

ESCALA

Expansion Units and Disk-Drive Enclosures



REFERENCE
86 A1 60EW 03

ESCALA

Expansion Units and Disk- Drive Enclosures

Hardware

November 2008

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49008 ANGERS CEDEX 01
FRANCE

REFERENCE
86 A1 60EW 03

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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

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 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 metalically 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 metalically 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.

Part 1. Enclosures and Expansion Units

You can attach your expansion units to system units using either remote input/output (RIO), also known as high-speed link (HSL), adapters (RIO), or GX Dual-Port 12X Channel Attach adapters (12X adapter's).

Note: The terms *enclosure* and *expansion unit* are synonymous with each other.

Note: You can add your expansion units concurrently. This means you can add or install the expansion units with the server at firmware running state. Active partitions do not have to be shut down. Only in the following situations must the server be shut down (powered off) to add expansion units:

- The expansion units are being added to a server that is not managed by an Hardware Management Console (HMC).
- GX adapters (I/O hub cards) must be added to accommodate the new expansion units.
- The existing RIO/HSL fabric must be redistributed across the GX adapters to accommodate the new expansion units as determined in the planning steps for adding the expansion units.

RIO configuration changes, such as moving existing expansion units to different GX adapters, should not be performed at the same time as adding new expansion units. If these two tasks must be performed, first make configuration changes involving existing expansion units with server power off. After the configuration changes are complete, power on the server to firmware standby or running state and add the new expansion units using this procedure.

The following expansion units are available:

- 11D/11 or 11D/20
- 14G/30

Chapter 1. Preparing to connect your expansion units

Use this information to plan the cable layout and to learn the configuration rules.

About this task

This topic collection provides information about connecting your expansion units with Remote Input/Output (High Speed Link) (RIO), GX Dual-Port 12X Channel Attach adapter (12X) cables, and system power control network (SPCN) cables. This is a customer task. You can perform this task yourself or contact a service provider for this service.

You should be familiar with the system, display, and keyboards. In addition, you will need to know how to shut down and perform a system initial program load (power on), and how to shut down system peripheral devices such as printers, monitors, and PCs.

To prepare to connect the expansion units, complete the following tasks:

1. "Where to install new expansion units."
2. Unpack the expansion units by using the unpacking instructions.
3. "RIO, GX Dual-Port 12X Channel Attach adapter, and SPCN cable identification."
4. "Cable layout options" on page 4.
5. Continue with Chapter 2, "Connecting your expansion units," on page 9.

Where to install new expansion units

Before you begin the installation process, plan where you will install the new expansion units.

Consider several elements that include size, security, and environmental factors. For more information, refer to the Site preparation and physical planning.

If you plan to install your expansion unit in a rack, refer to Installing systems and expansion units into a rack. To view the PDF file of Installing systems and expansion units into a rack, approximately 12 MB in size, see [oemiphbf.pdf](#) .

Note: If you are installing an expansion unit that uses a 12X communications adapter, the part number of the 12X adapter will determine where you can install the expansion unit:

- The Short Run GX Dual-Port 12X Channel Attach adapter (FC 6446) *does not contain* a repeater and requires the use of shorter cables. An expansion unit containing this adapter must be placed in the same rack as the system unit.
- The Long Run GX Dual-Port 12X Channel Attach adapter (FC 6457) *contains* a repeater and allows the use of longer cables. An expansion unit containing this adapter can be placed in a different rack than the system unit.

RIO, GX Dual-Port 12X Channel Attach adapter, and SPCN cable identification

You might need to identify the RIO, GX Dual-Port 12X Channel Attach adapter (12X) cables, and SPCN cables for the expansion unit. This section includes reference tables for these types of cables.

The system uses RIO and 12X cables to send and receive customer data and auxiliary control information to and from the expansion unit and to download expansion unit firmware. The SPCN network is used to

control power to the expansion units and as a backup to the RIO and 12X cables for auxiliary control and firmware control.

Table 1. RIO cables

Cable feature	CCIN	Cable type	Length	Part number
1307 (copper)	1307	-2/RIO-2	1.75 meters	03N5867
1308 (copper)	1308	-2/RIO-2	2.5 meters	03N5866
1481 (copper)	1481	-2/RIO-2	1 meters	39J2562
1482 (copper)	1482	-2/RIO-2	3.5 meters	39J2554
1483 (copper)	1483	-2/RIO-2	10 meters	39J2561
1485 (copper)	1485	-2/RIO-2	15 meters	21P5457
3170 (copper)	3170	-2/RIO-2	8 meters	
7924 (copper)	7924	-2/RIO-2	0.6 meters	

Table 2. 12X cables

Cable feature	Cable type	Length	Part number
1828 (copper)	12X to 4X channel converter adapter	1.5 meters	
1829	12X adapter	0.6 meters	42V2129
1830	12X adapter	1.5 meters	42V2130
1834	12X adapter	8 meters	42R6160
1840	12X adapter	3.0 meters	42V2132
1841	12X to 4X channel conversion cable	3.0 meters	
1842	12X to 4X channel conversion cable	10 meters	

Table 3. SPCN cables

Cable feature	CCIN	Length	Part number
6001	6001	2 meters	87G6235
6006	6006	3 meters	09P1251
6007	6007	15 meters	21F9358
6008	6008	6 meters	21F9469
6029	6029	30 meters	21F9359

Cable layout options

Learn about cable topologies, options, and configuration requirements.

When you decide where to place the cables, follow your site plan and keep the following items in mind:

- Avoid creating a safety hazard.
- Avoid damaging the cables.
- Avoid placing cables parallel to high-voltage lines.

Example: Topologies of Remote Input/Output (High Speed Link) (RIO) loops

Link redundancy is achieved by cabling the RIO in a loop. This section provides examples of RIO loops.

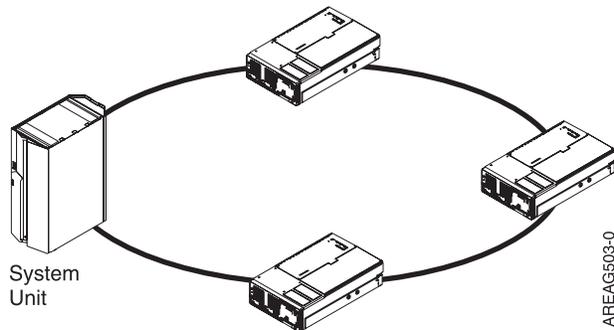


Figure 1. RIO loop example

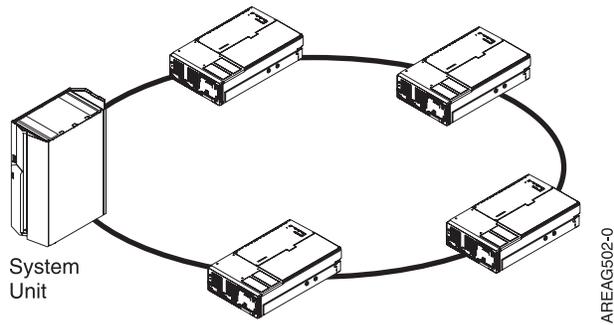


Figure 2. RIO loop example

System unit cable options

Learn which Remote Input/Output (High Speed Link) (RIO) and GX Dual-Port 12X Channel Attach adapter (12X) cables are supported on which system units.

Use the following table to identify the RIO cables for the machine types and model numbers identified.

Table 4. System unit RIO and 12X cable options

Cable feature	17M/MA or	03E/4A or 04E/8A	or
1482 (copper)		X	X
1481 (copper)	X	X	X
1483 (copper)	X	X	X
1307 (copper)	X	X	X
1308 (copper)	X	X	X

Expansion unit cable options

Learn which RIO and 12X cables are available for which expansion units.

Use the following tables to identify the RIO and 12X cables for the expansion units identified.

Table 5. Expansion unit RIO cable options

Cable feature	11D/11	11D/20
1307 (copper)		
1308 (copper)		
1460 (copper)		
1461 (copper)		
1462 (copper)		
1474 (copper)		
1475 (copper)		
1481 (copper)		
1482 (copper)		
1483 (copper)		
1485 (copper)		
3146 (copper)	X	X
3147 (copper)	X	X
3148 (copper)	X	X
3156 (copper)		
3168 (copper)		

Table 6. Expansion unit 12X cable options

Cable feature	14G/30 or
1829 0.6M 12X adapter	X
1830 1.5M 12X adapter	X
1834 8.0M 12X adapter	X
1840 3.0M 12X adapter	X

Expansion unit configuration requirements for RIO and GX Dual-Port 12X Channel Attach adapter cables

Learn about the configuration requirements for RIO and GX Dual-Port 12X Channel Attach adapter (12X) cables.

When you set up the expansion unit, observe the configuration requirements as shown in the following tables.

Table 7. RIO and 12X adapter configuration rules for expansion units for servers servers

Configuration	Maximum number of ports	Maximum number of loops	Maximum number of expansion units per loop	Maximum number of supported expansion units
17M/MA (RIO) 11D/11 11D/20	16	8	4	20
17M/MA (12X adapter) 14G/30	16	8	4	32

Table 7. RIO and 12X adapter configuration rules for expansion units for servers servers (continued)

Configuration	Maximum number of ports	Maximum number of loops	Maximum number of expansion units per loop	Maximum number of supported expansion units
04E/8A (RIO) 11D/20	4	2	4	8
04E/8A (12X adapter) 14G/30	4	2	4	8
03E/4A (RIO) 11D/20	4	2	4	8
03E/4A (12X adapter) 14G/30	4	2	4	8

Chapter 2. Connecting your expansion units

The instructions contain important information about connecting your expansion units. Some installations require that a unit be powered off. You should verify your Remote Input/Output (High Speed Link) (RIO/HSL), and GX Dual-Port 12X Channel Attach adapter (12X) configuration prior to connecting any expansion unit.

Before you begin

To add expansion units, follow these steps:

1. You can install the expansion units with the system unit power on or off. For more information about when system unit power must be off before installation, refer to Part 1, “Enclosures and Expansion Units,” on page 1.
 - a. If you are installing a new system unit and expansion units, refer to step 5 on page 10.
 - b. If you must power off the system to add the expansion units, or you are choosing to add the expansion units with the system power off and the system unit is not currently powered off, power it off now. For details, refer to ../iphaj/crustopsys.htm. After you have powered off your system unit, continue with step 5 on page 10 to complete this procedure.
 - c. If you are installing an expansion unit to an existing system and can leave the power on, continue with step 2.
2. Verify the existing RIO/12X configuration.

Important: When simultaneously adding multiple expansion units to an existing RIO/HSL/12X loop, it is required that the units be adjacent to each other so the existing loop is broken at only one spot.

Tip: If multiple expansion units are to be added with the system power on, it is recommended to work with one RIO/HSL/12X loop at a time. For example, if the plan is to add three expansion units to loop X and two to loop Y, follow the complete procedure to simultaneously add the three units to loop X. When the first procedure has been completed, then follow the procedure to simultaneously add the two units to loop Y. It is not necessary to complete the procedure for each expansion unit separately.

If problems with the RIO/HSL/12X loops are discovered in this step, they must be corrected before continuing with the expansion unit add procedure. Follow the appropriate step below to determine if there are problems with the RIO/HSL/12X loops.

- If your system *is* managed by an HMC, refer to “Verifying the Remote Input/Output (High-Speed Link) (RIO) and GX Dual-Port 12X Channel Attach adapter (12X) loops with an Hardware Management Console (HMC)” on page 24. You can use the **Save** button to overwrite the existing Last Valid Hardware Topology. This action allows you to compare the topology before and after the addition of the expansion units.
3. To verify the System Power Control Network (SPCN), refer to “Verifying the system power control network (SPCN)” on page 25. If problems with the SPCN are discovered in this step, they must be corrected before continuing with the expansion unit add procedure.

Important: When simultaneously adding multiple expansion units to an existing SPCN loop, the units must be adjacent to each other so the existing loop is broken at only one spot.

4. Set the SPCN Firmware Update Policy.

The SPCN Firmware Update Policy controls when and how SPCN firmware on expansion units will be updated. The default setting shipped with your system is for the SPCN Firmware Update Policy

Enabled. This setting allows for firmware updates to be completed over the RIO/HSL/12X interface whenever an update is required and does not allow updates over the slower serial SPCN interface.

- a. Access the ASMI using an authority level of Administrator or Authorized service provider. For details, refer to the ASMI and nonpartitioned systems.
- b. In the ASMI navigation area, expand **System Configuration** and select **Configure I/O Enclosures**.
- c. Verify there are no SPCN firmware updates in progress by checking the **Power Control Network Firmware Update Status** column. This will show the words **In Progress** and a percent complete if an SPCN firmware update is in progress.

If there is an SPCN firmware update in progress, determine if the update is a Serial or HSL update by checking the Power Control Network Firmware Update Status column for one of these words indicating the type of update.

If the SPCN firmware update is an HSL update, wait for the update to complete before continuing.

Tip: To determine when the update is complete, select **Configure I/O Enclosures** every 15 to 30 seconds until the words Not Required are displayed in the **Power Control Network Firmware Update Status** column. Do not use the **Back** or **Refresh** buttons on the browser to monitor the status.

If the SPCN firmware update is a Serial update, either wait for the update to complete or stop the update. If you choose to stop the update, the update will need to be restarted from the beginning after you have completed the procedure. To stop the update, perform the following steps:

- 1) Complete step 4d.
 - 2) Press the **Stop SPCN Firmware Update** button on the Configure I/O Enclosures panel.
 - 3) Select **Configure I/O Enclosures** every 15 to 30 seconds until the word Pending is displayed in the **Power Control Network Firmware Update Status** column. Do not use the **Back** or **Refresh** buttons on the browser to monitor the status.
- d. If your SPCN Firmware Update Policy is **Expanded**, record the current setting so it can be restored later and then change the setting to **Enabled**. If the SPCN Firmware Update Policy is **Enabled** or **Disabled**, continue without changing the setting.
5. Remove or open the back of the system unit.
 6. Locate the connectors on your expansion unit and system unit. For details on the connector locations, refer to “Connector locations” on page 19.
 7. To connect the expansion unit with RIO/HSL cables, refer to “Connecting the expansion unit with Remote Input/Output (High-Speed Link) (RIO) and GX Dual-Port 12X Channel Attach adapter cables” on page 12.
 8. To connect the expansion unit with SPCN cables, refer to “Connecting the expansion unit with system power control network (SPCN) cables” on page 15.
 9. Connect the power cables for the expansion units that you are installing to the power source. Then connect them to the power supplies on the expansion units. If you installed the expansion units with the system unit’s power off, continue with step 11 on page 11. If not, continue with the next step.

Note: Plug the power cable into the power source prior to connecting it into the power supply of the expansion unit.

10. The expansion units will power on automatically. After the expansion units that you have installed are powered on and you have waited 10 minutes for the hardware initialization to complete, continue with step 12 on page 11.

Tip: For each expansion unit, wait for the green power indicator to light on the control panel of the expansion unit that just powered on. This may take between one and 10 minutes. During this time, the yellow attention indicator may be lit on the control panel of the expansion unit that just powered

on. After the green power indicators are lit on the control panels of all of the expansion units that were just powered on, wait 10 additional minutes for hardware initialization to complete before proceeding to step 12.

11. To start the system or logical partition, refer to “Start the system or logical partition” on page 77.
12. To verify the SPCN, refer to “Verifying the system power control network (SPCN)” on page 25. When following these instructions, consider that the following errors logs are expected depending upon various factors in the system configuration and procedure.
 - 1000 9135 informational or permanent log entry due to an open SPCN loop.
 - 1000 9137 permanent log entry due to disruption to the RIO/HSL or GX Dual-Port 12X Channel Attach adapter loop.
 - 1000 9139 informational log entry for SPCN closed.
 - 1000 910A, 1000 91DE if SPCN firmware updates were required.
 - 1000 913B permanent log entry if an SPCN firmware update is required but not automatically started. If this error log entry is found, continue with the procedure and the error will be handled in step 14.
13. Verify the RIO/HSL/12X Loops.

If your system is managed by an HMC, refer to “Verifying the Remote Input/Output (High-Speed Link) (RIO) and GX Dual-Port 12X Channel Attach adapter (12X) loops with an Hardware Management Console (HMC)” on page 24. If you saved the original RIO/HSL/12X topology before adding the expansion units, use this saved topology to compare the original and modified configurations.

When following these instructions, consider that the following errors log entries are expected depending upon various factors in the system configuration and procedure.

 - B700 6907 informational log entries for each new expansion unit that was added that has information in its nonvolatile storage from a system which the expansion unit was previously attached to.
 - B700 6985 informational log entries before and after the B700 6907 informational log entries.
 - B700 6984 informational log entries to indicate a broken HSL loop.
14. Start necessary SPCN firmware updates.

If a 1000913B error log entry was found in step 12, an SPCN firmware update is needed but not allowed due to the current SPCN Firmware Update Policy. You need to update your SPCN firmware. To complete this task, see “Updating system power control network (SPCN) firmware” on page 29.

Wait for the SPCN firmware updates to complete before continuing to the next step. This could take several hours depending on the number of expansion units on the SPCN loop and the current level of the SPCN firmware in the expansion unit.
15. If you changed the SPCN Firmware Update Policy in step 4 on page 9, ensure you changed the policy back to the original setting.
 - a. Access the ASMI using an authority level of Administrator or Authorized service provider. For details, refer to the ASMI and nonpartitioned systems. To view the PDF file of ASMI and nonpartitioned systems, approximately 2 MB in size, see [oemiphby.pdf](#) .
 - b. In the ASMI navigation area, expand **System Configuration** and select **Configure I/O Enclosures**.
 - c. Change the **SPCN Firmware Update Policy** setting to the setting recorded in step 4 on page 9. The default and recommended setting is **Enabled**.
16. Verify the new configuration. For details, refer to “Verifying new configuration functions” on page 23.
17. If the system is partitioned, you can now assign the new hardware to a partition.

Connecting the expansion unit with Remote Input/Output (High-Speed Link) (RIO) and GX Dual-Port 12X Channel Attach adapter cables

These instructions explain how to connect units with RIO/12X cables in either a new or existing loop. It also includes information about connecting multiple units.

Adding expansion units to a new Remote Input/Output (High-Speed Link) (RIO and GX Dual-Port 12X Channel Attach adapter) loop

Use this procedure to add expansion units to a new RIO loop.

Before you begin

Unused RIO/12X connectors might be covered with metal clips. Remove the clips before you install the RIO/12X cables.

1. On the system unit to which you are going to connect the new RIO/12X, identify connectors 0 and 1 of the RIO/12X connector pair that you are going to use.
2. Find the RIO/12X cables that were included with the expansion units.
3. Connect a RIO/12X cable to connector 0 on an expansion unit.
4. Connect another RIO/12X cable to connector 1 on the expansion unit.
5. If there is another expansion unit to add, do the following:
 - a. Connect the other end of the cable from connector 1 on the expansion unit just added to connector 0 on the next expansion unit.
 - b. Connect another cable to connector 1 on the expansion unit from step 5a.
 - c. Repeat step 5 for each additional expansion unit.
6. Connect the other end of the cable from connector 0 on the first expansion unit added to connector 0 on your system unit.
7. Connect the other end of the cable from connector 1 on the last expansion unit added to connector 1 on your system unit.
8. Return to the procedure that sent you here.

Adding expansion units to an existing Remote Input/Output (High-Speed Link) (RIO) and GX Dual-Port 12X Channel Attach adapter loop

Use this procedure to add expansion units to an existing RIO/12X loop.

Before you begin

Unused RIO/HSL/12X connectors might be covered with metal clips. Remove the clips before you install the RIO/HSL/12X cables.

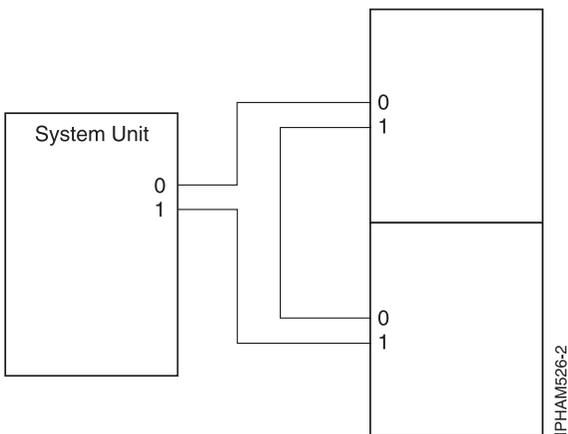
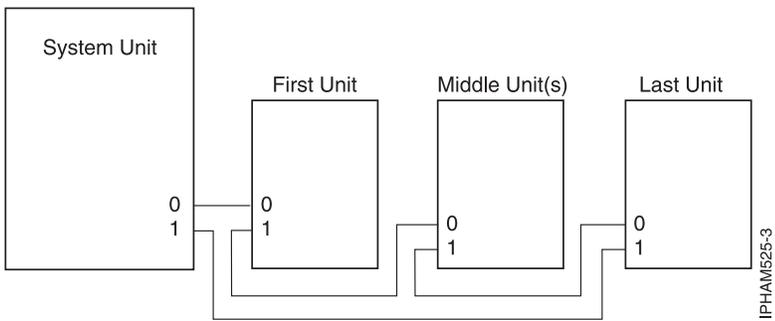
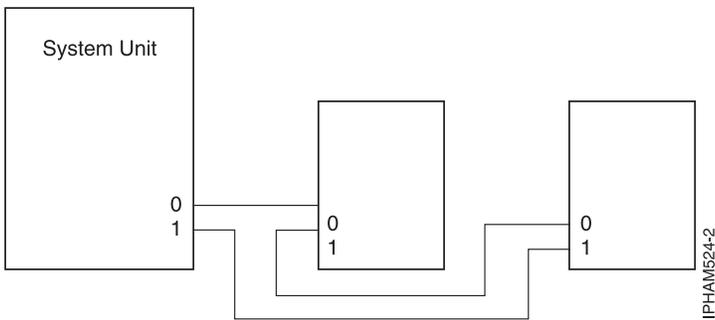
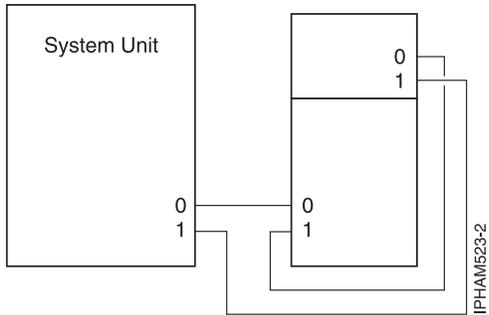
Before doing this procedure, review “Examples: Remote Input/Output (High-Speed Link) (RIO/12X) expansion unit connections” on page 14.

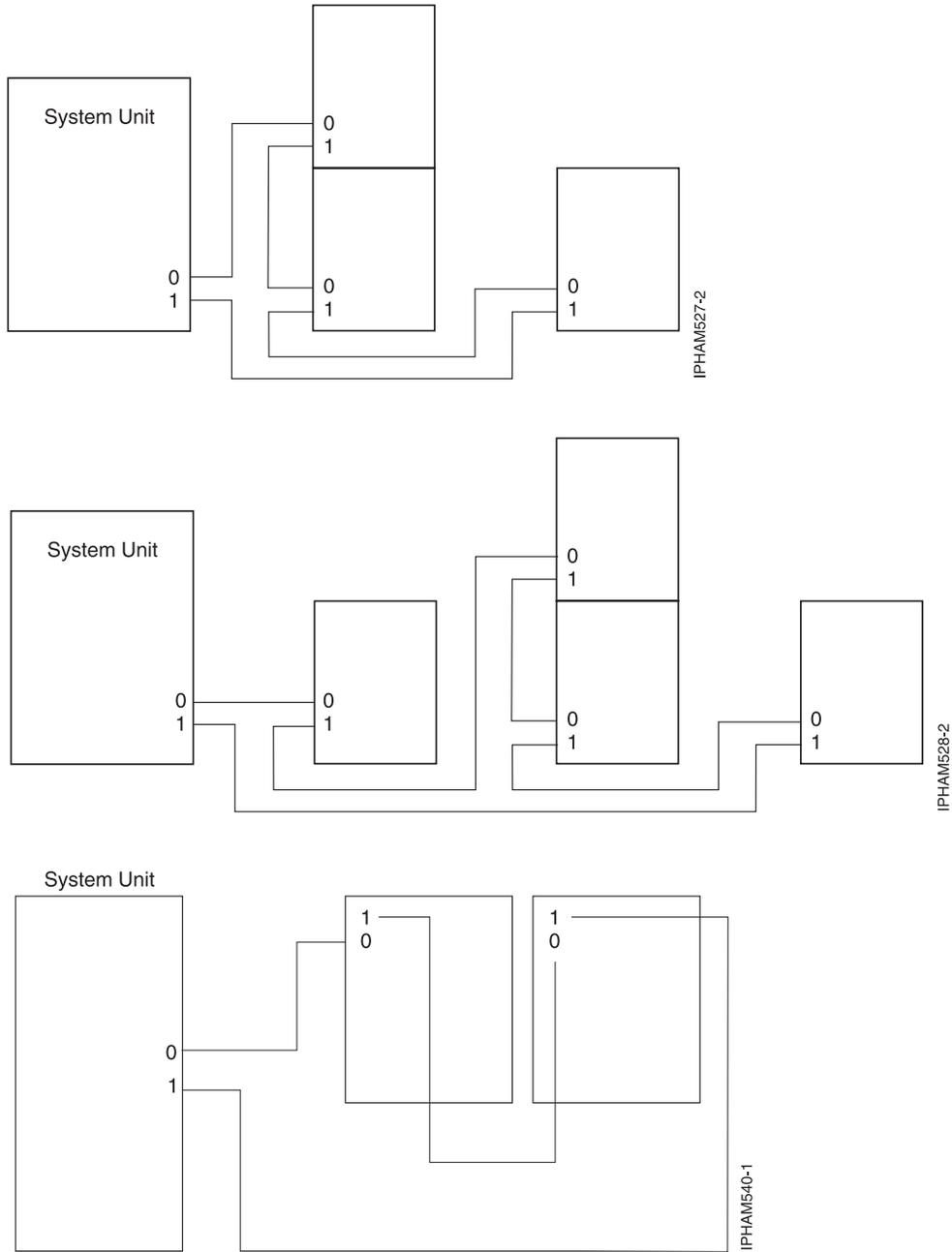
1. Identify the RIO/HSL/12X loop to which you want to add the expansion units.
2. Identify connectors 0 and 1 of the RIO/HSL/12X connector pair on the system unit that are associated with the loop identified in step 1.
3. Find the RIO/HSL/12X cables that were included with the expansion units.
4. Choose from the following options:
 - To add the expansion units to the beginning of the loop, go to step 5 on page 13.
 - To add the expansion units to the middle of the loop, go to step 6 on page 13.

- To add the expansion units to the end of the loop, go to step 7.
5. To add the expansion units to the beginning of the loop, complete the following steps:
 - a. Move the RIO/HSL/12X cable from connector 0 on the first expansion unit on the loop (the one connected to connector 0 on the system unit) to connector 0 on the new expansion unit.
 - b. Connect another RIO/HSL/12X cable to connector 1 on the new expansion unit.
 - c. If you are adding another expansion unit, do the following:
 - 1) Connect the other end of the cable from connector 1 on the expansion unit just added to connector 0 on the next expansion unit.
 - 2) Connect another cable to connector 1 on the expansion unit from step 5c1.
 - 3) Repeat step 5c for each additional expansion unit.
 - d. Connect the other end of the cable from connector 1 on the last expansion unit added to connector 0 on the expansion unit that was disconnected in step 5a.
 6. To add the expansion units to the middle of the loop, complete the following steps:
 - a. Move the RIO/HSL/12X cable from connector 0 on the existing expansion unit that follows the location of the new expansion unit to connector 0 on the new expansion unit.
 - b. Connect another RIO/HSL/12X cable to connector 1 on the new expansion unit.
 - c. If you are adding another expansion unit, do the following:
 - 1) Connect the other end of the cable from connector 1 on the expansion unit just added to connector 0 on the next expansion unit.
 - 2) Connect another cable to connector 1 on the expansion unit from step 6c1.
 - 3) Repeat step 6c for each additional expansion unit.
 - d. Connect the other end of the cable from connector 1 on the last expansion unit added to connector 0 on the expansion unit that was disconnected in step 6a.
 7. To add the expansion units to the end of the loop, complete the following steps:
 - a. Move the RIO/HSL/12X cable from connector 1 on the system unit to connector 0 on the new expansion unit.
 - b. Connect another RIO/HSL/12X cable to connector 1 on the new expansion unit.
 - c. If you are connecting another expansion unit, do the following:
 - 1) Connect the other end of the cable from connector 1 on the expansion unit just added to connector 0 on the next expansion unit.
 - 2) Connect another cable to connector 1 on the new expansion unit from step 7a.
 - 3) Repeat step 7c for each additional expansion unit.
 - d. Connect the other end of the cable from connector 1 on the last expansion unit added to connector 1 on the system unit.
 8. Return to the procedure that sent you here.

Examples: Remote Input/Output (High-Speed Link) (RIO/12X) expansion unit connections

See examples of possible RIO/12X connections.





Connecting the expansion unit with system power control network (SPCN) cables

You can connect expansion units to system units with system power control network (SPCN) cables. System units use SPCN cables to control the power to expansion units.

Before you begin

Review the “Examples: Remote Input/Output (High-Speed Link) (RIO) and GX Dual-Port 12X Channel Attach adapter (12X) system power control network (SPCN) connections” on page 17 and then return here and continue with the instructions.

About this task

If you encounter difficulties during the procedure, contact your service provider for assistance.

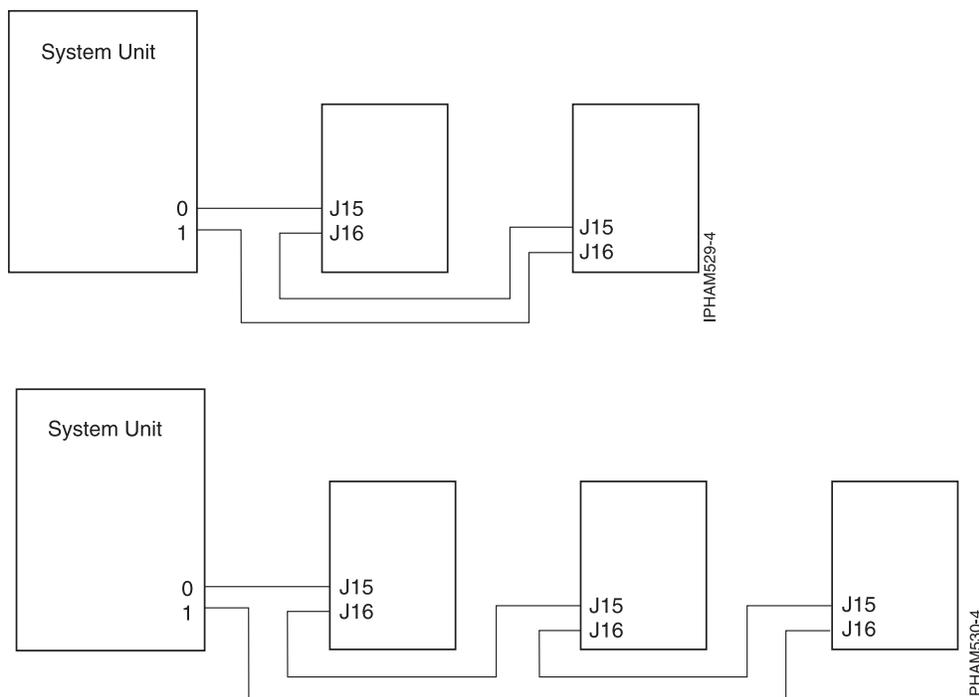
If you are installing an expansion unit in an existing SPCN loop with the system unit power on, errors are logged when you disconnect and reconnect cables. You can ignore these error messages.

