Power Systems

PCI adapter placement for machine type 94xx

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Note

Before using this information and the product it supports, read the information in "Notices" on page 43, "Safety notices" on page v, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125–5823.

This edition applies to IBM Power Systems servers that contain the POWER6 processor and to all associated models.

Contents

Safety notices

Safety notices may be printed throughout this guide:

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

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, 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.

German safety information

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

Laser safety information

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

Laser compliance

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)

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

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

The equipment is suitable for installation in the following:

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

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

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

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

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

Chapter 1. What's new in PCI adapter placement for machine type 94xx

See what is new and what has changed in the PCI adapter placement for machine type 94xx since the last edition of this topic.

November 2008

References to the i5/OS® operating system have been changed to the IBM i or i operating system.

Chapter 2. Overview of adapter placement

Some adapters must be placed in specific PCI slots to function correctly or perform optimally. Use this information to determine where to install PCI adapters in the following IBM System i® and IBM Power Systems™ models and their associated I/O expansion units: 9406-MMA, 9407-M15, 9408-M25, and 9409-M50.

Adapters have different capabilities. Adapters covered in this topic may be PCI, PCI-X or PCI Express™ (PCIe). Some adapters are 32 bit, some are 64 bit. Adapters can run at different frequencies, such as 33 MHz, 66 MHz, 133 MHz and 266 MHz.

System and expansion units also have adapter slots that come in different bit lengths and frequencies. For best performance, the adapters should be placed in a slot with the same characteristics as the adapter. To the extent that an adapter does not match the slot, the performance may be reduced.

Note: When using the TotalStorage® EXP24 Disk Enclosure 5786/5787, there are specific feature codes needed depending on the adapter that is being used with the enclosure:

- Feature code 0300 indicates the 5736/5775 is going to attach to the TotalStorage EXP24 Disk Enclosure 5786/5787.
- Feature code 0301 indicates the 5737/5776 is going to attach to the TotalStorage EXP24 Disk Enclosure 5786/5787.
- Feature code 0310 indicates the 5739/5778 is going to attach to the TotalStorage EXP24 Disk Enclosure 5786/5787.

Before installing these features, check to see if there are program temporary fixes (PTFs) available.

Prerequisites for adding or moving PCI adapters

If you are adding or moving adapters, be sure to use the System Planning Tool to validate your new adapter placement plan before you physically install or move the adapters.

Go to the System Planning Tool Web site at

http://www.ibm.com/systems/support/tools/systemplanningtool/ .

If you are installing a new feature, ensure that you have the software required to support the new feature and that you determine if there are any existing PTF prerequisites. To do this, use the IBM Prerequisite Web site at http://www-912.ibm.com/e_dir/eServerPrereq.nsf

Optimal performance guidelines for PCI adapters

Learn about placement guidelines for PCI adapters that are moderately to highly active.

For optimal adapter performance, use the following general placement guidelines, which are for adapters that are moderately to highly active.

POWER6 system units and the 5796 expansion unit

- The POWER6™ system units and 5796 expansion unit do not contain multi-adapter bridge slots but instead have direct host bridge slots, which can increase performance.
- Place high-bandwidth and extra-high bandwidth PCI-X DDR adapters in the PCI-X DDR slots in the system first, and then the PCI-X DDR slots in the expansion unit.

- Place PCIe adapters in PCIe slots only. For more information, see "PCI Express."
- Limit to 2 the number of extra-high bandwidth adapters per PCI host bridge (PHB).
- Limit to 3 the number of high bandwidth adapters per PHB.
- Spread out high-bandwidth and extra-high bandwidth adapters across towers or drawers and HSL, HSL-2, or 12X loops. Place the towers or drawers with the most high-bandwidth and extra-high bandwidth adapters closest to the system unit on the HSL, HSL-2, or 12X loops.
- When more then 50% of a loop is used for the AIX® operating system, follow the System p® configuration rules for that loop. One of these rules is to limit the number of I/O expansion units to 4 per loop. For more information about these rules, see the PCI adapter placement for machine types 82xx and 91xx. For model 9406-MMA, see the rules for model 9117-MMA. For models 9407-M15 and 9408-M25, see the rules for model 8203-E4A. For model 9409-M50, see the rules for model 8204-E8A.

5088, 0588, 5094, 5096, 5294, 5296, 8294, 9194, 0595, 5095, or 5790 expansion unit

- Place high-bandwidth and extra-high bandwidth PCI-X adapters in the PCI-X slots in the expansion units.
- Limit to 1 the number of extra-high performance adapter per multi-adapter bridge, with no other extra-high performance adapters on the same multi-adapter bridge. PCI bridges for all the systems and expansion units covered in this publication are identified in Chapter 5, "Configuration tables for system units and expansion units," on page 33.
- Limit to 2 the number of high-bandwidth adapters per multi-adapter bridge with no other extra-high bandwidth adapters in the same multi-adapter bridge.
- Spread out high-bandwidth and extra-high bandwidth adapters across multi-adapter bridges, towers or drawers and HSL, HSL-2, or 12X loops. Place the towers or drawers with the most high-bandwidth and extra-high bandwidth adapters closest to the system unit on the HSL, HSL-2, or 12X loops.
- When more then 50% of a loop is used for the AIX operating system, follow the System p configuration rules for that loop. One of these rules is to limit the number of I/O expansion units to 4 per loop. For more information about these rules, see the PCI adapter placement for machine types 82xx and 91xx. For model 9406-MMA, see the rules for model 9117-MMA. For models 9407-M15 and 9408-M25, see the rules for model 8203-E4A. For model 9409-M50, see the rules for model 8204-E8A.
- For more information about optimizing performance, see the *Performance Capabilities Reference* publications at http://www-03.ibm.com/servers/eserver/iseries/perfmgmt/resource.html.

In addition to these general guidelines, see the following sections for specific guidelines for specific adapters:

- Chapter 3, "Supported adapters," on page 7
- "High-performance SCSI, disk controller placement" on page 28

PCI Express

Learn about PCI Express adapters and their unique slot requirements.

PCI Express (PCIe) adapters use a different type of slot than Peripheral Component Interconnect (PCI) and Peripheral Component Interconnect-X (PCI-X) adapters. If you attempt to force an adapter into the wrong type of slot, you might damage the adapter or the slot. A PCI adapter can be installed in a PCI-X slot, and a PCI-X adapter can be installed in a PCI adapter slot. A PCIe adapter cannot be installed in a PCI or PCI-X adapter slot, and a PCI or PCI-X adapter cannot be installed in a PCIe slot. The following illustration shows an example of a PCI-X adapter (**A**) next to a PCIe 4x (**B**) adapter.

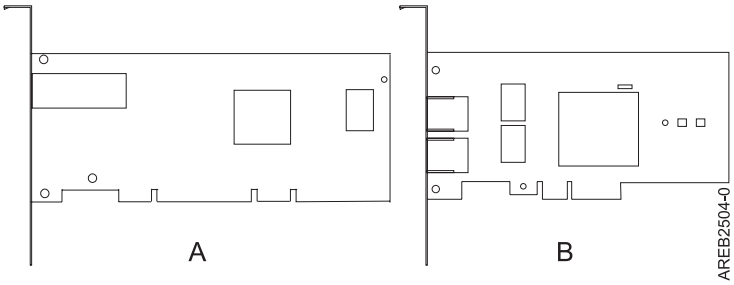


Figure 1. PCI-X adapter and PCIe 4x adapter

PCIe adapters and slots come in 4 different sizes: 1x, 4x, 8x and 16x. Smaller size adapters will fit in larger slots, but larger size adapters will not fit in smaller slots. The following table shows PCIe slot compatibility.

Table 1. PCIe slot compatibility

	1x slot	**4x slot**	**8x slot**	**16x slot**
1x adapter	Supported	Supported	Supported	Supported
4x adapter	Not supported	Supported	Supported	Supported
8x adapter	Not supported	Not supported	Supported	Supported
16x adapter	Not supported	Not supported	Not supported	Supported

To learn more about the PCIe standard, see the IBM Redbooks® Technote, *Introduction to PCI Express* at http://www.redbooks.ibm.com/abstracts/tips0456.html.

Chapter 3. Supported adapters

Learn about PCI adapters that are supported on IBM System i and IBM Power Systems models that contain the POWER6 processor, and associated I/O expansion units.

Note: Not all adapters are supported on all models. Supported adapters are subject to change. This topic does not replace the latest sales and marketing publications and tools that document supported features. To confirm that a specific adapter is supported on a specific configuration, see the Prerequisites for adding or moving PCI adapters.

Related tasks

Installing PCI adapters
Find instructions for installing, removing, and replacing PCI adapters.

Related reference

IBM Prerequisite Web page
Find prerequisite information for features you currently have or plan to add to your system.

Managing PCI adapters
Find specifications, instructions, and part numbers for specific adapters.

IOP PCI adapters

I/O processor (IOP) adapters process instructions from the server and work with IOP-controlled I/O adapters (IOAs) to control the I/O devices.

Table 2 shows the IOP adapters that are supported on expansion units connected to the 9406-MMA, 9407-M15, 9408-M25, and 9409-M50 servers.

Expansion unit 5796 does not support IOPs.

For more information about expansion units that can be connected to a machine type 940*x* server, see "Placing an adapter in an expansion unit" on page 26 and Chapter 5, "Configuration tables for system units and expansion units," on page 33.

Note: The internal PCI-X DDR and PCIe slots on machine type 940*x* servers are designed for IOPless adapters. IOP adapters, and IOA adapters that require an IOP adapter, are not supported in the internal slots..

Table 2. IOP adapters

Feature	CCIN	Description
2843 3705	2843	PCI IOP • Short adapter, can go in short or long slot • 3 v slot required • Maximum number of IOAs: 4 • Memory value: 211 • Performance value: 100

Table 2. IOP adapters (continued)

Feature	CCIN	Description
2847	2847	PCI IOP for SAN Load Source • Maximum number of IOAs: 1 • This is a dedicated IOP for SAN load Source and is only supported with 2787 and 5760 IOAs • IOP can not be placed where embedded adapters require an IOP
2844	2844	• Short adapter, can go in short or long slot • 3 v slot required • Maximum number of IOAs: 4 • Memory value: 211 • Performance value: 100

IBM i PCI adapters

Learn about which PCI, PCI-X, and PCIe adapters are supported on IBM Power Systems models running the i operating system.

