot priorities for the 8233-E8B" on page 11
      - "PCI adapter slot priorities for the 8236-E8C" on page 26
    - **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 21.

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 21 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 21. 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 22. 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]

[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 adapter placement for the 8233-E8B or 8236-E8C" on page 1
Find information about the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters that are supported for the IBM Power 750 Express (8233-E8B) and the IBM Power 755 (8236-E8C) system that contains the POWER7 processor and the associated I/O expansion units.

"Supported PCI adapters for the 8233-E8B or 8236-E8C" on page 1
Find information about the placement rules and slot priorities for the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters that are supported for the 8233-E8B or 8236-E8C system.

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

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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

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

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

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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

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電話：0800-016-888

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

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
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Technical Regulations, Abteilung M372
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 7032 15 2941
email: lugi@de.ibm.com

Generelle Informationen:

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- 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.

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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

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Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
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IBM-Allee 1, 71139 Ehningen, Germany
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Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse B.

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