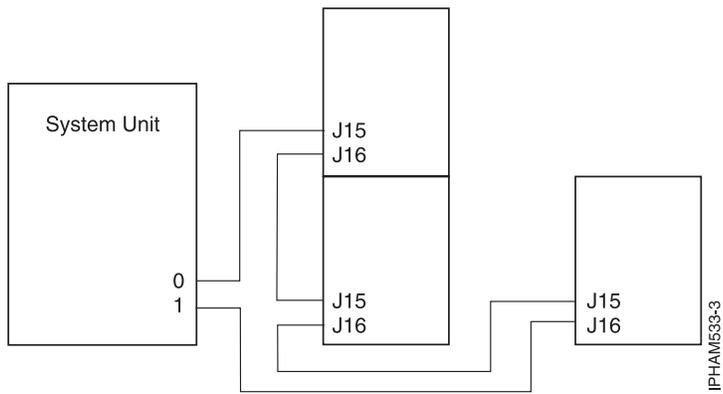
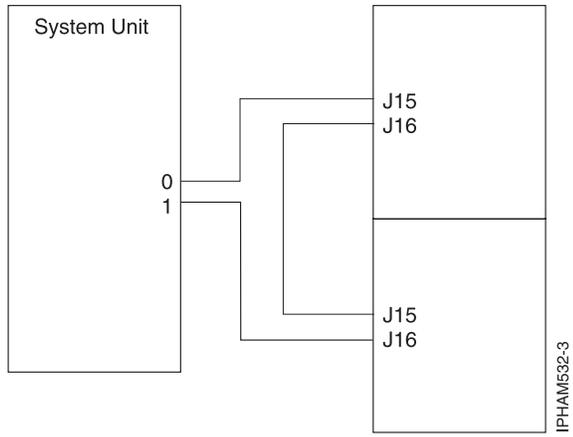
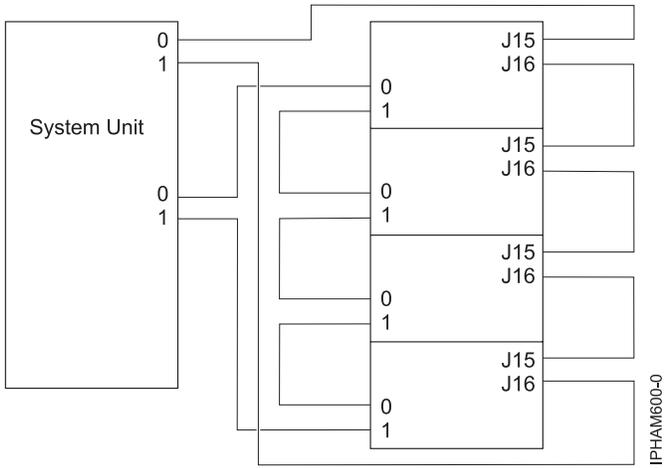
1. Choose from the following options:
 - To connect SPCN cables when there is not already an SPCN loop, go to step 2.
 - To connect SPCN cables to the beginning of an existing SPCN loop, go to step 3.
 - To connect SPCN cables to the middle of an existing SPCN loop, go to step 4.
 - To connect SPCN cables to the end of an existing SPCN loop, go to step 5 on page 17.
2. To connect SPCN cables when there is not already an SPCN loop, do the following:
 - a. Find the SPCN cables that were included with your expansion units.
 - b. Connect an SPCN cable to connector SPCN0 on your system unit.
 - c. Connect the other end of the SPCN cable to connector J15 on one of the new expansion units.
 - d. Connect another cable to connector J16 on the new expansion unit.
 - e. If there is another expansion unit to add, do the following:
 - 1) Connect the other end of the cable from connector J16 on the expansion unit just added to connector J15 on the next expansion unit.
 - 2) Connect another cable to connector J16 on the expansion unit from step 2e1.
 - 3) Repeat step 2e for each additional expansion unit.
 - f. Connect the other end of the cable from connector J16 on the last expansion unit added to connector SPCN1 on your system unit.
 - g. Return to the procedure that sent you here.
3. To connect SPCN cables to the beginning of an existing SPCN loop, do the following:
 - a. Find the SPCN cables that were included with your expansion units.
 - b. Move the SPCN cable from connector J15 on the first expansion unit (the one connected to connector SPCN0 on the system unit) to connector J15 on one of the new expansion unit.
 - c. Connect another SPCN cable to connector J16 on the new expansion unit.
 - d. If there is another expansion unit to add, do the following:
 - 1) Connect the other end of the cable from connector J16 on the expansion unit just added to connector J15 on the next expansion unit.
 - 2) Connect another cable to connector J16 on the expansion unit from step 3d1.
 - 3) Repeat step 3d for each additional expansion unit.
 - e. Connect the other end of the cable from connector J16 on the last expansion unit added to connector J15 on the expansion unit that was disconnected in step 3b.
 - f. Return to the procedure that sent you here.
4. To connect SPCN cables to the middle of an existing SPCN loop, do the following:
 - a. Find the SPCN cables that were included with your expansion units.
 - b. Move the SPCN cable from connector J15 on the expansion unit to follow the expansion units which are being added to connector J15 on the new expansion unit.
 - c. Connect another SPCN cable to connector J16 on one of the new expansion units.
 - d. If there is another expansion unit to add, do the following:
 - 1) Connect the other end of the cable from connector J16 on the expansion unit just added to connector J15 on the next expansion unit.
 - 2) Connect another cable to connector J16 on the expansion unit from step 4d1.
 - 3) Repeat step 4d for each additional expansion unit.

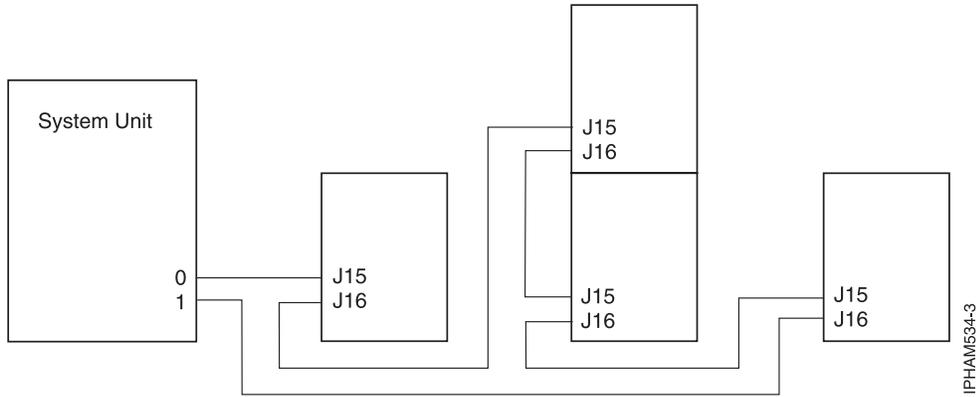
- e. Connect the other end of the cable from connector J16 on the last expansion unit added to connector J15 on the expansion unit that was disconnected in step 4b on page 16.
 - f. Return to the procedure that sent you here.
5. To connect SPCN cables to the end of an existing SPCN loop, do the following:
- a. Find the SPCN cables that were included with your expansion units.
 - b. Move the SPCN cable from connector J16 on the last expansion unit (the one connected to connector SPCN1 on the system unit) to connector J16 on one of the new expansion units.
 - c. Connect another SPCN cable to connector J15 on the new expansion unit.
 - d. If there is another expansion unit to add, do the following:
 - 1) Connect the other end of the cable from connector J15 on the expansion unit just added to connector J16 on the next expansion unit.
 - 2) Connect another cable to connector J15 on the expansion unit from step 5d1.
 - 3) Repeat step 5d for each additional expansion unit.
 - e. Connect the other end of the cable from connector J15 on the last expansion unit added to connector J16 on the expansion unit that was disconnected in step 5d.
 - f. Return to the procedure that sent you here.

Examples: Remote Input/Output (High-Speed Link) (RIO) and GX Dual-Port 12X Channel Attach adapter (12X) system power control network (SPCN) connections

See examples that show possible RIO/12X SPCN connections.







Connector locations

Learn about Remote Input/Output (High Speed Link) (RIO) and system power control network (SPCN) connector locations.

Model 03E/4A connector locations

Learn about connector locations on rack-mounted and stand-alone models.

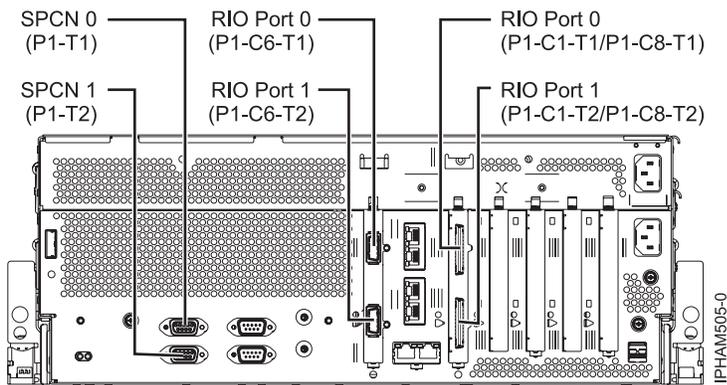


Figure 3. Model 03E/4A connector locations on rack-mounted model

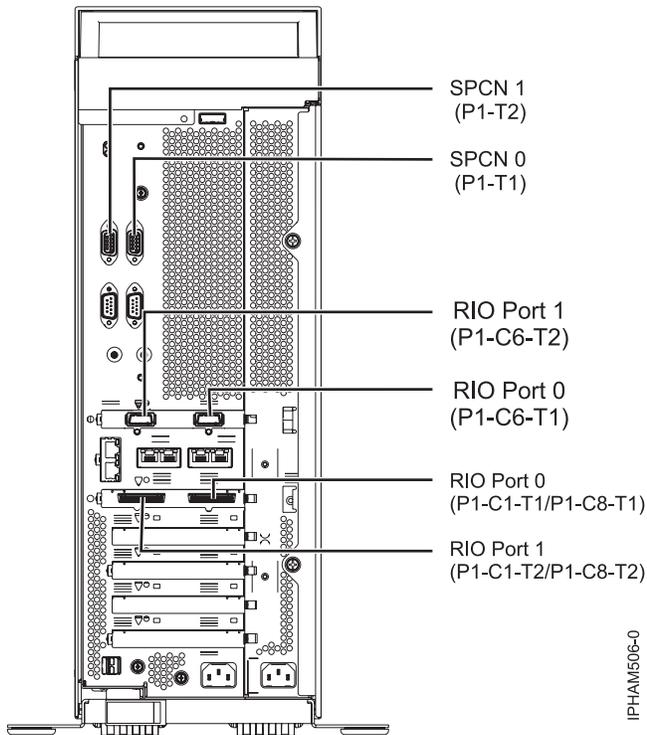


Figure 4. Model 03E/4A connector locations on stand-alone model

Model 04E/8A connector locations

Learn about connector locations on rack-mounted and stand-alone models.

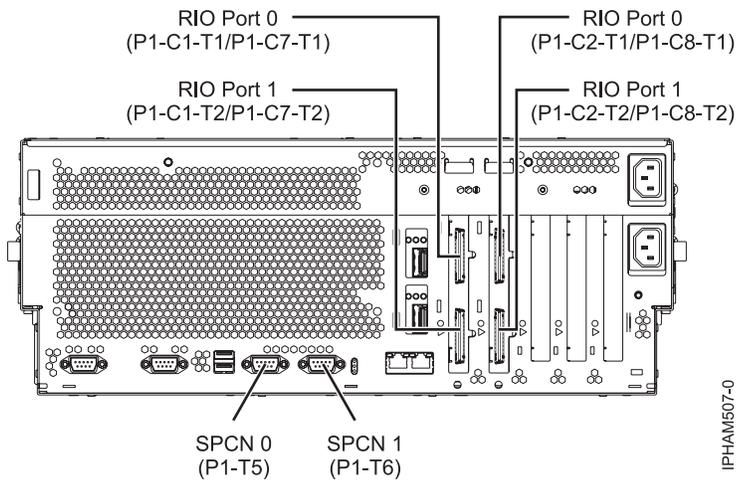


Figure 5. Model 04E/8A connector locations on rack-mounted model

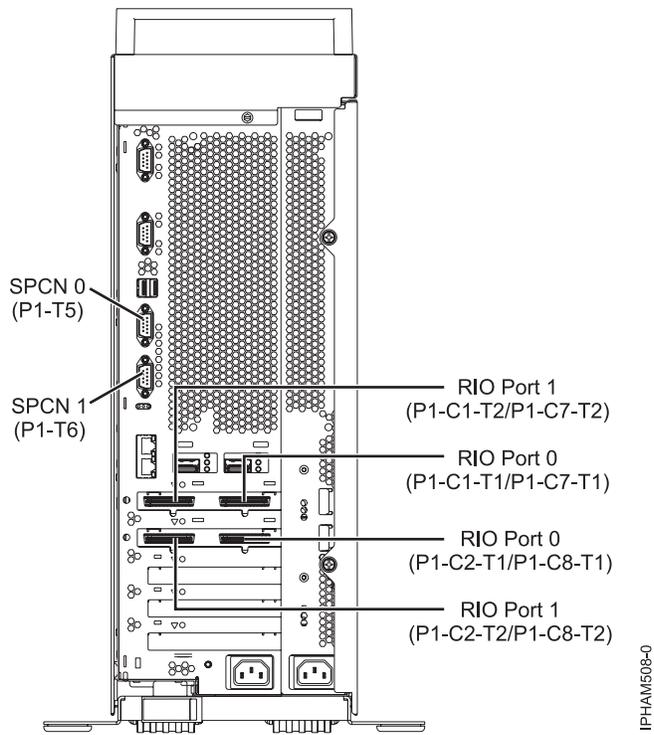


Figure 6. Model 04E/8A connector locations on stand-alone model

Model 17M/MA or connector locations

Learn about connector locations.

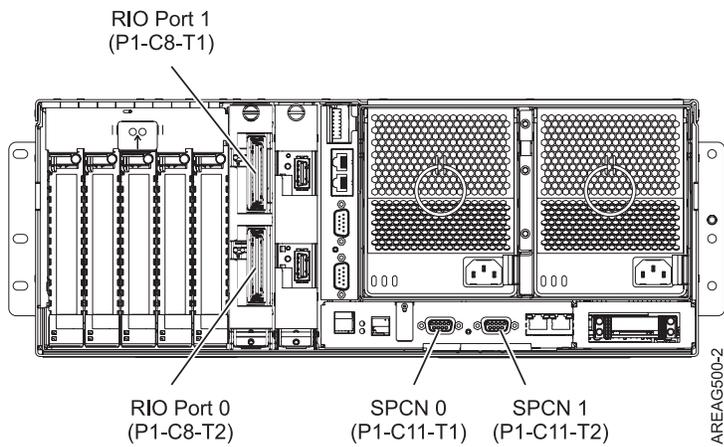


Figure 7. Model 17M/MA connector locations

Model or 11D/11 connector locations

Learn about connector locations.

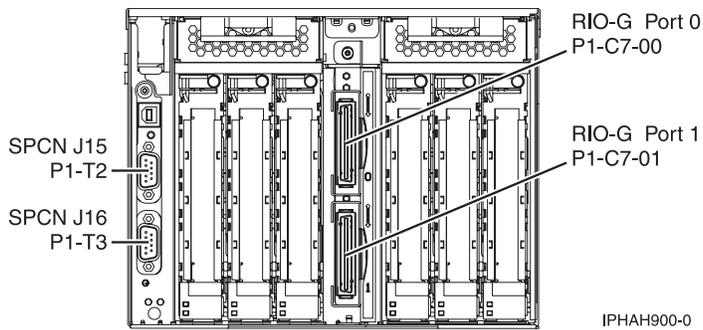


Figure 8. Model or 11D/11 connector locations

Model 05/95 or 11D/20 connector locations

Learn about connector locations.

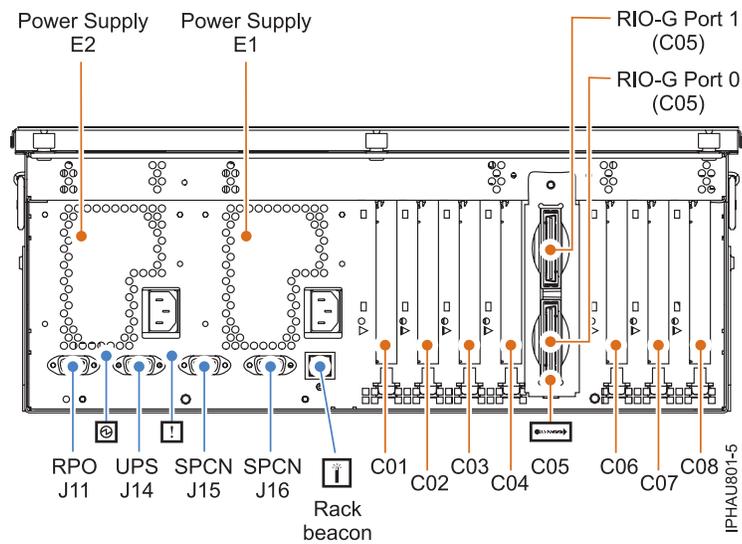


Figure 9. Model or 11D/20 connector locations

Model 57/96 or 14G/30 connector locations

Learn about connector locations.

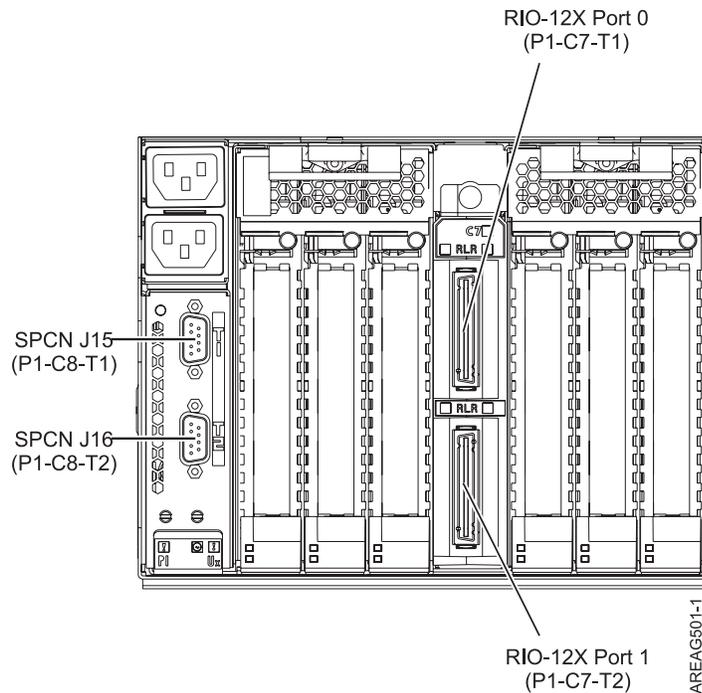


Figure 10. Model 57/96 or 14G/30 connector locations

Verifying new configuration functions

Use the procedures in this section to verify that the new configuration is correctly functioning.

1. Choose from the following options:
 - If your system *is not* managed by an HMC, refer to [../iphaj/hsmverify.htm](#). When you are finished, return to the procedure that sent you here.
 - If your system *is* managed by an HMC, continue with step 2.
2. View information about the managed system. For details, refer to “Viewing information about the managed system” on page 25.
3. To view more information about the managed system, complete the following steps:
 - a. From the navigation area of the HMC, expand **Systems Management**.
 - b. Click **Servers**.
 - c. Select the server with which you want to work. Information about the system will be located under the Tasks section in the contents area.
4. View the properties of the managed system and verify the new expansion units by doing the following:
 - a. Select your server with which you want to work.
 - b. Click **Tasks** → **Properties**.
 - c. Select the **I/O** tab.
 - d. Verify that the new expansion unit is displayed in the list and that the unit ID information displayed on the panel for the I/O unit matches the label on the I/O unit.

Note: Wait up to ten minutes for the new expansion units to be displayed in the list. If they are not displayed after ten minutes, go to the next step. If they are displayed, go to step 6.

Tip: To refresh the list of expansion units, you must completely exit and re-enter the function.

5. If the expansion units are not displayed on the I/O panel, verify the installation by performing the following steps:
 - a. Make sure the expansion units are powered on and the power cables are connected to the power source and the expansion units.
 - b. Make sure that the RIO/HSL and SPCN cables are installed correctly. See Chapter 2, “Connecting your expansion units,” on page 9 for cabling information.
 - c. Make sure you verified the MTMS and Configuration ID of the new expansion units. For details, refer to Setting I/O enclosure configuration ID and MTMS value.
 - d. If the expansion units still are not displayed, contact your service provider for assistance.
6. Return to the procedure that sent you here.

Verifying the Remote Input/Output (High-Speed Link) (RIO) and GX Dual-Port 12X Channel Attach adapter (12X) loops with an Hardware Management Console (HMC)

Use this procedure when your system is managed by a Hardware Management Console (HMC) and you want to verify that the RIO/HSL/12X cabling loops are correctly placed.

About this task

To verify the RIO/HSL/12X cabling loops are hooked up and seated correctly, complete the following steps with an HMC and with the system unit power on:

1. If you were sent here from Powering off an expansion unit during a repair procedure, skip to step 3.
2. Use the HMC to verify that there are no B700 69xx errors by completing the following steps:
 - a. In the Navigation area, select **Service Management**.
 - b. Select **Manage Serviceable Events**.
 - c. In the Manage Serviceable Events window, do the following:
 - 1) Select **Open** for the Serviceable event status field.
 - 2) Select the machine type and model (MTM) numbers of the server you are working with for Reporting MTMS field.
 - 3) Select **ALL** for all other fields.
 - d. Click **OK**.
 - e. Scan for any B700 69xx errors.
 - f. Choose from the following options:
 - If there are no errors, click **Cancel** to exit and continue with step 3.
 - If there are errors, they must be corrected before continuing. If you need assistance, contact your service provider.
3. To verify the existing RIO/HSL/12X loops from the HMC, perform the following steps:
 - a. From the navigation bar, expand **Systems Management**.
 - b. Select **Servers**.
 - c. Select the server you are working from.
 - d. From the Tasks area, do the following:
 - 1) Expand **Hardware information**.
 - 2) Select **View Hardware Topology**.

- e. Verify that all of the entries of type External (ignore Internal links) have a LinkStatus of Operational. If the LinkStatus for all of the external entries is operational, continue to the next step. If the LinkStatus is not operational for any of the external entries, the links must be repaired before continuing. If you need assistance, contact your service provider.

Note: If you were sent here from Powering off an I/O enclosure during a repair procedure, it is possible that the LinkStatus values will not be operational for the ports on the enclosure being powered off and repaired. It is not necessary to correct those failures before proceeding.

4. Return to the procedure that sent you here.

Viewing information about the managed system

View information about the managed system's configuration and capabilities.

About this task

You can view the managed system's configuration and capabilities. Any user can view managed system properties. To view information about the managed system:

1. From the navigation area of the HMC, expand **Systems Management**.
2. Click **Servers**.
3. Select the server with which you want to work.
4. Select **Properties** under **Tasks** in the contents area to view information about the system.

Results

The HMC displays the system's name, logical partition capability, state, serial number, model and type, and policy information. A system that is powered on using the Partition Standby option displays this information, as well as available and assigned processors, memory, I/O drawers and slots, power-on parameters, reference codes, and policy information. The HMC also displays power-on parameters and reference codes for a managed system in the power-off state.

The Processor page displays information that is helpful when performing Dynamic Logical Partitioning processor tasks. Click the **Processor** tab to view processor usage data for partitions and determine whether a processor is assigned to a logical partition. The information on the Processor page is also helpful when you need to know if processors are disabled and therefore cannot be used by any logical partition.

The Memory page shows deconfigured resources, as well as information about available and configured memory. To view or change memory allocation on systems with huge page table support, click the **Memory** tab and select **Show details** in the Advanced Options area. To change the requested value for huge page memory, the system must be powered off.

The information provided in the memory tab (for example, deconfigured resources), along with the information provided on the I/O tab, is useful for planning for processors and dynamic logical partitions.

Verifying the system power control network (SPCN)

Check for system power control network (SPCN) errors and inactive enclosures, and fix machine type, model, and serial number (MTMS) problems.

1. Choose from the following options:
 - If your system *is* managed by an HMC, continue with step 2.
 - If your system *is not* managed by an HMC, continue with step 3 on page 26.
2. Use the HMC to verify that there are no 1000 9xxx errors by completing the following steps:
 - a. In the navigation area of the HMC, select **Service Management**.

- b. In the contents area, select **Manage Serviceable Events**.
 - c. In the Manage Serviceable Events – Select Serviceable Events window, select the following:
 - 1) **Open** for the Serviceable Event Status.
 - 2) The MTMS of the server you are working with for Reporting MTMS.
 - 3) **ALL** for all other fields
 - d. Click **OK**.
 - e. Scan for any 1000 9xxx errors, and do the following:
 - If there are no errors, click **Cancel** twice to exit Manage Serviceable Events.
 - If there are errors, they must be corrected before continuing. If you need assistance, contact your service provider.
 - f. Go to step 3.
3. Verify that none of the existing expansion units with control panels have a 'C62E' code on the display area of the control panel. This indicates that the expansion unit is unable to communicate with the system. If one or more of them do, there is a problem with the SPCN cabling. Correct the problem before continuing.
 4. To verify that there are no inactive expansion units in the SPCN, do the following:
 - a. Access the ASMI using an authority level of Administrator or Authorized service provider. For details, on using the ASMI, refer to the ASMI and nonpartitioned systems.
 - b. In the ASMI navigation area, expand **System Configuration** and select **Configure I/O Enclosures**.
 - c. Verify that each row has the word **Active** in the Status column. If any of the I/O enclosures have a status of **Inactive**, do one of the following:
 - 1) If you have already concurrently added expansion units to the system, do not invoke **Clear inactive enclosures**. Contact your service provider for assistance.
 - 2) If you are preparing to add expansion units but have not done so yet, click the **Clear inactive enclosures** button on this panel. Wait for the completion indication, then repeat steps 4b and 4c. If the problem persists, contact your service provider.
 5. Correct any temporary configuration IDs and MTMS (machine type, model, and serial numbers) for the expansion units. If you have already concurrently added expansion units to the system, go to step 6. If you are preparing to add expansion units, but have not yet done so, go to step 7.
 6. If you have already concurrently added expansion units to the system, perform the tasks in "Setting I/O enclosure configuration ID and machine type, model, and serial number (MTMS) value" on page 27. Then go to step 8.
 7. If you are preparing to add expansion units but have not done so yet, complete the following steps for all expansion units on the system.
 - a. Access the ASMI using an authority level of Administrator or Authorized service provider. For details, on using the ASMI, refer to the ASMI and nonpartitioned systems. To view the PDF file of ASMI and nonpartitioned systems, approximately 2 MB in size, see [oemiphby.pdf](#) 
 - b. In the ASMI navigation area, expand **System Configuration** and select **Configure I/O Enclosures**.
 - c. Verify that none of the values in the **Location code** column are of the form UTMPx.xxx.xxxxxxx where 'x' may be any number 0-9 or character A-Z. If any of the expansion units have a Location Code with the format UTMPx.xxx.xxxxxxx, perform the tasks in "Setting I/O enclosure configuration ID and machine type, model, and serial number (MTMS) value" on page 27 to correct it.
 8. Return to the procedure that sent you here.

Related concepts

"Accessing the ASMI without an HMC" on page 65

You can access the ASMI through a Web browser or an ASCII terminal.

Setting I/O enclosure configuration ID and machine type, model, and serial number (MTMS) value

Updating the configuration ID and the machine type, model, and serial number (MTMS) values keep the configuration and error information in sync, and is used by the system when you create the location codes.

To set the configuration ID, use the Advanced System Management Interface (ASMI). However if the ASMI is not available you can use the physical control panel. To set the MTMS value you must use the ASMI, not with the control panel. However, if you do not have access to the ASMI, the system will still operate without updating this information. The MTMS value should match the original value of the enclosure, which can be found on a label affixed to the enclosure.

For details, refer to “Using the Advanced System Management Interface (ASMI) to verify and set the configuration ID and machine type, model, and serial number (MTMS) value.”

Using the Advanced System Management Interface (ASMI) to verify and set the configuration ID and machine type, model, and serial number (MTMS) value

This topic provides detailed instructions for setting the configuration ID and machine type, model, and serial number (MTMS) value.

About this task

To perform this operation, verify that the following prerequisites have been met:

- The server must be powered on to a firmware standby or a firmware running state.
 - The expansion unit must have ac power and be correctly installed in the system power control network.
 - Your authority level must be one of the following:
 - Administrator
 - Authorized service provider
1. Login in to ASMI.
 2. Expand **System Configuration**.
 3. Select **Configure I/O Enclosures**.
 4. Select **Clear Inactive Enclosures**.
 5. If you were directed here from a replacement procedure, the expansion unit that was replaced contained the nonvolatile storage where the expansion unit machine type-model-serial (MTMS) was stored. It is necessary to restore the expansion unit MTMS now. It may also be necessary to set or change the expansion unit configuration ID (power control network identifier).

The nonvolatile storage where the expansion unit MTMS value is stored in a new replacement expansion unit is uninitialized. The system will detect the uninitialized value and assign an obvious, unique value of the form `TMPx.xxx.xxxxxxx`, where `x` can be any character 0-9 and A-Z. As a result, the expansion units location code will change to `UTMPx.xxx.xxxxxxx`. You must use the new `UTMPx.xxx.xxxxxxx` location code in the instructions below when selecting the expansion unit to power off and selecting the expansion unit to change settings for.

6. From the ASMI utility, expand **System Configuration**.
7. Select **Configure I/O Enclosures**.
8. Verify the configuration ID and MTMS data
 - a. Compare the power control network identifier value shown for the expansion unit you are working with to the power control network identifier (configuration ID) values in the following list.
 - 0x84 for 50/96 and 52/96 expansion units
 - 0x88 for 11D/11 and 57/90 expansion units

- 0x89 for 50/88 and 05/88 expansion units
 - 0x8A for 50/94 and 52/94 expansion units
 - 0x8B for 50/95 and 05/95 expansion units
 - 0x8C for 11D/20 expansion units
 - 0x8D for 14G/30 and 57/96 expansion units
- b. Compare the values shown on the 'Type-Model' and 'Serial number' columns for the expansion unit you are servicing to the type, model, and serial values on the label located on the expansion unit. The expansion unit location code format will be either UTMPx.xxx.xxxxxxx or UTTTT.MMM.SSSSSS, where TTTT, MMM, and SSSSSS are the enclosure type (TTTT), model (MMM), and serial number (SSSSSS).

Note:

- A 10009132 information log will be produced following a platform IPL, or when an expansion unit is added indicating that a temporary MTMS was assigned to an expansion unit. The temporary MTMS has the following location code format, UTMPx.xxx.xxxxxxx. This is an indication that the MTMS should be updated.
 - Serial numbers are case sensitive. (All alphabetic characters contained in the serial number must be entered as a capital letter.)
- c. If any changes must be made, go to step 9. Otherwise go to step 21 on page 29.
9. If the server is powered on to the firmware running state, go to step 10. If the server is powered on to the firmware standby state, go to step 11.
10. Choose from the following options:
- If the configuration ID must be changed, perform the following steps:
 - a. Read the notes below.
 - b. Power off the I/O enclosure.
 - c. Go to step 11.
 - If the MTMS data must be changed and the system has partitions running the AIX® or Linux® operating system and any of the resources in the expansion unit are owned by active partitions running AIX or Linux, perform the following steps:
 - a. Read the notes below.
 - b. Power off the I/O enclosure.
 - c. Go to step 11.
 - If neither of the above statements apply, go to step 11.