Note: Not all adapters are supported on all models. Supported adapters are subject to change. This topic does not replace the latest sales and marketing publications and tools that document supported features. To confirm that a specific adapter is supported on a specific configuration, see the Prerequisites for adding or moving PCI adapters.

Adapters can be serviced with the system power on (hot-pluggable) unless noted that they must be serviced with the system power off (not hot-pluggable).

Dual mode adapters are capable of functioning IOPless or IOP controlled. If an IOP is placed on the same multi-adapter bridge number and at a lower address number, then dual mode adapters will be under IOP control and will not function as an IOPless adapter.

Adapters that require IOPs cannot be placed in the 9406-MMA, 9407-M15, 9408-M25, and 9409-M50 servers. These adapters can be placed in an attached expansion unit except for the 5796, which only supports IOPless adapters.

IBM i PCI and PCI-X adapters

See the following table to learn about PCI and PCI-X adapters that can by used on models running the i operating system.

Table 3. i PCI and PCI-X adapters

Feature	CCIN	Description
2742	2742	PCI Two-Line WAN IOA • Short, 32-bit, 66 MHz • IOP controlled – Memory value: 15 – Performance value: 14

Table 3. i PCI and PCI-X adapters (continued)

Feature	CCIN	Description
2744	2744	PCI 4/16/100 Mbps Token-Ring IOA • Short, 32-bit, 33 MHz • IOP controlled – Memory value: 25 – Performance value: 36 • A maximum of two 2744, 2849, and 4805 adapters in any combination allowed per IOP, except for CCIN 289x IOPs.
2749	2749	PCI Ultra Magnetic Media Controller • Short, 32-bit, 33 MHz • IOP controlled – Memory value: 22 – Performance value: 25 • This adapter might encounter performance limitations in PCI-X towers and systems. • A maximum of two 2744, 2849, and 4805 adapters in any combination allowed per IOP, except for CCIN 289x IOPs.
2757	2757	PCI Ultra RAID Disk Controller • Long, 64-bit • High bandwidth • IOP controlled – Memory value: 29 – Performance value: 30 • Must be mirrored in order to be supported • See “SCSI RAID controller restrictions” on page 18
2780	2780	PCI-X Ultra4 RAID Disk Controller • Long, 64-Bit, 133 MHz • High bandwidth • IOP controlled – Memory value: 29 – Performance value: 30 • Must be mirrored in order to be supported • See “SCSI RAID controller restrictions” on page 18
2787	2787	PCI-X Fibre Channel Disk Unit Controller • Short, 64-bit, 133 MHz • High bandwidth • For best performance, place in a 64-bit position. • IOP controlled • Only one per IOP and no other IOAs • A maximum of two 2787, 5704, 5760, or 5761 (any combination) per PCI bridge set boundary. • This IOA can be used in Multipath configurations. To improve the availability provided by Multipath configurations, place each IOA and its IOP on different HSL loops, in different expansion units or on different multi-adapter bridges.
2793	2793	PCI 2-Line WAN with Modem • Short, 32-bit, 66 MHz • IOP controlled – Memory value: 15 – Performance value: 14 • Non-CIM (complex impedance matching)

Table 3. i PCI and PCI-X adapters (continued)

Feature	CCIN	Description
2794	2793	PCI 2-Line WAN with Modem • Short, 32-bit, 66 MHz • IOP controlled – Memory value: 15 – Performance value: 14 • CIM (complex impedance matching)
2805	2805	PCI Quad Modem IOA • Long, 32-bit, 66 MHz • Non-CIM • IOP controlled – Memory value: 15 – Performance value: 14
2806	2805	PCI Quad Modem IOA • Long, 32-bit, 66 MHz • IOP controlled – Memory value: 15 – Performance value: 14 • CIM
2849 3709	2849	PCI 100/10 Mbps Ethernet IOA • Short, 32-bit, 33 MHz • IOP controlled – Memory value: 25 – Performance value: 36 • A maximum of two 2849 and 2744 adapters in any combination allowed per IOP
4746	2746	PCI Twinaxial Workstation Controller IOA • Short, 32-bit, 33 MHz • IOP controlled – Memory value: 10 – Performance value: 6
4801	4758	PCI Cryptographic Coprocessor • Short, 32-bit, 33 MHz • IOP controlled – Memory value: 11 – Performance value: 18 • Cannot be controlled by the load source IOP.
4805	2058	PCI Cryptographic Accelerator • Short, 32-bit, 33 MHz • IOP controlled – Memory value: 2 – Performance value: 26 • A maximum of two 2744, 2849, and 4805 adapters in any combination allowed per IOP, except for CCIN 289x IOPs. • Cannot be controlled by the load source IOP. • A maximum of two 4805 adapters are allowed per IOP, but is restricted to a maximum of one per IOP if this IOP is also driving a 5700 or 5701 adapter.

Table 3. i PCI and PCI-X adapters (continued)

Feature	CCIN	Description
4806	4764	PCI-X Cryptographic Coprocessor • Short, 64-bit, 133 MHz, 3.3 V • IOPless • 9-pin D-shell connector is not for customer use. • This feature meets the Class B, electromagnetic compatibility requirements. • This feature might be shipped with environmental warning labels. If labels regarding the mercury content of this feature are present, they must be applied to the system unit in which this feature is placed. Apply the labels in a conspicuous location as near as possible to the product information labels (UL, FCC, CE) at the back of the system unit.
4812 4813		Base PCI Integrated xSeries® Server • Long, double-width, 64 bit, 66 MHz, 3.3 V • Contains a 2.0GHz processor with 2MB integrated L2 cache • Two integrated 1000/100/10Mbps Ethernet ports, two USB 1.1 ports and traditional PC keyboard and mouse ports • A keyboard and mouse can either connect to the traditional ports or connect to the USB ports • An SVGA video port for connection of a display. • This feature has two memory slots. These slots must always contain a pair of identical memory features • Available memory features are: #9726 - Base 512MB Server Memory (Initial order only) #8546 - Opt Base 1 Gb Server Memory (Initial order only) #0446 - 512MB DDR Server Memory (MES only) #0447 - 1 Gb DDR Server Memory (MES only) The #9812 requires an IOP (#2844, #9744 or #9844).
4960		Cryptographic Accelerator • Short, 32-bit, 3.3 or 5 V
5580	2780 5708	2780 Controller with 5708 Auxiliary Write Cache • Long, 133 MHz, 32 or 64-bit, 3.3V • Two adapter set, requires two open slots within the same enclosure. • The 2757 and 2780 controllers are high bandwidth • 5708 Auxiliary Write Cache is low bandwidth. The auxiliary cache can be placed in a 32-bit slot without performance impacts. If an I/O enclosure has both 64 and 32-bit slots, put the auxiliary cache in a 32-bit slot in order to conserve 64-bit slots for higher bandwidth adapters. • If possible, place the 2757 or 2780 controller in a 64 bit/133 MHz slot for best performance. • IOP controlled – Memory value: 29 – Performance value: 30 • See “SCSI RAID controller restrictions” on page 18
5581	2757 5708	2757 Controller with 5708 Auxiliary Write Cache • Long, 133 MHz, 32 or 64-bit, 3.3V • Two adapter set, requires two open slots within the same enclosure. • The 2757 and 2780 controllers are high bandwidth • 5708 Auxiliary Write Cache is low bandwidth. The auxiliary cache can be placed in a 32-bit slot without performance impacts. If an I/O enclosure has both 64 and 32-bit slots, put the auxiliary cache in a 32-bit slot in order to conserve 64-bit slots for higher bandwidth adapters. • If possible, place the 2757 or 2780 controller in a 64 bit/133 MHz slot for best performance. • IOP controlled – Memory value: 29 – Performance value: 30 • See “SCSI RAID controller restrictions” on page 18

Table 3. i PCI and PCI-X adapters (continued)

Feature	CCIN	Description
5582	571E 574F	5738 Controller with 574F Auxiliary Write Cache IOA • Long, 133 MHz, 32 or 64-bit, 3.3V • Two adapter set, requires two open slots within the same enclosure. • The 5738 or 5777 controller is extra-high bandwidth • 574F Auxiliary Write Cache is low bandwidth. The auxiliary cache can be placed in a 32-bit slot without performance impacts. If an I/O enclosure has both 64 and 32-bit slots, put the auxiliary cache in a 32-bit slot in order to conserve 64-bit slots for higher bandwidth adapters. • If possible, place 5738/5777 in 64 bit/133 MHz slot for best performance. • IOP controlled – Memory value: 29 – Performance value: 30 • For more information about this adapter and slot restrictions, see “SCSI RAID controller restrictions” on page 18 and “High-performance SCSI, disk controller placement” on page 28.
5583	571E 574F	5738 Controller with 574F Auxiliary Write Cache IOA • Long, 133 MHz, 32 or 64-bit, 3.3V • IOPless • For more information about this adapter and slot restrictions, see “SCSI RAID controller restrictions” on page 18 and “High-performance SCSI, disk controller placement” on page 28.
5590	2780 574F	2780 Controller with 574F Auxiliary Write Cache IOA • Long, 133 MHz, 32 or 64-bit, 3.3V • Place the controller sided of the adapter pair in a 64 bit, 133 MHz slot for best performance. • Two adapter set, requires two open slots within the same enclosure. • The 2780 and 2757 controllers are high bandwidth • The Auxiliary Write Cache is low bandwidth. The auxiliary cache can be placed in a 32-bit slot without performance impacts. If an I/O enclosure has both 64 and 32-bit slots, put the auxiliary cache in a 32-bit slot in order to conserve 64-bit slots for higher bandwidth adapters. • IOP controlled – Memory value: 29 – Performance value: 30 • For more information about this adapter and slot restrictions, see “SCSI RAID controller restrictions” on page 18 and “High-performance SCSI, disk controller placement” on page 28.
5591	2757 574F	2757 Controller with 574F Auxiliary Write Cache IOA • Long, 133 MHz, 32 or 64-bit, 3.3V • Two adapter set, requires two open slots within the same enclosure. • The 2780 and 2757 controllers are high bandwidth • The Auxiliary Write Cache is low bandwidth. The auxiliary cache can be placed in a 32-bit slot without performance impacts. If an I/O enclosure has both 64 and 32-bit slots, put the auxiliary cache in a 32-bit slot in order to conserve 64-bit slots for higher bandwidth adapters. • Place the controller in a 64 bit, 133 MHz slot for best performance. • IOP controlled – Memory value: 29 – Performance value: 30 • For more information about this adapter and slot restrictions, see “SCSI RAID controller restrictions” on page 18 and “High-performance SCSI, disk controller placement” on page 28.

