

Power Systems

Isolation procedures

IBM

Power Systems

Isolation procedures

IBM

Note

Before using this information and the product it supports, read the information in “Safety notices” on page xi, “Notices” on page 337, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125-5823.

This edition applies to IBM Power Systems™ servers that contain the POWER8® processor and to all associated models.

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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, safety information documentation is included in the publications package (such as in printed documentation, on DVD, or as part of the product) shipped with the product. The documentation contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information documentation. You should also refer to the safety information documentation any time you do not clearly understand any safety information in the U.S. English publications.

Replacement or additional copies of safety information documentation can be obtained by calling the IBM Hotline at 1-800-300-8751.

German safety information

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

Laser safety information

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

Laser compliance

IBM servers may be installed inside or outside of an IT equipment rack.

DANGER: When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.

- For racks with AC power, 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.
- For racks with a DC power distribution panel (PDP), connect the customer’s DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

(R001 part 1 of 2):

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. In addition, do not lean on rack mounted devices and do not use them to stabilize your body position (for example, when working from a ladder).



- Each rack cabinet might have more than one power cord.
 - For AC powered racks, be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
 - For racks with a DC power distribution panel (PDP), turn off the circuit breaker that controls the power to the system unit(s), or disconnect the customer's DC power source, 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.

(R001 part 2 of 2):

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.

CAUTION:

Removing components from the upper positions in the rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building.

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:
 - Remove all devices in the 32U position (compliance ID RACK-001 or 22U (compliance ID RR001) and above.
 - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.
 - Ensure that there are little-to-no empty U-levels between devices installed in the rack cabinet below the 32U (compliance ID RACK-001 or 22U (compliance ID RR001) level, unless the received configuration specifically allowed it.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- If the rack cabinet you are relocating was supplied with removable outriggers they must be reinstalled before the cabinet is relocated.
- Inspect the route that you plan to take to eliminate potential hazards.
- Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).
- Ensure that all devices, shelves, drawers, doors, and cables are secure.
- Ensure that the four leveling pads are raised to their highest position.
- Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
 - Lower the four leveling pads.
 - Install stabilizer brackets on the rack cabinet.
 - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.
- If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.

(R002)

(L001)



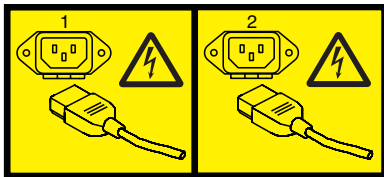
DANGER: Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)

(L002)

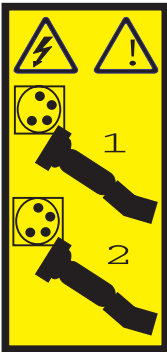


DANGER: Rack-mounted devices are not to be used as shelves or work spaces. (L002)

(L003)



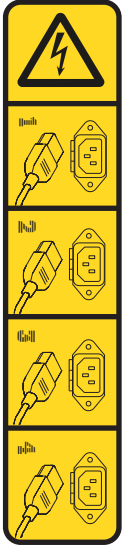
or



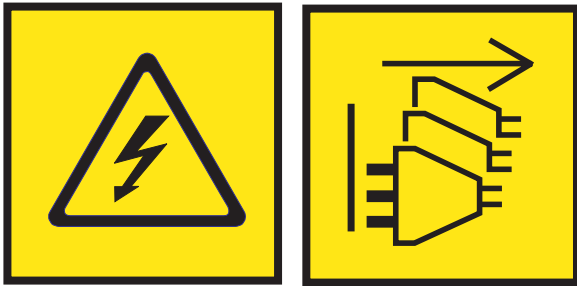
or



or



or



DANGER: Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

(L007)



CAUTION: A hot surface nearby. (L007)

(L008)



CAUTION: Hazardous moving parts nearby. (L008)

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. Although shining light into one end and looking into the other end of a disconnected optical fiber to verify the continuity of optic fibers many not injure the eye, this procedure is potentially dangerous. Therefore, verifying the continuity of optical fibers by shining light into one end and looking at the other end is not recommended. To verify continuity of a fiber optic cable, use an optical light source and power meter. (C027)

CAUTION:

This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

CAUTION:

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

CAUTION:

The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.

Do Not:

- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C003)

CAUTION:

Regarding IBM provided VENDOR LIFT TOOL:

- Operation of LIFT TOOL by authorized personnel only.
- LIFT TOOL intended for use to assist, lift, install, remove units (load) up into rack elevations. It is not to be used loaded transporting over major ramps nor as a replacement for such designated tools like pallet jacks, walkies, fork trucks and such related relocation practices. When this is not practicable, specially trained persons or services must be used (for instance, riggers or movers).
- Read and completely understand the contents of LIFT TOOL operator's manual before using. Failure to read, understand, obey safety rules, and follow instructions may result in property damage and/or personal injury. If there are questions, contact the vendor's service and support. Local paper manual must remain with machine in provided storage sleeve area. Latest revision manual available on vendor's web site.
- Test verify stabilizer brake function before each use. Do not over-force moving or rolling the LIFT TOOL with stabilizer brake engaged.
- Do not move LIFT TOOL while platform is raised, except for minor positioning.
- Do not exceed rated load capacity. See LOAD CAPACITY CHART regarding maximum loads at center versus edge of extended platform.
- Only raise load if properly centered on platform. Do not place more than 200 lb (91 kg) on edge of sliding platform shelf also considering the load's center of mass/gravity (CoG).
- Do not corner load the platform tilt riser accessory option. Secure platform riser tilt option to main shelf in all four (4x) locations with provided hardware only, prior to use. Load objects are designed to slide on/off smooth platforms without appreciable force, so take care not to push or lean. Keep riser tilt option flat at all times except for final minor adjustment when needed.
- Do not stand under overhanging load.
- Do not use on uneven surface, incline or decline (major ramps).
- Do not stack loads.
- Do not operate while under the influence of drugs or alcohol.
- Do not support ladder against LIFT TOOL.
- Tipping hazard. Do not push or lean against load with raised platform.
- Do not use as a personnel lifting platform or step. No riders.
- Do not stand on any part of lift. Not a step.
- Do not climb on mast.
- Do not operate a damaged or malfunctioning LIFT TOOL machine.
- Crush and pinch point hazard below platform. Only lower load in areas clear of personnel and obstructions. Keep hands and feet clear during operation.
- No Forks. Never lift or move bare LIFT TOOL MACHINE with pallet truck, jack or fork lift.
- Mast extends higher than platform. Be aware of ceiling height, cable trays, sprinklers, lights, and other overhead objects.
- Do not leave LIFT TOOL machine unattended with an elevated load.
- Watch and keep hands, fingers, and clothing clear when equipment is in motion.
- Turn Winch with hand power only. If winch handle cannot be cranked easily with one hand, it is probably over-loaded. Do not continue to turn winch past top or bottom of platform travel. Excessive unwinding will detach handle and damage cable. Always hold handle when lowering, unwinding. Always assure self that winch is holding load before releasing winch handle.
- A winch accident could cause serious injury. Not for moving humans. Make certain clicking sound is heard as the equipment is being raised. Be sure winch is locked in position before releasing handle. Read instruction page before operating this winch. Never allow winch to unwind freely. Freewheeling will cause uneven cable wrapping around winch drum, damage cable, and may cause serious injury. (C048)

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

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

The equipment is suitable for installation in the following:

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

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be 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.

The dc-powered system is intended to be installed in a common bonding network (CBN) as described in GR-1089-CORE.

Isolation procedures

Isolation procedures are used together with diagnostic programs, which are part of server firmware.

If a server is connected to a management console, these procedures are available on the management console. Use the management console procedures to continue isolating the problem. If the server does not have a management console and you are directed to perform an isolation procedure, the procedures documented here are needed to continue isolating a problem.

The procedures and functions of the HMC Enhanced + Tech Preview (Pre-GA) login option and interface type, which was provided with the Hardware Management Console (HMC) version 8.2.0, are the same as the HMC Enhanced+ login option and interface type that is provided with HMC version 8.3.0 and later. Only the HMC Enhanced+ is referred to in the documentation, but that content also applies to the HMC Enhanced + Tech Preview (Pre-GA) interface.

Communication isolation procedure

Isolate a communications failure.

Read and observe the following warnings when using this procedure.

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.
 - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.

- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

COMIP01, COMPIP1

This procedure helps you to isolate problems with the communications input/output adapter (IOA) or input/output processor (IOP).

Read and observe the danger notices in “Communication isolation procedure” on page 1 before proceeding with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions.
2. To determine which communications hardware to test, use the SRC from the problem summary form, or problem log. For details on line description information, see the Starting a Trace section of Work with communications trace.
3. Perform the following steps:
 - a. Vary off the resources.
 - b. On the Start a Service Tool display, select **Hardware service manager > Logical hardware resources > System bus resources > Resources associated with IOP** for the attached IOPs in the list until you display the suspected failing hardware.
 - c. Select **Verify** on the hardware you want to test. The **Verify** option may be valid on the IOP, IOA, or port resource. When it is valid on the IOP resource, any replaceable memory will be tested. Communications IOAs are tested by using the **Verify** option on the port resource.
4. Run the IOA/IOP tests. This may include any of the following:
 - Adapter internal test
 - Adapter wrap test (requires adapter wrap plug - available from your hardware service provider).
 - Processor internal test
 - Memory test

- System port test

Does the IOA/IOP tests complete successfully?

No: The problem is in the IOA or IOP. If a verify test identified a failing memory module, replace the memory module. On multiple card combinations, exchange the IOA card before exchanging the IOP card. Exchange the failing hardware. See Part locations and location codes. **This ends the procedure.**

Yes: The IOA/IOP is good. Do not replace the IOA/IOP. Continue with the next step.

5. Before running tests on modems or network equipment, the remaining local hardware should be verified. Since the IOA/IOP tests have completed successfully, the remaining local hardware to be tested is the external cable.

Is the IOA adapter type 2838, with a UTP (unshielded twisted pair) external cable?

Yes: Continue with the next step.

No: Go to step 8.

6. Is the RJ-45 connector on the external cable correctly wired according to the EIA/TIA-568A standard? That is,

- Pins 1 and 2 using the same twisted pair,
- Pins 3 and 6 using the same twisted pair,
- Pins 4 and 5 using the same twisted pair,
- Pins 7 and 8 using the same twisted pair.

Yes: Continue with the next step.

No: Replace the external cable with correctly wired cable. **This ends the procedure.**

7. Do the Line Speed and Duplex values of the line description (DSPLINETH) match the corresponding values for the network device (router, hub or switch) port?

No: Change the Line Speed and/or Duplex value for either the line description or the network device (router, hub or switch) port. **This ends the procedure.**

Yes: Go to step 9.

8. Is the cable wrap test option available as a *Verify* test option for the hardware you are testing?

- **Yes:** Verify the external cable by running the cable wrap test. A wrap plug is required to perform the test. This plug is available from your hardware service provider.

Does the cable wrap test complete successfully?

Yes: Continue with the next step.

No: The problem is in the cable. Exchange the cable. **This ends the procedure.**

- **No:** The communications IOA/IOP is not the failing item. One of the following could be causing the problem.

- External cable.
- The network.
- Any system or device on the network
- The configuration of any system or device on the network.
- Intermittent problems on the network.
- A new SRC - perform problem analysis or ask your next level of support for assistance.

Work with the customer or your next level of support to correct the problem. **This ends the procedure.**

9. All the local hardware is good. This completes the local hardware verification. The communications IOA/IOP and/or external cable is not the failing item.

One of the following could be causing the problem:

- The network
- Any system or device on the network
- The configuration of any system or device on the network

- Intermittent problems on the network
 - A new SRC - perform problem analysis or ask your next level of support for assistance
- Work with the customer or your next level of support to correct the problem. **This ends the procedure.**

Disk unit isolation procedure

Provides a procedure to isolate a failure in a disk unit.

Read and observe all safety procedures before servicing the system and while performing the disk unit isolation procedure.

Attention: Unless instructed otherwise, always power off the system or expansion unit where the FRU is located before removing, exchanging, or installing a field-replaceable unit (FRU).

DSKIP03

Use this procedure to determine the reference code, which is used to isolate a problem and to determine the failing device.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to determining if the system has logical partitions.
2. Look in the Service action log for other errors logged at or around the same time as the 310x SRC. If no entries appear in the service action log, use the product activity log. Use the other SRCs to correct the problem before performing an IPL. Contact your next level of support as necessary for assistance with SCSI bus problem isolation. If the problem is not corrected, continue with the next step.
3. Perform an IPL to dedicated service tool (DST). See dedicated service tools.

Does an SRC appear on the control panel?

- **Yes:** Go to step 6 on page 5.
- **No:** Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear?

Yes: Continue with the next step.

No: Go to step 5.

4. Does one of the following messages appear in the list?

- Missing disk units in the configuration
- Missing mirror protection disk units in the configuration
- Device parity protected units in exposed mode

– **No:** Continue with the next step.

– **Yes:** Select option 5, press **F11**, and then press **Enter** to display the details.

If all of the reference codes are 0000, go to “LICIP11” on page 62 and use cause code 0002. If any of the reference codes are not 0000, go to step 6 on page 5 and use the reference code that is not 0000.

Note: Use the characters in the *Type* column to find the correct reference code table.

5. Does the Display Failing System Bus display appear?

- **No:** Look at all the Product activity logs by selecting **Product activity log** under DST (see dedicated service tools). If there is more than one SRC logged, use an SRC that is logged against the IOP or IOA.
Is an SRC logged as a result of this IPL?
Yes: Continue with the next step.
No: You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. **This ends the procedure.**
 - **Yes:** Use the reference code that is displayed under *Reference Code* to correct the problem. **This ends the procedure.**
6. Record the SRC.
Is the SRC the same one that sent you to this procedure?
Yes: Continue with the next step.
No: Perform problem analysis to correct the problem. **This ends the procedure.**
 7. Perform the following steps:
 - a. Power off the system or expansion unit.
 - b. Find the devices identified by FI code FI01106. See FI01106.
 - c. Disconnect one of the disk units, (other than the load-source disk unit), the tape units, or the optical storage units that are identified by FI code FI01106. Slide it partially out of the system.

Note: Do not disconnect the load-source disk unit, although FI code FI01106 may identify it.
 8. Power on the system or the expansion unit that you powered off.
Does an SRC appear on the control panel?
No: Continue with the next step.
Yes: Go to step 12.
 9. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear with one of the following listed?
 - Missing disk units in the configuration
 - Missing mirror protection disk units in the configuration
 - Device parity protected units in exposed mode**Yes:** Continue with the next step.
No: Go to step 11.
 10. Select option 5, press **F11**, and then press **Enter** to display details.
Does an SRC appear in the Reference Code column?
No: Continue with the next step.
Yes: Go to step 12.
 11. Look at all the Product activity logs by selecting **Product activity log** under DST.
Is an SRC logged as a result of this IPL?
 - **Yes:** Continue with the next step.
 - **No:** The last device you disconnected is the failing item. Replace the failing device and reconnect the devices that were disconnected previously. **This ends the procedure.**
 12. Record the SRC.
Is the SRC the same one that sent you to this procedure?
 - **No:** Continue with the next step.
 - **Yes:** The last device you disconnected is not the failing item.
 - a. Leave the device disconnected and go to step 7 to continue isolation.
 - b. If you have disconnected all devices that are identified by FI code FI01106 except the load-source disk unit, reconnect all devices. Then, go to step 15 on page 6.

13. Does the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear with one of the following listed?
 - Missing disk units in the configuration
 - Missing mirror protection disk units in the configuration
 - Device parity protected units in exposed mode

Yes: Continue with the next step.

No: Use the reference code to correct the problem. **This ends the procedure.**
14. Select option 5, press **F11**, and then press **Enter** to display details.

Are all the reference codes 0000?

 - **No:** Use the reference code to correct the problem. **This ends the procedure.**
 - **Yes:** The last device you disconnected is the failing item.
 - a. Reconnect all devices except the failing item.
 - b. Replace the failing item. **This ends the procedure.**
15. Was disk unit 1 (the load-source disk unit) a failing item that FI code FI01106 identified?

Yes: The failing items that FI code FI01106 identified are not failing. The load-source disk unit may be failing. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. **This ends the procedure.**

No: The failing items that FI code FI01106 identified are not failing. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. **This ends the procedure.**

EMX0 PCIe3 expansion drawer isolation procedures

Use the following procedures to resolve a problem with an EMX0 PCIe3 expansion drawer.

MEXIP01

Use this procedure to isolate an I/O module that is not valid or is not supported.

To isolate an I/O module, complete the following steps:

1. Is a location code in the format $Un-Px-Cy$ or $Un-Px-Cy-Cz$ available in the serviceable event view for the reference code you are working on?

Yes: Continue with the next step.

No: Contact your next level of support. **This ends the procedure.**
2. Trace the expansion drawer cables from the PCIe3 cable adapter that was identified in the previous step to the attached I/O module in an EMX0 PCIe3 expansion drawer and note the number of card slots and expansion drawer cable ports on the I/O module. For information about locations, see Part locations and location codes.
3. Only the PCIe3 6-slot fanout module is supported. Ensure that only supported I/O modules are installed. **This ends the procedure.**

MEXIP02

Use this procedure to isolate a problem detecting the I/O module at location $Un-P1$ (left bay) of an EMX0 PCIe3 expansion drawer.

To isolate a problem detecting the I/O module, complete the following steps:

1. Is a location code in the format $Un-Px-Cy$ or $Un-Px-Cy-Cz$ available in the serviceable event view for the reference code you are working on?

Yes: Continue with the next step.

No: Contact your next level of support. **This ends the procedure.**

- Trace the expansion drawer cables from the PCIe3 cable adapter that was identified in the previous step to the attached I/O module at location $Un-P2$ (right bay) of the EMX0 PCIe3 expansion drawer. For information about locations, see Part locations and location codes. Is an I/O module present and properly seated in location $Un-P1$ (left bay) of the EMX0 PCIe3 expansion drawer?

Yes: Continue with the next step.

No: The installed firmware level requires an I/O module to be installed in location $Un-P1$ (left bay). Install a supported I/O module in this location. For more information about EMX0 PCIe3 expansion drawer location codes and removal and replacement procedures, see EMX0 PCIe Gen3 I/O expansion drawer locations. For more information about EMX0 PCIe3 expansion drawer part numbers, see EMX0 PCIe Gen3 I/O expansion drawer system parts. **This ends the procedure.**

- Trace the expansion drawer cables from the I/O module at location $Un-P1$ (left bay) and the I/O module at location $Un-P2$ (right bay) to their corresponding PCIe3 cable adapters in the system unit. Ensure that the following requirements are met:

- Each I/O module expansion drawer cable pair is connected to the same PCIe3 cable adapter.
- Both ends of all expansion drawer cables are properly seated.

Were any problems detected with the expansion drawer cables?

Yes: If any expansion drawer cables are not properly located or seated, reroute or reseal the expansion drawer cables. Then, continue with the next step.

No: Continue with the next step.

- Use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer.

Is the problem resolved?

Yes: **This ends the procedure.**

No: Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

MEXIP03

Use this procedure to isolate a power problem with an I/O module in an EMX0 PCIe3 expansion drawer.

To isolate a power problem with an I/O module, complete the following steps:

- Is a location code in the format $Un-Px$ available in the serviceable event view for the reference code you are working on?

Yes: Continue with the next step.

No: Contact your next level of support. **This ends the procedure.**

- Use the location to find the EMX0 PCIe3 expansion drawer. For information about locations, see Part locations and location codes. Ensure that there is power to the EMX0 PCIe3 expansion drawer by verifying the following LED states:
 - The ac input LED (**A**) and the dc output LED (**B**) are on solid for at least one of the power supplies in the EMX0 PCIe3 expansion drawer. See figure 1.
 - The I/O module power LED (**C**) is on solid. The power LED is located below the expansion drawer cable ports on the I/O module that was identified in the previous step. For the location of the Power LED on a PCIe3 6-slot fanout module, see figure 2.

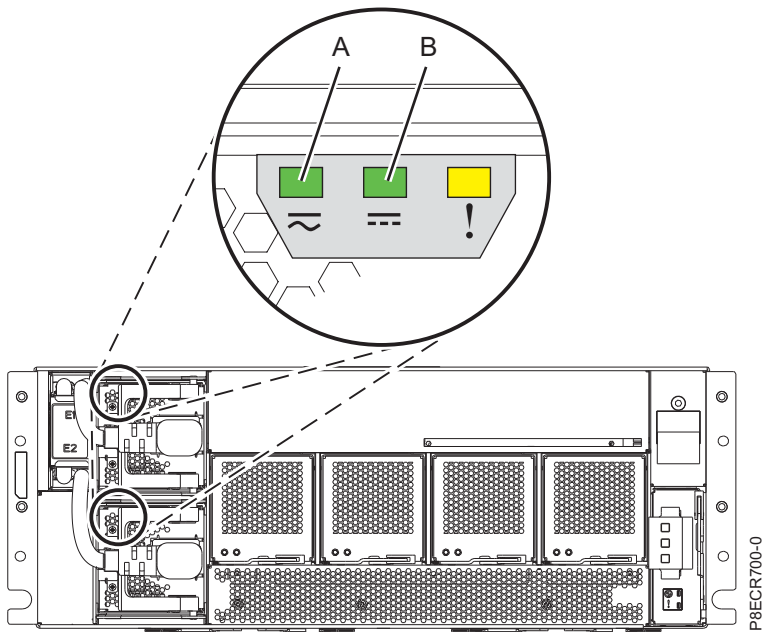


Figure 1. Power supply LEDs of an EMX0 PCIe3 expansion drawer

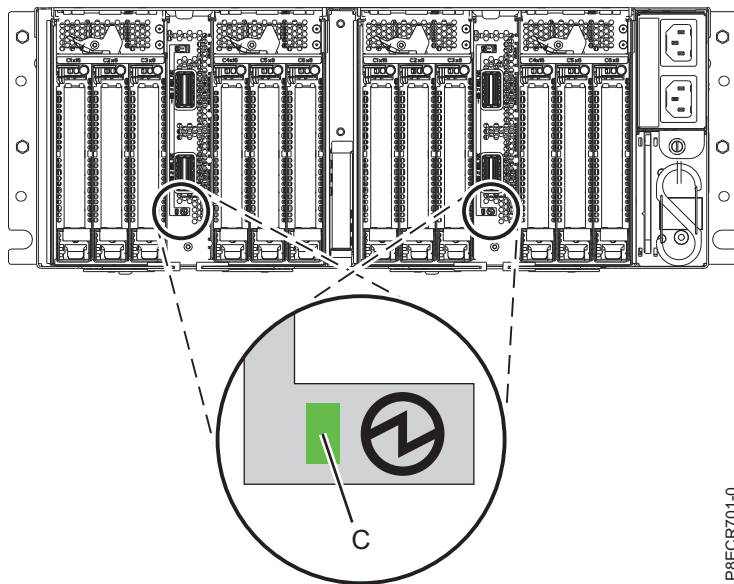


Figure 2. Power LED of a PCIe3 6-slot fanout module

Were any power LED problems detected?

Yes: Ensure that the EMX0 PCIe3 expansion drawer has power. If the EMX0 PCIe3 expansion drawer has power, complete the replacement procedure for any FRU with a power LED problem. For more information about EMX0 PCIe3 expansion drawer location codes and removal and replacement procedures, see EMX0 PCIe Gen3 I/O expansion drawer locations. For more information about EMX0 PCIe3 expansion drawer part numbers, see EMX0 PCIe Gen3 I/O expansion drawer system parts. **This ends the procedure.**

No: Continue with the next step.

3. Are there any 1000xxxx reference codes in the serviceable event view that have the EMX0 PCIe3 expansion drawer that contains the I/O module identified in step 1 in the failing item list?

Yes: Complete the service actions that are indicated for the reference code. **This ends the procedure.**

No: Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

MEXIP04

Use this procedure to isolate a power problem with an I/O module in an EMX0 PCIe3 expansion drawer.

Go to “MEXIP03” on page 7. **This ends the procedure.**

MEXIP05

Use this procedure to isolate the problem when a duplicate EMX0 PCIe3 expansion drawer is detected.

To isolate the problem when a duplicate EMX0 PCIe3 expansion drawer is detected, complete the following steps:

1. Is a location code in the format *Un-Px-Cy* or *Un-Px-Cy-Cz* available in the serviceable event view for the reference code you are working on?

Yes: Continue with the next step.

No: Contact your next level of support. **This ends the procedure.**

2. Trace the expansion drawer cables from the PCIe3 cable adapter that was identified in the previous step to the I/O module in an EMX0 PCIe3 expansion drawer. For information about locations, see Part locations and location codes. Ensure that both expansion drawer cables are connected to the correct I/O module of the EMX0 PCIe3 expansion drawer and ensure proper seating of both expansion drawer cables at the I/O module ports. Were any problems detected with the expansion drawer cables?

Yes: If any expansion drawer cables are not properly located or seated, reroute or reseal the expansion drawer cables. Then, use procedure “MEXIP06” to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

No: Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

MEXIP06

Use this procedure to recover an EMX0 PCIe3 expansion drawer after you correct an expansion drawer cable issue.

To recover an EMX0 PCIe3 expansion drawer, complete the following steps:

1. Was the expansion drawer cable issue corrected while the system unit was powered off?
 - **Yes:** After you correct the expansion drawer cable issue, power on the system. **This ends the procedure.**
 - **No:** Continue with the next step.
2. Recover the expansion drawer:
 - If the system is managed by a management console, complete the management console expansion drawer cable exchange procedure, but do not replace the expansion drawer cable.
 - If the system is not managed by a management console, complete the Removing and replacing an expansion drawer cable in the EMX0 PCIe3 expansion drawer procedure, but do not replace the expansion drawer cable.

This ends the procedure.

MEXIP07

Use this procedure to resolve a problem with the expansion drawer cable topology of an EMX0 PCIe3 expansion drawer.

The four rightmost characters of word 4 of the system reference code (SRC) represent the program reference code (PRC), which identifies the specific topology problem that was detected.

Notes:

- On the Advanced System Management Interface (ASMI), SRC words are known as hex words. You can display hex words by choosing **Show details** for the selected log.
- On the Hardware Management Console (HMC), SRC words are known as SRC extensions. You can display SRC extensions by choosing **View Details** for the selected serviceable event.

Use the SRC and the PRC in the following table to find the problem description and the service action to perform.

Table 1. Problem descriptions and service actions for expansion drawer cable topology problems on an EMX0 PCIe3 expansion drawer

SRC	PRC	Problem description	Service action
B7006A82	4105	The two expansion drawer cable connections from a PCIe3 cable adapter in the system unit to an EMX0 PCIe3 expansion drawer are swapped.	See "MEXIP13" on page 16.
B7006A82	4137	One of the expansion drawer cable connections from a PCIe3 cable adapter in the system unit is not connected to an I/O module in an EMX0 PCIe3 expansion drawer.	See "MEXIP11" on page 13.
B7006A83	410C	During a concurrent maintenance operation, the I/O module type in an EMX0 PCIe3 expansion drawer changed.	See "MEXIP13" on page 16.
B7006A83	410D	During a concurrent maintenance operation, PCIe3 cable adapters in the system unit that were previously attached to the same EMX0 PCIe3 expansion drawer are now attached to a different EMX0 PCIe3 expansion drawer or to different PCIe3 expansion drawers.	See "MEXIP13" on page 16.
B7006A83	413F	During a concurrent maintenance operation, expansion drawer cables that were previously connected to a PCIe3 cable adapter in the system unit are no longer detected.	See "MEXIP17" on page 20.
B7006A93	410F	Expansion drawer cables are connected to a PCIe3 cable adapter in the system unit but the links are not operational.	See "MEXIP16" on page 18.
B7006A9D	4107	An expansion drawer cable that was plugged into a PCIe3 cable adapter in the system unit is no longer detected.	See "MEXIP11" on page 13.
B7006A9D	4116	An expansion drawer cable is not detected on one of the ports of a PCIe3 cable adapter in the system unit.	See "MEXIP11" on page 13.
B7006A9D	413F	During a concurrent maintenance operation, expansion drawer cables that were previously connected to a PCIe3 cable adapter in the system unit are no longer detected.	See "MEXIP17" on page 20.

Table 1. Problem descriptions and service actions for expansion drawer cable topology problems on an EMX0 PCIe3 expansion drawer (continued)

SRC	PRC	Problem description	Service action
B7006A9D	4142	An expansion drawer cable that was plugged into a PCIe3 cable adapter in the system unit was unplugged. It is now plugged into a PCIe3 cable adapter in the system unit. Action is required to recover the EMX0 PCIe3 expansion drawer.	See “MEXIP06” on page 9.
B7006AA0	4104	Multiple system units are connected to the same EMX0 PCIe3 expansion drawer.	See “MEXIP14” on page 16.
B7006AA0	4106	The two expansion drawer cable connections from a PCIe3 cable adapter in the system unit to an EMX0 PCIe3 expansion drawer are connected to two different EMX0 PCIe3 expansion drawer I/O modules.	See “MEXIP13” on page 16.
B7006AA0	4126	One of the ports on an I/O module in an EMX0 PCIe3 expansion drawer is not connected to a PCIe3 cable adapter in the system unit.	See “MEXIP11” on page 13.
B7006AA0	4142	One of the ports on an I/O module in an EMX0 PCIe3 expansion drawer was not connected to a PCIe3 cable adapter in the system unit. The port is now connected to the PCIe3 cable adapter in the system unit. Action is required to recover the EMX0 PCIe3 expansion drawer.	See “MEXIP06” on page 9.
B7006AA1	4119	Both sideband signals in the expansion drawer cables from a PCIe3 cable adapter in a system unit to an I/O module in an EMX0 PCIe3 expansion drawer are not operational.	See “MEXIP16” on page 18.
B7006AA2	411B	The lengths of the two expansion drawer cables from a PCIe3 cable adapter in the system unit to an EMX0 PCIe3 expansion drawer do not match.	See “MEXIP15” on page 17.
B7006AA3	410D	During a concurrent maintenance operation, expansion drawer cables were connected to different I/O module ports in an EMX0 PCIe3 expansion drawer.	See “MEXIP13” on page 16.

This ends the procedure.

MEXIP08

Use this procedure to isolate the problem when a transceiver in an expansion drawer cable detects a thermal problem.

To isolate and correct the thermal problem, complete the following steps:

1. Is the room temperature less than 40°C (104°F)?

Note: Derate the dry-bulb temperature 1°C per 175 m (574 ft) above 950 m (3117 ft). For more information about environmental requirements, see Hardware specification sheets.

No: Notify the customer. The customer must bring the room temperature within normal range. Continue with the next step.

- Yes:** Continue with the next step.
2. Is an EMX0 PCIe3 expansion drawer location code in the format *Un-Py-Tz* available in the serviceable event view for the reference code you are working on?
Yes: The transceiver that detected the thermal problem is at the end of the cable that is connected to the EMX0 PCIe3 expansion drawer. Continue with step 6.
No: Continue with the next step.
 3. Is the location code in the format *Un-Px-Cy-Tw* or *Un-Px-Cy-Cz-Tw* available in the serviceable event view for the reference code you are working on?
Yes: The transceiver that detected the thermal problem is at the end of the cable that is connected to the system unit. Continue with the next step.
No: Contact your next level of support. **This ends the procedure.**
 4. Is the front and rear of the system unit free of obstructions?
No: Remove obstructions from the front and rear of the system unit for proper air flow. Continue with the next step.
Yes: Continue with the next step.
 5. Are rack fillers installed in the empty rack slots of the rack that contains the system unit?
No: Install rack fillers in the empty rack slots of the rack that contains the system unit for proper air flow. Continue with the next step.
Yes: Continue with step 10.
 6. Is the front and rear of the EMX0 PCIe3 expansion drawer that was identified in step 2 free of obstructions?
No: Remove obstructions from the front and rear of the EMX0 PCIe3 expansion drawer for proper air flow. Continue with the next step.
Yes: Continue with the next step.
 7. Are rack fillers installed in the empty rack slots of the rack that contains the EMX0 PCIe3 expansion drawer?
No: Install rack fillers in the empty rack slots of the rack that contains the EMX0 PCIe3 expansion drawer for proper air flow. Continue with the next step.
Yes: Continue with the next step.
 8. If only one I/O module is installed in the EMX0 PCIe3 expansion drawer, is an I/O module filler installed in the empty I/O module bay?
No: Install I/O module fillers in empty I/O module bays for proper air flow. Continue with the next step.
Yes: Continue with the next step.
 9. If any of the slots in the EMX0 PCIe3 expansion drawer do not have PCIe adapters installed, are filler tailstocks installed in the PCIe adapter cassettes for each of these slots?
No: Install a filler tailstock in each of the PCIe adapter cassettes for proper air flow. Continue with the next step.
Yes: Continue with the next step.
 10. Have any changes been made in the previous steps to decrease the room temperature or improve air flow in the system or EMX0 PCIe3 expansion drawer?
No: Continue with the next step.
Yes: Close the serviceable event. If the transceiver in the expansion drawer cable continues to detect thermal problems, another error will be logged. **This ends the procedure.**
 11. Has reference code 1xx7201 been logged?
Yes: The room temperature is too high. The customer must lower the room temperature to less than 40°C (104°F). If the room temperature is less than 40°C (104°F), continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

No: Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

MEXIP11

Use this procedure to verify and correct cable connections to an EMX0 PCIe3 expansion drawer.

To verify and correct cable connections, complete the following steps:

1. Is a location code available in the serviceable event view for the reference code you are working on?
Yes: Continue with the next step.
No: Contact your next level of support. **This ends the procedure.**
2. Is the location code in the format *Un-Px-Cy-Tw* or *Un-Px-Cy-Cz-Tw*?
Yes: Continue with step 4.
No: Continue with the next step.
3. Is the location code in the format *Un-Px-Ty*?
Yes: Continue with step 9.
No: Contact your next level of support. **This ends the procedure.**
4. A location code in the format *Un-Px-Cy-Tw* or *Un-Px-Cy-Cz-Tw* is the location of a port on a PCIe3 cable adapter. For information about locations, see Part locations and location codes. Is an expansion drawer cable connected to the port on the PCIe3 cable adapter that you identified in this step?
Yes: Continue with step 7.
No: Continue with the next step.
5. Is an expansion drawer cable connected to the other port of the PCIe3 cable adapter that was identified in step 4?
Yes: Continue with the next step.
No: Replace the missing expansion drawer cable. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**
6. Trace the expansion drawer cable that is connected to the other port on the PCIe3 cable adapter that was identified in step 4. Is this expansion drawer cable connected to an I/O module in an EMX0 PCIe3 expansion drawer?
No: Replace the missing expansion drawer cable. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**
Yes: Complete the following steps:
 - a. Find the other expansion drawer cable that is connected to the same port pair of the I/O module.
Note: Some examples of port pairs are *Un-Px-T1* and *Un-Px-T2*, *Un-Px-T3* and *Un-Px-T4*, and so on.
 - b. Properly seat the expansion drawer cable that was identified in step a into the empty PCIe3 cable adapter port that was identified in step 4.
 - c. Use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**
7. Ensure that the PCIe3 cable adapter port that is identified in step 4 has an expansion drawer cable in it that is properly seated. Does the expansion drawer cable need to be reseated?
Yes: Reseat the expansion drawer cable. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**
No: Continue with the next step.
8. Trace the expansion drawer cable that is connected to the port of the PCIe3 cable adapter that was identified in step 4 to the port of the I/O module of the EMX0 PCIe3 expansion drawer. Ensure that the expansion drawer cable is properly seated in the port of the I/O module. Does the expansion drawer cable need to be reseated?

Yes: Reseat the expansion drawer cable. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

No: Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

Note:

For more information about EMX0 PCIe3 expansion drawer location codes and removal and replacement procedures, see EMX0 PCIe Gen3 I/O expansion drawer locations. For more information about EMX0 PCIe3 expansion drawer part numbers, see EMX0 PCIe Gen3 I/O expansion drawer system parts.

9. A location code in the format $Un-Px-Ty$ is the location of a port on an I/O module in an EMX0 PCIe3 expansion drawer. For information about locations, see Part locations and location codes. Is an expansion drawer cable connected to the port on the I/O module that you identified in this step?

Yes: Continue with step 12.

No: Continue with the next step.

10. Is an expansion drawer cable connected to the other port of the port pair on the I/O module that was identified in step 9?

Note: Some examples of port pairs are $Un-Px-T1$ and $Un-Px-T2$, $Un-Px-T3$ and $Un-Px-T4$, and so on.

Yes: Continue with the next step.

No: Replace the missing expansion drawer cable. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

11. Trace the expansion drawer cable that is connected to the other port of the port pair that was identified in step 9. Is this expansion drawer cable connected to a PCIe3 cable adapter?

No: Replace the missing expansion drawer cable. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

Yes: Complete the following steps:

- a. Find the other expansion drawer cable that is connected to the same port pair of the PCIe3 cable adapter.
- b. Properly seat the expansion drawer cable that was identified in step a into the empty port of the I/O module that was identified in step 9.
- c. Use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

12. Ensure that the I/O module port that is identified in step 9 has an expansion drawer cable in it that is properly seated. Does the expansion drawer cable need to be reseated?

Yes: Continue with the next step.

No: Go to step 14.

13. Reseat the expansion drawer cable. Then, view PCIe hardware topology to identify the port location of the PCIe3 cable adapter that is connected to the I/O module port that was identified in step 9.
 - To view PCIe hardware topology by using a management console, go to PCIe Hardware Topology.
 - To view PCIe hardware topology by using the Advanced System Management Interface (ASMI), log in to ASMI. In the navigation area, expand **System Configuration** and click **PCIe Hardware Topology**.

Use the $Un-Px-Cy-Tw$ or $Un-Px-Cy-Cz-Tw$ location and procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

14. Trace the expansion drawer cable that is connected to the port of the I/O module that was identified in step 9 to the port of the PCIe3 cable adapter. Ensure that the expansion drawer cable is properly seated in the port of the PCIe3 cable adapter. Does the expansion drawer cable need to be reseated?

Yes: Reseat the expansion drawer cable. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

No: Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

Note:

For more information about EMX0 PCIe3 expansion drawer location codes and removal and replacement procedures, see EMX0 PCIe Gen3 I/O expansion drawer locations. For more information about EMX0 PCIe3 expansion drawer part numbers, see EMX0 PCIe Gen3 I/O expansion drawer system parts.

MEXIP12

Use this procedure to verify and correct cable connections to an EMX0 PCIe3 expansion drawer.

To verify and correct cable connections, complete the following steps:

1. Is a location code in the format $Un-Px-Cy-Tw$ or $Un-Px-Cy-Cz-Tw$ available in the serviceable event view for the reference code you are working on?
 - Yes:** Continue with the next step.
 - No:** Contact your next level of support. **This ends the procedure.**
2. Use the location to find the PCIe3 cable adapter port. For information about locations, see Part locations and location codes. Trace the expansion drawer cable that is connected to the port identified in the previous step to the I/O module in the EMX0 PCIe3 expansion drawer. Is the expansion drawer cable connected to an I/O module?
 - Yes:** Continue with step 5.
 - No:** Continue with the next step.
3. Is an expansion drawer cable connected to the other port on the PCIe3 cable adapter that contains the port that was identified in step 1?
 - Yes:** Continue with the next step.
 - No:** Replace the missing expansion drawer cable. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**
4. Trace the expansion drawer cable that is connected to the other port. Is this expansion drawer cable connected to an I/O module in an EMX0 PCIe3 expansion drawer?
 - No:** Replace the missing expansion drawer cable. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**
 - Yes:** Complete the following steps:
 - a. Find the other expansion drawer cable port of the port pair on the same I/O module.
 - Note:** Some examples of port pairs are $Un-Px-T1$ and $Un-Px-T2$, $Un-Px-T3$ and $Un-Px-T4$, and so on.
 - b. Properly seat the expansion drawer cable that is connected to the port identified in step 1 to this empty port on the I/O module.
 - c. Use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**
5. Ensure that the expansion drawer cable that was traced to the EMX0 PCIe3 expansion drawer is properly seated in the I/O module port. Does the expansion drawer cable need to be reseated?
 - Yes:** Reseat the expansion drawer cable. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**
 - No:** Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

For more information about EMX0 PCIe3 expansion drawer location codes and removal and replacement procedures, see EMX0 PCIe Gen3 I/O expansion drawer locations. For more information about EMX0 PCIe3 expansion drawer part numbers, see EMX0 PCIe Gen3 I/O expansion drawer system parts. **This ends the procedure.**

MEXIP13

Use this procedure to verify and correct cable connections to an EMX0 PCIe3 expansion drawer.

To verify and correct cable connections, complete the following steps:

1. Is a location code in the format $Un-Px-Cy-Tw$ or $Un-Px-Cy-Cz-Tw$ available in the serviceable event view for the reference code you are working on?

Yes: Continue with the next step.

No: Contact your next level of support. **This ends the procedure.**

2. Ensure that the expansion drawer cables associated with the PCIe3 cable adapter identified in the previous step are properly seated. For information about locations, see Part locations and location codes. Were any problems detected with the expansion drawer cable connections?

Yes: Reseat the expansion drawer cables. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

No: Continue with the next step.

3. Trace each expansion drawer cable that is connected to the PCIe3 cable adapter that was identified in step 1 to the I/O module in an EMX0 PCIe3 expansion drawer to which it is connected. Ensure that the following requirements are met:

Note: If a concurrent maintenance operation occurred recently, ensure that all of the expansion drawer cables are connected to the same EMX0 PCIe3 expansion drawer and I/O module type as they were before the concurrent maintenance operation occurred.

- Both expansion drawer cables are connected to the same I/O module of the EMX0 PCIe3 expansion drawer.
- Both expansion drawer cables are connected to the proper port. The top port of the PCIe3 cable adapter is connected to the top port of the port pair on the I/O module. The bottom port of the PCIe3 cable adapter is connected to the bottom port of the port pair on the I/O module.

Note: Some examples of port pairs are $Un-Px-T1$ and $Un-Px-T2$, $Un-Px-T3$ and $Un-Px-T4$, and so on.

- Both expansion drawer cables are properly seated on the I/O module ports of the EMX0 PCIe3 expansion drawer.

Were any problems detected with the cabling?

Yes: Reroute or reseat the expansion drawer cables. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

No: Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

MEXIP14

Use this procedure to verify and correct cable connections to an EMX0 PCIe3 expansion drawer.

To verify and correct cable connections, complete the following steps:

1. Is a location code in the format $Un-Px-Cy$ or $Un-Px-Cy-Cz$ available in the serviceable event view for the reference code you are working on?

Yes: Continue with the next step.

No: Contact your next level of support. **This ends the procedure.**

- Trace each expansion drawer cable that is connected to the PCIe3 cable adapter that was identified in step 1 to the I/O module in an EMX0 PCIe3 expansion drawer to which it is connected. Ensure that the following requirements are met:

- Both expansion drawer cables are connected to the same port pair of the I/O module in the EMX0 PCIe3 expansion drawer.