Note:

- Do not disconnect the ac power cables after powering off the expansion unit.
 - If the expansion unit is not immediately displayed on the service utility used to power off the expansion unit, refresh the utility periodically for up to ten minutes until it does. If it still is not displayed, go to step 1 on page 27 and repeat this procedure.
 - Remember to use the new UTMPx.xxx.xxxxxxx location code when selecting the expansion unit to power off if you were directed here from a replacement procedure.
 - If the procedure that directed you here involved powering off the expansion unit and while powering off the expansion unit you were instructed to use panel function 69 to power on the expansion unit, perform panel function 69 now (with the control panel set to manual mode) from the system unit control panel. Do this even though the expansion unit is already on.
11. From the ASMI utility, expand **System Configuration**.
12. Select **Configure I/O Enclosure**.
13. Select the expansion unit you are working with.
14. Select **Change settings**.

15. If in step 8 on page 27 you determined that the power control network identifier (configuration ID) value is not correct, enter the correct value now.
16. If in step 8 on page 27 you determined that the Type-Model and Serial number values are not correct, enter the correct values now.

Note: Serial numbers are case sensitive. All alphabetic characters contained in the serial number must be entered as a capital letter.

17. Click **Save settings** to complete the operation.
18. Verify that the values you just entered are reflected in the Power Control Network Identifier, Type-Model, Serial number, and Location code columns for the expansion unit you are servicing. Do not use the browser Back button to do this. Rather, expand System Configuration. Then select **Configure I/O Enclosures**.
19. If the server is powered on to a firmware standby state and you entered a new power control network identifier (Configuration ID) in step 15, the expansion unit will power off and back on automatically. If this is the case, go to step 21. Otherwise go to step 20.
20. If you powered off the expansion unit in step 10 on page 28, read the notes below to power on the expansion unit.

Note:

- If the system is not managed by an HMC, disconnect all power to the expansion unit by disconnecting the cables from the power supplies on the expansion unit. Wait for the display panel to go off, wait an additional 30 seconds, and then reconnect the power cables. The expansion unit will power on automatically.
- If the system is managed by an HMC, power on the expansion unit using the Power On/Off Unit utility on the HMC. If the values you just entered are not immediately reflected in the location code of the expansion unit in the Power On/Off Unit utility, restart the utility periodically for up to ten minutes until the values you entered are reflected.

21. Log off and close the ASMI.
22. Return to the procedure that sent you here.

Updating system power control network (SPCN) firmware

The system power control network (SPCN) Firmware Update Policy is not initially set to update. Therefore, a system power control network (SPCN) firmware update is needed and must be done manually.

About this task

Notes:

- Do not perform maintenance on an expansion unit or change the SPCN network while the SPCN firmware update is being performed.
- If you power off the system while performing firmware updates, the SPCN firmware update will be interrupted and must be restarted.
- This procedure can take several hours depending on the number of expansion units on the SPCN loop and the current level of the SPCN firmware on the expansion unit.

To change the SPCN firmware update policy to expanded and start an SPCN firmware update, perform the following steps:

1. Access the Advanced System Management Interface (ASMI).
2. Select **System Configuration** → **Configure I/O Enclosures**.
3. Record the current SPCN Firmware Update Policy setting so it can be restored later.

4. Change the **SPCN Firmware Update Policy** setting to **Expanded** and click **Save Policy Setting** to allow SPCN firmware updates to be performed over the RIO/HSL and serial SPCN interfaces.
5. Select **Start SPCN Firmware Update**. The SPCN firmware is then downloaded to the expansion units that require an update.
6. Change the SPCN Firmware Update Policy setting back to what it was originally set to in step 3 on page 29 and click **Save Policy Setting**.

Notes:

- To monitor the progress of the SPCN firmware update, click **Configure I/O Enclosures**. The screen is refreshed. Do not use the browser **Back** or **Refresh** button to monitor the update progress. The Power Control Network Firmware Update Status column shows the percentage completed, and In Progress is displayed while the download operation is in progress. Not Required is displayed when the download process is completed.
- To stop the SPCN firmware update (not recommended), click **Stop SPCN Firmware Update**.

Part 2. 31D/24, or 31T/24 SCSI disk-drive enclosure

Learn about the SCSI disk-drive enclosure and how to assemble it.

This SCSI disk-drive enclosure can hold up to 24 disk drives. The enclosure is organized into 4 groups, with each group containing 6 disk drive slots. The enclosure can be used as a stand-alone tower or a rack-mounted drawer.

When connecting with your server, you can connect your SCSI cables to either a single initiator repeater card or to a dual initiator repeater card on your SCSI disk drive enclosure. The dual initiator repeater card allows for high availability and combining groups of disk drive slots.

Tip: Before you connect the enclosure, you will need the following information:

- You will want to install the SCSI adapter you will use to connect the enclosure to your system. Either print this task or complete it and return here. To view the PDF file of PCI adapters, approximately 40 MB in size, see [oemiphak.pdf](#)  .
- For systems or partitions with AIX or Linux as the operating system, you will want to have the SCSI adapter information for your operating system. This will be critical information for configuring the disks after you have attached the enclosure you will want to print the information before you begin the procedure. This guide is available from the SCSI PCI Adapters (http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm) web page.
- If you are going to configure RAID arrays, ensure you have the following number of available disks for each RAID level:

RAID 0 or 1

Two drives per array

RAID 5

At least 3 drives per array

RAID 6

At least 4 drives per array

Chapter 3. Connect the 31D/24, or 31T/24 to a system with the AIX operating system

Use the information in this section to understand the cabling, SCSI addressing, and post connection requirements for the disk-drive enclosure.

1. Install the initiator repeater cards into the disk drive enclosure. For instructions, see Chapter 6, “SCSI repeater card,” on page 45.
2. Connect the SCSI cable to your repeater card. Choose one of the following methods based on your situation:
 - If you are using only single repeater cards or only dual repeater cards, install your SCSI cable **A** to the initiator repeater card **B** as shown in the following figure.
 - **Single SCSI adapter connected to single repeater card:** If in this case you are not sharing resources (disk drives), simply attach each SCSI cable to each repeater card.

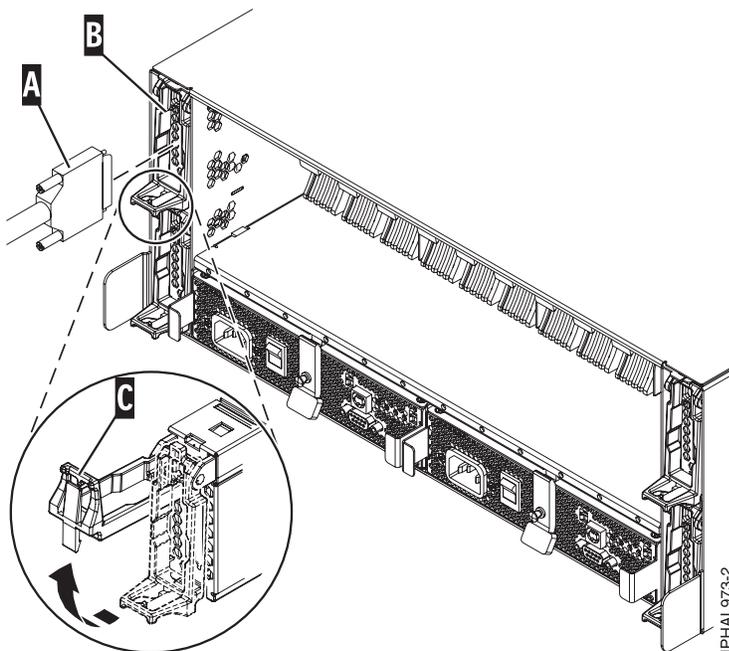


Figure 11. SCSI cable to single repeater card

- **Two SCSI adapters connected to dual repeater cards:** If in this case you are sharing resources (disk drives) between systems or logical partitions, ensure that you understand the SCSI addressing and cabling order. For more information, see “Connecting and configuring the 31D/24 or 31T/24 SCSI disk-drive enclosure in an AIX clustered environment” on page 36.

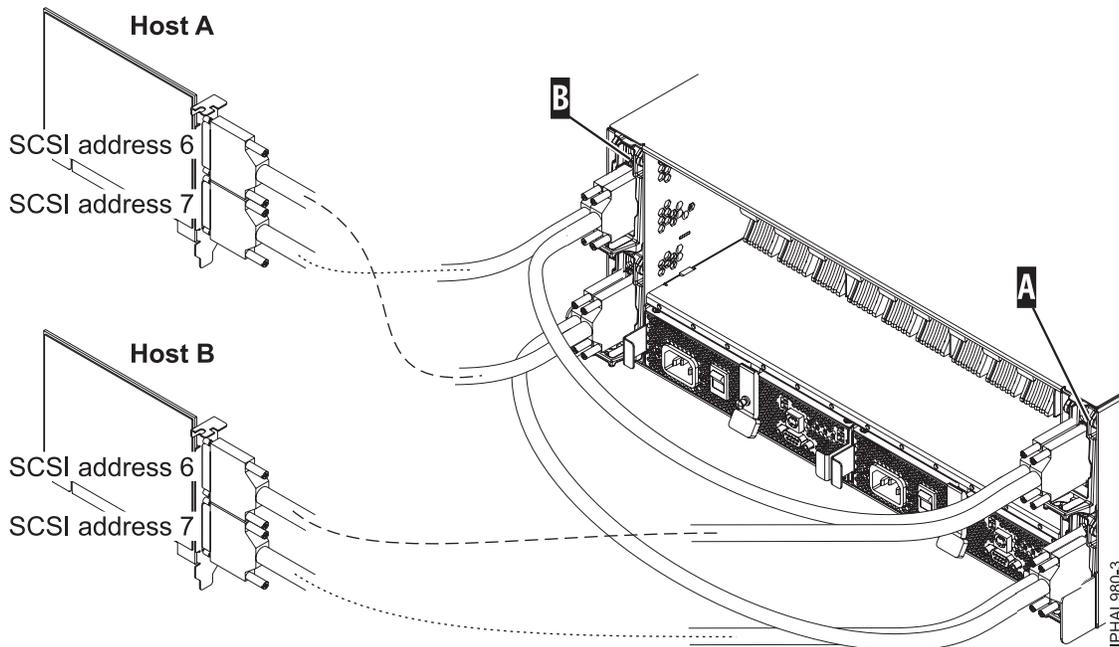


Figure 12. SCSI cable to dual repeater card connected with two SCSI cards

- **Four SCSI adapters connected to dual repeater cards:** If in this case you are sharing resources (disk drives) between systems or logical partitions, ensure that you understand the SCSI addressing and cabling order. For more information, see “Connecting and configuring the 31D/24 or 31T/24 SCSI disk-drive enclosure in an AIX clustered environment” on page 36.

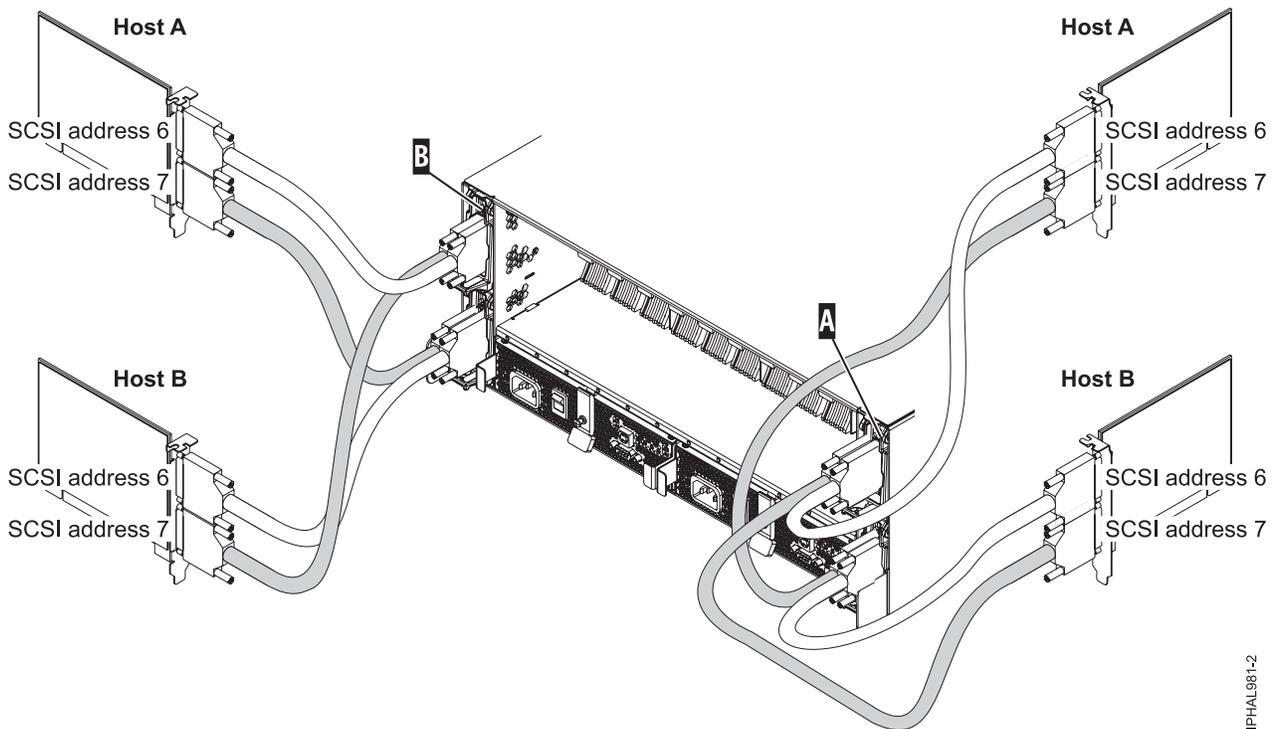


Figure 13. SCSI cable to dual repeater card connected with four SCSI cards

- **Single SCSI adapter connected to a combination of single and dual repeater cards:** If in this case you are sharing resources (disk drives) between systems or logical partitions, ensure that you

understand the SCSI addressing and cabling order. For more information, see “Connecting and configuring the 31D/24 or 31T/24 SCSI disk-drive enclosure in an AIX clustered environment” on page 36.

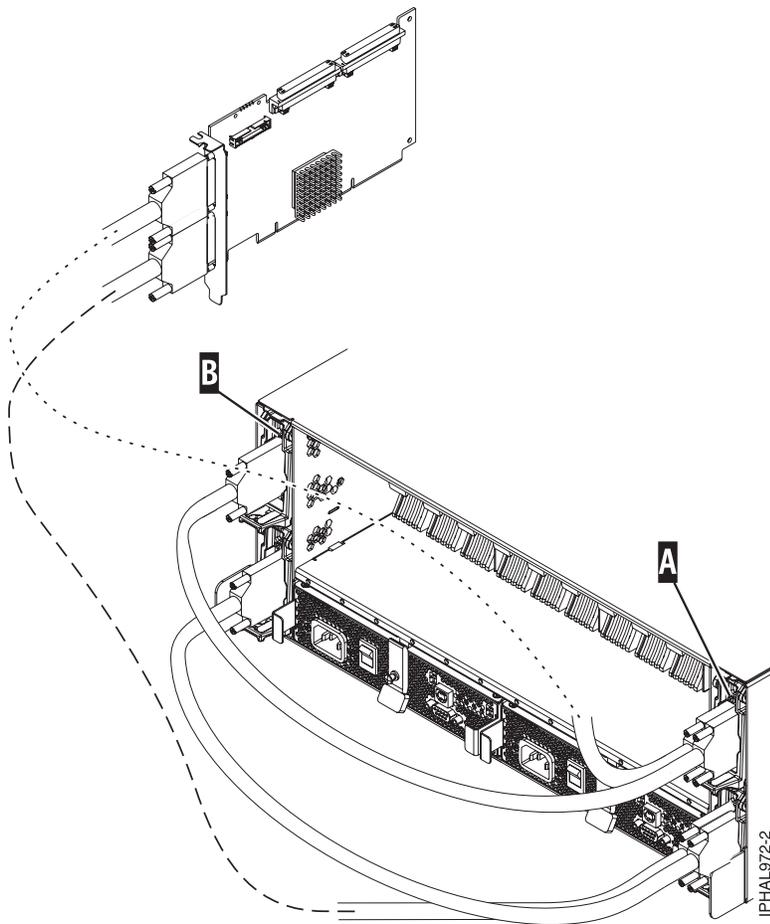


Figure 14. SCSI cable to dual repeater card connected to single repeater card

3. Use the information that you printed for the SCSI adapter to complete the configuration of your disk drives. For more information see the SCSI PCI Adapters (http://publib.boulder.ibm.com/infocenter/pseries/v5r3/index.jsp?topic=/com.ibm.pseries.doc/hardware_docs/scsipciadapters.htm) Web page and locate the file for the adapter you are using to attach the enclosure to your system.

Important: If you plan on using the disk enclosure in an AIX environment, it is critical that you set up an AIX CRON job so that if errors exist, they report to the attached system. The AIX CRON job needs to be setup during the initial installation.

Note: Errors on disks in the enclosure will be found without this CRON job (script) through normal Automatic Error Log Analysis; however, other errors such as fan and power supply problems in the enclosure can only be found when running diagnostics manually, which is accomplished by using the following scripts.

To collect enclosure errors, add this CRON job SES Healthcheck to the system CRON table. Edit the system CRON with the `crontab -e` command. At the bottom of that file, enter:

```
* 3 * * * /usr/lpp/diagnostics/bin/run_ses_healthcheck 1>/dev/null 2>/dev/null
```

This CRON runs the script "run_ses_healthcheck" daily at 3 A.M. The script's contents depend on the configuration of the system that the enclosure is attached to.

Example 1

If the system the enclosure is attached to has either an HMC or is running Electronic Service Agent™, create the file named "run_ses_healthcheck" in the /usr/lpp/diagnostics/bin directory, with the following contents:

```
-----  
#!/bin/ksh  
#Name:run_ses_healthcheck  
#Location:/usr/lpp/diagnostics/bin  
#Function: SCSI SES hourly heathcheck  
for i in `lsdev -Cc container -t ses -s scsi -F name -S available`  
do  
    diag -cd $i > /dev/null  
    done  
#any registered "external notification" will be notified of errors  
#(such as HMC or Electronic Service Agent)  
-----
```

Note: On a partitioned system, it is only necessary to have the CRON job and script running on one partition associated with the enclosure, though it is acceptable to have the same CRON job and scripts on any partition associated with the enclosure.

Example 2

If the system the enclosure is attached to has neither an HMC nor is running Electronic Service Agent, create the file named "run_ses_healthcheck" in the /usr/lpp/diagnostics/bin directory, with the following contents:

```
-----  
#!/bin/ksh  
#Name:run_ses_healthcheck  
#Location:/usr/lpp/diagnostics/bin  
#Function: SCSI SES hourly heathcheck  
for i in `lsdev -Cc container -t ses -s scsi -F name -S available`  
do  
    diag -cd $i > /dev/null  
    if [ $? -ne 0 ]  
    then  
        /usr/lpp/diagnostics/bin/diagrpt -o >/tmp/ses.health.output  
        #you might want to process the output prior to placing it in  
        #a file  
        #somhow notify the user of the error. A sample is shown  
        #below.  
        mail -s "7031 Health Check" root</tmp/ses.health.output  
        rm /tmp/ses.health.output  
    fi  
done  
-----
```

Note: You can customize the actual notification in the script based on your preferences. These scripts send mail to root user if there are errors that need attention. You can modify the script if needed to inform certain users about the errors.

In both examples, once you have created the "run_ses_healthcheck" file, make it executable by typing (at AIX command prompt):

```
chmod 544 /usr/lpp/diagnostics/bin/run_ses_healthcheck.
```

Connecting and configuring the 31D/24 or 31T/24 SCSI disk-drive enclosure in an AIX clustered environment

Special considerations exist for connecting the disk-drive enclosure in a clustered environment. The information in this section will help you meet these considerations.

Before you begin

Having any planning and cabling documentation for the system you are attaching available during this process will make some parts of this process much easier.

About this task

To assure that the SCSI disk-drive enclosure is ready to be connected to the cluster complete the following steps.

1. Ensure that each SCSI device connected to the shared SCSI bus has a unique ID. A common configuration is to set the SCSI ID of the adapters on the nodes to be higher than the SCSI IDs of the shared devices. (Devices with higher IDs take precedence in SCSI bus contention.)
 - a. Use the command: `lscfg | grep scsi` to determine and record the logical name of each adapter. In the command output, the first column lists the logical name of the SCSI adapter, such as + SCSI0.
 - b. Use the `lscfg -vpl` command and logical name of the adapter to record the I/O slot (physical slot) that each SCSI adapter uses. For example `lscfg -vpl scsi0` where `scsi0` is the logical name of the adapter.
 - c. Use the `lsattr` command, as in the following example to find the ID of the adapter `scsi0`: `lsattr -E -l scsi0 | grep id`

Note: Do not use wildcard characters or full pathnames on the command line for the device name designation.

In the resulting output, the first column lists the attribute names. The integer to the right of the `id` attribute is the adapter SCSI ID:

If a SCSI adapter address conflict exists move on to the next step, if no conflict exists return to the connection page for the operating system of the system you are connecting.

2. Examine the cabling to see if the proper ports on the system are connected to the proper ports on the repeater cards on the disk-drive enclosure. For example if you are connecting the system using two host adapter cards and dual repeater cards as shown in the following figure you will want to connect the systems as follows.

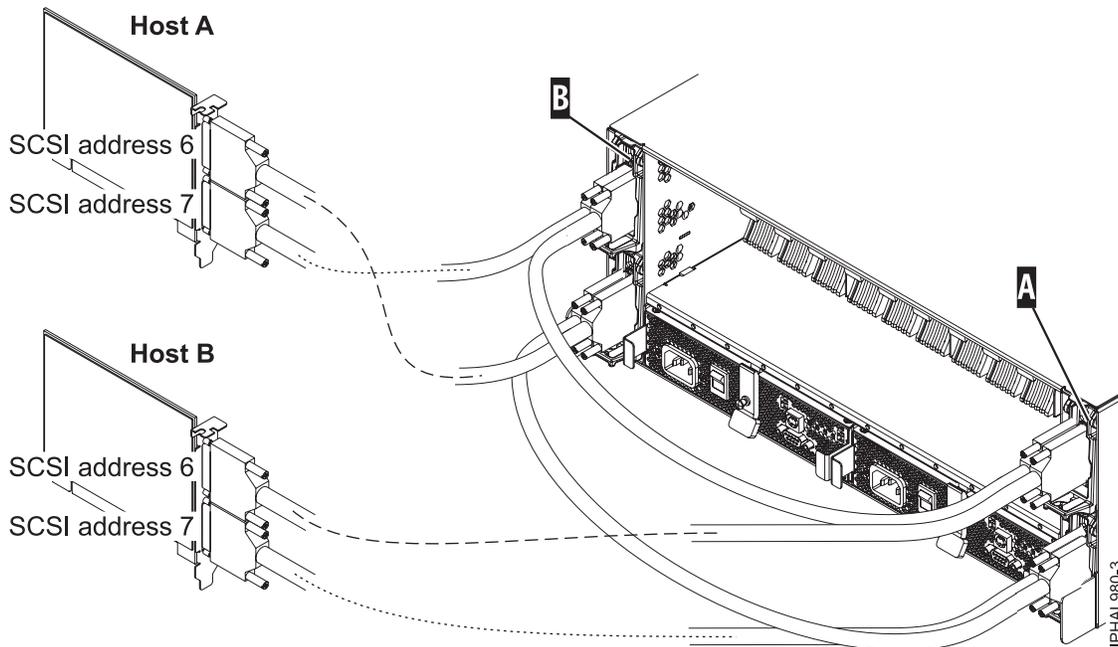


Figure 15. SCSI cable to dual repeater card connected with two SCSI cards

Cable the first SCSI bus or set of shared disks by doing the following:

- a. Connect the bottom port of the adapter on **Host A** (SCSI address 7) to the exterior port on the repeater card in slot C2 on the enclosure.
- b. Connect the top port of the adapter on **Host B** (SCSI address 6) to the exterior port on the repeater card in slot C3 on the enclosure.

This creates a set of shared disks and a shared SCSI bus (such as scsi0) between Host A and Host B. The important thing to consider at this point is that you connect the cables in descending order of the SCSI address on the host adapter. Connecting the cables in descending order of the Host SCSI address will reduce the potential for address conflicts.

Cable the second SCSI bus or set of shared disks by doing the following:

- a. Connect the bottom port of the adapter on **Host B** (SCSI address 7) to the interior port on the repeater card in slot C5 on the enclosure.
- b. Connect the top port of the adapter on **Host A** (SCSI address 6) to the interior port on the repeater card in slot C4 on the enclosure.

This creates a set of shared disks and a shared SCSI bus (such as scsi1) between Host A and Host B. The important thing to consider at this point is that this is an independent SCSI bus or set of shared disks from the first set. Ensuring that you do not mistakenly connect one of the cables from the either SCSI bus to another will reduce the potential for SCSI address conflicts.

Important: When adding, removing, or replacing SCSI adapters in Host systems you might want to disconnect the cabling at the enclosure first and reconnect the cabling to the enclosure last. This is because the new adapter may default to a SCSI ID of 7. You should ensure that the correct SCSI ID is set for the port you are cabling.

Chapter 4. Connect and configure the disk drive enclosure in a system with the Linux operating system

Use the information in this section to understand the cabling, SCSI addressing, and post connection requirements for the disk-drive enclosure.

1. Install the initiator repeater cards into the disk drive enclosure. For instructions, see Chapter 6, “SCSI repeater card,” on page 45.
2. Connect the SCSI cable to your repeater card. Choose one of the following based on your situation:
 - If you are using only single repeater cards or only dual repeater cards, install your SCSI cable **A** to the initiator repeater card **B**. For more details, see Figure 16, Figure 17 on page 40, Figure 18 on page 40, depending upon your situation.

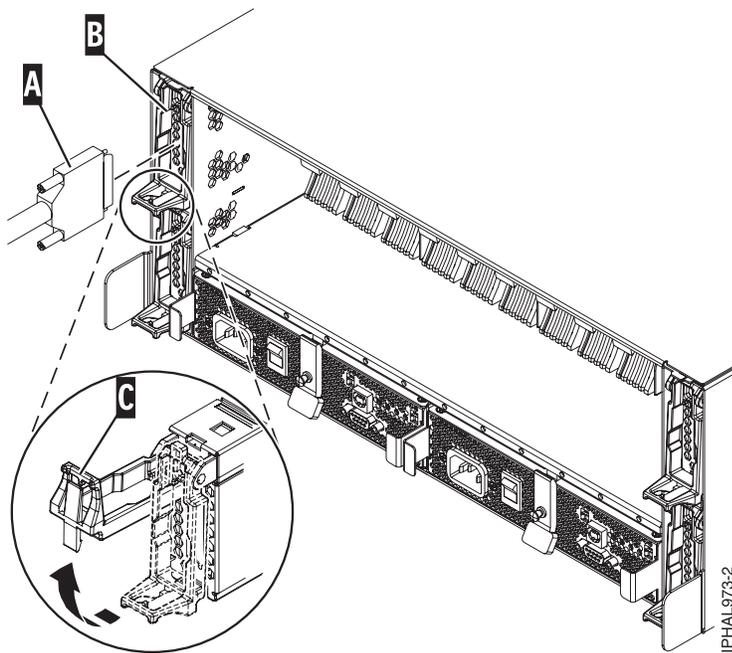


Figure 16. SCSI cable to single repeater card

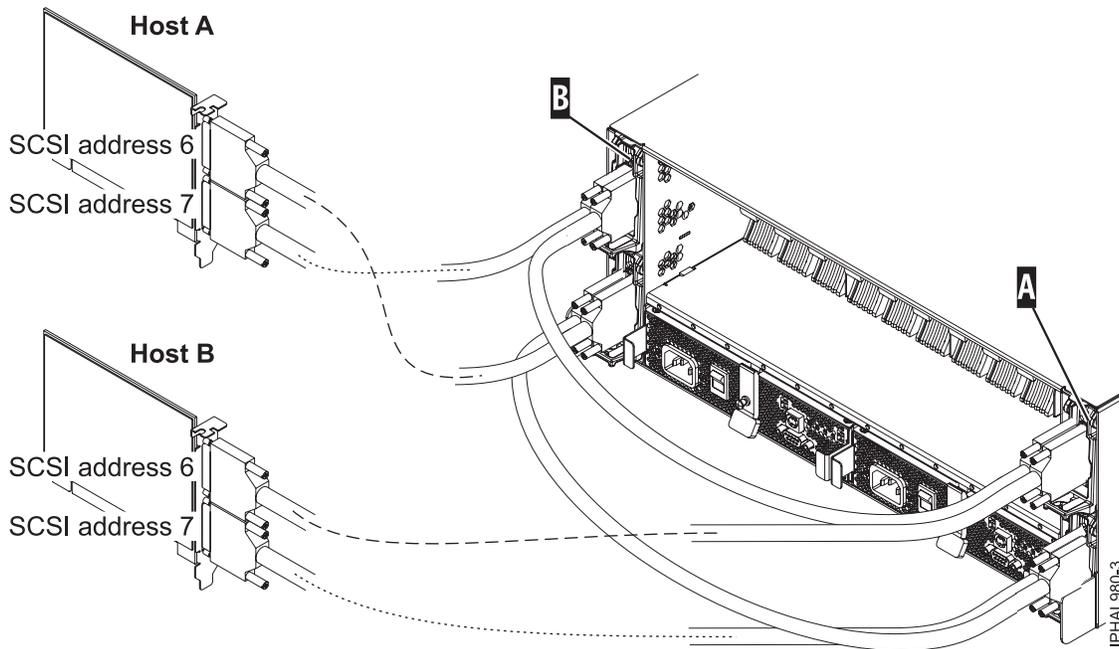


Figure 17. SCSI cable to dual repeater card connected with two SCSI cards

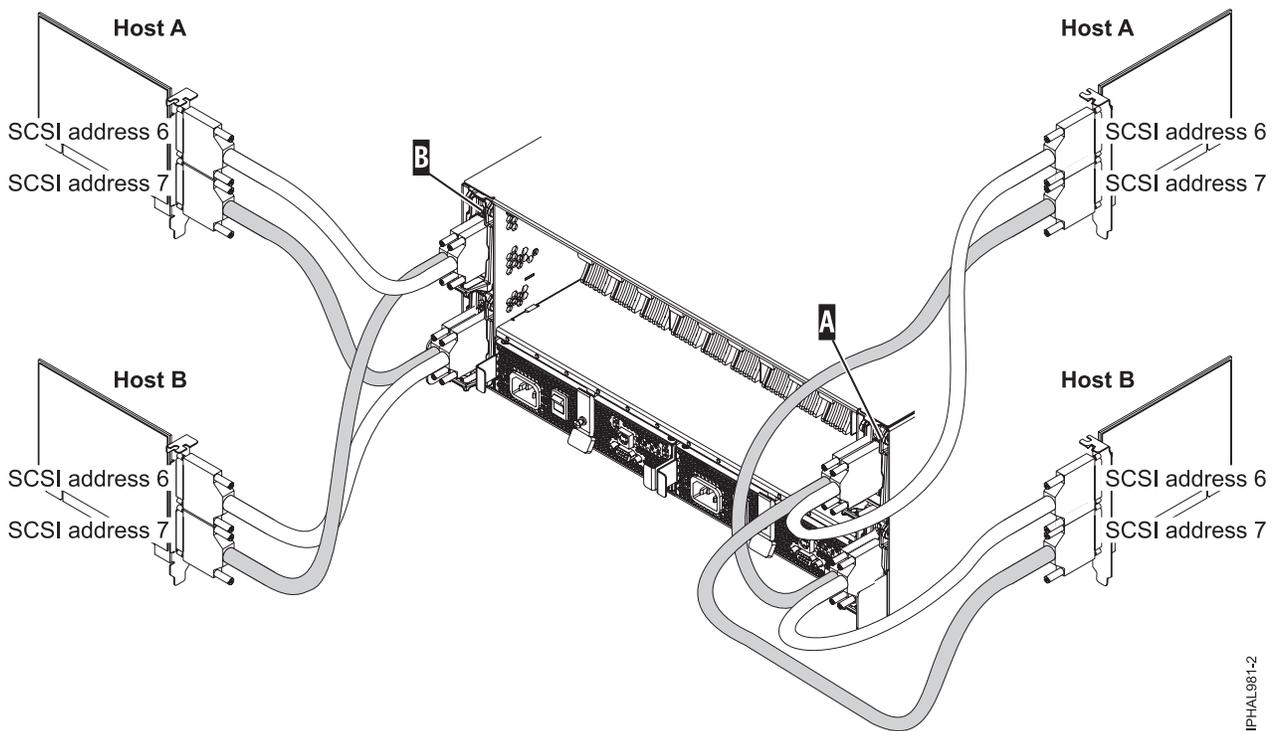


Figure 18. SCSI cable to dual repeater card connected with four SCSI cards

- If you are using a combination of single and dual repeater cards, install a SCSI cable to the dual initiator repeater card **A**. Then, connect the dual repeater card **A** to the single repeater card **B** with a different SCSI cable. For more information, see Figure 19 on page 41.