Table 3. i PCI and PCI-X adapters (continued)

Feature	CCIN	Description
5700 5701	5700 5701	PCI-X 1 Gbps Ethernet • Short, 64-bit, 133 MHz • Only TCP/IP supported • High bandwidth • Place in a 64-bit, PCI-X slot if available • Crossover cable is not supported • IOP controlled – Memory value: 2 – Performance value: 26 • Can be combined with a maximum of one other IOA. • A maximum of two 4805, 5700, or 5701 in any combination per IOP. • Half Duplex (HDX) mode is not supported. • SNA is not supported.
5702	5702	PCI-X Ultra Tape Controller • Short, 64-bit, 133 MHz • High bandwidth • IOP controlled – Memory value: 29 – Performance value: 21
5703	5703	PCI-X RAID Disk Unit Controller • Long, 32 or 64-bit, 3.3V • IOP controlled – Memory value: 29 – Performance value: 21 • Must be mirrored in order to be supported
5704	5704	PCI-X Fibre Channel Tape Controller • Short, 64-bit, 133 MHz • High bandwidth • IOP controlled – Memory value: 36 – Performance value: 50 • For best performance, place in a 64-bit position • A maximum of two 2787, 5704, 5760, or 5761 (any combination) per PCI bridge set boundary.
5706	5706	PCI-X 1 Gbps Ethernet UTP 2-port IOA • Short, 64-bit, 133 MHz • Only TCP/IP supported • High bandwidth • IOPless
5707	5707	PCI-X 1 Gbps Ethernet SX Fiber 2-port IOA • Short, 64-bit, 133 MHz • Only TCP/IP supported • High bandwidth • IOPless
5712	5702	PCI-X U320 Tape Controller • Short, 64-bit, 133 MHz • High bandwidth • IOP controlled – Memory value: 29 – Performance value: 21

Table 3. i PCI and PCI-X adapters (continued)

Feature	CCIN	Description
5715	5702	PCI-X U320 Tape/Disk Unit Controller • Short, 32 or 64-bit, 3.3V • High bandwidth • IOP controlled – Memory value: 29 – Performance value: 21
5721 5722	573A 576A	10 Gbps Ethernet (short reach) 10 Gbps Ethernet (long reach) • Short, 64-bit, 3.3V • Extra-high bandwidth • IOPless • None allowed in PCI slot (PCI-X is acceptable) • None allowed in 32 bit slot • Maximum of 2 adapters per PHB • For best performance, do not combine other extra-high or high bandwidth adapters in the same PHB. • Place in slots 5-9 when the adapter is used in one of these expansion units: 5094, 5294, 0588, 5088, 0694, 8294, or 9194. • Recommended in DDR slot • Maximum of 6 per RIO HSL-2 loop • Maximum of 3 per HSL loop. • Maximum or near maximum quantity of adapters assumes some adapters are for backup or are running at reduced capacity • If an AIX or Linux® partition is used in the same PHB, then 5718 or 5719 are not supported with the 5721/5722.
5736	571A	PCI-X Disk/Tape Controller • Short, 64 bit, 266 MHz • High bandwidth if used with tape drives, extra-high bandwidth if used with disk drives. • IOP controlled – Memory value: 29 – Performance value: 21 • See “SCSI RAID controller restrictions” on page 18
5737	571B	PCI-X Disk Controller - 90MB • Long, 64 bit, 266 MHz • Extra-high bandwidth • IOP controlled – Memory value: 29 – Performance value: 21 • Must be mirrored in order to be supported • See “SCSI RAID controller restrictions” on page 18
5738	571E	PCI-X Dual Channel Ultra320 SCSI Raid Adapter • Long, 32 or 64-bit, 3.3V. 133 MHz • Extra-high bandwidth • Dual-mode capable adapter – If IOP controlled - Memory value: 29 - Performance value: 21 • Must be mirrored in order to be supported • EEH Supported • See “SCSI RAID controller restrictions” on page 18

Table 3. i PCI and PCI-X adapters (continued)

Feature	CCIN	Description
5739	571F 575B	PCI-X Dual Channel Ultra320 SCSI Raid Adapter with Auxiliary write cache (double-wide) • Long, 64-bit, 3.3V, 266 MHz • IOP controlled – Memory value: 29 – Performance value: 30 • EEH Supported • Extra-high bandwidth • Double-wide adapter, requires 2, 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 dynamic logical partitioning (DLPAR), both slots of the adapter must be managed together. • Because of the complexity of this adapter, concurrent maintenance is not supported through the Hardware Management Console (HMC). Concurrent maintenance must be done from the Hardware Service Manager (HSM). • For more information about this adapter and slot restrictions, see “SCSI RAID controller restrictions” on page 18 and “High-performance SCSI, disk controller placement” on page 28.
5749	576B	4 Gigabit Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter • Short, 64-bit, 3.3V • Extra-high bandwidth • 64-bit slot required • Recommended in DDR slot • IOPless • Maximum of four per enclosure • Maximum of two per PCI host bridge
5760	280E	PCI-X Fibre channel Disk Controller • Short, 64-bit, 3.3V, 133 MHz • Extra-high bandwidth • IOP controlled • For best performance, place in a 64-bit position. • Only one per IOP and no other IOAs. • A maximum of two 2787, 5704, 5760, or 5761 (any combination) per PCI bridge set boundary. • This IOA can be used in Multipath configurations. To improve the availability provided by Multipath, place each IOA and its IOP on different HSL loops, in different expansion units or on different multi-adapter bridges.
5761	280D	PCI-X Fibre channel Disk Controller • Short, 64-bit, 3.3V, 133 MHz • Extra-high bandwidth • IOP controlled – Memory value: 36 – Performance value: 50 • Extra-high bandwidth. • For best performance, place in a 64-bit position. • A maximum of two 2787, 5704, 5760, or 5761 (any combination) per PCI bridge set boundary. • For best performance, do not mix with other extra-high bandwidth adapters in the same multi-adapter bridge boundary.

Table 3. i PCI and PCI-X adapters (continued)

Feature	CCIN	Description
5775	571A	PCI-X Dual Channel Ultra320 SCSI Adapter • Short, 32 or 64-bit, 3.3V • EEH Supported • High Bandwidth • IOPless • Maximum of 6 disk drives
5776	571B	PCI-X Disk Controller - 90MB • Long, 64 bit, 266 MHz • Extra-high bandwidth • IOPless • Dual-mode capable adapter • Must be mirrored in order to be supported • Also supported on models 270, 800, 810, 820, 825, 830, 840, 870, and 890.
5777	571E	PCI-X Dual Channel Ultra320 SCSI Raid Adapter • Long, 32 or 64-bit, 3.3V, 133 MHz • IOPless • Dual-mode capable adapter • EEH Supported • Extra-high bandwidth • Must be mirrored in order to be supported • For more information about this adapter and slot restrictions, see “SCSI RAID controller restrictions” on page 18 and “High-performance SCSI, disk controller placement” on page 28.
5778 5781 5782	571F 575B	PCI-X Dual Channel Ultra320 SCSI Raid Adapter with Auxiliary write cache (double-wide) • Long, 64-bit, 3.3V, 266 MHz • IOPless • Dual-mode capable adapter • EEH Supported • Extra-high bandwidth • IOPless • Double-wide adapter, requires 2, 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 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). • For more information about this adapter and slot restrictions, see “SCSI RAID controller restrictions” on page 18 and “High-performance SCSI, disk controller placement” on page 28.
5783 5784	573B 573C	PCI-X iSCSI HBA Copper PCI-X iSCSI HBA Fiber • Short, 64-bit, 3.3V • High bandwidth • IOPless • A nonpartitioned system running the i operating system needs to have one Ethernet port for a system with 5783 or 5784. • A partitioned system needs to have one Ethernet port per i operating system partition that contains a 5783 or 5784.

Table 3. i PCI and PCI-X adapters (continued)

Feature	CCIN	Description
6800 6801	5700 5701	PCI-X 1 Gbps Ethernet IOA PCI-X 1 Gbps Ethernet UTP IOA • Short, 64-bit, 133 MHz • Only TCP/IP supported • High bandwidth • IOPless • Dual-mode adapter • Place in 64-bit PCI-X slot if available • A crossover cable is not supported. • Only TCP/IP supported. • Half Duplex (HDX) mode is not supported. • SNA is not supported.
6803	2793	PCI 2-Line WAN with Modem • Short, 32-bit, 66 MHz • IOPless • Dual-mode adapter • Limited protocol support. In IOPless mode only PPP for ECS is supported on the modem. An RVX port is not supported. • Non-CIM
6804	2793	PCI 2-Line WAN with Modem • Short, 32-bit, 66 MHz • IOPless • Dual-mode adapter • Limited protocol support. In IOPless mode, only PPP for ECS is supported on the modem. An RVX port is not supported. • CIM
6805	2742	PCI Two-Line WAN IOA • Short, 32-bit, 66 MHz • IOPless
6808	2805	PCI Quad Modem IOA • Long, 32-bit, 66 MHz • Non-CIM • IOPless
6809	2805	PCI Quad Modem IOA • Long, 32-bit, 66 MHz • IOPless • CIM
6833	2793	PCI 2-Line WAN with Modem • Short, 32-bit, 66 MHz • IOPless • Dual-mode adapter • Non-CIM
6834	2793	PCI 2-Line WAN with Modem • Short, 32-bit, 66 MHz • IOPless • Dual-mode adapter • CIM

