

PCI Adapter Placement for
E1-700, E1-705, E1-715,
E3-700, E3-705 or E3-715

ESCALA Power7



REFERENCE
86 A1 87FF 05

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

February 2013

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Safety notices

Safety notices may be printed throughout this guide.

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

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, a safety information booklet is included in the publications package shipped with the product. The booklet 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 in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the U.S. English publications.

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:

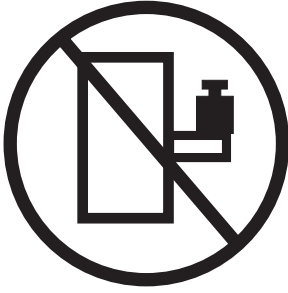
- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:
 - Remove all devices 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)

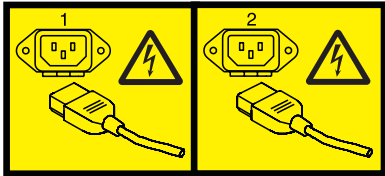
(L001)



(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 31E/2B, 31E/1C, 31E/1D, 31E/2C, or 31E/2D

Find information about the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters that are supported for the 31E/2B, 31E/1C, 31E/1D, 31E/2C, or 31E/2D systems.

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

Supported PCI adapters for the 31E/2B, 31E/1C, 31E/1D, 31E/2C, or 31E/2D

Find information about the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters that are supported for the 31E/2B, 31E/1C, 31E/1D, 31E/2C, or 31E/2D systems.

Find reference information that information technology (IT) personnel and service representatives can use in determining where to install PCI adapters in the 31E/2B, 31E/1C, 31E/1D, 31E/2C, or 31E/2D.

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

Table 2 on page 2 lists the adapters supported on the AIX, , and Linux operating systems. Not all adapters are supported on all operating systems. Exceptions are noted in the Description column.

The following table lists the supported PCIe adapters.

Table 2. PCIe adapters supported on the AIX, , or Linux operating system

System	Feature code	CCIN	Description
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5277	57D2	4-port Async EIA-232 PCIe 1X LP Adapter (FC 5277; CCIN 57D2) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x1 • OS support: AIX and Linux operating systems
31E/2C and 31E/2D	5289	57D4	PCIe 2-port Async EIA-232 PCIe 1X LPC Adapter (FC 5289; CCIN 57D4) <ul style="list-style-type: none"> • Short, x1 • PCIe 1.1 • Two ports through RJ45 by using the DB9 connector • EIA-232 Compatible • OS support: AIX and Linux operating systems
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5290	57D4	PCIe LP 2-port Async EIA-232 Adapter (FC 5290; CCIN 57D4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe 1.1 • Short, x8 • 2 Ports through RJ45 by using the DB9 connector • EIA-232 compatible • OS support: AIX and Linux operating systems
31E/2C and 31E/2D	5785	57D2	4 Port Async EIA-232 PCIe Adapter (FC 5785; CCIN 57D2) <ul style="list-style-type: none"> • Short, x1 • OS support: AIX and Linux operating systems
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5273	577D	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5273; CCIN 577D) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX, , and Linux operating systems
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5276	5774	4-Gb PCI Express Dual-port Fibre Channel Adapter (FC 5276; CCIN 5774) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, , and Linux operating systems
31E/1D and 31E/2D	EN0B	577F	PCIe2 LP 16 Gb 2-port Fibre Channel Adapter (FC EN0B; CCIN 577F) <ul style="list-style-type: none"> • Short, low-profile, x8 • Extra-high bandwidth • OS support: AIX, , and Linux operating systems

Table 2. PCIe adapters supported on the AIX, , or Linux operating system (continued)

System	Feature code	CCIN	Description
31E/2C and 31E/2D	5735	577D	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5735; CCIN 577D) <ul style="list-style-type: none"> • 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
31E/2C and 31E/2D	5773	5773	4 Gb PCI Express Single Port Fibre Channel Adapter (FC 5773; CCIN 5773) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems
31E/2C and 31E/2D	5774	5774	4 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5774; CCIN 5774) <ul style="list-style-type: none"> • Short, x4 • Extra-high bandwidth • OS support: AIX, , and Linux operating systems
31E/1C, 31E/1D, 31E/2C, and 31E/2D	EN0Y	EN0Y	PCIe2 LP 8Gb 4-port Fibre Channel Adapter (FC EN0Y; CCIN EN0Y) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Short form factor plus (SFF+) Host Bus Adapter (HBA) • Extra-high bandwidth • OS support: AIX, , and Linux operating systems
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5269	5269	POWER GXT145 PCI Express Graphics Accelerator (FC 5269; CCIN 5269) <ul style="list-style-type: none"> • Low-profile adapter • Short, x1 • OS support: AIX and Linux operating systems
31E/2C and 31E/2D	5748	5748	POWER GXT145 PCI Express Graphics Accelerator (FC 5748; CCIN 5748) <ul style="list-style-type: none"> • Short, x1 • Not hot-pluggable • OS support: AIX and Linux operating systems
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5260	576F	PCIe2 LP 4-port 1 GbE Adapter (FC 5260; CCIN 576F) <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, , and Linux operating systems
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5270	2B3B	10 Gb FCoE PCIe Dual-port Adapter (FC 5270; CCIN 2B3B) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems

Table 2. PCIe adapters supported on the AIX, , or Linux operating system (continued)

