ESCALA Power7

PCI Adapter Placement for M6-700,
M6-705, M6-715, M7-700, M7-705
or *M7-715*

ESCALA Models Reference

The ESCALA Power7 publications concern the following models:

Bull Escala E1-700 / E3-700	(31E/2B ,8231-E2B)
Bull Escala E1-705	(31E/1C, 8231-E1C)
Bull Escala E1-715	(31E/1D, 8231-E1D)
Bull Escala E3-705	(31E/2C, 8231-E2C)
Bull Escala E3-715	(31E/2D, 8231-E2D)
Bull Escala E2-700 / E2-700T	(02E/4B, 8202-E4B)
Bull Escala E2-705 / E2-705T	(02E/4C, 8202-E4C)
Bull Escala E2-715 / E2-715T	(02E/4D, 8202-E4D)
Bull Escala E4-700 / E4-700T	(05F/6B, 8205-E6B)
Bull Escala E4-705	(05E/6C, 8205-E6C)
Bull Escala E4-715	(05E/6D, 8205-E6D)
Bull Escala E5-700	(33E/8B, 8233-E8B)
Bull Escala E5-715	(08E/8D, 8408-E8D)
Bull Escala M5-715	(09R/MD, 9109-RMD)
Bull Escala M6-700	(17M/MB, 9117-MMB)
Bull Escala M6-705	(17M/MC, 9117-MMC)
Bull Escala M6-715	(17M/MD, 9117-MMD)
Bull Escala M7-700	(79M/HB, 9179-MHB)
Bull Escala M7-705	(79M/HC, 9179-MHC)
Bull Escala M7-715	(79M/HD, 9179-MHD)
Bull Escala H9-700	(19F/HB, 9119-FHB)

References to 8236-E8C models are irrelevant.

Hardware

July 2013

Trademarks and Acknowledgements

We acknowledge the rights of the proprietors of the trademarks mentioned in this manual.

All brand names and software and hardware product names are subject to trademark and/or patent protection.

Quoting of brand and product names is for information purposes only and does not represent trademark misuse.

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.

Laser safety information

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

Laser compliance

The 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 provided power cord. Do not use the 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.**
>
> **(D005a)**

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.
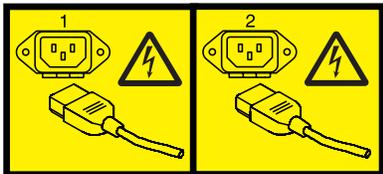
(R002)

(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 approved part. Recycle or discard the battery as instructed by local regulations. (C003a)

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

The following comments apply to the 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 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, or 79M/HD

Find information about the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters that are supported for the E/SE (12E/AD), 7/70 (17M/MB, 17M/MC, or 17M/MD), and the 7/80 (79M/HB, 79M/HC, or 79M/HD) 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

PDF file for PCI adapter placement

You can view and print a PDF of this information.

PCI adapter placement PDF

Learn about peripheral component interconnect (PCI), PCI-X and PCI Express (PCIe) adapters that are supported on systems that contain the POWER7 processor, and their associated I/O expansion units.

PCI adapter placement for the 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, or 79M/HD

 (approximately 2 MB)

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Supported PCI adapters for the 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, or 79M/HD

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 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, or 79M/HD 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 PCI, PCI-X, and PCIe adapters.

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

Table 2 and Table 3 on page 8 list adapters supported on the AIX or 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 add URL here.
- If you are installing a new feature, ensure that you have the software required to support the new feature and determine whether you must install any existing PTF prerequisites. To do this, use the add URL here.

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

System	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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

Table 2. PCI and PCI-X adapters (continued)

System	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5704 or 6239	5704	2 Gb Fibre Channel Tape Controller (FC 5704, 6239; CCIN 5704) • Provides attachment to external tape devices • Extra-high bandwidth
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5749	576B	4 Gb Dual-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5749; CCIN 576B)
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5760 and 5761	280D and 280E	4 Gb Single-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5760, 5761; CCIN 280D, 280E) • 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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	2849	2849	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

Table 2. PCI and PCI-X adapters (continued)

System	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	2844	2844	PCI IOP (FC 2844, CCIN 2844)
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	2847	2847	PCI IOP for SAN Load Source (FC 2847, CCIN 2847)
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5707	5706	IBM 2-port Gb Ethernet-SX PCI-X Adapter (FC 5707; CCIN 5706) • Short, 32-bit or 64-bit, 3.3 V or 5 V • High bandwidth • OS support: AIX, , and Linux operating system
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5721	573A	10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter (FC 5721; CCIN 573A) • High bandwidth • OS support: AIX, , and Linux operating system
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5722	573A	10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter (FC 5722; CCIN 573A) • High bandwidth • OS support: AIX, , and Linux operating systems

Table 2. PCI and PCI-X adapters (continued)

System	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	4764	4764	PCI-X Cryptographic Coprocessor (FC 4764; CCIN 4764) • Short, 64-bit, 3.3 V • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	4805	2058	PCI Cryptographic Accelerator (FC 4805; CCIN 2058) • Short, 32-bit, 33 MHz • OS support: operating system
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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

12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems

Table 2. PCI and PCI-X adapters (continued)

System	Feature code	CCIN	Description

12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems

12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linuxoperating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	2757	2757	PCI Ultra RAID Disk Controller (FC 2757; CCIN 2757) • Long, 64-bit • High bandwidth • IOP controlled • The controller must be mirrored to be supported. • This adapter might encounter performance limitations in PCI-X expansion units and systems. • OS support: operating system
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	2780	2780	PCI-X Ultra4 RAID Disk Controller (FC 2780; CCIN 2780) • Long, 64-bit, 133 MHz • High bandwidth • IOP controlled • The controller must be mirrored to be supported. • OS support: operating system
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5580	5708	PCI-X Ultra4 RAID Disk Controller with Auxiliary-write cache IOA (FC 5580; CCIN 2780) • Long, 64-bit, 133 MHz • High bandwidth • IOP controlled auxiliary-write cache • The controller must be mirrored to be supported. • OS support: operating system

Table 2. PCI and PCI-X adapters (continued)

System	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5583	571E	PCI-X Quad-Channel Ultra320 SCSI RAID Adapter (FC 5582, 5583, 5738, 5777; CCIN 571E) • PCI-X compliant • 64-bit, 3.3 V • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5590	574F	Auxiliary-write cache IOA (FC 5590; CCIN 574F)
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5776	571B	PCI-X Disk Controller (FC 5776; CCIN 571B) • Long, 64-bit, 266 MHz • Extra-high bandwidth • Dual-mode capable adapter • The controller must be mirrored to be supported • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5777	571F	PCI-X Disk Controller (FC 5777; CCIN 571F) • Long, 64-bit, 266 MHz • Extra-high bandwidth • Dual-mode capable adapter • The controller must be mirrored to be supported • OS support: operating system
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5778	571F	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: operating system

Table 2. PCI and PCI-X adapters (continued)

System	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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: operating system
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	2947	576C	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	6805	2742	PCI 2-Line WAN IOA (FC 6805; CCIN 2742) • Short, 32-bit, 66 MHz • No IOP • OS support: and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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: and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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: and Linux operating systems

PCIe adapters

The following table lists PCIe adapters.