Table 3. i PCI and PCI-X adapters (continued)

Feature	CCIN	Description
9933	2793	Base PCI 2-Line WAN w/Modem • Short, 32-bit, 66 MHz • IOPless • Dual-mode adapter • Limited protocol support. In IOPless mode, only PPP for ECS is supported on the modem. An RVX port is not supported. • Non-CIM
9934	2793	Base PCI 2-Line WAN w/Modem • Short, 32-bit, 66 MHz • IOPless • Dual-mode adapter • Limited protocol support. In IOPless mode, only PPP for ECS is supported on the modem. An RVX port is not supported. • CIM

SCSI RAID controller restrictions

Observe the following restrictions when placing the SCSI RAID controllers that are identified in the following list:

- The 2757, 2780, 5580, 5581, 5582, 5583, 5590, 5591, 5738, or 5777 disk controllers cannot be placed in the system units of the 9406-MMA, 9407-M15, 9408-M25, and 9409-M50. These controllers can be placed in an attached expansion unit.
- A maximum of three 2757, 2780, 4748, 4778, 5580, 5581, 5582, 5583, 5590, 5591, 5736, 5703, 5736, 5738, 5739, 5737, 5781, 5799 allowed per IOP in any combination. Feature codes 5580, 5581, 5582, 5583, 5590, 5591, 5739, 5781, and 5799 contain two adapters. An auxiliary write cache IOA also counts as one IOA towards the maximum of three. For example, 5580 consists of 2 adapters so 5580 counts as two towards the three maximum when located under the same IOP.
- A maximum of six 2780, 5580, 5590, 2757, 5581, 5591, 5582/5583, 5738/5777, 5739/5778 allowed per 0694, 5094, 5294, 8093 (bottom unit), 8094 (both units), 8294 (both units), 9094 and 9194 unit enclosure regardless of operating system.

  For features that include a SCSI controller paired with an auxiliary write-cache IOA CCIN 574F or CCIN 575B, the pair counts as only 1 adapter towards the 6 maximum.

  For features that include a SCSI controller paired with an auxiliary write-cache IOA CCIN 5708, the pair count as 2 adapters towards the 6 maximum.

IBM i PCIe adapters

See the following table to learn about PCI Express (PCIe) adapters that can by used on models running the i operating system.

PCIe adapters can only be used in PCIe slots.

Table 4. i PCIe adapters

Feature	CCIN	Description
2893 9693	576C	PCI Express 2-Line WAN with Modem • Short, x4 • Non CIM

Table 4. i PCIe adapters (continued)

Feature	CCIN	Description
2894 9694	576C	PCI Express 2-Line WAN with Modem • Short, x4 • CIM
5717	5717	4-port 10/100/1000 Base-TX Ethernet PCI Express Adapter • Short, x4 • High bandwidth
5767	5767	2-Port 10/100/1000 Base-TX PCI Express Adapter • Short, x4 • High bandwidth
5768	5768	2- port Gigabit Ethernet-SX PCI Express Adapter • Short, x4 • Extra-high bandwidth
5774	5774	4 Gb Fibre Channel 2-Port Adapter • Short, x4 • Extra-high bandwidth • IOPless

Related reference

"High-performance SCSI, disk controller placement" on page 28
Determine which PCI slots can accommodate the 2780, 5580, 5582, 5583, 5590, 5738, 5739, 5746, 5777, 5778, 5781, 5782, 5799, and 5800 SCSI controllers on machine type 940*x* models and associated I/O expansion units.

AIX and Linux PCI adapters

Learn about PCI adapters supported on IBM Power Systems models running the AIX and Linux operating systems.

Note: Not all adapters are supported on all models. Supported adapters are subject to change. This topic does not replace the latest sales and marketing publications and tools that document supported features. To confirm that a specific adapter is supported on a specific configuration, see the Prerequisites for adding or moving PCI adapters.

19*xx* features are not supported on machine type 940*x* and associated I/O expansion units.

AIX is not supported on the 0588 and 5088 I/O expansion units.

AIX and Linux PCI and PCI-X adapters shows PCI and PCI-X adapters. AIX and Linux PCIe adapters shows the PCI Express adapters. All adapters support extended error handling (EEH).

AIX and Linux PCI and PCI-X adapters

See the following table to learn about adapters that can by used on Power Systems models running the AIX and Linux operating system.

When using these adapters on machine type 940*x* models, follow the same placement guidelines and restrictions documented in the PCI adapter placement for machine types 82xx and 91xx. This topic is available on the Hardware Information Web site at

http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/iphdx/power_systems.htm .

Table 5. AIX and Linux PCI and PCI-X adapters

Feature	CCIN	Description
0603	2744	Direct Attach-2744 • Short, 32-bit, 33 MHz
0613	2742	Direct Attach-2742, PCI Two-Line WAN IOA • Short, 32-bit, 66 MHz
0614	2793	Direct Attach-2793, PCI 2-Line WAN with Modem • Short, 32-bit, 66 MHz
0615	2793	Direct Attach-2794, PCI 2-Line WAN with Modem (complex impedance matching) • Short, 32-bit, 66 MHz
0616	2805	Direct Attach-2805, PCI Quad Modem IOA • Long, 32-bit, 66 MHz
0617	2805	Direct Attach-2806: PCI Quad Modem IOA (complex impedance matching) • Long, 32-bit, 66 MHz
0620 0621	5700 5701	Direct Attach-5700: IBM Gigabit Ethernet-SX PCI-X Adapter Direct Attach-5701: IBM 10/100/1000 Base-TX Ethernet PCI-X Adapter • Short, 32 or 64-bit, 3.3 or 5V • EEH Supported • High Bandwidth • Place in 64-bit PCI-X slot if available
0623	2849	Direct Attach-2849, PCI 100/10Mbps Ethernet IOA • Short, 32-Bit, 33 MHz, 3.3 or 5 V • EEH Supported
0624	5702	Direct Attach-5702, PCI-X Dual Channel Ultra320 SCSI Adapter • Short, 32 or 64-bit, 3.3V • EEH Supported • High Bandwidth
0625	5704	Direct Attach-5704, PCI-X Fibre Channel Tape Controller • Short, 32 or 64-bit, 3.3V • High Bandwidth
0626	2787	Direct Attach-2787: PCI-X Fibre Channel Disk Unit Controller • Short, 64-bit, 133 MHz • High Bandwidth
0627	2780	Direct Attach-2787: PCI-X Fibre Channel Disk Unit Controller • Short, 64-bit, 133 MHz • High Bandwidth
0628	5703	Direct Attach-5703: PCI-X RAID Disk Unit Controller • Long, 32 or 64-bit
0629	5758	See feature 5758 later in the table for a description.
0630	5713	See feature 5713 later in the table for a description. 5713 can be used with both AIX and Linux. 0630 is for use with Linux only.
0631	5714	See feature 5714 later in the table for a description. 5714 can be used with both AIX and Linux. 0631 is for use with Linux only.
0632	2738	2 Port USB PCI Adapter • Short, 32-bit, 3.3 or 5V

Table 5. AIX and Linux PCI and PCI-X adapters (continued)

Feature	CCIN	Description
0633	2849	POWER® GXT135P Graphics Accelerator with Digital Support • Short, 32-bit, 3.3V
0634		128-port ASYNC Adapter • Short, 32-bit, 3.3 or 5V
0635		SDLC/X.25 - 2-port Adapter • Short, 32-bit, 3.3 or 5V
0645	5702	Direct Attach-5702: PCI-X Ultra Tape Controller • Short, 64-bit, 133 MHz • High bandwidth
0646	280B	2 Gigabit Fibre Channel PCI-X Adapter • Short, 32 or 64-bit, 3.3 or 5V • High bandwidth • Not allowed in slot 1 or 6 of the 0595 or 5095 expansion units
0647	571A	Direct Attach-5736: PCI-X Dual Channel Ultra320 SCSI Adapter • Short, 32 or 64-bit, 3.3V • EEH Supported • Extra-high bandwidth if used with disks
0648	571B	Direct Attach-5736: PCI-X Dual Channel Ultra320 SCSI Raid Adapter • Long, 32 or 64-bit, 3.3V • EEH Supported • Extra-high Bandwidth
0649	571E 574F	Direct Attach-5583: PCI-X Dual Channel Ultra320 SCSI Raid Adapter with Auxiliary Write Cache IOA • Long, 133 MHz, 32 or 64-bit, 3.3V • For use with AIX only • For more information about this adapter and slot restrictions, see “SCSI RAID controller restrictions” on page 18 and “High-performance SCSI, disk controller placement” on page 28
0650 0651	571F 575B	PCI-X Dual Channel Ultra320 SCSI Raid Adapter with Auxiliary write cache (double-wide) • Long, 64-bit, 3.3V, 266 MHz • Dual-mode capable adapter • EEH Supported • Extra-high bandwidth • For more information about this adapter and slot restrictions, see “SCSI RAID controller restrictions” on page 18 and “High-performance SCSI, disk controller placement” on page 28.
0655	5759	4 Gbps Fibre Channel (2-Port) • Short, 64-bit, 3.3V • High bandwidth
2732		PCI Serial HIPPI Adapter • Long, 32-bit, 3.3 or 5 V
2737	N-D	Keyboard or mouse attachment adapter • Short, 32-bit, 3.3 or 5V

Table 5. AIX and Linux PCI and PCI-X adapters (continued)