System	Feature code	CCIN	Description
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5271	5717	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5271; CCIN 5717) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX and Linux operating systems
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5272	5732	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5272; CCIN 5272) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5274	5768	2-port Gb Ethernet-SX PCI Express Adapter (FC 5274; CCIN 5768) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, , and Linux operating systems
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5275	2B54	10 Gb Ethernet-SR PCI Express Adapter (FC 5275; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems
31E/1C, 31E/1D, 31E/2C, and 31E/2D	5279	2B52	PCIe2 LP 2x10 GbE SFP+ Copper 2x1 GbE UTP Adapter (FC 5279; CCIN 2B52) <ul style="list-style-type: none"> • Low-profile, Short, x8 • PCIe 2 • OS support: Linux operating system
31E/1C, 31E/1D, 31E/2C, and 31E/2D	5280	2B54	PCIe2 LP 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5280; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: Linux operating system
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5281	5767	1 Gb Ethernet UTP 2-port PCIe Adapter (FC 5281; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: AIX, , and Linux operating system
31E/1C, 31E/1D, 31E/2C, and 31E/2D	5284	5287	PCIe2 LP 2-port 10 GbE SR Adapter (FC 5284; CCIN 5287) <ul style="list-style-type: none"> • Generation 2, x8 • Low-profile adapter • Extra-high bandwidth • 10 GBASE-SR short-reach optics • OS support: AIX, (supported only through VIOS), Linux operating systems

Table 2. PCIe adapters supported on the AIX, , or Linux operating system (continued)

System	Feature code	CCIN	Description
31E/1C, 31E/1D, 31E/2C, and 31E/2D	5286	5288	PCIe2 LP 2-port 10 GbE SFP+ Copper Adapter (FC 5286; CCIN 5288) <ul style="list-style-type: none"> • Generation 2, low-profile adapter • Two 10 Gb Ethernet ports • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX and Linux operating systems
31E/2C and 31E/2D	5708	2B3B	10 Gb FCoE PCIe Dual-port Adapter (FC 5708; CCIN 2B3B) <ul style="list-style-type: none"> • 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
31E/2C and 31E/2D	5717	5717	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5717; CCIN 5717) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems
31E/2C and 31E/2D	5732	2B43	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5732; CCIN 2B43) <ul style="list-style-type: none"> • Short, x8 • Extra-high bandwidth • OS support: AIX and Linux operating systems
31E/2C and 31E/2D	5767	5767	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter (FC 5767; CCIN 5767) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX, , and Linux operating systems
31E/2C and 31E/2D	5768	5768	2-port Gigabit Ethernet-SX PCI Express Adapter (FC 5768; CCIN 5768) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX, , and Linux operating systems
31E/2C and 31E/2D	5769	2B44	10 Gb Ethernet-SR PCI Express Adapter (FC 5769; CCIN 2B44) <ul style="list-style-type: none"> • Short, full-high, x8 • Low-profile capable • Extra-high bandwidth • OS support: AIX and Linux operating systems
31E/2C and 31E/2D	5772	576E	10 Gb Ethernet-LR PCI Express Adapter (FC 5772; CCIN 576E) <ul style="list-style-type: none"> • Short, x8 • Low-profile capable • Extra-high bandwidth • OS support: AIX, , and Linux operating systems

Table 2. PCIe adapters supported on the AIX, , or Linux operating system (continued)

System	Feature code	CCIN	Description
31E/2C and 31E/2D	5899	576F	PCIe2 4-port 1 GbE Adapter (FC 5899; CCIN 576F) <ul style="list-style-type: none"> • Regular-height adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, , and Linux operating systems
31E/1C, 31E/1D, 31E/2C, and 31E/2D	9056	5767	PCIe LP 2-port 1 GbE TX adapter (FC 9056; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, PCIe x4 • PCIe 1.0a compliant • High bandwidth • Two full-duplex 10/100/1000 Base-TX UTP connections to gigabit Ethernet (GbE) LANs • OS support: AIX, , and Linux operating systems
31E/1C, 31E/1D, 31E/2C, and 31E/2D	EC27	EC27	PCIe2 LP 2-port 10 GbE RoCE SFP+ adapter (FC EC27; CCIN EC27) <ul style="list-style-type: none"> • Short, low-profile • 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
31E/1D and 31E/2D	EN0J	2B93	PCIe2 LP 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EN0J, CCIN 2B93) <ul style="list-style-type: none"> • Extra-high bandwidth • OS support: AIX, , and Linux operating systems
31E/1C, 31E/1D, 31E/2C, and 31E/2D	EC29	EC29	PCIe2 LP 2-port 10 GbE RoCE SR adapter (FC EC29; CCIN EC29) <ul style="list-style-type: none"> • Low-profile 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
31E/2C and 31E/2D	2728	57D1	4-port USB PCIe Adapter (FC 2728; CCIN 57D1) <ul style="list-style-type: none"> • Low-profile adapter • Single-slot, half-length PCIe adapter • PCIe 1.1 • OS support: AIX and Linux operating systems
31E/2C and 31E/2D	4808	4765	PCIe Cryptographic Coprocessor (FC 4808; CCIN 4765) <ul style="list-style-type: none"> • Generation 3 blind-swap cassette • PCIe x4, full-height, half-length • OS support: AIX and operating systems

Table 2. PCIe adapters supported on the AIX, , or Linux operating system (continued)