Note: Some examples of port pairs are $Un-Px-T1$ and $Un-Px-T2$, $Un-Px-T3$ and $Un-Px-T4$, and so on.

- Both expansion drawer cables are properly seated on the I/O module ports of the EMX0 PCIe3 expansion drawer.

Were any problems detected with the cabling?

Yes: Reroute or reseal the expansion drawer cables. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

No: Continue with the next step.

- Trace each pair of expansion drawer cables from the I/O module at location $Un-P1$ (left bay) and the I/O module at location $Un-P2$ (right bay) to their corresponding PCIe3 cable adapters in the system unit. Ensure that the following requirements are met:

- All cables are connected to the same system unit.
- Each I/O module expansion drawer cable pair is connected to the same PCIe3 cable adapter.
- Both ends of all expansion drawer cables are properly seated.

Are the expansion drawer cables connected to two different system units?

Yes: The expansion drawer cables must be connected to the same system unit. Ask the system administrator how the expansion drawer cables should be routed so that they are connected to the same system unit. Then, reroute the expansion drawer cables. Use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

No: Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

MEXIP15

Use this procedure to verify and correct cable connections to an EMX0 PCIe3 expansion drawer.

To verify and correct cable connections, complete the following steps:

- Is a location code in the format $Un-Px-Cy$ or $Un-Px-Cy-Cz$ available in the serviceable event view for the reference code you are working on?

Yes: Continue with the next step.

No: Contact your next level of support. **This ends the procedure.**

- Ensure that the expansion drawer cables associated with the PCIe3 cable adapter identified in the previous step are properly seated. For information about locations, see Part locations and location codes. Were any problems detected with the expansion drawer cable connections?

Yes: Reseat the expansion drawer cables. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

No: Continue with the next step.

- Find the part number and cable length of each of the expansion drawer cables that are connected to the PCIe3 cable adapter identified in step 1. Are the cable lengths the same for each of the expansion drawer cables?

Yes: Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

No: Replace one of the expansion drawer cables so that the cable lengths and part numbers for each of the expansion drawer cables are the same. The PCIe link is trained based on the expansion drawer cable in port T2. Unless the expansion drawer cable in port T1 is the preferred length for

both expansion drawer cables, replace the expansion drawer cable in port T1 with an expansion drawer cable that is of the same length and part number as the expansion drawer cable in port T2. If the system is managed by a Hardware Management Console (HMC), go to Exchange FRU. If the system is not managed by an HMC, go to Removing and replacing the expansion drawer cable in the EMX0 PCIe3 expansion drawer.

For more information about EMX0 PCIe3 expansion drawer location codes and removal and replacement procedures, see EMX0 PCIe Gen3 I/O expansion drawer locations. For more information about EMX0 PCIe3 expansion drawer part numbers, see EMX0 PCIe Gen3 I/O expansion drawer system parts. **This ends the procedure.**

MEXIP16

Use this procedure to verify and correct cable connections to an EMX0 PCIe3 expansion drawer.

To verify and correct cable connections, complete the following steps:

1. Is a location code in the format $Un-Px-Cy$ or $Un-Px-Cy-Cz$ available in the serviceable event view for the reference code you are working on?
Yes: Continue with the next step.
No: Contact your next level of support. **This ends the procedure.**
2. Trace each expansion drawer cable that is connected to the PCIe3 cable adapter that was identified in step 1 to the I/O module in an EMX0 PCIe3 expansion drawer to which it is connected. Ensure that the following requirements are met:
 - Both expansion drawer cables are connected to the same I/O module of the EMX0 PCIe3 expansion drawer.
 - Both expansion drawer cables are connected to the proper port. The top port of the PCIe3 cable adapter is connected to the top port of the port pair on the I/O module. The bottom port of the PCIe3 cable adapter is connected to the bottom port of the port pair on the I/O module.

Note: Some examples of port pairs are $Un-Px-T1$ and $Un-Px-T2$, $Un-Px-T3$ and $Un-Px-T4$, and so on.

 - Both expansion drawer cables are properly seated on the I/O module ports of the EMX0 PCIe3 expansion drawer.

Were any problems detected with the cabling?

Yes: Reroute or reseal the expansion drawer cables. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**

No: Continue with the next step.

3. Ensure that there is power to the EMX0 PCIe3 expansion drawer by verifying the following LED states:
 - The ac input LED (**A**) and the dc output LED (**B**) are on solid for at least one of the power supplies in the EMX0 PCIe3 expansion drawer. See figure 1.
 - The I/O module power LED (**C**) is on solid. The power LED is located below the expansion drawer cable ports on the I/O module that was identified in the previous step. For the location of the Power LED on a PCIe3 6-slot fanout module, see figure 2.

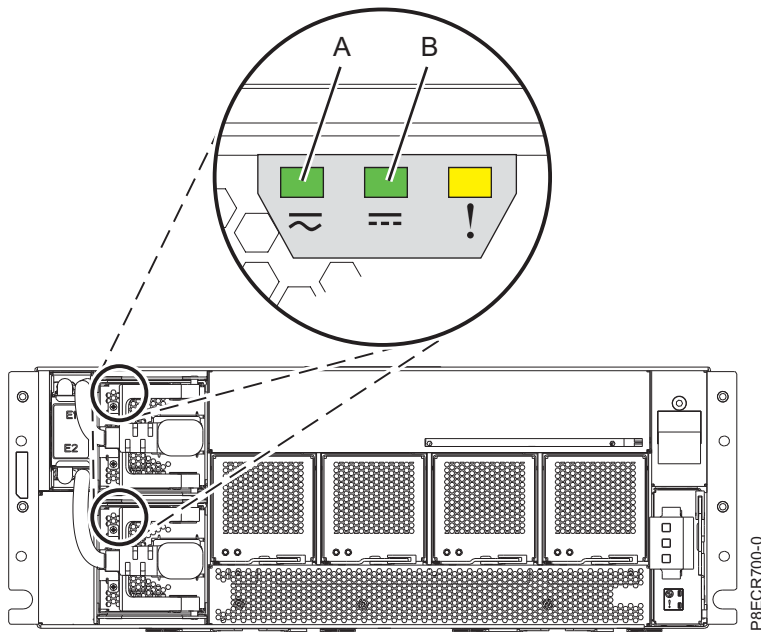


Figure 3. Power supply LEDs of an EMX0 PCIe3 expansion drawer

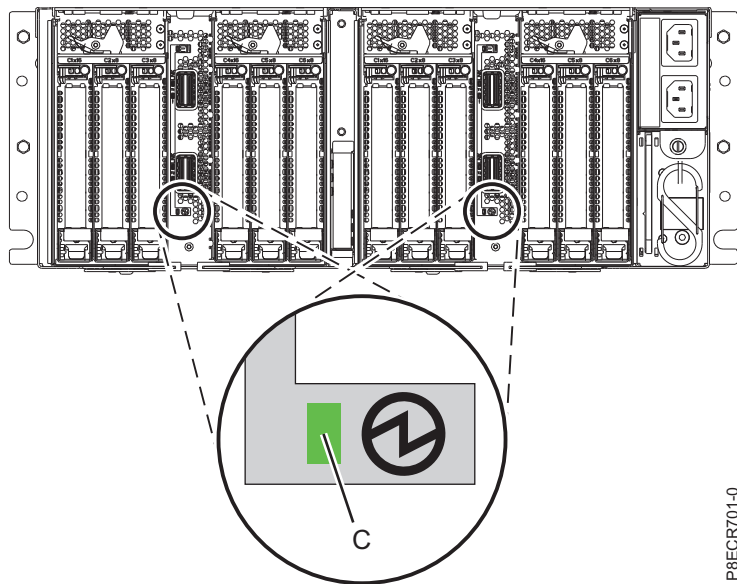


Figure 4. Power LED of a PCIe3 6-slot fanout module

Were any power or cooling LED problems detected?

Yes: Ensure that the EMX0 PCIe3 expansion drawer has power. If the EMX0 PCIe3 expansion drawer has power, complete the replacement procedure for any FRU with a power or cooling LED problem. For more information about EMX0 PCIe3 expansion drawer location codes and removal and replacement procedures, see EMX0 PCIe Gen3 I/O expansion drawer locations. For more information about EMX0 PCIe3 expansion drawer part numbers, see EMX0 PCIe Gen3 I/O expansion drawer system parts. **This ends the procedure.**

No: Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

MEXIP17

Use this procedure to verify and correct cable connections to an EMX0 PCIe3 expansion drawer.

To verify and correct cable connections, complete the following steps:

1. Is a location code in the format *Un-Px-Cy* or *Un-Px-Cy-Cz* available in the serviceable event view for the reference code you are working on?
Yes: Continue with the next step.
No: Contact your next level of support. **This ends the procedure.**
2. Use the location to find the PCIe3 cable adapter. For information about locations, see Part locations and location codes. Are expansion drawer cables connected to the PCIe3 cable adapter that you identified in the previous step?
Yes: Continue with the next step.
No: The expansion drawer cables were not reconnected to the PCIe3 cable adapter after a service action occurred. Find the expansion drawer cables and connect them to the PCIe3 cable adapter. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. If you cannot find the expansion drawer cables, contact your next level of support. **This ends the procedure.**
3. Ensure that the expansion drawer cables associated with the PCIe3 cable adapter identified in step 1 are properly seated. For information about locations, see Part locations and location codes. Were any problems detected with the expansion drawer cable connections?
Yes: Reseat the expansion drawer cables. Then, use procedure “MEXIP06” on page 9 to recover the EMX0 PCIe3 expansion drawer. **This ends the procedure.**
No: Continue with the next failing item in the failing item list of the serviceable event. **This ends the procedure.**

For more information about EMX0 PCIe3 expansion drawer location codes and removal and replacement procedures, see EMX0 PCIe Gen3 I/O expansion drawer locations. For more information about EMX0 PCIe3 expansion drawer part numbers, see EMX0 PCIe Gen3 I/O expansion drawer system parts. **This ends the procedure.**

Intermittent isolation procedures

These procedures help you to correct an intermittent problem.

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer’s DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.

- For racks with a DC power distribution panel (PDP), connect the customer’s DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

Use these procedures to correct an intermittent problem, if other problem analysis steps or tables sent you here. Only perform the procedures that apply to your system.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion unit where the FRU is located. See Powering on and powering off the system before removing, exchanging, or installing a field-replaceable unit (FRU).

Use the procedure below to identify intermittent problems and the associated corrective actions.

INTIP03

Use this procedure to isolate problems with external noise on AC voltage lines.

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.
 - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

Electrical noise on incoming ac voltage lines can cause various system failures. The most common source of electrical noise is lightning.

1. Ask the customer if an electrical storm was occurring at the time of the failure to determine if lightning could have caused the failure.
Could lightning have caused the failure?
No: Go to step 3.
Yes: Continue with the next step.
2. Determine if lightning protection devices are installed on the incoming ac voltage lines where they enter the building. There must be a dedicated ground wire from the lightning protection devices to earth ground.
Are lightning protection devices installed?
Yes: Continue with the next step.
No: Lightning may have caused the intermittent problem. Recommend that the customer install lightning protection devices to prevent this problem from recurring. **This ends the procedure.**
3. Have an installation planning representative perform the following steps:
 - a. Connect a recording ac voltage monitor to the incoming ac voltage lines of the units that contain the failing devices with reference to ground.
 - b. Set the voltage monitor to start recording at a voltage slightly higher than the normal incoming ac voltage.Does the system fail again with the same symptoms?
No: This ends the procedure.
Yes: Continue with the next step.
4. Look at the recording and see if the voltage monitor recorded any noise when the failure occurred.
Did the monitor record any noise when the failure occurred?
Yes: Review with the customer what was happening external to the system when the failure occurred. This may help you to determine the source of the noise. Discuss with the customer what to do to remove the noise or to prevent it from affecting the server. **This ends the procedure.**
No: Perform the next intermittent isolation procedure listed in the *Isolation procedure* column. **This ends the procedure.**

INTIP05

Use this procedure to isolate problems with external noise on twinaxial cables.

Electrical noise on twinaxial cables that are not installed correctly may affect the twinaxial workstation I/O processor card.

Examples of this include open shields on twinaxial cables, and station protectors that are not being installed where necessary.

Check for the following on the system:

- There must be no more than 11 connector breaks in a twinaxial cable run.
- Station protectors must be installed (in pairs) where a cable enters or leaves a building.
- There can only be two station protectors for each twinaxial run.
- There is a maximum of seven devices (with addresses 0-6) for each cable run.
- There is a maximum cable length of 1524 meters (5000 feet) for each port.
- All cable runs must be ended (terminated).
- Disconnect all twinaxial cables that are not used.
- Remove any cause of electrical noise in the twinaxial cables.
- All workstations must be grounded.

This ends the procedure.

INTIP07

Use this procedure to lessen the effects of electrical noise (electromagnetic interference, or EMI) on the system.

1. Ensure that air flow cards are installed in all adapter card slots that are not used.
2. Keep all cables away from sources of electrical interference, such as ac voltage lines, fluorescent lights, arc welding equipment, and radio frequency (RF) induction heaters. These sources of electrical noise can cause the system to become powered off.
3. If you have an expansion unit, ensure that the cables that attach the system unit to the expansion unit are seated correctly.

Note: If the failures occur when people are close to the system or machines that are attached to the system, the problem may be electrostatic discharge (ESD).

4. Have an **installation planning representative** use a radio frequency (RF) field intensity meter to determine if there is an unusual amount of RF noise near the server. You also can use it to help determine the source of the noise. **This ends the procedure.**

INTIP08

Use this procedure to ensure that the system is electrically grounded correctly.

1. Have an **installation planning representative** or an electrician (when necessary), perform the following steps.
2. Power off the server and the power network branch circuits before performing this procedure.
3. Ensure the safety of personnel by making sure that all electrical wiring in the United States meets National Electrical Code requirements.
4. Check *all* system receptacles to ensure that each one is wired correctly. This includes receptacles for the server and all equipment that attaches to the server, including workstations. Do this to determine if a wire with primary voltage on it is swapped with the ground wire, causing an electrical shock hazard.
5. For each unit, check continuity from a conductive area on the frame to the ground pin on the plug. Do this at the end of the mainline ac power cable. The resistance must be 0.1 ohm or less.
6. Ground continuity must be present from each unit receptacle to an effective ground. Therefore, check the following:
 - The ac voltage receptacle for each unit must have a ground wire connected from the ground terminal on the receptacle to the ground bar in the power panel.
 - The ground bars in all branch circuit panels must be connected with an insulated ground wire to a **ground point**, that is defined as follows:
 - The nearest available metal cold water pipe, only if the pipe is effectively grounded to the earth (see *National Electric Code* Section 250-81, in the United States).
 - The nearest available steel beams in the building structure, only if the beam is effectively grounded to the earth.
 - Steel bars in the base of the building or a metal ground ring that is around the building under the surface of the earth.
 - A ground rod in the earth (see *National Electric Code* Section 250-83, in the United States).

Note: For installations in the United States only, by National Electrical Code standard, if more than one of the preceding grounding methods are used, they must be connected together electrically. See *National Electric Code* Section 250, for more information about grounding.

- The grounds of all separately derived sources (uninterruptable power supply, service entrance transformer, system power module, motor generator) must be connected to a **ground point** as defined above.
- The service entrance ground bar must connect to a **ground point** as defined above.

- All ground connections **must be tight**.
- Check continuity of the ground path for each unit that is using an ECOS tester, Model 1023-100. Check continuity at each unit receptacle, and measure to the **ground point** as defined above. The total resistance of each ground path must be 1.0 ohm or less. If you cannot meet this requirement, check for faults in the ground path.
- Conduit is sometimes used to meet wiring code requirements. If conduit is used, the branch circuits must still have a green (or green and yellow) wire for grounding as stated above.

Note: The ground bar and the neutral bar must never be connected together in branch circuit power panels.

The ground bar and the neutral bar in the power panels that make up the electrical power network for the server must be connected together. This applies to the first electrically isolating unit that is found in the path of electrical wiring from the server to the service entrance power panel. This isolating unit is sometimes referred to as a **separately derived source**. It can be an uninterruptable power supply, the system power module for the system, or the service entrance transformer. If the building has none of the above isolating units, the ground bar and the neutral bar must be connected together in the service entrance power panel.

7. Look inside all power panels to ensure the following:
 - There is a separate ground wire for each unit.
 - The green (or green and yellow) ground wires are connected only to the ground bar.
 - The ground bar inside each power panel is connected to the frame of the panel.
 - The neutral wires are connected only to the neutral bar.
 - The ground bar and the neutral bar are not connected together, except as stated in step 6 on page 24.
8. For systems with more than one unit, ensure that the ground wire for each unit is not connected from one receptacle to the next in a string. Each unit must have its own ground wire, which goes to the power source.
9. Ensure that the grounding wires are insulated with green (or green and yellow) wire at least equal in size to the phase wires. The grounding wires also should be as short as possible.
10. If extension-mainline power cables or multiple-outlet power strips are used, make sure that they must have a three-wire cable. One of the wires must be a ground conductor. The ground connector on the plug must not be removed. This applies to any extension mainline power cables or multiple-outlet power strips that are used on the server. It also applies for attaching devices such as personal computers, workstations, and modems.

Note: Check all extension-mainline power cables and multiple-outlet power strips with an ECOS tester and with power that is applied. Ensure that no wires are crossed (for example, a ground wire crossed with a wire that has voltage on it).

This ends the procedure.

INTIP09

Use this procedure to check the AC electrical power for the system.

1. Have an **installation planning representative** or an electrician (when necessary), perform the following steps.
2. Power off the server and the power network branch circuits before performing this procedure.
3. To ensure the safety of personnel, all electrical wiring in the United States must meet National Electrical Code requirements.
4. Check all system receptacles to ensure that each is wired correctly. This includes receptacles for the server and all equipment that attaches to the server, including workstations. Do this to determine if a wire with primary voltage on it has been swapped with the ground wire, causing an electrical shock hazard.

5. When three-phase voltage is used to provide power to the server, correct balancing of the load on each phase is important. The units should be connected so that all three phases are used equally.
6. The power distribution neutral must return to the "separately derived source" (uninterruptable power supply, service entrance transformer, system power module, motor generator) through an insulated wire that is the same size as the phase wire or larger.
7. The server and its attached equipment should be the only units that are connected to the power distribution network that the server gets its power.
8. The equipment that is attached to the server, such as workstations and printers, must be attached to the power distribution network for the server when possible.
9. Check all circuit breakers in the network that supply ac power to the server as follows:
 - Ensure that the circuit breakers are installed tightly in the power panel and are not loose.
 - Feel the front surface of each circuit breaker to detect if it is warm. A warm circuit breaker may be caused by:
 - The circuit breaker that is not installed tightly in the power panel.
 - The contacts on the circuit breaker that is not making a good electrical connection with the contacts in the power panel.
 - A defective circuit breaker.
 - A circuit breaker of a smaller current rating than the current load which is going through it.
 - Devices on the branch circuit which are using more current than their rating.
10. Equipment that uses a large amount of current, such as: Air conditioners, copiers, and FAX machines, should not receive power from the same branch circuits as the system or its workstations. Also, the wiring that provides ac voltage for this equipment should not be placed in the same conduit as the ac voltage wiring for the server. The reason for this is that this equipment generates ac noise pulses. These pulses can get into the ac voltage for the server and cause intermittent problems.
11. Measure the ac voltage to each unit to ensure that it is in the normal range.

Is the voltage outside the normal range?

No: Continue with the next step.

Yes: Contact the customer to have the voltage source returned to within the normal voltage range.

12. *The remainder of this procedure is only for a server that is attached to a separately derived source.*

Some examples of separately derived sources are an uninterruptable power supply, a motor generator, a service entrance transformer, and a system power module.

The ac voltage system must meet all the requirements that are stated in this procedure and also all of the following:

Notes:

- a. The following applies to an uninterruptable power supply, but it can be used for any separately derived source.
- b. System upgrades **must not** exceed the power requirements of your derived source.

The uninterruptable power supply must be able to supply the peak repetitive current that is used by the system and the devices that attach to it. The uninterruptable power supply can be used over its maximum capacity if it has a low peak repetitive current specification, and the uninterruptable power supply is already fully loaded. Therefore, a de-rating factor for the uninterruptable power supply must be calculated to allow for the peak-repetitive current of the complete system. To help you determine the de-rating factor for an uninterruptable power supply, use the following:

Note: The peak-repetitive current is different from the "surge" current that occurs when the server is powered on.

The de-rating factor equals the crest factor multiplied by the RMS load current divided by the peak load current where the:

- Crest factor is the peak-repetitive current rating of the uninterruptable power supply that is divided by the RMS current rating of the uninterruptable power supply. If you do not know the crest factor of the uninterruptable power supply, assume that it is 1.414.
- RMS load current is the steady state RMS current of the server as determined by the power profile.
- Peak load current is the steady state peak current of the server as determined by the power profile.

For example, if the de-rating factor of the uninterruptable power supply is calculated to be 0.707, then the uninterruptable power supply must not be used more than 70.7% of its kVA-rated capacity. If the kVA rating of the uninterruptable power supply is 50 kVA, then the maximum allowable load on it is 35.35 kVA (50 kVA multiplied by 0.707).

When a three-phase separately derived source is used, correct balancing of the load as specified in step 5 on page 26 is *critical*. If the load on any one phase of an uninterruptable power supply is more than the load on the other phases, the voltage on all phases may be reduced.

13. If the system is attached to an uninterruptable power supply or motor generator, then check for the following:
 - The system and the attached equipment should be the only items that are attached to the uninterruptable power supply or motor generator. Equipment such as air conditioners, copiers, and FAX machines should not be attached to the same uninterruptable power supply, or motor generator that the system is attached.
 - The system unit console and the Electronic Customer Support modem must get ac voltage from the same uninterruptable power supply or motor generator to which the system is attached. **This ends the procedure.**

INTIP14

Use this procedure to isolate problems with station protectors.

Station protectors must be installed on all twinaxial cables that leave the building in which the server is located. This applies even if the cables go underground, through a tunnel, through a covered outside hallway, or through a skyway. Station protectors help prevent electrical noise on these cables from affecting the server.

1. Look at the Product Activity Log to determine what workstations are associated with the failure.
2. Determine if station protectors are installed on the twinaxial cables to the failing workstations.

Are station protectors installed on the twinaxial cables to the failing workstations?

Yes: Perform the next intermittent isolation procedure listed in the *Isolation procedure* column. **This ends the procedure.**

No: You may need to install station protectors on the twinaxial cables to the failing workstations. **This ends the procedure.**

INTIP16

Use this procedure when you need to copy a main storage dump to give to your next level of support.

For some problems, performing a dump of main storage helps to analyze the problem. The data on the dump is analyzed by support personnel to determine the cause of the problem and how to correct it.

1. Copy the main storage dump to tape. See Copying a dump.
2. Ask your next level of support to determine for assistance. **This ends the procedure.**

INTIP18

Use this procedure to determine if one or more PTFs are available to correct this specific problem.

1. Ensure that all PTFs that relate to the problem have been installed.

Note: Ensure that the latest platform LIC fix has been installed before you exchange a service processor.

2. Contact your next level of support for more information. **This ends the procedure.**

INTIP20

Use this procedure to analyze system performance problems.

1. Look in the Product Activity Log, ASM log, or management console to determine if any hardware errors occurred at the same time that the performance problem occurred. Did any hardware problems occur at the same time that the performance problem occurred?

Yes: Perform problem analysis and correct the hardware errors. **This ends the procedure.**

No: The performance problems are not related to hardware. Continue with the next step.

2. Perform the following steps:
 - a. Ask the customer if they have asked software support for any software PTFs that relate to this problem.
 - b. Recommend that the customer install a cumulative PTF package if they have not done so in the past three months.
 - c. Inform the customer that performance could possibly be improved by having Software Support analyze the conditions.
 - d. Inform the customer that your service provider has performance tools. Contact Software Support for more information. **This ends the procedure.**

INTIP24

Use this procedure to collect data when the service processor reports a suspected intermittent problem.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

It is important that you collect data for this problem so that the problem can be corrected. Use this procedure to collect the data.

There are several ways the system can display the SRC. Follow the instructions for the correct display method, defined as follows:

- If this SRC is displayed in the Product Activity Log or ASM log, then record all of the SRC data words, save all of the error log data, and contact your next level of support to submit an APAR.
- If the control panel is displaying SRC data words scrolling automatically through control panel functions 11, 12 and 13, and the control panel user interface buttons are not responding, then perform "FSPSP02" on page 178 instead of using this procedure.
- If the SRC is displayed at the control panel, and the control panel user interface buttons respond normally, then record all of the SRC words.

Do not perform an IPL until you perform a storage dump of the service processor. To get a storage dump of the service processor, perform the following steps:

1. Record the complete system reference code (SRC) (functions 11 through 20).
2. Perform a service processor dump. See Performing dumps.

3. Is a display shown on the console?
 - **Yes:** Continue with the next step.
 - **No:** The problem is not intermittent. Choose from the following options:
 - If you were sent here from another procedure, return there and follow the procedure for a problem that is not intermittent.
 - If the problem continues, replace the service processor hardware. **This ends the procedure.**
4. The problem is intermittent. Copy the IOP dump to tape. See Performing dumps.
5. Complete the IPL.
6. Determine if there are available program temporary fixes (PTFs) for this problem.
7. If a PTF is found, apply the PTF. Then, return here and answer the following question.

Did you find and apply a PTF for this problem?

 - **Yes: This ends the procedure.**
 - **No:** Record the following information, and contact your next level of support.
 - The complete SRC you recorded in this procedure
 - The service processor dump to tape you obtained in step 4.
 - All known system symptoms:
 - How often the intermittent problem occurs
 - System environment (IPL, certain applications)
 - If necessary, other SRCs that you suspect relate to the problem
 - Information needed to write an LICTR. **This ends the procedure.**

I/O processor isolation procedures

Isolate a failure in the multiple function I/O card.

Read all safety procedures before servicing the system.

Attention: Unless instructed otherwise, always power off the system or expansion unit where the field replaceable unit (FRU) is located before removing, exchanging, or installing a FRU.

Attention: Disconnecting the J15 and J16 cables will not prevent the system unit from powering on.

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.

- For racks with a DC power distribution panel (PDP), connect the customer’s DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

IOPIP01

Use this procedure to perform an IPL to dedicated service tool (DST) to determine if the same reference code occurs.

If a new reference code occurs, more analysis may be possible with the new reference code. If the same reference code occurs, you are instructed to exchange the failing items.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions, before continuing with this procedure.
2. Was the IPL performed from disk (Type A or Type B)?
 - No:** Continue with the next step.
 - Yes:** Go to step 5 on page 31.
3. Perform the following steps:
 - a. Ensure that the IPL media is the correct version and level that are needed for the system model.
 - b. Ensure that the media is not physically damaged.

- c. Choose from the following options to clean the IPL media:
 - If it is cartridge type optical media (for example, DVD), do not attempt to clean the media.
 - If it is non-cartridge type media (for example, CD-ROM), wipe the disc in a straight line from the inner hub to the outer rim. Use a soft, lint-free cloth or lens tissue. Always handle the disc by the edges to avoid finger prints.
 - If it is tape, clean the recording head in the tape unit. Use the correct Cleaning Cartridge Kit provided by your service provider.
4. Perform a Type D IPL in **Manual** mode.

Does a system reference code (SRC) appear on the control panel?

 - **No:** Go to step 8.
 - **Yes:** Is the SRC the same one that sent you to this procedure?
 - Yes:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. See the reference code list. If the failing item list contains FI codes, see Part locations and location codes to help determine part numbers and location in the system. **This ends the procedure.**
 - No:** A different SRC occurred. Use the new SRC to correct the problem. See Starting a repair action. **This ends the procedure.**
5. Perform an IPL to DST. See Performing an IPL to dedicated service tools.

Does an SRC appear on the control panel?

 - No:** Continue with the next step.
 - Yes:** Go to step 10 on page 32.
6. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
 - **No:** Continue with the next step.
 - **Yes:** Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:
 - If all of the reference codes are 0000, go to “LICIP11” on page 62 and use cause code 0002.
 - If any of the reference codes are not 0000, go to step 10, and use the reference code that is not 0000.

Note: Use the characters in the *Type* column to find the correct reference code table.
7. Look at the product activity log. See “Using the product activity log” on page 33 for details.

Is an SRC logged as a result of this IPL?

 - Yes:** Continue with the next step.
 - No:** The problem cannot be isolated any more. Use the original SRC and exchange the failing items. Start with the highest probable cause of failure in the failing item list for this reference code. If the failing item list contains FI codes, see Part locations and location codes to help determine part numbers and location in the system. **This ends the procedure.**
8. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
 - **Yes:** Continue with the next step.
 - **No:** Look at the product activity log. See “Using the product activity log” on page 33 for details.

Is an SRC logged as a result of this IPL?

 - Yes:** Continue with the next step.
 - No:** The problem is corrected. **This ends the procedure.**
9. Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:
 - If all of the reference codes are 0000, go to “LICIP11” on page 62 and use cause code 0002.

- If any of the reference codes are not 0000, continue with the next step and use the reference code that is not 0000.

Note: Use the characters in the *Type* column to find the correct reference code table.

10. Record the SRC.

Are the SRC and unit reference code (URC) the same ones that sent you to this procedure?

Yes: Continue with the next step.

No: Use the new SRC or reference code to correct the problem. **This ends the procedure.**

11. Perform the following steps:

- a. Power off the system or expansion unit. See Powering on and powering off the system.
- b. Exchange the FRUs in the failing item list for the SRC you have now. Start with the highest probable cause of failure in the failing item column in the reference code list. Perform the remaining steps of this procedure after you exchange each FRU until you determine the failing FRU.

Note: If you exchange a disk unit, do not attempt to save customer data until instructed to do so in this procedure.

12. Power on the system or the expansion unit. See Powering on and powering off the system.

Does an SRC appear on the control panel?

No: Continue with the next step.

Yes: Go to step 16.

13. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?

- **Yes:** Continue with the next step.
- **No:** Look at the product activity log. See “Using the product activity log” on page 33 for details. Is an SRC logged as a result of this IPL?
 - **Yes:** Continue with the next step.
 - **No:** The last FRU you exchanged was failing.

Note: Before exchanging a disk unit, you should attempt to save customer data.

This ends the procedure.

14. Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:

- If all of the reference codes are 0000, go to “LICIP11” on page 62 and use cause code 0002.
- If any of the reference codes are not 0000, go to step 10, and use the reference code that is not 0000.

Note: Use the characters in the *Type* column to find the correct reference code table.

15. Record the SRC on the Problem summary form. See “Using the product activity log” on page 33 for details.

Is the SRC the same one that sent you to this procedure?

- **Yes:** The last FRU you exchanged is not the failing FRU. Go to step 12 to continue FRU isolation.
- **No:** Is the SRC B100 4504 or B100 4505 and have you exchanged disk unit 1 in the system unit, or are all the reference codes on the console 0000?
 - **Yes:** The last FRU you exchanged was failing. **This ends the procedure.**

Note: Before exchanging a disk unit, you should attempt to save customer data.

– **No:** Use the new SRC or reference code to correct the problem. **This ends the procedure.**

Using the product activity log

This procedure can help you learn how to use the Product Activity Log (PAL).

1. To locate a problem, find an entry in the product activity log for the symptom you are seeing.

- a. On the command line, enter the Start System Service Tools command:

STRSST

If you cannot get to SST, select DST.

Note: Do not IPL the system or partition to get to DST.

- b. On the Start Service Tools Sign On display, type in a User ID with service authority and password.
- c. From the System Service Tools display, select **Start a Service Tool > Product activity log > Analyze log.**
- d. On the Select Subsystem Data display, select the option to view **All Logs.**

Note: You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

- e. Use the defaults on the Select Analysis Report Options display by pressing the Enter key.
- f. Search the entries on the Log Analysis Report display.

Note: For example, a 6380 Tape Unit error would be identified as follows:

System Reference Code: 6380CC5F

Class: Perm

Resource Name: TAP01

2. Find an SRC from the product activity log that best matches the time and type of the problem the customer reported.

Did you find an SRC that matches the time and type of problem the customer reported?

Yes: Use the SRC information to correct the problem. **This ends the procedure.**

No: Contact your next level of support. **This ends the procedure.**

IOPIP13

Use this procedure to isolate problems on the interface between the I/O card and the storage devices.

The unit reference code (part of the SRC that sent you to this procedure) indicates the SCSI bus that has the problem:

Unit reference code (URC)	SCSI bus
3100	0
3101	1
3102	2
3103	3

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions.
2. Were you performing an IPL from removable media (IPL type D) when the error occurred?
No: Continue with the next step.
Yes: Exchange the FRUs in the failing item list for the reference code that sent you to this procedure. **This ends the procedure.**
3. Perform the following steps:
 - a. Look in the service action log (see Searching the service action log) for other errors logged at or around the same time as the 310x SRC.

- b. If no entries appear in the service action log, use the product activity log (see Using the product activity log).
 - c. Use the other SRCs to correct the problem before performing an IPL.
 - d. Contact your next level of support as necessary for assistance with SCSI bus problem isolation.
 - e. If the problem is not corrected, continue with the next step.
4. Perform an IPL to DST. See Performing an IPL to dedicated service tools. Does an SRC appear on the control panel?
- No:** Continue with the next step.
Yes: Go to step 7.
5. Does one of the following displays appear on the console?
- Disk Configuration Error Report
 - Disk Configuration Attention Report
 - Disk Configuration Warning Report
 - Display Unknown Mirrored Load-Source Status
 - Display Load-Source Failure
 - **Yes:** Continue with the next step.
 - **No:** Look at the product activity log. See Using the product activity log for details.
- Is an SRC logged as a result of this IPL?
- **Yes:** Continue with the next step.
 - **No:** You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure see the failing item list for this reference code. If the failing item list contains FI codes, see the Part locations and location codes topic to help determine part numbers and location in the system. **This ends the procedure.**
6. Are all of the reference codes 0000? On some of the displays, you must press **F11** to display reference codes.
- **No:** Continue with the next step. Use the reference code that is not 0000.
 - **Yes:** Go to “LICIP11” on page 62 and use cause code 0002. **This ends the procedure.**
7. Is the SRC the same one that sent you to this procedure?
- Yes:** Continue with the next step.
No: Record the SRC. Then use the SRC description to correct the problem. **This ends the procedure.**
8. Perform the following steps:
- a. Power off the system or the expansion unit. See Powering on and powering off the system for details.
 - b. Find the I/O card identified in the failing item list.
 - c. Remove the I/O card and install a new I/O card. This item has the highest probability of being the failing item.
 - d. Power on the system or the expansion unit.
- Does an SRC appear on the control panel?
- No:** Continue with the next step.
Yes: Go to step 12 on page 35.
9. Does one of the following displays appear on the console?
- Disk Configuration Error Report
 - Disk Configuration Attention Report
 - Disk Configuration Warning Report
 - Display Unknown Mirrored Load-Source Status
 - Display Load-Source Failure

- **Yes:** Does the Display Unknown Mirrored Load-Source Status display appear on the console?
Note: On some of these displays, you must press **F11** to display reference codes.
 - **Yes:** Continue with the next step.
 - **No:** Are all of the reference codes 0000?
 - **No:** Go to step 12 using the reference code that is not 0000.
 - **Yes:** Go to “LICIP11” on page 62 and use cause code 0002. **This ends the procedure.**
 - **No:** Go to step 11.
10. Is the reference code the same one that sent you to this procedure?
- **No:** Either a new reference code occurred, or the reference code is 0000. There may be more than one problem. The original I/O card may be failing, but it must be installed in the system to continue problem isolation. Install the original I/O card by doing the following:
 - a. Power off the system or the expansion unit. See Powering on and powering off the system for details.
 - b. Remove the I/O card you installed in step 8 on page 34 and install the original I/O card.

Note: Do not power on the system or the expansion unit now.
 A device connected to the I/O card could be the failing item. Go to “IOPIP16,” step (9) to continue isolating the problem. **This ends the procedure.**
 - **Yes:** Go to step 13.
11. Look at the product activity log. See Using the product activity log for details. Is an SRC logged as a result of this IPL?
- Yes:** Continue with the next step.
 - No:** The I/O card, which you removed in step 8 on page 34, is the failing item. **This ends the procedure.**
12. Is the SRC or reference code the same one that sent you to this procedure?
- Yes:** Continue with the next step.
 - No:** Record the SRC. Then use the SRC description to correct the problem. **This ends the procedure.**
13. The original I/O card is not the failing item. Install the original I/O card by doing the following:
- a. Power off the system or the expansion unit. See Powering on and powering off the system for details.
 - b. Remove the I/O card you installed in step 8 on page 34 of this procedure and install the original I/O card.
- Note:** Do not power on the system or the expansion unit now.
 A device connected to the I/O card could be the failing item. Go to “IOPIP16,” step (9) to continue isolating the problem. **This ends the procedure.**

IOPIP16

Use this procedure to isolate failing devices that are identified by FI codes FI01105, FI01106, and FI01107.

During this procedure, you will remove devices that are identified by the FI code, and then you will perform an IPL to determine if the symptoms of the failure have disappeared, or changed. You should not remove the load-source disk until you have shown that the other devices are not failing. Removing the load-source disk can change the symptom of failure, although it is not the failing unit.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.

2. Use the Hardware Service Manager (HSM) verify function (use DST or SST), and verify that all tape and optical units attached to the SCSI bus (identified by FI01105, FI01106, or FI01107) are operating correctly. See Verifying a repair for details.

Note: Do not IPL the system to get to DST.

3. Choose from the following options:
 - If verification was successful for all tape and optical units, then go to step 5.
 - If any tape or optical device could not be verified, or if it failed verification, then exchange the failing item. See the Part locations and location codes and continue with the next step.
4. Use the Hardware Service Manager (HSM) verify function (use SST or DST) and verify that the exchanged item is operating correctly. See Verifying a repair for details.

Was the verification successful?

No: Replace the exchanged device with the original. See Part locations and location codes and continue with the next step.

Yes: The newly exchanged tape or optical device was the failing item. **This ends the procedure.**

5. Perform an IPL to DST. See Performing an IPL to dedicated service tools.

Does an SRC appear on the control panel?

No: Continue with the next step.

Yes: Go to step 8.

6. Does one of the following displays appear on the console?
 - Disk Configuration Error Report
 - Disk Configuration Attention Report
 - Disk Configuration Warning Report
 - Display Unknown Mirrored Load-Source Status
 - Display Load-Source Failure

Note: On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.

– **No:** Continue with the next step.

– **Yes:** Are all of the reference codes 0000?

No: Go to step 8, and use the reference code that is not 0000.

Yes: Go to “LICIP11” on page 62 and use cause code 0002. **This ends the procedure.**

7. Look at the Product Activity Log. See Using the product activity log for details.

Is a reference code logged as a result of this IPL?

Yes: Continue with the next step.

No: You cannot continue isolating the problem. Use the original reference code and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, see Part locations and location codes for additional details. **This ends the procedure.**

8. Is the SRC or reference code the same one that sent you to this procedure?

Yes: Continue with the next step.

No: Record the SRC or reference code. Then, use the SRC or reference code to correct the problem. **This ends the procedure.**

9. Isolate the failing device by doing the following:
 - a. Power off the system or the expansion unit if it is powered on. See Powering on and powering off the system.
 - b. Go to Part locations and location codes to find the devices identified by FI code FI01105, FI01106, or FI01107 in the failing item list.

- c. Disconnect one of the devices that are identified by the FI code, other than the load-source disk unit.

Note: The tape, or optical units should be the first devices to be disconnected, if they are attached to the SCSI bus identified by FI01105, FI01106, or FI01107.

- d. Go to step 11.
10. Continue to isolate the possible failing items by doing the following:
 - a. Power off the system or the expansion unit. See Powering on and powering off the system.
 - b. Disconnect the next device that is identified by FI codes FI01105, FI01106, or FI01107 in the FRU list. See the note in step 9 on page 36. Do not disconnect disk unit 1 (load-source disk) until you have disconnected all other devices and the load-source disk is the last device that is identified by these FI codes.

11. Power on the system or the expansion unit.

Does an SRC appear on the control panel?

No: Continue with the next step.

Yes: Go to step 14.

12. Does one of the following displays appear on the console?

- Disk Configuration Error Report
- Disk Configuration Attention Report
- Disk Configuration Warning Report
- Display Unknown Mirrored Load-Source Status
- Display Load-Source Failure

Note: On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.

– **Yes:** Go to step 14.

– **No:** Look at the Product Activity Log. See Using the product activity log for details. Is a reference code logged as a result of this IPL?

No: Continue with the next step.

Yes: Go to step 14.

13. You are here because the IPL completed successfully. The last device you disconnected is the failing item.

Is the failing item a disk unit?

No: Exchange the failing item and reconnect the devices you disconnected previously. See the Part locations and location codes. **This ends the procedure.**

Yes: Exchange the failing FRU. Before exchanging a disk drive, you should attempt to save customer data. **This ends the procedure.**

14. Is the SRC or reference code the same one that sent you to this procedure?

Yes: Continue with the next step.

No: Record the SRC or reference code on the Problem summary form. Then go to step 16 on page 38.

15. The last device you disconnected is not failing.

Have you disconnected all the devices that are identified by FI codes FI01105, FI01106, or FI01107 in the FRU list?

No: Leave the device disconnected and return to step 10 to continue isolating the possible failing items.

Yes: Replace the device backplane or backplanes associated with the devices you removed in the earlier steps. If the device backplane does not fix the problem, then you cannot continue isolating

the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, see Part locations and location codes for additional information. **This ends the procedure.**

16. Is the SRC B1xx 4504, and have you disconnected the load-source disk unit? (The load-source disk unit is disconnected by disconnecting disk unit 1.)
 - **Yes:** Continue with the next step.
 - **No:** Does one of the following displays appear on the console, and are all reference codes 0000?
 - Disk Configuration Error Report
 - Disk Configuration Attention Report
 - Disk Configuration Warning Report
 - Display Unknown Mirrored Load-Source Status
 - Display Load-Source Failure

Note: On some of these displays, you must press **F11** to display reference codes. The characters under Type are the same as the 4 leftmost characters of word 1. The characters under Reference Code are the same as the 4 rightmost characters of word 1.

Yes: Continue with the next step.

No: A new SRC or reference code occurred. Perform problem analysis and correct the problem. **This ends the procedure.**

17. The last device you disconnected may be the failing item. Exchange the last device you disconnected. See the Part locations and location codes.

Note: Before exchanging a disk drive, you should attempt to save customer data.

Was the problem corrected by exchanging the last device you disconnected?

No: Continue with the next step.