Feature	CCIN	Description
2848	I-X	POWER GXT135P Graphics Accelerator with Digital Support • Short, 32-bit, 3.3 or 5V
2943		8-Port ASYNC Adapter • Short, 32-bit, 3.3 or 5V
2944	3-C	128-Port Asynchronous Controller, PCI bus • Short, 32-bit, 3.3 or 5V • No Linux support
2946		PCI 622 Mbs ATM Fiber Adapter • Short, 64-bit, 3.3 or 5V
2947		PCI Multiprotocol Adapter • Long, 32-bit, 3.3 or 5V
5700	5700	Gigabit Ethernet-SX PCI-X Adapter • Short, 32 or 64-bit, 3.3 or 5V • High bandwidth
5701	5701	10/100/1000 Base-TX Ethernet PCI-X Adapter • Short, 32 or 64-bit, 3.3 or 5V • High bandwidth
5706 5707	5706 5707	2-Port 10/100/1000 Base-TX Ethernet PCI-X Adapter 2-Port Gigabit Ethernet-SX PCI-X Adapter • Short, 64-bit, 3.3 or 5 V • High Bandwidth • Place in 64-bit PCI-X slot if available
5713 5714	5713 5714	1 Gigabit-TX iSCSI TOE PCI-X Adapter 1 Gigabit-SX iSCSI TOE PCI-X Adapter • Short, 32 or 64-bit, 3.3 or 5V • High bandwidth
5718	5718	10 Gbps Ethernet IOA (short) • Short, 32 or 64-bit, 3.3V • Extra-high bandwidth
5719	5719	10 Gbps Ethernet IOA (long) • Short, 32 or 64-bit, 3.3V • Extra-high bandwidth

Table 5. AIX and Linux PCI and PCI-X adapters (continued)

Feature	CCIN	Description
5721 5722	573A 576A	10 Gb Ethernet-SR PCI-X 2.0 DDR Adapter 10 Gb Ethernet-LR PCI-X 2.0 DDR Adapter • Short, 64-bit, 3.3V • Extra-high bandwidth • None allowed in PCI slot (PCI-X is acceptable) • None allowed in 32 bit slot • Maximum of 2 adapters per PHB • For best performance, do not combine other extra-high or high bandwidth adapters in the same PHB. • Place in slots 5-9 when the adapter is used in one of these expansion units: 5094, 5294, 0588, 5088, 0694, 8294, or 9194. • Recommended in DDR slot. • Maximum of 6 per RIO HSL-2 loop. • Maximum of 3 per HSL loop. • Maximum or near maximum quantity of adapters assumes some adapters are for backup or are running at reduced capacity. • If an AIX or Linux partition is used in the same PHB, then 5718 or 5719 are not supported with the 5721/5722.
5723	5723	2-Port EIA-232 Asynch PCI Adapter • Short, 32 or 64-bit, 3.3 or 5V
5736	5736	PCI-X DDR 2.0 Dual Channel Ultra320 SCSI Adapter • Short, 32 to 64-bit, 3.3V • High bandwidth
5737	5737	PCI-X Dual Channel Ultra320 SCSI Raid- 2.0 DDR Adapter • Long, 64-bit, 3.3V • High bandwidth • Must be mirrored in order to be supported
5740	5740	4-Port 10/100/1000 Base-TX PCI-X Adapter • Short, 64-bit, 3.3V • High bandwidth
5758	5758	4 Gb Single-Port Fibre Channel PCI-X 2.0 DDR Adapter • Short, 64-bit, 3.3V • Extra-high bandwidth
5759	5759	4 Gb Dual-Port Fibre Channel PCI-X 2.0 DDR Adapter • Short, 64-bit, 3.3V • High bandwidth

AIX and Linux PCIe adapters

See the following table to learn about adapters that can by used on Power Systems models running the AIX and Linux operating system.

Table 6. AIX and Linux PCIe adapters

Feature	CCIN	Description
2893	576C	PCI Express 2-Line WAN with Modem • Linux only • Short, x4 • Non CIM
2894	576C	PCI Express 2-Line WAN with Modem • Linux only • Short, x4 • CIM
5717	5717	4-port 10/100/1000 Base-TX Ethernet PCI Express Adapter • Short, x4 • High bandwidth
5767	5767	2-Port 10/100/1000 Base-TX PCI Express Adapter • Short, x4 • High bandwidth
5768	5768	2- port Gigabit Ethernet-SX PCI Express Adapter • Short, x4 • Extra-high bandwidth
5773	5773	4 Gigabit PCI Express Single Port Fibre Channel Adapter • Short, x4 • Extra-high bandwidth
5774	5774	4 Gb Fibre Channel 2-Port Adapter • Short, x4 • Extra-high bandwidth

Related reference

"High-performance SCSI, disk controller placement" on page 28
Determine which PCI slots can accommodate the 2780, 5580, 5582, 5583, 5590, 5738, 5739, 5746, 5777, 5778, 5781, 5782, 5799, and 5800 SCSI controllers on machine type 940*x* models and associated I/O expansion units.

Chapter 4. Determining the best place to install an adapter

Determine the best place to install an adapter in IBM Power Systems models that contain the POWER6 processor, and their associated I/O expansion units.

Finding your current system configuration in IBM i

You can use the system service tools (SST) or the Hardware Management Console (HMC) to find your current system configuration in the i operating system.

Before you begin, you need to know the location codes that are used for the PCI adapter slots on the system with which you are working. To look up the location codes, see the reference information for the system unit:

- "9406-MMA system unit" on page 33
- "9407-M15 and 9408-M25 system units" on page 34
- "9409-M50 system unit" on page 35

If the partition is managed by a Hardware Management Console (HMC), use the HMC to determine what hardware is installed in the system, and which partitions are using which slots.

To view the I/O configuration on the HMC, the managed system must be in Operating or Standby state.

To view the I/O configuration for a managed system, do the following steps:

1. In the navigation area, expand **Systems Management**.
2. Select **Servers**.
3. In the contents area, select the server.
4. Select **Properties**.
5. Click the **I/O** tab. The physical I/O resources for the managed system are displayed.

For more information about using the HMC, see the online help in the HMC interface.

If your system is not managed by an HMC, use the SST in the i operating system to find the current system configuration for a partition.

Note: The SST will provide information for the partition on which the tools are running. The tools do not provide accurate information for slots that are not owned by the partition.

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

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

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

Placing adapters in the system unit

Select an available slot by using the reference information for the system unit.

The following list identifies that system units covered in this topic:

- "9406-MMA system unit" on page 33
- "9407-M15 and 9408-M25 system units" on page 34
- "9409-M50 system unit" on page 35

Placing an adapter in an expansion unit

Learn about installing adapters in expansion units connected to IBM Power Systems models that contain the POWER6 processor.

If you are installing an IOPless adapter, see the section "IOPless adapters." If you are installing an IOP adapter, see the section "IOP adapters."

Note: When more then 50% of a loop is used for the AIX operating system, follow the System p configuration rules for that loop. One of these rules is to limit the number of I/O expansion units to 4 per loop. For more information about these rules, see the PCI adapter placement for machine types 82xx and 91xx. For model 9406-MMA, see the rules for model 9117-MMA. For models 9407-M15 and 9408-M25, see the rules for model 8203-E4A. For model 9409-M50, see the rules for model 8204-E8A.

IOPless adapters

To install an IOPless adapter, select an available slot by using Chapter 5, "Configuration tables for system units and expansion units," on page 33.

IOP adapters

Use these instructions to determine where to place IOP adapters in expansion units attached to the 940*x* servers. The internal PCI-X DDR and PCIe slots on machine type 940*x* servers are designed for IOPless adapters. IOP adapters, and IOA adapters that require an IOP adapter, are not supported in the internal slots..

When going through the following steps, refer to the "Examples of IOP placement tables" on page 27 to determine the best place to install or move your IOA, using the adapter information in the Chapter 5, "Configuration tables for system units and expansion units," on page 33.

Follow these steps:

1. Use "IOP PCI adapters" on page 7 to locate the values of your current configuration, then continue to the next step.

   Note:

   a. You can install the IOP in any adapter position labeled **IOP**. For the IOP locations, refer to the expansion units listed in Chapter 5, "Configuration tables for system units and expansion units," on page 33.
   b. You might need to move an IOA to install your IOP.
   c. By installing an IOP, you are creating a new IOP adapter group.
   d. IOPs cannot be placed in consecutive positions.
2. Locate the first IOP (2843, 2844, or 2847).
3. Determine the IOAs controlled by the IOP (IOP adapter group).
   - An IOP adapter group is an IOP and all IOAs controlled by that IOP.
   - IOP adapter groups cannot cross PCI bridge set boundaries. To identify the PCI bridge set boundaries, refer to the Chapter 5, "Configuration tables for system units and expansion units," on page 33.
4. Locate the first IOP adapter group that has an empty position.
5. Find and enter (on the placement table) the values of each IOA that is currently installed in this IOP adapter group that has an empty position. Use Table 3 on page 8 to find the values.
6. Install the new adapter in the next available position in the IOP adapter group.

   Do not leave open positions if possible. You should try to not move your console position.
7. Write down the feature number or CCIN of the new adapter in the table.
8. Find and enter the values of the new adapter in the placement table.
9. Add together the IOA *Memory Values* and record it in the *IOA totals*.
10. Add together the IOA *Performance Values* and record it in the *IOA totals*.
11. If the totals are not greater than the value of the IOP for that adapter group, verify the restrictions, such as adapter length, to make sure the adapter can be installed in the empty position. If the restrictions are not met, choose another empty position and repeat the process. Otherwise, you are ready to install the new adapter in that empty position.
12. If the totals are greater than either IOP adapter value, move to the next available IOP adapter group that has an empty adapter position and repeat the steps to complete another placement worksheet.

Examples of IOP placement tables

Use one worksheet for each IOP in all of your units.

Table 7. 2843 IOP

IOP adapter group	Adapter position	Feature number or CCIN number from type column	Memory value	Performance value
	C	**2843**	**211**	**100**
	C			
	C			
	C			
	C			
	IOA totals			

Table 8. 2844 IOP

IOP adapter group	Adapter position	Feature number or CCIN number from type column	Memory value	Performance value
	C	**2844**	**211**	**100**
	C			
	C			
	C			
	C			
	IOA totals			

IOP adapter group	Adapter position	Feature number or CCIN number from adapter position
	C	
	C	
	C	
	C	

High-performance SCSI, disk controller placement

Determine which PCI slots can accommodate the 2780, 5580, 5582, 5583, 5590, 5738, 5739, 5746, 5777, 5778, 5781, 5782, 5799, and 5800 SCSI controllers on machine type 940*x* models and associated I/O expansion units.

Overview and prerequisites

This section provides special placement information for the SCSI controllers and auxiliary-write cache adapters listed in Table 9 on page 29.