System	Feature code	CCIN	Description
31E/1C, 31E/1D, 31E/2C, and 31E/2D	5283	58E2	PCIe2 LP 2-port 4X InfiniBand QDR Adapter (FC 5283; CCIN 58E2) <ul style="list-style-type: none"> • Generation 2 low-profile adapter • Extra-high bandwidth • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX and Linux operating systems
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	2053	57CD	PCIe RAID and SSD SAS Adapter 3 Gb Low-profile (FC 2053; CCIN 57CD) <ul style="list-style-type: none"> • Low-profile adapter, requires two slots • Short, x8 • OS support: AIX, , and Linux operating systems • VIOS attachment requires version 2.2, or later
31E/2C and 31E/2D	2055	57CD	PCIe RAID and SSD SAS Adapter 3 Gb with Blind-Swap Cassette (FC 2055; CCIN 57CD) <ul style="list-style-type: none"> • Low-profile adapter, requires two slots • Short, x8 • OS support: AIX, , and Linux operating systems • VIOS attachment requires version 2.2, or later
31E/2B, 31E/1C, 31E/1D, 31E/2C, and 31E/2D	5278	57B3	PCIe Dual-x4 SAS Adapter (FC 5278; CCIN 57B3) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x8 • OS support: AIX, , and Linux operating systems
31E/2C and 31E/2D	5805	574E	PCIe 380 MB Cache Dual - x4 3 Gb SAS RAID Adapter (FC 5805; CCIN 574E) <ul style="list-style-type: none"> • Short, dual x4 • SAS RAID adapter • Installed in pairs • OS support: AIX, , and Linux operating systems
31E/2C and 31E/2D	5901	57B3	PCIe Dual - x4 SAS Adapter (FC 5901; CCIN 57B3) <ul style="list-style-type: none"> • Short • Extra-high bandwidth • OS support: AIX, , and Linux operating systems
31E/2C and 31E/2D	5913	57B5	PCIe2 1.8-GB Cache RAID SAS Tri-port 6 Gb Adapter (FC 5913; CCIN 57B5) <ul style="list-style-type: none"> • 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

Table 2. PCIe adapters supported on the AIX, , or Linux operating system (continued)

System	Feature code	CCIN	Description
31E/2C and 31E/2D	ESA1	57B4	PCIe2 RAID SAS Adapter Dual-port 6 Gb (FC ESA1; CCIN 57B4) <ul style="list-style-type: none"> • Regular-height adapter • PCIe generation 2, x8 • OS support: AIX, , and Linux operating systems
31E/1C, 31E/1D, 31E/2C, and 31E/2D	ESA2	57B4	PCIe2 RAID SAS Adapter Dual-port 6 Gb LP (FC ESA2; CCIN 57B4) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • OS support: AIX, , and Linux operating systems
31E/2C and 31E/2D	2893	576C	PCI Express 2-Line WAN with Modem (FC 2893; CCIN 576C) <ul style="list-style-type: none"> • Short, x4 • Non-CIM • OS support: AIX, , and Linux operating systems
31E/2C and 31E/2D	2894	576C	PCI Express 2-Line WAN with Modem (FC 2894; CCIN 576C) <ul style="list-style-type: none"> • Short, x4 • CIM • OS support: AIX, , and Linux operating systems

PCI adapters placement rules and slot priorities for the 31E/2B, 31E/1C, 31E/1D, 31E/2C, or 31E/2D

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 31E/2B, 31E/1C, 31E/1D, 31E/2C, or 31E/2D systems that contain the POWER7[®] processor and the associated I/O expansion units.

PCI adapter placement rules and slot priorities for the 31E/2B

Some adapters must be placed in specific PCI Express (PCIe) slots to function correctly or to perform optimally. Learn how to determine the slot to install PCI adapters for the 31E/2B system.

PCI slot descriptions

Figure 1 on page 9 shows the rear view of the 31E/2B system with the location codes for the PCI adapter slots. Table 3 on page 9 describes the slots. Table 4 on page 9 shows details of the slot priorities and the maximum supported adapters on the 31E/2B system.

All slots in this system are low-profile slots only. Each PCIe is a separate PCI host bridge (PHB).

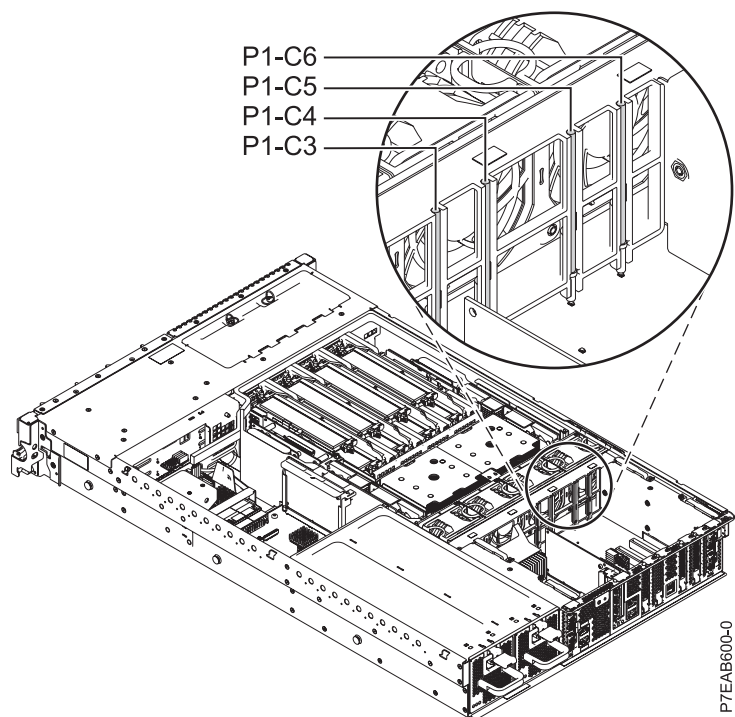


Figure 1. Rear view of the 31E/2B with location codes for the PCI slots

Table 3. PCI slot locations and descriptions

Slot	Location code	Description	PHB	Adapter size
Slot 1	P1-C3	PCIe x8	PCIe PHB0 module A	Low-profile
Slot 2	P1-C4	PCIe x8	PCIe PHB1 module A	Low-profile
Slot 3	P1-C5	PCIe x8	PCIe PHB2 module A	Low-profile
Slot 4	P1-C6	PCIe x8	PCIe PHB3 module A	Low-profile

PCIe adapters

All slots in this system are the same and have equal importance while installing the adapter. Use this information to identify slot placement priorities and the maximum number of specified adapters that you can install. Verify whether the adapter is supported for your system. For details about the supported adapters, see “Supported PCI adapters for the 31E/2B, 31E/1C, 31E/1D, 31E/2C, or 31E/2D” on page 1.