Table 3. PCIe adapters

Supported system	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems

Table 3. PCIe adapters (continued)

Supported system	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5785	57D2	4 Port Async EIA-232 PCIe Adapter (FC 5785; CCIN 57D2) • Short, x1 • OS support: AIX and Linux operating systems
12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD	5729	5729	PCIe2 FH 4-port 8 Gb Fibre Channel Adapter (FC 5729; CCIN 5729) • PCIe 2.1, x8 • Full-height, full length adapter with standard-size bracket • Extra-high bandwidth • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5774	5774	4 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5774; CCIN 5774) • Short, x4 • Extra-high bandwidth • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD	EN0A	577F	PCIe2 16 Gb 2-port Fibre Channel Adapter (FC EN0A; CCIN 577F) • Extra-high bandwidth • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5748	5774	4 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5774; CCIN 5774) • Short, x4 • Extra-high bandwidth • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD	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
12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD	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

Table 3. PCIe adapters (continued)

Supported system	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5708	2B3B	10 Gb FCoE PCIe Dual-port Adapter (FC 5708; CCIN 2B3B) • Regular full-height • Extra-high bandwidth • PCIe 2.0 adapter with x8 generation 1 • Convergence enhanced Ethernet (CEE) supported • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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
12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD	5744	2B44	PCIe2 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5744; CCIN 2B44) • Short, x8 • Full-height adapter • Extra-high bandwidth • PCIe generation 2 • OS support: Linux operating system
12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5767	5767	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter (FC 5767; CCIN 5767) • Short, x4 • High bandwidth • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5768	5768	2-port Gigabit Ethernet-SX PCI Express Adapter (FC 5768; CCIN 5768) • Short, x4 • High bandwidth • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5769	2B44	10 Gb Ethernet-SR PCI Express Adapter (FC 5769; CCIN 2B44) • Short, full-high, x8 • Low-profile capable • Extra-high bandwidth • OS support: AIX and Linux operating systems

Table 3. PCIe adapters (continued)

Supported system	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5772	576E	10 Gb Ethernet-LR PCI Express Adapter (FC 5772; CCIN 576E) • Short, x8 • Low-profile capable • Extra-high bandwidth • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems
12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD	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
12E/AD, 17M/MD, and 79M/HD	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
12E/AD, 17M/MD, and 79M/HD	EC2K	EC2H	PCIe 2-Port 10 GbE SFN5162F Adapter (FC EC2K; CCIN EC2H) • High bandwidth • Regular-height adapter • OS support: Linux operating system
12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD	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
12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD	EN0H	2B93	PCIe2 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EN0H, CCIN 2B93) • Extra-high bandwidth • OS support: AIX, , and Linux operating systems

Table 3. PCIe adapters (continued)

Supported system	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	2728	57D1	4-port USB PCIe Adapter (FC 2728; CCIN 57D1) • Low-profile adapter • Single-slot, half-length PCIe adapter • PCIe 1.1 • OS support: AIX and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	4808	4765	PCIe Cryptographic Coprocessor (FC 4808; CCIN 4765) • Generation 3 blind-swap cassette • PCIe x4, full-height, half-length • OS support: AIX and operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	4809	4765	PCIe Cryptographic Coprocessor (FC 4809; CCIN 4765) • Generation 4 blind-swap cassette • PCIe x4, full-height, half-length • OS support: AIX and operating systems
12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD	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
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	2055	57CD	PCIe RAID and SSD SAS Adapter 3 Gb with Blind-Swap Cassette (FC 2055; CCIN 57CD) • Low-profile adapter, requires two slots • Short, x8 • OS support: AIX, , and Linux operating systems • VIOS attachment requires version 2.2, or later
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5901	57B3	PCIe Dual - x4 SAS Adapter (FC 5901; CCIN 57B3) • Short • Extra-high bandwidth • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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

Table 3. PCIe adapters (continued)

Supported system	Feature code	CCIN	Description
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5909	57B9	PCI Express® x8 Ext Dual-x4 3 Gb SAS Adapter and cable card (FC 5909; CCIN 57B9) • Short, 8x, PCIe adapter combined with a cable card assembly • Extra-high bandwidth • OS support: AIX and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	5911	57BA	SAS adapter for internal Split DASD option (FC5911; CCIN 57BA) • Short, 8x, PCIe adapter combined with a cable card assembly • Extra-high bandwidth • OS support: AIX and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	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, , and Linux operating systems
12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD	ESA1	57B4	PCIe2 RAID SAS Adapter Dual-port 6 Gb (FC ESA1; CCIN 57B4) • Regular-height adapter • PCIe generation 2, x8 • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	2893	576C	PCI Express 2-Line WAN with Modem (FC 2893; CCIN 576C) • Short, x4 • Non-CIM • OS support: AIX, , and Linux operating systems
12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD	2894	576C	PCI Express 2-Line WAN with Modem (FC 2894; CCIN 576C) • Short, x4 • CIM • OS support: AIX, , and Linux operating systems

PCI adapters placement rules and slot priorities for the 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, or 79M/HD

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 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, or 79M/HD systems that contain the POWER7 processor and the associated I/O expansion units.

PCI adapter slot priorities for the 17M/MB, 17M/MC, and 17M/MD

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 unit with the location codes for the PCI and GX++ adapter slots. Table 4 to Table 6 on page 15 describe the slots for the 17M/MB, 17M/MC, and 17M/MD. Each PCI-X DDR or PCIe is a separate PCI host bridge (PHB).
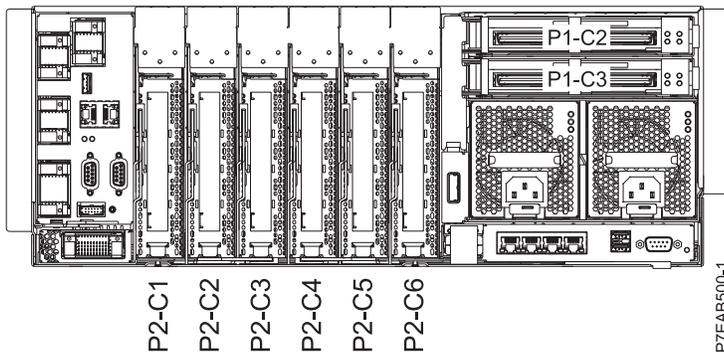

Figure 1. Rear view of enclosure with location codes

Table 4. PCI slot locations and descriptions for the 17M/MB

Slot	Location code	Description	PHB	Slot size
Slot 1	P2-C1	PCIe x8, generation-1	PCIe PHB0 module A	Long
Slot 2	P2-C2	PCIe x8, generation-1	PCIe PHB1 module A	Long
Slot 3	P2-C3	PCIe x8, generation-1	PCIe PHB2 module A	Long
Slot 4	P2-C4	PCIe x8, generation-1	PCIe PHB3 module A	Long
Slot 5	P2-C5	PCIe x8, generation-1	PCIe PHB0 module B	Long
Slot 6	P2-C6	PCIe x8, generation-1	PCIe PHB1 module B	Long
GX++	P1-C2	Location for GX++ adapter		NA
GX++	P1-C3	Location for GX++ adapter		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.