If you are installing a new feature, ensure that you have the software required to support the new feature and that you determine if there are any existing PTF prerequisites. To do this, use the IBM Prerequisite Web site at http://www-912.ibm.com/e_dir/eServerPrereq.nsf .

Use the list in Table 9 on page 29 to cross-reference adapter feature codes with their CCIN numbers and descriptions. See also the adapter tables in Chapter 3, “Supported adapters,” on page 7 for more detailed descriptions, notes, and restrictions for these adapters.

Then go to one of the following system or expansion unit tables to determine which PCI slots can accommodate these adapters.

- “5094 or 5294 expansion unit” on page 29
- “5096 or 5296 expansion unit” on page 30
- “5088 or 0588 expansion unit” on page 30
- “5095 or 0595 expansion unit” on page 30
- “5790 expansion unit” on page 31
- “5796 expansion unit” on page 31
- “9406-MMA system unit” on page 31
- “9407-M15 and 9408-M25 system units” on page 31
- “9409-M50 system units” on page 32

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

Table 9. High performance SCSI controllers.

Feature codes	CCIN numbers	Description	Variables
2780	2780	PCI-X Ultra 4 RAID Disk Unit Controller	IOP controlled
5580, 5590	2780 and 574F	2780 Disk Controller with a secondary, auxiliary-write cache IOA	IOP controlled
5738	571E	PCI-X Ultra320 SCSI Disk Controller	IOP controlled
5582	571E and 574F	5738 Disk Controller with a secondary, auxiliary-write cache IOA	IOP controlled
5777	571E	PCI-X Ultra320 SCSI Disk Controller	IOPless
5583	571E and 574F	5777 Disk Controller with a secondary, auxiliary-write cache IOA	IOPless
5739, 5746, 5781, 5799	571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache Double-wide adapter. 571F is the controller. 575B is the auxiliary-write cache.	IOP controlled
5778, 5782, 5800	571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache Double-wide adapter. 571F is the controller. 575B is the auxiliary-write cache.	IOPless
0650, 0651	571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache Double-wide adapter. 571F is the controller. 575B is the auxiliary-write cache.	Direct attach

5094 or 5294 expansion unit

Adapters are supported in the slots shown in the Allowed slots column.

CCIN numbers	Description	Variables	Allowed slots
2780	PCI-X Ultra 4 RAID Disk Unit Controller	IOP controlled	2, 3, 4, 6, 7, 8, 9, 12, 13, 14, 15
		AIX or Linux controlled	2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15
574F	Auxiliary-Write Cache IOA	IOP controlled	2, 3, 4, 6, 7, 8, 9, 12, 13, 14, 15
		IOPless or direct attach	1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15
571E	PCI-X Ultra320 SCSI Disk Controller	IOP controlled	3, 6, 7, 8, 9
		IOPless or direct attach	1, 3, 5, 6, 7, 8, 9
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	**2**, 3, 4, **8**, 9
		IOPless double-wide*	**1**, 2, 3, 4, **5**, 6, **8**, 9
* Double-wide adapter, requires 2 adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. Slots with **bold** numbers can be used for the SCSI controller side of the adapter. Slots where the number is underlined can be used for either side of the adapter. The remaining slot numbers can be used for the cache side (575B) of the adapter.			

5096 or 5296 expansion unit

The 2780, 574F, and 571E adapters are not supported on the 5096 or 5296.

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

CCIN numbers	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	**2**, 3, 4, **8**, 9
		IOPless double-wide*	**1**, 2, 3, 4, **5**, 6, **8**, 9
* Double-wide adapter, requires 2 adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. Slots with **bold** numbers can be used for the SCSI controller side of the adapter. Slots where the number is underlined can be used for either side of the adapter. The remaining slot numbers can be used for the cache side (575B) of the adapter.			

5088 or 0588 expansion unit

The 2780, 574F, and 571E adapters are not supported on the 5088 or 0588.

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

CCIN numbers	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	**8**, 9
		IOPless double-wide*	**8**, 9
* Double-wide adapter, requires 2 adjacent slots. The SCSI controller side of the adapter pair can be placed in slot 8. The cache side of the adapter would then go in slot 9.			

5095 or 0595 expansion unit

The following adapters are supported in the slots shown in the Allowed slots column.

CCIN numbers	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	**2**, 3, 4
		IOPless double-wide*	**1**, 2, 3, 4
571E	PCI-X Ultra320 SCSI Disk Controller Maximum of one 571E	IOP controlled	2, 3, 4
		IOPless or direct attach	1, 2, 3, 4
2780	PCI-X Ultra 4 RAID Disk Unit Controller	IOP controlled	2, 3, 4, 7, 8
		AIX or Linux controlled	1, 2, 3, 4, 6, 7, 8
574F	Auxiliary-Write Cache IOA	IOP controlled	2, 3, 4, 7, 8
		IOPless or direct attach	1, 2, 3, 4, 6, 7, 8
* Double-wide adapter, requires 2 adjacent slots. Slots with **bold** numbers can be used for the SCSI controller side of the adapter. Slots where the number is underlined can be used for either side of the adapter. The remaining slot numbers can be used for the cache side (575B) of the adapter.			

5790 expansion unit

The 2780, 574F, and 571E adapters are not supported on the 5790.

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

CCIN numbers	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOP controlled double-wide*	**2**, 3, **6**, 7
		IOPless double-wide*	**1**, 2, 3 **5**, 6, 7
* Double-wide adapter, requires 2 adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. Slots with **bold** numbers can be used for the SCSI controller side (571F) of the adapter. Slots where the number is underlined can be used for either side of the adapter. The remaining slot numbers can be used for the cache side (575B) of the adapter.			

5796 expansion unit

The 2780, 574F, and 571E adapters are not supported on the 5796.

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

CCIN numbers	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOPless double-wide*	**1**, 2, 3, **4**, 5, 6
* Double-wide adapter, requires 2 adjacent slots. The SCSI controller side of the adapter pair requires a 64-bit slot. Slots with **bold** numbers can be used for the SCSI controller side (571F) of the adapter. Slots where the number is underlined can be used for either side of the adapter. The remaining slot numbers can be used for the cache side (575B) of the adapter.			

9406-MMA system unit

The 2780, 574F, and 571E adapters are not supported in the 9406-MMA.

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

CCIN numbers	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOPless double-wide*	**4**, 5
* Double-wide adapter, requires 2 adjacent slots. Slot 4 can be used for the SCSI controller side (571F) of the adapter. Slot 5 number can be used for the cache side (575B) of the adapter.			

9407-M15 and 9408-M25 system units

The 2780, 574F, and 571E adapters are not supported in the 9407-M15 and 9408-M25.

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

CCIN numbers	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOPless double-wide*	**4**, 5

CCIN numbers	Description	Variables	Allowed slots
* Double-wide adapter, requires 2 adjacent slots. Slot 4 can be used for the SCSI controller side (571F) of the adapter. Slot 5 number can be used for the cache side (575B) of the adapter.			

9409-M50 system units

The 2780, 574F, and 571E adapters are not supported in the 9409-M50.

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

CCIN numbers	Description	Variables	Allowed slots
571F and 575B	PCI-X Ultra320 SCSI Disk Controller with auxiliary-write cache	IOPless double-wide*	**4**, 5
* Double-wide adapter, requires 2 adjacent slots. Slot 4 can be used for the SCSI controller side (571F) of the adapter. Slot 5 number can be used for the cache side (575B) of the adapter.			

Related tasks

Installing PCI adapters
Find instructions for installing, removing, and replacing PCI adapters.

Related reference

IBM Prerequisite Web page
Find prerequisite information for features you currently have or plan to add to your system.

Managing PCI adapters
Find specifications, instructions, and part numbers for specific adapters.

"IBM i PCI adapters" on page 8
Learn about which PCI, PCI-X, and PCIe adapters are supported on IBM Power Systems models running the i operating system.

"AIX and Linux PCI adapters" on page 19
Learn about PCI adapters supported on IBM Power Systems models running the AIX and Linux operating systems.

Chapter 5. Configuration tables for system units and expansion units

Identify the types of PCI slots that are available in IBM Power Systems servers that contain the POWER6 processor and associated I/O expansion units.

9406-MMA system unit

Identify the types of Peripheral Component Interconnect-X (PCI-X) double data rate (DDR) and PCI Express (PCIe) slots that are available in the 9406-MMA.

Related tasks

Installing PCI adapters
Find instructions for installing, removing, and replacing PCI adapters.

Related reference

IBM Prerequisite Web page
Find prerequisite information for features you currently have or plan to add to your system.

Managing PCI adapters
Find specifications, instructions, and part numbers for specific adapters.

PCI slot descriptions

Figure 2 shows the back view of the system unit enclosure with the location codes for the PCIe, PCI-X DDR and GX+ slots. Table 10 describes the slots. There are two PCI host bridges (PHBs), one for the PCI-X DDR slots, and one for the PCIe slots. Each PCI-X DDR or PCIe slot connects directly to the PHB.

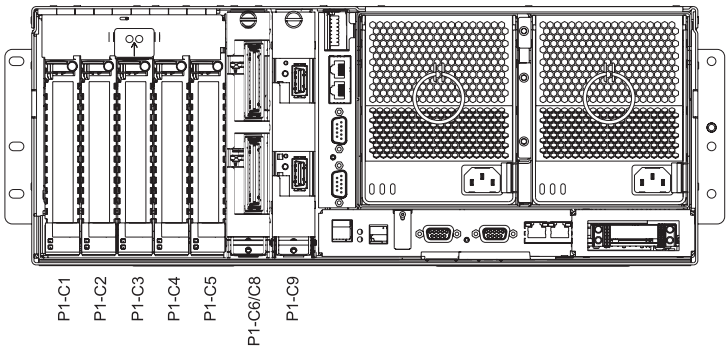


Figure 2. Back view of enclosure with location codes

Table 10. Slot locations and descriptions

Slot number	Location code	Description	PHB	Adapter size
Slot 1	P1-C1	PCIe x8	PCIe PHB-A	Long
Slot 2	P1-C2	PCIe x8	PCIe PHB-A	Long
Slot 3	P1-C3	PCIe x8	PCIe PHB-A	Long
Slot 4	P1-C4	PCI-X DDR, 64-bit, 266 MHz	PCI-X PHB-B	Long
Slot 5	P1-C5	PCI-X DDR, 64-bit, 266 MHz	PCI-X PHB-B	Long

Table 10. Slot locations and descriptions (continued)

Slot number	Location code	Description	PHB	Adapter size
Slot 6	P1-C6	PCIe x8	PCIe PHB-A	Short
	P1-C8	GX+	NA	NA
Slot 7	P1-C9	GX+	NA	NA

- Slot 6 can be used for either a PCIe x8 adapter in connector P1-C6, or a GX+ adapter in connector P1-C8.
- All slots support enhanced error handling (EEH).
- This system uses generation 3, blind swap cassettes to manage the installation and removal of adapters. Cassettes can be installed and removed without removing the drawer from the rack. Because of the cassettes, internal SCSI connectors on PCI storage adapters are not supported for use in this system.