Table 4. Adapter slot priorities and maximums for PCIe adapters

Feature code	Description	Maximum number of adapters supported per system
5277	4-port Async EIA-232 PCIe 1X LP Adapter (FC 5277; CCIN 57D2) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x1 • OS support: AIX and Linux operating systems 	4

Table 4. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Maximum number of adapters supported per system
5290	PCIe LP 2-port Async EIA-232 Adapter (FC 5290; CCIN 57D4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe 1.1 • Short, x8 • 2 Ports through RJ45 by using the DB9 connector • EIA-232 compatible • OS support: AIX and Linux operating systems 	4
5273	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5273; CCIN 577D) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX, , and Linux operating systems 	4
5276	4-Gb PCI Express Dual-port Fibre Channel Adapter (FC 5276; CCIN 5774) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, , and Linux operating systems 	4
5269	POWER GXT145 PCI Express Graphics Accelerator (FC 5269; CCIN 5269) <ul style="list-style-type: none"> • Low-profile adapter • Short, x1 • OS support: AIX and Linux operating systems 	4
5260	PCIe2 LP 4-port 1 GbE Adapter (FC 5260; CCIN 576F) <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, , and Linux operating systems 	4
5270	10 Gb FCoE PCIe Dual-port Adapter (FC 5270; CCIN 2B3B) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	4
5271	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5271; CCIN 5717) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX and Linux operating systems 	4
5272	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5272; CCIN 5272) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	4

Table 4. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Maximum number of adapters supported per system
5274	2-port Gb Ethernet-SX PCI Express Adapter (FC 5274; CCIN 5768) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, , and Linux operating systems 	4
5275	10 Gb Ethernet-SR PCI Express Adapter (FC 5275; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	4
5281	1 Gb Ethernet UTP 2-port PCIe Adapter (FC 5281; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: AIX, , and Linux operating system 	4
2053	PCIe RAID and SSD SAS Adapter 3 Gb Low-profile (FC 2053; CCIN 57CD) <ul style="list-style-type: none"> • Low-profile adapter, requires two slots • Short, x8 • OS support: AIX, , and Linux operating systems • VIOS attachment requires version 2.2, or later 	2
5278	PCIe Dual-x4 SAS Adapter (FC 5278; CCIN 57B3) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x8 • OS support: AIX, , and Linux operating systems 	4

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 regarding GX++ channel adapters

Table 4 on page 9 identifies the slot placement priorities and the maximum number of specified adapters that can be installed for connectivity. However, for optimum performance, you might want to further limit the total number of high bandwidth and extra-high bandwidth adapters. The system supports the FC 5266 GX++ dual port adapter. When plugging in these adapters, if only one adapter is being configured it must be placed in the GX++ slot 2. This placement helps distribute the I/O traffic over the GX buses to the processors.

PCI adapter placement rules and slot priorities for the 31E/1C or 31E/1D

Some adapters must be placed in specific PCI Express (PCIe) slots to function correctly or to perform optimally. Learn how to determine the slot to install PCI adapters for the 31E/1C or 31E/1D system.

PCI slot descriptions

The 31E/1C or 31E/1D system has five PCIe x8 G2 low-profile slots and one PCIe x4 low-profile slot. All slots support enhanced error handling (EEH), but are not hot pluggable. Figure 2 shows the rear view of the system with the location codes for the PCI adapter slots. Table 5 describes the slots. All slots in this system are low-profile slots only. Each PCIe is a separate PCI host bridge (PHB). PCIe slots 1 and 4 have an x16 connector and the other slots have an x8 connector.

For the information about the maximum adapters supported on your system, see Table 6 on page 13.

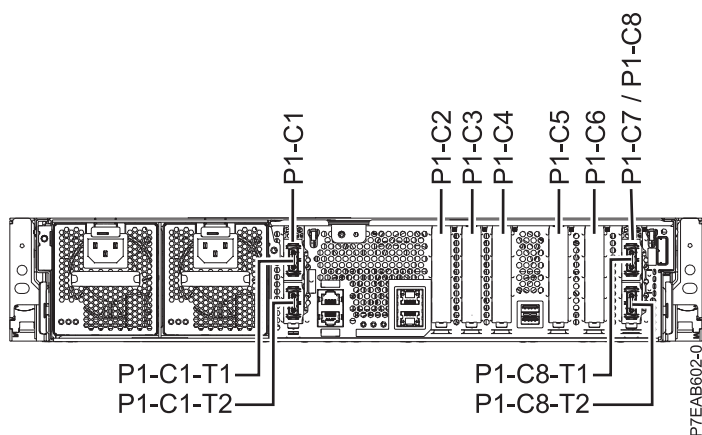


Figure 2. Rear view of the system with location codes

Table 5. PCI slot locations and descriptions

Slot	Location code	Description	PHB	Adapter size
Slot 1	P1-C2	PCIe x8 G2	PCIe-PHB5	Low-profile
Slot 2	P1-C3	PCIe x8 G2	PCIe-PHB4	Low-profile
Slot 3	P1-C4	PCIe x8 G2	PCIe-PHB3	Low-profile
Slot 4	P1-C5	PCIe x8 G2	PCIe-PHB2	Low-profile
Slot 5	P1-C6	PCIe x8 G2	PCIe-PHB1	Low-profile
Slot 6 ^{1, 2}	P1-C7	PCIe x4 G2	PCIe-PHB0	Low-profile

² The following PCIe adapters are not supported at PCIe slot 6 (P1-C7):

- FC 5277
- FC 5269
- FC 5278

PCIe adapters

Use this information to identify slot placement priorities and the maximum number of specified adapters that you can install. Verify whether the adapter is supported for your system. For details about the supported adapters, see “Supported PCI adapters for the 31E/2B, 31E/1C, 31E/1D, 31E/2C, or 31E/2D” on page 1.