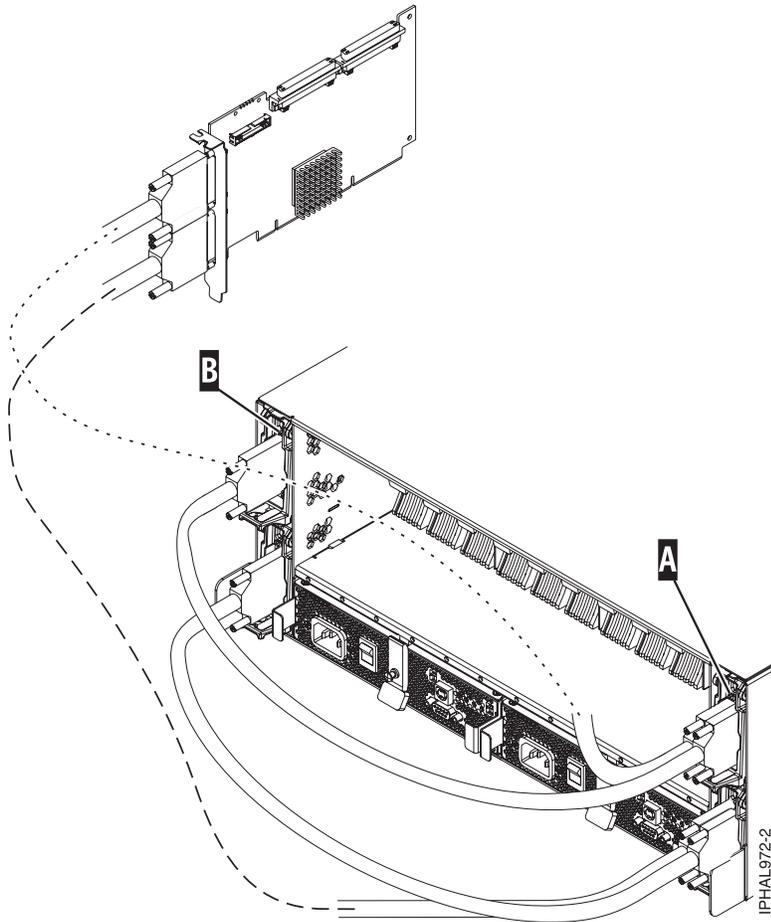


Figure 19. SCSI cable to dual repeater card connected to single repeater card

3. Install the other end of the SCSI cable C to the SCSI adapter D on the server. For more details, see Figure 20.

Important: The SCSI adapter or the system or partition must be powered off before making this connection.

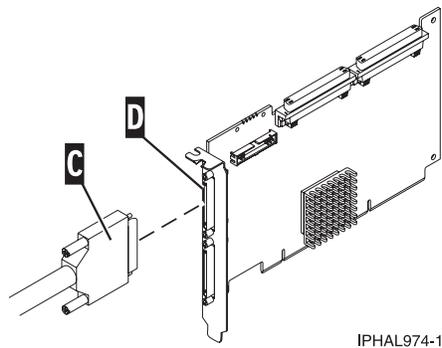


Figure 20. SCSI cable to SCSI interface card

4. Set up the Linux CRON job during the initial installation of your SCSI disk-drive enclosure. Perform the following tasks to ensure that your Linux CRON job is setup.
 - a. Install the following RPMs from Service and productivity tools (<http://www14.software.ibm.com/webapp/set2/sas/f/lopdiags/home.html>).

- librtas
- lsvpd
- ppc64-utils
- diagela

- b. If your partitions are managed by a Hardware Management Console (HMC), install the `src`, `rsct.core.utils`, `rsct.core`, `csn.core`, `csn.client`, and `devices.chrp.base.ServiceRM` packages in order to report errors to the Service Focal Point on the attached HMC. Instructions for installing the packages are located on the Web site listed previously.

Note: Errors on hard disks within the enclosure will not be found using this CRON job. This diagnostic is limited to reporting errors with the fans, power supplies, VPD card, and repeater in the enclosure.

- c. Add a CRON job to execute enclosure diagnostics to the system CRON table. As root, edit the system CRON by running `crontab -e`. At the bottom of that file, enter:

```
* 3 * * * /usr/sbin/diag_encl -s 1>/dev/null 2>&1
```

- d. Adding this line causes the diagnostic application `/usr/sbin/diag_encl` to be run daily at 3:00 a.m. The `diag_encl` diagnostic application will read the contents of the `/etc/diagela/diagela.config` file to determine what applications have been registered to be notified of errors. To add additional notification methods or for more information, see that file. By default, the following notifications will occur.

- The Service Focal Point on the HMC will be notified if the system is managed by an HMC. If the system is not managed by an HMC, the root group will be notified.
- If the system has Electronic Service Agent installed, it will be notified.
- The error details will be printed to the console, to the end of the `/var/log/platform` log file, and to the `syslog` (`/var/log/messages`).

Notes:

- On a partitioned system, it is only necessary to have the CRON job on one partition associated with the enclosure. However, it is acceptable to have the same CRON job on all partitions.
- `/usr/sbin/diag_encl` might run at any time to diagnose enclosures attached to the system.

Chapter 5. Connect and configure the enclosure in a system with the operating system

Use the information in this section to understand the cabling, SCSI addressing, and post connection requirements for the disk-drive enclosure.

1. Install the initiator repeater cards into the disk drive enclosure. For instructions, see Chapter 6, “SCSI repeater card,” on page 45.
2. Connect the SCSI cable to your repeater card. Choose one of the following based on your situation:

Tip: Ensure that the cable length for connections across the enclosure are long enough to allow concurrent maintenance of disk drives.

- If you are using only single repeater cards or only dual repeater cards, install your SCSI cable **A** to the initiator repeater card **B**.

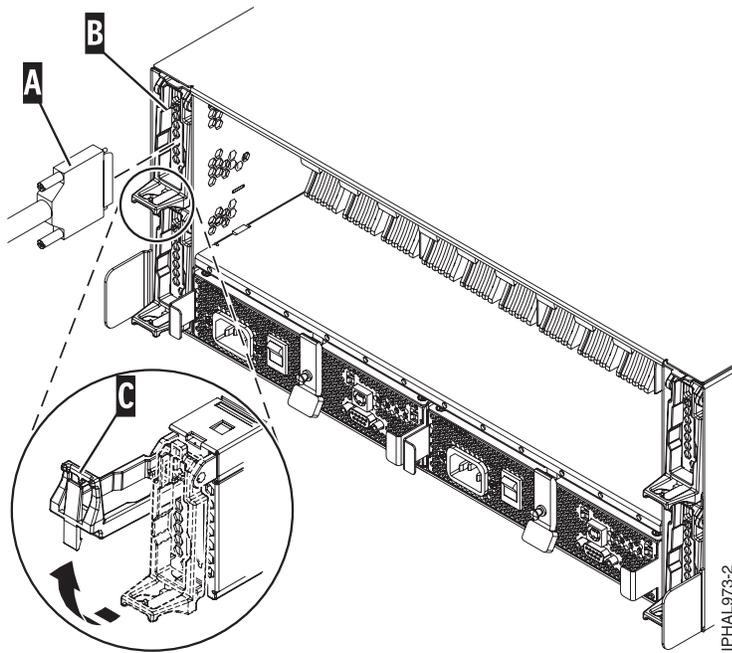


Figure 21. SCSI cable to single repeater card

- If you are using a combination of single and dual repeater cards, install a SCSI cable to the dual initiator repeater card **A**. Then, connect the dual repeater card **A** to the single repeater card **B** with a different SCSI cable.

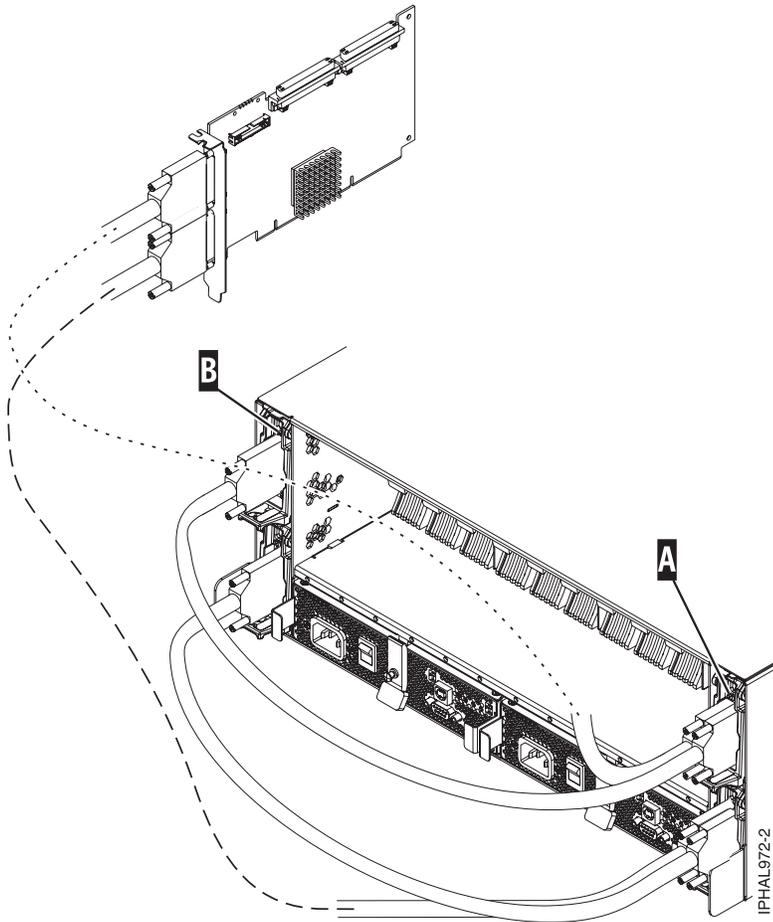


Figure 22. SCSI cable to dual repeater card connected to single repeater card

3. Install the other end of the SCSI cable C to the SCSI adapter D on the server.

Important: The SCSI adapter or the system or partition must be powered off before making this connection.

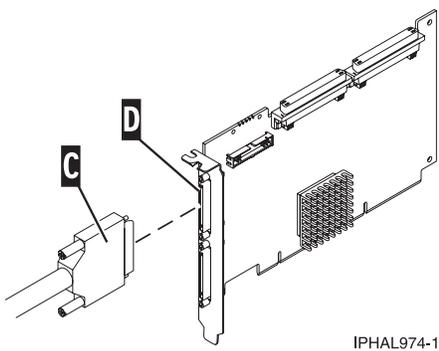


Figure 23. SCSI cable to SCSI interface card

Chapter 6. SCSI repeater card

Use this information to understand where to place your repeater card and how to install your repeater card.

Use the following figure and instructions to place your repeater cards.

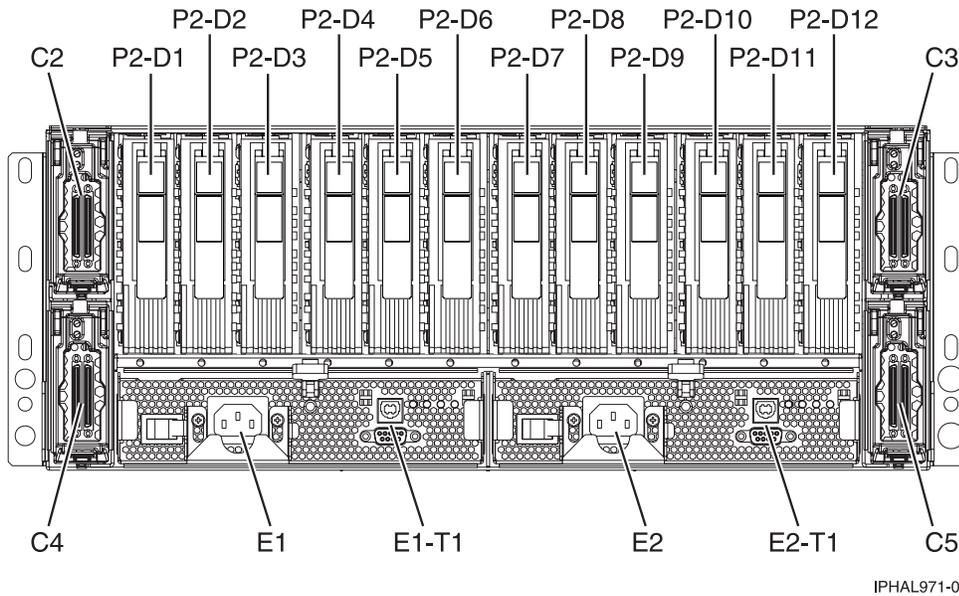


Figure 24. Repeater card location of the and 31D/24 SCSI disk-drive enclosure (drawer models)

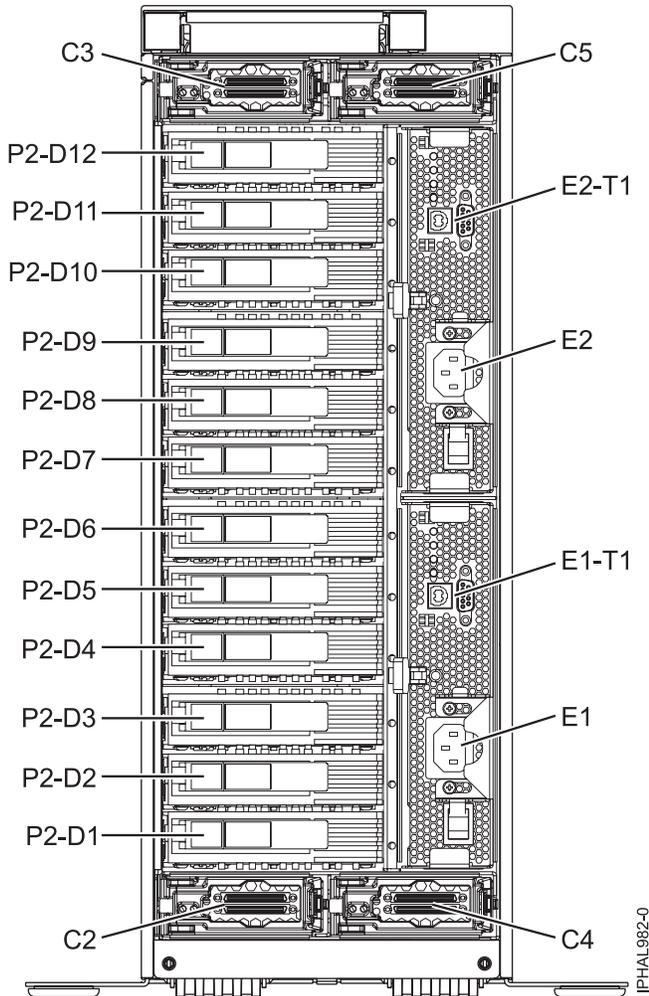


Figure 25. Repeater card location of the and 31T/24 SCSI disk-drive enclosure (stand-alone models)

If you only have dual repeater cards, place as follows:

Important: On stand-alone models, the locations C3 and C5 are located on top, C2 and C4 are located on the bottom. Follow the location codes when placing repeater cards.

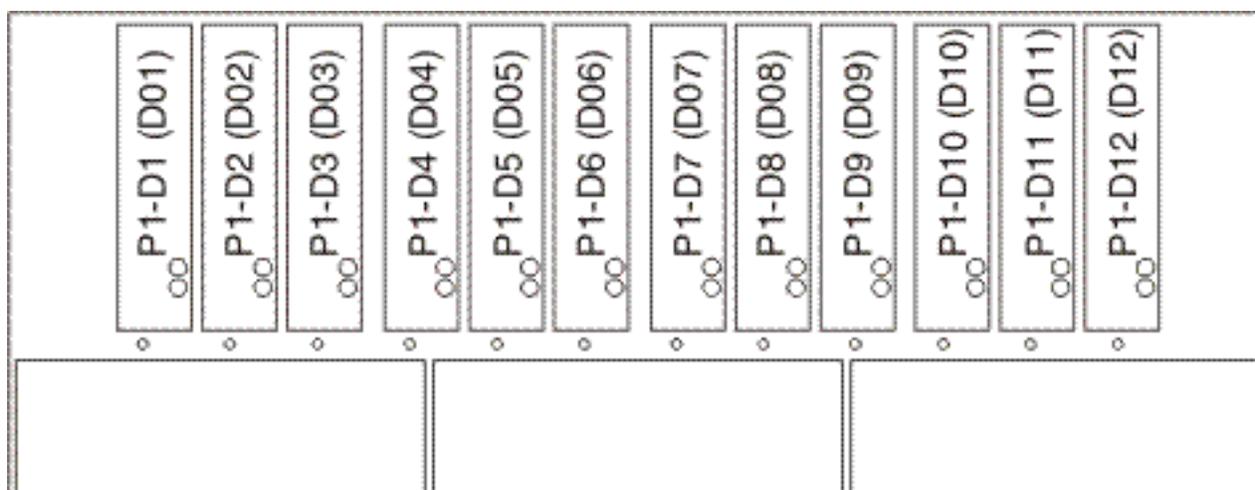
Table 8. Repeater card placement for single and dual style frepeater cards

Type and number of repeater cards	Single repeater card placement	Dual repeater card placement
1 single repeater card and 0 dual repeater cards	C5	
2 single repeater cards and 0 dual repeater cards	Place in order C5 then C2	
3 single repeater cards and 0 dual repeater cards	Place in order C5, C2, then C4	
4 single repeater cards and 0 dual repeater cards	Place in order C5, C2, C4 then C3	
1 single repeater card and 1 dual repeater card	Place in C5 first then place dual repeater card	C4
1 single repeater card and 2 dual repeater cards	Place in C5 first then place dual repeater card	Place in order C4 then C3

Table 8. Repeater card placement for single and dual style frepeater cards (continued)

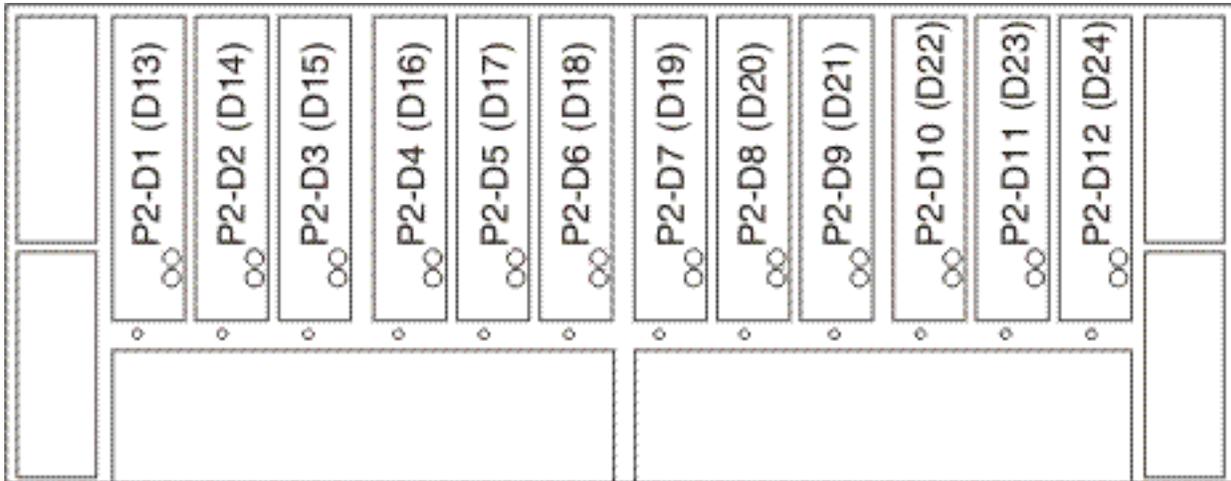
Type and number of repeater cards	Single repeater card placement	Dual repeater card placement
2 single repeater cards and 1 dual repeater cards	Place in C5 then C2 then place dual repeater card	C4
2 single repeater cards and 2 dual repeater cards	Place in C5 then C2 then place dual repeater card	Place in order C4 then C3
0 single repeater cards and 1 dual repeater card		C4
0 single repeater cards and 2 dual repeater cards		Place in order C4 then C5
0 single repeater card and 3 dual repeater cards		Place in order C4, C5, then C3
0 single repeater card and 4 dual repeater cards Restriction: This configuration is for servers models only.		Place in order C4, C5, C3, then C2

The following figures show the locations of the disk drives for the front and back of the 31D/24 or 31T/24 SCSI disk-drive enclosure.



IPHAL975-0

Figure 26. Front view of 31D/24 or 31T/24 SCSI disk-drive enclosure



IPHAL976-0

Figure 27. Back view of 31D/24 or 31T/24 SCSI disk-drive enclosure

The following list describes how the repeater card locations affect the disk drive bays.

- The top left repeater card (C2) drives the front right 6 bays (D07 to D12). Figure 26 on page 47
- The top right repeater card (C3) drives the front left 6 bays (D01 to D06). Figure 26 on page 47
- The bottom left repeater card (C4) drives the back left 6 bays (D13 to D18). Figure 27
- The bottom right repeater card (C5) drives the back right 6 bays (D19 to D24). Figure 27

To install your repeater card, complete the following steps:

1. Remove the filler from the repeater card slot.
2. Install your new repeater card.

Chapter 7. Remove and replace SCSI repeater card

You might need to remove and replace one of the Small Computer System Interface (SCSI) repeater cards to repair a failing device or as a part of another service action.

Before you begin

Before you remove and replace an SCSI repeater card, follow the instructions for your operating system to save any jobs.

Restriction: You must replace the repeater card with the same type of card to continue. If you are changing card configurations from single to dual stop here and follow the instructions in Chapter 3, “Connect the 31D/24, or 31T/24 to a system with the AIX operating system,” on page 33 or Chapter 4, “Connect and configure the disk drive enclosure in a system with the Linux operating system,” on page 39.

About this task

The disk drive enclosure SCSI repeater card can be removed and replaced with the system and enclosure power on. To avoid errors, you can power off the adapter that connects the disk drive enclosure to your system. For details, refer to the Hardware Information Web site at [add URL here](#) and find the PCI adapters guide for your model.

1. Locate the repeater card you are replacing. For instructions see Chapter 12, “Service Action Log (SAL),” on page 73.
2. Remove the cable **A** from the repeater card **B**.

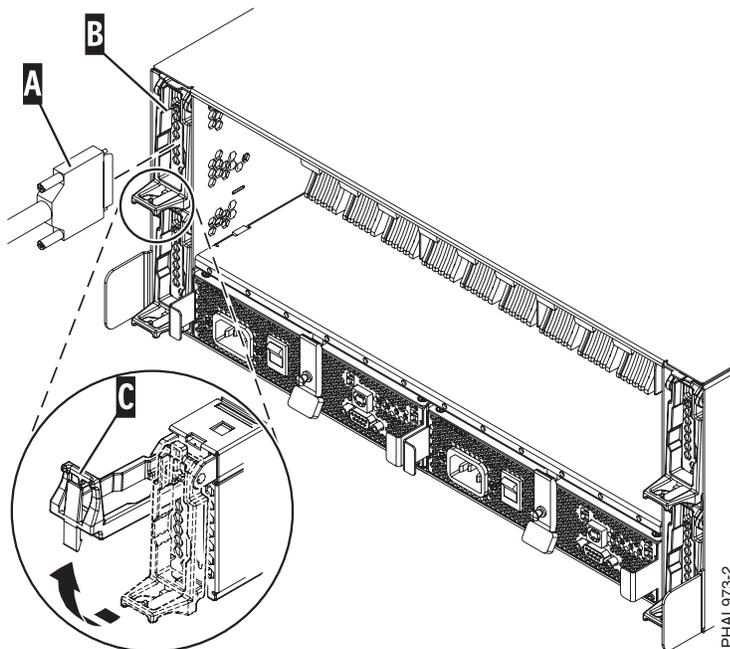


Figure 28. Removing SCSI cable from repeater card

3. Lift the handle **C** to unseat the repeater card from the enclosure.
4. Pull the repeater card out of the enclosure.

5. Align the replacement repeater card with the empty slot on the enclosure, and insert the card until it is firmly seated.
6. Lower the handle to secure the repeater card into place.
7. Reattach the cable to the repeater card.
8. Restart the adapter. For instructions, see *Managing PCI adapters*. To view the PDF file of *Managing PCI adapters*, approximately 4 MB in size, see [oemiphcd.pdf](#) 

Chapter 8. Disk-drive concurrent maintenance lights for 31D/24 or 31T/24 SCSI disk-drive enclosure

Learn where the disk-drive concurrent maintenance lights are located on your system.

The following figures show the locations of the disk-drive concurrent maintenance light **A** for the models 31D/24 or 31T/24 SCSI disk-drive enclosure.

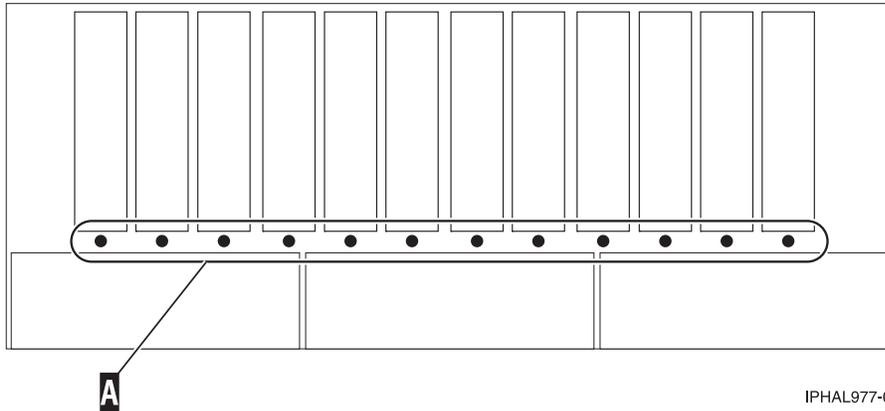


Figure 29. Front view of model 31D/24 or 31T/24 SCSI disk-drive enclosure concurrent maintenance lights

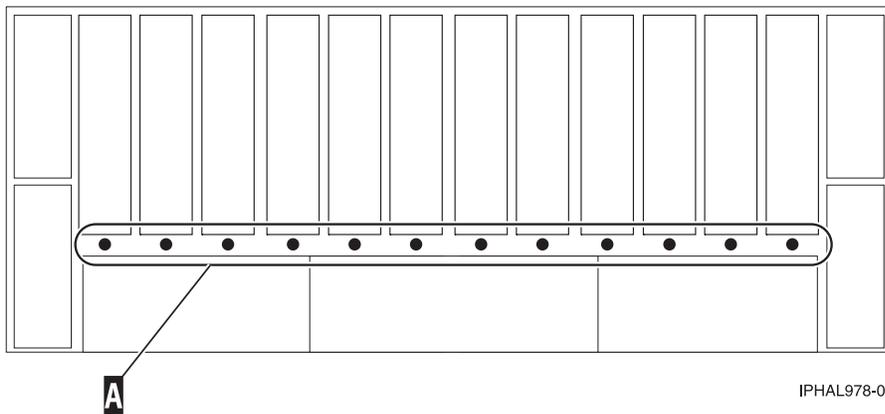


Figure 30. Back view of model 31D/24 or 31T/24 SCSI disk-drive enclosure SCSI disk-drive enclosure concurrent maintenance lights

Part 3. 58/86 SAS disk-drive enclosure

Learn about the SAS disk-drive enclosure and how to assemble it.

This SAS disk-drive enclosure can hold up 12 disk drives. The enclosure is organized into 2 groups, with each group containing 6 disk drive slots.