Table 5. PCI slot locations and descriptions for the 17M/MC

Slot	Location code	Description	PHB	Slot size
Slot 1	P2-C1	PCIe x8, generation-2	PCIe PHB0 module A	Long
Slot 2	P2-C2	PCIe x8, generation-2	PCIe PHB1 module A	Long
Slot 3	P2-C3	PCIe x8, generation-2	PCIe PHB2 module A	Long
Slot 4	P2-C4	PCIe x8, generation-2	PCIe PHB3 module A	Long
Slot 5	P2-C5	PCIe x8, generation-2	PCIe PHB0 module B	Long
Slot 6	P2-C6	PCIe x8, generation-2	PCIe PHB1 module B	Long

Table 5. PCI slot locations and descriptions for the 17M/MC (continued)

Slot	Location code	Description	PHB	Slot size
GX++	P1-C2	Location for GX++ adapter		NA
GX++	P1-C3	Location for GX++ adapter		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.

Table 6. PCI slot locations and descriptions for the 17M/MD

Slot	Location code	Description	PHB	Slot size	Direct memory access (DMA) capable
Slot 1	P2-C1	PCIe x8, generation-2	PCIe PHB0 module A	Long	32-bit
Slot 2	P2-C2	PCIe x8, generation-2	PCIe PHB1 module A	Long	64-bit
Slot 3	P2-C3	PCIe x8, generation-2	PCIe PHB2 module A	Long	32-bit
Slot 4	P2-C4	PCIe x8, generation-2	PCIe PHB3 module A	Long	32-bit
Slot 5	P2-C5	PCIe x8, generation-2	PCIe PHB0 module B	Long	64-bit
Slot 6	P2-C6	PCIe x8, generation-2	PCIe PHB1 module B	Long	32-bit
GX++	P1-C2	Location for GX++ adapter		NA	
GX++	P1-C3	Location for GX++ adapter		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.

PCI and PCI-X expansion units

Each system unit supports up to eight I/O expansion units attached to GX++ adapters. I/O expansion units are required to achieve the maximum number of adapters listed in Table 7 on page 17

Expansion unit 57/96 is supported on the 17M/MB, 17M/MC, and 17M/MD systems that are running AIX or Linux operating system.

Feature code (FC) 1808 (GX++ 12X DDR Dual-port IB Adapter) is supported for the 17M/MB, 17M/MC, and 17M/MD systems.

The 57/96 attaches to a GX++ adapter installed in one of the two GX slots available in each system unit. The limit is four 57/96 I/O drawers attached to each GX 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 28.

The maximum number of attached remote I/O drawers depends on the number processor features configured in the system for 12X Host Channel attached I/O drawers:

- Systems with one processor unit support up to eight 57/96 expansion units, four per GX++ adapter.

- Systems with two processor units support up to sixteen 57/96 expansion units, four per GX++ adapter.
- Systems with three processor units support up to twenty-four 57/96 expansion units, four per GX++ adapter.
- Systems with four processor units support up to thirty-two 57/96 expansion units, four per GX++ adapter.

PCIe expansion units

PCIe expansion unit 58/77 and 58/02 are supported on the system that are running AIX 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 58/77 or 58/02 expansion units or one of each 58/77 and 58/02 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 28.

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 58/02 or 58/77 expansion units, two per GX++ adapter.
- Systems with two processor units support up to eight 58/02 or 58/77 expansion units, two per GX++ adapter.
- Systems with three processor units support up to twelve 58/02 or 58/77 expansion units, two per GX++ adapter.
- Systems with four processor units support up to sixteen 58/02 or 58/77 expansion units, two per GX++ adapter.

Systems with a combination of PCI/PCI-X and PCIe expansion units

A system can have a combination of PCI/PCI-X expansion units (57/96) and PCIe expansion units (58/02 or 58/77). The expansion units cannot be combined on the same GX++ adapter. Following are the limits per each system unit:
- Up to eight 57/96 (PCI/PCI-X) expansion units
- Up to four 58/02 or 58/77 (PCIe) expansion units
- Up to four 57/96 (PCI/PCI-X) expansion units on one GX++ adapter and two 58/02 or 58/77 (PCIe) expansion units on the second GX++ adapter.

PCI and PCI-X adapters

Use this information to identify slot placement priorities and the maximum number of specified adapters allowed. In the following table, adapters are sorted in descending order by priority. Verify whether the adapter is supported for your system. For details about the supported adapters, see "Supported PCI adapters for the 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, or 79M/HD" on page 2.

Table 7. Adapter slot priorities and maximums for PCI and PCI-X adapters

Feature code	Description	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	192 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	192 per system
5704 or 6239[2]	2 Gb Fibre Channel Tape Controller (FC 5704, 6239; CCIN 5704) • Provides attachment to external tape devices • Extra-high bandwidth	Supported only in expansion units
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	192 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, , and Linux operating systems	184 per system
5749[2]	4 Gb Dual-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5749; CCIN 576B)	192 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	192 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	192 per system
5760 and 5761	4 Gb Single-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5760, 5761; CCIN 280D, 280E) • 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	Supported only in expansion units

Table 7. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	Maximum number of adapters supported
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	8 per system
2844	PCI IOP (FC 2844, CCIN 2844)	Supported only in expansion units
2847	PCI IOP for SAN Load Source (FC 2847, CCIN 2847)	Supported only in expansion units
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, , and Linux operating systems	192 per system
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, , and Linux operating systems	192 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, , and Linux operating systems	192 per system
5707[1]	IBM 2-port Gb Ethernet-SX PCI-X Adapter (FC 5707; CCIN 5706) • Short, 32-bit or 64-bit, 3.3 V or 5 V • High bandwidth • OS support: AIX, , and Linux operating system	Supported only in expansion units
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, , and Linux operating systems	192 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, , and Linux operating systems	192 per system
5721[1]	10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter (FC 5721; CCIN 573A) • High bandwidth • OS support: AIX, , and Linux operating system	192 per system
5722[1]	10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter (FC 5722; CCIN 573A) • High bandwidth • OS support: AIX, , and Linux operating systems	192 per system

Table 7. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	Maximum number of adapters supported
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	192 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	192 per system
4764	PCI-X Cryptographic Coprocessor (FC 4764; CCIN 4764) • Short, 64-bit, 3.3 V • OS support: AIX, , and Linux operating systems	192 per system
4805	PCI Cryptographic Accelerator (FC 4805; CCIN 2058) • Short, 32-bit, 33 MHz • OS support: operating system	Supported only in expansion units
5900[2]	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	192 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	192 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, , and Linux operating systems
		Supported only in expansion units

Feature code	Description	Maximum number of adapters supported

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, , and Linux operating systems
		64 per system