Yes: **This ends the procedure.**

18. Reconnect the devices you disconnected previously in this procedure.
19. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure. Do not exchange the FRU that you exchanged in this procedure. If the failing item list contains FI codes, see Part locations and location codes to help determine part numbers and location in the system. **This ends the procedure.**

IOPIP17

Use this procedure to isolate problems that are associated with SCSI bus configuration errors and device task initialization failures.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Were you performing an IPL from removable media (IPL type D) when the error occurred?
 - **Yes:** Exchange the FRUs in the failing item list for the reference code that sent you to this procedure.
 - **No:** Perform an IPL to DST. See Performing an IPL to dedicated service tools. Does an SRC appear on the control panel?
 - No:** Continue with the next step.
 - Yes:** Go to step 5 on page 39.
3. Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
 - **No:** Continue with the next step.
 - **Yes:** Does one of the following messages appear in the list?

- Missing disk units in the configuration
- Missing mirror protection disk units in the configuration
- Device parity protected units in exposed mode.
 - **No:** Continue with the next step.
 - **Yes:** Select option 5, press **F11**, then press **Enter** to display the details. Then, choose from the following options:
 - If all of the reference codes are 0000, go to “LICIP11” on page 62 and use cause code 0002.
 - If any of the reference codes are not 0000, go to step 5, and use the reference code that is not 0000.

Note: Use the characters in the *Type* column to find the correct reference code table.

4. Look at the product activity log. See Searching the service action log. Is an SRC logged as a result of this IPL?

Yes: Continue with the next step.

No: You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure (see the failing item list for this reference code in the (System Reference Codes)) topic. If the failing item list contains FI codes, see (Failing items) to help determine part numbers and location in the system. **This ends the procedure.**

5. Record the SRC. Is the SRC the same one that sent you to this procedure?

- **No:** A different SRC or reference code occurred. Use the new SRC or reference code to perform problem analysis and correct the problem. **This ends the procedure.**
- **Yes:** Determine the device unit reference code (URC) from the SRC. If the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appears on the console, the device URC is displayed under *Reference Code*. This is on the same line as the missing device. Is the device unit reference code **3020, 3021, 3022, or 3023**?

Yes: Continue with the next step.

No: Go to step 7 on page 40.

6. A unit reference code of **3020, 3021, 3022, or 3023** indicates that there is a problem on an I/O card SCSI bus. The problem can be caused by a device that is attached to the I/O card that:

- Is not supported.
- Does not match system configuration rules. For example, there are too many devices that are attached to the bus.
- Is failing.

Perform the following steps:

- a. Look at the characters on the control panel Data display or the Problem Summary Form for characters 9 - 16 of the top 16 character line of function 12 (word 3). Use the format BBBB-xxxx (BBBB = bus, xxxx = not used) to determine the card slot location for the I/O card.
- b. The unit reference code indicates the SCSI bus that has the problem:

URC	SCSI Bus
3020	0
3021	1
3022	2
3023	3

- c. Find the bus and device locations. See Part locations and location codes for information about FRU locations for the system you are servicing.
- d. Find the printout that shows the system configuration from the last IPL and compare it to the present system configuration.

Note: If configuration is not the problem, a device on the SCSI bus may be failing.

- e. If you need to perform isolation on the SCSI bus, go to “IOPIP16” on page 35. **This ends the procedure.**
7. The possible failing items are FI codes **FI01105** (90%) and **FI01112** (10%). Find the device unit address from the SRC (see System Reference Code (SRC) Format Description). Use this information to find the physical location of the device. Record the type and model numbers to determine if the addressed I/O card supports this device. Is the device given support on your system?
 - **No:** Continue with the next step.
 - **Yes:** Perform the following steps:
 - a. Exchange the device.
 - b. Perform an IPL to DST. See Performing an IPL to dedicated service tools.
 Does this correct the problem?
 - No:** Ask your next level of support for assistance. **This ends the procedure.**
 - Yes: This ends the procedure.**
 8. Perform the following steps:
 - a. Remove the device.
 - b. Perform an IPL to DST. See Performing an IPL to dedicated service tools.
 Does this correct the problem?
 - No:** Ask your next level of support for assistance. **This ends the procedure.**
 - Yes: This ends the procedure.**

IOPIP18

Use this procedure to isolate problems that are associated with SCSI bus configuration errors and device task initialization failures.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Perform an IPL to DST. See Performing an IPL to dedicated service tools.

Does an SRC appear on the control panel?

 - **Yes:** Go to step 5 on page 41.
 - **No:** Does either the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear on the console?
 - Yes:** Continue with the next step.
 - No:** Go to step 4.
3. Does one of the following messages appear in the list?
 - Missing disk units in the configuration
 - Missing mirror protection disk units in the configuration
 - Device parity protected units in exposed mode.
 - **No:** Continue with the next step.
 - **Yes:** Select option 5, press **F11**, and then press **Enter** to display the details. Choose from the following options:
 - If all of the reference codes are 0000, go to “LICIP11” on page 62 and use cause code 0002.
 - If any of the reference codes are not 0000, go to step 5 on page 41, and use the reference code that is not 0000.

Note: Use the characters in the *Type* column to find the correct reference code table.
4. Look at the product activity log.

Is an SRC logged as a result of this IPL?

Yes: Continue with the next step.

No: You cannot continue isolating the problem. Use the original SRC and exchange the failing items, starting with the highest probable cause of failure in the failing item column in the reference code list. If the failing item list contains FI codes, see Part locations and location codes to help determine part numbers and location in the system. **This ends the procedure.**

5. Record the SRC.

Is the SRC the same one that sent you to this procedure?

Yes: Continue with the next step.

No: A different SRC or reference code occurred. Use the new SRC or reference code to correct the problem. **This ends the procedure.**

6. Determine the device unit reference code (URC) from the SRC. If the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appears on the console, the device URC is displayed under *Reference Code*. This is on the same line as the missing device.

Is the device unit reference code 3020?

• **No:** Continue with the next step.

• **Yes:** A device reference code of 3020 indicates that a device is attached to the addressed I/O card. Either it is not supported, or it does not match system configuration rules. For example, there are too many devices that are attached to the bus. Perform the following steps:

- a. Find the printout that shows the system configuration from the last IPL and compare it to the present system configuration.
- b. Use the unit address and the physical address in the SRC to help you with this comparison.
- c. If configuration is not the problem, a device on the SCSI bus may be failing. Use FI code FI00884 in the Part locations and location codes table to help find the failing device.
- d. If you need to perform isolation on the SCSI bus, go to "IOPIP16" on page 35. **This ends the procedure.**

7. The possible failing items are FI codes FI01105 (90%) and FI01112 (10%).

Find the device unit address from the SRC. Use this information to find the physical location of the device. Record the type and model numbers to determine if the addressed I/O card supports this device.

Is the device given support on your system?

• **No:** Continue with the next step.

• **Yes:** Perform the following steps:

- a. Exchange the device.
- b. Perform an IPL to DST. See Performing an IPL to dedicated service tools.

Does this correct the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: This ends the procedure.

8. Perform the following steps:

- a. Remove the device.
- b. Perform an IPL to DST. See Performing an IPL to dedicated service tools.

Does this correct the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: This ends the procedure.

IOPIP19

You were sent to this procedure from unit reference code (URC) 9010, 9011, or 9013.

Contact your next level of support for assistance.

IOPIP20

Use this procedure to isolate the problem when two or more devices are missing from a disk array.

You were sent to this procedure from unit reference code (URC) 9020 or 9021.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions, before continuing with this procedure.
2. Access SST/DST by doing one of the following:
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
3. Have any other I/O card or device SRCs (other than a 902F SRC) occurred at about the same time as this error?
 - **Yes:** Use the other I/O card or device SRCs to correct the problem. **This ends the procedure.**
 - **No:** Has the I/O card, or have the devices been repaired or reconfigured recently?
 - **Yes:** Continue with the next step.
 - **No:** Contact your next level of support for assistance. **This ends the procedure.**
4. Did you perform a D IPL to get to DST?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here and view the "Additional Information" to record the formatted log information. Record all devices that are missing from the disk array. These are the array members that have both a present address of 0 and an expected address that is not 0.

Note: There might be more than one Product Activity Log entry with the same Log ID. Access any additional entries by pressing the enter key from the "Display Detail Report for Resource" screen. View the "Additional Information" for each entry to record the formatted log information.

For example: There might be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array.
 - b. Continue with step 6.
5. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see Examples: Obtaining additional information from hexadecimal reports. Record all devices that are missing from the disk array. These are the array members that have both a present address of 0 and an expected address that is not 0.

Note: There might be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array. In order to interpret the hexadecimal information for these additional disk units, see Examples: Obtaining additional information from hexadecimal reports.
6. There are three possible ways to correct the problem:

- a. Find the missing devices and install them in the correct physical locations in the system. If you can find the missing devices and want to continue with this repair option, then continue with the next step.
 - b. Stop the disk array that contains the missing devices.
Attention: Customer data might be lost.
If you want to continue with this repair option, go to step 8.
 - c. Initialize and format the remaining members of the disk array.
Attention: Customer data will be lost.
If you want to continue with this repair option, go to step 9.
7. Perform the following steps:
- a. Install the missing devices in the correct locations in the system. See Part locations and location codes.
 - b. Power on the system. See Powering on and powering off the system.
Does the IPL complete successfully?
No: You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**
Yes: This ends the procedure.
8. You have chosen to stop the disk array that contains the missing devices.
Attention: Customer data might be lost.
Perform the following steps:
- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to dedicated service tools.
If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Select **Work with disk units**.
Did you get to DST with a Type D IPL?
Yes: Continue with the next step.
No: Select **Work with disk configuration > Work with device parity protection**. Then, continue with the next step.
 - c. Select **Stop device parity protection**.
 - d. Follow the on-line instructions to stop device parity protection.
 - e. Perform an IPL from disk.
Does the IPL complete successfully?
No: You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**
Yes: This ends the procedure.
9. You have chosen to initialize and format the remaining members of the disk array. Perform the following steps:
Attention: Customer data will be lost.
- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to dedicated service tools.
If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Select **Work with disk units**.
Did you get to DST with a Type D IPL?
Yes: Continue with the next step.
No: Select **Work with disk unit recovery > Disk unit problem recovery procedures**, and continue with the next step.
10. Select **Initialize and format disk unit**.

11. Follow the online instructions to format and initialize the disk units.
12. Perform an IPL from disk. Does the IPL complete successfully?
 - No:** You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**
 - Yes:** **This ends the procedure.**

IOPIP21

Use this procedure to determine the failing disk unit when, a disk unit is not compatible with other disk units in the disk array, or when a disk unit has failed. If the URC is 9025 or 9030, the disk array is running, but it might not be protected.

You were sent to this procedure from a unit reference code (URC) of 9025, 9030, or 9032.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Is the device location information for this SRC available in the service action log (see Searching the service action log for details)?
 - Yes:** Exchange the disk unit.
 - No:** Continue with the next step.
3. Access SST/DST by doing one of the following:
 - If you **can** enter a command at the console, access system service tools (SST). See System service tools.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
4. Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here.
 - b. Press the **F9** key for address information. This is the I/O card address.

Note: There may be more than one entry with the same Log ID. Entries with the same Log ID may be accessed by pressing the **Enter** key from the "Display Detail Report for Resource" screen.

Example: There may be a device specific SRC and/or an xxxx902F SRC entry in the Product Activity Log. The xxxx902F SRC will occur if there are more than 10 disk units in the array.

- c. Continue with the next step.
5. Perform the following steps:
 - a. Return to the SST or DST main menu.
 - b. Select **Work with disk units > Display disk configuration > Display disk configuration status**.
 - c. On the Display disk configuration status display, look for the devices attached to the I/O card that is identified in step 4.
 - d. Find the device that has a status of "DPY/Unknown" or "DPY/Failed". This is the device that is causing the problem. Show the device address by selecting **Display Disk Unit Details > Display Detailed Address**. Record the device address.
 - e. See Part locations and location codes and find the diagram of the system unit, or the expansion unit and find the following:
 - The card slot that is identified by the I/O card direct select address
 - The disk unit location that is identified by the device address

Have you determined the location of the I/O card and disk unit that is causing the problem?

Yes: Exchange the disk unit that is causing the problem. **This ends the procedure.**

No: Ask your next level of support for assistance. **This ends the procedure.**

IOPIP22

Use this procedure to gather error information and contact your next level of support.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions, before continuing with this procedure.
2. Access SST/DST by doing one of the following:
 - If you **can** enter a command at the console, access system service tools (SST). See System service tools.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
3. Did you perform a D IPL to get to DST?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here and view the "Additional Information" to record the formatted log information. Record all the information.

Note: There may be more than one Product Activity Log entry with the same Log ID. Access any additional entries by pressing the **Enter** key from the "Display Detail Report for Resource" screen. View the "Additional Information" for each entry to record the formatted log information. Example: There may be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array.

- b. Continue with step 5.
4. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see Examples: Obtaining additional information from hexadecimal reports. Record all the information. Then continue with the next step.

Note: There may be an xxxx902F SRC entry in the Product Activity Log if there are more than 10 disk units in the array. In order to interpret the hexadecimal information for these additional disk units, see Examples: Obtaining additional information from hexadecimal reports.

5. Ask your next level of support for assistance.

Note: Your next level of support may require the error information you recorded in the previous step. **This ends the procedure.**

IOPIP23

You were sent to this procedure from a unit reference code (URC) 9050.

Contact your next level of support for assistance.

IOPIP25

Use this procedure to isolate the problem when a device attached to the I/O card has functions that are not given support on the I/O card.

You were sent to this procedure from URC 9008.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions, before continuing with this procedure.
2. Have any other I/O card or device SRCs occurred at about the same time as this error?
 - **Yes:** Use the other I/O card or device SRCs to correct the problem. See the system reference codes. **This ends the procedure.**

- **No:** Has the I/O card, or have the devices been repaired or reconfigured recently?
 - **Yes:** Continue with the next step.
 - **No:** Contact your next level of support for assistance. **This ends the procedure.**
3. Access SST/DST by doing one of the following:
- If you **can** enter a command at the console, access system service tools (SST). System service tools.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
4. Did you perform a D IPL to get to DST?
- **No:** Access the Product Activity Log and display the SRC that sent you here. Press the **F9** key for address information. This is the I/O card address. Then, view the "Additional Information" to record the formatted log information. Record the addresses that are not 0000 0000 for all devices listed.
Continue with the next step.
 - **Yes:** Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O Card is in the format BBBB-xxxx:
 - BBBB = hexadecimal offsets 4C and 4D
 - xxxx = not used
 The unit address of the I/O card is hexadecimal offset 18C through 18F.
A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see Examples: Obtaining additional information from hexadecimal reports. Record the addresses that are not 0000 0000 for all devices listed.
Continue with the next step.
5. See Part locations and location codes and find the diagram of the system unit, or the expansion unit. Then find the following:
- The card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.
 - The disk unit locations that are identified by the unit addresses.
- Have you determined the location of the I/O card and the devices that are causing the problem?
- **No:** Ask your next level of support for assistance. **This ends the procedure.**
 - **Yes:** Have one or more devices been moved to this I/O card from another I/O card?
 - Yes:** Continue with the next step.
 - No:** Ask your next level of support for assistance. **This ends the procedure.**
6. Is the I/O card capable of supporting the devices attached?
- **No:** Remove the devices from the I/O card.

Note: You can remove disk units without installing another disk unit, and the system continues to operate.
This ends the procedure.
 - **Yes:** Do you want to continue using these devices with this I/O card?
 - Yes:** Continue with the next step.
 - **No:** Remove the devices from the I/O card. **This ends the procedure.**
7. Initialize and format the disk units by performing the following steps:
- Attention:** Data on the disk unit will be lost.
- a. Access SST or DST.
 - b. Select **Work with disk units**.
Did you get to DST with a Type D IPL?

Yes: Continue with the next step.

No: Select **Work with disk unit recovery > Disk unit problem recovery procedures**. Then continue with the next step.

- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This may take 30 minutes or longer. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

IOPIP26

Use this procedure to correct the problem when the I/O card recognizes that the attached disk unit must be initialized and formatted.

You were sent to this procedure from URC 9092.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Have any other I/O card or device SRCs occurred at about the same time as this error?
 - **Yes:** Use the other I/O card or device SRCs to correct the problem. **This ends the procedure.**
 - **No:** Has the I/O card, or have the devices been repaired or reconfigured recently?
 - Yes:** Continue with the next step.
 - No:** Contact your next level of support for assistance. **This ends the procedure.**
3. Access SST/DST by doing one of the following:
 - If you **can** enter a command at the console, access system service tools (SST). See System service tools.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools for details.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
4. Did you perform a D IPL to get to DST?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here.
 - b. Press the **F9** key for address information. This is the I/O card address.
 - c. Then view the "Additional Information" to record the formatted log information.
 - d. Record the addresses that are not 0000 0000 for all devices listed.
 - e. Continue with step 6.
5. Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O card is in the format BBBB-xxxx:
 - BBBB = hexadecimal offsets 4C and 4D
 - xxxx = not usedThe unit address of the I/O card is hexadecimal offset 18C through 18F.
 - b. A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see Examples: Obtaining additional information from hexadecimal reports. Record the addresses that are not 0000 0000 for all devices listed.
 - c. Continue with the next step.
6. See Part locations and location codes and find the diagram of the system unit, or the expansion unit. Then find the following:

- The card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.
- The disk unit locations that are identified by the unit addresses.

Have you determined the location of the I/O card and the devices that are causing the problem?

- **No:** Ask your next level of support for assistance. **This ends the procedure.**
- **Yes:** Have one or more devices been moved to this I/O card from another I/O card?

Yes: Continue with the next step.

No: Ask your next level of support for assistance. **This ends the procedure.**

7. Do you want to continue using these devices with this I/O card?

- **Yes:** Continue with the next step.
- **No:** Remove the devices from the I/O card.

Note: You can remove disk units without installing another disk unit, and the system continues to operate.

This ends the procedure.

8. Initialize and format the disk units by performing the following steps:

Attention: Data on the disk unit will be lost.

- Access SST or DST.
- Select **Work with disk units**.

Did you get to DST with a Type D IPL?

Yes: Continue with the next step.

No: Select **Work with disk unit recovery > Disk unit problem recovery procedures**. Then continue with the next step.

- Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This may take 30 minutes or longer. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

IOPIP27

I/O card cache data exists for a missing or failed device.

You were sent to this procedure from a unit reference code (URC) of 9051.

Note: For some storage I/O adapters, the cache card is integrated and not removable.

Having I/O card cache data for a missing or failed device might be caused by the following conditions:

- One or more disk units have failed on the I/O card.
- The cache card of the I/O card was not cleared before it was shipped as a MES to the customer. In addition, the service representative moved devices from the I/O card to a different I/O card before performing a system IPL.
- The cache card of the I/O card was not cleared before it was shipped to the customer. In addition, residual data was left in the cache card for disk units that manufacturing used to test the I/O card.
- The I/O card and cache card were moved from a different system or a different location on this system after an abnormal power off.
- One or more disk units were moved either concurrently, or they were removed after an abnormal power off.

CAUTION:

Any Function 08 power off (including from a D-IPL) is an abnormal power off.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Access SST/DST by doing one of the following:
 - If you **can** enter a command at the console, access system service tools (SST). See System service tools.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
3. Did you perform a D IPL to get to DST?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here.
 - b. Press the **F9** key for address information. This is the I/O card address.
 - c. Then view the "Additional Information" to record the formatted log information. Record the device types and serial numbers for those devices that show a unit address of 0000 0000.
 - d. Continue with step 5.
4. Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the I/O card is in the format BBBB-xxxx:
 - BBBB = hexadecimal offsets 4C and 4D.
 - xxxx = not used

The unit address of the I/O card is hexadecimal offset 18C through 18F.

A formatted display of hexadecimal information for Product Activity Log entries is not available. In order to interpret the hexadecimal information, see Examples: Obtaining additional information from hexadecimal reports.
 - b. Record the device types and serial numbers for those devices that show a unit address of 0000 0000.
 - c. Continue with the next step.
5. See Part locations and location codes and find the diagram of the system unit, or the expansion unit. Find the card slot that is identified by the I/O card direct select address (DSA) and unit address. If there is no IOA with a matching DSA and unit address, the IOP and IOA are one card. Use the IOP with the same DSA.
6. Choose from the following options:
 - If the devices from step 3 of this procedure have never been installed on this system, continue with the next step.
 - If the devices are not in the current system disk configuration, go to step 9 on page 50.
 - Otherwise, the devices are part of the system disk configuration; go to step 11 on page 50.
7. Choose from the following options:
 - If this I/O card and cache card were moved from a different system, continue with the next step.
 - Otherwise, the cache card was shipped to the customer without first being cleared. Perform the following steps:
 - a. Make a note of the serial number, the customer number, and the device types and their serial numbers. These were found in step 3.
 - b. Inform your next level of support.
 - c. Then go to step 10 on page 50 to clear the cache card and correct the URC 9051 problem.
8. Install both the I/O card and the cache cards back into their original locations. Then re-IPL the system. There could be data in the cache card for devices in the disk configuration of the original

system. After an IPL to DST and a normal power off on the original system, the cache card will be cleared. It is then safe to move the I/O card and the cache card to another location.

9. One or more devices that are not currently part of the system disk configuration were installed on this I/O card. Either they were removed concurrently, they were removed after an abnormal power off, or they have failed. Continue with the next step.
10. Use the Reclaim IOP cache storage procedure to clear data from the cache for the missing or failed devices as follows:
 - a. Perform an IPL to DST. See Performing an IPL to dedicated service tools.
If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Reclaim the cache adapter card storage. See Reclaiming IOP cache storage.
11. Choose from the following options:
 - If this I/O card and cache card were moved from a different location on this system, go to step 8 on page 49.
 - If the devices from step 3 on page 49 of this procedure are now installed on another I/O card, and they were moved there before the devices were added to the system disk configuration, go to step 7 on page 49. (On an MES, the disk units are sometimes moved from one I/O card to another I/O card. This problem will result if manufacturing did not clear the cache card before shipping the MES.)
 - Otherwise, continue with the next step.
12. One or more devices that are currently part of the system disk configuration are either missing or failed, and have data in the cache card. Consider the following:
 - The problem may be because devices were moved from the I/O card concurrently, or they were removed after an abnormal power off. If this is the case, locate the devices, power off the system and install the devices on the correct I/O card.
 - If no devices were moved, look for other errors logged against the device, or against the I/O card that occurred at approximately the same time as this error. Continue the service action by using these system reference codes.

IOPIP28

You were sent to this procedure from unit reference code (URC) 9052.

Contact your next level of support for assistance.

IOPIP29

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

IOPIP30

Use this procedure to correct the problem when the system cannot find the required cache data for the attached disk units.

You were sent to this procedure from URC 9050.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Did you just exchange the storage input/output (I/O) adapter as a result of a failure?
No: Continue with step 9 on page 51.
Yes: Continue with the next step.

3. Remove the I/O adapter. Install the **new** replacement storage I/O adapter with the cache directory card from the **original** storage I/O adapter installed on it. On adapters with removable cache cards, the cache directory card will move with the removable cache card.

Note: Label all parts (both old and new) before moving them.

See Part locations and location codes for information about removing and replacing parts.

- If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see System parts.
4. Did the 9050 SRC that sent you to this procedure occur on a type-D IPL?
Yes: Perform a type-D IPL and continue with the next step.
No: Continue with the next step.
 5. Has a new 9010 or 9050 SRC occurred in the Service Action Log or Product Activity Log?
No: Go to step 8
Yes: Continue with the next step.
 6. Was the new SRC 9050?
No: Continue with the next step.
Yes: Contact your next level of support. **This ends the procedure.**
 7. The new SRC was 9010. Reclaim the cache storage. See Reclaiming IOP cache storage.

Note: When an auxiliary cache I/O adapter that is connected to the storage I/O adapter logs a 9055 SRC in the Product Activity Log, the reclaim does not result in lost sectors. Otherwise, the reclaim does result in lost sectors, and the system operator might want to restore data from the most recent saved tape after you complete the repair.

8. Remove the I/O adapter. Install the **new** replacement storage I/O adapter that has the cache directory card from the **new** storage I/O adapter installed on it. On adapters with removable cache cards, the cache directory card will move with the removable cache card. See Part locations and location codes.
 - If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see System parts.

This ends the procedure

9. Identify the affected disk units using information in the Product Activity Log. Access SST/DST by doing one of the following:
 - If you can enter a command at the console, access system service tools (SST). See System Service Tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools .
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
10. Did you perform a D IPL to get to DST?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following steps:
 - a. Access the Product Activity Log and display the SRC that sent you here, then view *Additional Information* to record the formatted log information. The *Device Errors detected* field indicates the total number of disk units that are affected. The *Device Errors logged* field indicates the number of disk units for which detailed information is provided. Under the *Device* heading, the unit address, type, and serial number are provided for up to three disk units. Additionally, the controller type and serial number for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

Note: You might find more than one Product Activity Log entry with the same Log ID. Access any additional entries by pressing Enter from the Display Detail Report for Resource screen. View *Additional Information* for each entry, and record the formatted log information. For example: You might find an entry for an xxxx902F SRC in the Product Activity Log when the array includes more than 10 disk units.

b. Continue with step 12.

11. A formatted display of hexadecimal information for Product Activity Log entries is not available. To interpret the hexadecimal information, see Examples: Obtaining additional information from hexadecimal reports. The *Device Errors detected* field indicates the total number of disk units that are affected. The *Device Errors logged* field indicates the number of disk units for which detailed information is provided. Under the *Device* heading, the unit address, type, and serial number are provided for up to three disk units. Additionally, the controller type and serial number for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

Note: You might find an entry for an xxxx902F SRC entry in the Product Activity Log when the array includes more than 10 disk units. To interpret the hexadecimal information for these additional disk units, see Examples: Obtaining additional information from hexadecimal reports.

12. Has the I/O card or have the devices been repaired or reconfigured recently?

Yes: Continue with the next step.

No: Contact your next level of support for assistance. **This ends the procedure.**

13. You can use one of the following repair options to correct the problem:

- Reunite the adapter and disk units identified in previous steps so that the cache data can be written to the disk units. If you can find the devices and adapters and want to continue with this repair option, then continue with the next step.
- If the data for the disk units identified in previous steps is not needed on this or any other system, initialize and format these disk units.

Attention: This repair option causes a loss of customer data. If you want to continue with this repair option, go to step 15.

14. Perform the following steps:

- a. Restore the adapter and disk units back to their original configuration. For more information, see Part locations and location codes. After the system writes cache data to the disk units and you power off the system normally, you can move the adapter and disk units to another location.
- b. Power on the system. For more information, see Powering on and powering off the system. Does the IP complete successfully?

No: Perform problem analysis to correct the new problem. **This ends the procedure.**

Yes: This ends the procedure.

15. You have chosen to initialize and format the identified disk units. Perform the following steps:

Attention: Performing the following steps causes a loss of customer data.

- a. If you are not already using dedicated service tools, perform an IPL to DST. For more information, see Performing an IPL to dedicated service tools . If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Select Work with disk units. Did you get to DST with a Type D IPL?

Yes: Continue with the next step.

No: Select **Work with disk unit recovery > Disk unit problem recovery procedures**, then continue with the next step.

16. Select **Initialize and format disk unit**.

17. Follow the online instructions to format and initialize the disk units.

18. Perform an IPL from disk. Does the IPL complete successfully?

No: Perform problem analysis and correct the new problem. **This ends the procedure.**

Yes: This ends the procedure.

IOPIP31

Cache data associated with the attached devices cannot be found.

You were sent to this procedure from URC 9010.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Has the system been powered off for several days?
 - **No:** Go to step 4.
 - **Yes:** The cache battery pack may be depleted. Do not replace the I/O adapter or the cache battery pack. Reclaim the cache storage. See Reclaiming IOP cache storage. Then continue with the next step.

Note: When an auxiliary cache I/O adapter connected to the storage I/O adapter logs a 9055 SRC in the Product Activity Log, the Reclaim does not result in lost sectors. Otherwise, the Reclaim does result in lost sectors, and the system operator may want to restore data from the most recent saved tape after you complete the repair.

3. Does the IPL complete successfully?
 - No:** Contact your next level of support. **This ends the procedure.**
 - Yes:** **This ends the procedure.**
4. Remove the I/O adapter. Install the **new** replacement storage I/O adapter with the cache directory card from the **original** storage I/O adapter installed on it. On adapters with removable cache cards, the cache directory card will move with the removable cache card.

Note: Label all parts (both old and new) before moving them.
See Part locations and location codes.

- If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see System parts.
5. Did the 9010 SRC that sent you to this procedure occur on a type-D IPL?
 - No:** Continue with the next step.
 - Yes:** Perform a type-D IPL and continue with the next step.
 6. Has a new 9010 or 9050 SRC occurred in the Service Action Log?
 - No:** Go to step 9.
 - Yes:** Continue with the next step.
 7. Was the new SRC 9050?
 - No:** Continue with the next step.
 - Yes:** Contact your next level of support. **This ends the procedure.**
 8. The new SRC was 9010. Reclaim the cache storage. See Reclaiming IOP cache storage.

Note: When an auxiliary cache I/O adapter that is connected to the storage I/O adapter logs a 9055 SRC in the Product Activity Log, the reclaim does not result in lost sectors. Otherwise, the reclaim does result in lost sectors, and the system operator might want to restore data from the most recent saved tape after you complete the repair.

9. Remove the I/O adapter. Install the **new** replacement storage I/O adapter that has the cache directory card from the **new** storage I/O adapter installed on it. On adapters with removable cache cards, the cache directory card will move with the removable cache card. See Part locations and location codes.
 - If the I/O adapter is attached to an auxiliary cache I/O adapter, ensure that the SCSI cable on the last port of the new replacement storage I/O adapter is connected to the auxiliary cache I/O adapter. For a list of auxiliary cache I/O adapters, see the System parts.

This ends the procedure

IOPIP32

You were sent to this procedure from unit reference code (URC) 9011.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

Attention: There is data in the cache of this I/O card, that belongs to devices other than those that are attached. Customer data may be lost.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.

2. Did you just exchange the storage I/O adapter as a result of a failure?

- **No:** Continue with the next step.
- **Yes:** Reclaim the cache storage. See Reclaiming IOP cache storage.

Does the IPL complete successfully?

No: You have a new problem. Perform problem analysis and correct the problem. **This ends the procedure.**

Yes: **This ends the procedure.**

3. Have the I/O cards been moved or reconfigured recently?

- **No:** Ask your next level of support for assistance. **This ends the procedure.**
- **Yes:** Perform the following steps:
 - a. Power off the system. See Powering on and powering off the system for details.
 - b. Restore all I/O cards to their original position.
 - c. Select the IPL type and mode that are used by the customer.
 - d. Power on the system.

Does the IPL complete successfully?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: **This ends the procedure.**

IOPIP33

The I/O processor card detected a device configuration error. The configuration sectors on the device may be incompatible with the current I/O processor card.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

You were sent to this procedure from unit reference code (URC) 9001.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to (Determine if the system has logical partitions) before continuing with this procedure.

2. Has the I/O adapter been replaced with a different type of I/O adapter, or have the devices been moved from a different type of I/O adapter to this one?

- **No:** Contact your next level of support. **This ends the procedure.**
- **Yes:** Continue with the next step.

3. Does the disk unit contain data that needs to be saved?
 - **Yes:** Continue with the next step.
 - **No:** Initialize and format the disk units.

Attention: Any data on the disk unit will be lost. Perform the following steps:

 - a. Access SST or DST.
 - b. Select **Work with disk units**.
 - c. Did you get to DST with a type D IPL?
 - **No:** Select **Work with disk unit recovery > Disk unit problem recovery procedures**. Then, continue with the next step.
 - **Yes:** Continue with the next step.
 - d. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display will show that the status is complete. This may take 30 minutes or longer.
 - e. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**
4. The disk unit contains data that needs to be saved.
 - If the I/O adapter has been replaced with a different type of I/O adapter, reinstall the original I/O adapter. Then continue with the next step.
 - If the disk units have been moved from a different type of I/O adapter to this one, return the disk units to their original I/O adapter. Then continue with the next step.
5. Stop parity protection on the disk units, and power off the system normally with the I/O adapter in an operational state. The I/O adapter or disk units can now be returned to the configuration at the beginning of this procedure. **This ends the procedure.**

IOPIP34

You were sent to this procedure from unit reference code (URC) 9027.

The I/O processor card detected that an array is not functional due to the present hardware configuration.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to (Determine if the system has logical partitions) before continuing with this procedure.
2. Has the I/O adapter been replaced with a different I/O adapter, or have the devices been moved from a different I/O adapter to this one?
 - **No:** Perform (IOPIP22). **This ends the procedure.**
 - **Yes:** Perform the following steps:
 - a. Power off the system. See (Power on/off the system and logical partitions).
 - b. Restore all I/O cards or devices to their original position.
 - c. Power on the system.
3. Does the IPL complete successfully?
 - **No:** Ask your next level of support for assistance. **This ends the procedure.**
 - **Yes:** **This ends the procedure.**

IOPIP40

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

IOPIP41

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

Licensed Internal Code isolation procedures

Use this section to isolate Licensed Internal Code problems.

Read and observe all safety procedures before servicing the system and while performing a procedure.

Attention: Unless instructed otherwise, always power off the system or expansion unit where the FRU is located before removing, exchanging, or installing a field-replaceable unit (FRU).

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.
 - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

LICIP01

Licensed Internal Code detected an IOP programming problem.

You will need to gather data to determine the cause of the problem. If using **OptiConnect**, and the IOP is connected to another system, then collect this information from both systems. Read the "Licensed Internal Code isolation procedures" on page 56 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Is the system operational: Did the SRC come from the Service Action Log, Product Activity Log, problem log, or system operator message?
 - **No:** Go to step 9.
 - **Yes:** Is this a x6xx5121 SRC?
 - No:** Continue with the next step.
 - Yes:** Go to step 4.
3. If the IOP has DASD attached to it, then the IOP dump is in SID87 (or SID187 if the DASD is mirrored). Copy the IOP dump. For more information about copying the IOP dump, contact your next level of support.
4. Print the Product Activity Log, including any IOP dumps, to removable media for the day which the problem occurred. Select the option to obtain HEX data.
5. Use the "Licensed Internal Code log" service function under DST/SST to copy the LIC log entries to removable media for the day that the problem occurred.
6. Copy the system configuration list. For instructions, see System configuration list.
7. Provide the dumps to Service Support.
8. Check the Logical Hardware Resource STATUS field using Hardware Service Manager. If the status is not *Operational* then IPL the IOP using the I/O Debug option. Ignore resources with a status of *not connected*.

To IPL a failed IOP, the following command can be used: **VRYCFG CFGOBJ(XXXX) CFGTYPE(*CTL) STATUS(*RESET)** or use DST/SST Hardware Service Manager.

If the IPL does not work:

 - Check the Service Action Log for new SRC entries. For instructions, see Searching the service action log. Use the new SRC and perform problem analysis to correct the problem.
 - If there are no new SRCs in the Service Action Log, contact your next level of support. **This ends the procedure.**
9. Has the system stopped but the DST console is still active: Did the SRC come from the Main Storage Dump manager screen on the DST console?
 - Yes:** Continue with the next step.
 - No:** Go to step 15 on page 58.
10. Complete a Problem Summary Form using the information in words 1-9 from the control panel, or from the DST Main Storage Dump screen.

11. The system has already taken a partial main storage dump for this SRC and automatically re-IPLed to DST.
12. Copy the main storage dump to tape. For instructions, see Storage dumps.
13. When the dump is completed, the system will re-IPL automatically. Sign on to DST or SST. Obtain the data in steps 3 on page 57, 4 on page 57, 5 on page 57, and 6 on page 57.
14. Provide the dumps to Service Support. **This ends the procedure.**
15. Has the system stopped with an SRC at the control panel?
 - Yes:** Continue with the next step.
 - No:** Go to step 2 on page 57.
16. Complete a Problem Summary Form using the information in words 1-9 from the control panel, or from the DST Main storage dump screen.
17. Do **not** power off the system. Perform a manual IPL to DST, and start the Main storage dump manager service function.
18. Copy the main storage dump to tape.
19. Obtain the data in steps 3 on page 57, 4 on page 57, 5 on page 57, and 6 on page 57.
20. Re-IPL the system.
21. Has the system stopped with an SRC at the control panel?
 - Yes:** Using the new SRC, perform problem analysis to correct the problem. **This ends the procedure.**
 - No:** Provide the dumps to Service Support. **This ends the procedure.**

LICIP03

Dedicated service tools (DST) found a permanent program error, or a hardware failure occurred.

Read the danger notices in the “Licensed Internal Code isolation procedures” on page 56 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Perform a main storage dump. See Storage dumps.
3. Go to “LICIP08” on page 61. **This ends the procedure.**

LICIP04

The initial program load (IPL) service function ended.

Dedicated service tools (DST) was in the disconnected status or lost communications with the IPL console because of a console failure and could not communicate with the user. Read the danger notices in “Licensed Internal Code isolation procedures” on page 56 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Select function **21** (Make DST Available) on the control panel and press **Enter** to start DST again.

Does the DST Sign On display appear?

 - **No:** Continue with the next step.
 - **Yes:** Perform the following steps (see Dedicated service tools for details):
 - a. Select **Start a Service Tool > Licensed Internal Code log**.
 - b. Perform a dump of the Licensed Internal Code log to tape. See Start a service tool for details.
 - c. Return here and continue with the next step.

3. Perform a main storage dump. See Storage dumps for details.
4. Copy the main storage dump to removable media. See Storage dumps for details.
5. Report a Licensed Internal Code problem to your next level of support. **This ends the procedure.**

LICIP07

The system detected a problem while communicating with a specific I/O processor.

The problem could be caused by Licensed Internal Code, the I/O processor card, or by bus hardware. Read the danger notices in "Licensed Internal Code isolation procedures" on page 56 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Did a previous procedure have you power off the system, perform an IPL in Manual mode, **and** is the system in Manual mode now?
 - **Yes:** Continue with the next step.
 - **No:** Perform the following steps:
 - a. Power off the system. For instructions, see Powering on and powering off the system for details.
 - b. Select **Manual** mode on the control panel. For instructions, see IPL type, mode, and speed options.
 - c. Power on the system.
 - d. Continue with the next step.
3. Does the SRC that sent you to this procedure appear on the control panel?
 - **No:** Continue with the next step.
 - **Yes:** Use the information in the SRC to determine the card direct select address. If the SRC is B6006910, you can use the last 8 characters of the top 16 character line of function 13 (word 7) to find the card direct select address in BBBBxxxx format.

BBBB Bus number
xxxx Not used

Go to step 11 on page 60.
4. Does the console display indicate a problem with missing disks?
 - Yes:** Continue with the next step.
 - No:** Go to step 6.
5. Perform the following steps:
 - a. Go to the DST main menu.
 - b. On the DST sign-on display, enter the DST full authority user ID and password. For instructions, see Dedicated service tools.
 - c. Select **Start a service tool > Hardware service manager**.
 - d. Check for the SRC in the service action log. For instructions, see Searching the service action log. Did you find the same SRC that sent you to this procedure?
 - **Yes:** Note the date and time for that SRC. Go to the Product Activity Log and search all logs to find the same SRC. When you have found the SRC, go to step 9 on page 60.
 - **No:** Perform the following steps:
 - 1) Return to the DST main menu.
 - 2) Perform an IPL and return to the Display Missing Disk Units display.
 - 3) Go to "LICIP11" on page 62. **This ends the procedure.**
6. Does the SRC that sent you to this procedure appear on the console or on the alternative console?

- **Yes:** Continue with the next step.
- **No:** Does the IPL complete successfully to the IPL or Install the System display?
Yes: Continue with the next step.
No: A different SRC occurred. Use the new SRC to correct the problem. **This ends the procedure.**

7. Perform the following steps:

- a. Use the full-authority password to sign on to DST.
- b. Search *All logs* in the product activity log looking for references of SRC B600 5209 and the SRC that sent you to this procedure.

Note: Search only for SRCs that occurred during the last IPL.

Did you find B600 5209 or the same SRC that sent you to this procedure?

- **Yes:** Go to step 10.
- **No:** Did you find a different SRC than the one that sent you to this procedure?
Yes: Continue with the next step.
No: The problem appears to be intermittent. Ask your next level of support for assistance. **This ends the procedure.**

8. Use the new SRC to correct the problem. **This ends the procedure.**

9. Use **F11** to move through alternative views of the log analysis displays until you find the card position and frame ID of the failing IOP associated with the SRC.

Was the card position and frame ID available, **and** did this information help you find the IOP?

No: Continue with the next step.

Yes: Go to step 12.

10. Perform the following steps:

- a. Display the report for the log entry of the SRC that sent you to this procedure.
- b. Display the additional information for the entry.
- c. If the SRC is B6006910, use characters 9-16 of the top 16 character line of function 13 (word 7) to find the card direct select address in BBBBxxxx format.

BBBB Bus number
xxxx Not used

11. Use the BBBBxxxx information and see Part locations and location codes to determine the failing IOP and its location.

12. Go to "MABIP55" on page 102 to isolate an I/O adapter problem on the IOP you just identified. If this fails to isolate the problem, return here and continue with the next step.

13. Perform the following steps:

- a. Power off the system.
- b. Remove the IOP card.
- c. Power on the system.

Does the SRC that sent you to this procedure appear on the control panel or appear as a new entry in the service action log or product activity log?

- **No:** Continue with the next step.
- **Yes:** Perform the following steps:
 - a. Power off the system.
 - b. Install the IOP card you just removed.
 - c. Replace the I/O backplane (*Un-P1*). **This ends the procedure.**

14. Perform the following steps:

- a. Power off the system.

- b. Exchange the failing IOP card.
15. Power on the system.
Does the SRC that sent you to this procedure appear on the control panel, on the console, or on the alternative console?
No: Continue with the next step.
Yes: Go to step 17.
16. Does a different SRC appear on the control panel, on the console, or on the alternative console?
 - **Yes:** Use the new SRC to correct the problem. **This ends the procedure.**
 - **No:** On the IPL or Install the System display, check for the SRC in the service action log. For instructions, see Searching the service action log.
Did you find the same SRC that sent you to this procedure?
Yes: Continue with the next step.
No: Go to Verifying a repair. **This ends the procedure.**
17. Perform the following steps:
 - a. Power off the system.
 - b. Remove the IOP card you just exchanged and install the original card.
 - c. Go to (Bus-PIP1). **This ends the procedure.**
18. Ask your next level of support for assistance and report a Licensed Internal Code problem. You may be asked to verify that all PTFs have been applied.
If you are asked to perform the following, see the following:
 - Copy the main storage dump from disk to tape or diskette, see Storage dumps.
 - Print the product activity log, see Using the product activity log.
 - Copy the IOP storage dump to removable media, see Storage dumps. **This ends the procedure.**

LICIP08

Licensed Internal Code detected an operating system program problem.