Tip: Before you connect the enclosure you will need the following information:

- If you are going to configure RAID arrays, ensure you have the following number of available disks for each RAID level:

RAID 0 or 1

Two drives per array

RAID 5

At least 3 drives per array

RAID 6

At least 4 drives per array

Chapter 9. Connecting the SAS adapter to the 58/86 disk-drive enclosure

Learn about how to connect the 58/86 disk-drive enclosure

About this task

Use this procedure to connect the 58/86 disk-drive enclosure:

1. Install the SAS adapter into your server. For details, refer to the information center at <http://publib.boulder.ibm.com/infocenter/systems/scope/hw>, and locate the PCI Adapters topic collection for your machine type.
2. Connect the SAS cable to your disk drive. Choose one of the following methods based on your situation:
 - Figure 31
 - Figure 32 on page 56
 - Figure 33 on page 57

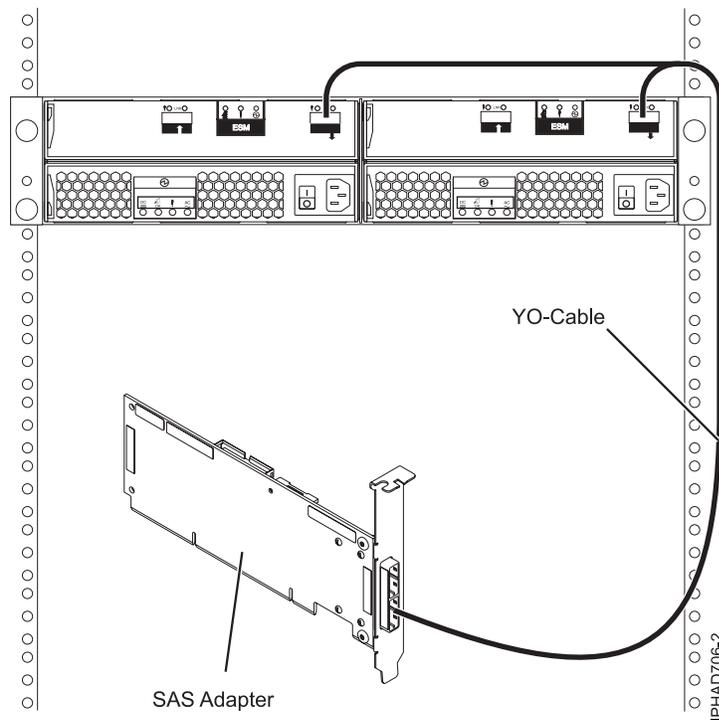


Figure 31. SAS YO cable to single enclosure card

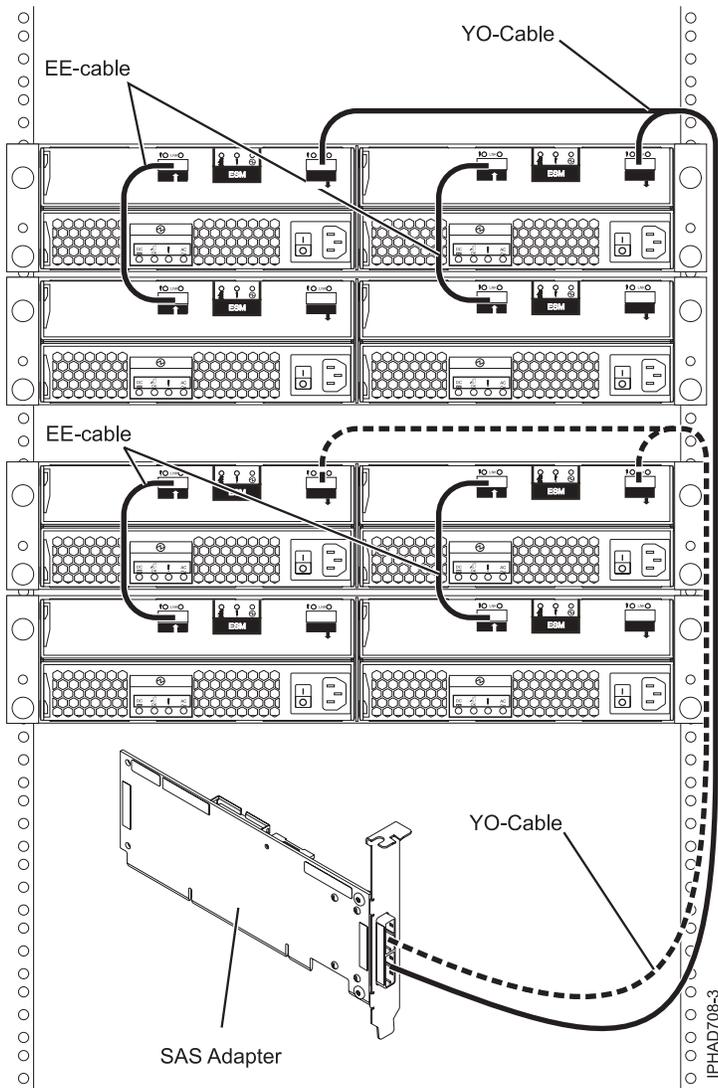


Figure 32. SAS YO cable to single enclosure with EE cables adding an additional enclosure or two YO connected enclosures each with an additional enclosure attached

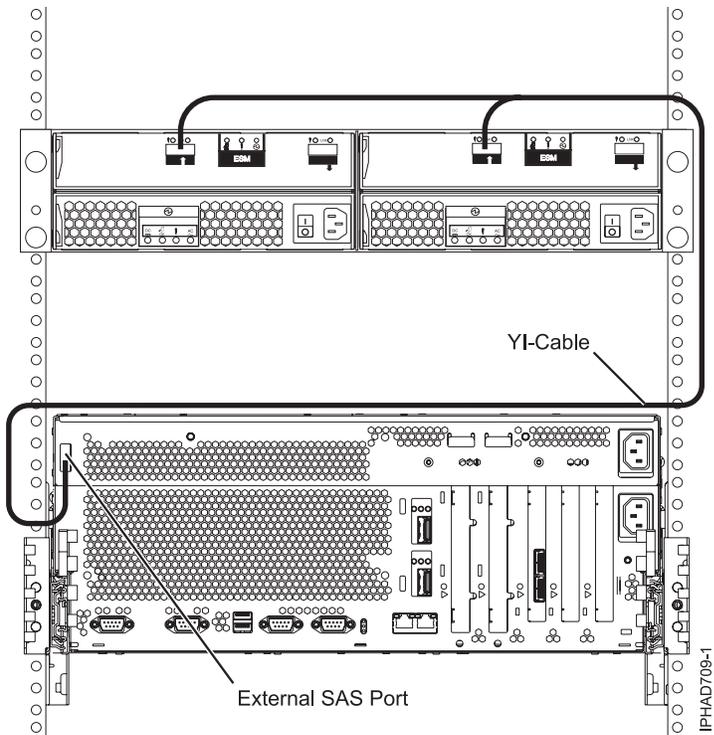


Figure 33. Single enclosure attached with YI cable to external SAS port

3. Install the other end of the SAS cable to the SAS adapter on the server.

Part 4. Common Procedures

This section contains all the common procedures related to installing, removing and replacing features.

Chapter 10. Before you begin

Understand prerequisites for installing, removing, or replacing features and parts.

About this task

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)

Before you begin a replacement or installation procedure, perform these tasks:

1. If you are installing a new feature, ensure that you have the software required to support the new feature.
2. If you are performing an installation or replacement procedure that might put your data at risk, ensure, wherever possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).
3. Review the installation or replacement procedure for the feature or part.
4. Note the significance of color on your system.

Blue or terra-cotta on a part of the hardware indicates a touch point where you can grip the hardware to remove it from or install it in the system, open or close a latch, and so on. Terra-cotta might also indicate that the part can be removed and replaced with the system or logical partition power on.

5. Ensure that you have access to a medium, flat-blade screwdriver.
6. If parts are incorrect, missing, or visibly damaged, do the following:
 - If you are replacing a part, contact your service provider or next level of support.
 - If you are installing a feature, contact one of the following:
 - Your service provider or next level of support.
7. If you encounter difficulties during the installation, contact your service provider, or your next level of support.
8. If you are installing new hardware in a logical partition, you need to understand and plan for the implications of partitioning your system. For details, see the Logical partitioning and then return to these instructions. To view the PDF file of Logical partitioning, approximately 3 MB in size, see

oemiphat.pdf 

Chapter 11. Managing the Advanced System Management Interface

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power.

The ASMI might also be referred to as the service processor menus.

Accessing the ASMI without an HMC

You can access the ASMI through a Web browser or an ASCII terminal.

Accessing the ASMI using a PC and Web browser

Connect a PC or mobile computer to the server to access the Advanced System Management Interface (ASMI). The Web interface to the ASMI is available during all phases of system operation including the initial program load (IPL) and run time.

About this task

The Web interface to the ASMI is accessible through Microsoft® Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 running on a PC or mobile computer connected to the service processor. The Web interface is available during all phases of system operation including the initial program load (IPL) and run time. However, some of the menu options in the Web interface are unavailable during IPL or run time to prevent usage or ownership conflicts if the system resources are in use during that phase.

The following instructions apply to systems that are *not* connected to an HMC.

If you are managing the server using an HMC, refer to Access the ASMI using the HMC.

To set up the Web browser for direct or remote access to the ASMI, complete the following tasks:

1. Connect the power cord from the server to a power source, and wait for the control panel to display 01.
2. Select a PC or mobile computer that has Microsoft Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 to connect to your server.

If you do not plan to connect your server to your network, this PC or mobile computer will be your ASMI console.

If you plan to connect your server to your network, this PC or mobile computer will be temporarily connected directly to the server for setup purposes only. After setup, you can use any PC or mobile computer on your network that is running Microsoft Internet Explorer 6.0, Netscape 7.1, or Opera 7.23 as your ASMI console.

3. Connect an Ethernet cable from the PC or mobile computer to the Ethernet port labeled HMC1 on the back of the managed system. If HMC1 is occupied, connect an Ethernet cable from the PC or mobile computer to the Ethernet port labeled HMC2 on the back of the managed system.
4. Configure the Ethernet interface on the PC or mobile computer to an IP address and subnet mask within the same subnet as the server so that your PC or mobile computer can communicate with the server. For instructions, see “Setting the IP address on your PC or mobile computer” on page 67. Use the following table to help you determine these values:

Table 9. PC or mobile computer network configuration information

Service processor	Server connector	Subnet mask	IP address
Service processor A	HMC1	255.255.255.0	169.254.2.147
	HMC2	255.255.255.0	169.254.3.147
Service processor B (if installed)	HMC1	255.255.255.0	169.254.2.146
	HMC2	255.255.255.0	169.254.3.146

For example, if you connected your PC or mobile computer to HMC1, the IP address for your PC or mobile computer could be 169.254.2.146 and the subnet mask would be 255.255.255.0. Set the gateway IP address to the same IP address as the PC or mobile computer.

5. Use Table 9 to determine the IP address of the Ethernet port that your PC or mobile computer is connected to, and type the IP address in the Address field of your PC's or mobile computer's Web browser. For example, if you connected your PC or mobile computer to HMC1, type `https://169.254.2.147` in your PC's or mobile computer's Web browser.
6. When the login display appears, enter one of the following default user IDs and passwords:

Table 10. Default user IDs and passwords for the Web interface

User ID	Password
general	general
admin	admin

7. Change the default password when prompted. For information, see "ASMI authority levels" on page 68.
8. If you plan to connect your PC or mobile computer to your network, complete the following steps:
 - a. From the navigation area, expand **Network Services**.
 - b. Click **Network Configuration**.
 - c. If your PC or mobile computer is connected to HMC1, fill in the section labeled Network interface eth0.
If your PC or mobile computer is connected to HMC2, fill in the section labeled Network interface eth1.
Ensure that the following fields are filled in correctly.

Table 11. Fields and values for network configuration

Field	Value
Configure this interface?	Selected
Type of IP address	Static
Host name	Enter a new value.
Domain name	Enter a new value.
IP address	This is a set IP address obtained from the network administrator. Note: To verify you are using the correct IP address, perform control panel function 30, CEC FSP IP address and location.
Subnet mask	This is a set subnet mask obtained from the network administrator.

Note: For information about the other fields and values, refer to "Configuring network interfaces" on page 69.

- d. Click **Continue**.
- e. Click **Save Settings**.
- f. Disconnect your PC or mobile computer from the server.
- g. Connect the server to your company network.
- h. Go to any PC or mobile computer on your company network that is running Microsoft Internet Explorer 6.0, Netscape 7.1, or Opera 7.23, and type the following in the Address field of your browser:

https://host name.domain name

where *host name* and *domain name* are the host name and domain name you entered when completing step 8c on page 66.

- i. Log in to the ASMI.
9. Change the time of the day on the server. For details, see “Changing the time of day” on page 70.

Setting the IP address on your PC or mobile computer

To access the ASMI through a Web browser you first need to set the IP address on your PC or mobile computer. The following procedures describe setting the IP address on PC and mobile computers running Microsoft Windows® and Linux.

Setting the IP address in Windows XP and Windows 2000:

To set the IP address within Windows XP and Windows 2000, complete these steps.

1. Click **Start** → **Settings** → **Control Panel**.
2. On the control panel, double-click **Network Connections**.
3. Right-click **Local Area Connection**.
4. Click **Properties**.

Attention: Record the current settings before making any changes. This will allow you to restore these settings if you disconnect the PC or mobile computer after setting up the ASMI Web interface.

Note: If Internet Protocol (TCP/IP) does not appear in the list, do the following:

- a. Click **Install**.
 - b. Select **Protocol**, and then click **Add**.
 - c. Select **Internet Protocol (TCP/IP)**.
 - d. Click **OK** to return to the Local Area Connection Properties window.
5. Select **Internet Protocol (TCP/IP)**, and then click **Properties**.
 6. Select **Use the Following IP Address**.
 7. Complete the **IP address**, **Subnet mask**, and **Default gateway** fields by using the values in step 4 on page 65 from Accessing the ASMI using a Web Browser.
 8. Click **OK** on the Local Area Connection Properties window. It is not necessary to restart your PC.

Setting the IP address in Linux:

To set the IP address in Linux, complete these steps.

About this task

You will need the information from step 4 on page 65 in Accessing the ASMI using a Web Browser to complete step 4 on page 68 in the following procedure.

1. Make sure you are logged on as a root user.
2. Start a terminal session.
3. Type `ifconfig` at the command prompt.

Attention: Record or print the current settings before making any changes. This allows you to restore these settings if you disconnect the PC or mobile computer after setting up the ASMI Web interface.

4. Type `ifconfig eth0 xxx.xxx.xxx.xxx netmask xxx.xxx.xxx.xxx`, where the `xxx.xxx.xxx.xxx` values are the values from step 4 on page 65 for IP address and Subnet mask.
5. Press Enter.

Setting the IP address in Vista:

To set the IP address in Vista, complete these steps.

1. Click **Start** → **Control Panel**.
2. Ensure **Classic View** is selected.
3. Select **Network and Sharing Center**.
4. Select **View status** in the Public network area.
5. Click **Properties**.
6. If the security dialog appears, click **Continue**.
7. Highlight **Internet Protocol Version 4**.
8. Click **Properties**.
9. Select **Use the following IP address**.
10. Complete the **IP address**, **Subnet mask**, and **Default gateway** fields by using the values in step 4 on page 65 from Accessing the ASMI using a Web Browser.
11. Click **OK** → **Close** → **Close**.

ASMI authority levels

Several authority levels are available for accessing the service processor menus by using the ASMI.

The following levels of access are supported:

General user

The menu options presented to the general user are a subset of the options available to the administrator and authorized service provider. Users with general authority can view settings in the ASMI menus. The login ID is `general` and the default password is `general`.

Administrator

The menu options presented to the administrator are a subset of the options available to the authorized service provider. Users with administrator authority can write to persistent storage, and view and change settings that affect the server's behavior. The first time a user logs into the ASMI after the server is installed, a new password must be selected. The login ID is `admin` and the default password is `admin`.

Authorized service provider

This login gives the authorized service provider access to all functions that could be used to gather additional debug information from a failing system, such as viewing persistent storage, and clearing all deconfiguration errors. There are three authorized service provider login IDs: **celogin**, **celogin1**, and **celogin2**.

- **celogin** is the primary service provider account. It is enabled by default, and it can enable or disable the other two service provider IDs (**celogin1** and **celogin2**). The login ID is **celogin**; the password is generated dynamically and must be obtained by calling technical support. **celogin** can be disabled by the **admin** user.
- **celogin1** and **celogin2** are disabled by default. If the IDs are enabled, a static password must be set for them. The default password for both IDs is **celogin**. The default password must be changed the first time the ID is enabled. The **admin** user can also disable and enable these login IDs.

- To reset the password for **celogin1** or **celogin2**, the **admin** user can disable, then re-enable the ID. As soon as the ID is re-enabled, the password must be changed.
- If enabled, **celogin**, **celogin1**, or **celogin2** can be used to reset the admin password, if necessary.

During the initial administrator and general user logins, the only menu option available is **Change Password**. In order to gain access to additional ASMI menus, you must change the administrator and general user default passwords. If you are an authorized service provider, you cannot change your password. For information about how to change your password, see “Changing ASMI passwords.”

Changing ASMI passwords:

Change the general user, administrator, and HMC access passwords.

About this task

You can change the general user, administrator, and HMC access passwords. If you are a general user, you can change only your own password. If you are an administrator, you can change your password and the passwords for general user accounts. If you are an authorized service provider, you can change your password, the passwords for general and administrator user accounts, and the HMC access password.

Passwords can be any combination of up to 64 alphanumeric characters. The default password for the general user ID is **general**, and the default password for the administrator ID is **admin**. After your initial login to the ASMI and after the reset toggle jumpers are moved, the general user and administrator passwords must be changed.

The HMC access password is usually set from the HMC during initial login. If you change this password using the ASMI, the change takes effect immediately.

To change a password, follow these steps:

Note: As a security measure, you are required to enter the current user’s password into the **Current password for current user** field. This password is not the password for the user ID you want to change.

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **Login Profile**.
3. Select **Change Password**.
4. Specify the required information, and click **Continue**.

Configuring network interfaces

You can configure network interfaces on the system. The number and type of interfaces vary according to the specific needs of your system.

About this task

Attention: This operation can be performed when the system is powered on as well as powered off. Because network configuration changes occur immediately, existing network sessions, such as HMC connections, are stopped. If a firmware update is in progress, do not perform this operation. The new settings must be used to re-establish any network connections. Additional errors might also be logged if the system is powered on.

You can change the network configurations when the system is in any state.

To perform this operation, you must have one of the following authority levels:

- Administrator
- Authorized service provider

To configure network interfaces, do the following:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **Network Services**.
3. Select **Network Configuration**.

Important: If you are attempting to configure a network connection on a multi-drawer system, you must select the primary or secondary service processor, and then click **Continue**.

4. In the right pane, locate the interface that you want to change. Select the box corresponding to the **Configure this interface?** field of the identified interface. If this box is not selected, the corresponding field changes are ignored.
5. Select the **Type of IP address** from the following options:

Static The IP address, subnet mask, broadcast address, default gateway and first DNS server address must be entered. The second and third DNS server addresses are optional.

Dynamic

No additional input is required.

6. Click **Continue**. The next screen allows you to verify the IP settings that have been entered.

Attention: If incorrect network configuration information is entered, you may not be able to use the ASMI after the changes are made. To remedy this situation, you must reset the service processor to the default settings by removing the service processor assembly from the server and moving the reset jumpers. Resetting the service processor also resets all user IDs and passwords to their default values.

Note: To reset network configuration settings to the default factory settings, click **Reset Network Configuration**.

7. Click **Save settings** to make the changes.

Changing the time of day

You can display and change the system's current date and time. The date and time can only be changed when the system is powered off. The time is stored as UTC (Coordinated Universal Time), formerly expressed as Greenwich mean time (GMT).

About this task

To perform this operation, your authority level must be one of the following:

- Administrator
- Authorized service provider

Note: You can change the time of day only when the system is powered off.

To change the time of day, do the following:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration**.
3. Select **Time of Day**. If the system is powered off, the right pane displays a form that shows the current date (month, day, and year) and time (hours, minutes, seconds).
4. Change either the date value or the time value or both, and click **Save settings**.

Accessing the ASMI using the HMC

Complete these steps to access the ASMI through the HMC interface.

About this task

To access the Advanced System Management Interface (ASMI) using the HMC, complete the following steps:

1. From the **System Management** tasks list, select **Operations**.
2. From the Operations task list, select **Advanced System Management (ASM)**.

Chapter 12. Service Action Log (SAL)

The Service Action Log (SAL) is a subset of the PAL.

To access the SAL, select the following options, in order, from a DST or SST menu:

- Start a service tool
- Hardware service manager
- Work with service action log

The SAL is a utility that scans the PAL and displays entries that require service representative action. It pulls out the relevant information from those entries and formats it to the display to show service information, such as failing resource names, field replaceable unit (FRU) part numbers, and FRU locations. If FRU part numbers and locations cannot be determined, the SAL display shows symbolic FRU names and isolation procedure names, which then correspond to problem analysis procedures for the service representative. The SAL runs before the operating system is operational.

A **shadow** log is maintained by LIC on the load source disk. The 128 K-byte shadow log contains a duplicate of the most recent or latest Product Activity Log entries that occurred before IPL began and those entries that were logged since the beginning of IPL. The *Product Activity Log* option uses the shadow log when the system is operating in limited paging environment.

If Product Activity Log initialization is not complete, only the shadow log is accessible to this option. Also, the *Product Activity Log* menu offers only a few specific Product Activity Log options. The Main menu informs the user that log initialization has not completed, that all Product Activity Log entries are not accessible, and to IPL the operating system to complete initialization. If initialization completes after the *Product Activity Log* option has been selected, the option must be selected again to make all Product Activity Log options available for use and to generate reports that show all the log entries.

Identifying a failing part on an AIX system or logical partition

Use these instructions to learn how to locate a failing part, and then activate the indicator light for that part on a system or logical partition running the AIX operating system.

Locating a failing part in an AIX system or logical partition

You might need to use AIX tools, before activating the indicator light, to locate a part that is failing. Use the procedure in this section to accomplish this task.

1. Log in as root user or celogin-.
2. At the command line, type `diag` and press Enter.
3. From the Function Selection menu, select **Task Selection** and press Enter.
4. Select **Display Previous Diagnostic Results** and press Enter.
5. From the Display Previous Diagnostic Results display, select **Display Diagnostic Log Summary**. A Display Diagnostic Log display shows a chronological list of events.
6. Look in the **T** column for the most recent **S** entry. Select this row in the table and press Enter.
7. Select **Commit**. The details of this log entry are shown.
8. Record the location information and the SRN value shown near the end of the entry.
9. Exit to the command line.

Results

Use the location information for the failing part to activate the indicator light that identifies the failing part.

Activating the indicator light for the failing part

Use these instructions to help physically identify the location of a part you are servicing.

1. Log in as root user.
2. At the command line, type `diag` and press Enter.
3. From the Function Selection menu, select **Task Selection** and press Enter.
4. From the Task Selection menu, select **Identify and Attention Indicators** and press Enter.
5. From the list of lights, select the location code for the failing part and press Enter.
6. Select **Commit**. This turns on the system attention and indicator light for the failing part.
7. Exit to the command line.

Identifying a failing part on a Linux system or logical partition

Use the instructions in this section to identify a failing part on a system or logical partition running the Linux operating system.

Locateing a failing part in a system or logical partition running the operating system

If the service aids have been installed on a system or logical partition you need to locate the failing part and then activate the indicator light for that part.

Finding the location code of a failing part in a Linux system or logical partition

Use these instructions to retrieve the location code of the failing part, if you do not know the location code.

About this task

To locate the failing part in a system or logical partition follow these steps:

1. Log in as root user.
2. At the command line, type `grep diagela /var/log/platform` and press Enter.
3. Look for the most recent entry that contains a system reference code (SRC).
4. Record the location information.

Activating the indicator light for the failing part

If you know the location code of the failing part, activate the indicator light to help you locate which part to replace.

About this task

To activate the indicator light, follow these steps:

1. Log in as root user.
2. At the command line, type `/usr/sbin/usysident -s identify -l<location code>` and press Enter.
3. Look for the system attention light to identify the enclosure that contains the failing part.

Deactivating the failing-part indicator light

After you complete a removal and replacement procedure, use this task to deactivate the failing-part indicator light.

About this task

To deactivate the indicator light, follow these steps:

1. Log in as root user.
2. At the command line, type `/usr/sbin/usysident -s normal -l<location code>` and press Enter.

Locate a failing part in a Virtual I/O Server system or logical partition

You might need to use Virtual I/O Server (VIOS) tools, before activating the indicator light, to locate a part that is failing. Use the procedure in this section to accomplish this task.

1. Log in as root user or celogin-.
2. At the command line, type `diagmenu` and press Enter.
3. From the **Function Selection** menu, select **Task Selection** and press Enter.
4. Select **Display Previous Diagnostic Results** and press Enter.
5. From the **Display Previous Diagnostic Results** display, select **Display Diagnostic Log Summary**. A **Display Diagnostic Log** display appears. This display contains a chronological list of events.
6. Look in the T column for the most recent S entry. Select this row in the table and press Enter.
7. Choose **Commit**. The details of this log entry are shown.
8. Record the location information and the SRN value shown near the end of the entry.
9. Exit to the command line.

Results

Use the location information for the failing part to activate the indicator light that identifies the failing part. For instructions, see “Identifying a part using the Virtual I/O Server.”

Identifying a part using the Virtual I/O Server

Use these instructions to turn on the indicator light to help you physically locate a part using the Virtual I/O Server (VIOS).

1. Log in as root user.
2. At the command line, type `diagmenu` and press Enter.
3. From the Function Selection menu, select **Task Selection**. Press Enter.
4. From the Task Selection menu, select **Identify and Attention Indicators**. Press Enter.
5. From the list of lights, select the location code for the failing part and press Enter.
6. Select **Commit**. This turns on the system attention and indicator light for the failing part.
7. Exit to the command line.

Chapter 13. Starting or stopping the system or logical partition

Learn how to start or stop a system or logical partition to perform a service action or restart the system.

Start the system or logical partition

You might need to start a system or logical partition after performing a service action or system upgrade. You can use this procedure to start the system or logical partition.

About this task

Start a system that is not managed by a Hardware Management Console

You can use the power button or the Advanced System Management Interface to start a system that is not managed by a Hardware Management Console.

About this task

To start a system that is not managed by a Hardware Management Console (HMC), follow these steps:

1. On a rack-mounted system unit, open the front rack door, if necessary. On a stand-alone system unit, open the front door.
2. Before you press the power button on the control panel, ensure that power is connected to the system unit as follows:
 - All system power cables are connected to a power source.
 - The power-on light, as shown in the following figure, is slowly blinking.
 - The top of the display, as shown in the following figure, shows 01 V=F.

Tip: The system attention light, as shown in the following figure, does not appear on the control panel on the model 17M/MA.

3. Press the power button (A), as shown in the following figure, on the control panel.

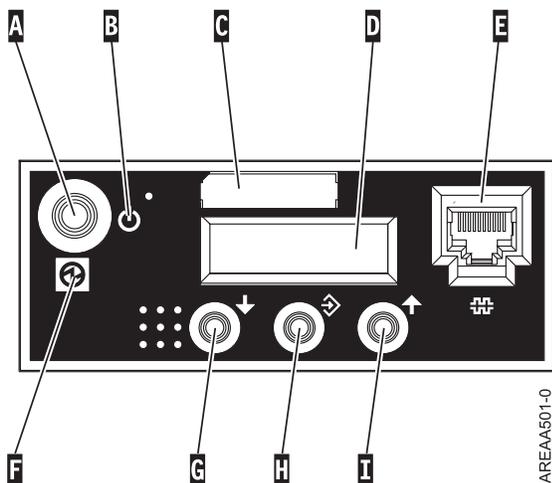


Figure 34. 5/70 control panel

- **A:** Power-on button
- **B:** On/off power symbol
- **C:** Serial number label
- **D:** Function/Data display
- **E:** System port (S1)
- **F:** Power LED
 - A blinking light indicates standby power to the unit.
 - A constant light indicates full system power to the unit.

Note: There is approximately a 30-second transition period from the time the power-on button is pressed to when the power LED goes from blinking to solid. During the transition period, you might observe the blinking intervals speed up.

- **G:** Decrement button
- **H:** Enter button
- **I:** Increment button

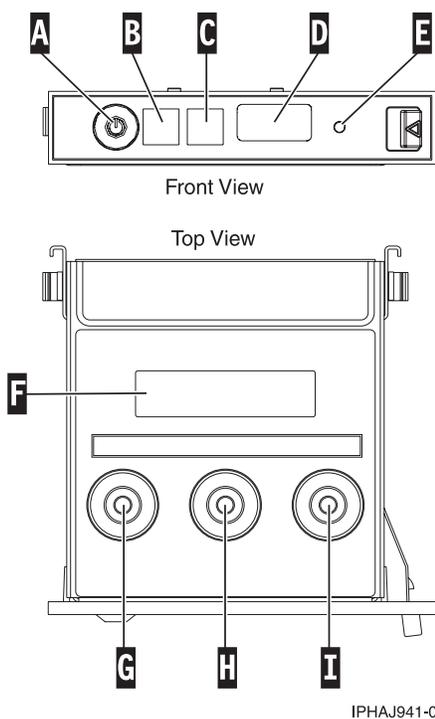


Figure 35. Control panel for the 03E/4A, 04E/8A.

- **A:** Power-on button
- **B:** Power LED
 - A blinking light indicates standby power to the unit.
 - A constant light indicates full system power to the unit.

Note: There is approximately a 30-second transition period from the time the power-on button is pressed to when the power LED goes from blinking to solid. During the transition period, you might observe the blinking intervals speed up.

- **C:** Attention light
- **D:** USB port

- E: Pinhole reset button
 - F: Function/Data display
 - G: Decrement button
 - H: Enter button
 - I: Increment button
4. Observe the following after pressing the power button:
- The power-on light begins to blink faster.
 - The system cooling fans are activated after approximately 30 seconds and begin to accelerate to operating speed.
 - Progress indicators, also referred to as checkpoints, appear on the control panel display while the system is being started. The power-on light on the control panel stops blinking and remains on, indicating that system power is on.

What to do next

Tip: If pressing the power button does not start the system, do the following steps to start the system using the Advanced System Management Interface (ASMI):

1. Set up access to the ASMI. For instructions, see Chapter 11, “Managing the Advanced System Management Interface,” on page 65.
2. Start the system using the ASMI. For instructions, see “Powering the system on and off.”

Powering the system on and off

View and customize various initial program load (IPL) parameters.

About this task

You can start and shut down the system in addition to setting IPL options.

To perform these operations, your authority level must be one of the following:

- Administrator
- Authorized service provider

Several IPL options that you can set pertain to the server firmware. Firmware is an integral part of the server that is stored in *flash memory*, whose contents are preserved when the system is powered off. The firmware is code that automatically starts when the server is turned on. Its main purpose is to bring the server to a state where it is ready to operate, which means the server is ready to install or boot an operating system. Firmware also enables the handling of exception conditions in the hardware and provides extensions to the functions of the server hardware platform. You can view the server’s current firmware level on the Advanced System Management Interface (ASMI) Welcome pane.

This server has a permanent firmware boot side, or P side, and a temporary firmware boot side, or T side. When updating the firmware, install new levels of firmware on the temporary side first to test the compatibility with your applications. When the new level of firmware has been approved, copy it to the permanent side.

To view and change IPL settings, perform the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **Power/Restart Control** and select **Power On/Off System**.
3. Set the following desired boot settings.

Note: On systems with the EM310_xxx release of system firmware installed, *slow* and *fast* are the only two boot speeds available.

System boot speed

Select the speed for the next boot:

Slow All IPL diagnostic tests are run, and the full memory test is run.

Fast Several IPL diagnostic test are skipped, and a shorter memory test is run.

Note: This is the default setting on systems with firmware EX310_xxx or later installed.

Hyper This option is available only when hyperboot is enabled. The majority of the initial program load (IPL) diagnostics are skipped, and cached data is used for vital product data (VPD), system configuration, and main store data. Since there is minimal VPD verification that the hardware is the same as the previous boot, this speed setting should only be used if there have not been any hardware changes since the last system boot.

Firmware boot side for next boot

Select the side from which the firmware boots the next time: **Permanent** or **Temporary**. Test firmware updates by booting from the temporary side before being copied into the permanent side.

System operating mode

Select the operating mode: **Manual** or **Normal**. Manual mode overrides various automatic power-on functions, such as auto-power restart, and enables the power button.

Boot to system server firmware

Select the state for the server firmware: **Standby** or **Running**. When the server is in the server firmware standby state, logical partitions can be set up and activated.

System power off policy

Select the system power off policy. The system power off policy is a system parameter that controls the system's behavior when the last partition (or the only partition in the case of a system that is not managed by an HMC) is powered off.

Default partition environment

Select **Default** (valid only if the BR keyword is not S0), **AIX**, , or **Linux**.

Notes:

- If the default partition environment is changed from any other value to , the enable/disable setting is automatically changed to Enabled.
- If the default partition environment is changed from to any other value, the enable/disable setting is not affected.

Current[®] hyperboot mode state

This setting is displayed if the hyperboot feature is activated for the system. The hyperboot mode states are: **Capable** and **Enabled**. When the mode state is changed to **Enabled**, the mode state initializes in the ASMI and displays **Capable** until the system is restarted. After the system has restarted the state changes to **Enabled**. Any time you restart the system in the enabled state, it starts in hyperboot mode.