9407-M15 and 9408-M25 system units

Identify the types of Peripheral Component Interconnect-X (PCI-X) double data rate (DDR) and PCI Express (PCIe) slots that are available in the 9407-M15 and 9408-M25 system units.

PCI slot descriptions

Figure 3 shows the back view of the system unit enclosure with the location codes for the PCI and GX+ slots. Table 11 describes the slots. Each PCI-X DDR or PCIe slot is a separate PCI host bridge (PHB).

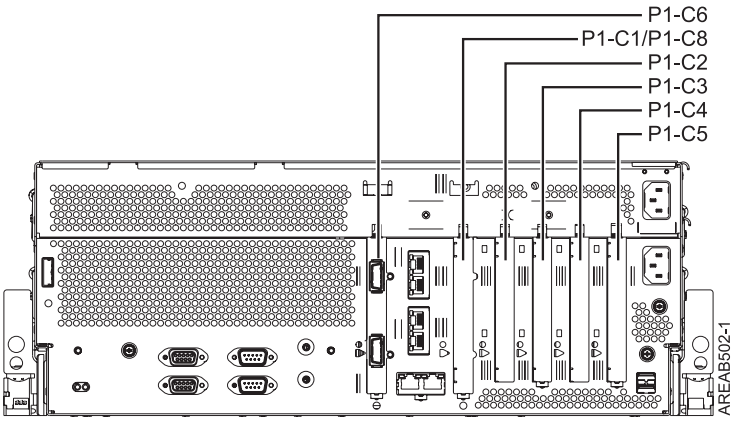


Figure 3. Back view of enclosure with location codes

Table 11. PCI slot locations and descriptions

Slot number	Location code	Description	PHB	Adapter size
Slot 1	P1-C1	PCIe x8	PCIe PHB0	Short
	P1-C8	GX+		
Slot 2	P1-C2	PCIe x8	PCIe PHB1	Long
Slot 3	P1-C3	PCIe x8	PCIe PHB3	Long
Slot 4	P1-C4	PCI-X DDR, 64-bit, 266 MHz	PCI-X PHB0	Long
Slot 5	P1-C5	PCI-X DDR, 64-bit, 266 MHz	PCI-X PHB1	Long
	P1-C6	GX+		

Table 11. PCI slot locations and descriptions (continued)

Slot number	Location code	Description	PHB	Adapter size
• Slot 1 can be used for either a PCIe x8 adapter in connector P1-C1 or a GX+ adapter in connector P1-C8. • P1-C6 is a 2-port, GX+ or GX++ adapter. This feature is only available on 4-core systems. • All PCIe and PCI-X slots support enhanced error handling (EEH).				

Related tasks

Installing PCI adapters
Find instructions for installing, removing, and replacing PCI adapters.

Related reference

IBM Prerequisite Web page
Find prerequisite information for features you currently have or plan to add to your system.

Managing PCI adapters
Find specifications, instructions, and part numbers for specific adapters.

9409-M50 system unit

Identify the types of Peripheral Component Interconnect-X (PCI-X) double data rate (DDR) and PCI Express (PCIe) slots that are available in the 9409-M50.

Related tasks

Installing PCI adapters
Find instructions for installing, removing, and replacing PCI adapters.

Related reference

IBM Prerequisite Web page
Find prerequisite information for features you currently have or plan to add to your system.

Managing PCI adapters
Find specifications, instructions, and part numbers for specific adapters.

PCI slot descriptions

Figure 4 on page 36 shows the back view of the system unit enclosure with the location codes for the PCI and GX+ slots. Table 12 on page 36 describes the slots. Each PCI-X DDR or PCIe slot is a separate PCI host bridge (PHB).

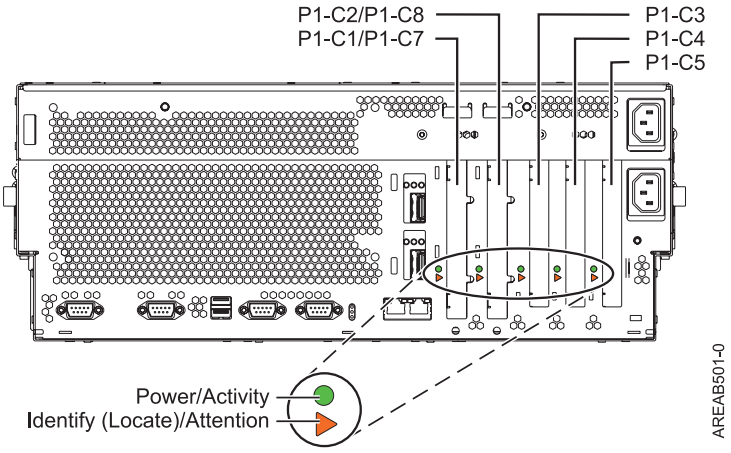


Figure 4. Back view of enclosure with location codes

Table 12. PCI slot locations and descriptions

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

- Slot 1 can be used for either a PCIe x8 adapter in connector P1-C1 or a GX+ adapter in connector P1-C7.
- Slot 2 can be used for either a PCIe x8 adapter in connector P1-C2 or a GX+ adapter in connector P1-C8.
- All slots support enhanced error handling (EEH).

Model 5088 or 0588 expansion units

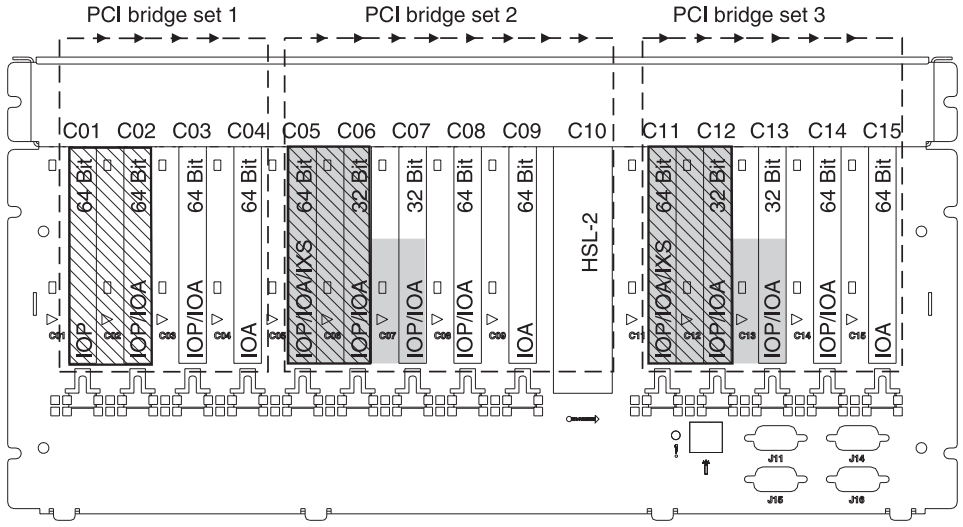
Some adapters must be placed in specific Peripheral Component Interconnect-X (PCI-X) slots to function correctly or perform optimally. Use this information to determine where to install PCI and PCI-X adapters.

The 5088 or 0588 are 19-inch, I/O expansion units.

Configuration notes:

- The second PCI-X bridge set is designed for higher performance than the first and third PCI-X bridge sets. Place the highest bandwidth adapters in the second PCI-X bridge set.
- Maximum of 3 IXS (CCIN 4812) per expansion unit.
- IOPs control IOAs in the direction of the arrows in the PCI-X bridge sets.

  Resource name: _____



= Positions occupied if 2890, 2891, or 2899 IXS is installed

= Positions occupied if 2892 or 4810 IXS is installed

Note: Long or short feature cards can go in any position.

Position	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15
Type										HSL-2					

IPHAK801-1

Model 5094, 5096, 5294, 5296, 8294 and 9194 expansion units

Some adapters must be placed in specific Peripheral Component Interconnect-X (PCI-X) slots to function correctly or perform optimally. Use this information to determine where to install PCI and PCI-X adapters.

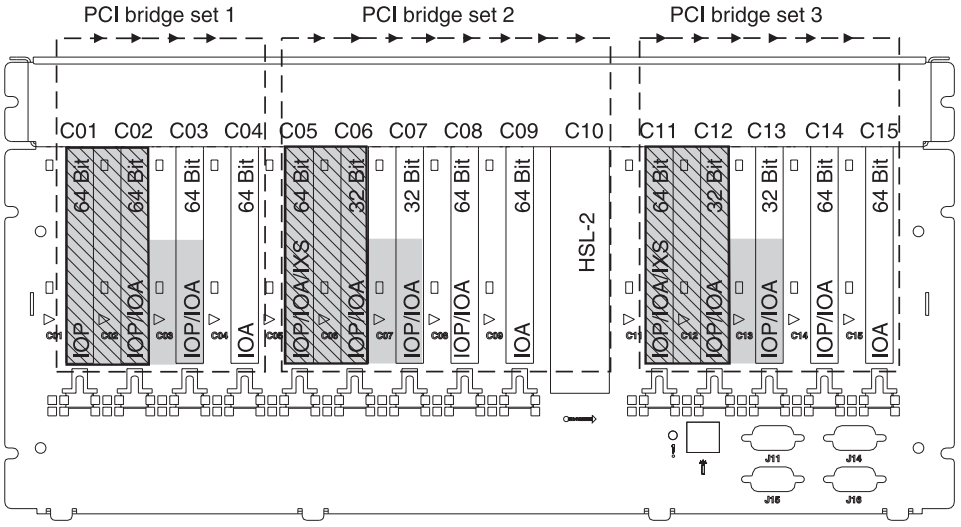
You need one diagram for each expansion unit that is attached to the system unit. Copy the diagram for your use.