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, , and Linux operating systems	192 per system
1912[1]	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, , and Linuxoperating systems	192 per system
2757[1]	PCI Ultra RAID Disk Controller (FC 2757; CCIN 2757) • Long, 64-bit • High bandwidth • IOP controlled • The controller must be mirrored to be supported. • This adapter might encounter performance limitations in PCI-X expansion units and systems. • OS support: operating system	Supported only in expansion units
2780[1]	PCI-X Ultra4 RAID Disk Controller (FC 2780; CCIN 2780) • Long, 64-bit, 133 MHz • High bandwidth • IOP controlled • The controller must be mirrored to be supported. • OS support: operating system	Supported only in expansion units
5580[1]	PCI-X Ultra4 RAID Disk Controller with Auxiliary-write cache IOA (FC 5580; CCIN 2780) • Long, 64-bit, 133 MHz • High bandwidth • IOP controlled auxiliary-write cache • The controller must be mirrored to be supported. • OS support: operating system	Supported only in expansion units

Feature code	Description	Maximum number of adapters supported
5583	PCI-X Quad-Channel Ultra320 SCSI RAID Adapter (FC 5582, 5583, 5738, 5777; CCIN 571E) • PCI-X compliant • 64-bit, 3.3 V • OS support: AIX, , and Linux operating systems	Supported only in expansion units
5590	Auxiliary-write cache IOA (FC 5590; CCIN 574F)	Supported only in expansion units
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, , and Linux operating systems	192 per system
5776[2]	PCI-X Disk Controller (FC 5776; CCIN 571B) • Long, 64-bit, 266 MHz • Extra-high bandwidth • Dual-mode capable adapter • The controller must be mirrored to be supported • OS support: AIX, , and Linux operating systems	Supported only in expansion units
5777[2]	PCI-X Disk Controller (FC 5777; CCIN 571F) • Long, 64-bit, 266 MHz • Extra-high bandwidth • Dual-mode capable adapter • The controller must be mirrored to be supported • OS support: operating system	Supported only in expansion units
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: operating system	Supported only in expansion units

Table 7. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	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: operating system	64 per system
2947	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	192 per system
6805	PCI 2-Line WAN IOA (FC 6805; CCIN 2742) • Short, 32-bit, 66 MHz • No IOP • OS support: and Linux operating systems	192 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: and Linux operating systems	192 per system
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: and Linux operating systems	192 per system
[1]High bandwidth adapter. See the "Performance notes" on page 28 before installing this adapter.		
[2]Extra-high bandwidth adapter. See the "Performance notes" on page 28 before installing this adapter.		

PCIe adapters

Use this information to identify slot placement priorities and the maximum number of specified adapters allowed. In the following table, adapters are sorted in descending order by priority. Verify whether the adapter is supported for your system. For details about the supported adapters, see "Supported PCI adapters for the 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, or 79M/HD" on page 2.

Table 8. Adapter slot priorities and maximums for PCIe adapters

Feature code	Description	System unit slot priority[3]	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, , and Linux operating systems	1, 5, 2, 6, 3, 4	56 per system
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 per system
5729[2, 4]	PCIe2 FH 4-port 8 Gb Fibre Channel Adapter (FC 5729; CCIN 5729) • PCIe 2.1, x8 • Full-height, full length adapter with standard-size bracket • Extra-high bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	24 per system
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 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, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 per system
EN0A[2]	PCIe2 16 Gb 2-port Fibre Channel Adapter (FC EN0A; CCIN 577F) • Extra-high bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	24 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, 5, 2, 6, 3, 4	8 per system
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 per system

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported
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 per system
5708[2]	10 Gb FCoE PCIe Dual-port Adapter (FC 5708; CCIN 2B3B) • Regular full-height • Extra-high bandwidth • PCIe 2.0 adapter with x8 generation 1 • Convergence enhanced Ethernet (CEE) supported • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	• 184 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, 5, 2, 6, 3, 4	184 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, 5, 2, 6, 3, 4	128 per system
5744[2, 4]	PCIe2 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5744; CCIN 2B44) • Short, x8 • Full-height adapter • Extra-high bandwidth • PCIe generation 2 • OS support: Linux operating system	1, 5, 2, 6, 3, 4	184 per system
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 per system

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported
5767[1]	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter (FC 5767; CCIN 5767) • Short, x4 • High bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	• 184 per system • 64 per system for
5768[1]	2-port Gigabit Ethernet-SX PCI Express Adapter (FC 5768; CCIN 5768) • Short, x4 • High bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	• 184 per system • 64 per system for
5769[2]	10 Gb Ethernet-SR PCI Express Adapter (FC 5769; CCIN 2B44) • Short, full-high, x8 • Low-profile capable • Extra-high bandwidth • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	128 per system
5772[2]	10 Gb Ethernet-LR PCI Express Adapter (FC 5772; CCIN 576E) • Short, x8 • Low-profile capable • Extra-high bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	48 per system
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, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 per system
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	128 per system
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	16 per system

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported
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	16 per system
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	128 per system
EN0H[2]	PCIe2 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EN0H, CCIN 2B93) • Extra-high bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	24 per system
2728	4-port USB PCIe Adapter (FC 2728; CCIN 57D1) • Low-profile adapter • Single-slot, half-length PCIe adapter • PCIe 1.1 • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	8 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 operating systems	1, 5, 2, 6, 3, 4	10 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 operating systems	1, 5, 2, 6, 3, 4	10 per system
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 per system
2055	PCIe RAID and SSD SAS Adapter 3 Gb with Blind-Swap Cassette (FC 2055; CCIN 57CD) • Low-profile adapter, requires two slots • Short, x8 • OS support: AIX, , and Linux operating systems • VIOS attachment requires version 2.2, or later	1, 5, 2, 6, 3, 4	80 per system

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported
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, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 per system
5901[2]	PCIe Dual - x4 SAS Adapter (FC 5901; CCIN 57B3) • Short • Extra-high bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 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, 5, 2, 6, 3, 4	184 per system
5909[2]	PCI Express x8 Ext Dual-x4 3 Gb SAS Adapter and cable card (FC 5909; CCIN 57B9) • Short, 8x, PCIe adapter combined with a cable card assembly • Extra-high bandwidth • OS support: AIX and Linux operating systems	Supported only in expansion units	
5911[2]	SAS adapter for internal Split DASD option (FC5911; CCIN 57BA) • Short, 8x, PCIe adapter combined with a cable card assembly • Extra-high bandwidth • OS support: AIX and Linux operating systems	Supported only in expansion units	
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, , and Linux operating systems	1, 5, 2, 6, 3, 4	136 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, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 per system

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported
2893	PCI Express 2-Line WAN with Modem (FC 2893; CCIN 576C) • Short, x4 • Non-CIM • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 per system
2894	PCI Express 2-Line WAN with Modem (FC 2894; CCIN 576C) • Short, x4 • CIM • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 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.			
[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 17M/MB system and 58/02 and 58/77 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

Notes:
- Feature code (FC) 1808 (GX++ 12X DDR Dual-port IB adapter) is supported for the 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD systems.
- FC 1914 (GX++ 2-port PCIe2 x8 adapter) is supported for the 12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD systems.

When using extra-high bandwidth adapters, follow these guidelines:
- 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.
- When using multiple GX++ adapters on a system with multiple system units, spread the GX++ adapter across the system units. For example, on a system with two system units attached to two FC 58/02 expansion units, use two GX++ adapters, and install one in the P1-C2 slot of one system and then place the second GX++ adapter in P1-C2 slot in the second system (rather than installing both GX++ adapters in one system). Installing of the GX++ adapters in separate systems ensures a better spread of the I/O devices across the systems for best performance.