4. Perform one of the following steps:

- Click **Save settings** to save the selected options. The power state does not change.
- Click **Save settings and power on/off**. All selected options are saved and the system turns on or off. The power-on option is available only if the system is powered off. The power-off option is available only if the system is powered on.
- Click **Save settings and continue server firmware boot** to save the selected options, and turn the server firmware on or off. This option is available only if the server firmware is in *standby* mode.

Start the system or logical partition using the Hardware Management Console

You can use the Hardware Management Console (HMC) user interface to start the system or logical partition after the required cables are installed and the power cables are connected to a power source.

About this task

For instructions on working with the HMC, see *Managing the Hardware Management Console*. For instructions on starting a logical partition, see *Logical partitioning*. For instructions on starting the system, see *Powering on the managed system*.

Progress indicators, also referred to as checkpoints, appear on the control panel display while the system is being started. When the power-on light on the control panel stops blinking and remains on, the system power is on.

Powering on a managed system

Understand how to power on a managed system using the HMC.

About this task

You can use the HMC to power on a managed system and to monitor the power-on state.

To power on a managed system, you must be a member of one of the following roles:

- super administrator
- service representative
- operator
- product engineer

To power on a managed system, complete the following steps:

1. In the Navigation area, expand the **Systems Management** folder.
2. Click the **Servers** icon.
3. In the Contents area, select the managed system.
4. Select **Tasks**, then **Operations**, and then **Power On**
5. Select the desired power-on mode and click **OK**.

Stop a system or logical partition

Learn how to stop a system or logical partition as a part of a system upgrade or service action.

About this task

Attention: Using either the power-on button on the control panel or entering commands at the Hardware Management Console (HMC) to stop the system can cause unpredictable results in the data files. Also, the next time you start the system, it might take longer if all applications are not ended before stopping the system.

To stop the system or logical partition, select the appropriate procedure:

Stopping a system that is not managed by a Hardware Management Console

You might need to stop the system to perform another task. Use these instructions to stop the system using the power button or Advanced System Management Interface.

Before you begin

Before you stop the system, follow these steps:

1. Ensure that all jobs are completed and end all applications.
2. Ensure that the operating system is stopped.

Attention: Failure to do so can result in the loss of data.

About this task

The following procedure describes how to stop a system that is not managed by a Hardware Management Console (HMC).

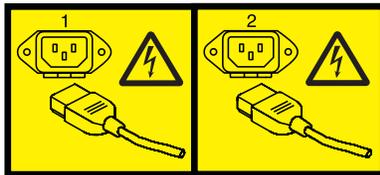
1. Log in to the system as a user with the authority to run the shutdown or Power Down System (pwrdownsys) command.
2. At the command line, enter one of the following commands:
 - If your system is running the AIX operating system, type **shutdown**.
 - If your system is running the Linux operating system, type **shutdown -h now**.
 - If your system is running the operating system, type **PWRDOWNSYS**. If your system is partitioned, use the PWRDOWNSYS command to power down each of the secondary partitions. Then, use the PWRDOWNSYS command to power down the primary partition.

The command stops the operating system. The system power turns off, the power-on light begins to slowly blink, and the system goes into a standby state.

3. Set the power switches of any devices connected to the system to off.
4. Unplug any power cables that are attached to the unit from electrical outlets. Ensure that you unplug power cables from peripheral devices, such as printers and expansion units.

Important: The system might be equipped with a second power supply. Before continuing with this procedure, ensure that all power sources to the system have been completely disconnected.

(L003)



or



Stop the system or logical partition using the Hardware Management Console

About this task

You can use the Hardware Management Console (HMC) user interface to stop the system or a logical partition. For instructions on stopping the system, see.

By default, the managed system is set to power off automatically when you shut down the last running logical partition on the managed system. If you set the managed system properties on the HMC so that the managed system does not power off automatically, you must use this procedure to power off your managed system.

Attention: If possible, shut down the running logical partitions on the managed system before powering off the managed system. Powering off the managed system without shutting down the logical partitions first causes the logical partitions to shut down abnormally and can cause data loss.

To power off a managed system, you must be a member of one of the following roles:

- super administrator
- service representative
- operator
- product engineer

1. In the Navigation area, expand the **Systems Management** folder.
2. Click the **Servers** icon.
3. In the Contents area, select the managed system.
4. Select **Tasks**, then **Operations**, and then **Power Off**
5. Select the desired power-off mode and click **OK**.

Chapter 14. Disconnect the SMP processor cable from a system unit

You might need to disconnect this cable to add or remove memory or processors. Use the procedure in this section to accomplish this task.

About this task

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.

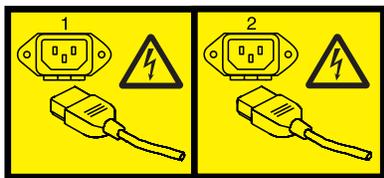
(D005a)

To disconnect an SMP processor cable connection from a system unit, complete the following steps:

1. If necessary, open the front door of the rack.
2. Disconnect the power source from the system by unplugging the system.

Note: This system can be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

(L003)



or



3. "Removing the front cover from the model 34E/MA, 17M/MA, or " on page 104.
4. Remove the left edge of the trim kit on the system rack to expose the left edge of the SMP processor cable.

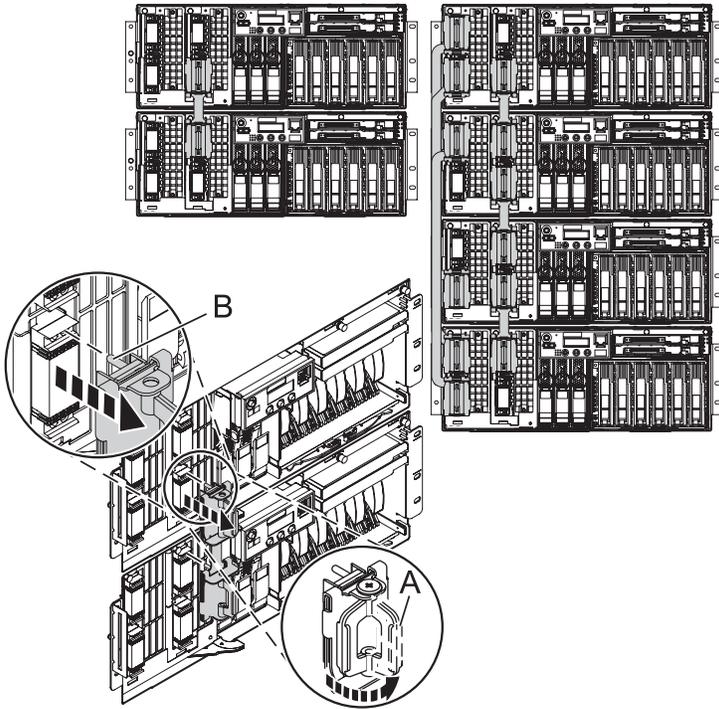
Attention:

Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.

When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.

If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

5. Unlatch the plastic fastener **A**, as shown in the following figure.
6. Lift the latch handle **B** until the connector is unseated.



7. Carefully pull the connector from the system.
8. When the guide pins are free, carefully pull the cable away from the system unit.

Chapter 15. Reconnect the SMP processor cable to a system unit

You might need to reconnect this cable after adding or removing memory or processors. Use the procedure in this section to accomplish this task.

About this task

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.

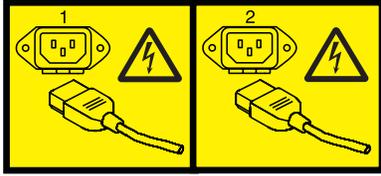
(D005a)

To connect an SMP processor cable to a single system unit, complete the following steps:

1. Perform prerequisite tasks as described in Chapter 10, "Before you begin," on page 61.
2. Stop all system units. Refer to "Stop a system or logical partition" on page 81.
3. If necessary, open the front rack door.
4. Disconnect the power source from the system by unplugging the system.

Note: This system can be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

(L003)



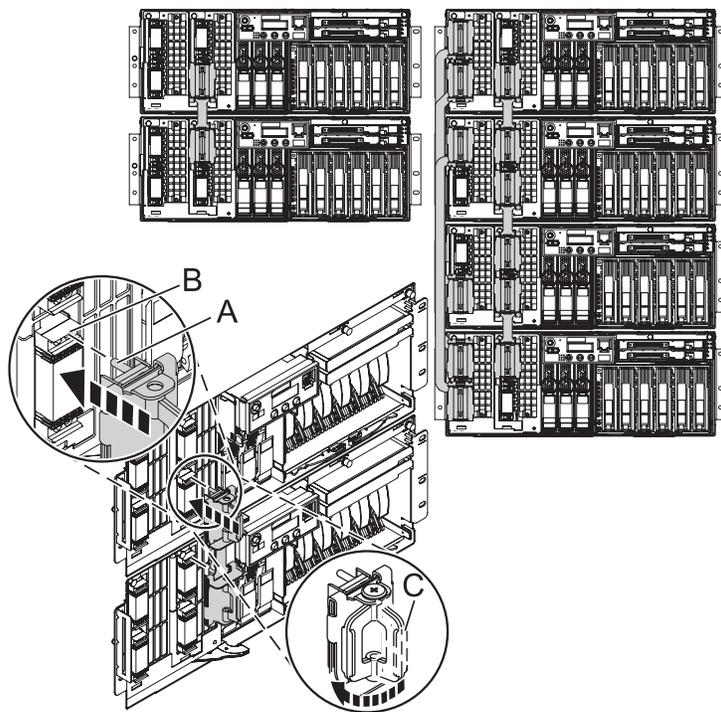
or



5. If necessary, remove the left edge of the trim kit on the system rack.

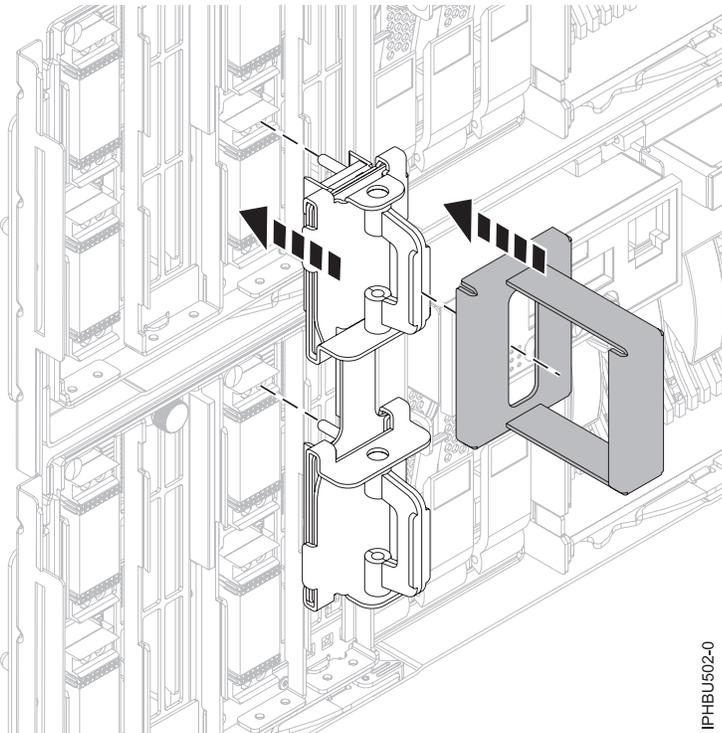
Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
6. Lift the latch handle C to the open position.



7. Align the guide pins **A** with the connector **B** on the system unit.
8. Carefully push the cable connector into the system unit connection.

Note: Evenly press the connector in place, using firm straight pressure on both the top and bottom of each cable-end. At the same time, press evenly at the top and bottom of each cable-end. Use the SMP tool to seat the cable as shown in the following figure.



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Figure 36. Using the SMP cable tool

9. Push the latch handle down to seat the pins.
10. Replace the left edge of the trim kit.
11. “Installing the front cover on the model 34E/MA, 17M/MA” on page 105.
12. Close the front rack door.

Results

Chapter 16. Removing and replacing expansion unit cover or door

You might need to remove, replace, or install covers or doors on an expansion unit as a part of accessing components or servicing your unit.

Remove the front cover on model 14G/30

You might need to remove the front cover to perform service to the system. Use the instructions in this section to accomplish these tasks.

1. Remove the two thumbscrews (**B**) located on the left and right of the cover.

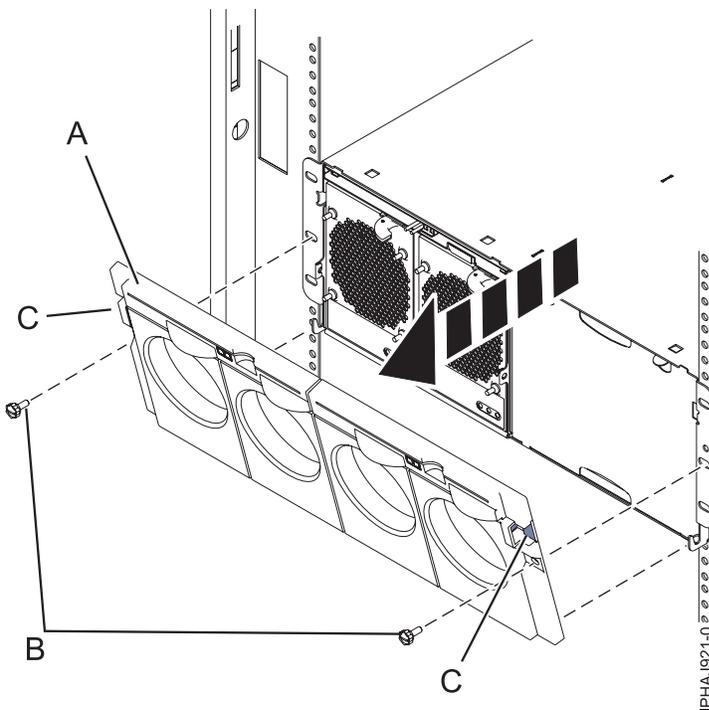


Figure 37. Remove the front cover for model 14G/30

2. Press in on the two latches (**C**) located left and right of the cover to release the cover.
3. Lift the cover (**A**) out and away from the chassis.

Tip: If an airflow block is present on an unpopulated side of the chassis do not remove it unless you are populating that side of the chassis.

Installing the front cover on a model 14G/30

You might need to install the front cover after installing the system or performing a service action.

Before you begin

If you only have one side of the chassis populated, ensure that the airflow block is present on the unpopulated side.

1. Insert the posts on the bottom of the cover (A) into the hooks on the chassis of the enclosure.
2. Press in on the two latches (C) on the right and left of the front cover.

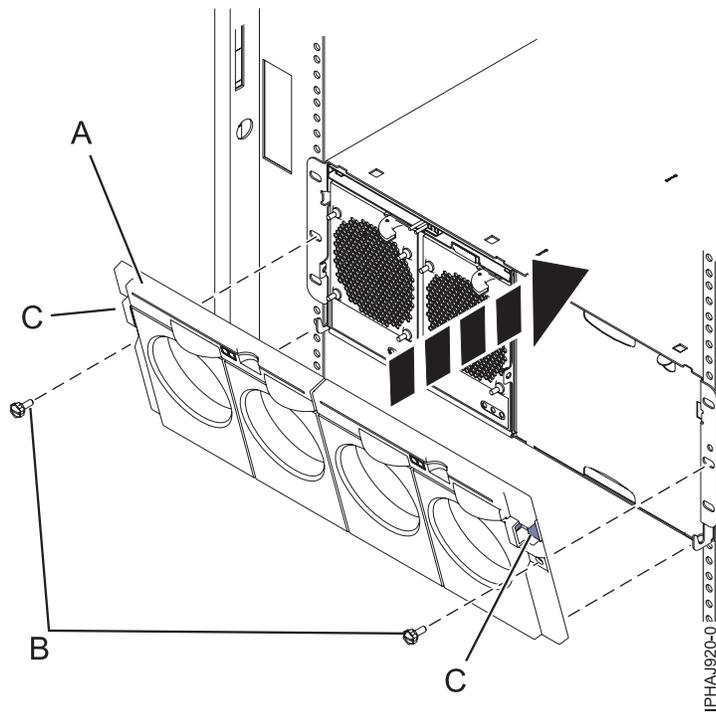


Figure 38. Front cover on a model 14G/30

3. Push the cover onto the chassis and release the latches. The cover should securely snap into place.
4. Replace the two thumbscrews (B) into the slots on the left and right of the front cover.

Removing the front cover from a 11D/11 expansion unit

You might need to remove the cover to access components or perform service. Use the procedure in this section to accomplish this task.

About this task

To remove the front cover, follow these steps:

1. Open the rack front door, if necessary.
2. Press down on both release tabs and pivot the cover from the top forward.
3. Pull the cover out and away from the expansion unit.

Install the front cover on the 11D/11 expansion unit

You might need to install the cover after accessing components or performing service. Use the instructions in this section to accomplish this task.

About this task

To install the front cover, follow these steps:

1. Position the cover on the front of the expansion unit so that the pins on the cover line up with the slots on the front of the expansion unit.

2. Insert the tabs on the bottom of the cover into the slots at the front of the expansion unit.
3. Push the cover up and forward until the tabs on the top secure the cover in place.

Removing a front cover from the 11D/20 expansion unit

You might need to remove the cover to access components or perform service.

About this task

To remove the expansion unit front cover, follow these steps:

1. If necessary, open the front rack door.
2. Remove the thumbs screws that are securing the covers to the rack.
3. Push both cover-release latches in the direction of the arrows to release the cover as shown in the following figure.

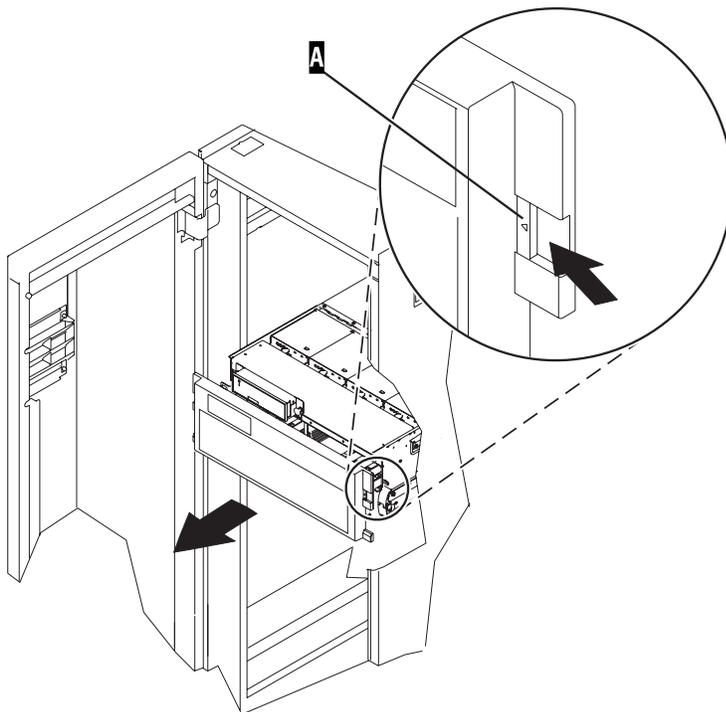


Figure 39. Removing the front cover

4. Pivot the cover from the bottom and swing the top of the cover out.
5. Pull the bottom of the cover up and then away from the expansion unit. This releases the two tabs located on the bottom of the cover.
6. Put the cover in a safe place.

Installing a front cover on the 11D/20 expansion unit

You might need to install the cover after accessing components or performing service.

About this task

To install the expansion unit front cover, follow these steps:

1. If necessary, open the front rack door.
2. Insert the two tabs located on the bottom edge of the cover into their locking slots, located on the expansion unit frame.
3. Pivot the front cover up toward the top of the expansion unit frame.
4. Align the tabs to the matching slots located on the front of the expansion unit frame.
5. Gently push the tabs into the slots until the cover seats against the front of the expansion unit.
6. Install the thumbs screws to secure the covers to the rack.
7. Close the front rack door.

Results

Chapter 17. Removing and Replacing Covers and Doors

You might need to remove, replace, or install covers to access components or perform service.

Removing the service access cover from a rack-mounted model 03E/4A, 04E/8A

You might need to remove the service access cover to perform service or to gain access to internal components.

1. Place the system into the service position, for instructions see “Placing a rack-mounted model 03E/4A, 04E/8A in the service position” on page 113.
2. Loosen the two thumbscrews (A) located at the back of the cover.
3. Slide the cover (B) toward the back of the system unit. When the front of the service access cover clears the upper frame ledge, lift the cover up and off the system unit.

Results

Attention: For proper cooling and airflow, install the cover before starting the system. Operating the system without the cover for more than 30 minutes could damage the system components.

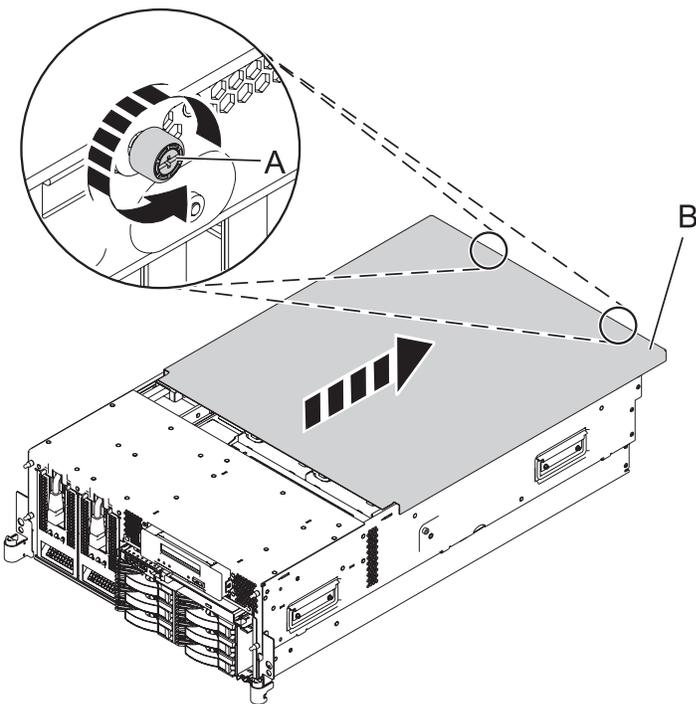


Figure 40. Remove the service access cover from a rack-mounted model

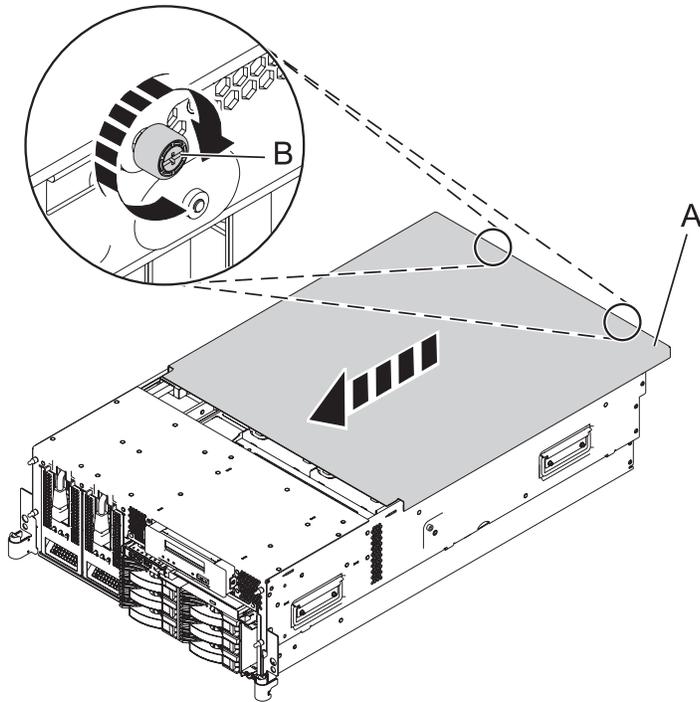
Install the service access cover on a rack-mounted model 03E/4A, 04E/8A

You might need to install the service access cover after performing service or accessing internal components. Use the procedure in this section to perform this task.

1. Place the service access cover (A) on the top of the system unit, approximately 25 mm (1 in.) from the front of the system unit.
2. Hold the service access cover against the system unit, and slide it toward the front of the system.
The tabs on the service access cover slide beneath the upper chassis ledge, and the two thumbscrews align with the screw holes at the back of the system unit.

Important: Ensure that the fan LED cables do not get caught on the front edge of the service access cover as you move it forward.

3. Tighten the thumbscrews (B) located at the back of the cover.



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Figure 41. Install the service access cover on the rack-mounted model

Removing the service access cover from a stand-alone model 03E/4A, 04E/8A

You might need to remove the service access cover to perform service or to gain access to internal components.

About this task

To remove the service access cover from a stand-alone model do the following:

1. Loosen the two thumbscrews (A) located at the back of the service access cover as shown in the following figure.
2. Slide the service access cover (B) toward the back of the system unit. When the front of the cover clears the front frame ledge, lift the cover off the system unit.

Attention: For proper cooling and airflow, install the cover before starting the system. Operating the system without the cover for more than 30 minutes could damage the system components.

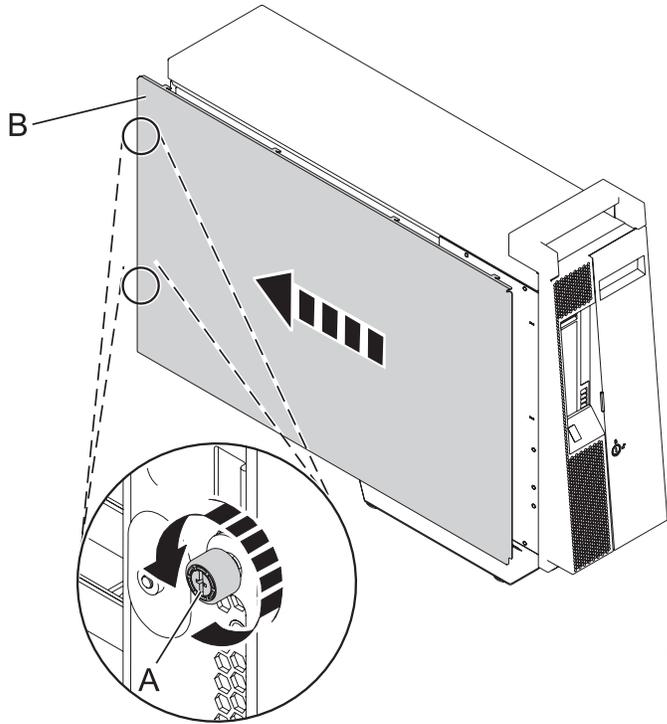
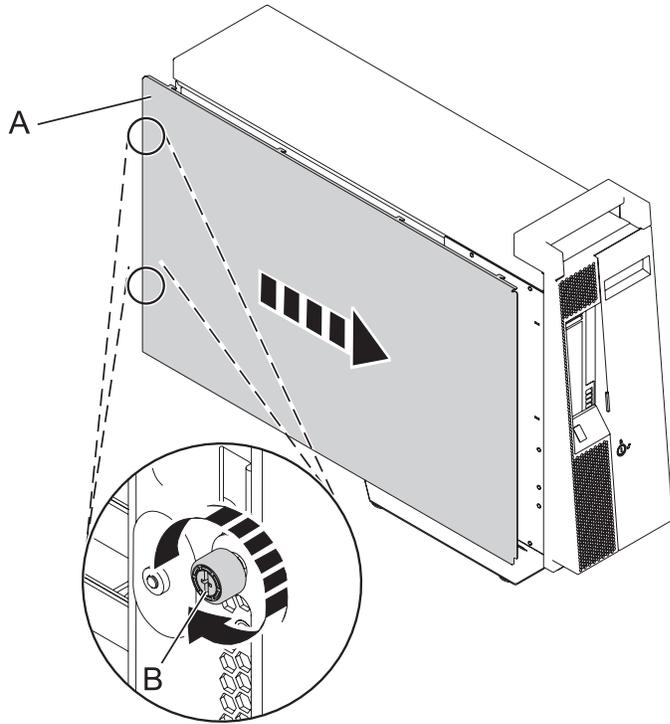


Figure 42. Removing the service access cover from the stand-alone model

Installing the service access cover on a stand-alone model 03E/4A, 04E/8A

You might need to install the service access cover after performing service or accessing internal components.

1. Align the service access cover pins with the slots in the system. The flanges on the top and bottom of the cover wrap around the system frame.
2. Hold the service access cover against the system unit (**A**) and slide it toward the front of the system.
3. Tighten the two thumbscrews (**B**) located at the back of the cover.



IPHAJ860-0

Figure 43. Installing the service access cover on a stand-alone model

Removing the front cover from a rack mounted model 03E/4A, 04E/8A

You might need to remove the cover to access components or perform service.

1. Remove the two thumbscrews (A) that secure the system to the rack (B) as shown in the following figure.
2. Push in the release latches (C) and pull the cover away from the system.

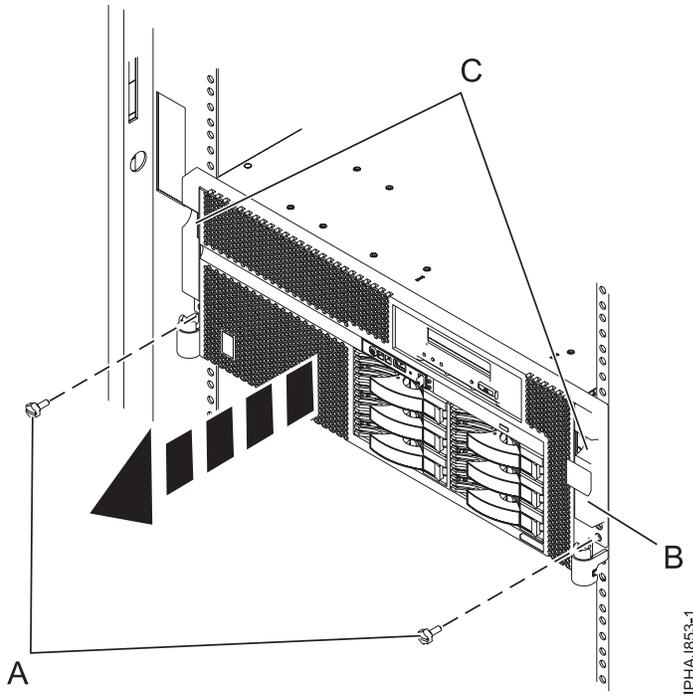


Figure 44. Removing the front cover from a rack-mounted model

Installing the front cover on the rack-mounted model 03E/4A, 04E/8A

You might need to install the cover after accessing components or performing service.

1. Push in the release latches (**B**) and push the cover onto system.
2. Gently push the cover in until the two cover-release latches (**B**) are seated in their respective slots.
3. Replace the two thumbscrews (**C**) that secure the system to the rack (**A**) as shown in the following figure.

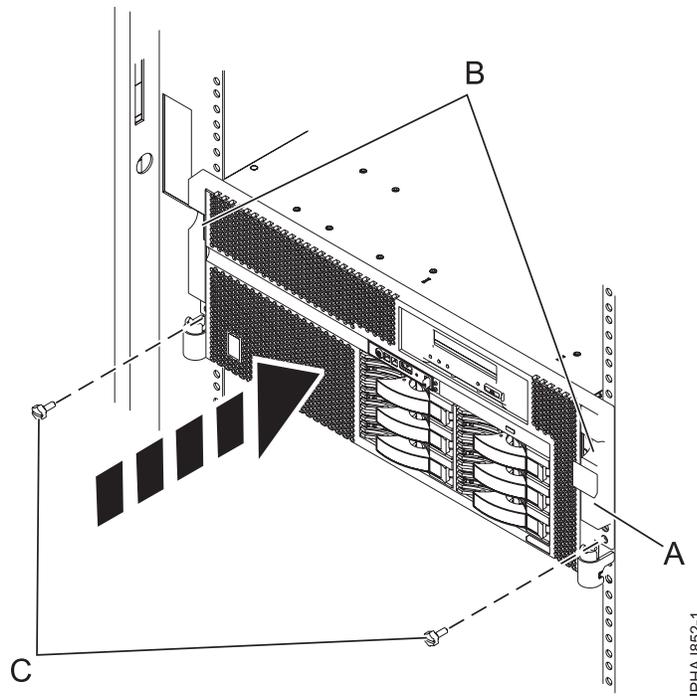


Figure 45. Installing the front cover on a rack-mounted model

Removing the door from a model 04E/8A

You might need to remove the door to access components or perform service. Use the procedure in this section to accomplish this task.