Table 6. Adapter slot priorities and maximums for PCIe adapters

Feature code	Description	Slot priorities	Maximum number of adapters supported
5277	4-port Async EIA-232 PCIe 1X LP Adapter (FC 5277; CCIN 57D2) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x1 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5 ¹	5
5290	PCIe LP 2-port Async EIA-232 Adapter (FC 5290; CCIN 57D4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe 1.1 • Short, x8 • 2 Ports through RJ45 by using the DB9 connector • EIA-232 compatible • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5273	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5273; CCIN 577D) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5276	4-Gb PCI Express Dual-port Fibre Channel Adapter (FC 5276; CCIN 5774) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5
EN0B	PCIe2 LP 16 Gb 2-port Fibre Channel Adapter (FC EN0B; CCIN 577F) <ul style="list-style-type: none"> • Short, low-profile, x8 • Extra-high bandwidth • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5
EN0Y	PCIe2 LP 8Gb 4-port Fibre Channel Adapter (FC EN0Y; CCIN EN0Y) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Short form factor plus (SFF+) Host Bus Adapter (HBA) • Extra-high bandwidth • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5269	POWER GXT145 PCI Express Graphics Accelerator (FC 5269; CCIN 5269) <ul style="list-style-type: none"> • Low-profile adapter • Short, x1 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5 ¹	4

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

Feature code	Description	Slot priorities	Maximum number of adapters supported
5260	PCIe2 LP 4-port 1 GbE Adapter (FC 5260; CCIN 576F) <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, , and Linux operating systems 	6, 1, 2, 3, 4, 5	6
5270	10 Gb FCoE PCIe Dual-port Adapter (FC 5270; CCIN 2B3B) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5271	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5271; CCIN 5717) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5272	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5272; CCIN 5272) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5274	2-port Gb Ethernet-SX PCI Express Adapter (FC 5274; CCIN 5768) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5275	10 Gb Ethernet-SR PCI Express Adapter (FC 5275; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5279	PCIe2 LP 2x10 GbE SFP+ Copper 2x1 GbE UTP Adapter (FC 5279; CCIN 2B52) <ul style="list-style-type: none"> • Low-profile, Short, x8 • PCIe 2 • OS support: Linux operating system 	1, 2, 3, 4, 5, 6	5
5280	PCIe2 LP 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5280; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: Linux operating system 	1, 2, 3, 4, 5, 6	5

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

Feature code	Description	Slot priorities	Maximum number of adapters supported
5281	1 Gb Ethernet UTP 2-port PCIe Adapter (FC 5281; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: AIX, , and Linux operating system 	1, 2, 3, 4, 5, 6	5
5284	PCIe2 LP 2-port 10 GbE SR Adapter (FC 5284; CCIN 5287) <ul style="list-style-type: none"> • Generation 2, x8 • Low-profile adapter • Extra-high bandwidth • 10 GBASE-SR short-reach optics • OS support: AIX, (supported only through VIOS), Linux operating systems 	1, 2, 3, 4, 5, 6	5
5286	PCIe2 LP 2-port 10 GbE SFP+ Copper Adapter (FC 5286; CCIN 5288) <ul style="list-style-type: none"> • Generation 2, low-profile adapter • Two 10 Gb Ethernet ports • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	5
9056	PCIe LP 2-port 1 GbE TX adapter (FC 9056; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, PCIe x4 • PCIe 1.0a compliant • High bandwidth • Two full-duplex 10/100/1000 Base-TX UTP connections to gigabit Ethernet (GbE) LANs • OS support: AIX, , and Linux operating systems 	6, 1, 2, 3, 4, 5	1
EC27	PCIe2 LP 2-port 10 GbE RoCE SFP+ adapter (FC EC27; CCIN EC27) <ul style="list-style-type: none"> • Short, low-profile • 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, 2, 3, 4, 5, 6	5
EN0J	PCIe2 LP 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EN0J, CCIN 2B93) <ul style="list-style-type: none"> • Extra-high bandwidth • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5
EC29	PCIe2 LP 2-port 10 GbE RoCE SR adapter (FC EC29; CCIN EC29) <ul style="list-style-type: none"> • Low-profile 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, 2, 3, 4, 5, 6	5

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

Feature code	Description	Slot priorities	Maximum number of adapters supported
5283	PCIe2 LP 2-port 4X InfiniBand QDR Adapter (FC 5283; CCIN 58E2) <ul style="list-style-type: none"> • Generation 2 low-profile adapter • Extra-high bandwidth • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	2
2053	PCIe RAID and SSD SAS Adapter 3 Gb Low-profile (FC 2053; CCIN 57CD) <ul style="list-style-type: none"> • Low-profile adapter, requires two slots • Short, x8 • OS support: AIX, , and Linux operating systems • VIOS attachment requires version 2.2, or later 	1, 3, 5 ²	
5278	PCIe Dual-x4 SAS Adapter (FC 5278; CCIN 57B3) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x8 • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5 ¹	5
ESA2	PCIe2 RAID SAS Adapter Dual-port 6 Gb LP (FC ESA2; CCIN 57B4) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	2
¹ The adapter can be installed in any slot other than slot 6 and is not supported in slot 6. ² The adapter requires two adjacent slots.			