Table 7 on page 17 and Table 8 on page 23 identify 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 57/96, 58/02, or 58/77.

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 with a support representative for additional guidelines.

Extra-high bandwidth storage adapters

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

System configuration	PCIe adapters in system units	PCI, PCI-X adapters in I/O expansion unit FC 57/96[1]	Adapters in system units plus I/O expansion FC 57/96[1]	PCIe adapters in 58/02 or 58/77 I/O Expansion units[1]	System maximum[1]
One system unit	6	3	6	4	10
Two system units	12	6	12	8	20
Three system units	18	9	18	12	30
Four system units	24	12	24	16	40
[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 10. Maximum number of high-bandwidth storage adapters for best performance

System configuration	PCIe adapters in system units	PCI, PCI-X adapters in I/O expansion unit FC 57/96[1]	Adapters in system units plus I/O expansion FC 57/96[1]	PCIe adapters in 58/02 or 58/77 I/O Expansion units[1]	System maximum
One system unit	6	6	12	8	20
Two system units	12	12	24	16	40
Three system units	18	18	36	24	60
Four system units	24	24	48	32	80

[1]

- For optimum performance, no more than one 10 Gb Ethernet port per two processors must be used in a system. If one 10 Gb Ethernet port is present per POWER7 processor, no other 10 Gb or 1 Gb ports must be used.
- If 5708 or 5735 adapters are used in an application with both ports active, each adapter counts as two extra-high bandwidth adapters.

Extra-high bandwidth Ethernet adapters

Table 11. Maximum number of extra-high bandwidth Ethernet adapters for best performance

System configuration	PCIe adapters in system units[2]	PCI, PCI-X adapters in I/O expansion unit FC 57/96[1]	Adapters in system units plus I/O expansion FC 57/96[1]	PCIe adapters in 58/02 or 58/77 I/O Expansion units[1]	System maximum
One system unit	2	2	2	2	2
Two system units	4	4	4	4	4
Three system units	6	6	6	6	6
Four system units	8	8	8	8	8

Table 11. Maximum number of extra-high bandwidth Ethernet adapters for best performance (continued)

System configuration	PCIe adapters in system units[2]	PCI, PCI-X adapters in I/O expansion unit FC 57/96[1]	Adapters in system units plus I/O expansion FC 57/96[1]	PCIe adapters in 58/02 or 58/77 I/O Expansion units[1]	System maximum
[1]					
• For optimum performance, no more than one 10 Gb Ethernet port per two processors must be used in a system. If one 10 Gb Ethernet port is present per POWER7 processor, no other 10 Gb or 1-Gb ports must be used.					
• If 5708 or 5735 adapters are used in an application with both ports active, each adapter counts as two extra-high bandwidth adapters.					
[2]For best performance, extra-high bandwidth Ethernet adapters must be installed in 58/02 or 58/77 expansion drawers when available, instead of using internal system unit slots.					

High-bandwidth Ethernet adapters

Table 12. Maximum number of high-bandwidth Ethernet adapters for best performance

System configuration	PCIe adapters in system units	PCI, PCI-X adapters in I/O expansion unit FC 57/96[1]	Adapters in system units plus I/O expansion FC 57/96[1]	PCIe adapters in 58/02 or 58/77 I/O Expansion units[1]	System maximum
One system unit	6	6	6	6	8
Two system units	12	12	12	12	16
Three system units	18	18	18	18	24
Four system units	24	24	24	24	32
[1]For optimum performance, no more than one 10 Gb Ethernet port per two processors must be used in a system. If two 1 Gb Ethernet ports are present per processor, no other 1 Gb or 10-Gb ports must be used.					

PCI adapter slot priorities for the 12E/AD, 79M/HB, 79M/HC, and 79M/HD

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 2 on page 31 shows the rear view of the system unit with the location codes for the PCI and GX++ adapter slots. Table 13 on page 31 to Table 15 on page 32 describe the slots for the 12E/AD, 79M/HB, 79M/HC, and 79M/HD. Each PCI-X DDR or PCIe is a separate PCI host bridge (PHB).
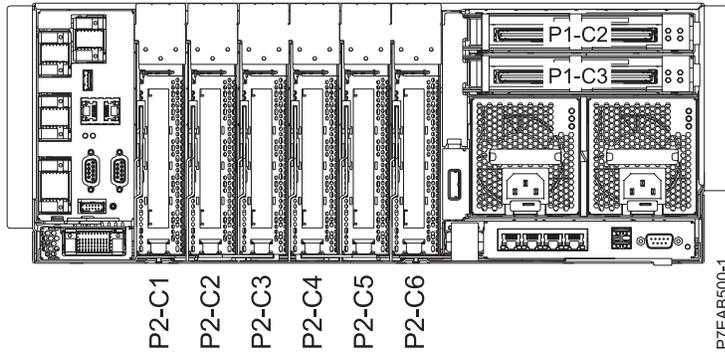
Figure 2. Rear view of enclosure with location codes

Table 13. PCI slot locations and descriptions for the 79M/HB

Slot	Location code	Description	PHB	Slot size
Slot 1	P2-C1	PCIe x8, generation-1	PCIe PHB0 module A	Long
Slot 2	P2-C2	PCIe x8, generation-1	PCIe PHB1 module A	Long
Slot 3	P2-C3	PCIe x8, generation-1	PCIe PHB2 module A	Long
Slot 4	P2-C4	PCIe x8, generation-1	PCIe PHB3 module A	Long
Slot 5	P2-C5	PCIe x8, generation-1	PCIe PHB0 module B	Long
Slot 6	P2-C6	PCIe x8, generation-1	PCIe PHB1 module B	Long
GX++	P1-C2	Location for GX++ adapter		NA
GX++	P1-C3	Location for GX++ adapter		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.

Table 14. PCI slot locations and descriptions for the 79M/HC

Slot	Location code	Description	PHB	Slot size
Slot 1	P2-C1	PCIe x8, generation-2	PCIe PHB0 module A	Long
Slot 2	P2-C2	PCIe x8, generation-2	PCIe PHB1 module A	Long
Slot 3	P2-C3	PCIe x8, generation-2	PCIe PHB2 module A	Long
Slot 4	P2-C4	PCIe x8, generation-2	PCIe PHB3 module A	Long
Slot 5	P2-C5	PCIe x8, generation-2	PCIe PHB0 module B	Long
Slot 6	P2-C6	PCIe x8, generation-2	PCIe PHB1 module B	Long
GX++	P1-C2	Location for GX++ adapter		NA
GX++	P1-C3	Location for GX++ adapter		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.