Read the danger notices in “Licensed Internal Code isolation procedures” on page 56 before continuing with this procedure.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to dedicated service tools.
Does the same SRC occur?
 - **Yes:** Go to step 5.
 - **No:** Does the same URC appear on the console?
No: Continue with the next step.
Yes: Go to step 4.
3. Does a different SRC occur, or does a different URC appear on the console?
 - **Yes:** Use the new SRC or reference code to correct the problem. If the procedure for the new SRC sends you back to this procedure, then continue with the next step. **This ends the procedure.**
 - **No:** Select **Perform an IPL** on the IPL or Install the System display to complete the IPL.
Is the problem intermittent?
Yes: Continue with the next step.
No: **This ends the procedure.**
4. Copy the main storage dump to removable media. See Storage dumps.
5. Report a Licensed Internal Code problem to your next level of support. **This ends the procedure.**

LICIP11

Use this procedure to isolate a system **STARTUP** failure in the initial program load (IPL) mode.

Ensure you have read the danger notices in "Licensed Internal Code isolation procedures" on page 56 before continuing with this procedure.

How to find the cause code

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions.
2. Were you given a cause code by another procedure?
No: Continue with the next step.
Yes: Use the cause code given by the other procedure. Then, go to step 4.
3. Look at the Data display characters in word 3. You can obtain these characters by either:
 - Looking at word 3 on the Problem summary form that was filled out earlier.
 - Selecting characters 9-16 of the top 16 character line of function 12 (word 3).
4. The 4 leftmost characters of word 3 represent the **cause code**. Select the cause code to go to the correct isolation instructions:

"0001"	"0010" on page 68	"0020" on page 70	"0031" on page 71
"0002" on page 63	"0011" on page 68	"0021" on page 70	"0033" on page 71
"0004" on page 65	"0012" on page 68	"0022" on page 70	"0034" on page 71
"0005" on page 66	"0015" on page 68	"0023" on page 70	"0035" on page 72
"0006" on page 66	"0016" on page 68	"0024" on page 70	"0037" on page 72
"0007" on page 66	"0017" on page 68	"0025" on page 71	"0038" on page 72
"0008" on page 66	"0018" on page 68	"0026" on page 71	"0039" on page 72
"0009" on page 66	"0019" on page 68	"0027" on page 71	"003A" on page 72
"000A" on page 66	"001A" on page 69	"002A" on page 71	"0099" on page 72
"000B" on page 67	"001C" on page 69	"002B" on page 71	
"000C" on page 67	"001D" on page 69		
"000D" on page 67	"001E" on page 69		
"000E" on page 67	"001F" on page 69		

0001

Disk configuration is missing.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools. Does the Disk Configuration Error Report display appear?
Yes: Continue with the next step.
No: The IPL completed successfully. **This ends the procedure.**
2. Is Missing Disk Configuration information displayed?
Yes: Continue with the next step.
No: Go to step 1 on page 63 for cause code 0002.
3. On the Missing Disk Configuration display, perform the following:
 - a. Select option 5 > **Display Detailed Report** > **Work with disk units** > **Work with disk unit recovery** > **Recover Configuration**.
 - b. Follow the instructions on the display. After the disk configuration is recovered, the system automatically performs an IPL. **This ends the procedure.**

0002

Disk units are missing from the disk configuration.

Data from the control panel can be used to find information about the missing disk unit.

1. Did you enter this procedure because all the devices listed on the Display Missing Units display (reached from the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display) have a reference code of 0000?
No: Continue with the next step.
Yes: Go to step 20 on page 65.
2. Have you installed a new disk enclosure in a disk unit and not restored the data to the disk unit?
No: Continue with the next step.
Yes: Ignore SRC A600 5090. Continue with the disk unit exchange recovery procedure. **This ends the procedure.**
3. Use words 1-9 from the information recorded on the Problem summary form to determine the disk unit that is missing from the configuration:
 - Characters 1-8 of the bottom 16 character line of function 12 (word 4) contain the IOP direct select address.
 - Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit type, level and model number.
 - Characters 9-16 of the top 16 character line of function 13 (word 7) contains the disk unit serial number.

Note: For 2105 and 2107 disk units, the 5 rightmost characters of word 7 contain the disk unit serial number.

- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the number of missing disk units.

Are the problem disk units 432x, 433x, 660x, 671x, or 673x disk units?

No: Continue with the next step.

Yes: Go to step 5.

4. Attempt to get all devices attached to the MSIOP to Ready status by performing the following:
 - a. The MSIOP address (MSIOP Direct Select Address) to use is characters 1-8 of the bottom 16 character line of function 12 (word 4).
 - b. Verify the following and correct if necessary before continuing with step 10 on page 64.
 - All cable connections are made correctly and are tight.
 - All storage devices have the correct signal bus address, as indicated in the system configuration list.
 - All storage devices are powered on and ready.
5. Did you enter this procedure because there was an entry in the Service Action Log which has the reference code B6005090?
Yes: Continue with the next step.
No: Go to step 10 on page 64.
6. Are customer jobs running on the system now?
Yes: Continue with the next step.
No: Ensure that the customer is not running any jobs before continuing with this procedure. Then go to step 10 on page 64.
7. Select **System Service Tools (SST) > Work with disk units > Display disk configuration > Display disk configuration status.**
Are any disk units missing from the configuration (indicated by an asterisk *)?
Yes: Continue with the next step.

No: This ends the procedure.

8. Do all of the disk units that are missing from the configuration have a status of "Suspended"?

Yes: Continue with the next step.

No: Ensure that the customer is not running any jobs before continuing with this procedure. Then go to step 10.

9. Use the Service Action Log to determine if there are any entries for the missing disk units (see Searching the service action log). Are there any entries in the Service Action Log for the missing disk units that were logged since the last IPL?

Yes: Use the information in the Service Action Log, and Reference codes). Perform the action indicated for the unit reference code. **This ends the procedure.**

No: Go to step 21 on page 65.

10. Select **Manual** mode and perform an IPL to DST for the failing partition (see Performing an IPL to dedicated service tools). Does the Disk Configuration Error Report, the Disk Configuration Attention Report, or the Disk Configuration Warning Report display appear?

Yes: Continue with the next step.

No: The IPL completed successfully. **This ends the procedure.**

11. Does one of the following messages appear in the list?

- Missing disk units in the configuration
- Missing mirror protected disk units in the configuration

Yes: Continue with the next step.

No: Go to step 16.

12. Select option 5. Do the missing units have device parity protected status? (Device parity protection status is indicated by "DPY/" as the first four characters of the status.)

Yes: Continue with the next step.

No: Go to step 14.

13. Is the status DPY/Active?

Yes: Continue with the next step.

No: Use the Service Action Log to determine if there are any entries for the missing disk units or the IOA/IOP controlling them. See Searching the service action log for details. **This ends the procedure.**

14. Press **F11**, and press **Enter** to display the details.

Do all of the disk units listed on the display have a reference code of 0000?

Yes: Continue with the next step.

No: Use the disk unit reference code shown on the display and Reference codes. Perform the action indicated for the unit reference code. **This ends the procedure.**

15. Do all of the IOPs or devices listed on the display have a reference code of 0000?

No: Use the IOP reference code shown on the display and Reference codes. Perform the action indicated for the reference code. **This ends the procedure.**

Yes: Go to step 20 on page 65.

16. Does the following message appear in the list: Unknown load-source status?

Yes: Continue with the next step.

No: Go to step 18.

17. Select option 5, press **F11**, and then press **Enter** to display the details.

Does the Assign Missing Load Source Disk display appear?

No: Continue with the next step.

Yes: Press **Enter** to assign the missing load-source disk unit. **This ends the procedure.**

18. Does the following message appear in the list?

Load source failure

Yes: Continue with the next step.

No: The IPL completed successfully. **This ends the procedure.**

19. Select option 5, press **F11**, and then press **Enter** to display the details.
20. The number of failing disk unit facilities (actuators) is the number of disk units displayed. A disk unit has a *Unit* number greater than zero.
Find the failing disk unit by type, model, serial number, or address displayed on the console.
21. Is there more than one failing disk device attached to the IOA or MSIOP?
Yes: Continue with the next step.
No: Go to step 24.
22. Use the SAL to determine if there are any entries that occurred around the time of the A6xx/B6xx 5090 SRC. See Using the service action log. Are there any such entries?
No: Continue with the next step.
Yes: Use the information in the SAL and Reference codes). Perform the action indicated for the unit reference code. **This ends the procedure.**
23. Are all the disk devices that are attached to the IOA or MSIOP failing? (If the disk units are using mirrored protection, select **Display Disk Status** to find out.)
No: Continue with the next step.
Yes: Go to step 25.
24. Go to the Reference codes and exchange the FRUs shown one at a time. Then return here and answer the question below the listed disk units.

Disk Unit	SRC to look up
2105	21053002
2107	21073002
432x	432x3002
433x	433x3002
660x	660x3002
671x	671x3002
673x	673x3002

Did the disk unit service information correct the problem?

No: Continue with the next step.

Yes: **This ends the procedure.**

25. Exchange the IOA or MSIOP. See Part locations and location codes for information about FRU locations for the system you are servicing.

If exchanging the IOA or MSIOP did not correct the problem, use the original SRC and exchange the failing items, starting with the highest probable cause of failure. If the failing item list contains FI codes, Reference codes to help determine parts and locations. **This ends the procedure.**

0004

Some disk units are unprotected but configured into a mirrored ASP. These units were originally DPY protected but protection was disabled.

Perform the following steps:

1. Is the system managed by a management console?
Yes: Select **DST** by performing the management console action for Function 21 for the failing partition. See Control panel functions on the management console. Then continue with the next step.

No: Select **DST** using Function 21 for the failing partition. See Selecting function 21 from the control panel in Service functions. Then continue with the next step.

2. Select **Work with disk units** and take the actions to protect the system.

If you do not know what actions to take, select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.

When the Disk configuration error report appears, the recovery actions are listed in the Help text for the error message "Unprotected disk units in a mirrored ASP". **This ends the procedure.**

0005

A disk unit using parity protection is operating in exposed mode.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. Choose from the following options:
 - If the same reference code appears, ask your next level of support for assistance.
 - If no reference code appears and the IPL completes successfully, the problem is corrected.
 - If a different reference code appears, use it to perform problem analysis and correct the new problem. **This ends the procedure.**

0006

There are new devices attached to the system that do not have Licensed Internal Code installed. Ask your next level of support for assistance.

0007

Some of the configured disk units have device parity protection disabled when the system expected device parity protection to be enabled.

1. Is the system managed by a management console?

Yes: Select **DST** by performing the management console action for Function 21 for the failing partition. See Control panel functions on the management console. Then continue with the next step.

No: Select **DST** using Function 21 for the failing partition. See Selecting function 21 from the control panel in Service functions. Then continue with the next step.
2. Correct the problem by doing the following:
 - a. Select **Work with disk units** > **Work with disk unit recovery** > **Correct device parity protection**.
 - b. Follow the online instructions. **This ends the procedure.**

0008

A disk unit has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See The system reference code format description.
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.

432x 102E, 433x 102E, 660x 102E, 671x 102E, 673x 102E (Reference codes).

This ends the procedure.

0009

The procedure to restore a disk unit from the tape unit did not complete. Continue with the disk unit exchange recovery procedure.

000A

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system.

Perform the following steps:

1. Is the system managed by a management console?

Yes: Select **DST** by performing the management console action for Function 21 for the failing partition. See Control panel functions on the management console. Then continue with the next step.

No: Select **DST** using Function 21 for the failing partition. See Selecting function 21 from the control panel in Service functions. Then continue with the next step.

2. On the Service Tools display, select **Start a Service Tool > Product activity log > Analyze log**.
3. On the Select Subsystem Data display, select the option to view **All Logs**.

Note: You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

4. Use the defaults on the Select Analysis Report Options display by pressing **Enter**.
5. Search the entries on the Log Analysis Report display for system reference codes associated with the missing disk units.
6. Go to Reference codes to correct the problem. **This ends the procedure.**

000B

Some system IOPs require cache storage be reclaimed.

1. Is the system managed by a management console?

Yes: Select **DST** by performing the management console action for Function 21 for the failing partition. See Control panel functions on the management console. Then continue with the next step.

No: Select **DST** using Function 21 for the failing partition. See Selecting function 21 from the control panel in Service functions. Then continue with the next step.

2. Reclaim the cache adapter card storage. See Reclaiming IOP cache storage.

Note: The system operator may want to restore data from the most recent saved tape after you complete the repair.

This ends the procedure.

000C

One of the mirror protected disk units has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See System reference code information.
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.

432x 102E, 433x 102E, 660x 102E, 671x 102E, 673x 102E (Reference codes).

This ends the procedure.

000D

The system disk capacity has been exceeded.

For more information about disk capacity, see *iSeries Handbook*, GA19-5486-20.

000E

Start compression failure.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. Correct the problem by doing the following:
 - a. Select **Work with disk units > Work with disk unit recovery > Recover from start compression failure**.
 - b. Follow the on-line instructions. **This ends the procedure.**

0010

The disk configuration has changed.

The operating system must be installed again, and all customer data must be restored.

1. Select **Manual** mode on the control panel.
2. Perform an IPL to reinstall the operating system.
3. The customer must restore all data from the latest system backup. **This ends the procedure.**

0011

The serial number of the control panel does not match the system serial number.

1. Select **Manual** mode on the control panel.
2. Perform an IPL. You will be prompted for the system serial number. **This ends the procedure.**

0012

The operation to write the vital product data (VPD) to the control panel failed.

Exchange the multiple function I/O processor card. See Part locations and location codes for information about FRU locations for the system that you are servicing.

0015

The mirrored load-source disk unit is missing from the disk configuration. Go to step 1 on page 63 for cause code 0002.

0016

A mirrored protected disk unit is missing. Wait six minutes. If the same reference code appears, go to step 1 on page 63 for cause code 0002.

0017

One or more disk units have a lower level of mirrored protection than originally configured.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. Review the detailed display, which shows the new and the previous levels of mirrored protection. **This ends the procedure.**

0018

Load-source configuration problem. The load-source disk unit is using mirrored protection and is configured at an incorrect address. Ensure that the load-source disk unit is in device location 1.

0019

One or more disk units were formatted incorrectly.

The system will continue to operate normally. However, it will not operate at optimum performance. To repair the problem, perform the following steps:

1. Record the unit number and serial number of the disk unit that is formatted incorrectly.
2. Sign on to DST. See Accessing dedicated service tools.
3. Select **Work with disk units > Work with disk unit configuration > Remove unit from configuration.**
4. Select the disk unit you recorded earlier in this procedure.
5. Confirm the option to remove data from the disk unit. This step may take a long time because the data must be moved to other disk units in the auxiliary storage pool (ASP).
6. When the remove function is complete, select **Add unit to configuration.**
7. Select the disk unit you recorded earlier in this procedure.
8. Confirm the add. The disk unit is formatted during functional operation. **This ends the procedure.**

001A

The load-source disk unit data is down-level.

The load-source disk unit is mirror protected. The system is using the load-source disk unit that does not have the current level of data.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools. Does the Disk Configuration Error Report display appear?

No: The system is now using the correct load-source. **This ends the procedure.**

Yes: Continue with the next step.

2. Does a "Load source failure" message appear in the list?

Yes: Continue with the next step.

No: The system is now using the correct load-source. **This ends the procedure.**

3. Select option **5**, press **F11**, and then press **Enter** to display details.

The load-source type, model, and serial number information that the system needs is displayed on the console.

Is the load-source disk unit (displayed on the console) attached to an MSIOP that cannot be used for a load-source?

Yes: Contact your next level of support. **This ends the procedure.**

No: The load-source disk unit is missing. Go to step 1 on page 63 for cause code 0002.

001C

The disk units that are needed to update the system configuration are missing.

Perform an IPL by doing the following:

1. Select **Manual** mode on the control panel.
2. Perform an IPL. Use the IPL information to determine the cause of the problem. **This ends the procedure.**

001D

1. Is the Disk Configuration Attention Report, or the Disk Configuration Warning Report displayed?

Yes: Continue with the next step.

No: Ask your next level of support for assistance. **This ends the procedure.**

2. On the Bad Load Source Configuration message line, select **5**, and press **Enter** to rebuild the load-source configuration information. If there are other types of warnings, select option **5** on the warnings, and correct the problem. **This ends the procedure.**

001E

The load-source data must be restored.

001F

Licensed Internal Code was installed on the wrong disk unit of the load-source mirrored pair.

The system performed an IPL on a load source that may not contain the same level of Licensed Internal Code that was installed on the other load source. The type, model, and address of the active device are displayed in words 4-7 of the SRC.

Choose from the following options:

1. If the load-source disk unit in position 1 contains the correct level of Licensed Internal Code, perform the following steps:
 - a. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools. Is the Disk Configuration Attention Report or Disk Configuration Warning Report displayed?

Yes: Select option 5 on the Incorrect Licensed Internal Code Install message line. When the Display Incorrect Licensed Internal Code Install display appears on the console, press **Enter**.

No: The system is now using the correct load source. **This ends the procedure.**

2. If the load-source disk unit in position 1 of the system unit does **not** contain the correct level of Licensed Internal Code, restore the Licensed Internal Code to the disk unit in position 1 of the system unit. **This ends the procedure.**

0020

The system appears to be a one disk unit system. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.

0021

The system password verification failed.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. When prompted, enter the correct system password. If the correct system password is not available perform the following steps:
 - a. Select **Bypass the system password**.
 - b. Have the customer contact the marketing representative immediately to order a new system password from your service provider. **This ends the procedure.**

0022

A different compression status was expected on a reporting disk unit. Accept the warning. The reported compression status will be used as the current compression status.

0023

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system. The system is capable of IPLing in this state.

1. Is the system managed by a management console?

Yes: Select **DST** by performing the management console action for Function 21 for the failing partition. See Control panel functions on the management console. Then continue with the next step.

No: Select **DST** using Function 21 for the failing partition. See Selecting function 21 from the control panel in Service functions. Then continue with the next step.
2. On the Service Tools display, select **Start a Service Tool > Product activity log > Analyze log**.
3. On the Select Subsystem Data display, select the option to view All Logs.

Note: You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

4. Use the defaults on the Select Analysis Report Options display by pressing **Enter**.
5. Search the entries on the Log Analysis Report display for system reference codes associated with the missing disk units.
6. Go to the Reference codes topic and use the SRC information to correct the problem. **This ends the procedure.**

0024

The system type or system unique ID needs to be entered.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. When prompted, enter the correct system type or system unique ID. **This ends the procedure.**

0025

Hardware Resource Information Persistence disabled.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. Contact your next level of support for instructions on how to enable the Hardware Resource Information Persistence function. **This ends the procedure.**

0026

A disk unit is incorrectly configured for an LPAR system.

1. Select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools.
2. On the Service Tools display, select **Start a Service Tool > Product activity log > Analyze log.**
3. On the Select Subsystem Data display, select the option to view All Logs.

Note: You can change the From: and To: Dates and Times from the 24-hour default if the time that the customer reported having the problem was more than 24 hours ago.

4. Use the defaults on the Select Analysis Report Options display by pressing **Enter.**
5. Search the entries on the Log Analysis Report display for system reference codes (B6xx 53xx) that are associated with the error.
6. Using the SRC information, Reference codes and use the information to correct the problem. **This ends the procedure.**

0027

The user ASP has overflowed. Contact your next level of support.

002A

The command to examine the status of the IOA cache storage failed. Contact your next level of support.

002B

Data from the user ASP has overflowed into the system ASP because the user ASP was full. Either add more disk units to the user ASP or delete data from the user ASP so that there is enough capacity in the user ASP to hold the data which has overflowed. Then select **Manual** mode and perform an IPL to DST for the failing partition. See Performing an IPL to dedicated service tools. At the display, recover the overflowed user ASP. This will move the overflowed data from the system ASP back to the user ASP. If you need assistance, contact your next level of support.

0031

A problem was detected with the installation of Licensed Internal Code service displays. The cause may be defective media, the installation media being removed too early, a device problem or a Licensed Internal Code problem.

- Ask your next level of support for assistance. Characters 13-16 of the top 16 character line of function 12 (4 rightmost characters of word 3) contain information regarding the install error.
- If the customer does not require the service displays to be in the national language, you may be able to continue by performing another system IPL. **This ends the procedure.**

0033

System model not supported. This model of hardware does not support the System Licensed Internal Code version and release that is being used. Use a supported version and release of the System Licensed Internal Code.

0034

Insufficient main storage capacity.

There is not enough main storage capacity. For details about how much more capacity is required, see the "Insufficient Main Storage Capacity" screen, that is displayed when the system is IPLed in manual mode. Typically, this error occurs when you have moved memory between logical partitions, and one partition no longer has a sufficient amount of main storage.

0035

Data from a User ASP has overflowed into the System ASP (ASP 1). There is not enough free space in the User ASP to move the overflowed data from the System ASP back into the User ASP. The system will continue to run in this condition, but if a disk failure in the System ASP causes the System ASP to be cleared, the data in the User ASP will also be cleared out.

You should delete some files or objects from the User ASP so that enough free space exists in the User ASP to allow the data that is overflowed into the System ASP to be moved back.

0037

One or more functional connections to a disk unit in a multi-path environment have not been detected. The connections to the disk unit were established by running ESS Specialist. If you use the server in this state, you may cause a loss of data. You must ensure that all of the functional connections are still established between the disk and the Input/Output Adapters (IOAs) attached to this server and this logical partition. If there is an IOA which has a connection to the disk unit that has been moved to a different logical partition or different server, you should not continue with the IPL. Notify your next level of support.

0038

Verification of the encryption key failed. Using the backup media which contains the correct encryption key value, restore the system. Contact your next level of support.

0039

The disk unit is attached to the partition in a dual storage adapter configuration. The secondary adapter is missing or disabled. The primary adapter is working, so the disk unit is available to the partition. Contact your next level of support to determine why the secondary controller is missing or disabled.

003A

The disk unit is attached to the partition in a dual storage adapter configuration. The secondary adapter is failed. The primary adapter is working, so the disk unit is available to the partition. Repair or replace the failed secondary adapter.

0099

A Licensed Internal Code program error occurred. Ask your next level of support for assistance.

LICIP12

Use this procedure to isolate an Independent Auxiliary Storage Pool (IASP) vary on failure.

Message CPDB8E0 occurred if the user attempted to vary on the IASP. Read the **Danger** notices in "Licensed Internal Code isolation procedures" on page 56 before continuing with this procedure.

How to find the cause code

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
2. Were you given a cause code by another procedure?
 - No:** Continue with the next step.
 - Yes:** Use the cause code given by the other procedure. Then go to step 4 on page 73.
3. Look at the characters in word 3. You can obtain these characters by doing the following:

- a. On the command line, enter the Start System Service Tools (STRSST) command. If you cannot get to SST, use function 21 to get to DST. Do not IPL the system to get to DST.
 - b. On the Start Service Tools Sign On display, type in a User ID with service authority and password.
 - c. Select **Start a Service Tool > Hardware Service Manager > Work with service action log.**
 - d. On the Select Timeframe display, change the From: Date and Time to a date and time prior to when the user attempted to vary on the IASP.
 - e. Search for a B6005094 system reference code that occurred at the time the user attempted to vary on the IASP. Display the failing item information for this entry.
 - f. Select the function key for **Additional details.**
 - g. The 4 leftmost characters of word 3 is the cause code to be used in this procedure.
4. Find the **cause code** below:

"0002" on page 75	"000A" on page 75	"002C" on page 76	"0030" on page 76
"0004" on page 75	"000B" on page 75	"002D" on page 76	"0032" on page 76
"0007" on page 75	"000D" on page 75	"002E" on page 76	"0099" on page 76
"0009" on page 75	"000E" on page 76	"002F" on page 76	

0002

Disk units are missing from the IASP disk configuration.

1. Have you installed a new disk enclosure in a disk unit and not restored the data to the disk unit?
 - **No:** Continue with the next step.
 - **Yes:** Ignore SRC A600 5094.

Continue with the disk unit exchange recovery procedure. **This ends the procedure.**

2. Use words 1-9 from the information in the Service Action Log to determine the disk unit that is missing from the configuration:
 - Word 4 contains the IOP direct select address.
 - Word 5 contains the unit address.
 - Word 6 contains the disk unit type, level and model number.
 - Word 7 contains the disk unit serial number.
 - Word 8 contains the number of missing disk units.

Are the problem disk units 432x, 660x, or 671x Disk Units?

- **Yes:** Continue with the next step.
 - **No:** Attempt to get all devices attached to the IOP to Ready status by performing the following:
 - a. The IOP address (IOP Direct Select Address) to use is Word 4.
 - b. Verify the following, and correct if necessary:
 - Ensure all cable connections are made correctly and are tight.
 - Ensure the configuration within the device is correct.
 - Ensure all storage devices are powered on and ready.
 - c. Continue with the next step.
3. Perform the following steps:

Select **System Service Tools (SST) > Work with disk units > Display disk configuration > Display disk configuration status.**

Are any disk units missing-indicated with an asterisk (*)- from the IASP configuration?

Yes: Continue with the next step.

No: **This ends the procedure.**

4. Use the Service Action Log to determine if there are any entries other than B6xx 5094 for the missing disk units or the IOA or IOP that is controlling them. See Using the product activity log.

Are there any entries in the Service Action Log other than B6xx 5094 for the missing disk units or the IOA or IOP that is controlling them?

No: Continue with the next step.

Yes: Use the information in the Service Action Log to solve the problem. See Using the product activity log. **This ends the procedure.**

5. Did you enter this procedure because there was a B6xx 5094 cause code of 0030?

- **No:** Continue with the next step.

- **Yes:** Work with the customer to recover the unknown configuration source disk unit.

Use a workstation with System i[®] Navigator installed to select the disk pool with the problem, and then select **Recover unknown configuration source** for this disk pool. **This ends the procedure.**

6. Use Hardware Service Manager to display logical resources connected to the IOP. See Hardware service manager.

7. Is every device attached to the IOP failing?

- **Yes:** Continue with the next step.

- **No:** Are all of the disk units that are attached to one IOA missing?

- **No:** Continue with the next step.

- **Yes:** Exchange the IOA. Use the IOP direct select address and the first character of the unit address from step 2 on page 73 to find the location. See Part locations and location codes. **This ends the procedure.**

8. Is there more than one storage IOA attached to the IOP?

- **Yes:** Exchange the IOP. Use the IOP direct select address from step 2 on page 73 to find the location. See Part locations and location codes. **This ends the procedure.**

- **No:** Go to step 10.

9. Go to the service information for the specific disk unit that is listed below and perform the action indicated. Then return here and answer the following question.

- **2105 Disk Units:** Use SRC 3002 exchange the FRUs shown one at a time.

- **432x, 660x, 671x Disk Units:** Use SRC 3002 and exchange the FRUs shown one at a time.

Did the disk unit service information correct the problem?

No: Continue with the next step.

Yes: **This ends the procedure.**

10. Perform the following steps:

- a. Exchange the IOA. Use the IOP direct select address and the first character of the unit address from step 2 on page 73 to find the location. See Part locations and location codes.

- b. If exchanging the IOA does not correct the problem, exchange the IOP. Use the IOP direct select address from step 2 on page 73 to find the location. See Part locations and location codes.

- c. If exchanging the IOP does not correct the problem, exchange the failing items in the following FRU list starting with the first item in the list.

- 1) FI01140

- 2) System backplane

- 3) FI00580

- 4) AJDG301

This ends the procedure.

0004

Some disk units are unprotected but configured into a mirrored IASP. These units were originally DPY protected but protection was disabled.

Direct the customer to take the actions necessary to start protection on these disk units. **This ends the procedure.**

0007

Some of the configured disk units have device parity protection disabled when the system expected device parity protection to be enabled.

1. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to dedicated service tools.
2. Correct the problem by doing the following:
 - a. Select **Work with disk units > Work with disk unit recovery > Correct device parity protection mismatch**.
 - b. Follow the on-line instructions. **This ends the procedure.**

0008

A disk unit has no more alternate sectors to assign.

1. Determine the failing unit by type, model, serial number or address given in words 4-7. See The system reference code format description.
2. See the service information for the specific storage device. Use the disk unit reference code listed below for service information entry.
432x 102E, 660x 102E, 671x 102E **This ends the procedure.**

0009

The procedure to restore a disk unit from the tape unit did not complete.

Continue with the disk unit exchange recovery procedure. **This ends the procedure.**

000A

There is a problem with a disk unit subsystem. As a result, there are missing disk units in the system.

Use the Service Action Log to find system reference codes associated with the missing disk units by changing the From: Date and Time on the Select Timeframe display to a date and time prior to when the user attempted to vary on the IASP. For information about how to use the Service Action Log, see Searching the service action log. **This ends the procedure.**

000B

Some system IOPs require cache storage be reclaimed.

1. Start SST.
2. Reclaim the cache adapter card storage by performing the following:
 - a. Select **Work with disk units > Work with disk unit recovery > Reclaim IOP Cache Storage**.
 - b. Follow the on-line instructions to reclaim cache storage.
 - c. After you complete the repair, the system operator may want to restore data from the most recently saved tape. **This ends the procedure.**

000D

The system disk capacity has been exceeded.

For more information about disk capacity, see the *iSeries Handbook*. **This ends the procedure.**

000E

Start compression failure.

1. Select **Manual** mode and perform an IPL to DST. See Performing an IPL to dedicated service tools.
2. Correct the problem by doing the following:
 - a. Select **Work with disk units > Work with disk unit recovery > Recover from start compression failure**.
 - b. Follow the on-line instructions. **This ends the procedure.**

002C

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

002D

The IASP configuration source disk unit data is down-level.

The system is using the IASP configuration source disk unit that does **not** have the current level of data.

Work with the customer to recover the configuration. On a workstation with System i Navigator installed, select the disk pool with the problem, and then select **Recover configuration**. **This ends the procedure.**

002E

The Independent ASP is assigned to another system or a Licensed Internal Code program error occurred.

Work with the customer to check other systems to determine if the Independent ASP has been assigned to it. If the Independent ASP has not been assigned to another system, ask your next level of support for assistance. **This ends the procedure.**

002F

The system version and release are at a different level than the IASP version and release.

The system version and release must be upgraded to be the same as the system version and release in which the IASP was created. **This ends the procedure.**

0030

The mirrored IASP configuration source disk unit has a disk configuration status of *unknown* and is missing from the disk configuration.

Go to step 1 on page 73 for cause code 0002.

0032

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

0099

A Licensed Internal Code program error occurred.

Ask your next level of support for assistance. **This ends the procedure.**

LICIP13

A disk unit seems to have stopped communicating with the system.

The system has stopped normal operation until the cause of the disk unit failure is found and corrected. Ensure you have read the **Danger** notices in “Licensed Internal Code isolation procedures” on page 56 before continuing with this procedure.

If the disk unit that stopped communicating with the system has **mirrored protection active**, normal operation of the system stops for one to two minutes. Then the system suspends mirrored protection for that disk unit and continues normal operation.


Note: Do not power off the system or partition using the white button, function 08, ASMI, or management console immediate power-off when performing this procedure. If this procedure or other isolation procedures referenced by this procedure direct you to IPL or power off the system,

- perform a partition main storage dump (see Performing dumps), or
 - if additional dump information is not needed, perform a function 03 IPL or restart the system or partition using the management console.
1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
 2. Was a problem summary form completed for this problem?
 - No:** Continue with the next step.
 - Yes:** Use the problem summary form information and go to step 4.
 3. Fill out a Problem Reporting Form completely with the instructions provided.
 4. Recovery from a device command time-out may have caused the communications loss condition (indicated by an SRC on the control panel or in the management console). This communications loss condition has the following symptoms:
 - The A6xx SRC does not increment within two minutes.
 - The system continues to run normally after it recovers from the communications loss condition and the reference code is cleared from the control panel.Does the communication loss condition have the above symptoms?
 - Yes:** Continue with the next step.
 - No:** Go to step 6.
 5. Verify that all Licensed Internal Code PTFs have been applied to the system. Apply any Licensed Internal Code PTFs that have not been applied to the system. Does the intermittent condition continue?
 - Yes:** Print all product activity logs. Print the LIC logs with a major code of 1000. Provide this information to your next level of support. **This ends the procedure.**
 - No: This ends the procedure.**
 6. Is the storage hosted by another partition?
 - Yes:** Contact your next level of support.
 - No:** Continue with the next step.
 7. A manual reset of the IOP may clear the attention reference code. Perform the following steps:
 - If you are working from the control panel:**
 - a. Select *Manual* mode on the control panel.
 - b. Select **Function 25** and press Enter.
 - c. Select **Function 26** and press Enter.
 - d. Select **Function 67** and press Enter to reset the IOP.
 - e. Wait 10 minutes.
 - f. Select **Function 25** and press Enter to disable the service functions on the control panel.
 - If you are working from the HMC:**

Choose one of the following navigation options depending on the interface type of the Hardware Management Console (HMC):

- If you are using an HMC Classic or HMC Enhanced interface, complete the following steps:
 - a. In the navigation area, select **Systems Management**.
 - b. In the contents area, click the server on which the logical partition is located.
 - c. In the contents area, select the logical partition.
 - d. Click **Serviceability > Control Panel Functions**.
 - e. Select **(67) Disk Unit IOP Reset/Reload**.
 - f. Wait 10 minutes.
- If you are using an HMC Enhanced+ interface, complete the following steps:



- a. In the navigation area, click the **Resources** icon , and then select **All Systems**.
- b. To enable the tasks for the server, select the name of that server.
- c. Click **Actions > View System Partitions**.
- d. To enable the tasks for the partition, select the name of that partition.
- e. In the navigation area, click **Serviceability > Serviceability**.
- f. In the content pane, under the **Control Panel Functions** section, click **(67) Disk Unit IOP Reset/Reload**.
- g. Wait 10 minutes.

Did the reset successfully clear the control panel SRC or management console panel value and can commands be entered on the partition console?

No: Continue with the next step.

Yes: Look for a Service Action Log (SAL) entry since the last IPL, and use it to fix the problem (see Searching the service action log). If a B6xx 5090 SRC occurred since the last IPL, look for other SRC entries and take action on them first. **This ends the procedure.**

8. Is the SRC the same reference code that sent you here?

Yes: The same reference code occurred. Continue with the next step.

No: Collect all words of the reference code and perform, problem analysis to resolve the new problem. **This ends the procedure.**

9. Powering off and powering on the affected IOP domain may clear the attention reference code. Perform the following steps:

If you are working from the control panel:

- a. Select *Manual* mode on the control panel.
- b. Select **Function 25** and press Enter.
- c. Select **Function 26** and press Enter.
- d. Select **Function 68** and press Enter to power off the domain.
- e. After the domain has been powered off or 10 minutes have passed, select **Function 69** and press Enter to power on the domain.
- f. Wait 10 minutes.
- g. Select **Function 25** and press Enter to disable the service functions on the control panel.


If you are working from the HMC:

Choose one of the following navigation options depending on the interface type of the Hardware Management Console (HMC):

- If you are using an HMC Classic or HMC Enhanced interface, complete the following steps:
 - a. In the navigation area, select **Systems Management**.

- b. In the contents area, click the server on which the logical partition is located.
- c. In the contents area, select the logical partition.
- d. Click **Serviceability > Control Panel Functions**.
- e. Select **(68) Concurrent Maintenance Power Off Domain**.
- f. After the domain has been powered off or 10 minutes have passed, select **(69) Concurrent Maintenance Power On Domain**.
- g. Wait 10 minutes.
- If you are using an HMC Enhanced+ interface, complete the following steps:



- a. In the navigation area, click the **Resources** icon , and then select **All Systems**.
- b. To enable the tasks for the server, select the name of that server.
- c. Click **Actions > View System Partitions**.
- d. To enable the tasks for the partition, select the name of that partition.
- e. In the navigation area, click **Serviceability > Serviceability**.
- f. In the content pane, under the **Control Panel Functions** section, click **(68) Concurrent Maintenance Power Off Domain**.
- g. After the domain has been powered off or 10 minutes have passed, select **(69) Concurrent Maintenance Power On Domain**.
- h. Wait 10 minutes.

Did this successfully clear the control panel SRC or management console panel value, and can commands be entered on the partition console?

No: Continue with the next step.

Yes: Look for a SAL entry since the last IPL, and use it to fix the problem (see Searching the service action log). If a B6xx 5090 SRC occurred since the last IPL, look for other SRC entries and take action on them first. **This ends the procedure.**

10. Is the SRC the same reference code that sent you here?

Yes: The same reference code occurred. Continue with the next step.

No: Collect all words of the reference code and perform problem analysis to resolve the new problem. **This ends the procedure.**

11. Perform a main storage dump, then perform an IPL by performing the following:

If you are working from the control panel:

- a. Select *Manual* mode on the control panel.
- b. Select **Function 22** and press Enter to dump the main storage to the load-source disk unit.
- c. Wait for SRC A100 300x to occur.
- d. Select **Function 22** and press Enter again.
- e. Copy the dump file for service.
- f. Then perform an IPL to DST (see Performing an IPL to dedicated service tools).


If you are working from the HMC:

Choose one of the following navigation options depending on the interface type of the Hardware Management Console (HMC):

- If you are using an HMC Classic or HMC Enhanced interface, complete the following steps:
 - a. In the navigation area, select **Systems Management > Servers**.
 - b. In the contents area, click the server on which the logical partition is located.
 - c. In the contents area, select the logical partition.
 - d. From the Tasks menu, select **Operations > Restart**.

- e. In the Restart Partition window, select **Dump**. Then click **OK**.
- If you are using an HMC Enhanced+ interface, complete the following steps:



- a. In the navigation area, click the **Resources** icon , and then select **All Systems**.
- b. To enable the tasks for the server, select the name of that server.
- c. Click **Actions** > **View System Partitions**.
- d. To enable the tasks for the partition, select the name of that partition.
- e. Click **Actions** > **Restart**.
- f. In the Restart Partition window, select **Dump**. Then click **OK**.

Does a different SRC occur, or does a display appear on the console showing reference codes?

No: Continue with the next step.

Yes: Perform problem analysis to correct the new problem. **This ends the procedure.**

12. Does the same reference code occur?

- **Yes:** Continue with the next step.
- **No:** The problem is intermittent. Perform the following:
 - a. Print the system product activity log for the magnetic storage subsystem and print the LIC logs with a major code of 1000.
 - b. Copy the main storage dump to removable media (see Managing dumps).
 - c. Contact your next level of support and provide them with this information. **This ends the procedure.**

13. Are characters 7-8 of the top 16 character line of function 12 (2 rightmost characters of word 2) equal to 13 or 17?

Yes: Continue with the next step.

No: Go to step 16 on page 81.

14. Use the word 1 through 9 information recorded on the Problem summary form to determine the disk unit that stopped communicating with the system:

- Characters 9-16 of the top 16 character line of function 12 (word 3) contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 12 (word 4) contains the unit address.
- Characters 1-8 of the top 16 character line of function 13 (word 6) may contain the disk unit type, level and model number.
- Characters 13-16 of the top 16 character line of function 13 (4 rightmost characters of word 7) may contain the disk unit reference code.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) may contain the disk unit serial number.

Note: For 2105 and 2107 disk units, characters 4-8 of the bottom 16 character line of function 13 (5 rightmost characters of word 8) contain the disk unit serial number.

15. Is the disk unit reference code 0000?

- **No:** Using the information from step 14, find the table for the indicated disk unit type. Perform problem analysis for the disk unit reference code. **This ends the procedure.**
- **Yes:** Perform the following steps:
 - a. Determine the IOP type by using characters 9-12 of the bottom 16 character line of function 13 (4 leftmost characters of word 9).
 - b. Find the unit reference code table for the IOP type. Determine the unit reference code by using characters 13-16 of the bottom 16 character line of function 13 (4 rightmost characters of word 9).

- c. Perform problem analysis for the unit reference code. **This ends the procedure.**
16. Are characters 7-8 of the top 16 character line of function 12 (the two rightmost characters of word 2) equal to 27?
Yes: Continue with the next step.
No: Go to step 20.
17. Use the word 1 through 9 information recorded on the Problem summary form to determine the disk unit that stopped communicating with the system:
- Characters 9-16 of the top 16 character line of function 12 (word 3) contain the IOP direct select address.
 - Characters 1-8 of the bottom 16 character line of function 12 (word 4) contains the disk unit address
 - Characters 9-16 of the bottom 16 character line of function 12 (word 5) contains the disk unit type, level and model number.
 - Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit serial number.
- Note:** For 2105 and 2107 Disk Units, characters 4-8 of the bottom 16 character line of function 13 (5 rightmost characters of word 8) contain the disk unit serial number.
- Characters 13-16 of the bottom 16 character line of function 13 (4 rightmost characters of word 9) contain the disk unit reference code.
18. Is the disk unit reference code 0000?
 - **No:** Continue with the next step.
 - **Yes:** Find the table for the indicated disk unit type. Then find unit reference code (URC) 3002 in the table, and exchange the FRUs for that URC, one at a time.

Note: Do not perform any other isolation procedures that are associated with URC 3002.
This ends the procedure.

19. Are characters 9-16 of the bottom 16 character line of function 13 (word 9) B6xx 51xx?
Yes: Using the B6xx table, perform problem analysis for the 51xx unit reference code. **This ends the procedure.**
No: Using the information from step 17, find the table for the indicated disk unit type. Perform problem analysis for the disk unit reference code. **This ends the procedure.**

20. Are the 2 rightmost characters of word 2 on the Problem summary form equal to 62?
No: Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9) and use this information instead of the information in word 1 for the reference code. **This ends the procedure.**
Yes: Continue with the next step.

21. Are characters 9-16 of the top 16 character line of function 12 (word 3) equal to 00010004?
Yes: Continue with the next step.
No: Go to step 24 on page 82.

22. Are characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) equal to 0000?
No: Continue with the next step.
Yes: Go to step 25 on page 82.

23. Note the following:

 - Characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) contain the disk unit reference code.
 - Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit address.

- Characters 9-16 of the top 16 character line of function 13 (word 7) contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit type, level and model number.

Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 - 4 leftmost characters of word 8), and use characters 13-16 of the bottom 16 character line of function 12 (4 rightmost characters of word 5) as the unit reference code. **This ends the procedure.**

24. Are characters 9-16 of the top 16 character line of function 12 (word 3) equal to 0002000D?

- **Yes:** Continue with the next step.
- **No:** Use the information in characters 9-16 of the bottom 16 character line of function 13 (word 9), instead of the information in word 1 for the reference code, and perform problem analysis.
 - Characters 1-8 of the top 16 character line of function 13 (word 6) may contain the disk unit address.
 - Characters 9-16 of the top 16 character line of function 13 (word 7) may contain the IOP direct select address.
 - Characters 1-8 of the bottom 16 character line of function 13 (word 8) may contain the disk unit type, level and model number. **This ends the procedure.**

25. Note the following:

- Characters 1-8 of the top 16 character line of function 13 (word 6) contains the disk unit address.
- Characters 9-16 of the top 16 character line of function 13 (word 7) contain the IOP direct select address.
- Characters 1-8 of the bottom 16 character line of function 13 (word 8) contains the disk unit type, level and model number.