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 regarding GX++ channel adapters

Table 6 on page 13 identifies the slot placement priorities and the maximum number of specified adapters that can be installed for connectivity. However, for optimum performance, you might want to further limit the total number of high bandwidth and extra-high bandwidth adapters. The system supports only one type of GX++ adapter, feature code (FC) EJ0H (GX++ LP 1-port PCIe2 x8 adapter). When plugging in these adapters, if only one adapter is being configured it must be placed in the GX++ slot 2. This placement helps distribute the I/O traffic over the GX buses to the processors.

PCI adapter placement rules and slot priorities for the 31E/2C or 31E/2D

Some adapters must be placed in specific PCI Express (PCIe) slots to function correctly or to perform optimally. Learn how to determine the slot to install PCI adapters for the 31E/2C or 31E/2D system.

PCI slot descriptions

The 31E/2C or 31E/2D system has five PCIe x8 G2 low-profile slots and one PCIe x4 low-profile slot. All slots support enhanced error handling (EEH), but are not hot pluggable. Figure 3 shows the rear view of the system with the location codes for the PCI adapter slots. Table 7 provides information about the slots. All slots in this system are low-profile slots only. Each PCIe is a separate PCI host bridge (PHB). PCIe slots 1 and 4 have an x16 connector and the other slots have x8 connector.

For the information about the maximum adapters supported on your system, see Table 8 on page 18.

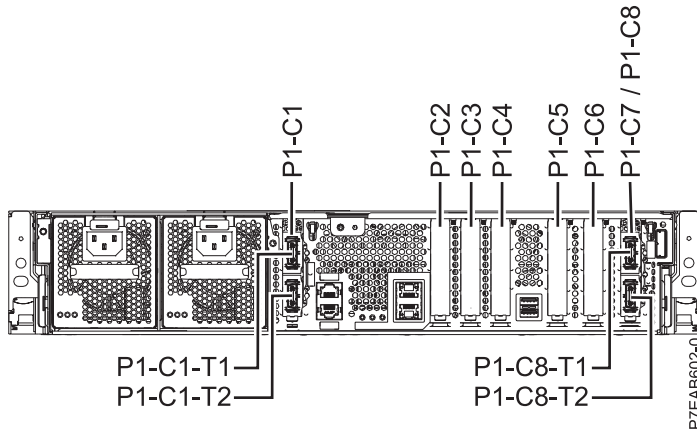


Figure 3. Rear view of the system with location codes

Table 7. PCI slot locations and descriptions

Slot	Location code	Description	PHB	Adapter size
Slot 1 ¹	P1-C2	PCIe x8 G2	PCIe-PHB5	Low-profile
Slot 2	P1-C3	PCIe x8 G2	PCIe-PHB4	Low-profile
Slot 3	P1-C4	PCIe x8 G2	PCIe-PHB3	Low-profile
Slot 4	P1-C5	PCIe x8 G2	PCIe-PHB2	Low-profile
Slot 5 ¹	P1-C6	PCIe x8 G2	PCIe-PHB1	Low-profile
Slot 6 ^{1, 2}	P1-C7	PCIe x4 G2	PCIe-PHB0	Low-profile

¹Slot 1, slot 5, and slot 6 availability:

- If the 2-Port 12X InfiniBand2 adapter (feature code (FC) EJ0G) is installed in GX++ slot 2 in the 31E/2C system, slot 6 (P1-C7), slot 5 (P1-C6), and slot 1 (P1-C2) are not available to install any PCI adapter.
- The FC EJOG adapter occupies slot 6 and slot 5
- The SPCN connector on the GX adapter tailstock occupies slot 1

² The following PCIe adapters are not supported at PCIe slot 6 (P1-C7):

- FC 5269
- FC 5277
- FC 5278

PCIe adapters

Use this information to identify slot placement priorities and the maximum number of specified adapters that you can install. Verify whether the adapter is supported for your system. For details about the supported adapters, see “Supported PCI adapters for the 31E/2B, 31E/1C, 31E/1D, 31E/2C, or 31E/2D” on page 1.

Table 8. Adapter slot priorities and maximums for PCIe adapters

Feature code	Description	Slot priorities	Maximum number of adapters supported
5277	4-port Async EIA-232 PCIe 1X LP Adapter (FC 5277; CCIN 57D2) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x1 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5 ¹	5
5289	PCIe 2-port Async EIA-232 PCIe 1X LPC Adapter (FC 5289; CCIN 57D4) <ul style="list-style-type: none"> • Short, x1 • PCIe 1.1 • Two ports through RJ45 by using the DB9 connector • EIA-232 Compatible • OS support: AIX and Linux operating systems 	6	20
5290	PCIe LP 2-port Async EIA-232 Adapter (FC 5290; CCIN 57D4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe 1.1 • Short, x8 • 2 Ports through RJ45 by using the DB9 connector • EIA-232 compatible • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	2
5785	4 Port Async EIA-232 PCIe Adapter (FC 5785; CCIN 57D2) <ul style="list-style-type: none"> • Short, x1 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	20
5273	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5273; CCIN 577D) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5276	4-Gb PCI Express Dual-port Fibre Channel Adapter (FC 5276; CCIN 5774) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5