Table 15. PCI slot locations and descriptions for the 12E/AD and 79M/HD

Slot	Location code	Description	PHB	Slot size	Direct memory access (DMA) capable
Slot 1	P2-C1	PCIe x8, generation-2	PCIe PHB0 module A	Long	32-bit
Slot 2	P2-C2	PCIe x8, generation-2	PCIe PHB1 module A	Long	64-bit
Slot 3	P2-C3	PCIe x8, generation-2	PCIe PHB2 module A	Long	32-bit
Slot 4	P2-C4	PCIe x8, generation-2	PCIe PHB3 module A	Long	32-bit
Slot 5	P2-C5	PCIe x8, generation-2	PCIe PHB0 module B	Long	64-bit
Slot 6	P2-C6	PCIe x8, generation-2	PCIe PHB1 module B	Long	32-bit
GX++	P1-C2	Location for GX++ adapter	NA		
GX++	P1-C3	Location for GX++ adapter	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.

PCI and PCI-X expansion units

Each system supports up to eight I/O expansion units attached to GX++ adapters. I/O expansion units are required to achieve the maximum number of adapters listed in Table 16 on page 33

Expansion unit 57/96 is supported on the 12E/AD, 79M/HB, 79M/HC, and 79M/HD systems that are running AIX or Linux operating systems.

Feature code (FC) 1808 (GX++ 12X DDR Dual-port IB Adapter) is supported for the 12E/AD, 79M/HB, 79M/HC, and 79M/HD systems.

The 57/96 attaches to a GX++ adapter installed in one of the two GX slots available in each system unit. The limit is four 57/96 I/O drawers attached to each GX++ adapter.

Note: For optimum performance, you can limit the total number of expansion units that contain high bandwidth and extra-high bandwidth adapters. See "Performance notes" on page 45.

The maximum number of attached remote I/O drawers depends on the number processor features configured in the system for 12X Host Channel attached I/O drawers:
- Systems with one processor unit support up to eight 57/96 expansion units, four per GX++ adapter.
- Systems with two processor units support up to sixteen 57/96 expansion units, four per GX++ adapter.
- Systems with three processor units support up to twenty-four 57/96 expansion units, four per GX++ adapter.
- Systems with four processor units support up to thirty-two 57/96 expansion units, four per GX++ adapter.

PCIe expansion units

PCIe expansion unit 58/77 and 58/02 are supported on the system that are running AIX 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 58/77 or 58/02 expansion units connected cannot have anything else connected to that adapter.

Note: For optimum performance, you can limit the total number of expansion units that contain high bandwidth and extra-high bandwidth adapters. See "Performance notes" on page 45.

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

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 58/02 or 58/77 expansion units, two per GX++ adapter.
- Systems with two processor units support up to eight 58/02 or 58/77 expansion units, two per GX++ adapter.
- Systems with three processor units support up to twelve 58/02 or 58/77 expansion units, two per GX++ adapter.
- Systems with four processor units support up to sixteen 58/02 or 58/77 expansion units, two per GX++ adapter.

Systems with a combination of PCI/PCI-X and PCIe expansion units

A system can have a combination of PCI/PCI-X expansion units (57/96) and PCIe expansion units (58/02 or 58/77). The expansion units cannot be combined on the same GX++ adapter. Following are the limits per each system unit:
- Up to eight 57/96 (PCI/PCI-X) expansion units
- Up to four 58/02 or 58/77 (PCIe) expansion units
- Up to four 57/96 (PCI/PCI-X) expansion units on one GX++ adapter and two 58/02 or 58/77 (PCIe) expansion units on the second GX++ adapter.

PCI and PCI-X adapters

Use this information to identify slot placement priorities and the maximum number of specified adapters allowed. In the following table, adapters are sorted in descending order by priority. Verify whether the adapter is supported for your system. For details about the supported adapters, see "Supported PCI adapters for the 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, or 79M/HD" on page 2

Table 16. Adapter slot priorities and maximums for PCI and PCI-X adapters

Feature code	Description	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	192 per system

Table 16. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	Maximum number of adapters supported
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	192 per system
5704 or 6239[2]	2 Gb Fibre Channel Tape Controller (FC 5704, 6239; CCIN 5704) • Provides attachment to external tape devices • Extra-high bandwidth	Supported only in expansion units
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	192 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, , and Linux operating systems	184 per system
5749[2]	4 Gb Dual-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5749; CCIN 576B)	192 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	192 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	192 per system
5760 and 5761	4 Gb Single-port Fibre Channel PCI-X 2.0 DDR Adapter (FC 5760, 5761; CCIN 280D, 280E) • 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	Supported only in expansion units
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	8 per system

Table 16. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	Maximum number of adapters supported
2844	PCI IOP (FC 2844, CCIN 2844)	Supported only in expansion units
2847	PCI IOP for SAN Load Source (FC 2847, CCIN 2847)	Supported only in expansion units
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, , and Linux operating systems	192 per system
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, , and Linux operating systems	192 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, , and Linux operating systems	192 per system
5707[1]	IBM 2-port Gb Ethernet-SX PCI-X Adapter (FC 5707; CCIN 5706) • Short, 32-bit or 64-bit, 3.3 V or 5 V • High bandwidth • OS support: AIX, , and Linux operating system	Supported only in expansion units
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, , and Linux operating systems	192 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, , and Linux operating systems	192 per system
5721[1]	10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter (FC 5721; CCIN 573A) • High bandwidth • OS support: AIX, , and Linux operating system	192 per system
5722[1]	10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter (FC 5722; CCIN 573A) • High bandwidth • OS support: AIX, , and Linux operating systems	192 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	192 per system

Table 16. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	Maximum number of adapters supported
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	192 per system
4764	PCI-X Cryptographic Coprocessor (FC 4764; CCIN 4764) • Short, 64-bit, 3.3 V • OS support: AIX, , and Linux operating systems	192 per system
4805	PCI Cryptographic Accelerator (FC 4805; CCIN 2058) • Short, 32-bit, 33 MHz • OS support: operating system	Supported only in expansion units
5900[2]	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	192 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	192 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, , and Linux operating systems
		Supported only in expansion units

Table 16. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	Maximum number of adapters supported

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, , and Linux operating systems
		64 per system

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, , and Linux operating systems	192 per system
1912[1]	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, , and Linuxoperating systems	192 per system
2757[1]	PCI Ultra RAID Disk Controller (FC 2757; CCIN 2757) • Long, 64-bit • High bandwidth • IOP controlled • The controller must be mirrored to be supported. • This adapter might encounter performance limitations in PCI-X expansion units and systems. • OS support: operating system	Supported only in expansion units
2780[1]	PCI-X Ultra4 RAID Disk Controller (FC 2780; CCIN 2780) • Long, 64-bit, 133 MHz • High bandwidth • IOP controlled • The controller must be mirrored to be supported. • OS support: operating system	Supported only in expansion units
5580[1]	PCI-X Ultra4 RAID Disk Controller with Auxiliary-write cache IOA (FC 5580; CCIN 2780) • Long, 64-bit, 133 MHz • High bandwidth • IOP controlled auxiliary-write cache • The controller must be mirrored to be supported. • OS support: operating system	Supported only in expansion units

Table 16. Adapter slot priorities and maximums for PCI and PCI-X adapters (continued)