Find the table for the disk unit type (characters 1-4 of the bottom 16 character line of function 13 (4 leftmost characters of word 8) and use 3002 as the unit reference code. Exchange the FRUs for URC 3002 one at a time. **This ends the procedure.**

LICIP14

Licensed Internal Code detected a card slot test failure.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

1. Has the I/O adapter moved to a new card location?

Yes: Continue with the next step.

No: Go to step 4.

2. Perform one of the following, and then continue with the next step:

- Use the concurrent maintenance option in Hardware Service Manager in SST/DST to power off, remove, reinsert, and power on the I/O adapter.
- Power off the system, remove and reinsert the I/O adapter. Then IPL the system.

3. Does the reference code occur again for this same I/O adapter?

- **Yes:** Continue with the next step.
- **No:** No further service action is needed.

This ends the procedure.

4. Move the I/O adapter to a different card location by performing one of the following, and then continue with the next step:

- Use the concurrent maintenance option in Hardware Service Manager in SST/DST to power off, remove the I/O adapter, install the I/O adapter in a different card location, and power on the I/O adapter.
 - Power off the system, remove the I/O adapter, install the I/O adapter in a different card location, and then IPL the system.
5. Does the same reference code occur again for this I/O adapter?
- **Yes:** Replace the I/O adapter.
This ends the procedure.
 - **No:** Replace the backplane.
This ends the procedure.

LICIP15

Use this procedure to help you recover from an initial program load (IPL) failure.

1. Is the system managed by Hardware Management Console (HMC) or Integrated Virtualization Manager (IVM)?
 - Yes:** Continue with the next step.
 - No:** Go to step 4.
2. Check the LPAR configuration to ensure that the load source and alternate load source devices are valid. Is the LPAR configuration correct?
 - Yes:** Continue with the next step.
 - No:** Correct the LPAR configuration problem. **This ends the procedure.**
3. Is the load source hosted by another partition?
 - Yes:** Contact your next level of support.
 - No:** Continue with the next step.
4. Did the failure occur when you were performing a type-D IPL?
 - **No:** Go to step 10 on page 84.
 - **Yes:** Perform the following steps:
 - a. Ensure that the device is ready and has valid install media.
 - b. Ensure that the device has the correct SCSI address and that any cables are properly connected and terminated.

If a correction is made during the above checks, try the IPL again. If none of the above items resolve the problem, continue with the next step.
5. Are the load source and alternate load source devices controlled by the same I/O adapter, and does the load source disk unit have SLIC loaded on it?
 - Yes:** Continue with the next step.
 - No:** Go to step 7 on page 84.
6. Perform a type-B IPL in manual mode. Does the same SRC occur?
 - **No:** Continue with the next step.
 - **Yes:** Replace the following items, one at a time, and try the IPL again until the problem is resolved (see Part locations and location codes):
 - a. The I/O adapter controlling load source and alternate load source devices.
 - Note:** The I/O adapter may be embedded on the system unit backplane.
 - b. The common cable, if present, attached between both the load source and alternate load source and the controlling I/O adapter.
 - c. If none of the items above resolve the problem, contact your next level of support. **This ends the procedure.**

7. Replace the following items, one at a time, and try the type-D IPL again until the problem is resolved (see Part locations and location codes):
 - a. Media in the alternate load source device
 - b. Device cables (if present)
 - c. Media device
 - d. Media backplane
 - e. I/O adapter controlling the alternate load source device

Note: The I/O adapter may be embedded on the system unit backplane

 - f. If the problem persists after replacing each of these parts, contact your next level of support. **This ends the procedure.**
8. You performed a type A or type B IPL. Is the load source I/O adapter a Fibre Channel adapter?

Yes: Continue with the next step.

No: Continue with step 10.
9. Perform a type-D IPL in manual mode to DST. Look for other SRCs and use them to resolve the problem. If there are no SRCs, or if the SRCs do not resolve the problem, perform the actions for the 2847 3100 SRC. **This ends the procedure.**
10. Is the device in a valid location (see Part locations and location codes)?

Yes: Continue with the next step.

No: Correct the device location problem and try the IPL again. If the problem persists, continue with the next step.
11. Perform a type-D IPL in manual mode to DST. Is the type-D IPL successful?
 - **No:** Continue with the next step.
 - **Yes:** Look for other SRCs and use them to resolve the problem. If there are no SRCs, or the SRCs do not resolve the problem, replace the following items, one at a time, until the problem is resolved (see Part locations and location codes):
 - a. Load source disk drive
 - b. Cables (if present)
 - c. Disk drive backplane
 - d. I/O adapter controlling the load source device

Note: The I/O adapter may be embedded on the system unit backplane

 - e. Backplane that the I/O adapter is plugged into
 - f. If the problem persists after replacing each of these parts, contact your next level of support. **This ends the procedure.**
12. The type-D IPL in manual mode to DST was not successful. Is the I/O adapter embedded on the system unit backplane?

No: Continue with the next step.

Yes: Replace the system unit backplane and try the IPL again. If the IPL still fails, contact your next level of support. **This ends the procedure.**
13. Are the load source and alternate load source controlled by the same I/O adapter?

No: Go to step 16 on page 85.

Yes: Continue with the next step.
14. Replace the I/O adapter and perform a type-A or type-B IPL. Does the IPL complete successfully?

Yes: **This ends the procedure.**

No: Continue with the next step.
15. Perform a type-D IPL in manual mode to DST. Is the type-D IPL successful?
 - **No:** Continue with the next step.

- **Yes:** Look for other SRCs and use them to resolve the problem. If there are no SRCs, or the SRCs do not resolve the problem, replace the following items, one at a time, until the problem is resolved (see Part locations and location codes):
 - a. Load source disk drive
 - b. Cables (if present)
 - c. Disk drive backplane
 - d. I/O adapter controlling the load source device

Note: The I/O adapter may be embedded on the system unit backplane

- e. Backplane that the I/O adapter and I/O processor are plugged into
- f. If the problem persists after replacing each of these parts, contact your next level of support.

This ends the procedure.

16. Replace the backplane that the I/O adapter is plugged into and try the IPL again. If the IPL still fails, contact your next level of support. **This ends the procedure.**

LICIP16

Use this procedure to identify an adapter that is operational but is not located in the same partition as its associated adapter.

An adapter identified that its associated adapter is operational but is not located in the same partition. Use this procedure to identify the serial number and then find the location of the associated adapter and reassign it so that both adapters are in the same partition. **Note:** If the associated adapter is located in a different IBM i partition, there might also be a B600690A logged against the associated adapter in that partition.

1. The adapter against which the B600690A is logged has identified that its associated adapter can not be found in this partition. Find the resource name that this error was logged against. This can be obtained from the Service Action Log. Then, using the resource name, perform the following steps:
 - a. Access SST or DST.
 - b. Select **Start a Service Tool**.
 - c. Select **Hardware Service Manager**.
 - d. Select **Locate resource by resource name**.
 - e. Enter the resource name that this error was logged against.
 - f. Take the option to Display detail for the adapter.
2. The bottom of the resource detail screen displays any combination of the following information:


```
Attached storage IOA resource name. :
Attached storage IOA serial number. :
Attached storage IOA link status. . :
```

Or

```
Attached auxiliary IOA resource name:
Attached auxiliary IOA serial number:
Attached auxiliary IOA link status. . :
```

Or

```
Remote storage IOA resource name. . :
Remote storage IOA serial number. . :
Remote storage IOA link status. . . :
```
3. Using the serial number information displayed for the Attached or Remote IOA, have the customer determine which partition currently owns the adapter with that serial number by using logical resource or VPD utilities in each of the partitions on the system.

Note: The CCIN of the associated adapter is the first four characters of word 6 of the SRC.

4. Then, have the customer ensure that both adapters are owned by the same partition. For further assistance, the customer should contact their software service provider. **This ends the procedure.**

Logical partition isolation procedure

Identify logical partition (LPAR) configuration conditions and the associated corrective actions.

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.
 - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

LPRIP01

Use this procedure to isolate the problem when LPAR configuration data does not match the current system configuration.

1. Is there **only one** B6005311 error logged, and is it against the load source device for the partition, in either the primary or a secondary partition?
 - **Yes:** Is the reporting partition the primary partition?
 - **Yes:** Continue with the next step.
 - **No:** Go to step 3.
 - **No:** Go to step 4.
2. Was the load source disk unit migrated from another partition within the same system?
 - **Yes:** Is this load source device intended to be the load source for the primary partition?
 - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions > Recover configuration data > Accept load source disk unit. This ends the procedure.**
 - **No:** Power off the system. Return the original load source disk to the primary partition and perform a system IPL. **This ends the procedure.**
 - **No:** The load source disk unit has not changed. Contact your next level of support. **This ends the procedure.**
3. The reporting partition is a secondary partition.
 Since the last IPL of the reporting partition, has one of the following events occurred?
 - Has the primary partition time/date been moved backward to a time/date earlier than the previous setting?
 - Has the system serial number been changed?
 - Was the load source disk unit in this secondary partition replaced intentionally with a load source from another system or another partition from the same system?
 - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions > Recover configuration data > Accept load source disk unit. This ends the procedure.**
 - **No:** Contact your next level of support. **This ends the procedure.**
4. Are there **multiple** B6005311 SRCs logged in the same partition?
 - **Yes:** Continue with the next step.
 - **No:** None of the conditions in this procedure have been met. Contact your next level of support. **This ends the procedure.**
5. Is the resource for **one** of the B6005311 SRCs the load source device and are **all** of the other B6005311 entries for resources which are non-configured disk units?

Note: To determine if a disk unit is a non-configured disk unit, see the "Work with disk unit options" section in the "DST options" section of the DST topic collection in the *iSeries Service Functions* information.

- **Yes:** Is the partition that is reporting the error the **primary** partition?
 - **Yes:** Continue with the next step.
 - **No:** Go to step 7 on page 88.

- **No:** Go to step 8.
6. Was the load source disk unit migrated from another partition within the same system?
- **Yes:** Is this load source device intended to be the load source for the primary partition?
 - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions > Recover configuration data > Accept load source disk unit. This ends the procedure.**
 - **No:** Power off the system. Return the original load source disk to the primary partition and perform a system IPL. **This ends the procedure.**
 - **No:** The load source disk unit has not changed. Contact your next level of support. **This ends the procedure.**
7. The reporting partition is a secondary partition.
Since the last IPL of the reporting partition, has one of the following events occurred?
- Has the primary partition time/date been moved backward to a time/date earlier than the previous setting?
 - Has the system serial number been changed?
 - Was the load source disk unit in this secondary partition, replaced intentionally with a load source from another system or another partition from the same system?
 - **Yes:** To accept the load source disk unit: Go to SST/DST in the current partition and select **Work with system partitions > Recover configuration data > Accept load source disk unit. This ends the procedure.**
 - **No:** Contact your next level of support. **This ends the procedure.**
8. One or more B6005311 SRCs have been logged in the same partition.
Do all of the B6005311 errors have a resource that is a non-configured disk unit in the partition?
- Note:** To determine if a disk unit is a non-configured disk unit, see the "Work with disk unit options" section in the "DST options" section of the DST topic collection in the *iSeries Service Functions* information.
- **Yes:** Continue with the next step.
 - **No:** None of the conditions in this procedure have been met. Contact your next level of support. **This ends the procedure.**
9. Have any disk unit resources associated with the B6005311 SRCs been added to the partition since the last IPL of the partition?
- **No:** Continue with the next step.
 - **Yes:** Perform the following steps to clear non-configured disk unit configuration data:
 - a. Go to SST/DST in the partition and select **Work with system partitions > Recover configuration data > Clear non-configured disk unit configuration data.**
 - b. Select each unit in the list that is new to the system and press **Enter**.
 - c. Continue the system IPL. **This ends the procedure.**
10. None of the resources that are associated with the B6005311 SRCs are disk units that were added to the partition since the last IPL of the partition.
Has a scratch install recently been performed on the partition that is reporting the errors?
- **No:** Continue with the next step.
 - **Yes:** Go to step 13 on page 89.
11. If a scratch install was not performed, was the clear configuration data option recently used to discontinue LPAR use?
- **Yes:** Continue with the next step.
 - **No:** The **Clear configuration data** option was not used. Contact your next level of support. **This ends the procedure.**

12. Perform the following steps to clear non-configured disk unit configuration data:
 - a. Go to SST/DST in the partition and select **Work with system partitions > Recover configuration data > Clear non-configured disk unit configuration data**.
 - b. Select each unit in the list that is new to the system and press **Enter**.
 - c. Continue the system IPL. **This ends the procedure.**
13. Was the load source device previously mirrored before the scratch install?
 - **Yes:** Continue with the next step.
 - **No:** Go to step 15.
14. Perform the following steps to clear the old configuration data from the disk unit that was mirroring the old load source disk
 - a. Go to SST/DST in the partition and select **Work with system partitions > Recover configuration data > Clear non-configured disk unit configuration data**.
 - b. Select the former load source mirror in the list and press **Enter**.
15. Is the primary partition reporting the B6005311 errors?
 - **No: This ends the procedure.**
 - **Yes:** Does the customer want multiple partitions on the system?
 - **No: This ends the procedure.**
 - **Yes:** Use the **Recover primary partition configuration data** option to retrieve the LPAR configuration data from other devices in the system.
 - a. Go to SST/DST in the primary partition and select **Work with system partitions > Recover configuration data > Recover primary partition configuration data**. The system will perform an automatic IPL.
 - b. Verify the information that appears.
 - The device should be a former load source device from a secondary partition.
 - The time and date should reflect a time when that partition was active. It should be more recent than the last change to the logical partition configuration. **This ends the procedure.**

Operations console isolation procedures

These procedures help you to isolate a failure with the Operations Console.

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.

- For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

The following safety notices apply throughout this section.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion unit where the field-replaceable unit (FRU) is located before removing, exchanging, or installing a FRU.

OPCIP03

Use this procedure to isolate a bringup failure with Operations Console.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.
 - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

Use this procedure to isolate an Operations Console bringup failure when the SRC on the panel is A6xx5008 or B6xx5008. If you are not using the Operations Console, see A6005004. This procedure only works with cable-connected and LAN configurations. It is not valid for dial-connected configurations.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determine if the system has logical partitions before continuing with this procedure.
2. Is the SRC on the panel A6xx5008 or B6xx5008?
 - **No: This ends the procedure.**
 - **Yes:** Are you connecting Operations Console using the ASYNC adapter?
 - Yes:** Continue with the next step.
 - No:** You are connecting using a LAN adapter. Go to step 6.
3. Are words 17, 18, and 19 all equal to 00000000?
 - **Yes:** Report the problem to your next level of support. **This ends the procedure.**
 - **No:** Is word 17 equal to 00000001?
 - No:** Continue with the next step.
 - Yes:** The ASYNC adapter was not detected. Ensure that the ASYNC adapter card is installed, or replace the IOA and try again. **This ends the procedure.**
4. Is word 17 equal to 00000002?
 - **Yes:** On the ASYNC adapter card that was found, no cable was detected. Word 18 contains the card position. Locate the ASYNC adapter card in this card position, and ensure that the external cable is attached. Install or replace the external cable. **This ends the procedure.**
 - **No:** Is word 17 equal to 00000003?
 - No:** Continue with the next step.
 - Yes:** The cable that was detected does not have the correct cable ID. Word 18 contains the card position. Word 19 contains the cable ID. Locate the ASYNC adapter card in this card position, and verify that the correct cable is attached, or replace the cable. **This ends the procedure.**
5. Is word 17 equal to 00000004?
 - No:** Report the problem to you next level of support. **This ends the procedure.**
 - Yes:** Operations Console failed to make a connection because the port is already being used. Word 18 contains the card position. Disconnect the active communications session and try using the resource again. **This ends the procedure.**
6. Are words 13, 14 and 15 all equal to 00000000?
 - **Yes:** Report the problem to you next level of support. **This ends the procedure.**
 - **No:** Is word 13 equal to 00000002?
 - No:** Continue with the next step.
 - Yes:** The LAN hardware failed to activate. Replace the LAN IOA being used. **This ends the procedure.**
7. Is word 13 equal to 00000003?
 - **No:** Continue with the next step.
 - **Yes:** A hardware error occurred. Word 14 contains the error code (example: 53001A80). Word 15 contains the card position.
 - Is the error code equal to 53001A80?
 - Yes:** The network cable is not attached to the LAN adapter, the cable is defective, or the network is not operational. **This ends the procedure.**
 - No:** The LAN adapter hardware is not operational. Replace the hardware and try again. **This ends the procedure.**
8. Is word 13 equal to 00000004?

- **Yes:** The console did not respond. Word 14 contains the number of attempts made. Word 15 contains the card position. The system is inserted into the network but there is no connection to the client (PC). Verify the configuration for the network at the system and client; verify the configuration of Operations Console. **This ends the procedure.**
- **No:** Is word 13 equal to 00000005?
 - No:** Report the problem to your next level support. **This ends the procedure.**
 - Yes:** IP information was received from the console. Word 14 contains the IP address that was received. Verify the configuration data for the client (PC) or verify the configuration for the network. **This ends the procedure.**

PCI bus isolation procedures

Use PCI bus isolation procedures if there is not a management console attached to the server. If the server is connected to a management console, use the procedures that are available on the management console to continue FRU isolation.

PCI bus isolation using AIX, Linux, or the management console

Isolate a PCI bus problem from the management console or while running in the AIX® or Linux environment.

If you have a management console, then this procedure should be performed from the management console as part of the management console directed service.

If you do not have a management console, then you should perform this procedure when directed by the maintenance package.

Isolating a PCI bus problem while running AIX or Linux

Choose from the following:

- If you are running AIX, go to Running the online and standalone diagnostics log to isolate the PCI bus failure with online diagnostics in concurrent mode.
- If you are running Linux, go to Running the online and standalone diagnostics log to isolate the PCI bus failure with stand-alone diagnostics.

Isolating a PCI bus problem from the management console

To isolate a PCI bus problem from the management console, check the serviceable event view for the server for FRU part locations associated with the serviceable event, then continue with this procedure:

1. Did the serviceable event view provide the locations for the failing FRUs?
 - Yes:** Use those locations to exchange the given FRUs one at a time until the problem is resolved. **This ends the procedure.**
 - No:** Continue with the next step.
2. Go to “DSA translation” on page 96 to determine the Direct Select Address (DSA).
3. Perform the following steps:
 - a. Record the bus number value (BBBB) from the DSA and convert it to decimal format.
 - b. Search for the decimal system bus number in the partition resources screens on the management console.
 - c. Record the frame or unit type and continue with the next step.
4. See “Card positions” on page 96 and use the BBBB value that you recorded to identify the card position. Then return to the procedure that sent you here. **This ends the procedure.**

Verifying a system PCI bus repair

Use this procedure to verify a repair for a system PCI bus.

Within this procedure, the terms "system" and "logical partition" are interchangeable when used individually.

1. Perform this procedure from the logical partition you were in when you were sent to this procedure, or from the management console if this error was worked from the management console.
2. If you previously powered off a system or logical partition, or an expansion unit during this service action, then you need to power it off again.
3. Install all cards, cables, and hardware, ensuring that all connections are tight. You can use the system configuration list to verify that the cards are installed correctly.
4. Power on any expansion unit, logical partition or system unit that was powered off during the service action. Is one of the following true?
 - If the system or a logical partition was powered off during the service action, does the IPL complete successfully to the IPL or does Install the System display?
 - If an expansion unit was powered off during the service action, does the expansion unit power on complete successfully?
 - If any IOA card locations were powered off using concurrent maintenance during the service action, do the slots power on successfully?
 - If you exchanged a FRU that should appear as a resource or resources to the system, such as an IOA, does the new FRU's resource appear in HSM as operational?

Yes: Continue with the next step.

No: Verify that you have followed the power off, remove and replace, and power-on procedures correctly. When you are sure that you have followed the procedures correctly, then exchange the next FRU in the list. If there are no more FRUs to exchange, then contact your next level of support. **This ends the procedure.**

5. Does the system or logical partition have mirrored protection? Select Yes if you are not sure.

No: Continue with the next step.

Yes: From the Dedicated Service Tools (DST) display, select **Work with disk units**, and resume mirrored protection for all units that have a suspended status.

6. Choose from the following options:

- If you are working from a partition, from the Start a Service Tool display, select **Hardware service manager** and look for the I/O adapters that have a failed or missing status.
- If you are working from a management console, look at the system unit properties.

a. Choose the I/O tab.

b. Look for IOAs that have a failed or missing status.

Are all I/O adapter cards operational?

Note: Ignore any IOAs that are listed with a status of not connected.

Yes: Go to step 10 on page 95.

No: Display the logical hardware resource information for the non-operational I/O adapters. For all I/O adapters that are failing; record the bus number. Continue with the next step.

7. Perform the following steps:

a. Return to the Dedicated Service Tools (DST) display.

b. Display the Product Activity Log.

c. Select **All logs** and search for an entry with the same bus address information as the non-operational I/O adapter. Do not include informational or statistical entries in your search. Use only entries that occurred during the last IPL.

Did you find an entry for the SRC that sent you to this procedure?

No: Continue with the next step.

Yes: Ask your next level of support for assistance. **This ends the procedure.**

8. Did you find a B600 6944 SRC that occurred during the last IPL?

Yes: Continue with the next step.

No: A different SRC is associated with the non-operational I/O adapter. Go to the Starting a repair action procedure and look up the new SRC to correct the problem. **This ends the procedure.**

9. Is there a B600 xxxx SRC that occurred during the last IPL other than the B600 6944 and informational SRCs?

Yes: Use the other B600 xxxx SRC to determine the problem. Go to the Starting a repair action and look up the new SRC to correct the problem. **This ends the procedure.**

No: You connected an I/O adapter in the wrong card position. Use the system configuration list to compare the cards. When you have corrected the configuration, go to the start of this procedure to verify the bus repair. **This ends the procedure.**

10. If in a partition, use the hardware service manager function to print the system configuration list. Are there any configuration mismatches?

No: Continue with the next step.

Yes: Ask your next level of support for assistance. **This ends the procedure.**

11. You have verified the repair of the system bus.

a. If for this service action only an expansion unit was powered off or only the concurrent maintenance function was used for an IOA, then continue with the next step.

b. Otherwise, perform the following steps to return the system to the customer:

1) Power off the system or logical partition. See Powering on and powering off the system for procedures on powering on or off your system.

2) Select the operating mode with which the customer was originally running.

3) Power on the system or logical partition.

12. If the system has logical partitions and the entry point SRC was B600 xxxx, then check for related problems in other logical partitions that could have been caused by the failing part. **This ends the procedure.**

Analyzing a PCI bus reference code

Use Word 7 of the reference code to determine the bus number, bus type, and logical card number from the direct select address (DSA).

Physical card slot labels and card positions for PCI buses are determined by using the DSA and the appropriate system unit or I/O unit card positions. See “Card positions” on page 96 for details.

Table 2. PCI reference code analysis

Word of the reference code	Control panel function	Panel function characters	Format	Description
1	11	1–8	B600 uuuu or B700 uuuu	uuuu = unit reference code (69xx)
1 – extended reference code information	11	9–16	iiii	Frame ID of the failing resource
1 – extended reference code information	11	17–24	ffff	Frame location
1 – extended reference code information	11	25–32	bbbb	Board position
2	12	1–8	MIGVEP62 or MIGVEP63	See System Reference Code (SRC) Format Description.

Table 2. PCI reference code analysis (continued)

Word of the reference code	Control panel function	Panel function characters	Format	Description
3	12	9–16	cccc cccc	Component reference code
4	12	17–24	pppp pppp	Programming reference code
5	12	25–32	qqqq qqqq	Program reference code high order qualifier
6	13	1–8	qqqq qqqq	Program reference code low order qualifier
7	13	9–16	BBBB xxxx	See “DSA translation”
8	13	17–24	TTTT MMMM	Type (TTTT) and model (MMMM) of the failing item (if not zero)
9	13	25–32	uuuu uuuu	Unit address (if not zero)

DSA translation

The Direct Select Address (DSA) may be coded in word 7 of the reference code.

This DSA is a PCI system bus number. With the following information, and the information in the card position table, you can isolate a failing PCI bus. Use the following instructions to translate the DSA:

- The DSA is of the form BBBB xxxx, and separates into the following parts:
 - BBBB = bus number
 - xxxx = not used
- The bus number is a PCI bus number in hexadecimal. Convert the number to decimal, and then continue with the next step.
- Use one of the following guides to determine the type of system unit or expansion unit in which the bus is located:
 - If you are using a management console interface, view the managed system's properties on the management console.
 - If you are using AIX or Linux, use the command line interface to determine the enclosure type. On the command line, type the following:

```
lshwres -r io --rsubtype bus
```

The result will be in the form:

```
unit_phys_loc=Uxxxx.yyy.zzzzzz,bus_id=a,  
.....
```

Find the bus ID "a" entry that matches the decimal bus number you determined in step 2. Using the corresponding Uxxxx value, look up the unit model or enclosure type using the Unit Type and Locations table in Part locations and location codes.
- See “Card positions” to search for the bus number that matches the system unit or expansion unit type where the bus is located. **This ends the procedure.**

Card positions

The following information correlates PCI bus numbers to PCI card location codes for the listed machine types and models.

PCI bus numbers in system units are assigned as indicated in the following tables. PCI bus numbers in expansion units are assigned by Licensed Internal Code or firmware as the buses are discovered.

- Card positions for model 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A
- Card positions for model 8247-42L, 8286-41A, or 8286-42A
- Card positions for model 8408-44E or 8408-E8E
- Card positions for model 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME
- Card positions for a PCIe3 6-slot fanout module in an EMX0 PCIe3 expansion drawer

Table 3. Card positions for a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A

Bus number (hexadecimal/decimal)	Item that is designated by the bus number	Location
12/18	Internal PCIe bus	Un-P1
1A/26	Internal PCIe bus	Un-P1
1B/27	PCIe embedded USB controller <ul style="list-style-type: none"> • P1-T3 (rear on 5148-21L, 8247-21L, and 8284-21A only) • P1-T4 (rear on 5148-21L, 8247-21L, and 8284-21A only) • P1-T5 (front) • P1-T6 (front) 	Un-P1
28/40	PCIe3 x8 IOA card	Un-P1-C2
29/41	PCIe3 x16 IOA card	Un-P1-C3
21/33	PCIe3 x16 IOA card	Un-P1-C5
18/24	PCIe3 x16 IOA card	Un-P1-C6
10/16	PCIe3 x16 IOA card	Un-P1-C7
1D/29	PCIe3 x8 IOA card	Un-P1-C9
1E/30	PCIe3 x8 IOA card	Un-P1-C10
13/19	PCIe3 x8 IOA card	Un-P1-C11
14/20	PCIe3 x8 IOA card	Un-P1-C12
15/21	PCIe3 x8 SAS RAID internal adapter or PCIe3 x8 cache SAS RAID internal adapter	Un-P1-C14
1F/31	PCIe3 x8 SAS RAID internal adapter or PCIe3 x8 cache SAS RAID internal adapter	Un-P1-C15

Table 4. Card positions for an 8247-42L, 8286-41A, or 8286-42A

Bus number (hexadecimal/decimal)	Item that is designated by the bus number	Location
12/18	Internal PCIe bus	Un-P1
1A/26	Internal PCIe bus	Un-P1
1B/27	PCIe embedded USB controller <ul style="list-style-type: none"> • P1-T1 (rear) • P1-T2 (rear) • P1-T5 (front) • P1-T6 (front) 	Un-P1
28/40	PCIe3 x8 IOA card	Un-P1-C2
29/41	PCIe3 x16 IOA card	Un-P1-C3
20/32	PCIe3 x8 IOA card	Un-P1-C4

Table 4. Card positions for an 8247-42L, 8286-41A, or 8286-42A (continued)

Bus number (hexadecimal/decimal)	Item that is designated by the bus number	Location
21/33	PCIe3 x16 IOA card	Un-P1-C5
18/24	PCIe3 x16 IOA card	Un-P1-C6
10/16	PCIe3 x16 IOA card	Un-P1-C7
1C/28	PCIe3 x8 IOA card	Un-P1-C8
1D/29	PCIe3 x8 IOA card	Un-P1-C9
1E/30	PCIe3 x8 IOA card	Un-P1-C10
13/19	PCIe3 x8 IOA card	Un-P1-C11
14/20	PCIe3 x8 IOA card	Un-P1-C12
15/21	PCIe3 x8 SAS RAID internal adapter or PCIe3 x8 cache SAS RAID internal adapter	Un-P1-C14
1F/31	PCIe3 x8 SAS RAID internal adapter or PCIe3 x8 cache SAS RAID internal adapter	Un-P1-C15

Table 5. Card positions for an 8408-44E or 8408-E8E

Bus number (hexadecimal/decimal)	Item that is designated by the bus number	Location
2A/42	Internal PCIe bus	Un-P1
2B/43	PCIe embedded USB controller on I/O backplane <ul style="list-style-type: none"> • P1-T1 (rear) • P1-T2 (rear) • P1-T3 (front) • P1-T4 (front) 	Un-P1
40/64	PCIe3 x16 IOA card	Un-P1-C1
48/72	PCIe3 x16 IOA card	Un-P1-C2
30/48	PCIe3 x16 IOA card	Un-P1-C3
38/56	PCIe3 x16 IOA card	Un-P1-C4
2C/44	PCIe3 x8 IOA card	Un-P1-C6
2D/45	PCIe3 x8 IOA card	Un-P1-C7
20/32	PCIe3 x16 IOA card	Un-P1-C8
28/40	PCIe3 x16 IOA card	Un-P1-C9
10/16	PCIe3 x16 IOA card	Un-P1-C10
18/24	PCIe3 x8 IOA card	Un-P1-C11
19/25	PCIe3 x16 IOA card	Un-P1-C12
11/17	PCIe3 embedded storage controller (Un-P3-R2) on RAID card (Un-P3)	Un-P3
21/33	PCIe3 embedded storage controller (Un-P3-R1) on RAID card (Un-P3)	Un-P3

Table 6. Card positions for a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

Bus number (hexadecimal/decimal)	Location
<ul style="list-style-type: none"> • 10/16 (node 1) • 20/32 (node 2) • 30/48 (node 3) • 40/64 (node 4) 	Un-P1-C1-C1
<ul style="list-style-type: none"> • 11/17 (node 1) • 21/33 (node 2) • 31/49 (node 3) • 41/65 (node 4) 	Un-P1-C2-C1
<ul style="list-style-type: none"> • 12/18 (node 1) • 22/34 (node 2) • 32/50 (node 3) • 42/66 (node 4) 	Un-P1-C3-C1
<ul style="list-style-type: none"> • 13/19 (node 1) • 23/35 (node 2) • 33/51 (node 3) • 43/67 (node 4) 	Un-P1-C4-C1
<ul style="list-style-type: none"> • 14/20 (node 1) • 24/36 (node 2) • 34/52 (node 3) • 44/68 (node 4) 	Un-P1-C5-C1
<ul style="list-style-type: none"> • 15/21 (node 1) • 25/37 (node 2) • 35/53 (node 3) • 45/69 (node 4) 	Un-P1-C6-C1
<ul style="list-style-type: none"> • 16/22 (node 1) • 26/38 (node 2) • 36/54 (node 3) • 46/70 (node 4) 	Un-P1-C7-C1
<ul style="list-style-type: none"> • 17/23 (node 1) • 27/39 (node 2) • 37/55 (node 3) • 47/71 (node 4) 	Un-P1-C8-C1

Table 7. Card positions for a PCIe3 6-slot fanout module in an EMX0 PCIe3 expansion drawer

Bus number (hexadecimal)	Item that is designated by the bus number	Location
xx1	PCIe3 x16 IOA card	Un-Py-C1
xx2	PCIe3 x8 IOA card	Un-Py-C2
xx3	PCIe3 x8 IOA card	Un-Py-C3
xx4	PCIe3 x16 IOA card	Un-Py-C4
xx5	PCIe3 x8 IOA card	Un-Py-C5
xx6	PCIe3 x8 IOA card	Un-Py-C6

Note: To determine whether P_y is P1 or P2, complete the following steps:

1. Convert the hexadecimal IOA card bus number into a hexadecimal PCIe3 cable adapter bus number by removing the last digit of the bus number. For example, if the IOA card bus number is 102, then the PCIe3 cable adapter bus number is 10.
2. Find the hexadecimal PCIe3 cable adapter bus number in the appropriate system unit table to determine the location of the PCIe3 cable adapter. For example, if the PCIe3 cable adapter bus number is 10, and the adapter is located in a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME, the adapter is in node 1 with location U_n -P1-C1-C1.
3. Trace the cables from the PCIe3 cable adapter in the system unit to the I/O module in the EMX0 PCIe3 expansion drawer. The I/O module on the left side is P1. The I/O module on the right side is P2.

MABIP02

Use this procedure to resolve a problem with a PCI bus.

Perform "MABIP51."

MABIP03

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

MABIP05

Use this procedure to reset an IOP.

Attention: When the IOP reset is performed, all resources controlled by the IOP will be reset. Perform this procedure only if the customer has verified that the IOP reset can be performed at this time.

1. Go to the SST/DST display in the partition which reported the problem. Use STRSST if IBM i is running; use function 21 if STRSST does not work; or IPL the partition to DST.
2. On the Start Service Tools Sign On display, type in a user ID with service authority and password.
3. Select **Start a service tool > Hardware service manager > Logical hardware resources > System bus resources**.
4. Page forward until you find the IOP that you want to reset. For help in identifying the IOP from the Direct Select Address (DSA) in the reference code, see "DSA translation" on page 96.
5. Verify that the IOP are correct by matching the resource names on the display with the resource names in the Service Action Log (SAL) for the problem you are working on.
6. Move the cursor to the IOP that you want to reset, and select **I/O Debug > Reset IOP > IPL IOP**.
This ends the procedure.

MABIP50

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

MABIP51

Use this procedure to resolve a problem with a PCI bus.

1. Is the partition an AIX partition or a Linux partition, or is a management console attached?
No: Continue with the next step.
Yes: Go to "PCI bus isolation using AIX, Linux, or the management console" on page 93 to isolate a PCI bus problem from AIX, Linux, or the management console.

2. Perform PIOCARD. **This ends the procedure.**

MABIP52

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

MABIP53

Use this procedure to determine a card position when the location of the PCI adapter is not available in the failing item list of a serviceable event.

This procedure uses the direct select address (DSA) in the reference code because the location of the PCI adapter was not available in the failing item list of a serviceable event.

1. Are system service tools (SST) or dedicated service tools (DST) available?

No: You cannot identify a card position by using SST or DST. Return to the procedure that sent you here. **This ends the procedure.**

Yes: Continue with the next step.

2. If you were sent to this procedure with a specific direct select address (DSA), then use it. Otherwise, use the DSA in the reference code. For information about finding the DSA in the system reference code words, see "DSA translation" on page 96. The bus number is the 4 leftmost characters of the 8 character DSA. Convert the bus number portion of the DSA from the hexadecimal to the decimal format so that it can be used in SST or DST.
3. Complete the following steps:
 - a. Log in to SST or DST.
 - b. Select **Start a service tool > Hardware service manager > Logical hardware resources > System bus resources**.
 - c. Move the cursor to a system bus resource and select **Display detail** for each bus until you find the bus number, which is in decimal format, that was identified in step 2.
 - d. Record the type-model location information for the frame or unit type.
 - e. Continue with the next step.
4. From the System bus resources display, select **Include non-reporting resources**. Type the decimal bus number in the **System bus(es) to work with** field and press Enter. Then, continue with the next step.
5. From the Logical Hardware Resources on System Bus display, examine the status of all the resources under the bus and locate a failed resource.
 - To examine the status of the IOAs, select **Resources associated with IOP** for each IOP under the bus.
 - To determine the card position of a failed resource, select **Associated packaging resources > Display detail** and record the unit ID and the part number.

Did you find any failed resources?

Yes: Select **Associated packaging resources** and press Enter. Select **Display detail** and press Enter. Record the physical location information for the card position you identified. Return to the procedure that sent you here. **This ends the procedure.**

No: You cannot identify a card position by using SST or DST. Return to the procedure that sent you here. **This ends the procedure.**

MABIP54

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

MABIP55

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

MABIP56

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

MABIP57

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

Power isolation procedures

Use power isolation procedures for isolating a problem in the power system. Use isolation procedures if there is not a management console attached to the server. If the server is connected to a management console, use the procedures that are available on the management console to continue FRU isolation.

Some field replaceable units (FRUs) can be replaced with the unit powered on. Follow the instructions in Part locations and location codes when directed to remove, exchange, or install a FRU.

The following safety notices apply throughout the power isolation procedures. Read all safety procedures before servicing the system and observe all safety procedures when performing a procedure.

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.
 - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.

- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

Power problems

Use the following table to learn how to begin analyzing a power problem.

Table 8. Analyzing power problems

Symptom	What you should do
The system unit does not power on.	See "Cannot power on system unit."
The system unit does not power off.	See "Cannot power off system unit" on page 106.
The system does not remain powered on during a loss of incoming ac voltage and has an uninterruptible power supply (UPS) installed.	See the UPS user's guide that was provided with your unit.

Cannot power on system unit

Perform this procedure until you correct the problem and you can power on the system.

For important safety information before continuing with this procedure, see "Power isolation procedures" on page 102.

1. Attempt to power on the system. See Powering on and powering off the system for information about powering on or off your system. Does the system power on, and is the system power status indicator light on continuously?

Note: The system power status indicator flashes at the slower rate (one flash per two seconds) while powered off, and at the faster rate (one flash per second) during a normal power-on sequence.

No: Continue with the next step.

Yes: Go to step 13 on page 105.

2. Are there any characters displayed on the control panel (a scrolling dot may be visible as a character)?

No: Continue with the next step.

Yes: Go to step 5.

3. Are the mainline ac power cables from the power supply, power distribution unit, or external uninterruptible power supply (UPS) to the customer's ac power outlet connected and seated correctly at both ends?

Yes: Continue with the next step.

No: Connect the mainline ac power cables correctly at both ends and go to step 1 on page 103.

4. Perform the following steps:

- a. Verify that the UPS is powered on (if it is installed). If the UPS will not power on, follow the service procedures for the UPS to ensure proper line voltage and UPS operation.
- b. Disconnect the mainline ac power cable or ac power jumper cable from the system's ac power connector at the system.
- c. Use a multimeter to measure the ac voltage at the system end of the mainline ac power cable or ac power jumper cable.

Note: Some system models have more than one mainline ac power cable or ac power jumper cable. For these models, disconnect all the mainline ac power cables or ac power jumper cables and measure the ac voltage at each cable before continuing with the next step.

Is the ac voltage from 200 V ac to 240 V ac, or from 100 V ac to 127 V ac?

No: Go to step 8.

Yes: Continue with the next step.

5. Perform the following steps:

- a. Disconnect the mainline ac power cables from the power outlet.
- b. Exchange the system unit control panel (Un-D1). See Part locations and location codes.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system.

Does the system power on?

No: Continue with the next step.

Yes: The system unit control panel was the failing item. **This ends the procedure.**

6. Perform the following steps:

- a. Disconnect the mainline ac power cables from the power outlet.
- b. Exchange the power supply or supplies (Un-E1, Un-E2). See Part locations and location codes.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system. See Powering on and powering off the system.

Does the system power on?

No: Continue with the next step.

Yes: The power supply was the failing item. **This ends the procedure.**

7. Perform the following steps:

- a. Disconnect the mainline ac power cables.
- b. Replace the system backplane (Un-P1). See Part locations and location codes.
- c. Reconnect the mainline ac power cables to the power outlet.
- d. Attempt to power on the system.

Does the system power on?

No: Continue with the next step.

Yes: The system backplane was the failing item. **This ends the procedure.**

8. Are you working with a system unit with a power distribution unit with tripped breakers?

- **No:** Continue with the next step.

- **Yes:** Perform the following steps:
 - a. Reset the tripped power distribution breaker.
 - b. Verify that the removable ac power cable is not the problem. Replace the cord if it is defective.
 - c. If the breaker continues to trip, install a new power supply in each location until the defective one is found. **This ends the procedure.**
9. Does the system have an external UPS installed?

Yes: Continue with the next step.

No: Go to step 11.
 10. Use a multimeter to measure the ac voltage at the external UPS outlets. Is the ac voltage from 200 V ac to 240 V or from 100 V ac to 127 V ac?

No: The UPS needs service. For 9910 type UPS, call IBM Service Support. For all other UPS types, have the customer call the UPS provider. In the meantime, go to step 12 to bypass the UPS.

Yes: Replace the ac power cable. See System parts for FRU part number. **This ends the procedure.**
 11. Perform the following steps:
 - a. Disconnect the mainline ac power cable from the customer's ac power outlet.
 - b. Use a multimeter to measure the ac voltage at the customer's ac power outlet.

Note: Some system models have more than one mainline ac power cable. For these models, disconnect all the mainline ac power cables and measure the ac voltage at all ac power outlets before continuing with this step.

Is the ac voltage from 200 V ac to 240 V ac or from 100 V ac to 127 V ac?

Yes: Exchange the mainline ac power cable. See System parts for the FRU part number. Then go to step 1 on page 103.

No: Inform the customer that the ac voltage at the power outlet is not correct. When the ac voltage at the power outlet is correct, reconnect the mainline ac power cables to the power outlet. **This ends the procedure.**
 12. Perform the following steps to bypass the UPS unit:
 - a. Power off your system and the UPS unit.
 - b. Remove the signal cable used between the UPS and the system.
 - c. Remove any power jumper cords used between the UPS and the attached devices.
 - d. Remove the country or region-specific power cord used from the UPS to the wall outlet.
 - e. Use the correct power cord (the original country or region-specific power cord that was provided with your system) and connect it to the power inlet on the system. Plug the other end of this cord into a compatible wall outlet.
 - f. Attempt to power on the system.

Does the power-on standby sequence complete successfully?

Yes: Go to Verifying a repair. **This ends the procedure.**

No: Go to step 5 on page 104.
 13. Display the selected IPL mode on the system unit control panel. Is the selected mode the same mode that the customer was using when the power-on failure occurred?

No: Go to step 15.

Yes: Continue with the next step.
 14. Is a function 11 reference code displayed on the system unit control panel?

No: Go to step 16 on page 106.

Yes: Return to Starting a repair action. **This ends the procedure.**
 15. Perform the following steps:

- a. Power off the system. See Powering on and powering off the system for information about powering on and off your system.
- b. Select the mode on the system unit control panel that the customer was using when the power-on failure occurred.
- c. Attempt to power on the system.

Does the system power on?

Yes: Continue with the next step.

No: Exchange the system unit control panel (Un-D1). See Part locations and location codes. **This ends the procedure.**

16. Continue the IPL. Does the IPL complete successfully?

Yes: **This ends the procedure.**

No: Return to Starting a repair action. **This ends the procedure.**

Cannot power off system unit

Use this procedure to analyze a failure of the normal command and control panel procedures to power off the system unit.