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

Feature code	Description	Slot priorities	Maximum number of adapters supported
EN0B	PCIe2 LP 16 Gb 2-port Fibre Channel Adapter (FC EN0B; CCIN 577F) <ul style="list-style-type: none"> • Short, low-profile, x8 • Extra-high bandwidth • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5735	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5735; CCIN 577D) <ul style="list-style-type: none"> • 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 	6	20
5773	4 Gb PCI Express Single Port Fibre Channel Adapter (FC 5773; CCIN 5773) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems 	6	20
5774	4 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5774; CCIN 5774) <ul style="list-style-type: none"> • Short, x4 • Extra-high bandwidth • OS support: AIX, , and Linux operating systems 	6	20
EN0Y	PCIe2 LP 8Gb 4-port Fibre Channel Adapter (FC EN0Y; CCIN EN0Y) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Short form factor plus (SFF+) Host Bus Adapter (HBA) • Extra-high bandwidth • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5269	POWER GXT145 PCI Express Graphics Accelerator (FC 5269; CCIN 5269) <ul style="list-style-type: none"> • Low-profile adapter • Short, x1 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5 ¹	5
5748	POWER GXT145 PCI Express Graphics Accelerator (FC 5748; CCIN 5748) <ul style="list-style-type: none"> • Short, x1 • Not hot-pluggable • OS support: AIX and Linux operating systems 	6	8

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

Feature code	Description	Slot priorities	Maximum number of adapters supported
5260	PCIe2 LP 4-port 1 GbE Adapter (FC 5260; CCIN 576F) <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, , and Linux operating systems 	6, 1, 2, 3, 4, 5	6
5270	10 Gb FCoE PCIe Dual-port Adapter (FC 5270; CCIN 2B3B) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5271	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5271; CCIN 5717) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5272	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5272; CCIN 5272) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5274	2-port Gb Ethernet-SX PCI Express Adapter (FC 5274; CCIN 5768) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5275	10 Gb Ethernet-SR PCI Express Adapter (FC 5275; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5 ¹	5
5279	PCIe2 LP 2x10 GbE SFP+ Copper 2x1 GbE UTP Adapter (FC 5279; CCIN 2B52) <ul style="list-style-type: none"> • Low-profile, Short, x8 • PCIe 2 • OS support: Linux operating system 	1, 2, 3, 4, 5, 6	5
5280	PCIe2 LP 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5280; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: Linux operating system 	1, 2, 3, 4, 5, 6	5

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

Feature code	Description	Slot priorities	Maximum number of adapters supported
5281	1 Gb Ethernet UTP 2-port PCIe Adapter (FC 5281; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: AIX, , and Linux operating system 	1, 2, 3, 4, 5, 6	5
5284	PCIe2 LP 2-port 10 GbE SR Adapter (FC 5284; CCIN 5287) <ul style="list-style-type: none"> • Generation 2, x8 • Low-profile adapter • Extra-high bandwidth • 10 GBASE-SR short-reach optics • OS support: AIX, (supported only through VIOS), Linux operating systems 	1, 2, 3, 4, 5, 6	5
5286	PCIe2 LP 2-port 10 GbE SFP+ Copper Adapter (FC 5286; CCIN 5288) <ul style="list-style-type: none"> • Generation 2, low-profile adapter • Two 10 Gb Ethernet ports • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	5
5708	10 Gb FCoE PCIe Dual-port Adapter (FC 5708; CCIN 2B3B) <ul style="list-style-type: none"> • 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 	6	20
5717	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5717; CCIN 5717) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems 	6	20
5732	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5732; CCIN 2B43) <ul style="list-style-type: none"> • Short, x8 • Extra-high bandwidth • OS support: AIX and Linux operating systems 	6	20
5767	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter (FC 5767; CCIN 5767) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	20

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

Feature code	Description	Slot priorities	Maximum number of adapters supported
5768	2-port Gigabit Ethernet-SX PCI Express Adapter (FC 5768; CCIN 5768) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX, , and Linux operating systems 	6	20
5769	10 Gb Ethernet-SR PCI Express Adapter (FC 5769; CCIN 2B44) <ul style="list-style-type: none"> • Short, full-high, x8 • Low-profile capable • Extra-high bandwidth • OS support: AIX and Linux operating systems 	6	20
5772	10 Gb Ethernet-LR PCI Express Adapter (FC 5772; CCIN 576E) <ul style="list-style-type: none"> • Short, x8 • Low-profile capable • Extra-high bandwidth • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5 ¹	20
5899	PCIe2 4-port 1 GbE Adapter (FC 5899; CCIN 576F) <ul style="list-style-type: none"> • 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, 2, 3, 4, 5, 6	20
9056	PCIe LP 2-port 1 GbE TX adapter (FC 9056; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, PCIe x4 • PCIe 1.0a compliant • High bandwidth • Two full-duplex 10/100/1000 Base-TX UTP connections to gigabit Ethernet (GbE) LANs • OS support: AIX, , and Linux operating systems 	6, 1, 2, 3, 4, 5	1
EC27	PCIe2 LP 2-port 10 GbE RoCE SFP+ adapter (FC EC27; CCIN EC27) <ul style="list-style-type: none"> • Short, low-profile • 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, 2, 3, 4, 5, 6	5
EN0J	PCIe2 LP 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EN0J, CCIN 2B93) <ul style="list-style-type: none"> • Extra-high bandwidth • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	5