Feature code	Description	Maximum number of adapters supported
5583	PCI-X Quad-Channel Ultra320 SCSI RAID Adapter (FC 5582, 5583, 5738, 5777; CCIN 571E) • PCI-X compliant • 64-bit, 3.3 V • OS support: AIX, , and Linux operating systems	Supported only in expansion units
5590	Auxiliary-write cache IOA (FC 5590; CCIN 574F)	Supported only in expansion units
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, , and Linux operating systems	192 per system
5776[2]	PCI-X Disk Controller (FC 5776; CCIN 571B) • Long, 64-bit, 266 MHz • Extra-high bandwidth • Dual-mode capable adapter • The controller must be mirrored to be supported • OS support: AIX, , and Linux operating systems	Supported only in expansion units
5777[2]	PCI-X Disk Controller (FC 5777; CCIN 571F) • Long, 64-bit, 266 MHz • Extra-high bandwidth • Dual-mode capable adapter • The controller must be mirrored to be supported • OS support: operating system	Supported only in expansion units
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: operating system	Supported only in expansion units

Feature code	Description	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: operating system	64 per system
2947	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	192 per system
6805	PCI 2-Line WAN IOA (FC 6805; CCIN 2742) • Short, 32-bit, 66 MHz • No IOP • OS support: and Linux operating systems	192 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: and Linux operating systems	192 per system
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: and Linux operating systems	192 per system
[1]High bandwidth adapter. See the "Performance notes" on page 45 before installing this adapter.		
[2]Extra-high bandwidth adapter. See the "Performance notes" on page 45 before installing this adapter.		

PCIe adapters

Use this information to identify slot placement priorities and the maximum number of specified adapters allowed. In the following table, adapters are sorted in descending order by priority. Verify whether the adapter is supported for your system. For details about the supported adapters, see "Supported PCI adapters for the 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, or 79M/HD" on page 2

Table 17. Adapter slot priorities and maximums for PCIe adapters

Feature code	Description	System unit slot priority[3]	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, , and Linux operating systems	1, 5, 2, 6, 3, 4	56 per system
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 per system
5729[2, 4]	PCIe2 FH 4-port 8 Gb Fibre Channel Adapter (FC 5729; CCIN 5729) • PCIe 2.1, x8 • Full-height, full length adapter with standard-size bracket • Extra-high bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	24 per system
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 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, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 per system
EN0A[2]	PCIe2 16 Gb 2-port Fibre Channel Adapter (FC EN0A; CCIN 577F) • Extra-high bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	24 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, 5, 2, 6, 3, 4	8 per system
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 per system

Table 17. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported
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 per system
5708[2]	10 Gb FCoE PCIe Dual-port Adapter (FC 5708; CCIN 2B3B) • Regular full-height • Extra-high bandwidth • PCIe 2.0 adapter with x8 generation 1 • Convergence enhanced Ethernet (CEE) supported • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	• 184 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, 5, 2, 6, 3, 4	184 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, 5, 2, 6, 3, 4	128 per system
5744[2, 4]	PCIe2 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5744; CCIN 2B44) • Short, x8 • Full-height adapter • Extra-high bandwidth • PCIe generation 2 • OS support: Linux operating system	1, 5, 2, 6, 3, 4	184 per system
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 per system

Table 17. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported
5767[1]	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter (FC 5767; CCIN 5767) • Short, x4 • High bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	• 184 per system • 64 per system for
5768[1]	2-port Gigabit Ethernet-SX PCI Express Adapter (FC 5768; CCIN 5768) • Short, x4 • High bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	• 184 per system • 64 per system for
5769[2]	10 Gb Ethernet-SR PCI Express Adapter (FC 5769; CCIN 2B44) • Short, full-high, x8 • Low-profile capable • Extra-high bandwidth • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	128 per system
5772[2]	10 Gb Ethernet-LR PCI Express Adapter (FC 5772; CCIN 576E) • Short, x8 • Low-profile capable • Extra-high bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	48 per system
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, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 per system
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	128 per system
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	16 per system

Table 17. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported
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	16 per system
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	128 per system
EN0H[2]	PCIe2 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EN0H, CCIN 2B93) • Extra-high bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	24 per system
2728	4-port USB PCIe Adapter (FC 2728; CCIN 57D1) • Low-profile adapter • Single-slot, half-length PCIe adapter • PCIe 1.1 • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	8 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 operating systems	1, 5, 2, 6, 3, 4	10 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 operating systems	1, 5, 2, 6, 3, 4	10 per system
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 per system
2055	PCIe RAID and SSD SAS Adapter 3 Gb with Blind-Swap Cassette (FC 2055; CCIN 57CD) • Low-profile adapter, requires two slots • Short, x8 • OS support: AIX, , and Linux operating systems • VIOS attachment requires version 2.2, or later	1, 5, 2, 6, 3, 4	80 per system

Table 17. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported
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, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 per system
5901[2]	PCIe Dual - x4 SAS Adapter (FC 5901; CCIN 57B3) • Short • Extra-high bandwidth • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 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, 5, 2, 6, 3, 4	184 per system
5909[2]	PCI Express x8 Ext Dual-x4 3 Gb SAS Adapter and cable card (FC 5909; CCIN 57B9) • Short, 8x, PCIe adapter combined with a cable card assembly • Extra-high bandwidth • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	Supported only in expansion units
5911[2]	SAS adapter for internal Split DASD option (FC5911; CCIN 57BA) • Short, 8x, PCIe adapter combined with a cable card assembly • Extra-high bandwidth • OS support: AIX and Linux operating systems	1, 5, 2, 6, 3, 4	Supported only in expansion units
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, , and Linux operating systems	1, 5, 2, 6, 3, 4	136 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, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 per system

Table 17. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	System unit slot priority[3]	Maximum number of adapters supported
2893	PCI Express 2-Line WAN with Modem (FC 2893; CCIN 576C) • Short, x4 • Non-CIM • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 per system
2894	PCI Express 2-Line WAN with Modem (FC 2894; CCIN 576C) • Short, x4 • CIM • OS support: AIX, , and Linux operating systems	1, 5, 2, 6, 3, 4	184 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.			
[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 79M/HB system and 58/02 and 58/77 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++ channel adapters and I/O expansion units

Notes:
- Feature code (FC) 1808 (GX++ 12X DDR Dual-port IB adapter) is supported for the 12E/AD, 17M/MB, 17M/MC, 17M/MD, 79M/HB, 79M/HC, and 79M/HD systems.
- FC 1914 (GX++ 2-port PCIe2 x8 adapter) is supported for the 12E/AD, 17M/MC, 17M/MD, 79M/HC, and 79M/HD systems.

When using extra-high bandwidth adapters, follow these guidelines:
- 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.
- When using multiple GX++ adapters on a system with multiple system units, spread the GX++ adapter across the system units. For example, on a system with two system units attached to two FC 58/02 expansion units, use two GX++ adapters, and install one in the P1-C2 slot of one system and then place the second GX++ in P1-C2 slot in the second system (rather than installing both GX++ adapters in one system). Installing of the GX++ adapters in separate systems ensures a better spread of the I/O devices across the systems for best performance.

Table 16 on page 33 and Table 17 on page 40 identify 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 57/96, 58/02, or 58/77.

The following 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 with a support representative for additional guidelines.