1. Open the front door by grasping the door handle and pulling the door out and away from the system unit.
2. To remove the door, press down on the top back edge of the door.
3. Gently swivel the top back edge of the door forward and out past the top of the system unit.
4. Lift the door up to release it from the lower retaining post.

Installing or replacing the door on a model 04E/8A

You might need to install the door after accessing components or performing service.

1. Set the door on the lower retaining post.
2. Rotate the door toward the top of the system unit.
3. Press down on the lower back edge of the door, and seat the top post into its matching slot.
4. Close and secure the door.

Remove the front cover from the stand-alone model 03E/4A, 04E/8A

You might need to remove the cover to access components or perform service.

1. Open the door covering the disk drives by unlocking and pulling the door open.
2. Press down on the cover-release tab (A) as shown in the following figure.
3. Pull the top of the cover (B) out and away from the system.

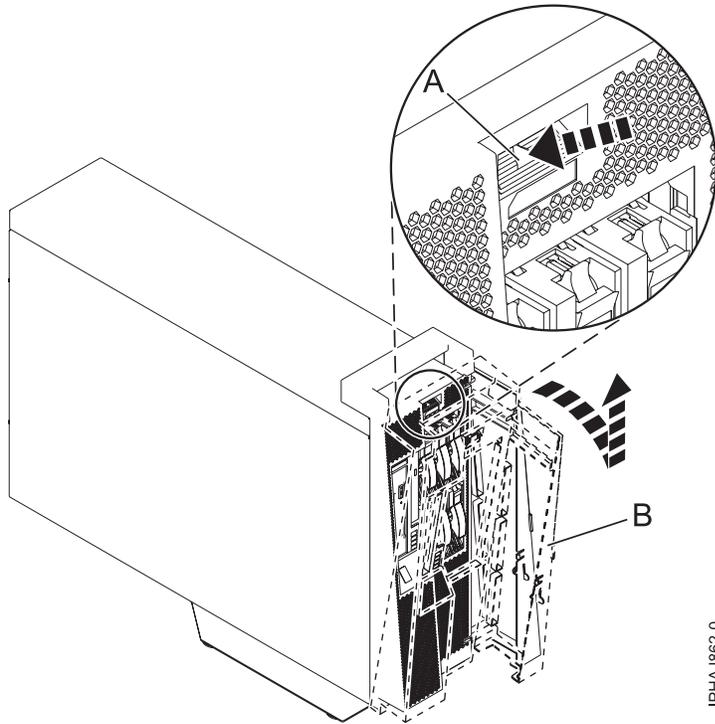


Figure 46. Remove the door from the model

4. Gently pull the cover up and off the base.

Installing the front cover on a stand-alone model 03E/4A, 04E/8A

You might need to install the cover after accessing components or performing service. Use the procedure in this section to accomplish this task.

1. Place the two lower cover-locking tabs into the retaining slots located on the base of the system unit as shown in the following figure.

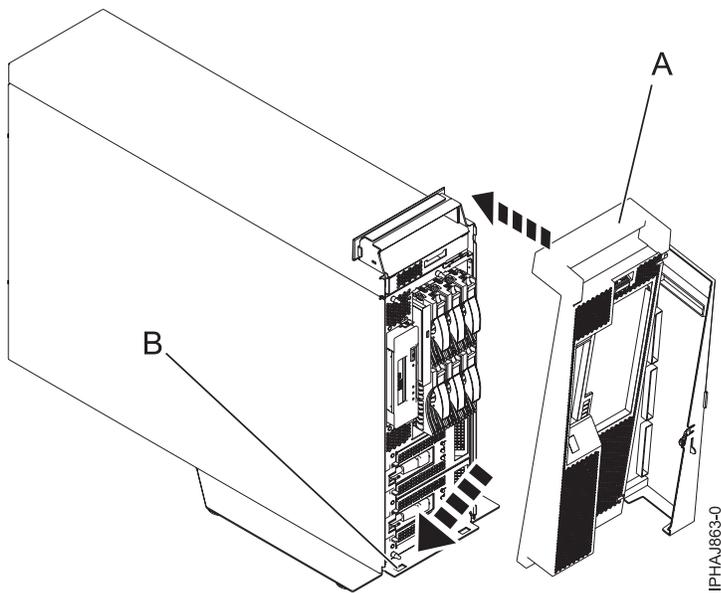


Figure 47. Replacing the cover on the model

2. Push the cover up toward the top of the system (A), ensuring that the aligning pins are aligned with their matching slots (B) located on the system.
3. Gently push the cover in until the cover-release tab snaps into place.
4. Close and secure the door.

Results

Front cover for the model 34E/MA, 17M/MA

You might need to remove and replace the cover to access components or perform service.

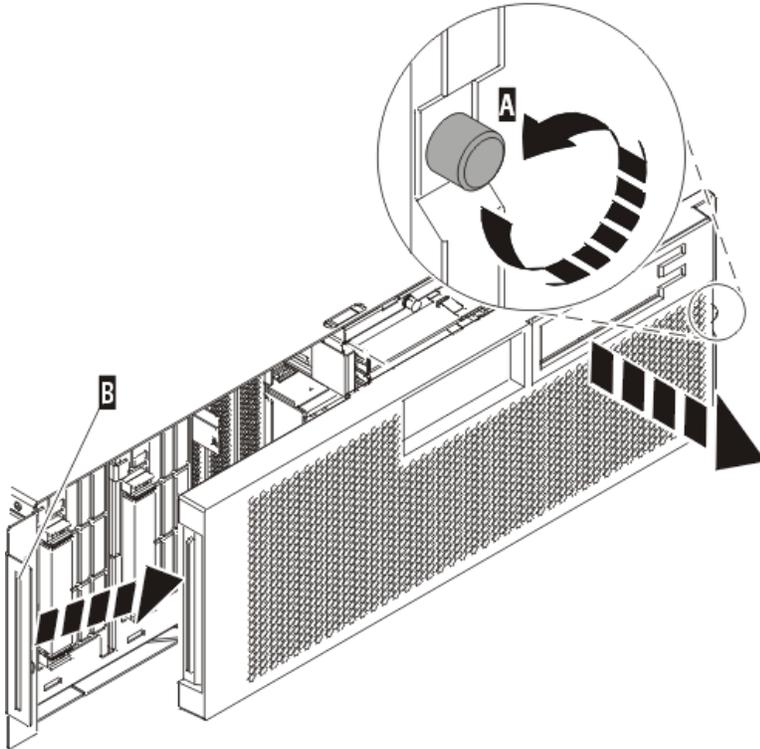
Removing the front cover from the model 34E/MA, 17M/MA, or

You might need to remove the cover to access components or perform service.

About this task

To remove the front cover follow these steps:

1. If necessary, open the front rack door.
2. Loosen the thumbscrew on the right side of the cover as shown in the following figure.



IPHA1F01-1

Figure 48. Removing the front cover

3. Slide the cover to the right, and remove it from the system unit.

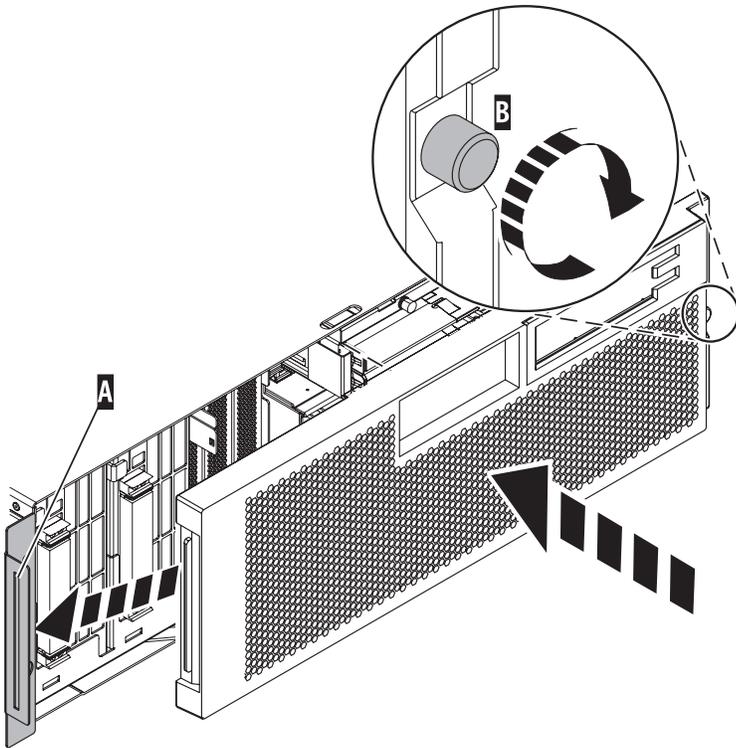
Installing the front cover on the model 34E/MA, 17M/MA

You might need to install the cover after accessing components or performing service.

About this task

To install the front cover follow these steps:

1. Position the cover on the front of the system unit so that the tab on the left side of the cover is in the matching slot on the left side of the system unit as shown in the following figure.



IPHAJ500-1

Figure 49. Installing the front cover

2. Tighten the thumbscrew on the right side of the cover.
3. Close the front rack door.

Chapter 18. Place the rack-mounted system or expansion unit in the service position or operating position

You might need to place a system or expansion unit into the service position or operating position to perform service or to gain access to internal components.

Placing the rack-mounted system or expansion unit in the service position

You might need to perform service or gain access to internal components by placing the rack-mounted system or expansion unit in the service position.

About this task

Note: Some of the figures in these procedures might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.

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)

To place a rack-mounted system or expansion unit into the service position, follow these steps:

1. If necessary, open the front rack door.
2. Remove the two thumbscrews (A) that secure the system or expansion unit (B) to the rack as shown in the following figure.

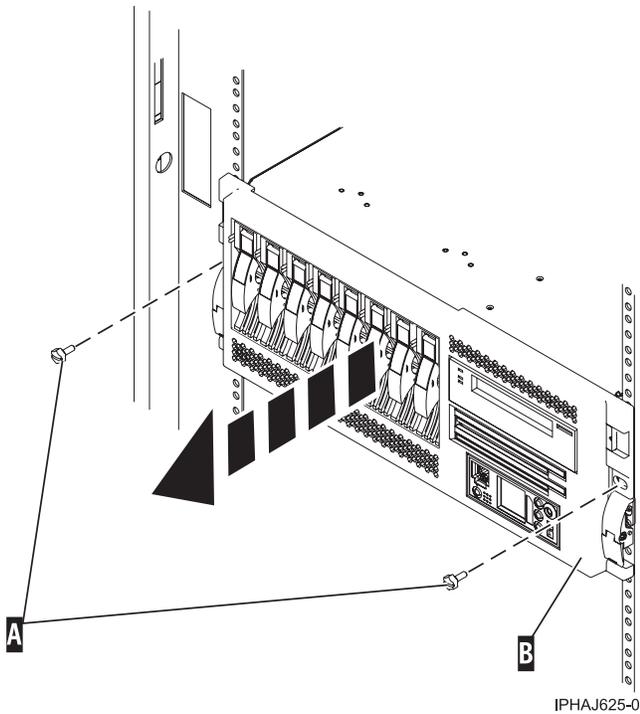


Figure 50. Removing the thumbscrews from the system and rack

3. Release the rack latches (A) on both the left and right sides as shown in the following figure.

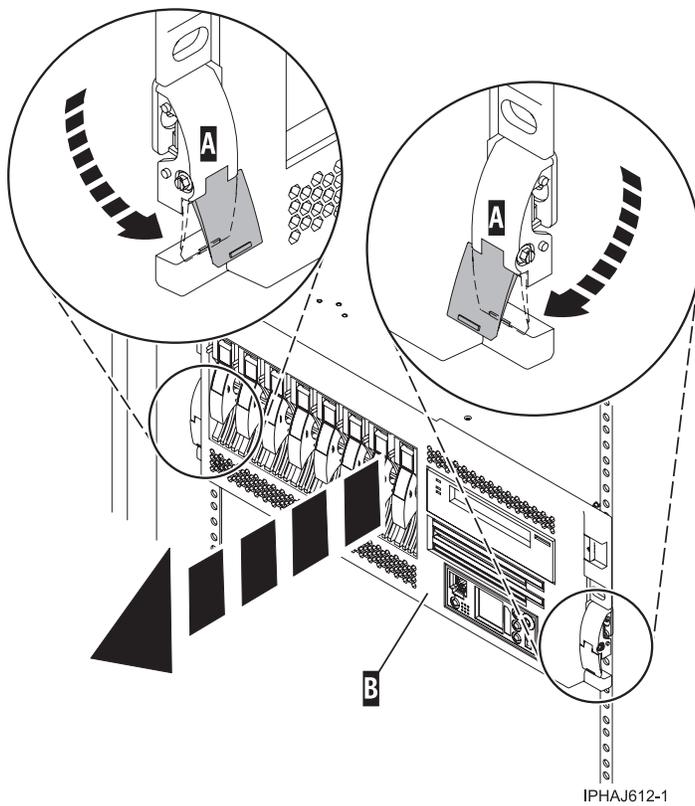


Figure 51. Releasing the rack latches

4. Read the following note, and then slowly pull the system or expansion unit out from the rack until the rails are fully extended and locked.

Note:

- If the procedure you are performing requires you to unplug cables from the back of the system or expansion unit, do so before you pull the unit out from the rack.
- Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you pull the unit out from the rack.
- Ensure the rails are fully extended. When the rails are fully extended, the rail safety latches lock into place. This action prevents the system or expansion unit from being pulled out too far.

Placing the rack-mounted system or expansion unit in the operating position

You might need to place the rack-mounted system or expansion unit in the operating position to make the unit available for use.

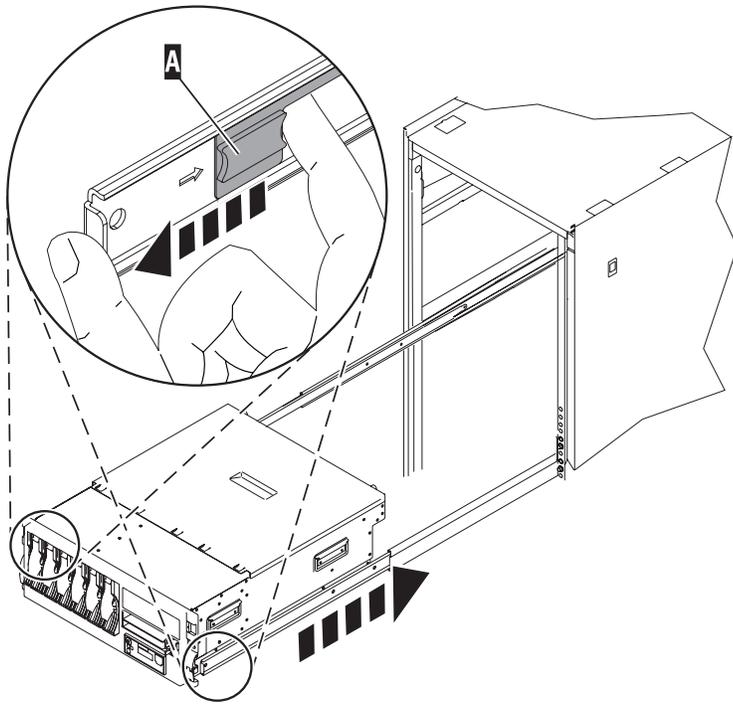
About this task

Tip: Some of the figures in these procedures might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.

To place the rack-mounted system or expansion unit into the operating position, follow these steps:

1. Simultaneously release the blue rail safety latches (**A**), located near the front of each rail, and push the system or expansion unit into the rack as shown in the following figure.

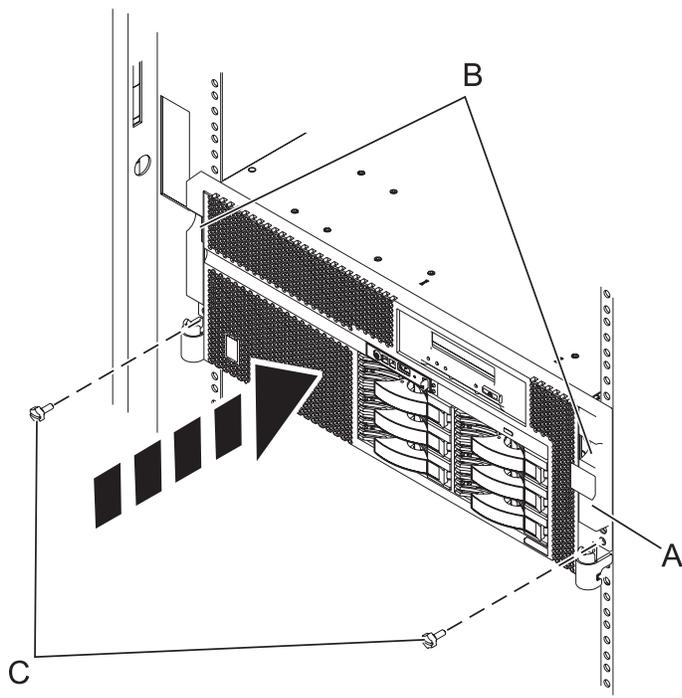
Note: Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you push the unit back into the rack.



IPHBF509-1

Figure 52. Releasing the rail safety latches

2. Replace and tighten the two thumbscrews (C) that secure the system or expansion unit (A) to the rack as shown in the following figure.



IPHAJ852-1

Figure 53. Pushing the system into the rack and attaching the thumbscrews

3. Close the front rack door.

Placing a rack-mounted model 03E/4A, 04E/8A in the service position

You might need to perform service or gain access to internal components by placing the rack-mounted system or expansion unit in the service position. Use the procedure in this section to accomplish this task.

About this task

Note: Some of the figures in these procedures might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.

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)

To place the rack-mounted system or expansion unit into the service position, follow these steps:

1. If necessary, open the front rack door.
2. Remove the two thumbscrews (A) that secure the system unit to the rack as shown in the following figure.
3. Release the rack latches (B) on both the left and right sides as shown in the following figure.

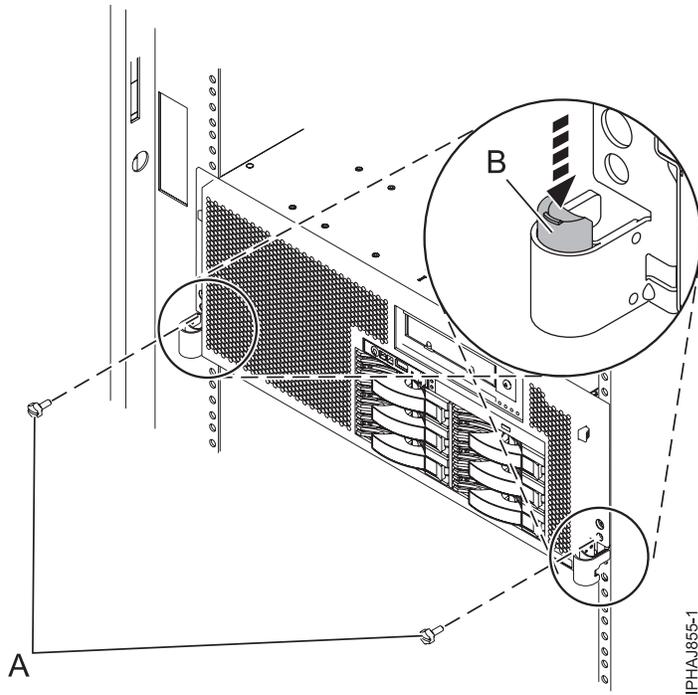


Figure 54. Releasing the rack latches

4. Read the following note, and then slowly pull the system or expansion unit out from the rack until the rails are fully extended and locked.

Note:

- If the procedure you are performing requires you to unplug cables from the back of the system or expansion unit, do so before you pull the unit out from the rack.
- Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you pull the unit out from the rack.
- Ensure the rails are fully extended. When the rails are fully extended, the rail safety latches lock into place. This action prevents the system or expansion unit from being pulled out too far.

Placing the rack-mounted 03E/4A, 04E/8A in the operating position

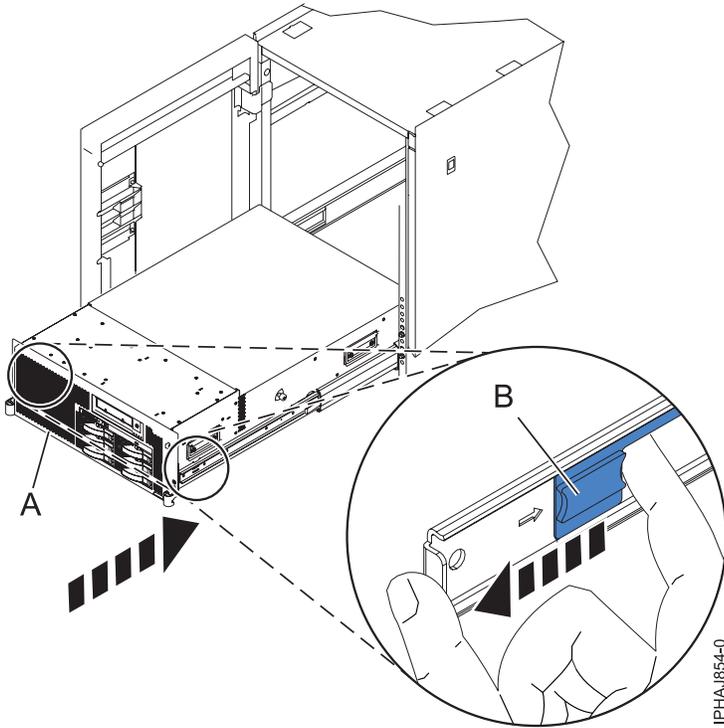
You might need to place the rack-mounted system or expansion unit in the operating position to make the unit available for use.

About this task

Tip: Some of the figures in these procedures might not look exactly like the system or expansion unit that you have. However, the steps to perform the task are the same.

1. Simultaneously release the blue rail safety latches (**B**), located near the front of each rail, and push the system or expansion unit into the rack as shown in the following figure.

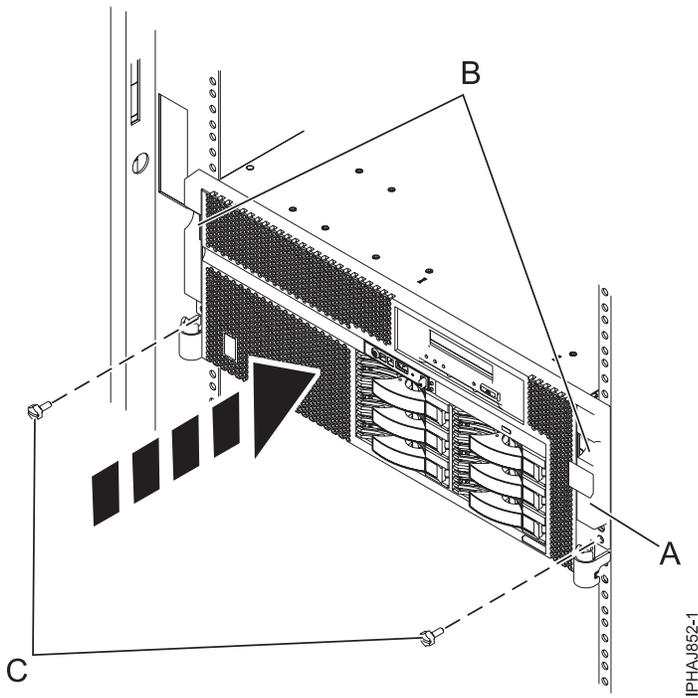
Note: Ensure that the cables at the rear of the system or expansion unit do not catch or bind as you push the unit back into the rack.



IPHAJ854-0

Figure 55. Releasing the rail safety latches

2. Replace and tighten the two thumbscrews (C) that secure the system or expansion unit (A) to the rack as shown in the following figure.



IPHAJ852-1

Figure 56. Replacing the thumbscrews

3. Close the front rack door.

Chapter 19. Viewing existing firmware levels

Find out how to view the level of firmware that currently runs on your server.

About this task

You can view the current and backup levels of server firmware on the managed system.

Using the HMC to view the existing firmware levels

Learn how to view the level of firmware that currently runs on your server using the HMC.

1. In the Navigation area, click **Updates**.
2. Ensure that the managed system Status is Power Off, Standby, or Operating.
3. Record the level that appears in the EC Number field. For example, 01EM310.

Using the ASMI to view the existing level of server firmware

Find out how to use the ASMI to view the level of firmware that currently runs on your server.

About this task

On the ASMI Welcome pane, view the existing level of server firmware in the upper-right corner below the copyright statement, for example, 01EM310.

Chapter 20. Installing a feature using the Hardware Management Console

You can use the Hardware Management Console to perform many service actions; including the installation of a new feature or part.

Before you begin

To use the Hardware Management Console user interface to install a feature or part into a system or expansion unit that is managed by an HMC, follow these steps:

1. In the navigation area, expand **Systems Management**.
2. Expand **Servers**.
3. Select the managed system you will install the part in.
4. In the Tasks area expand **Serviceability**.
5. Expand **Hardware**.
6. Select **Add FRU**.
7. In the Add/Install/Remove Hardware window select the system or enclosure into which you are installing the feature.
8. Select the type of feature you are installing from the menu and click **Next**
9. Select the location code for where you will install the feature and click **Add**.
10. Once the FRU is in pending actions click **Launch Procedure** and follow the instructions to install the feature.

Note: The HMC might open external instructions for installing the feature. If so, follow these instructions to install the feature.

Removing a part using the Hardware Management Console

Use the Hardware Management Console (HMC) to facilitate removing a part from your managed system.

About this task

To use the Hardware Management Console user interface to remove a part in a system or expansion unit that is managed by an HMC, follow these steps:

1. In the navigation area, expand **Systems Management**.
2. Expand **Servers**.
3. Select the managed system from which you are removing a part.
4. In the Tasks area expand **Serviceability**.
5. Expand **Hardware**.
6. Select **Remove FRU**.
7. In the Add/Install/Remove Hardware - Remove FRU, Select FRU Type window, select the system or enclosure from which you are removing the part.
8. Select the type of part you are removing from the menu and click **Next**.
9. Select the location of the part you are removing and click **Add**.
10. After the part is listed in the **Pending Actions** display click **Launch Procedure** and follow the instructions to remove the part.

Note: The HMC might open the information center instructions for removing the part. If so, follow those instructions to remove the part.

Exchange a part using the Hardware Management Console

About this task

If you are exchanging a part to repair a serviceable event follow those instructions. If you are exchanging a part as a part of any other procedure using HMC Version 7 or later use these steps, "Exchange a part using the HMC Version 7."

Exchange a part using the HMC Version 7

1. In the navigation area, expand **Systems Management**.
2. Expand **Servers**.
3. Select the managed system in which you are exchanging a part.
4. In the Tasks area expand **Serviceability**.
5. Expand **Hardware**.
6. Select **Exchange FRU**.
7. In the **Replace Hardware - Replace FRU, Select FRU Type** window select the system or enclosure in which you will exchange a part from the list.
8. Select the type of part you will exchange from the menu and click **Next**.
9. Select the location code of the part you will exchange from the menu and click **Add**.
10. Once the part is listed in **Pending Actions** click **Launch Procedure** and follow the instructions to exchange the part.

Note: The HMC might open external instructions for replacing the part. If so, follow these instructions to replace the part.

Chapter 21. Hardware Service Manager — Verify

Use the Hardware Service Manager to verify communications or devices.

About this task

To verify communications or devices on any model using the Hardware Service Manager *Verify* option, perform the following procedure:

Note: Before running a verification test, ensure that the customer is not using the resource you want to test and that all communication jobs on the resource to be tested are ended.

1. From the Start a Service Tool display, select the *Hardware Service Manager* option.
2. From the Hardware Service Manager display, select the *Logical hardware resources* option.
3. From the Logical Hardware Resources display, select the *System bus resources* option.
This display lists all the I/O processors.
4. Select the *Resources associated with IOP* option for the attached IOP in the list.
5. Select the *Verify* option for the communications, tape, optical storage unit, or File Server adapter that you want to test.
6. When the test completes, the system responds with either a Test is successful message or a Test failed message.

This ends the procedure.

Results

Notes:

1. Hardware units might perform automatic self-tests when they are powered on.
2. You can test some workstations by using the *Test Request* function key while the operating system Sign On display is shown.
3. See the specific device information for possible off-line tests that you can run.

Verify an installed feature or replaced part on an AIX system or logical partition

If you installed feature or replaced a part you might want to use the tools in AIX to verify that the feature or part is recognized by the system or logical partition. Use the procedure in this section to accomplish this task.

About this task

To verify the operation of a newly installed feature or replacement part, select the appropriate procedure:

- Verify the installed feature using AIX
- Verifying the replaced part using AIX

Verify the installed feature using AIX:

1. Log in as root user.
2. At the command line, type `diag` and press Enter.
3. Select **Advanced Diagnostics Routines**. Press Enter.
4. From the **Diagnostic Mode Selection** menu, select **System Verification**. Press Enter.

5. When the **Advanced Diagnostic Selection** menu appears, do one of the following:
 - To test a single resource, select the resource that you just installed from the list of resources and press Enter.
 - To test all the resources available to the operating system, select **All Resources** and press Enter.
6. Select **Commit**, and wait until the diagnostic programs run to completion, responding to any prompts that appear.
7. Did the diagnostics run to completion and display the message No trouble was found?
 - **No:** If a service request number (SRN) or other reference code is displayed, suspect a loose adapter or cable connection. Review the installation procedures to ensure that the new feature is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system is running in LPAR mode, note the logical partition in which you installed the feature. Contact your service provider for assistance.
 - **Yes:** The new device is installed correctly. Exit the diagnostic programs and return the system to normal operations.

Verify the replacement part using AIX

To verify the operation of a newly installed feature or replacement part, follow these steps:

1. Did you replace the part using either AIX or the online diagnostics service aid's concurrent (hot-swap) service operation?
 - No:** Go to step 2.
 - Yes:** Go to step 5.
2. Is the system powered off?
 - Yes:** If the system supports slow boot, set the system to perform a slow boot. For information, see "Using the HMC to perform a slow boot" on page 126.
 - No:** Go to step 4.
3. Start the system and wait until the AIX operating system login prompt displays or until apparent system activity on the operator panel or display has stopped.

Did the AIX login prompt display?

 - **Yes:** Go to step 4
 - **No:** If an SRN or other reference code is displayed, suspect a loose adapter or cable connection. Review the procedures for the part that you replaced to ensure that the new part is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system does not start or you have no login prompt, see: .
If the system is partitioned, note the logical partition in which you replaced the part. Contact your service provider for assistance.
4. At the command prompt, type `diag -a` and press Enter to check for missing resources. If you see a command prompt, go to step 5.