Attention: To prevent loss of data, ask the customer to verify that no interactive jobs are running before you perform this procedure.

For important safety information before continuing with this procedure, see “Power isolation procedures” on page 102.

1. Attempt to power off the system. Does the system unit power off, and is the power indicator light flashing slowly?

No: Continue with the next step.

Yes: The system is not responding to normal power off procedures which could indicate a Licensed Internal Code problem. Contact your next level of support. **This ends the procedure.**

2. Attempt to power off the system using ASMI. Does the system power off?

Yes: The system is not responding to normal power off procedures which could indicate a Licensed Internal Code problem. Contact your next level of support. **This ends the procedure.**

No: Continue with the next step.

3. Attempt to power off the system using the control panel power button. Does the system power off?

Yes: Continue with the next step.

No: Go to step 5.

4. Is there a reference code logged in the ASMI, the control panel, or the management console that indicates a power problem?

Yes: Perform problem analysis for the reference code in the log. **This ends the procedure.**

No: Contact your next level of support. **This ends the procedure.**

5. Ensure there are no jobs running on the system or partition, and verify that an uninterruptible power supply (UPS) is not powering the system. Then continue with the next step.

6. Perform the following steps:

- a. Remove the system unit ac power cord from the external UPS or, if an external UPS is not installed, from the customer's ac power outlet. If the system unit has more than one ac line cord, disconnect all the ac line cords.
- b. Exchange the following FRUs one at a time. See Part locations and location codes and System parts for information about FRU locations and parts for the system that you are servicing.

If the system unit is failing:

- 1) Power supply (Un-E1 or Un-E2). Go to step 7 on page 107.
- 2) Service processor (Un-P1)

3) System control panel (Un-D1)

This ends the procedure.

7. A power supply might be the failing item.

Attention: When replacing a redundant power supply, a 1xxx1504, 1xxx1514, 1xxx1524, or 1xxx1534 reference code may be logged in the error log. If you just removed and replaced the power supply in the location associated with this reference code, and the power supply came ready after the install, disregard this reference code. If you had not previously removed and replaced a power supply, the power supply did not come ready after installation, or there are repeated fan fault errors after the power supply replacement, continue to follow these steps.

Is the reference code 1xxx15xx?

No: Continue with the next step.

Yes: Perform the following steps:

- a. Find the unit reference code in one of the following table to determine the failing power supply.
- b. Ensure that the power cables are properly connected and seated.
- c. Is the reference code 1xxx1500, 1xxx1510, 1xxx1520, or 1xxx1530 and is the failing unit configured with a redundant power supply option (or dual line cord feature)?
 - **Yes:** Perform “PWR1911” on page 113 before replacing parts.
 - **No:** Continue with step 7d.
- d. See Part locations and location codes for information about FRU locations for the system that you are servicing.
- e. Replace the failing power supply (see the following table to determine which power supply to replace).
- f. If the new power supply does not fix the problem, perform the following :
 - 1) Reinstall the original power supply.
 - 2) Try the new power supply in each of the other positions listed in the table.
 - 3) If the problem still is not fixed, reinstall the original power supply and go to the next FRU in the list.
 - 4) For reference codes 1xxx1500, 1xxx1510, 1xxx1520, and 1xxx1530, exchange the power distribution backplane if a problem persists after replacing the power supply.

Table 9. System unit

Unit reference code	Power supply
1510, 1511, 1512, 1513, 1514, 7110	E1
1520, 1521, 1522, 1523, 1524, 7120	E2

Attention: For reference codes 1500, 1510, 1520, and 1530, perform “PWR1911” on page 113 before replacing parts.

This ends the procedure.

8. Is the reference code 1xxx2600, 1xxx2603, 1xxx2605, or 1xxx2606?

- **No:** Continue with the next step.
- **Yes:** Perform the following steps:
 - a. See Part locations and location codes for information about FRU locations for the system you are servicing.
 - b. Replace the failing power supply.
 - c. Perform the following if the new power supply does not fix the problem:
 - 1) Reinstall the original power supply.
 - 2) Try the new power supply in each of the other positions listed in the table.

- 3) If the problem still is not fixed, reinstall the original power supply and go to the next FRU in the list.

Attention: Do not install power supplies P00 and P01 ac jumper cables on the same ac input module.

Table 10. Failing power supplies

System or feature code	Failing power supply
System unit	U _n -E1, U _n -E2

This ends the procedure.

9. Is the reference code 1xxx8455 or 1xxx8456?
- **No:** Return to Starting a repair action. **This ends the procedure.**
 - **Yes:** One of the power supplies is missing, and must be installed. Use the following table to determine which power supply is missing, and install the power supply. See Part locations and location codes for information about FRU locations for the system you are servicing.

Table 11. Missing power supplies

Reference code	Missing power supply
1xxx8455	U _n -E1
1xxx8456	U _n -E2

This ends the procedure.

PWR1900

Determine which procedure to use based on the model number.

Complete the instructions for the model you are servicing.

- Perform isolation procedure “PWR1905” on page 110 to service a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E.
- Perform isolation procedure “PWR1904” to service a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.

This ends the procedure.

PWR1904

A power supply fault is occurring on the +12V/-12V line.

See “Power isolation procedures” on page 102 for important safety information before you service the system.

Procedure for a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

1. Perform the following steps:
 - a. Power off the system. For instructions, see Powering on and powering off the system.
 - b. Replace one of the memory DIMMs. For information about locations, see Part locations and location codes.
 - c. Power on the system. For instructions, see Powering on and powering off the system.
 - d. Has the problem been resolved?

No: Repeat step 1, replacing each memory DIMM one at a time. If you replaced all of the memory DIMMs and the problem remains, continue with the next step.

Yes: This ends the procedure.

2. Perform the following steps:

- a. Power off the system and disconnect the ac power cable from the unit you are working on. For instructions, see Powering on and powering off the system.
 - b. Disconnect all of the I/O devices from the unit you are working on by sliding them partially out of the unit.
 - c. Remove and label all cards.
 - d. Reconnect the ac power cable to the unit you are working on.
 - e. Power on the system. For instructions, see Powering on and powering off the system.
- Does a power reference code occur?
- Yes:** Continue with the next step.
- No:** Go to step 7.
3. Perform the following steps:
 - a. Power off the system. For instructions, see Powering on and powering off the system.
 - b. Replace one of the system fans. For information about locations, see Part locations and location codes.
 - c. Power on the system. For instructions, see Powering on and powering off the system.
- Does a power reference code occur?
- Yes:** Continue with the next step.
- No:** The fan that you replaced is the failing item. **This ends the procedure.**
4. Have you replaced all of the fans?

Yes: Continue with the next step.

No: Repeat step 3, replacing each fan one at a time.
 5. Perform the following steps:
 - a. Power off the system. For instructions, see Powering on and powering off the system.
 - b. Replace one of the voltage regulator modules. For information about locations, see Part locations and location codes.
 - c. Power on the system. For instructions, see Powering on and powering off the system.
- Does a power reference code occur?
- Yes:** Continue with the next step.
- No:** The voltage regulator module that you replaced is the failing item. **This ends the procedure.**
6. Have you replaced all of the voltage regulator modules?

Yes: Continue with the next step.

No: Repeat step 5, replacing each voltage regulator module one at a time.
 7. Perform the following steps:
 - a. Power off the system. For instructions, see Powering on and powering off the system.
 - b. Reinstall all of the cards that you removed in step 2 on page 108 to their original locations.
 - c. Power on the system. For instructions, see Powering on and powering off the system.
- Does a power reference code occur?
- Yes:** Continue with the next step.
- No:** Go to step 10 on page 110.
8. Perform the following steps:
 - a. Power off the system. For instructions, see Powering on and powering off the system.
 - b. Remove one of the cards you reinstalled in step 7.
 - c. Power on the system. For instructions, see Powering on and powering off the system.
- Does a power reference code occur?
- Yes:** Continue with the next step.

No: Replace the last card that you removed in this step. For information about locations, see Part locations and location codes. **This ends the procedure.**

9. Have you removed all of the cards?

Yes: Reinstall all of the parts that you removed or replaced in this procedure and perform problem analysis by using the power reference code. **This ends the procedure.**

No: Repeat step 8 on page 109, removing each card one at a time.

10. Perform the following steps:

- a. Power off the system. For instructions, see Powering on and powering off the system.
- b. Reconnect all of the I/O devices that you disconnected in step 2 on page 108.
- c. Power on the system. For instructions, see Powering on and powering off the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: The problem is resolved. **This ends the procedure.**

11. Perform the following steps:

- a. Power off the system. For instructions, see Powering on and powering off the system.
- b. Disconnect one of the I/O devices that you reconnected in step 10.
- c. Power on the system. For instructions, see Powering on and powering off the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: Replace the last I/O device that you disconnected in this step. For information about locations, see Part locations and location codes. **This ends the procedure.**

12. Have you disconnected all of the I/O devices?

Yes: Repeat step 11, disconnecting each I/O device one at a time.

No: Reinstall all of the parts that you removed or replaced in this procedure and contact your next level of support. **This ends the procedure.**

PWR1905

A system unit power supply load fault is occurring.

See "Power isolation procedures" on page 102 for important safety information before servicing the system.

Procedure for a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E

1. Is the reference code 1xxx 1B01?

Yes: Continue with the next step.

No: This procedure only isolates problems that cause 1xxx 1B01 to be logged. Return to the procedure that sent you here. **This ends the procedure.**

2. Perform the following steps:

- a. Power off the system and disconnect the ac power cables from the unit you are working on. See Powering on and powering off the system.
- b. Disconnect all the I/O devices by sliding them partially out of the system unit. See Part locations and location codes for information about system FRU parts, locations and addresses.
- c. Remove and label all cards.
- d. Reconnect the ac power cables to the unit you are working on.
- e. Power on the system. See Powering on and powering off the system for information about powering on or off your system.

Does a power reference code occur?

Yes: Continue with the next step.

No: Go to step 5.

3. Perform the following steps:
 - a. Power off the system. See Powering on and powering off the system.
 - b. Replace one of the system fans. See Part locations and location codes for information about system fan locations for the system you are servicing.
 - c. Power on the system. See Powering on and powering off the system for information about powering on or off your system.

Does a power reference code occur?

Yes: Continue with the next step.

No: The fan you just replaced was the failing item. **This ends the procedure.**

4. Have you tried replacing all the fans?
 - **Yes:** Reinstall the fan you just replaced in step 3 and continue with the next step.
 - **No:** Perform the following steps:
 - a. Power off the system.
 - b. Reinstall the fan that you just removed in step 3 to its original location.
 - c. Repeat step 3.

5. Perform the following steps:
 - a. Power off the system.
 - b. Reinstall all the cards you removed in step 2 on page 110 into their original locations.
 - c. Power on the system. See Powering on and powering off the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: Go to step 8.

6. Perform the following steps:
 - a. Power off the system. See Powering on and powering off the system.
 - b. Disconnect one of the cards you reinstalled in step 5.
 - c. Power on the system. See Powering on and powering off the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: Exchange the last card you disconnected in this step. See Part locations and location codes for information about FRU locations for the system you are servicing. **This ends the procedure.**

7. Have you disconnected all the cards?

No: Repeat step 6.

Yes: Reinstall all of the parts removed or exchanged in this procedure and return to Starting a repair action. **This ends the procedure.**

8. Perform the following steps:
 - a. Power off the system. See Powering on and powering off the system.
 - b. Reconnect all of the I/O devices that you disconnected in step 2 on page 110.
 - c. Power on the system. See Powering on and powering off the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: The problem has been resolved. **This ends the procedure.**

9. Perform the following steps:
 - a. Power off the system. See Powering on and powering off the system.
 - b. Disconnect one of the I/O devices that you reconnected in step 8.

c. Power on the system. See Powering on and powering off the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: Exchange the last I/O device you disconnected in this step. See Part locations and location codes for information about the I/O device location for the system you are servicing. **This ends the procedure.**

10. Have you tried disconnecting all of the I/O devices?

No: Repeat step 9 on page 111.

Yes: Continue with the next step.

11. Replace the system backplane (Un-P1). Reinstall all of the parts you have removed or exchanged in this procedure.

Does a power reference code occur?

Yes: Continue with the next step.

No: The system is fixed. **This ends the procedure.**

12. Does the system contain only one power supply?

Yes: Continue with the next step.

No: Go to step 14.

13. Replace the power supply.

Does a power reference code occur?

Yes: Contact your service support. **This ends the procedure.**

No: The system is fixed. **This ends the procedure.**

14. Power off the system. Remove one of the power supplies, and then power on the system. See Powering on and powering off the system.

Does a power reference code occur?

Yes: Continue with the next step.

No: The power supply you just removed is defective. Replace it. **This ends the procedure.**

15. Have you tried replacing all of the power supplies, one at a time?

• **Yes:** Continue with the next step.

• **No:** Perform the following steps:

a. Power off the system.

b. Reinstall the power supply that you just removed in step 14 to its original location.

c. Repeat step 14.

16. Power off the system. Replace all of the power supplies at the same time. Power on the system.

Does a power reference code occur?

Yes: Contact your next level of support. **This ends the procedure.**

No: The system is fixed. **This ends the procedure.**

PWR1907

Use this procedure to update EMX0 PCIe3 expansion drawer firmware if the firmware update did not begin because of the SPCN firmware update policy setting.

An EMX0 PCIe3 expansion drawer firmware update is needed. The firmware update did not begin because of the system power control network (SPCN) firmware update policy setting.

Note: Updating firmware, performing a concurrent maintenance procedure, or powering off the system interrupts an SPCN firmware update. If an SPCN firmware update was interrupted by any of these actions, the SPCN firmware update must be restarted.

Perform the following steps to update the EMX0 PCIe3 expansion drawer firmware.

1. Is the reference code that you are working with 1xxx913B?
 - **Yes:** Continue with the next step.
 - **No:** Contact your next level of support. **This ends the procedure.**
2. Use the Advanced System Management Interface (ASMI) to begin an SPCN firmware update. Perform the following steps:
 - a. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
 - b. In the navigation area, expand **System Configuration > Configure I/O Enclosures**
 - c. Record the current SPCN firmware update policy setting so that it can be restored later.
 - d. Change the SPCN firmware update policy setting to **Enabled** and click **Save Policy Setting** to allow SPCN firmware to be updated.
 - e. Select **Start SPCN Firmware Update**. The SPCN firmware is downloaded to the PCIe3 expansion drawers that require an update.
 - f. Change the SPCN firmware update policy setting back to what it was originally set to in step 2.c and click **Save Policy Setting**.

Note: The SPCN firmware update can be stopped by clicking **Stop SPCN Firmware Update**. However, the firmware update must be allowed to complete in order for the PCIe3 expansion drawers to be updated to the latest SPCN firmware level.

The progress of the SPCN firmware update can be monitored by clicking **Configure I/O Enclosures** to update the screen. Do not use the browser back or refresh buttons to monitor the update progress. The **Power Control Network Firmware Update Status** column shows the percentage complete and **In Progress** is displayed while the download progresses. **Not Required** is displayed when the download process completes. **This ends the procedure.**

PWR1909

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

PWR1911

You are here because of a power problem on a system with more than one line cord. If the failing unit does not have more than one line cord, return to the procedure that sent you here or go to the next item in the FRU list.

The following steps are for the system unit, unless other instructions are given. For important safety information before you service the system, see “Power isolation procedures” on page 102.

1. If an uninterruptible power supply is installed, verify that it is powered on before proceeding.
2. Are all the units powered on?
 - **Yes:** Go to step 7 on page 115.
 - **No:** On the unit that does not power on, perform the following steps:
 - a. Disconnect the line cords from the unit that does not power on.
 - b. Use a multimeter to measure the voltage at the system end of the line cords.

Table 12. Correct voltage

Model or expansion drawer	Correct ac voltage	Correct dc voltage
5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A	100 - 127 V or 200 - 240 V	-37.5 - -60 V or 192 - 400 V
8408-44E or 8408-E8E	200 - 240 V	192 - 400 V

Table 12. Correct voltage (continued)

Model or expansion drawer	Correct ac voltage	Correct dc voltage
9080-MHE, 9080-MME, 9119-MHE, or 9119-MME	200 - 240 V	192 - 400 V
EMX0 PCIe3 expansion drawer	100 - 127 V or 200 - 240 V	192 - 400 V

c. Is the voltage correct (see Table 12 on page 113)?

Yes: Continue with the next step.

No: Go to step 4.

3. Perform the following steps:

a. Reconnect the line cords.

b. Verify that the failing unit fails to power on.

c. Replace the failing power supply. Use the following table to determine which power supply needs to be replaced, and then see Part locations and location codes for location, part number, and exchange procedure information.

Table 13. Failing power supply for systems models and expansion drawers

Reference code	System unit or expansion drawer	Failing item name
1510	System unit	Power supply 1
	Expansion drawer	Power supply 1
1520	System unit	Power supply 2
	Expansion drawer	Power supply 2
1530	System unit	Power supply 3
1540	System unit	Power supply 4

This ends the procedure.

4. Is the system a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME?

Yes: Continue with the next step.

No: Go to step 6.

5. Perform the following steps at the rear of the system:

a. Disconnect the line cords from the connectors on the line cord conduit for the unit that does not power on.

b. Use a multimeter to measure the voltage at the system end of the line cords.

c. Is the voltage correct (see Table 12 on page 113)?

Yes: Replace the line cord conduit. **This ends the procedure.**

No: Continue with the next step.

6. Perform the following steps:

a. Disconnect the line cords from the customer's power outlet.

b. Use a multimeter to measure the voltage at the customer's power outlet.

Is the voltage correct (see Table 12 on page 113)?

- **Yes:** Exchange the failing line cord.

This ends the procedure.

- **No:** Perform the following steps:

a. Inform the customer that the voltage at the power outlet is not correct.

b. Reconnect the line cords to the power outlet after the voltage at the power outlet is correct.

This ends the procedure.

7. Is the reference code 1xxx00AC?
 - **No:** Continue with the next step.
 - **Yes:** This reference code might be caused by an outage. If the system will power on without an error, no parts need to be replaced.
This ends the procedure.
8. Is the reference code 1xxx15x0?
 - **No:** Perform Problem Analysis by using the reference code.
This ends the procedure.
 - **Yes:** Perform the following steps:
 - a. Use the following table to locate the failing parts. For information about locations, see Part locations and location codes.

Table 14. Power reference code table

System unit or expansion drawer	Reference code	Locate these parts
System unit	1xxx 1510	Power supply E1 and line cord 1
	1xxx 1520	Power supply E2 and line cord 2
	1xxx 1530	Power supply E3 and line cord 3
	1xxx 1540	Power supply E4 and line cord 4
Expansion drawer	1xxx 1510	Power supply 1 and line cord 1
	1xxx 1520	Power supply 2 and line cord 2

- b. Locate the line cord or the jumper cable for the reference code you are working on.
 - c. Go to step 9.
9. Perform the following steps:

Attention: Do not disconnect the other system line cords or the other jumper cables when powered on.

 - a. For the reference code you are working on, disconnect either the jumper cable or the line cord from the power supply.
 - b. Use a multimeter to measure the voltage at the power supply end of the jumper cable **or** the line cord.

Is the voltage correct (see Table 12 on page 113)?

No: Continue with the next step.

Yes: Exchange the failing power supply. See Table 13 on page 114 for its position, and then see Part locations and location codes for part numbers and directions to the correct exchange procedures. **This ends the procedure.**
10. Perform the following steps:
 - a. Disconnect the line cords from the power outlet.
 - b. Use a multimeter to measure the voltage at the customer's power outlet.

Is the voltage correct (see Table 12 on page 113)?

 - **Yes:** Exchange the following items, one at a time:
 - Failing line cord
 - Failing jumper cable (if installed)

This ends the procedure.
 - **No:** Perform the following steps:
 - a. Inform the customer that the voltage at the power outlet is not correct.
 - b. Reconnect the line cords to the power outlet after the voltage at the power outlet is correct.

This ends the procedure.

PWR1912

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

PWR1917

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

PWR1918

The server detected an error in the power system.

For information about locations, see Part locations and location codes.

Select the system that you are servicing and then perform the indicated PWR1918 procedure.

- 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A
- 8247-42L, 8286-41A, or 8286-42A
- 8408-44E, 8408-E8E, 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

Table 15. Action to perform for a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A.

Reference code	Action
1xxx2610	Replace the following items, if present, one at a time, and in the order listed: <ol style="list-style-type: none"> 1. System backplane (Un-P1) 2. PCIe3 x8 SAS RAID internal adapter (Un-P1-C14 or Un-P1-C15) or PCIe3 x8 cache SAS RAID internal adapter and backup power module card (Un-P1-C14 and Un-P1-C14-C1 or Un-P1-C15 and Un-P1-C15-C1)
1xxx8450	At least one VRM is missing from the system unit. Inspect all of the processor cards and memory cards and install the VRMs that are missing. For information about locations, see Part locations and location codes.
1xxx8453	There is an extra processor regulator in the system. Remove the extra regulator.

Table 16. Action to perform for an 8247-42L, 8286-41A, or 8286-42A.

Reference code	Action
1xxx2610	Replace the following items, if present, one at a time, and in the order listed: <ol style="list-style-type: none"> 1. System backplane (Un-P1) 2. PCIe3 x8 SAS RAID internal adapter (Un-P1-C14 or Un-P1-C15) or PCIe3 x8 cache SAS RAID internal adapter (Un-P1-C14 or Un-P1-C15)
1xxx8450	At least one VRM is missing from the system unit. Inspect all of the processor cards and memory cards and install the VRMs that are missing. For information about locations, see Part locations and location codes.
1xxx8453	There is an extra processor regulator in the system. Remove the extra regulator.

Table 17. Action to perform for an 8408-44E, 8408-E8E, 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.

Reference code	Action
1xxx2602	If the system is an 8408-44E or 8408-E8E that is configured for redundant power supply, ensure that the power supply cords are plugged properly.

Table 17. Action to perform for an 8408-44E, 8408-E8E, 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. (continued)

Reference code	Action
1xxx8450	At least one VRM is missing from the system unit. Inspect all of the processor cards and memory cards and install the VRMs that are missing. For information about locations, see Part locations and location codes.
1xxx8453	There is an extra processor regulator in the system. Remove the extra regulator.
B1xxxxxx	<p>DDR4 DIMMs are installed, but one or more VRMs that are needed to support the DDR4 DIMMs are missing. Either remove the DDR4 DIMMs, or install the VRMs.</p> <p>If the system is an 8408-44E or 8408-E8E, ensure that both memory VRMs are installed. The memory VRMs are in locations U_n-P2-C9 and U_n-P2-C42. For information about locations, see Part locations and location codes.</p> <p>If the system is a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME, ensure that the Vpp VRM is installed. The Vpp VRM is in location U_n-P1-C55. For information about locations, see Part locations and location codes.</p>

PWR1920

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

PWR2402

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

Router isolation procedures

These procedures serve as a guide to the correct isolation procedures from the reference code tables.

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.
 - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.

- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

Perform these procedures only when directed to do so from another procedure.

RTRIP02

Gives a link to a topic that might assist you when diagnosing errors detected by a workstation IOP.

Perform "TWSIP01" on page 217.

RTRIP03

Gives links to topics to assist you when diagnosing errors detected by a workstation IOP.

If you have a twinaxial terminal for the console, perform "TWSIP01" on page 217. Otherwise, perform "WSAIP01" on page 224.

RTRIP04

Use the FRU list in the service action log if it is available. If it is not available, examine word 5 of the reference code.

Is word 5 of the reference code zero (0000 0000)?

Yes: Perform SIIOADP.

No: Perform PIOCARD.

This ends the procedure.

RTRIP05

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

RTRIP06

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

RTRIP07

Gives a link to assist you when diagnosing a keyboard error.

Perform “WSAIP01” on page 224.

RTRIP08

Gives a link to assist when the Licensed Internal Code detected an IOP programming problem.

Perform a system IPL. Is the IPL successful?

Yes: Perform “LICIP01” on page 57 to determine the cause of the problem. **This ends the procedure.**

No: Perform the action described in the new reference code. **This ends the procedure.**

Serial-attached SCSI isolation procedures

Use serial-attached SCSI (SAS) isolation procedures when a management console is not attached to the server. If the server is connected to a management console, use the procedures that are available on the management console to continue FRU isolation.

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer’s DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.
 - For racks with a DC power distribution panel (PDP), connect the customer’s DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.

- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

SIP3110

This procedure resolves problems when disk units are incompatible or a disk unit is missing or failed.

The following SRCs are possible:

- SRC xxxx9025. Indicates that an incompatible disk unit is installed at the disk unit location that caused the array to be exposed.
- SRC xxxx9030. Indicates that a disk array is exposed due to a missing or failed disk unit.
- SRC xxxx9032. Indicates that a disk unit in a disk array is missing or failed, but the array is still protected.

If you received SRC xxxx9030 or xxxx9032, one of the following occurred:

- A disk unit has failed and the RAID array protection is exposed or will become exposed if another disk unit fails because no hot spare disk unit was available to replace it. If the array is exposed, then the array will continue to be exposed until the disk unit has been replaced and a manual rebuilding of the array has been started.
- A disk unit has failed in a RAID array, but a hot spare was used to automatically start rebuilding the array. Replace, format, and configure the failed disk unit as a hot spare.

Note: If the previous hot spare disk unit was a larger capacity than the failed disk unit, ensure that the customer understands that the replacement disk unit might not provide adequate hot spare coverage for all of the arrays under this adapter.

1. Is the device location information for this SRC available in the service action log (see Searching the service action log for details)?

No: Continue with the next step.

Yes: Exchange the disk unit. **This ends the procedure.**

2. Identify the affected adapter and disk units by examining the product activity log. Perform one of the following steps to access system service tools (SST) or dedicated service tools (DST):
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
3. Perform the following steps:
 - a. Access the product activity log and display the SRC that sent you here.
 - b. Press the F9 key for address information. This is the adapter address.
 - c. Continue with the next step.
4. Perform the following steps:
 - a. Return to the SST or DST main menu.
 - b. Select **Work with disk units > Display disk configuration > Display disk configuration status**.
 - c. On the Display disk configuration status display, look for the devices attached to the adapter that is identified in step 3.

Is there a device that has a status of RAID 5/Unknown, RAID 6/Unknown, RAID 5/Failed, or RAID 6/Failed?

No: Continue with step 7.

Yes: Continue with the next step.

5. Find the device that has a status of RAID 5/Unknown, RAID 6/Unknown, RAID 5/Failed, or RAID 6/Failed. This is the device that is causing the problem. Show the device address by selecting **Display Disk Unit Details > Display Detailed Address**. Record the device address. Go to Addresses and find the following items:
 - The slot that is identified by the direct select address of the adapter
 - The disk unit location that is identified by the device address
6. Have you determined the location of the adapter and disk unit that is causing the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Exchange the disk unit that is causing the problem. **This ends the procedure.**
7. Press the function key to cancel and to return to the Display Disk Configuration menu, then do the following:
 - a. Select **Display disk hardware status**.
 - b. Find a device that is either **Not operational** or **Read/write protected**.
 - c. Display details for the device and get the location of the failed disk unit.
 - d. Exchange the disk unit and configure it as a hot spare. **This ends the procedure.**

SIP3111

This procedure resolves the problem when two or more disk units are missing from a RAID 5 or RAID 6 disk array.

The following SRCs are possible:

- xxxx9020
- xxxx9021
- xxxx9022

1. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following steps:
 - a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the Product Activity Log and record address information.

If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the "Additional Information" to record the formatted log information. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

- c. Determine the location of the adapter and the devices that are causing the problem. Go to Addresses and find the following items:
 - The card slot that is identified by the direct select address (DSA)
 - The disk unit locations that are identified by the unit addresses
2. Perform one of the following options (listed in order of preference):

Option 1

Power off the system or partition and install the identified disk units in the correct physical locations (that is the expected addresses) in the system. **This ends the procedure.**

Option 2

Stop the disk array that contains the missing devices.

Attention: Customer data might be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to dedicated service tools. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Select **Work with disk units**. Did you get to DST with a type D IPL?
 - No:** Select **Work with disk configuration** > **Work with device parity protection**. Then, continue with substep 2c.
 - Yes:** Continue with substep 2c.
- c. Select **Stop device parity protection**.
- d. Follow the online instructions to stop device parity protection.

e. Perform an IPL from disk.

Does the IPL complete successfully?

No: Go to Starting a repair action. **This ends the procedure.**

Yes: **This ends the procedure.**

Option 3

If the data on the disk units is not needed, initialize and format the remaining members of the disk array by performing the following steps:

Attention: Data on the disk unit will be lost.

If a type D IPL was not performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units > Work with disk unit recovery > Disk unit problem recovery procedures.**
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a type D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units.**
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

SIP3112

This procedure resolves the problem when one or more disk array members are not at the required physical locations.

The possible SRC is SRC xxxx9023.

1. Identify the affected adapter and disk units that are not at their required locations by examining the Product Activity Log. Perform the following steps:
 - a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the product activity log and record address information.

If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. Record all devices that are not at their required locations. These are the array members that have a current address and an expected address that do not match. A current address of 0 is acceptable, and no action is needed to correct it for a known failed drive in the array.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. Record all devices that are not at their required locations. These are the array members that have a current address and an expected address that do not match. A current address of 0 is acceptable, and no action is needed to correct it for a known failed drive in the array.

- c. Determine the location of the adapter and the devices that are causing the problem. Go to Addresses and find the following items:
 - The card slot that is identified by the direct select address (DSA)
 - The disk unit locations that are identified by the unit addresses
2. Perform only one of the following options (listed in order of preference):

Option 1

Power off the system or partition and install the identified disk units in the correct physical locations (that is the expected addresses) in the system. **This ends the procedure.**

Option 2

Stop the disk array that contains the missing devices.

Attention: Customer data might be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to dedicated service tools. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Select **Work with disk units**. Did you get to DST with a type D IPL?

No: Select **Work with disk configuration > Work with device parity protection**. Then, continue with substep 2c.

Yes: Continue with the next substep 2c.

- c. Select **Stop device parity protection**.
- d. Follow the online instructions to stop device parity protection.
- e. Perform an IPL from disk.

Does the IPL complete successfully?

No: Go to Starting a repair action. **This ends the procedure.**

Yes: **This ends the procedure.**

Option 3

If the data on the disk units is not needed, initialize and format the remaining members of the disk array by performing the following steps:

Attention: Data on the disk unit will be lost.

If a type D IPL was not performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units > Work with disk unit recovery > Disk unit problem recovery procedures**.

- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a type D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

SIP3113

This procedure resolves problems when a disk array is or would become exposed and parity data is out of synchronization.

The possible SRC is xxxx9027.

1. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following steps:
 - a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the Product Activity Log and record address information.

If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. Record all devices that are missing from the disk array. These are the array members that have both a current address of 0 and an expected address that is not 0.

- c. Determine the location of the adapter and the devices that are causing the problem. Go to Addresses and find the following items:
 - The card slot that is identified by the direct select address (DSA)
 - The disk unit locations that are identified by the unit addresses
2. Have the adapter or disk units been physically moved recently?

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

Yes: Continue with the next step.

3. Perform one of the following two options (listed in order of preference):

Option 1

Power off the system or partition and restore the I/O adapter and disk units back to their original configuration. **This ends the procedure.**

Option 2

Stop the disk array that contains the missing devices.

Attention: Customer data might be lost.

Perform the following:

- a. If you are not already using dedicated service tools, perform an IPL to DST. See Performing an IPL to dedicated service tools. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Select **Work with disk units**. Did you get to DST with a type D IPL?

No: Select **Work with disk configuration > Work with device parity protection**. Then, continue with substep 3c.

Yes: Continue with substep 3c.

- c. Select **Stop device parity protection**.
- d. Follow the online instructions to stop device parity protection.
- e. Perform an IPL from disk.

Does the IPL complete successfully?

No: Go to Starting a repair action. **This ends the procedure.**

Yes: **This ends the procedure.**

Option 3

If the data on the disk units is not needed, initialize and format the disk units by performing the following steps:

Attention: Data on the disk unit will be lost.

If a type D IPL was not performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units > Work with disk unit recovery > Disk unit problem recovery procedures**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a type D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

SIP3120

This procedure resolves the problem when cache data associated with attached disk units cannot be found.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

The possible SRC is *xxxx9010*

1. Is the adapter connected in a dual storage adapter configuration (that is, two adapters connected to the same set of disk units)?

No Continue with the next step.

Yes Contact your hardware service provider.

2. Has the server been powered off for several days?

No Continue with the next step.

Yes Go to step 6.

3. Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:

Note: Label all parts (original and new) before moving them.

- The cache directory card from the original storage adapter. Refer to Replacing the cache directory card.
- The removable cache card from the original storage adapter. This applies only to certain adapters that have a removable cache card.

4. Has a new SRC of *xxxx9010* or *xxxx9050* occurred?

No Go to step 7.

Yes Continue with the next step.

5. Was the new SRC *xxxx9050*?

No The new SRC was *xxxx9010*. Reclaim adapter cache storage. See Reclaiming IOP cache storage.

Attention: Data might be lost. When an auxiliary cache adapter connected to the RAID adapter logs a *xxxx9055* SRC in the hardware error log, the reclaim process does not result in lost sectors. Otherwise, the reclaim process does result in lost sectors.

Note: On the Reclaim Controller Cache Storage results screen, the number of lost sectors is displayed. If the number is 0, there is no data loss. If the number is not 0, data has been lost and the system operator might want to restore data after this procedure is completed.
Go to step 7.

Yes: Contact your hardware service provider. **This ends the procedure.**

6. If the server has been powered off for several days after an abnormal power off, the cache battery pack might be depleted. Do not replace the adapter or the cache battery pack. Reclaim adapter cache storage. See Reclaiming IOP cache storage.

Attention: Data might be lost. When an auxiliary cache adapter connected to the RAID adapter logs a *xxxx9055* SRC in the hardware error log, the reclaim process does not result in lost sectors. Otherwise, the reclaim process does result in lost sectors.

Note: On the Reclaim Controller Cache Storage results screen, the number of lost sectors is displayed. If the number is 0, there is no data loss. If the number is not 0, data has been lost and the system operator might want to restore data after this procedure is completed.

This ends the procedure.

7. Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:

- The cache directory card from the new storage adapter. See Replacing the cache directory card.
- The removable cache card from the new storage adapter. This only applies to certain adapters which have a removable cache card.

This ends the procedure.

SIP3121

Use this procedure to resolve the following problem: RAID adapter resources not available due to previous problems (SRC xxxx9054).

Power off the system and remove all new or replacement disk units. IPL the system to DST. If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

Look for Product Activity Log entries for other reference codes and take action on them. **This ends the procedure.**

SIP3130

Use this procedure to resolve the following problem: Adapter does not support function expected by one or more disk units (SRC xxxx9008).

1. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following steps:
 - a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the product activity log and record address information.

If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the "Additional Information" to record the formatted log information. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D
xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided

for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

- c. Determine the location of the adapter and the devices that are causing the problem. Go to Addresses and find the following items:

- The card slot that is identified by the direct select address (DSA)
- The disk unit locations that are identified by the unit addresses

Have you determined the location of the adapter and the devices that are causing the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Have the adapter or disk units been physically moved recently, or were the disk units previously used by the AIX or Linux operating system?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

3. Perform one of the following options (listed in order of preference):

Option 1

Power off the system or partition and restore the adapter and disk units back to their original configuration. **This ends the procedure.**

Option 2

If the data on the disk units is not needed, initialize and format the disk units by performing the following steps:

Attention: Data on the disk unit will be lost.

If a type D IPL was not performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units > Work with disk unit recovery > Disk unit problem recovery procedures.**
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a type D IPL was performed to get to DST:

- a. Access DST.
- b. Select **Work with disk units.**
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

SIP3131

Use this procedure to resolve the following problem: Required cache data cannot be located for one or more disk units (SRC xxx9050).

1. Did you just exchange the adapter as the result of a failure?

No: Go to step 4 on page 130.

Yes: Continue with the next step.

2. Is the adapter connected in a dual storage adapter configuration (that is, two adapters connected to the same set of disk units)?

No: Continue with the next step.

Yes: Contact your hardware service provider.

3.

Attention:

- a. The failed adapter that you have just exchanged contains cache data that is required by the disk units that were attached to that adapter. If the adapter that you just exchanged is failing intermittently, reinstalling it and performing an IPL of the system might allow the data to be successfully written to the disk units. After the cache data is written to the disk units and the system is powered off normally, the adapter can be replaced without data being lost. Otherwise, continue with this procedure.

- b. Label all parts (original and new) before moving them.

Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:

- The cache directory card from the original storage adapter. Refer to Replacing the cache directory card.
- The removable cache card from the original storage adapter. This applies only to certain adapters that have a removable cache card.

Go to step 9 on page 132.

4. Identify the affected adapter and disk units by examining the Product Activity Log. Perform the following steps:

- a. Access SST/DST.

- If you can enter a command at the console, access system service tools (SST). See System service tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Access the product activity log and record address information.

If a type D IPL was not performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Device Errors detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged

field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

- c. Determine the location of the adapter and the devices that are causing the problem. Go to Addresses and find the following items:

- The card slot that is identified by the direct select address (DSA)
- The disk unit locations that are identified by the unit addresses

Have you determined the location of the adapter and the devices that are causing the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

5. Have the adapter or disk units been physically moved recently?

No: Contact your hardware service provider.

Yes: Continue with the next step.

6. Is the data on the disk units needed for this or any other system?

No: Go to step 8.

Yes: Continue with the next step.

7. Restore the adapter and disk units back to their original configuration. The adapter and disk units must be rejoined so that the cache data can be written to the disk units.

After the cache data is written to the disk units and the system is powered off normally, the adapter or disk units can be moved to another location. **This ends the procedure**

8. Perform only one of the following options, listed in the order of preference:

Option 1

Reclaim adapter cache storage. See Reclaiming IOP cache storage.

Attention: Data on the disk array will be lost.

This ends the procedure.

Option 2

If the data on the disk units is not needed, initialize and format the disk units by performing the following steps:

Attention: Data on the disk units will be lost.

If a type D IPL was not performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units > Work with disk unit recovery > Disk unit problem recovery procedures.**
- c. Select Initialize and format disk unit for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a type D IPL was performed to get to DST:

- a. Access DST.
- b. Select Work with disk units.
- c. Select Initialize and format disk unit for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This

might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

9. Has a new SRC *xxxx9010* or *xxxx9050* occurred?

No: Go to step 11.

Yes: Continue with the next step.

10. Was the new SRC *xxxx9050*?

No: The new SRC was *xxxx9010*.

Reclaim adapter cache storage. See Reclaiming IOP cache storage.

Attention: Data might be lost. When an auxiliary cache adapter connected to the RAID adapter logs an *xxxx9055* SRC in the hardware error log, the reclaim process does not result in lost sectors. Otherwise, the reclaim process does result in lost sectors.

Note: On the Reclaim Controller Cache Storage results screen, the number of lost sectors is displayed. If the number is 0, there is no data loss. If the number is not 0, data has been lost and the system operator might want to restore data after this procedure is completed. Continue with the next step.

Yes: Contact your hardware service provider.

11. Using the appropriate service procedures, remove the adapter. Install the new replacement storage adapter with the following parts installed on it:

- The cache directory card from the new storage adapter. See Replacing the cache directory card.
- The removable cache card from the new storage adapter. This only applies to certain adapters that have a removable cache card.

This ends the procedure.

SIP3132

Use this procedure to resolve the following problem: Cache data exists for one or more missing or failed disk units (SRC *xxxx9051*).

The possible causes are:

- One or more disk units have failed on the adapter.
- One or more disk units were either moved concurrently or were removed after an abnormal power off.
- The adapter was moved from a different system or a different location on this system after an abnormal power off.
- The cache of the adapter was not cleared before it was shipped to the customer.

1. Identify the affected adapter and disk units by examining the product activity log. Perform the following steps:

a. Access SST or DST.

- If you can enter a command at the console, access system service tools (SST). See System service tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

b. Access the Product Activity Log and record address information.

If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then,

press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

- c. Determine the location of the adapter and the devices that are causing the problem. Go to Addresses and find the following items:

- The card slot that is identified by the direct select address (DSA)
- The disk unit locations that are identified by the unit addresses

Have you determined the location of the adapter and the devices that are causing the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Are there other disk unit or adapter errors that have occurred at approximately the same time as this error?

No: Go to step 3.

Yes: Go to step 6.

3. Is the data on the disk units (and thus the cache data for the disk units) needed for this or any other system?

No: Go to step 7.

Yes: Go to step 4

4. Have the adapter card or disk units been physically moved recently?

No: Contact your hardware service provider.

Yes: Go to step 5.

5. Restore the adapter and disk units back to their original configuration. The adapter and disk units must be rejoined so that the cache data can be written to the disk units.

After the cache data is written to the disk units and the system is powered off normally, the adapter or disk units can be moved to another location. **This ends the procedure.**

6. Take action on the other errors that have occurred at the same time as this error. **This ends the procedure.**

7. Reclaim adapter cache storage. See Reclaiming IOP cache storage.

Attention: Data will be lost. **This ends the procedure.**

SIP3134

Use this procedure to resolve the following problem: Disk unit requires format before use (SRC xxx9092).

The possible causes are:

- Disk unit is a previously failed disk unit from a disk array and was automatically replaced by a hot spare disk unit.
 - Disk unit is a previously failed disk unit from a disk array and was removed and later reinstalled on a different adapter or different location on this adapter.
 - Appropriate service procedures were not followed when replacing disk units or reconfiguring the adapter, such as not performing a normal power off of the system prior to reconfiguring disk units and adapters.
 - Disk unit is a member of a disk array, but was detected subsequent to the adapter being configured.
 - Disk unit has multiple or complex configuration problems.
1. Identify the affected adapter and disk units by examining the product activity log. Perform the following steps:
 - a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the product activity log and record address information.

If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Device Errors Detected field indicates the total number of disk units that are affected. The Device Errors Logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. The Device Errors detected field indicates the total number of disk units that are affected. The Device Errors logged field indicates the number of disk units for which detailed information is provided. Under the Device heading, the unit address, type, serial number, and Worldwide ID are provided for up to three disk units. Additionally, the adapter type, serial number, and Worldwide ID for each of these disk units indicates the adapter to which the disk was last attached when it was operational.

c. Determine the location of the adapter and the devices that are causing the problem. Go to Addresses and find the following items:

- The card slot that is identified by the direct select address (DSA)
- The disk unit locations that are identified by the unit addresses

Have you determined the location of the adapter and the devices that are causing the problem?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Are there other disk unit or adapter errors that have occurred at about the same time as this error?

No: Go to step 3.

Yes: Go to step 5.

3. Have the adapter card or disk units been physically moved recently?

No: Go to step 4.

Yes: Go to step 6.

4. Is the data on the disk units needed for this or any other system?

No: Go to step 7.

Yes: Go to step 6.