Extra-high bandwidth storage adapters

Table 18. Maximum number of extra-high bandwidth storage adapters for best performance

System configuration	PCIe adapters in system units[1]	PCI, PCI-X adapters in I/O expansion unit FC 57/96[2]	Adapters in system units plus I/O expansion FC 57/96[2]	PCIe adapters in 58/02 or 58/77 I/O Expansion units[2]	System maximum[2]
One system unit	6	3	6	4	10
Two system units	12	6	12	8	20
Three system units	18	9	18	12	30
Four system units	24	12	24	16	40

[1]For best performance, extra-high bandwidth Ethernet adapters must be installed in 58/02 or 58/77 expansion drawers when available, instead of using internal system unit slots.

[2]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 19. Maximum number of high-bandwidth storage adapters for best performance

System configuration	PCIe adapters in system units	PCI, PCI-X adapters in I/O expansion unit FC 57/96[1]	Adapters in system units plus I/O expansion FC 57/96[1]	PCIe adapters in 58/02 or 58/77 I/O Expansion units[1]	System maximum
One system unit	6	6	12	8	20
Two system units	12	12	24	16	40
Three system units	18	18	36	24	60
Four system units	24	24	48	32	80

[1]

- For optimum performance, no more than one 10 Gb Ethernet port per two processors must be used in a system. If one 10 Gb Ethernet port is present per POWER7 processor, no other 10 Gb or 1-Gb ports must be used.
- If 5708 or 5735 adapters are used in an application with both ports active, each adapter counts as two extra-high bandwidth adapters.

Extra-high bandwidth Ethernet adapters

Table 20. Maximum number of extra-high bandwidth Ethernet adapters for best performance

System configuration	PCIe adapters in system units	PCI, PCI-X adapters in I/O expansion unit FC 57/96[1]	Adapters in system units plus I/O expansion FC 57/96[1]	PCIe adapters in 58/02 or 58/77 I/O Expansion units[1]	System maximum
One system unit	2	2	2	2	2
Two system units	4	4	4	4	4

Table 20. Maximum number of extra-high bandwidth Ethernet adapters for best performance (continued)

System configuration	PCIe adapters in system units	PCI, PCI-X adapters in I/O expansion unit FC 57/96[1]	Adapters in system units plus I/O expansion FC 57/96[1]	PCIe adapters in 58/02 or 58/77 I/O Expansion units[1]	System maximum
Three system units	6	6	6	6	6
Four system units	8	8	8	8	8

[1]

- For optimum performance, no more than one 10 Gb Ethernet port per two processors must be used in a system. If one 10 Gb Ethernet port is present per POWER7 processor, no other 10 Gb or 1-Gb ports must be used.
- 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 Ethernet adapters

Table 21. Maximum number of high bandwidth Ethernet adapters for best performance

System configuration	PCIe adapters in system units	PCI, PCI-X adapters in I/O expansion unit FC 57/96[1]	Adapters in system units plus I/O expansion FC 57/96[1]	PCIe adapters in 58/02 or 58/77 I/O Expansion units[1]	System maximum
One system unit	6	6	6	6	8
Four processor features, two system units	12	12	12	12	16
Three system units	18	18	18	18	24
Four system units	24	24	24	24	32

[1]For optimum performance, no more than two 1 Gb Ethernet ports per processor must be used in a system. If two 1 Gb Ethernet ports are present per processor, no other 1 Gb or 10-Gb ports must 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 systems servers that contain the POWER7 processor.

# PCI slot priorities for the 57/96 expansion unit

Find information about the PCI slots in the 57/96 expansion unit.

System description

The 57/96 expansion unit is a 19-inch, rack-mountable, I/O expansion drawer that is designed to be attached to the system unit using the 12X channel bus and 12X cables.

The 57/96 can accommodate six generation 3 blind-swap adapter cassettes. Cassettes can be installed and removed without removing the drawer from the rack.

The following figure shows the rear view of the expansion unit.
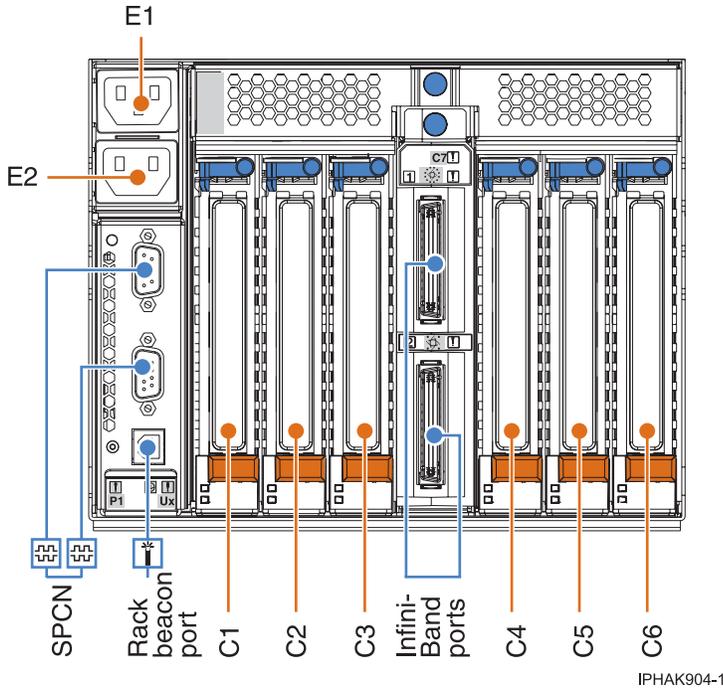
Figure 3. Rear view

Table 22. Location code descriptions. This table describes the location codes that are shown in Figure 3.

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 23. Slot properties. This table describes the PCI-X DDR slots.

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 58/02 and 58/77 expansion units

Learn about the PCI Express (PCIe) slots in the 58/02 and 58/77 expansion units.

System description

The 58/02 and 58/77 expansion units are 19-inch, rack-mountable, I/O expansion drawers that are designed to be attached to the system 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.

Note: PCIe2 adapters that provide extra-high bandwidths are not supported in the 58/02 and 58/77 expansion units.
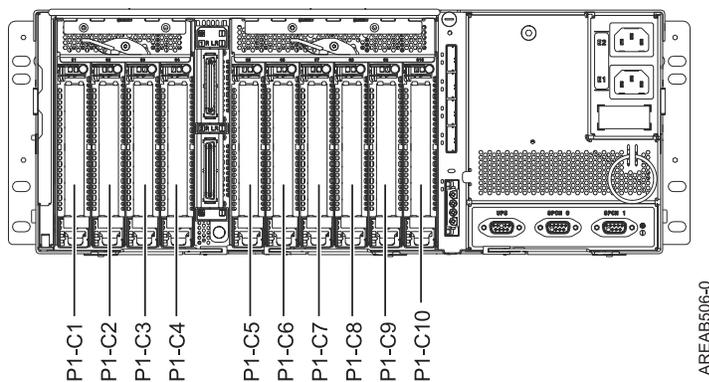

Figure 4. Rear view. This figure shows the rear view of the expansion unit.

Table 24. Location code descriptions. This table describes the location codes that are shown in Figure 4.

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 4 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.

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Tele: +49 7032 15 2941
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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.

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

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