Configuration notes:

- The second PCI-X bridge set is designed for higher performance than the first and third PCI-X bridge sets. Place the highest bandwidth adapters in the second PCI-X bridge set.
- The 5294, 5296, and 8294 are two units in a 1.8 meter tower. The diagram below shows one unit.
- In a 5094, 5294, 8294, or 9194, place the first disk unit controller adapter in position C02, C03, C04, C05, C06, C07, C08, or C09.
- The 5096 and 5296 do not support internal disks, internal media devices, or internal only disk and media adapters.
- There is a maximum of 3 IXS (CCIN 4812) per expansion unit.
- IOPs control IOAs in the direction of the arrows in the PCI-X bridge sets.

Resource name: _____

Important: Cooling fans and fan flaps are located at the back of the PCI-X adapter area. To ensure proper cooling, arrange the PCI-X adapter cables (if applicable) to allow air to circulate within the PCI-X adapter area. Do not place adapter cables too close to the fan vents, and do not bunch cables together in way that blocks airflow around the PCI-X adapters.



= Positions occupied if 2890, 2891, or 2899 IXS is installed

= Positions occupied if 2892 or 4810 IXS is installed

Note: Long or short feature cards can go in any position.

Position	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15
Type										HSL-2					

IPHAK802-0

Model 0595 or 5095 expansion units

Some adapters must be placed in specific Peripheral Component Interconnect-X (PCI-X) slots to function correctly or perform optimally. Use this information to determine where to install PCI and PCI-X adapters.

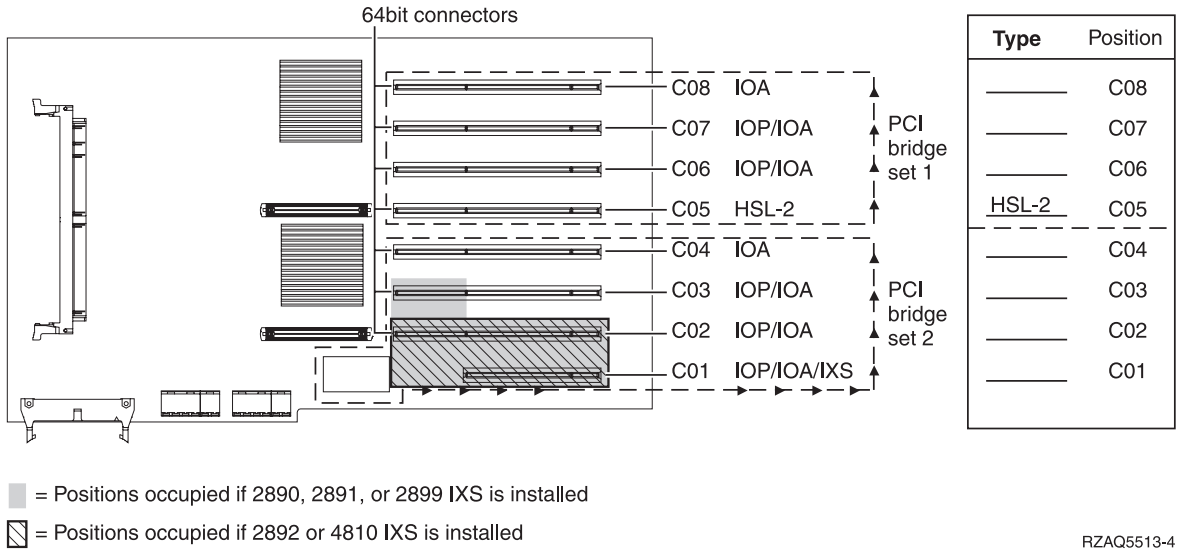
The 0595 and 5095 are 19-inch, I/O expansion units.

You need one diagram for each expansion unit that is attached to the system unit. Copy the diagram for your use.

Configuration notes:

- IOPs control IOAs in the direction of the arrows in the PCI-X bridge set.
- SCSI in the diagram indicates the disk unit controller position.

  Resource name: _____



Model 5790 expansion unit

Some adapters must be placed in specific Peripheral Component Interconnect-X (PCI-X) slots to function correctly or perform optimally. Use this information to determine where to install PCI and PCI-X adapters.

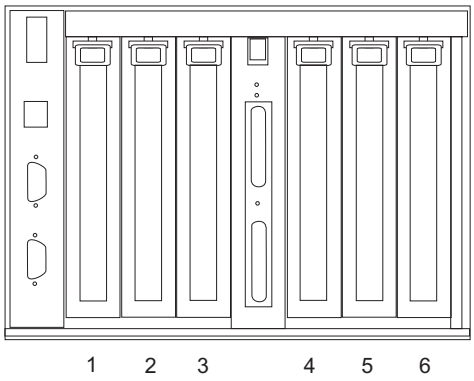
The 5790 is a 19-inch, four EIA unit I/O expansion drawer that provides six full length, 64-bit, 3.3-V, 133 MHz hot-plug PCI-X slots. The I/O Expansion drawer is attached to the system using a RIO-2 bus interface adapter. The 5790 includes redundant concurrently maintainable power and cooling and the blind swap PCI mechanism allows for PCI card servicing without removing the I/O expansion drawer The 5790 mounts in a 19-inch rack using a 7307 Dual I/O Unit Enclosure or a 7311 Dual I/O Unit Enclosure. Two 5790 drawers can be mounted side by side in a single 7307 or 7311 and are not required to be attached to the same system

You need one diagram for each expansion unit that is attached to the system unit. Copy the diagram for your use.

Configuration notes:

- IOPs control IOAs in the direction of slots 1 → 3, and 4→ 6.

  Resource name: _____



- The following table shows the slot properties and PHB connections.

Table 13. Slot location descriptions

PHB1			PHB2		
Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
Long	Long	Long	Long	Long	Long
64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz	64-bit 3.3V, 133 MHz
Un-P1-C1	Un-P1-C2	Un-P1-C3	Un-P1-C4	Un-P1-C5	Un-P1-C6

- Slots C1 through C6 are compatible with PCI, PCI-X, and PCI-X DDR adapters. PCI-X DDR would operate at PCI-X speeds.
- Short adapters can go in short or long slots.

Model 5796 expansion unit

Learn about the PCI-X DDR slots in the 5796 expansion unit.

System description

The 5796 expansion unit is a rack-mountable, I/O expansion drawer that is designed to be attached to the system unit using the 12X Channel bus and 12X cables. There is a limit of four 5796 per 12X loop. The 5796 can accommodate 6, Generation 3 blind swap adapter cassettes. Cassettes can be installed and removed without removing the drawer from the rack. The 5796 does not support I/O processor (IOP) adapters.

The following figure shows the back view of the expansion unit.

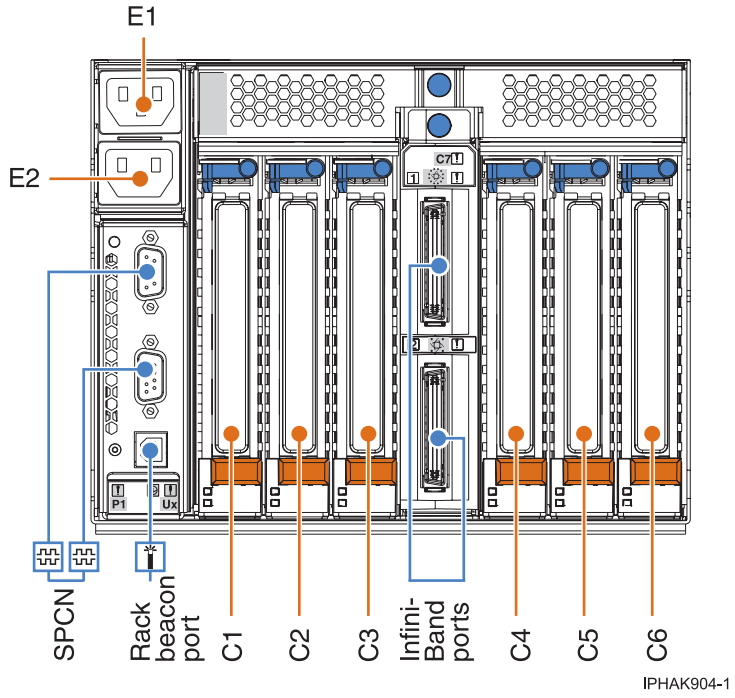


Figure 5. Back view

Table 14 describes the location codes that are shown in Figure 5 on page 40.

Table 14. Location code descriptions

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

PCI-X DDR slot descriptions

The following table describes the PCI-X DDR slots.

Table 15. PCI-X DDR slot properties

PHB-A1	PHB-A2	PHB-A3	PHB-B2	PHB-B2	PHB-B3
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
• There are two I/O chips, each with three PCI host busses (PHB)s. Each PCI-X DDR slot connects directly to a PHB • All slots are compatible with PCI, PCI-X and PCI-X DDR adapters. • Short adapters can go in long slots.					

Slot priority

The slot priority for all adapters is 1, 4, 2, 5, 3, and 6.

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

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

VCCI Statement - Japan

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

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

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

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

高調波ガイドライン適合品

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

高調波ガイドライン準用品

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

声　明

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

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

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者：
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

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

IBM Taiwan Contact Information:

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

Electromagnetic Interference (EMI) Statement - Korea

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Please note that this equipment has obtained EMC registration for commercial use. In the event that it has been mistakenly sold or purchased, please exchange it for equipment certified for home use.

Germany Compliance Statement

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

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

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

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:
"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

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

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

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

Verantwortlich für die Konformitätserklärung nach des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.

Generelle Informationen:

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

Electromagnetic Interference (EMI) Statement - Russia

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

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