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

Feature code	Description	Slot priorities	Maximum number of adapters supported
EC29	PCIe2 LP 2-port 10 GbE RoCE SR adapter (FC EC29; CCIN EC29) <ul style="list-style-type: none"> • Low-profile 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, 2, 3, 4, 5, 6	5
2728	4-port USB PCIe Adapter (FC 2728; CCIN 57D1) <ul style="list-style-type: none"> • Low-profile adapter • Single-slot, half-length PCIe adapter • PCIe 1.1 • OS support: AIX and Linux operating systems 	6	20
4808	PCIe Cryptographic Coprocessor (FC 4808; CCIN 4765) <ul style="list-style-type: none"> • Generation 3 blind-swap cassette • PCIe x4, full-height, half-length • OS support: AIX and operating systems 	1, 2, 3, 4, 5, 6	8
5283	PCIe2 LP 2-port 4X InfiniBand QDR Adapter (FC 5283; CCIN 58E2) <ul style="list-style-type: none"> • Generation 2 low-profile adapter • Extra-high bandwidth • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5, 6	2
2053	PCIe RAID and SSD SAS Adapter 3 Gb Low-profile (FC 2053; CCIN 57CD) <ul style="list-style-type: none"> • Low-profile adapter, requires two slots • Short, x8 • OS support: AIX, , and Linux operating systems • VIOS attachment requires version 2.2, or later 	1, 3, 5 ²	2
2055	PCIe RAID and SSD SAS Adapter 3 Gb with Blind-Swap Cassette (FC 2055; CCIN 57CD) <ul style="list-style-type: none"> • Low-profile adapter, requires two slots • Short, x8 • OS support: AIX, , and Linux operating systems • VIOS attachment requires version 2.2, or later 	1, 3, 5 ²	10
5278	PCIe Dual-x4 SAS Adapter (FC 5278; CCIN 57B3) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x8 • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5 ¹	5

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

Feature code	Description	Slot priorities	Maximum number of adapters supported
5805	PCIe 380 MB Cache Dual - x4 3 Gb SAS RAID Adapter (FC 5805; CCIN 574E) <ul style="list-style-type: none"> • Short, dual x4 • SAS RAID adapter • Installed in pairs • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	20
5901	PCIe Dual - x4 SAS Adapter (FC 5901; CCIN 57B3) <ul style="list-style-type: none"> • Short • Extra-high bandwidth • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	20
5913	PCIe2 1.8-GB Cache RAID SAS Tri-port 6 Gb Adapter (FC 5913; CCIN 57B5) <ul style="list-style-type: none"> • 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, 2, 3, 4, 5, 6	16
ESA1	PCIe2 RAID SAS Adapter Dual-port 6 Gb (FC ESA1; CCIN 57B4) <ul style="list-style-type: none"> • Regular-height adapter • PCIe generation 2, x8 • OS support: AIX, , and Linux operating systems 	6	20
ESA2	PCIe2 RAID SAS Adapter Dual-port 6 Gb LP (FC ESA2; CCIN 57B4) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • OS support: AIX, , and Linux operating systems 	1, 2, 3, 4, 5, 6	2
2893	PCI Express 2-Line WAN with Modem (FC 2893; CCIN 576C) <ul style="list-style-type: none"> • Short, x4 • Non-CIM • OS support: AIX, , and Linux operating systems 	6	20
2894	PCI Express 2-Line WAN with Modem (FC 2894; CCIN 576C) <ul style="list-style-type: none"> • Short, x4 • CIM • OS support: AIX, , and Linux operating systems 	6	20
<p>¹The adapter can be installed in any slot other than slot 6 and is not supported in slot 6.</p> <p>²The adapter requires two adjacent slots.</p>			

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 regarding GX++ channel adapters

Table 8 on page 18 identifies the slot placement priorities and the maximum number of specified adapters that can be installed for connectivity. However, for optimum performance, you might want to further limit the total number of high-bandwidth and extra-high bandwidth adapters. The system supports the following GX++ adapters feature codes (FCs):

- FC EJ0G: 2-Port 12X InfiniBand2 adapter
- FC EJ0H: GX++ LP 1-port PCIe2 x8 adapter

When plugging FC EJ0G GX adapter, ensure that it is placed in GX++ slot 2. If this adapter is installed in GX++ slot 2, PCIe slot 6 (P1-C7) is not available to install any PCIe adapter. Also, the system power control network (SPCN) cable of this GX adapter is installed in PCIe slot 1 (P1-C2).

The FC EJ0H GX adapter can be installed in any GX++ slot. The PCIe cable, such as FC EN05 or FC EN07, connects the FC EJ0H GX adapter and the 58/88 PCIe storage enclosure to the system.

Note: The FC EJ0H GX adapter provides only half of the FC 58/88 PCIe storage enclosure connections required.

The I/O enclosures, such as FC 5802 and FC 5877, are supported for the 31E/2C or 31E/2D system.

I/O expansion units

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

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.

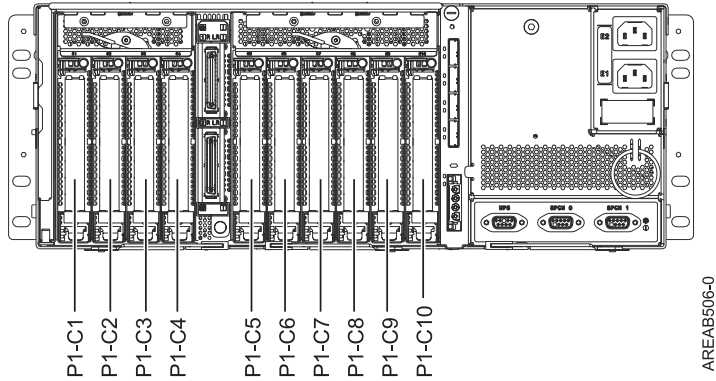


Figure 4. Rear view. This figure shows the rear view of the expansion unit.

Table 9. 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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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

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

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

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

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

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

Industry Canada Compliance Statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

European Community Compliance Statement

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

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

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VCCI Statement - Japan

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

取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

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

高調波ガイドライン適合品

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

高調波ガイドライン準用品

Electromagnetic Interference (EMI) Statement - Korea

이 기기는 가정용(B급)으로 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

Germany Compliance Statement

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

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

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung von IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung von IBM gesteckt/eingebaut werden.

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

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

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

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

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
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Generelle Informationen:

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

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