If the **Diagnostic selection** menu is shown with **M** appearing next to any resource, follow these steps:

 - a. Select the resource and press Enter.
 - b. Select **Commit**.
 - c. Follow any instructions that are shown.
 - d. If a *Do you want to review the previously displayed error?* message is shown, select **Yes** and press Enter.
 - e. If an SRN is shown, suspect a loose card or connection. If no obvious problem is shown, record the SRN and contact your service provider for assistance..
 - f. If no SRN is shown, go to 5.
5. Test the part by doing the following:

- a. At the command line, type `diag` and press Enter.
 - b. From the **Function Selection** menu, select **Advanced Diagnostics Routines**. Press Enter.
 - c. From the **Diagnostic Mode Selection** menu, select **System Verification**. Press Enter.
 - d. Select **All Resources**, or select the diagnostics for the individual part to test only the part you replaced, and any devices that are attached to the part you replaced. Press Enter.
Did the **Resource Repair Action** menu appear?
No: Go to step 6.
Yes: Go to step 7.
6. Did the *Testing Complete, No trouble was found* message appear?
- **No:** There is still a problem. Contact your service provider. **This ends the procedure.**
 - **Yes:** Select **Log Repair Action**, if not previously logged, from the **Task Selection** menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the Resource List, select `sysplanar0`. Press Enter.
- Tip:** This action changes the indicator light for the part from the fault state to the normal state. Go to step 9
7. When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the *Resource Repair Action* menu appears. After replacing a part, you must select the resource for that part from the *Resource Repair Action* menu. This updates the AIX error log to indicate that a system-detectable part has been replaced.
- Note:** On systems with a indicator light for the failing part, this changes the indicator light to the normal state.
- Follow these steps:
- a. Select the resource that has been replaced from the *Resource Repair Action* menu. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action does not appear on the Resource List, select `sysplanar0`. Press Enter.
 - b. Select **Commit** after you make your selections. Did another *Resource Repair Action* display appear?
No: If the *No Trouble Found* display appears, go to step 9
Yes: Go to step 8.
8. The parent or child of the resource you just replaced may also require that you run the Resource Repair Action option on it. When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the *Resource Repair Action* menu appears. After replacing that part, you must select the resource for that part from the *Resource Repair Action* menu. This updates the AIX error log to indicate that a system-detectable part has been replaced.
- Note:** This changes the indicator light for the part from the fault state to the normal state.
- Follow these steps:
- a. From the *Resource Repair Action* menu, select the parent or child of the resource that has been replaced. If the repair action was to reseat a cable or adapter, select the resource associated with that repair action. If the resource associated with your action does not appear on the Resource List, select `sysplanar0`. Press Enter.
 - b. Select **Commit** after you make your selections.
 - c. If the *No Trouble Found* display appears, go to step 9.
9. If you changed the service processor or network settings, as instructed in previous procedures, restore the settings to the value they had prior to servicing the system.
10. Did you do any hot-plug procedures before doing this procedure?

No: Go to step 11.

Yes: Go to step 12.

11. Start the operating system, with the system or logical partition in normal mode. Were you able to start the operating system?

No: Contact your service provider. **This ends the procedure.**

Yes: Go to step 12.

12. Are the indicator lights still on?

- **No. This ends the procedure.**
- **Yes.** Turn off the lights. See one of the following for instructions:
 - “Changing service indicators” on page 127

Using the HMC to perform a slow boot

Learn how to perform a slow boot using the HMC.

About this task

In some cases, you need to perform a slow-mode boot in order to perform extended diagnostic testing.

Note: A slow-mode boot might yield a new reference code on the control panel, or new errors in the service processor error log. When the server reports a new error code, record it for use in subsequent steps.

1. Record any reference codes appearing on the control panel or HMC. For details, see Collecting reference codes and system information.
2. Shut down all logical partitions and the server.
3. In the navigation area, select **Systems Management** → **Servers**.
4. Select the server you want to perform a slow boot on.
5. In the **Tasks** portion of the content area, select **Properties**.
6. Click the **Power-On Parameters** tab.
7. Record the current boot setting in the Power-on speed override box.
8. Select **slow** in the Power-on speed override list.

Note: These settings will apply to all future boots. After you complete the service action, change the settings back to what you recorded in step 7.

9. Click **OK**.
10. After you are done, return to the step in the procedure that caused you to perform a slow boot. **This ends the procedure.**

Using the control panel to collect reference codes and system information

When selected, functions 11 - 20 on the control panel display reference codes and system information.

About this task

Note: Ensure you have a printed copy of the appropriate problem reporting form to document the information you collect here.

To collect reference codes and system information using the control panel, perform the following steps:

1. On the control panel, press the increment button until function 11 is shown on the function/data display.
2. Press the middle button.
3. Record the data.

4. Repeat steps 1 - 3 for functions 12 - 20, until you have recorded the machine type, model, and serial number shown by function 20.

Results

Notes:

1. If 11 is shown in the function/data display on the control panel display, the numbers that follow are the reference codes.
2. If a number other than 11 is shown in the function/data display, the number might not indicate a problem with the system. These reference codes might indicate functions you select from the control panel display.
3. If you have a console with Type and Reference Code columns on it, record the data under the Type column as the first 4 characters of function 11 on the problem reporting form. If an A, B, C, or D is displayed as the first character in the Type column, use the data in the Reference Code column as the last 4 characters of function 11.

Changing service indicators

Turn off the system attention indicator, enable enclosure indicators, change indicators by location code, and perform an LED test on the control panel.

The service indicators alert you that the system requires attention or service. It also provides a method for identifying a field-replaceable unit (FRU) or a specific enclosure within the system.

A hierarchical relationship exists between FRU indicators and enclosure indicators. If any FRU indicator is in an *identify* state, then the corresponding enclosure indicator will change to an *identify* state automatically. You cannot turn off the enclosure indicator until all FRU indicators within that enclosure are in an *off* state.

Turning off the system attention indicator

The system attention indicator provides a visual signal that the system as a whole requires attention or service.

About this task

Each system has a single system attention indicator. When an event occurs that either needs your intervention or that of service and support, the system attention indicator lights continuously. The system attention indicator is turned on when an entry is made in the service processor error log. The error entry is transmitted to the system level and operating system error logs.

To perform this operation, your authority level must be one of the following:

- Administrator
- Authorized service provider

To turn off the system attention indicator, do the following:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration** and **Service Indicators**.
3. Select **System Attention Indicator**.
4. In the right pane, click **Turn off system attention indicator**. If the attempt is unsuccessful, an error message is displayed.

Verify the installed part on a Linux system or logical partition (run AIX diagnostics)

If you have installed a new part, use the instructions in this section to learn how to verify that the system recognizes the part.

About this task

To verify the newly installed or replaced part, continue with “Verify an installed part using stand-alone diagnostics.”

Verify an installed part using stand-alone diagnostics

If you have installed or replaced a part, verify that the system recognizes the new part. Use the procedure in this section to accomplish this task.

About this task

You can use stand-alone diagnostics to verify an installed part in a Linux system, expansion unit, or logical partition. You access these diagnostics from a CD-ROM or from the Network Installation Management (NIM) server. This procedure describes how to use the diagnostics from a CD-ROM. For information on running diagnostics from the Network Installation Management (NIM) server, see “Running stand-alone diagnostics from a Network Installation Management server” on page 129.

Prerequisites

- If this server is directly attached to another server or attached to a network, be sure communication with the other servers is stopped.
- stand-alone diagnostics require use of all of the logical partition resources. No other activity can be running on the logical partition.
- stand-alone diagnostics require access to the system console.

To use stand-alone diagnostics, follow these steps:

1. Stop all jobs and applications and then stop the operating system on the system or logical partition.
2. Remove all tapes, diskettes, and CD-ROM.
3. Turn off the system unit power. The next step boots the server or logical partition from the stand-alone diagnostics CD-ROM. If the optical drive is not available as the boot device on the server or logical partition on which you are working, follow these steps:
 - a. Access the ASMI. See “Accessing the ASMI without an HMC” on page 65 for information on using the ASMI.
 - b. On the ASMI main menu, click on **Power/Restart Control**.
 - c. Click on Power On/Off System.
 - d. Select the **Service mode boot from default boot list** option in the AIX/Linux logical partition mode boot drop-down menu.
 - e. Click on **Save settings and power on**. As soon as the optical drive has power, insert the standalone diagnostic CD-ROM.
 - f. Go to step 5.
4. Turn on the system unit power and immediately insert the diagnostics CD-ROM into the optical drive.
5. After the **keyboard** POST indicator displays on the system console and before the last POST indicator (**speaker**) displays, press the numeric 5 key on the system console to indicate that a service mode boot should be initiated using the default service mode boot list.
6. Enter any requested password.

7. At the *Diagnostic Operating Instructions* display, press Enter.

Note: If an SRN or other reference code is displayed, suspect a loose adapter or cable connection.

Note: If you received an SRN or any other reference code when you attempted to start the system, contact your service provider for assistance..

8. If the terminal type is requested, you must use the **Initialize Terminal** option on the *Function Selection* menu to initialize the operating system before you can continue.
9. From the Function Selection menu, select **Advanced Diagnostics Routines**. Press Enter.
10. From the Diagnostic Mode Selection menu, select **System Verification**. Press Enter.
11. When the Advanced Diagnostic Selection menu appears, select **All Resources**, or test only the part you replaced, and any devices that are attached to the part you replaced, by selecting the diagnostics for the individual part. Press Enter.
12. Did the *Testing Complete, No trouble was found* message appear?
 - **No:** There is still a problem. Contact your service provider.
 - **Yes:** Go to step 13.
13. If you changed the service processor or network settings, as instructed in previous procedures, restore the settings to the value they had prior to servicing the system.
14. If the indicator lights are still on, follow these steps:
 - a. Select **Identify and Attention Indicators** from the *Task Selection* menu to turn off the system attention and indicator lights. Press Enter.
 - b. Select **Set System Attention Indicator to NORMAL** and press Enter.
 - c. Select **Set All Identify Indicators to NORMAL** and press Enter.
 - d. Choose **Commit**.

Note: This changes the system attention and identify indicators from the *Fault* state to the *Normal* state.

 - e. Exit to the command line.

Running stand-alone diagnostics from a Network Installation Management server

If you have AIX installed but it cannot be started, or you have Linux installed, you can run the diagnostics from a Network Installation Management (NIM) server.

About this task

Note: Only perform this procedure if you are directed from another procedure or by your next level of support.

Diagnostics, which are available for AIX and Linux systems and logical partitions, can help you perform hardware analysis. If a problem is found, you will receive a service request number (SRN) that can help pinpoint the problem and determine a corrective action.

A client system connected to a network with a NIM server can boot stand-alone diagnostics from the NIM server if the client-specific settings on both the NIM server and client are correctly configured.

Notes:

- For NIM clients that have adapters that would typically require that supplemental media be installed when stand-alone diagnostics are run from CD, the support code for these adapters must be installed into the directory pointed to by the NIM SPOT from which you want to boot that client. Before

running stand-alone diagnostics on these clients from the NIM server, the NIM server system administrator must ensure that any needed support for these devices is installed on the server.

- All operations to configure the NIM server require root user authority.
- If you replace the network adapter in the client, the network adapter hardware address settings for the client must be updated on the NIM server.
- Ensure that the **Cstate** for each stand-alone diagnostics client on the NIM server is kept in the *diagnostic boot has been enabled* state.
- On the client system, the NIM server network adapter should be put in the bootlist after the boot disk drive. This allows the system to boot in stand-alone diagnostics from the NIM server if there is a problem booting from the disk drive.

Configuring the NIM server

For information about performing the following tasks, refer to the "Performing advanced NIM configuration tasks" chapter of the AIX Installation and Migration guide. Contact your next level of support to obtain the guide.

- Registering a client on the NIM server
- Enabling a client to run diagnostics from the NIM server

To verify that the client system is registered on the NIM server and the diagnostic boot is enabled, run the command from the command line on the NIM server: `lsnim -a Cstate -z ClientName`. Refer to the following table for system responses.

Note: The ClientName is the name of the system on which you want to run stand-alone diagnostics.

Table 12. Verification that the client system is registered on the NIM server and the diagnostic boot is enabled

System response	Client status
#name:Cstate:ClientName:diagnostic boot has been enabled:	The client system is registered on the NIM server and enabled to run diagnostics from the NIM server.
#name:Cstate:ClientName:ready for a NIM operation: or #name:Cstate:ClientName:BOs installation has been enabled:	The client is registered on the NIM server but not enabled to run diagnostics from the NIM server. Note: If the client system is registered on the NIM server but Cstate has not been set, no data will be returned.
0042-053 lsnim: there is no NIM object named "ClientName"	The client is not registered on the NIM server.

Configuring the client and running the stand-alone diagnostics from a NIM server

Perform the following steps to run stand-alone diagnostics on a client from the NIM server:

1. Let the system administrator and system users know that the system unit might be shut down.
2. Stop all programs including the AIX or Linux operating system. If you need help, contact the system administrator.
3. Remove all tapes, diskettes, and CDs.
4. Choose from the following options:
 - If you are running stand-alone diagnostics in a full system partition profile, verify with the system administrator and system users that the system unit can shut down using the shutdown command. Then power down the system.
 - If you are running on a logically partitioned system, make sure the CD drive is available to the partition used to run stand-alone diagnostics. Verify with the system administrator and system users using that partition that all applications on that partition must be stopped, and that the partition will be restarted. Stop all programs on that partition, including the operating system.

5. Choose from the following options:
 - If you are in a full system partition, power on the system unit to run stand-alone diagnostics.
 - If you are in a logically partitioned system, restart the partition to run stand-alone diagnostics.
6. When the keyboard indicator is displayed (the word *keyboard* on an HMC virtual terminal window or the keyboard icon on a graphical display) press the number 1 key on the keyboard to display the SMS menus.
7. Enter any requested passwords.
8. Select **Set Up Remote IPL** (Initial Program Load).
9. Enter the client address, server address, gateway address, if applicable, and subnet mask. If there is no gateway between the NIM server and the client, set the gateway address to 0.0.0.0.

To determine if there is a gateway, either ask the system network administrator or compare the first three octets of the NIM server address and the client address. If they are the same, (for example, if the NIM server address is 9.3.126.16 and the client address is 9.3.126.42, the first 3 octets (9.3.126) are the same), then set the gateway address in the Remote IPL field to 0.0.0.0.
10. If the NIM server is set up to allow pinging from the client system, use the Ping test option in the Remote IPL option to verify that the client system can ping the NIM server.
11. Under the Ping test option, choose the network adapter that provides the attachment to the NIM server to do the ping operation. If the ping returns with an OK prompt, the client is prepared to boot from the NIM server. If ping returns with a FAILED prompt, the client cannot proceed with the NIM boot.
12. Return to the SMS main menu screen.
13. Select **Select Boot Options** → **Install or Boot a Device** → **Network**.
14. Record the current bootlist settings. You will need to set the bootlist back to the original settings after running diagnostics from the NIM server.
15. Change the bootlist so the network adapter attached to the NIM is first in the bootlist.
16. Set the network parameters for the adapter from which you want to boot.
17. Exit completely from SMS. The system will start loading packets while doing a bootp from the network.
18. Follow the on-screen instructions.
 - If Diagnostic Operating Instructions Version *x.x.x* displays, stand-alone diagnostics have installed successfully.
 - If the AIX login prompt displays, stand-alone diagnostics did not load. Continue with step 19.
19. If the diagnostics did not load, check the following items:
 - The bootlist on the client might be incorrect.
 - **Cstate** on the NIM server might be incorrect.
 - Network problems might be preventing you from connecting to the NIM server.
 - Verify the settings and the status of the network. Contact your next level of support to obtain the guide.
20. After running diagnostics, restart the system and use SMS to change the IP settings and bootlist sequence back to the original settings.

Verify the presence of an installed part using Hardware Management Console (HMC)

If you have installed or replaced a part, use the Hardware Management Console (HMC) to update your HMC records after you have completed a service action on your server. Use the procedure in this section to accomplish this task. If you have reference codes, symptoms, or location codes that you used during the service action, locate the records to use during this procedure.

1. At the HMC, examine the service action event log for any open service action events. See “Viewing serviceable events” on page 133 for details.
2. Are there any service action events that are open?
 - No:** If the system attention LED is still on, use the HMC to turn off the LED. See “Activating and deactivating LEDs.” **This ends the procedure.**
 - Yes:** Continue with the next step.
3. Record the list of open service action events.
4. Examine the details of the open service action event. Is the error code associated with this service action event the same as you gathered earlier.
 - **Yes:** Continue with the next step.
 - **No:** Choose from the following options:
 - Review the other serviceable events and find one that does match and continue with the next step.
 - If the log does not match what you had gathered earlier, contact your service provider.
5. Select and highlight the service action event from the Error Associated With This Serviceable Event window.
6. Click **Close Event**.
7. Add comments for the serviceable event. Include any unique additional information. Click **OK**.
8. Did you replace, add, or modify a FRU of the open service action event?
 - **No:** Select the **No FRU Replaced for this Serviceable Event** option and click **OK** to close the service action event.
 - **Yes:** Perform the following steps:
 - a. From the FRU list, select a FRU that you need to update.
 - b. Double-click the FRU and update the FRU information.
 - c. Click **OK** to close the service action event.
9. If you continue to have problems, contact your service provider.

Activating and deactivating LEDs

Use this procedure to activate or deactivate LEDs using Service Focal Point for the HMC.

About this task

Choose from the following:

- “Deactivate a system attention LED or partition LED”
- “Activate or deactivate identify LED” on page 133

Deactivate a system attention LED or partition LED

About this task

You can deactivate a system attention LED or a logical partition LED. For example, you might determine that a problem is not a high priority and decide to repair the problem at a later time. However, you want to be alerted if another problem occurs, so you must deactivate the system attention LED so that it can be activated again if another problem occurs.

1. In the navigation area, open **Systems Management**.
2. Open **Servers** and select the appropriate system.
3. In the content area, check the box for the appropriate Partition.
4. Select **Tasks**, then **Operations**, and then **Manage Attention LED**.
5. Select the appropriate Partition.

6. Select **Deactivate System Attention LED** from the **Action** menu. A confirmation window is displayed that provides the following information:
 - A verification that the system attention LED was deactivated.
 - An indication that there still might be open problems within the system.
 - An indication that you cannot activate the system attention LED.
7. Select one of the logical partitions in the lower table, and select **Deactivate partition LED** from the **Partition Operations** menu. A confirmation window is displayed that provides the following information:
 - A verification that the logical partition LED was deactivated.
 - An indication that there still might be open problems within the logical partition.
 - An indication that you cannot activate the logical partition LED.

Activate or deactivate identify LED

About this task

The system provides several LEDs that help identify various components, such as enclosures or field replaceable units (FRUs), in the system. For this reason, they are called *Identify LEDs*.

You can activate or deactivate the following types of identify LEDs:

- **Identify LED for an enclosure**If you want to add an adapter to a specific drawer (enclosure), you need to know the machine type, model, and serial number (MTMS) of the drawer. To determine whether you have the correct MTMS for the drawer that needs the new adapter, you can activate the LED for a drawer and verify that the MTMS corresponds to the drawer that requires the new adapter.
- **Identify LED for a FRU associated with a specified enclosure**If you want to hook up a cable to a specific I/O adapter, you can activate the LED for the adapter which is a field replaceable unit (FRU), and then physically check to see where you should hook up the cable. This is especially useful when you have several adapters with open ports.

To activate or deactivate an identify LED for an enclosure or FRU, follow these steps:

1. In the navigation area, open **Systems Management**.
2. Select **Servers**.
3. In the content area, check the box for the appropriate System.
4. Select **Tasks**, then **Operations**, then **LED Status**, and then **Identify LED**.
5. To activate or deactivate an identify LED for an enclosure, select an enclosure from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.
6. To activate or deactivate an identify LED for a FRU, select an enclosure from the table, select **Selected** → **List FRUs**.
7. Select one or more FRUs from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.

Viewing serviceable events

Use this procedure to view a serviceable event, including details, comments, and service history.

About this task

To view serviceable events and other information about the events, you must be a member of one of the following roles:

- Super administrator
- Service representative
- Operator
- Product engineer

- Viewer

To view serviceable events, follow these steps:

1. In the navigation area, select **Service Management**.
2. Select **Manage Serviceable Events**.
3. Select the criteria for the serviceable events that you want to view, and click **OK**. The Serviceable Event Overview window opens. The list shows all serviceable events that match your selection criteria. You can use the menu options to perform actions on the serviceable events.
4. Select a line in the Serviceable Event Overview window, and select **Selected** → **View Details**. The Serviceable Event Details window opens, showing detailed information about the serviceable event. The upper table shows information, such as problem number and reference code. The lower table shows the field replaceable units (FRUs) associated with this event.
5. Select the error for which you want to view comments and history, and follow these steps:
 - a. Select **Actions** → **View Comments**.
 - b. When you are finished viewing the comments, click **Close**.
 - c. Select **Actions** → **View Service History**. The Service History window opens, showing service history associated with the selected error.
 - d. When you are finished viewing the service history, click **Close**.
6. When you are finished, click **Cancel** twice to close the Serviceable Event Details window and the Serviceable Event Overview window.

Verify an installed feature or replaced part on a Virtual I/O Server (VIOS) system or logical partition

If you installed feature or replaced a part you might want to use the tools in VIOS to verify that the feature or part is recognized by the system or logical partition. Use the procedure in this section to accomplish this task.

About this task

To verify the operation of a newly installed feature or replacement part, select the appropriate procedure:

- Verify the installed feature using VIOS
- Verifying the replaced part using VIOS

Verify the installed feature using VIOS:

1. Log in as root user.
2. At the command line, type `diagmenu` and press Enter.
3. Select **Advanced Diagnostics Routines**. Press Enter.
4. From the **Diagnostic Mode Selection** menu, select **System Verification**. Press Enter.
5. When the **Advanced Diagnostic Selection** menu appears, do one of the following:
 - To test a single resource, select the resource that you just installed from the list of resources and press Enter.
 - To test all the resources available to the operating system, select **All Resources** and press Enter.
6. Select **Commit**, and wait until the diagnostic programs run to completion, responding to any prompts that appear.
7. Did the diagnostics run to completion and display the message No trouble was found?
 - **No:** If a service request number (SRN) or other reference code is displayed, suspect a loose adapter or cable connection. Review the installation procedures to ensure that the new feature is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code

information that you see. If the system is running in LPAR mode, note the logical partition in which you installed the feature. Contact your service provider for assistance.

- **Yes:** The new device is installed correctly. Exit the diagnostic programs and return the system to normal operations.

Verify the replacement part using VIOS

To verify the operation of a newly installed feature or replacement part, follow these steps:

1. Did you replace the part using either VIOS or the online diagnostics service aid's concurrent (hot-swap) service operation?
 - No:** Go to step 2.
 - Yes:** Go to step 5.
2. Is the system powered off?
 - Yes:** If the system supports slow boot, set the system to perform a slow boot. For information, see "Using the HMC to perform a slow boot" on page 126.
 - No:** Go to step 4.
3. Start the system and wait until the VIOS operating system login prompt displays or until apparent system activity on the operator panel or display has stopped.

Did the VIOS login prompt display?

 - **Yes:** Go to step 4
 - **No:** If an SRN or other reference code is displayed, suspect a loose adapter or cable connection. Review the procedures for the part that you replaced to ensure that the new part is installed correctly. If you cannot correct the problem, collect all SRNs or any other reference code information that you see. If the system does not start or you have no login prompt, see: .
If the system is partitioned, note the logical partition in which you replaced the part. Contact your service provider for assistance.
4. At the command prompt, type `diag -a` and press Enter to check for missing resources. If you see a command prompt, go to step 5.

If the **Diagnostic selection** menu is shown with **M** appearing next to any resource, follow these steps:

 - a. Select the resource and press Enter.
 - b. Select **Commit**.
 - c. Follow any instructions that are shown.
 - d. If a *Do you want to review the previously displayed error?* message is shown, select **Yes** and press Enter.
 - e. If an SRN is shown, suspect a loose card or connection. If no obvious problem is shown, record the SRN and contact your service provider for assistance..
 - f. If no SRN is shown, go to 5.
5. Test the part by doing the following:
 - a. At the command line, type `diagmenu` and press Enter.
 - b. From the **Function Selection** menu, select **Advanced Diagnostics Routines**. Press Enter.
 - c. From the **Diagnostic Mode Selection** menu, select **System Verification**. Press Enter.
 - d. Select **All Resources**, or select the diagnostics for the individual part to test only the part you replaced, and any devices that are attached to the part you replaced. Press Enter.

Did the **Resource Repair Action** menu appear?

 - No:** Go to step 6.
 - Yes:** Go to step 7 on page 136.
6. Did the *Testing Complete, No trouble was found* message appear?

- **No:** There is still a problem. Contact your service provider. **This ends the procedure.**
- **Yes:** Select **Log Repair Action**, if not previously logged, from the **Task Selection** menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**. Press Enter.

Tip: This action changes the indicator light for the part from the fault state to the normal state. Go to step 9

7. When a test is run on a resource in system verification mode, and that resource has an entry in the VIOS error log, if the test on the resource was successful, the *Resource Repair Action* menu appears. After replacing a part, you must select the resource for that part from the *Resource Repair Action* menu. This updates the VIOS error log to indicate that a system-detectable part has been replaced.

Note: On systems with a indicator light for the failing part, this changes the indicator light to the normal state.

Follow these steps:

- a. Select the resource that has been replaced from the *Resource Repair Action* menu. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action does not appear on the Resource List, select **sysplanar0**. Press Enter.
 - b. Select **Commit** after you make your selections. Did another *Resource Repair Action* display appear?
No: If the *No Trouble Found* display appears, go to step 9
Yes: Go to step 8.
8. The parent or child of the resource you just replaced may also require that you run the Resource Repair Action option on it. When a test is run on a resource in system verification mode, and that resource has an entry in the VIOS error log, if the test on the resource was successful, the *Resource Repair Action* menu appears. After replacing that part, you must select the resource for that part from the *Resource Repair Action* menu. This updates the VIOS error log to indicate that a system-detectable part has been replaced.

Note: This changes the indicator light for the part from the fault state to the normal state.

Follow these steps:

- a. From the *Resource Repair Action* menu, select the parent or child of the resource that has been replaced. If the repair action was to reseat a cable or adapter, select the resource associated with that repair action. If the resource associated with your action does not appear on the Resource List, select **sysplanar0**. Press Enter.
 - b. Select **Commit** after you make your selections.
 - c. If the *No Trouble Found* display appears, go to step 9.
9. If you changed the service processor or network settings, as instructed in previous procedures, restore the settings to the value they had prior to servicing the system.
 10. Did you do any hot-plug procedures before doing this procedure?
No: Go to step 11.
Yes: Go to step 12.
 11. Start the operating system, with the system or logical partition in normal mode. Were you able to start the operating system?
No: Contact your service provider. **This ends the procedure.**
Yes: Go to step 12.
 12. Are the indicator lights still on?
 - **No. This ends the procedure.**
 - **Yes.** Turn off the lights. See one of the following for instructions:

- "Changing service indicators" on page 127

Chapter 22. Gain access to the model 04E/8A, 03E/4A control panels

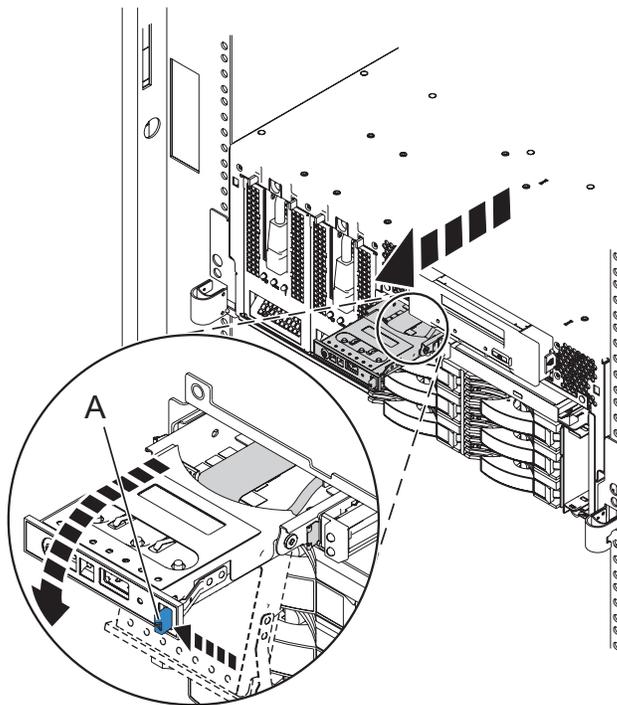
Since only part of the control panel is visible from the front of the server, you can use this procedure to gain access to all of the control panel's features, including the display.

About this task

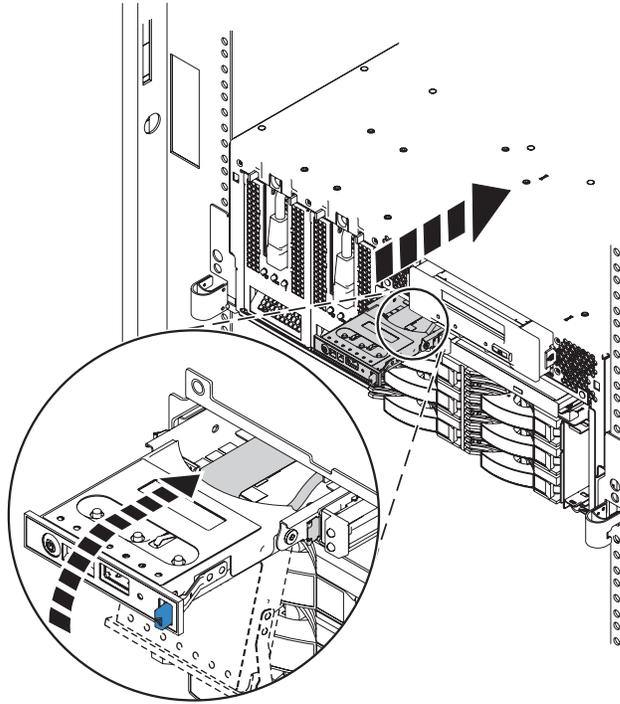
Because only part of the control panel is visible from the front of the server, the following procedure describes how to gain access to all of the control panel's features, including the display.

To access all of the control panel's features, complete the following steps:

1. Press inward on the spring-loaded tab **A** located on the right side of the control panel so that it pops out slightly, as shown in the following figure.



2. Pull the control panel out, toward the front of the system, until it can be pivoted downward on its hinge.
3. To move the control panel back into the device enclosure, lift the control panel up to align it with the opening and push it into place until you feel the tab lock, as shown in the following figure.



IPHAJ871-0

Part 5. Appendixes

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Electronic emission notices

Class A Notices

The following Class A statements apply to the servers.

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment

generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

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

Industry Canada Compliance Statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

European Community Compliance Statement

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

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

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E-mail: tjahn@de.ibm.com

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

VCCI Statement - Japan

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

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

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.

Electromagnetic Interference (EMI) Statement - Korea

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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

Class B Notices

The following Class B statements apply to model 115/20 (stand-alone version), 315/2A (stand-alone version), 471/85 and the 112/85.

Federal Communications Commission (FCC) statement

Note: 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 using other than recommended cables or connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interferences, and (2) this device must accept any interferences 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 respecte est conforme à la norme NMB-003 du Canada.

European Community Compliance Statement

This product is in conformity with the protection requirements of EC 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 CISPR 22 / 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 devices.

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communications and to other electrical or electronic equipment. Such cables and connectors are available from IBM authorized dealers. IBM cannot accept responsibility for an interference caused by using other than recommended cables and connectors.

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This is a Class B product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Electromagnetic Interference (EMI) Statement - Korea

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Radio Protection for Germany

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

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Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

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

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

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

Verantwortlich für die 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 B.

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