5. Take action on the other errors that have occurred at the same time as this error. **This ends the procedure.**

6. Perform one of the following options that is most applicable to your situation:

Option 1

Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

- a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
- b. Vary on any other resources attached to the virtual I/O processor.

Take action for any other errors that are now occurring. **This ends the procedure.**

Option 2

Power off the system or partition and restore the adapter and disk units to their original configuration. **This ends the procedure.**

Option 3

Remove the disk units from this adapter. **This ends the procedure.**

7. Do the following steps to format the disk units:

Attention: All data on the disk units will be lost.

If a type D IPL was not performed to get to SST or DST:

- a. Access SST or DST.
- b. Select **Work with disk units > Work with disk unit recovery > Disk unit problem recovery procedures.**
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

If a type D IPL was performed to get to DST:

- a. Access DST.

- b. Select **Work with disk units**.
- c. Select **Initialize and format disk unit** for each disk unit. When the new disk unit is initialized and formatted, the display shows that the status is complete. This might take 30 minutes or much longer depending on the capacity of the disk unit. The disk unit is now ready to be added to the system configuration. **This ends the procedure.**

SIP3140

Use this procedure to resolve the following problem: Multiple adapters connected in an invalid configuration (SRC xxx9073)

The possible causes are:

- Incompatible adapters are connected to each other. This includes invalid adapter combinations such as the following:
 - Adapters with different write cache sizes
 - One adapter is not supported by the IBM i operating system
 - An adapter that does not support auxiliary cache is connected to an auxiliary cache adapter
 - An adapter that supports dual storage IOAs is connected to another adapter which does not have the same support
 - Greater than 2 adapters are connected for dual storage IOAs
 - Adapter code levels are not up to date or are not at the same level of functioning
- One adapter, of a connected pair of adapters, is not operating under the IBM i operating system. Connected adapters must both be controlled by the IBM i operating system. Additionally, both adapters must be in the same system partition.
- Adapters connected for dual storage IOAs are not cabled correctly. Each type of dual storage IOA configuration requires specific cables be used in a supported manner.

Determine which of the possible causes applies to the current configuration and take the appropriate actions to correct it. If this does not correct the error, contact your hardware service provider. **This ends the procedure.**

SIP3141

Use this procedure to resolve the following problem: Multiple adapters not capable of similar functions or controlling same set of devices (SRC xxx9074)

1. This error relates to adapters connected in a dual storage IOA configuration. To obtain the reason or description for this failure, you must find the formatted error information in the Product Activity Log. This should also contain information about the connected adapter.

Perform the following steps:

- a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the Product Activity Log and record address information.

If a D IPL was not performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for "Address Information". This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view

the "Additional Information" to record the formatted log information. The Problem description field indicates the type of problem. The type, serial number, and Worldwide ID of the connected adapter is also available.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses. See Examples: Obtaining additional information from hexadecimal reports. The Problem description field indicates the type of problem. The type, serial number, and Worldwide ID of the connected adapter is also available.

2. Find the problem description and information for the connected adapter (remote adapter) shown in the error log, and perform the action listed for the reason in the following table.

Table 18. RAID array reason for failure

Problem description	Full description	Action	Adapter on which to perform the action
Secondary does not support RAID level being used by primary.	Secondary adapter detected that the primary has a RAID array with a RAID level that the secondary does not support.	Customer needs to upgrade the type of secondary adapter or change the RAID level of the array on the primary to a level that is supported by the secondary.	Physically change the type of adapter that logged the error. Change RAID level on primary adapter (remote adapter indicated in the error log).
Secondary does not support disk unit function being used by primary.	Secondary adapter detected a device function that it does not support.	Customer might need to upgrade the adapter code or upgrade the type of secondary adapter.	Adapter that logged the error.
Secondary is unable to find devices found by the primary.	Secondary adapter cannot discover all the devices that the primary has.	The adapter that is logging the error is the secondary adapter. View the logging adapter's resource details under "Logical Hardware Resources" in hardware service manager to determine the resource name of the primary adapter. Then view the devices attached to both the primary adapter and secondary adapter in the "Logical Hardware Resources" information to determine which of the devices are missing from the secondary adapter. Verify the cable connections to the missing devices. If the cable connections are correct but the problem persists, replace the cables.	Adapter that logged the error.

Table 18. RAID array reason for failure (continued)

Problem description	Full description	Action	Adapter on which to perform the action
Secondary found devices not found by the primary.	Secondary adapter has discovered more devices than the primary. After this error is logged, an automatic failover will occur.	Verify the connections to the devices from the remote adapter as indicated in the error log. View the disk units under each adapter using HSM to determine the SAS port that has the problem.	Remote adapter indicated in the error log.
Secondary port not connected to the same numbered port on primary.	SAS connections from the adapter to the devices are incorrect. Common disk expansion units must be connected to the same numbered SAS port on both adapters. The failure can also be caused by incorrect cabling to a disk expansion unit. Ensure that the Y0 cable, Y1 cable, or X cable is routed along the right side of the rack frame, as viewed from the rear, when connecting to a disk expansion unit.	Verify connections and re-cable SAS connections as necessary.	Either adapter.
Primary lost contact with disk units accessible by secondary.	Link failure from primary adapter to devices. An automatic failover will occur.	Verify cable connections from the adapter which logged the error. Possible disk expansion unit failure.	Adapter that logged the error.
Caching is disabled. Replace the remote adapter with an adapter that is of the same type as the adapter that logged this error.	A CCIN 57B5 adapter is connected to a CCIN 57BB adapter. These adapters are not compatible. The CCIN 57BB adapter will log this error and prevent either adapter from performing write caching. Performance might be degraded until the problem is resolved.	Identify the CCIN 57B5 adapter that is paired to the CCIN 57BB adapter that is logging this error and replace it with a CCIN 57BB adapter.	Remote adapter indicated in the serviceable event view.
Other	Not currently defined.	Contact your hardware service provider.	

This ends the procedure.

SIP3142

Use this procedure to resolve the following configuration error: incorrect connection between cascaded enclosures (SRC xxxx4010).

The possible causes are:

- Incorrect cabling of cascaded device enclosures
- Use of an unsupported device enclosure

To prevent hardware damage, power off the system, partition, or card slot as appropriate, before connecting and disconnecting cables or devices.

1. Identify the affected adapter and its port by examining the product activity log. Perform the following steps:

a. Access SST or DST.

- If you can enter a command at the console, access system service tools (SST). See System service tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

b. Access the product activity log and record address information.

If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional Information to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

c. Determine the location of the adapter that reported the problem. Go to Addresses and find the following items:

- The card slot that is identified by the direct select address (DSA)
- The physical connector identified by the port number found on the adapter tailstock

Have you determined the location of the adapter and its port?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning information. If unsupported device enclosures are attached, then either remove or replace them with supported device enclosures.

3. Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

- a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
- b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

No: This ends the procedure.

Yes: Contact your hardware service provider. This ends the procedure.

SIP3143

Use this procedure to resolve the following configuration error: connections exceed adapter design limits (SRC xxxx4020).

The possible causes are:

- Unsupported number of cascaded device enclosures
- Improper cabling of cascaded device enclosures

To prevent hardware damage, power off the system, partition, or card slot as appropriate, before connecting and disconnecting cables or devices.

1. Identify the affected adapter and its port by examining the product activity log. Perform the following steps:
 - a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the product activity log and record address information.

If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. Go to Addresses and find the following items:

- The card slot that is identified by the direct select address (DSA)
- The physical connector identified by the port number found on the adapter tailstock

Have you determined the location of the adapter and its port?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Reduce the number of cascaded device enclosures. Device enclosures can only be cascaded one level deep, and only in certain configurations. Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning information.

3. Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

- a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
- b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

No: **This ends the procedure.**

Yes: Contact your hardware service provider. **This ends the procedure.**

SIP3144

Use this procedure to resolve problems with multipath connections.

This procedure is used to resolve the following configuration errors:

- Configuration error, incorrect multipath connection (SRC xxxx4030)
- Configuration error, incomplete multipath connection between adapter and enclosure detected (SRC xxxx4040)

The possible causes are:

- Incorrect cabling to device enclosure.

Note: Pay special attention to the requirement that a Y0-cable, YI-cable, or X-cable must be routed along the right side of the rack frame (as viewed from the rear) when connecting it to a disk expansion unit. Review the device enclosure cabling and correct the cabling as required. To see example device configurations with serial attached SCSI (SAS) cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning.

- A failed connection caused by a failing component in the SAS fabric between, and including, the adapter and device enclosure.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS, PCI-X, and PCIe bus interface logic integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for these SAS, PCI-X, and PCIe buses. For these configurations, replacement of the RAID enablement card is unlikely to solve a SAS related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.

- Some systems have SAS RAID adapters integrated onto the system backplane and use a cache RAID and dual IOA enablement card to enable storage adapter write cache and dual storage I/O adapter (IOA) mode. For these configurations, replacement of the cache RAID and dual IOA enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system backplane.
- Some configurations involve a SAS adapter connecting to internal SAS disk enclosures within a system using a cable card. Keep in mind that when the procedure refers to a device enclosure, it could be referring to the internal SAS disk slots or media slots. Also, when the procedure refers to a cable, it could include a cable card.
- When using SAS adapters in a dual storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (that is, not the secondary adapter).

Attention: When SAS fabric problems exist, do not replace RAID adapters without assistance from your service provider. Because the adapter might contain non-volatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter. Follow appropriate service procedures when replacing the cache RAID and dual IOA Enablement Card. Incorrect removal can result in data loss or a nondual storage IOA mode of operation.

1. Was the SRC xxxx4030?

No: Go to step 5 on page 143.

Yes: Go to step 2.

2. Identify the affected adapter and its port by examining the product activity log. Perform the following steps:

a. Access SST or DST.

- If you can enter a command at the console, access system service tools (SST). See System service tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

b. Access the product activity log and record address information.

If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. Go to Addresses and find the following items:
 - The card slot that is identified by the direct select address (DSA)
 - The physical connector identified by the port number found on the adapter tailstock

Have you determined the location of the adapter and its port?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

3. Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning information.
4. Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

- a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
- b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

No: **This ends the procedure.**

Yes: Contact your hardware service provider. **This ends the procedure.**

5. The SRC is xxxx4040. Determine whether a problem still exists for the DCxx adapter resource that logged this error by examining the SAS connections. See Viewing SAS fabric path information. Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**

6. Perform the following steps to cause the adapter to rediscover the devices and connections:
 - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.

Note: At this point, ignore any problems found and continue with the next step.

7. Determine if the problem still exists for the adapter that logged this error by examining the SAS connections by performing the actions in step 5 again.

Do all expected devices appear in the list and are all paths marked as Operational?

No Go to step 8.

Yes **This ends the procedure.**

8. Because the problem persists, some corrective action is needed to resolve the problem. Proceed by doing the following:

Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions has previously been attempted, proceed to the next one in the list.

- Reseat cables if present on adapter and device enclosure. Perform the following:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Reseat the cables.
 - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
- Replace the cable, if present, from the adapter to the device enclosure. Perform the following steps:

- a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Replace the cables.
 - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
 - Replace the internal device enclosure or see the service documentation for an external expansion unit. Perform the following steps:
 - a. Power off the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power off the adapter slot.
 - b. Replace the device enclosure.
 - c. Power on the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power on the adapter slot.
 - Replace the adapter. The procedure to replace the adapter can be found in PCI adapter.
 - Contact your service provider.
9. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 5 on page 143 again. Do all expected devices appear in the list and are all paths marked as Operational?
- No:** Go to step 8 on page 143.
- Yes:** **This ends the procedure.**

SIP3145

Use this procedure to resolve the following problem: Unsupported enclosure function detected (SRC xxxx4110).

The possible causes are:

- Device enclosure or adapter code levels are not up to date.
- Unsupported type of device enclosure or device. For example, this error can occur if a SATA device, such as a DVD drive, is attached to certain levels of a CCIN 57B4 adapter. The initial levels of the CCIN 57B4 adapter did not support SATA devices. To determine whether an adapter supports SATA devices, see PCIe2 SAS RAID card comparison or PCIe3 SAS RAID card comparison.

Considerations:

To prevent hardware damage or erroneous diagnostic results, remove power from the system as appropriate before connecting and disconnecting cables or devices.

1. Identify the affected adapter and its port by examining the product activity log. Perform the following steps:
 - a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the product activity log and record address information.

If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Adapter Port field indicates the port on the adapter that is reporting the problem. There may be more than

one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. The Adapter Port field indicates the port on the adapter reporting the problem. There might be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. Go to Addresses and find the following items:

- The card slot that is identified by the direct select address (DSA)
- The physical connector identified by the port number found on the adapter tailstock

Have you determined the location of the adapter and its port?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. Check for the latest PTFs for the device enclosure or adapter and apply them. If you need assistance finding PTFs, contact your next level of support. If unsupported device enclosures or devices are attached, then either remove or replace them with supported device enclosures or devices.

Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning information.

3. Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

- a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
- b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

No: **This ends the procedure.**

Yes: Contact your hardware service provider. **This ends the procedure.**

SIP3146

Use this procedure to resolve the configuration error: Incomplete multipath connection between enclosures and device detected (SRC xxx4041).

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

The possible cause is a failed connection caused by a failing component within the device enclosure, including the device itself.

Note: The adapter is not a likely cause of this problem.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.
- Some configurations involve a serial-attached SCSI (SAS) adapter connecting to internal SAS disk enclosures within a system using a cable card. Keep in mind that when the procedure refers to a device enclosure, it could be referring to the internal SAS disk slots or media slots. Also, when the procedure refers to a cable, it could include a cable card.
- When using SAS adapters in a dual storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (that is, not the secondary adapter).

Attention: Do not remove functioning disk units in a disk array without assistance from your service provider. If functioning disk units are removed, a disk array might become unprotected or failed and additional problems could be created.

1. Determine the resource name of the adapter that reported the problem by performing the following steps:
 - a. Access SST or DST.
 - b. Access the product activity log and record the resource name that this error is logged against. If the resource name is an adapter resource name, use it and continue with the next step. If the resource name is a disk-unit resource name, use the Hardware Service Manager to determine the resource name of the adapter that is controlling this disk unit. The logical bus number of the disk-unit logical resource might be useful in determining the adapter resource name.
2. Determine whether a problem still exists for the DCxx adapter resource that logged this error by examining the SAS connections. See Viewing SAS fabric path information. Are all of the following statements true?
 - All expected devices appear in the list.
 - All paths are marked as Operational.
 - None of the paths are blank.

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**

3. Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

- a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources that are attached to the virtual I/O processor.
4. To determine whether the problem still exists for the adapter that logged this error, check the product activity log to determine whether any new errors were logged for the same resource that was identified in step 1. Also, examine the SAS connections by performing the actions in step 2 again. Are all of the following statements true?
 - All expected devices appear in the list.
 - All paths are marked as Operational.
 - None of the paths are blank.

- No new errors are logged in the product activity log for the resource.
No: Continue with the next step.
Yes: The error condition no longer exists. **This ends the procedure.**
5. Perform only one of the following corrective actions (listed in the order of preference) and then continue with step 6. If one of the corrective actions has previously been attempted, proceed to the next one in the list.
 - Review the device enclosure cabling and correct the cabling as required. To see example device configurations with SAS cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning information.
 - Replace the device.
 - Replace the internal device enclosure or see the service documentation for an external expansion unit. Perform the following steps:
 - a. Power off the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power off the adapter slot.
 - b. Replace the device-enclosure failing items. See SASEXP and DEVBPLN for possible failing items to replace.
 - c. Power on the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power on the adapter slot.
 - Contact your service provider.
 6. To determine whether the problem still exists for the adapter that logged this error, check the product activity log to determine whether any new errors were logged for the same resource that was identified in step 1 on page 146. Also, examine the SAS connections by performing the actions in step 2 on page 146 again. Are all of the following statements true?
 - All expected devices appear in the list.
 - All paths are marked as Operational.
 - None of the paths are blank.
 - No new errors are logged in the product activity log for the resource.
No: Go to step 5.
Yes: The error condition no longer exists. **This ends the procedure.**

SIP3147

Use this procedure to resolve the following problem: Missing remote adapter (SRC xxx9076)

1. An adapter attached in either an Auxiliary Cache or Dual Storage IOA configuration was not discovered in the allotted time. To obtain additional information about the configuration involved, locate the formatted log in the Product Activity Log.
 - a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the Product Activity Log and record address information.

If a D IPL was not performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for "Address Information". This is the reporting adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the "Additional Information" to record the formatted log information. The "Type of adapter connection" field indicates the type of configuration involved.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses. See Examples: Obtaining additional information from hexadecimal reports. The "Type of adapter connection" field indicates the type of configuration involved.

2. Determine which of the following is the cause of your specific error and take the appropriate actions listed. If this does not correct the error, contact your hardware service provider. The possible causes are:
 - An attached adapter for the configuration is not installed or is not powered on. Some adapters are required to be part of a Dual Storage IOA Configuration. Ensure that both adapters are properly installed and powered on. Use the Hardware Service Manager to determine the missing remote adapter that is paired with the reporting adapter.
 - If this is an Auxiliary Cache or dual storage IOA configuration, then both adapters may not be in the same partition. Ensure that both adapters are assigned to the same partition.
 - An attached adapter does not support the desired configuration.
 - An attached adapter for the configuration failed. Take action on the other errors that have occurred at the same time as this error.
 - Adapter code levels are not up to date or are not at the same level of supported function. Ensure that the code for both adapters is at the latest level.
 - A PCIe cable to a PCIe storage enclosure might be failing.

Note: The adapter that is logging this error will run in a performance degraded mode, without caching, until the problem is resolved.

This ends the procedure.

SIP3148

Use this procedure to resolve the following problem: Attached enclosure does not support required multipath function (SRC xxx4050).

The possible cause is the use of an unsupported device enclosure.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
1. Identify the adapter and adapter port that is associated with the problem by examining the product activity log. Perform the following steps:
 - a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the product activity log and record address information.

If a type D IPL was not performed to get to SST or DST:

The log information is formatted. Access the product activity log and display the SRC that sent you here. Press the F9 key for address information. This is the adapter address. Then,

press F12 to cancel and return to the previous screen. Then press the F4 key to view the additional information to record the formatted log information. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

If a type D IPL was performed to get to DST:

The log information is not formatted. Access the product activity log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB Hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses, see Examples: Obtaining additional information from hexadecimal reports. The Adapter Port field indicates the port on the adapter reporting the problem. There may be more than one port listed because multiple ports map to the same physical connector. For example, ports 0 through 3 map to the first physical connector, 4 through 7 map to the second physical connector, and so on. The port numbers are labeled on the adapter tailstock.

- c. Determine the location of the adapter that reported the problem. Go to Addresses and find the following items:

- The card slot that is identified by the direct select address (DSA)
- The physical connector identified by the port number found on the adapter tailstock

Have you determined the location of the adapter and its port?

No: Ask your next level of support for assistance. **This ends the procedure.**

Yes: Continue with the next step.

2. If unsupported device enclosures are attached to the identified adapter port, then either remove or replace them with supported device enclosures.
3. Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

- a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
- b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

No: **This ends the procedure.**

Yes: Contact your hardware service provider. **This ends the procedure.**

SIP3149

Use this procedure to resolve the following problem: Incomplete multipath connection between adapter and remote adapter (SRC xxxx9075)

The possible cause is a failure in the embedded SAS fabric. Use the following table to determine the service action to perform.

Table 19. Service actions for a failure in the embedded SAS fabric

Location of device or devices	Service action
5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A	<p>Replace the following FRUs, one at a time, in the order shown until the problem is resolved. See 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A locations to determine the location, part number, and replacement procedure to use for each FRU.</p> <ol style="list-style-type: none"> 1. Replace the adapter that logged the error. <ul style="list-style-type: none"> • PCIe3 x8 cache SAS RAID internal adapter and backup power module card (<i>Un-P1-C14</i> and <i>Un-P1-C14-C1</i> or <i>Un-P1-C15</i> and <i>Un-P1-C15-C1</i>) 2. Replace the partner adapter of the adapter that logged the error. <ul style="list-style-type: none"> • PCIe3 x8 cache SAS RAID internal adapter and backup power module card (<i>Un-P1-C14</i> and <i>Un-P1-C14-C1</i> or <i>Un-P1-C15</i> and <i>Un-P1-C15-C1</i>) 3. Replace the system backplane at location <i>Un-P1</i>.
8247-42L, 8286-41A, or 8286-42A	<p>Replace the following FRUs, one at a time, in the order shown until the problem is resolved. See 8247-42L, 8286-41A, or 8286-42A locations to determine the location, part number, and replacement procedure to use for each FRU.</p> <ol style="list-style-type: none"> 1. Replace the adapter that logged the error. <ul style="list-style-type: none"> • PCIe3 x8 cache SAS RAID internal adapter (<i>Un-P1-C14</i> or <i>Un-P1-C15</i>) 2. Replace the partner adapter of the adapter that logged the error. <ul style="list-style-type: none"> • PCIe3 x8 cache SAS RAID internal adapter (<i>Un-P1-C14</i> or <i>Un-P1-C15</i>) 3. Replace the system backplane at location <i>Un-P1</i>.

This ends the procedure.

SIP3150

Use this procedure to complete serial attached SCSI (SAS) fabric problem isolation.

Considerations:

- Power off the system, partition, or card slot before you connect and disconnect cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS, PCI-X, and PCIe bus interface logic that is integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for these SAS, PCI-X, and PCIe buses. For these configurations, replacement of the RAID enablement card is unlikely to solve a SAS related problem because the SAS interface logic is on the system board.
- Some systems have a disk enclosure or removable media enclosure that is integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.
- Some systems have SAS RAID adapters that are integrated onto the system backplane and use a cache RAID and dual IOA enablement card to enable storage adapter write cache and dual storage I/O adapter (IOA) mode. For these configurations, replacement of the cache RAID and dual IOA enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system backplane.

Attention: When SAS fabric problems exist, obtain assistance from your hardware service provider:

- When SAS fabric problems exist, do not replace RAID adapters without assistance from your service provider. Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Follow appropriate service procedures when you replace the Cache RAID and dual IOA enablement card. Incorrect removal can result in data loss or a nondual storage IOA mode of operation.
- Do not remove functioning disk units in a disk array without assistance from your service provider. A disk array might become unprotected or might fail if functioning disk units are removed. The removal of functioning disk units might also result in additional problems in the disk array.

1. Was the SRC xxxx3020 or SRC xxxx8130?

No: Go to step 3.

Yes: Go to step 2.

2. Determine which of the following problems is the cause of your specific error and take the appropriate actions listed.

The possible causes for SRC xxxx3020 are:

- More devices are connected to the adapter than the adapter supports. Change the configuration to reduce the number of devices below what is supported by the adapter.
- A SAS device was incorrectly moved from one location to another. Either return the device to its original location or move the device while the adapter is powered off.
- A SAS device was incorrectly replaced by a SATA device. A SAS device must be used to replace a SAS device.

The possible causes for SRC xxxx8130 are:

- One or more SAS devices were moved from a PCIe2 or PCIe3 adapter to a PCI-X or PCIe adapter. If the device was moved from a PCIe2 or PCIe3 adapter to a PCI-X or PCIe adapter, the Detail Data section of the hardware error log contains a reason for failure of Payload CRC Error. For this case, the error can be ignored and the problem is resolved if the devices are moved back to a PCIe2 or PCIe3 adapter or if the devices are formatted on the PCI-X or PCIe adapter.
- For all other causes, go to step 3.

3. Determine the status of the disk units in the array by doing the following steps:

- a. Access the product activity log and display the SRC that sent you here.
- b. Press the F9 key for address information. This is the adapter address.
- c. Return to the SST or DST main menu.
- d. Select **Work with disk units > Display disk configuration > Display disk configuration status**.
- e. On the Display disk configuration status screen, look for the devices that are attached to the adapter that was identified.

Is there a device that has a status of RAID 5/Unknown, RAID 6/Unknown, RAID 5/Failed, or RAID 6/Failed?

No: Go to step 5.

Yes: Go to step 4.

4. Other errors might have occurred that are related to the disk array having degraded protection. Take action on these errors to replace the failed disk unit and restore the disk array to a fully protected state. **This ends the procedure.**

5. Have other errors occurred at the same time as this error?

No: Go to step 7.

Yes: Go to step 6.

6. Take action on the other errors that occurred at the same time as this error. **This ends the procedure.**

7. Was the SRC xxxxFFFE?

No: Go to step 10.

Yes: Go to step 8.

8. Check for the latest PTFs for the device, device enclosure, and adapter and apply them. If you need assistance finding PTFs, contact your next level of support. Did you find and apply a PTF?

No: Go to step 10.

Yes: Go to step 9.

9. **This ends the procedure.**

10. Identify the adapter and adapter port that is associated with the problem by examining the product activity log. Perform the following steps:

- a. Access SST or DST.

- If you can enter a command at the console, access system service tools (SST). See System service tools.
- If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
- If you cannot perform a type A or B IPL, perform a type D IPL from removable media.

- b. Access the product activity log and display the SRC that sent you here. Record the adapter address and the adapter port by completing one of the following actions:

- If the SRC is `xxxxFFFE`, press the F9 key for address information. The adapter address is the bus information. The port is shown in the I/O bus field. Convert the port value from decimal to hexadecimal.
- Press the F9 key for address information. The adapter address is the bus information. Then, press F12 to cancel and return to the previous screen. Then, press the F4 key to view the additional information, if available. This information is the unit address. Go to SAS address and physical location information and use the unit address to determine the controller port.
- Go to Hexadecimal product activity log data to obtain the address information. The adapter address is the bus information. The controller port is contained in the unit address. Go to SAS address and physical location information and use the unit address to determine the controller port.

11. Perform the following steps:

- Select **Start a Service Tool > Hardware Service Manager > Logical Hardware Resources > System Bus Resources**.
- Enter the adapter bus address and use the **Associated packaging resource(s)** option to display the type, model, and unit ID.
- Record the type, model, and unit ID of the enclosure in which the adapter is located.
- Use the type, model, unit ID and adapter address to find the location of the adapter (see Addresses to find the location and then go to Part locations and location codes).
- The logical port number was identified in step 10. Logical port numbers are indicated on the physical connector labels that are located on the tailstock of the adapter. To locate the device or device enclosure that is experiencing the problem, use the logical port number to determine the physical connector to which the device or device enclosure is attached.

Note: For more information about unit address formats, see SAS address and physical location information.

12. Because the problem persists, some corrective action is needed to resolve the problem.

Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions was previously attempted, proceed to the next one in the list.

- Reseat cables, if present, on adapter and device enclosure. Perform the following steps:
 - Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.

- b. Reseat the cables.
- c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
- Replace the cable, if present, from the adapter to the device enclosure. Perform the following steps:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Replace the cables.
 - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
- Replace the device.

Note: If there are multiple devices with a path that is not Operational, the problem is not likely to be with a device.

- Replace the internal device enclosure or see the service documentation for an external expansion unit. Perform the following steps:
 - a. Power off the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power off the adapter slot.
 - b. Replace the device enclosure.
 - c. Power on the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power on the adapter slot.
- Replace the adapter. The procedure to replace the adapter can be found in PCI adapter.
- Contact your service provider.

13. Does the problem still occur after you completed the corrective action?

No: This ends the procedure.

Yes: Go to step 12 on page 152.

SIP3152

Use this procedure to resolve possible failed connection problems.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

This procedure is used to resolve the following problems:

- Multipath redundancy level is worse (SRC xxxx4060)
- Device bus fabric error (SRC xxxx4100)
- Temporary device bus fabric error (SRC xxxx4101)

The possible causes are:

- A failed connection caused by a failing component in the serial-attached SCSI (SAS) fabric between, and including, the adapter and device enclosure.
- A failed connection caused by a failing component within the device enclosure, including the device itself.

Note: For SRC xxxx4060, the failed connection was previously working, and might have already recovered.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS, PCI-X, and PCIe bus interface logic integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for these SAS, PCI-X, and PCIe buses. For these configurations, replacement of the RAID enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.
- Some systems have SAS RAID adapters integrated onto the system backplane and use a cache RAID and dual IOA enablement card to enable the storage-adapter write cache and dual-storage I/O adapter (IOA) mode. For these configurations, replacement of the cache RAID and dual IOA enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system backplane.
- Some configurations involve a SAS adapter connecting to internal SAS disk enclosures within a system that uses a cable card. When the procedure refers to a device enclosure, it could be referring to the internal SAS disk slots or media slots. Also, when the procedure refers to a cable, it could include a cable card.
- When using SAS adapters in a dual storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (not the secondary adapter).

Attention:

- When SAS fabric problems exist, do not replace RAID adapters without assistance from your service provider. Because the adapter might contain nonvolatile, write-cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
 - Follow appropriate service procedures when replacing the cache RAID and dual IOA enablement card. Incorrect removal can result in data loss or a nondual storage IOA mode of operation.
 - Do not remove functioning disk units in a disk array without assistance from your service provider. A disk array might become unprotected or might fail if functioning disk units are removed. The removal of functioning disk units might also result in additional problems in the disk array.
1. Determine the resource name of the adapter that reported the problem by performing the following steps:
 - a. Access SST or DST.
 - b. Access the product activity log and record the resource name that this error is logged against. If the resource name is an adapter resource name, use it and continue with the next step. If the resource name is a disk-unit resource name, use the Hardware Service Manager to determine the resource name of the adapter that is controlling this disk unit. The logical bus number of the disk-unit logical resource might be useful in determining the adapter resource name.
 2. Determine whether a problem still exists for the DCxx adapter resource that logged this error by examining the SAS connections. See Viewing SAS fabric path information. Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition has been recovered. If the error condition has been recovered more than once, go to step 5 on page 155. Otherwise, the error condition is not a persistent problem and no further service action is necessary. **This ends the procedure.**
 3. Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

 - a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources that are attached to the virtual I/O processor.

4. To determine whether the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 on page 154 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**

5. Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions has previously been attempted, proceed to the next one in the list.
 - Reseat cables, if present, on the adapter , device enclosure, and any additional device enclosures connected to the device enclosure. Perform the following steps:
 - a. Using Hardware Service Manager packaging resources, perform adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Reseat the cables.
 - c. Using Hardware Service Manager packaging resources, perform adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
 - Replace the cable, if present, from the adapter to device enclosure, and any cables between the device enclosure and additional device enclosures connected to the device enclosure. Perform the following steps:
 - a. Using Hardware Service Manager packaging resources, perform adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Replace the cables.
 - c. Using Hardware Service Manager packaging resources, perform adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
 - Replace the device.

Note: If there are multiple devices with a path that is not Operational, the problem is not likely to be with a device.

- Replace the internal device enclosure or see the service documentation for an external expansion unit. Perform the following steps:
 - a. Power off the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power off the adapter slot.
 - b. Replace the device-enclosure failing items. See SASEXP and DEVBPLN for possible failing items to replace.
 - c. Power on the system or partition. If the enclosure is external, adapter concurrent maintenance can be used instead to power on the adapter slot.
 - Replace the adapter. For the procedure to replace the adapter, see PCI adapter.
 - Contact your service provider.
6. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 on page 154 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Go to step 5.

Yes: The error condition has been recovered. If the error condition has been recovered more than once, go to step 5. Otherwise, the error condition is not a persistent problem and no further service action is necessary. **This ends the procedure.**

SIP3153

Use this procedure to resolve possible failed connection problems.

Use isolation procedure “SIP3152” on page 153.

SIP3250

Use this procedure to complete SAS fabric problem isolation for a PCIe2 or PCIe3 controller.

Considerations:

- Power off the system, partition, or card slot before you connect and disconnect cables or devices, as appropriate, to prevent hardware damage.
- Some systems have a disk enclosure or removable media enclosure that is integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards and a failed connection can be the result of a failed system board or integrated device enclosure.

Attention: When SAS fabric problems exist, obtain assistance from your hardware service provider:

- When SAS fabric problems exist, do not replace RAID adapters without assistance from your service provider. Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Do not remove functioning disk units in a disk array without assistance from your service provider. If functioning disk units are removed, a disk array might become unprotected or might fail. The removal of functioning disk units might also result in additional problems in the disk array.

1. Was the SRC `xxxx3020`?

No: Go to step 3.

Yes: Go to step 2.

2. The possible causes are:

- More devices are connected to the adapter than the adapter supports. Change the configuration to reduce the number of devices below what is supported by the adapter.
- A SAS device was incorrectly moved from one location to another. Either return the device to its original location or move the device while the adapter is powered off.
- A SATA device was incorrectly replaced a SAS device. A SAS device must be used to replace a SAS device.

This ends the procedure.

3. Determine the status of the disk units in the array by doing the following steps:

- a. Access the product activity log and display the SRC that sent you here.
- b. Press the F9 key for address information. The displayed information contains the adapter address.
- c. Return to the SST or DST main menu.
- d. Select **Work with disk units > Display disk configuration > Display disk configuration status**.
- e. On the Display disk configuration status screen, look for the devices that are attached to the adapter that was identified.

Is there a device that has a status of RAID 5/Unknown, RAID 6/Unknown, RAID 5/Failed, or RAID 6/Failed?

No: Go to step 5.

Yes: Go to step 4.

4. Other errors might have occurred that are related to the disk array having degraded protection. For these errors, replace the failed disk unit and restore the disk array to a fully protected state. **This ends the procedure.**

5. Was the SRC `xxxxFFFD`?

No: Go to step 8 on page 157.

Yes: Go to step 6.

6. Identify the location of the device that is associated with the problem. Perform the following steps:

- a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the product activity log and display the SRC that sent you here. Find the location of the device by completing one of the following actions:
 - Record the resource name of the device. Then, use the Hardware Service Manager to determine the location of the device by using the resource name.
 - Go to Hexadecimal product activity log data to obtain the direct select address (DSA) and the unit address information. Then, go to Addresses to determine the location of the device.
7. Replace the device at the location identified in step 6 on page 156. For information about locations, see Part locations and location codes. If replacing the device does not resolve the problem, contact your hardware service provider. **This ends the procedure.**
8. Have other errors occurred at the same time as this error?

No: Go to step 10.

Yes: Go to step 9.
9. Fix the other errors that occurred at the same time as this error. **This ends the procedure.**
10. Was the SRC `xxxxFFFE`?

No: Go to step 13.

Yes: Go to step 11.
11. Check for the latest PTFs for the device, device enclosure, and adapter and apply them. If you need assistance finding PTFs, contact your next level of support. Did you find and apply a PTF?

No: Go to step 13.

Yes: Go to step 12.
12. **This ends the procedure.**
13. Identify the adapter SAS port that is associated with the problem by examining the product activity log. Perform the following steps:
 - a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the product activity log and display the SRC that sent you here. Record the adapter address and the adapter port by completing one of the following actions:
 - If the SRC is `xxxxFFFE`, press the F9 key for address information. The adapter address is the bus information. The port is shown in the I/O bus field. Convert the port value from decimal to hexadecimal.
 - Press the F9 key for address information. The adapter address is the bus information. Then, press F12 to cancel and return to the previous screen. Then, press the F4 key to view the additional information, if available. This information is the unit address. Go to SAS address and physical location information and use the unit address to determine the controller port.
 - Go to Hexadecimal product activity log data to obtain the address information. The adapter address is the bus information. The controller port is contained in the unit address. Go to SAS address and physical location information and use the unit address to determine the controller port.

14. Perform the following steps:
 - a. Select **Start a Service Tool > Hardware Service Manager > Logical Hardware Resources > System Bus Resources**.
 - b. Enter the adapter bus address and use the **Associated packaging resource(s)** option to display the type, model, and unit ID.
 - c. Record the type, model, and unit ID of the enclosure in which the adapter is located.
 - d. Use the type, model, unit ID, and adapter address to find the location of the adapter (see Addresses to find the location and then go to Part locations and location codes).
 - e. The logical port number was identified in step 13 on page 157. Logical port numbers are indicated on the physical connector labels that are located on the tailstock of the adapter. To locate the device or device enclosure that is experiencing the problem, use the logical port number to determine the physical connector to which the device or device enclosure is attached.

15. Because the problem persists, some corrective action is required to resolve the problem. Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions was previously attempted, proceed to the next one in the list.

- Reseat cables, if present, on adapter and device enclosure. Perform the following steps:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Reseat the cables.
 - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
- Replace the cable, if present, from the adapter to the device enclosure. Perform the following steps:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Replace the cables.
 - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
- Replace the device.

Note: If there are multiple devices with a path that is not Operational, the problem is not likely to be with a device.

- Replace the internal device enclosure or see the service documentation for an external expansion unit. Perform the following steps:
 - a. Power off the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power off the adapter slot.
 - b. Replace the device enclosure.
 - c. Power on the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power on the adapter slot.
- Replace the adapter. The procedure to replace the adapter can be found in PCI adapter.
- Contact your service provider.

16. Does the problem still occur after you completed the corrective action?

No: This ends the procedure.

Yes: Go to step 15.

SIP3254

Use this procedure to resolve the following problem: Device bus fabric performance degradation (SRC xxxx4102) for a PCIe2 or PCIe3 controller.

Note: This problem is not common for a PCIe2 or PCIe3 controller.

Perform "SIP3290."

This ends the procedure.

SIP3290

The problem that occurred is uncommon or complex to resolve. Use this procedure to gather error information and contact your next level of support.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions, before continuing with this procedure.
2. Access SST/DST by doing one of the following:
 - If you **can** enter a command at the console, access system service tools (SST). See System service tools.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
3. Access the product activity log and collect any hardware error information, including hexadecimal data, logged about the same time for the adapter.
4. Determine the status of the disk units in the array by performing the following steps:
 - a. Access the product activity log and display the SRC that sent you here.
 - b. Press the F9 key for address information. This displays the adapter address.
 - c. Return to the SST or DST main menu.
 - d. Select **Work with disk units > Display disk configuration > Display disk configuration status**.
 - e. On the Display disk configuration status screen, look for the devices attached to the adapter that was identified and record their status.
5. Collect log, debug, and dump data if available and contact your next level of support for assistance.
This ends the procedure.

SIP3295

Use this procedure to resolve the following problem: Controller exceeded maximum operating temperature (SRC xxxx4080) for a PCIe2 or PCIe3 controller.

1. The storage controller chip has exceeded the maximum normal operating temperature. The adapter continues to run unless the temperature rises even more to the point where errors or hardware failures occur. The adapter is not likely to be the cause of the over temperature condition. Perform the following steps to view the temperature information:
 - a. Access SST/DST by doing one of the following:
 - If you **can** enter a command at the console, access system service tools (SST). See System service tools.
 - If you **cannot** enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - b. Access the product activity log and display the SRC that sent you here. Press the F4 key to view the temperature information in **Additional Information**. The **Detail Data** section contains the **Current Temperature** (in degrees Celsius in decimal notation) and **Maximum Operating Temperature** (in degrees Celsius in decimal notation) at the time the error was logged.
 - c. Continue with the next step to determine the possible cause and necessary action to prevent exceeding the maximum operating temperature.
2. Determine which of the following items is the cause of exceeding the maximum operating temperature and take the appropriate actions listed. If this does not correct the error, contact your next level of support for assistance.

The possible causes are:

- The adapter is installed in an unsupported system. For information about which systems support the adapter, see PCI adapter information by feature type.
- The adapter is installed in an unsupported slot location within the system unit or I/O enclosure. For information about supported slot locations, see PCI adapter placement information for the machine type model (MTM) where the adapter is located.
- Ensure that there are no issues affecting proper cooling (no fan failures or obstructions).

Note: The adapter that is logging this error continues to log this error while the adapter remains above the maximum operating temperature or each time it exceeds the maximum operating temperature.

This ends the procedure.

SIP4040

Use this procedure to resolve the following problem: Multiple adapters connected in an invalid configuration (SRC xxx9073)

A configuration error occurred. See "SAS RAID configurations" on page 331 to determine the allowable configurations. Then correct the configuration. If correcting the configuration does not resolve the error, contact your hardware service provider. **This ends the procedure.**

SIP4041

Use this procedure to resolve the following problem: Multiple adapters not capable of controlling the same set of devices (SRC xxx9074)

1. This error relates to adapters connected in a dual storage IOA configuration. To obtain the reason or description for this failure, you must find the formatted error information in the Product Activity Log. The log also contains information about the connected adapter.

Perform the following steps:

- a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the Product Activity Log and record address information.

If a D IPL was not performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for "Address Information". This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the "Additional Information" to record the formatted log information. The Problem description field indicates the type of problem. The type, serial number, and Worldwide ID of the connected adapter is also available.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses. See Examples: Obtaining additional information from hexadecimal reports. The Problem description field indicates the type of problem. The type, serial number, and Worldwide ID of the connected adapter is also available.

- Find the problem description and information for the connected adapter (remote adapter) shown in the error log, and perform the action listed for the reason in the following table.

Table 20. RAID array reason for failure

Problem description	Full description	Action	Adapter on which to perform the action
Secondary is unable to find devices found by the primary.	Secondary adapter cannot discover all the devices that the primary has.	Verify the connections to the devices from the adapter that logged the error. See "SAS fabric identification" on page 328 to verify connections.	Adapter that logged the error.
Secondary found devices not found by the primary.	Secondary adapter has discovered more devices than the primary. After this error is logged, an automatic failover will occur.	Verify the connections to the devices from the remote adapter as indicated in the error log. See "SAS fabric identification" on page 328 to verify connections.	Remote adapter indicated in the error log.
Primary lost contact with disk units accessible by secondary.	Link failure from primary adapter to devices. An automatic failover will occur.	Verify the connections to the devices from the adapter that logged the error. See "SAS fabric identification" on page 328 to verify connections.	Adapter that logged the error.
Other	Not currently defined.	Contact your hardware service provider.	

This ends the procedure.

SIP4044

Use this procedure to resolve problems with multipath connections.

This procedure is used to resolve the following configuration errors:

- Configuration error, incorrect multipath connection (SRC xxx4030)
- Configuration error, incomplete multipath connection between adapter and enclosure detected (SRC xxx4040)

The possible causes are:

- Incorrect cabling to device enclosure.

Note: Pay special attention to the requirement that a YI-cable must be routed along the right side of the rack frame (as viewed from the rear) when connecting to a disk expansion unit. Review the device enclosure cabling and correct the cabling as required. To see example device configurations with serial attached SCSI (SAS) cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning.

- A failed connection caused by a failing component in the SAS fabric between, and including, the adapter and device enclosure.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS, PCI-X, and PCIe bus interface logic integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for these SAS, PCI-X, and PCIe buses. For these configurations, replacement of the RAID enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.
- When using SAS adapters in a dual storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (that is, not the secondary adapter).

Attention: When SAS fabric problems exist, do not replace RAID adapters without assistance from your service provider. Because the adapter might contain non-volatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter. Follow appropriate service procedures when replacing the cache RAID and dual IOA Enablement Card. Incorrect removal can result in data loss or a nondual storage IOA mode of operation.

1. Was the SRC xxxx4030?

No: Go to step 4.

Yes: Go to step 2.

2. Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning information.
3. Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

- a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
- b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

No: **This ends the procedure.**

Yes: Contact your hardware service provider. **This ends the procedure.**

4. The SRC is xxxx4040. Determine whether a problem still exists for the DCxx adapter resource that logged this error by examining the SAS connections. See Viewing SAS fabric path information. Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**

5. Perform the following steps to cause the adapter to rediscover the devices and connections:
 - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.

Note: At this point, ignore any problems found and continue with the next step.

- Determine if the problem still exists for the adapter that logged this error by examining the SAS connections by performing the actions in step 4 on page 162 again.

Do all expected devices appear in the list and are all paths marked as Operational?

No Go to step 7.

Yes This ends the procedure.

- Go to “SAS fabric identification” on page 328. Then continue with the next step.
- To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 4 on page 162 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Go to step 7.

Yes: This ends the procedure.

SIP4047

Use this procedure to resolve the following problem: Missing remote adapter (SRC xxxx9076)

An adapter attached in a dual storage IOA configuration was not discovered in the allotted time. Determine which one of the following items is the cause of your specific error and take the appropriate actions listed. If this action does not correct the error, contact your hardware service provider. The possible causes are:

- An attached adapter for the configuration is not installed or is not powered on. Some adapters are required to be part of a Dual Storage IOA Configuration. Ensure that both adapters are properly installed and powered on.
- If this configuration is a dual storage IOA configuration, then both adapters might not be in the same partition. Ensure that both adapters are assigned to the same partition.
- An attached adapter does not support the desired configuration. See “SAS RAID configurations” on page 331 to determine the allowable configurations. Then correct the configuration. If correcting the configuration does not resolve the error, contact your hardware service provider.
- An attached adapter for the configuration failed. Take action on the other errors that have occurred at the same time as this error.
- Adapter code levels are not up to date or are not at the same level of supported function. Ensure that the code for both adapters is at the latest level.

Note: The adapter that is logging this error will run in a performance degraded mode, without caching, until the problem is resolved.

This ends the procedure.

SIP4049

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

SIP4050

Use this procedure to complete serial attached SCSI (SAS) fabric problem isolation.

Considerations:

- Power off the system, partition, or card slot before you connect and disconnect cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS, PCI-X, and PCIe bus interface logic that is integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for these SAS, PCI-X, and PCIe buses. For these configurations, replacement of the RAID enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board.

- Some systems have a disk enclosure or removable media enclosure that is integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.

Attention: When SAS fabric problems exist, obtain assistance from your hardware service provider:

- When SAS fabric problems exist, do not replace RAID adapters without assistance from your service provider. Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Follow appropriate service procedures when you replace the Cache RAID and dual IOA enablement card. Incorrect removal can result in data loss or a nondual storage IOA mode of operation.
- Do not remove functioning disk units in a disk array without assistance from your service provider. A disk array might become unprotected or might fail if functioning disk units are removed. The removal of functioning disk units might also result in additional problems in the disk array.

1. Was the SRC `xxxx3020`?

No: Go to step 3.

Yes: Go to step 2.

2. The possible causes are:

- More devices are connected to the adapter than the adapter supports. Change the configuration to the allowable number of devices.
- A SAS device was incorrectly moved from one location to another. Either return the device to its original location or move the device while the adapter is powered off.
- A SAS device was incorrectly replaced by a SATA device. A SAS device must be used to replace a SAS device.

This ends the procedure.

3. Determine the status of the disk units in the array by doing the following steps:

- Access the product activity log and display the SRC that sent you here.
- Press the F9 key for address information. This information is the adapter address.
- Return to the SST or DST main menu.
- Select **Work with disk units > Display disk configuration > Display disk configuration status**.
- On the Display disk configuration status screen, look for the devices that are attached to the adapter that was identified.

Is there a device that has a status of RAID 5/Unknown, RAID 6/Unknown, RAID 5/Failed, or RAID 6/Failed?

No: Go to step 5.

Yes: Go to step 4.

4. Other errors might have occurred that are related to the disk array having degraded protection. Take action on these errors to replace the failed disk unit and restore the disk array to a fully protected state. **This ends the procedure.**

5. Have other errors occurred at the same time as this error?

No: Go to step 7.

Yes: Go to step 6.

6. Take action on the other errors that occurred at the same time as this error. **This ends the procedure.**

7. Was the SRC `xxxxFFFE`?

No: Go to step 10 on page 165.

Yes: Go to step 8 on page 165.

8. Check for the latest PTFs for the device, device enclosure, and adapter and apply them. If you need assistance finding PTFs, contact your next level of support. Did you find and apply a PTF?
No: Go to step 10.
Yes: Go to step 9.
9. **This ends the procedure.**
10. Is the problem in a disk expansion unit?
No Go to “SAS fabric identification” on page 328.
Yes Go to 11.
11. Identify the adapter and adapter port that is associated with the problem by examining the product activity log. Perform the following steps:
 - a. Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - b. Access the product activity log and display the SRC that sent you here. Record the adapter address and the adapter port by completing one of the following actions:
 - If the SRC is xxxxFFFE, press the F9 key for address information. The adapter address is the bus information. The port is shown in the I/O bus field. Convert the port value from decimal to hexadecimal.
 - Press the F9 key for address information. The adapter address is the bus information. Then, press F12 to cancel and return to the previous screen. Then, press the F4 key to view the additional information, if available. This information is the unit address. Go to SAS address and physical location information and use the unit address to determine the controller port.
 - Go to Hexadecimal product activity log data to obtain the address information. The adapter address is the bus information. The controller port is contained in the unit address. Go to SAS address and physical location information and use the unit address to determine the controller port.
12. Perform the following steps:
 - a. Select **Start a Service Tool > Hardware Service Manager > Logical Hardware Resources > System Bus Resources**.
 - b. Enter the adapter bus address and use the **Associated packaging resource(s)** option to display the type, model, and unit ID.
 - c. Record the type, model, and unit ID of the enclosure in which the adapter is located.
 - d. Use the type, model, unit ID, and adapter address to find the location of the adapter (see Addresses to find the location and then go to Part locations and location codes).
 - e. The logical port number was identified in step 11. Logical port numbers are indicated on the physical connector labels that are located on the tailstock of the adapter. To locate the device or device enclosure that is experiencing the problem, use the logical port number to determine the physical connector to which the device or device enclosure is attached.
13. Because the problem persists, some corrective action is needed to resolve the problem. Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions was previously attempted, proceed to the next one in the list.
 - Reseat cables, if present, on adapter and device enclosure. Perform the following steps:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Reseat the cables.

- c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
- Replace the cable, if present, from the adapter to the device enclosure. Perform the following steps:
 - a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - b. Replace the cables.
 - c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
- Replace the device.

Note: If there are multiple devices with a path that is not Operational, the problem is not likely to be with a device.

- Replace the internal device enclosure or see the service documentation for an external expansion unit. Perform the following steps:
 - a. Power off the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power off the adapter slot.
 - b. Replace the device enclosure.
 - c. Power on the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power on the adapter slot.
- Replace the adapter. The procedure to replace the adapter can be found in PCI adapter.
- Contact your service provider.

14. Does the problem still occur after you complete the corrective action?

No: This ends the procedure.

Yes: Go to step 13 on page 165.

SIP4052

Use this procedure to resolve possible failed connection problems

This procedure is used to resolve the following problems:

- Multipath redundancy level is worse (SRC xxxx4060)
- Device bus fabric error (SRC xxxx4100)
- Temporary device bus fabric error (SRC xxxx4101)

The possible causes are:

- A failed connection caused by a failing component in the serial attached SCSI (SAS) fabric between, and including, the adapter and device enclosure.
- A failed connection caused by a failing component within the device enclosure, including the device itself.

Note: For SRC xxxx4060, the failed connection was previously working, and might have already recovered.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have SAS, PCI-X, and PCIe bus interface logic integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for these SAS, PCI-X, and PCIe buses. For these configurations, replacement of the RAID enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board.

- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.
- When using SAS adapters in a dual storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (not the secondary adapter).

Attention:

- When SAS fabric problems exist, do not replace RAID adapters without assistance from your service provider. Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
 - Follow appropriate service procedures when replacing the Cache RAID and dual IOA enablement card. Incorrect removal can result in data loss or a nondual storage IOA mode of operation.
 - Do not remove functioning disk units in a disk array without assistance from your service provider. A disk array might become unprotected or might fail if functioning disk units are removed. The removal of functioning disk units might also result in additional problems in the disk array.
1. Determine the resource name of the adapter that reported the problem by performing the following:
 - a. Access SST or DST.
 - b. Access the product activity log and record the resource name that this error is logged against. If the resource name is an adapter resource name, use it and continue with the next step. If the resource name is a disk unit resource name, use the Hardware Service Manager to determine the resource name of the adapter that is controlling this disk unit.
 2. Determine whether a problem still exists for the DCxx adapter resource that logged this error by examining the SAS connections. See Viewing SAS fabric path information. Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition has been recovered. If the error condition has been recovered more than one time, go to step 5. Otherwise, the error condition is not a persistent problem and no further service action is necessary. **This ends the procedure.**
 3. Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

 - a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.
 4. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**
 5. Go to “SAS fabric identification” on page 328. Then continue with the next step.
 6. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Go to step 5.

Yes: The error condition has been recovered. If the error condition has been recovered more than one time, go to step 5. Otherwise, the error condition is not a persistent problem and no further service action is necessary. **This ends the procedure.**

SIP4053

Use this procedure to resolve possible failed connection problems.

Use isolation procedure "SIP4052" on page 166.

SIP4140

Use this procedure to resolve the following problem: Multiple adapters connected in an invalid configuration (SRC xxx9073)

One adapter, of a connected pair of adapters, is not operating under the same operating system type as the other adapter. Connected adapters must both be controlled by the same type of operating system. Correct the configuration. If correcting the configuration does not resolve the error, contact your hardware service provider. **This ends the procedure.**

SIP4141

Use this procedure to resolve the following problem: Multiple adapters not capable of controlling the same set of devices (SRC xxx9074)

1. This error relates to adapters connected in a dual storage IOA configuration. To obtain the reason or description for this failure, you must find the formatted error information in the Product Activity Log. The log also contains information about the connected adapter.

Perform the following steps:

- a. Access SST/DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
- b. Access the Product Activity Log and record address information.

If a D IPL was not performed to get to SST/DST:

The log information is formatted. Access the Product Activity Log and display the SRC that sent you here. Press the F9 key for "Address Information". This is the adapter address. Then, press F12 to cancel and return to the previous screen. Then press the F4 key to view the "Additional Information" to record the formatted log information. The Problem description field indicates the type of problem. The type, serial number, and Worldwide ID of the connected adapter is also available.

If a D IPL was performed to get to DST:

The log information is not formatted. Access the Product Activity Log and display the SRC that sent you here. The direct select address (DSA) of the adapter is in the format BBBB-xxxx:

BBBB hexadecimal offsets 4C and 4D

xxxx Not used

In order to interpret the hexadecimal information to get device addresses. See Examples: Obtaining additional information from hexadecimal reports. The Problem description field indicates the type of problem. The type, serial number, and Worldwide ID of the connected adapter is also available.

2. Find the problem description and information for the connected adapter (remote adapter) shown in the error log, and perform the action listed for the reason in the following table.

Table 21. RAID array reason for failure

Problem description	Full description	Action	Adapter on which to perform the action
Secondary is unable to find devices found by the primary.	Secondary adapter cannot discover all the devices that the primary has.	Verify the connections to the devices from the adapter that logged the error. See "SAS fabric identification" on page 328 to verify connections.	Adapter that logged the error.
Secondary found devices not found by the primary.	Secondary adapter has discovered more devices than the primary. After this error is logged, an automatic failover will occur.	Verify the connections to the devices from the remote adapter as indicated in the error log. See "SAS fabric identification" on page 328 to verify connections.	Remote adapter indicated in the error log.
Primary lost contact with disk units accessible by secondary.	Link failure from primary adapter to devices. An automatic failover will occur.	Verify the connections to the devices from the adapter that logged the error. See "SAS fabric identification" on page 328 to verify connections.	Adapter that logged the error.
Other	Not currently defined.	Contact your hardware service provider.	

This ends the procedure.

SIP4144

Use this procedure to resolve problems with multipath connections.

This procedure is used to resolve the following configuration errors:

- Configuration error, incorrect multipath connection (SRC xxxx4030)
- Configuration error, incomplete multipath connection between adapter and enclosure detected (SRC xxxx4040)

The possible causes are:

- Incorrect cabling to device enclosure.

Note: Pay special attention to the requirement that a YI-cable must be routed along the right side of the rack frame (as viewed from the rear) when connecting to a disk expansion unit. Review the device enclosure cabling and correct the cabling as required. To see example device configurations with serial attached SCSI (SAS) cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning.

- A failed connection caused by a failing component in the SAS fabric between, and including, the adapter and device enclosure.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.

- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.
- Some systems have SAS RAID adapters integrated onto the system backplane and use a cache RAID and dual IOA enablement card to enable storage adapter write cache and dual storage I/O adapter (IOA) mode. For these configurations, replacement of the cache RAID and dual IOA enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system backplane.
- When using SAS adapters in a dual storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (that is, not the secondary adapter).

Attention: When SAS fabric problems exist, do not replace RAID adapters without assistance from your service provider. Because the adapter might contain non-volatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter. Follow appropriate service procedures when replacing the cache RAID and dual IOA Enablement Card. Incorrect removal can result in data loss or a nondual storage IOA mode of operation.

1. Was the SRC xxxx4030?

No: Go to step 4.

Yes: Go to step 2.

2. Review the device enclosure cabling and correct the cabling as required for the device or device enclosure attached to the identified adapter port. To see example device configurations with SAS cabling, see Serial-attached SCSI cable planning, in the Site and hardware planning information.
3. Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

- a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
- b. Vary on any other resources attached to the virtual I/O processor.

Did the error recur?

No: **This ends the procedure.**

Yes: Contact your hardware service provider. **This ends the procedure.**

4. The SRC is xxxx4040. Determine whether a problem still exists for the DCxx adapter resource that logged this error by examining the SAS connections. See Viewing SAS fabric path information. Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**

5. Perform the following steps to cause the adapter to rediscover the devices and connections:
 - a. Use Hardware Service Manager to re-IPL the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.

Note: At this point, ignore any problems found and continue with the next step.

6. Determine if the problem still exists for the adapter that logged this error by examining the SAS connections by performing the actions in step 4 again.

Do all expected devices appear in the list and are all paths marked as Operational?

No Go to step 7.

Yes **This ends the procedure.**

7. Go to "SAS fabric identification" on page 328. Then continue with the next step.

8. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 4 on page 170 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Go to step 7 on page 170.

Yes: This ends the procedure.

SIP4147

Use this procedure to resolve the following problem: Missing remote adapter (SRC xxxx9076)

An adapter attached in a dual storage IOA configuration was not discovered in the allotted time. Determine which one of the following items is the cause of your specific error and take the appropriate actions listed. If this action does not correct the error, contact your hardware service provider. The possible causes are:

- An attached adapter for the configuration is not installed or is not powered on. Some adapters are required to be part of a Dual Storage IOA Configuration. Ensure that both adapters are properly installed and powered on.
- If this configuration is a dual storage IOA configuration, then both adapters might not be in the same partition. Ensure that both adapters are assigned to the same partition.
- An attached adapter for the configuration failed. Take action on the other errors that have occurred at the same time as this error.
- Adapter code levels are not up to date or are not at the same level of supported function. Ensure that the code for both adapters is at the latest level.

Note: The adapter that is logging this error will run in a performance degraded mode, without caching, until the problem is resolved.

This ends the procedure.

SIP4149

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

SIP4150

Use this procedure to complete serial attached SCSI (SAS) fabric problem isolation.

Considerations:

- Power off the system, partition, or card slot before you connect and disconnect cables or devices, as appropriate, to prevent hardware damage.
- Some systems have a disk enclosure or removable media enclosure that is integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.
- Some systems have SAS RAID adapters that are integrated onto the system backplane and use a cache RAID and dual IOA enablement card to enable storage adapter write cache and dual storage I/O adapter (IOA) mode. For these configurations, replacement of the cache RAID and dual IOA enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system backplane.

Attention: When SAS fabric problems exist, obtain assistance from your hardware service provider:

- When SAS fabric problems exist, do not replace RAID adapters without assistance from your service provider. Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Follow appropriate service procedures when you replace the Cache RAID and dual IOA enablement card. Incorrect removal can result in data loss or a nondual storage IOA mode of operation.
- Do not remove functioning disk units in a disk array without assistance from your service provider. A disk array might become unprotected or might fail if functioning disk units are removed. The removal of functioning disk units might also result in additional problems in the disk array.

1. Was the SRC xxxx3020?

No: Go to step 3.

Yes: Go to step 2.

2. The possible causes are:

- More devices are connected to the adapter than the adapter supports. Change the configuration to the allowable number of devices.
- A SAS device was incorrectly moved from one location to another. Either return the device to its original location or move the device while the adapter is powered off.
- A SAS device was incorrectly replaced by a SATA device. A SAS device must be used to replace a SAS device.

This ends the procedure.

3. Determine the status of the disk units in the array by doing the following steps:

- a. Access the product activity log and display the SRC that sent you here.
- b. Press the F9 key for address information. This information is the adapter address.
- c. Return to the SST or DST main menu.
- d. Select **Work with disk units > Display disk configuration > Display disk configuration status**.
- e. On the Display disk configuration status screen, look for the devices that are attached to the adapter that was identified.

Is there a device that has a status of RAID 5/Unknown, RAID 6/Unknown, RAID 5/Failed, or RAID 6/Failed?

No: Go to step 5.

Yes: Go to step 4.

4. Other errors might have occurred that are related to the disk array having degraded protection. Take action on these errors to replace the failed disk unit and restore the disk array to a fully protected state. **This ends the procedure.**

5. Have other errors occurred at the same time as this error?

No: Go to step 7.

Yes: Go to step 6.

6. Take action on the other errors that occurred at the same time as this error. **This ends the procedure.**

7. Was the SRC xxxxFFFE?

No: Go to step 10 on page 173.

Yes: Go to step 8.

8. Check for the latest PTFs for the device, device enclosure, and adapter and apply them. If you need assistance finding PTFs, contact your next level of support. Did you find and apply a PTF?

No: Go to step 10 on page 173.

Yes: Go to step 9 on page 173.

9. **This ends the procedure.**
10. Is the problem in a disk expansion unit?
- No** Go to “SAS fabric identification” on page 328.
- Yes** Go to 11.
11. Identify the adapter and adapter port that is associated with the problem by examining the product activity log. Perform the following steps:
- Access SST or DST.
 - If you can enter a command at the console, access system service tools (SST). See System service tools.
 - If you cannot enter a command at the console, perform an IPL to DST. See Performing an IPL to dedicated service tools.
 - If you cannot perform a type A or B IPL, perform a type D IPL from removable media.
 - Access the product activity log and display the SRC that sent you here. Record the adapter address and the adapter port by completing one of the following actions:
 - If the SRC is `xxxxFFFE`, press the F9 key for address information. The adapter address is the bus information. The port is shown in the I/O bus field. Convert the port value from decimal to hexadecimal.
 - Press the F9 key for address information. The adapter address is the bus information. Then, press F12 to cancel and return to the previous screen. Then, press the F4 key to view the additional information, if available. This information is the unit address. Go to SAS address and physical location information and use the unit address to determine the controller port.
 - Go to Hexadecimal product activity log data to obtain the address information. The adapter address is the bus information. The controller port is contained in the unit address. Go to SAS address and physical location information and use the unit address to determine the controller port.
12. Perform the following steps:
- Select **Start a Service Tool > Hardware Service Manager > Logical Hardware Resources > System Bus Resources**.
 - Enter the adapter bus address and use the **Associated packaging resource(s)** option to display the type, model, and unit ID.
 - Record the type, model, and unit ID of the enclosure in which the adapter is located.
 - Use the type, model, unit ID, and adapter address to find the location of the adapter (see Addresses to find the location and then go to Part locations and location codes).
 - The logical port number was identified in step 11. Logical port numbers are indicated on the physical connector labels that are located on the tailstock of the adapter. To locate the device or device enclosure that is experiencing the problem, use the logical port number to determine the physical connector to which the device or device enclosure is attached.
13. Because the problem persists, some corrective action is needed to resolve the problem. Perform only one of the following corrective actions (listed in the order of preference). If one of the corrective actions was previously attempted, proceed to the next one in the list.
- Reseat cables, if present, on adapter and device enclosure. Perform the following steps:
 - Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
 - Reseat the cables.
 - Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
 - Replace the cable, if present, from the adapter to the device enclosure. Perform the following steps:

- a. Use adapter concurrent maintenance to power off the adapter slot, or power off the system or partition.
- b. Replace the cables.
- c. Use adapter concurrent maintenance to power on the adapter slot, or power on the system or partition.
- Replace the device.

Note: If there are multiple devices with a path that is not Operational, the problem is not likely to be with a device.

- Replace the internal device enclosure or see the service documentation for an external expansion unit. Perform the following steps:
 - a. Power off the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power off the adapter slot.
 - b. Replace the device enclosure.
 - c. Power on the system or partition. If the enclosure is external, use adapter concurrent maintenance instead to power on the adapter slot.
- Replace the adapter. The procedure to replace the adapter can be found in PCI adapter.
- Contact your service provider.

14. Does the problem still occur after you completed the corrective action?

No: This ends the procedure.

Yes: Go to step 13 on page 173.

SIP4152

Use this procedure to resolve possible failed connection problems

This procedure is used to resolve the following problems:

- Multipath redundancy level is worse (SRC xxxx4060)
- Device bus fabric error (SRC xxxx4100)
- Temporary device bus fabric error (SRC xxxx4101)

The possible causes are:

- A failed connection caused by a failing component in the serial attached SCSI (SAS) fabric between, and including, the adapter and device enclosure.
- A failed connection caused by a failing component within the device enclosure, including the device itself.

Note: For SRC xxxx4060, the failed connection was previously working, and might have already recovered.

Considerations:

- Power off the system, partition, or card slot before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.
- Some systems have SAS RAID adapters integrated onto the system backplane and use a cache RAID and dual IOA enablement card to enable storage adapter write cache and dual storage I/O adapter (IOA) mode. For these configurations, replacement of the cache RAID and dual IOA enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system backplane.

- When using SAS adapters in a dual storage IOA configuration, ensure that the actions taken in this procedure are against the primary adapter (not the secondary adapter).

Attention:

- When SAS fabric problems exist, do not replace RAID adapters without assistance from your service provider. Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Follow appropriate service procedures when replacing the Cache RAID and dual IOA enablement card. Incorrect removal can result in data loss or a nondual storage IOA mode of operation.
- Do not remove functioning disk units in a disk array without assistance from your service provider. A disk array might become unprotected or might fail if functioning disk units are removed. The removal of functioning disk units might also result in additional problems in the disk array.

1. Determine the resource name of the adapter that reported the problem by performing the following:
 - a. Access SST or DST.
 - b. Access the product activity log and record the resource name that this error is logged against. If the resource name is an adapter resource name, use it and continue with the next step. If the resource name is a disk unit resource name, use the Hardware Service Manager to determine the resource name of the adapter that is controlling this disk unit.

2. Determine whether a problem still exists for the DCxx adapter resource that logged this error by examining the SAS connections. See Viewing SAS fabric path information. Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition has been recovered. If the error condition has been recovered more than one time, go to step 5. Otherwise, the error condition is not a persistent problem and no further service action is necessary. **This ends the procedure.**

3. Perform the following steps to cause the adapter to rediscover the devices and connections:

Note: Performing this step causes the system partition to temporarily hang. Wait until the system bypasses the temporary hang.

- a. Use the logical resources IO debug option in Hardware Service Manager to perform another IPL of the virtual I/O processor that is associated with this adapter.
 - b. Vary on any other resources attached to the virtual I/O processor.
4. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Continue with the next step.

Yes: The error condition no longer exists. **This ends the procedure.**

5. Go to “SAS fabric identification” on page 328. Then continue with the next step.

6. To determine if the problem still exists for the adapter that logged this error, examine the SAS connections by performing the actions in step 2 again. Do all expected devices appear in the list and are all paths marked as Operational?

No: Go to step 5.

Yes: The error condition has been recovered. If the error condition has been recovered more than one time, go to step 5. Otherwise, the error condition is not a persistent problem and no further service action is necessary. **This ends the procedure.**

SIP4153

Use this procedure to resolve possible failed connection problems.

Use isolation procedure “SIP4152” on page 174.

Service processor isolation procedures

Use service processor isolation procedures if there is not a management console attached to the server. If the server is connected to a management console, use the procedures that are available on the management console to continue FRU isolation.

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.
 - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.

5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

FSPSP01

A part vital to system function is unconfigured. Review the system error logs for errors that include parts in their failing item list that are relevant to each reason code. If you replaced those parts and the problem is not resolved, use this procedure.

For information about removing and replacing FRUs, see Part locations and location codes.

Select the system that you are servicing:

- 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A
- 8408-44E or 8408-E8E
- 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Replace the system backplane at location U_n -P1.
3. Power on the system. For instructions, see Powering on and powering off the system.
4. Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

8408-44E or 8408-E8E

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Replace any unconfigured failing items. Complete the following steps to identify unconfigured failing items:
 - a. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
 - b. In the navigation area, expand **System Service Aids > Deconfiguration Records**.
3. Power on the system. For instructions, see Powering on and powering off the system.
4. Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Ensure that the cables that connect the system nodes and the cables that connect the system control unit and the system nodes are securely seated. For information about cabling, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
3. Replace any unconfigured failing items. Complete the following steps to identify unconfigured failing items:
 - a. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
 - b. In the navigation area, expand **System Service Aids > Deconfiguration Records**.
4. Power on the system. For instructions, see Powering on and powering off the system.
5. Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

FSPSP02

This procedure is for boot failures that terminate early in the boot process.

This error path is indicated when the reference code data words are scrolling automatically through control panel functions 11, 12, and 13, and the control panel interface buttons are not responsive.

Perform the following steps:

1. Push the power button to reset the system and start it on the other side of the platform Licensed Internal Code.

Note: The power button resets the system and attempts to reach standby.

2. Did a reference code occur after you started the system on the other side?

No: Verify that the system's firmware is at the latest level. Update the system's firmware on the failing side if necessary. Perform LICCODE. **This ends the procedure.**

Yes: Continue with the next step.

3. Is the reference code the same reference code that brought you to this procedure?

- **No:** Return to Starting a repair action to service this new reference code. **This ends the procedure.**
- **Yes:** Perform the action indicated for your system in the following table.

System:	Action:
5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A	Replace the system backplane (Un-P1). Refer to Part locations and location codes to locate the correct system location of the part you are replacing. If the problem is not resolved, contact your next level of support. This ends the procedure.
8408-44E or 8408-E8E	Replace the service processor card at location Un-P1-C5. If the problem persists, replace the I/O backplane at location Un-P1. Refer to Part locations and location codes to locate the correct system location of the part you are replacing. This ends the procedure.
9080-MHE, 9080-MME, 9119-MHE, or 9119-MME	Replace the service processor cards at locations Un-P1-C7 and Un-P1-C10 of the system control unit. If the problem persists, replace the system backplane at location Un-P1 of the system control unit. Refer to Part locations and location codes to locate the correct system location of the part you are replacing. This ends the procedure.

FSPSP03

A system operator or user error has occurred.

If a system reference code occurred, the system reference code description might provide information or an action that you can take to resolve the problem. Otherwise, see the documentation for the task that you were attempting to perform.

FSPSP04

A problem has been detected in the service processor firmware.

Perform LICCODE. **This ends the procedure.**

FSPSP05

The service processor has detected a problem in the platform firmware.

Perform LICCODE. **This ends the procedure.**

FSPSP06

The service processor reported a suspected intermittent problem.

Collect log, debug, and dump data if available and send it to your next level of support.

FSPSP07

The time of day was reset to the default value.

1. To set the time of day, see the systems operations guide.
2. If the problem persists, perform the following steps:
 - a. Power off the system. For instructions, see Powering on and powering off the system.
 - b. To determine the action to perform, use the following table.

System	Action
5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A	Replace the time-of-day battery at location Un-P1-E1. For information about locations, see Part locations and location codes.
8408-44E or 8408-E8E	Replace the time-of-day battery card at location Un-P1-C5-C1. For information about locations, see Part locations and location codes.
9080-MHE, 9080-MME, 9119-MHE, or 9119-MME	Replace the time-of-day battery. To determine which battery to replace, use the location code that is specified with the reference code. For information about locations, see Part locations and location codes.

3. Power on the system. For instructions, see Powering on and powering off the system. **This ends the procedure.**

FSPSP08

A problem was detected with a system processor, but it cannot be isolated to a specific processor.

5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Replace the processor modules one at a time (Un-P1-C32, then Un-P1-C33 if present). For information about locations, see Part locations and location codes.
3. Power on the system after you replace each processor. For instructions, see Powering on and powering off the system. **This ends the procedure.**

8408-44E or 8408-E8E

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Replace the processor modules one at a time (Un-P2-C2, Un-P2-C3, Un-P2-C6, and Un-P2-C7 if present). For information about locations, see Part locations and location codes.
3. Power on the system after you replace each processor. For instructions, see Powering on and powering off the system. **This ends the procedure.**

9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

This isolation procedure is not supported. Continue with the next failing item in the failing item list.

FSPSP09

A problem was detected with a memory DIMM, but it cannot be isolated to a specific memory DIMM.

1. Use the following table to determine the action to perform.

System	Action
5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A	Replace all of the memory DIMMs starting with memory DIMM 1: $U_{n-P1-Cx}$, where $x = 16$ through 31. For information about locations, see Part locations and location codes.
8408-44E or 8408-E8E	Replace all of the items that are included in the failing item list after this procedure. For information about locations, see Part locations and location codes.
9080-MHE, 9080-MME, 9119-MHE, or 9119-MME	Replace all of the items that are included in the failing item list after this procedure. For information about locations, see Part locations and location codes.

2. Power on the system. For instructions, see Powering on and powering off the system. **This ends the procedure.**

FSPSP10

The part indicated in the failing item list that follows this procedure is not valid or missing for this system's configuration.

For information about locations, see Part locations and location codes.

Select the system that you are servicing:

- 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A
- 8408-44E, 8408-E8E, 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A

Perform the following steps to correct the problem:

1. Does word 8 (the 8 leftmost characters in the second line of function 13) of the reference code end with 02 or 04?

No: Go to step 3.

Yes: Continue with the next step.

2. The FRU that is included in the failing item list after this procedure is either missing or not valid. Is that FRU installed and connected or plugged in correctly?

Yes: The installed FRU is not valid. Remove that FRU. Then, contact your next level of support to determine the correct FRU. **This ends the procedure.**

No: The FRU is missing. If the FRU is present but not connected, reconnect it and then power on the system. For instructions, see Powering on and powering off the system. Otherwise, contact your next level of support to determine the missing FRU.

This ends the procedure.

3. Does word 8 end with 01 or 05?

No: Return to Starting a repair action. **This ends the procedure.**

Yes: The FRU that is listed after this procedure has the same serial number as another FRU in the system. Remove all but one of the FRUs that are listed after this procedure and then power on the system. For instructions, see Powering on and powering off the system.

This ends the procedure.

8408-44E, 8408-E8E, 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

Perform the following steps to correct the problem:

1. Is the reference code B1xxBACA, B1xxBACB, B1xxBACE?

No: Go to step 3.

Yes: Continue with the next step.

2. The FRU that is included in the failing item list after this procedure is either missing or not valid. Is that FRU installed and connected correctly?

Yes: The installed FRU is not valid. Remove the FRU. Contact your next level of support to determine the correct FRU. **This ends the procedure.**

No: The FRU is missing. If the FRU is present but not connected, reconnect it and then power on the system. For instructions, see Powering on and powering off the system. Otherwise, contact your next level of support to determine the missing FRU. **This ends the procedure.**

3. Is the reference code B1xxBA13?

No: Continue with the next step.

Yes: The FRU that is listed after this procedure in the failing item list has the same serial number as another FRU in the system. Remove all but one of the FRUs that are listed after this procedure in the failing item list and then power on the system. For instructions, see Powering on and powering off the system. **This ends the procedure.**

4. Is the reference code B1xxBACC?

No: Return to Starting a repair action. **This ends the procedure.**

Yes: If the system is an 8408-44E or 8408-E8E, replace the system VPD card at location Un-P1-C14. Otherwise, replace the system VPD card at location Un-P1-C12 of the system control unit and power on the system. For instructions, see Powering on and powering off the system. **This ends the procedure.**

FSPSP11

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP12

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP14

The service processor cannot communicate with the system firmware. The server firmware will continue to run the system and partitions while it attempts to recover communications. Server firmware recovery actions will continue for approximately 30 to 40 minutes.

Perform the following steps:

1. Record the time the log was created or when the SRC was first noticed. Continue with the next step.
2. Are progress codes being displayed on the panel?
 - **Yes:** Server firmware was able to reset the service processor. **This ends the procedure.**
 - **No:** Continue with the next step.
3. Has an A7006995 SRC been displayed on the panel?
 - **Yes:** Partitions are being powered off and a server dump will be attempted. Follow the A7006995 SRC description if the partitions do not terminate as requested. **This ends the procedure.**
 - **No:** Continue with the next step.

4. Has the A1xx SRC remained on the panel for more than 40 minutes?
 - **Yes:** Server firmware could not begin termination of the partitions. Contact your next level of support to assist in attempting to terminate any remaining partitions and to assist in collecting a system dump. When the system dump option is selected, the system is powered off and then powered on to standby state. Do not power off the system again until the system dump is saved. The system dump also creates a service processor dump. Collect the system dump and the service processor dump for support. **This ends the procedure.**
 - **No:** Contact your next level of support. **This ends the procedure.**

FSPSP16

Save any error log and dump data and contact your next level of support for assistance.

FSPSP17

A system uncorrectable error has occurred.

1. Look for other serviceable events and use the failing items listed with them to correct the problem.
2. If you need to run the system in a degraded mode until you can perform the service actions, do the following:
 - a. Power off the system (see Powering on and powering off the system).
 - b. Power on the system (see Powering on and powering off the system) to allow the memory diagnostics to clean up the memory and unconfigure any defective parts.

This ends the procedure.

FSPSP18

A problem was detected in the platform Licensed Internal Code.

Perform LICCODE. **This ends the procedure.**

FSPSP20

A failing item has been detected by a hardware procedure.

To run full hardware diagnostics, power off and then power on the system. See Powering on and powering off the system.

If a new SRC occurs, repair the system using that reference code.

If an incomplete occurs, go to Managing the advanced system management interface (ASMI) menus to power off, check for unconfigured components and power on the system. See Powering on and powering off the system.

This ends the procedure.

FSPSP22

The system detected that a processor chip is missing from the system configuration because JTAG lines are not working.

For information about removing and replacing FRUs, see Part locations and location codes.

For an 8408-44E, 8408-E8E, 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME, this isolation procedure is not supported. Continue with the next failing item in the failing item list.

For a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A, perform the following steps:

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Replace the system backplane at location Un -P1.
3. Replace the first processor module at location Un -P1-C32.
4. Replace the second processor module if present at location Un -P1-C33.
5. Power on the system. For instructions, see Powering on and powering off the system.
6. Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

FSPSP23

The system needs to perform a service processor dump.

1. Perform a service processor dump (see Performing a platform system dump or service processor dump).
2. Attempt to perform an IPL on the system.
3. Save the service processor dump to storage. See Managing dumps.
4. Contact your next level of support. **This ends the procedure.**

FSPSP24

The system is running degraded. Array bit steering may be able to correct this problem without replacing hardware.

1. Power off and then power on the system (see Powering on and powering off the system).
2. If the problem persists, replace the FRU that is listed after this procedure in the failing item list. See Part locations and location codes for instructions. **This ends the procedure.**

FSPSP25

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP27

A problem was detected on an attention line.

For information about locations, see Part locations and location codes.

If the FRU that was replaced before this procedure did not correct the problem, complete the following procedure for the system that you are servicing:

- 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A
- 8408-44E or 8408-E8E
- 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A

1. Was the FRU listed before this procedure a memory DIMM (Un -P1-C x , where x =16 through 31)?

No: Continue with the next step.

Yes: Go to step 3.

2. Was the FRU listed before this procedure a processor module (Un -P1-C32 or Un -P1-C33)?

No: This ends the procedure.

Yes: Continue with the next step.

3. Perform the following steps:
 - a. Power off the system. For instructions, see Powering on and powering off the system.
 - b. Replace the system backplane at location *Un-P1*. For information about locations, see Part locations and location codes.
 - c. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

8408-44E or 8408-E8E

1. Was the FRU listed before this procedure a memory DIMM (*Un-P2-Cx*, where *x* =10 through 41)?

No: Continue with the next step.

Yes: Go to step 3.

2. Was the FRU listed before this procedure a processor module (*Un-P2-C2*, *Un-P2-C3*, *Un-P2-C6*, or *Un-P2-C7*)?

No: This ends the procedure.

Yes: Continue with the next step.

3. Perform the following steps:

- a. Power off the system. For instructions, see Powering on and powering off the system.
- b. Replace the system backplane at location *Un-P2*. For information about locations, see Part locations and location codes.
- c. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

Contact your next level of support. **This ends the procedure.**

FSPSP28

The resource ID (RID) of one or more FRUs could not be found in the vital product data (VPD) table.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

1. Go to your serviceable event view and find other failing items that read "FSPxxxx" where xxxx is a 4 digit hex number that represents the RID. Do not perform any actions on these failing items.
2. Record all failing items, RID numbers, and the model of the system and contact your next level of support. **This ends the procedure.**

FSPSP29

The system detected that all I/O bridges are missing from the system configuration.

For information about removing and replacing FRUs, see Part locations and location codes.

For an 8408-44E, 8408-E8E, 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME, this isolation procedure is not supported. Continue with the next failing item in the failing item list.

For a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A, perform the following steps:

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Replace the system backplane at location Un -P1.
3. Power on the system. For instructions, see Powering on and powering off the system.

FSPSP30

A problem was encountered accessing the VPD card or with the data that was found on the VPD card.

This error occurred before VPD collection was completed. No location codes were created.

1. Power off the system. To review the "Powering on and powering off" procedure, go to Powering on and powering off the system.
2. Clear any deconfiguration errors for the VPD card.
3. Perform the action indicated for your system in the following table.

System:	Action:
5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A	Replace the following one at a time in the order listed: <ol style="list-style-type: none"> 1. VPD card at location Un-P1-C13. For information about locations, see Part locations and location codes. 2. System backplane at location Un-P1. <p>This ends the procedure.</p>
8408-44E or 8408-E8E	<ol style="list-style-type: none"> 1. Replace the service processor card at location Un-P1-C5. 2. Power on the system. For instructions, see Powering on and powering off the system. 3. Does the problem persist? <p>No: Go to Verifying a repair. This ends the procedure.</p> <p>Yes: Continue with the next step.</p> 4. Replace the VPD card at location Un-P1-C14. 5. Does the problem persist? <p>No: Go to Verifying a repair. This ends the procedure.</p> <p>Yes: Replace the I/O backplane at location Un-P1. This ends the procedure.</p>
9080-MHE, 9080-MME, 9119-MHE, or 9119-MME	<ol style="list-style-type: none"> 1. Replace all of the service processor cards in the system control unit. 2. Power on the system. For instructions, see Powering on and powering off the system. 3. Does the problem persist? <p>No: Go to Verifying a repair. This ends the procedure.</p> <p>Yes: Continue with the next step.</p> 4. Replace the VPD card at location Un-P1-C12 in the system control unit. 5. Does the problem persist? <p>No: Go to Verifying a repair. This ends the procedure.</p> <p>Yes: Replace the system backplane at location Un-P1 in the system control unit. This ends the procedure.</p>

FSPSP31

The service processor has detected that one or more of the required fields in the system VPD has not been initialized.

1. Log into ASMI with authorized service provider authority (see Accessing the Advanced System Management Interface).

2. Set the system VPD values (see Setting the system enclosure type and Setting the system identifiers).

Note: The service processor will automatically reset when leaving the ASMI after updating the system VPD.

3. Power on the system. See Powering on and powering off the system. **This ends the procedure.**

FSPSP32

A problem with the enclosure was found.

The problem might be caused by one of the following items:

- The enclosure VPD cannot be found.
- The enclosure serial number is not programmed or has the same value as the system serial number.
- The enclosure feature code is not programmed.

For information about removing and replacing FRUs, see Part locations and location codes.

Select the system that you are servicing:

- 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A
- 8408-44E or 8408-E8E
- 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A

Perform the following steps:

1. Record the reason code (the last 4 characters of word 11) from the reference code by looking at the operator panel or accessing the error log with the ASMI.
2. Is the reason code A46F?
 - No:** Go to step 5.
 - Yes:** Continue with the next step.
3. Check for and apply any server firmware updates. Does the problem persist?
 - No: This ends the procedure.**
 - Yes:** Continue with the next step.
4. Perform the following steps:
 - a. Power off the system. For instructions, see Powering on and powering off the system.
 - b. Replace the system backplane (*Un-P1*).
 - c. Power on the system. For instructions, see Powering on and powering off the system.Does the problem persist?
 - No: This ends the procedure.**
 - Yes:** Contact your next level of support. **This ends the procedure.**
5. Is the reason code A41C or A460?
 - No:** Go to step 7 on page 187.
 - Yes:** Continue with the next step.
6. Perform the following steps:
 - a. Set the enclosure serial number by using the ASMI. For instructions, see Setting the system enclosure type.
 - Note:** The enclosure serial number can be found on the label that is on the system chassis.
 - b. The service processor is automatically reset after you complete the Setting the system enclosure type procedure.

c. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

7. Is the reason code A45F?

No: Contact your next level of support. **This ends the procedure.**

Yes: Continue with the next step.

8. Perform the following steps:

a. Set the enclosure feature code by using the ASMI. For instructions, see Setting the system enclosure type.

b. The service processor is automatically reset after you complete the Setting the system enclosure type procedure.

c. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

8408-44E or 8408-E8E

Perform the following steps:

1. Record the reason code (the last 4 characters of word 11) from the reference code by looking at the operator panel or accessing the error log with the ASMI.

2. Is the reason code A435 or A491?

No: Go to step 5 on page 188.

Yes: Continue with the next step.

3. Check for and apply any server firmware updates. Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.

4. Perform the following steps:

a. Power off the system. For instructions, see Powering on and powering off the system.

b. Replace the system backplane at location Un-P2.

c. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

5. Is the reason code A41C or A44C?

No: Go to step 7 on page 189.

Yes: Continue with the next step.

6. Perform the following steps:

a. Set the enclosure serial number by using the ASMI. For instructions, see Setting the system enclosure type.

Note: The enclosure serial number can be found on the label that is on the system chassis.

b. The service processor is automatically reset after you complete the Setting the system enclosure type procedure.

c. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

7. Is the reason code A41B or A44B?

No: Contact your next level of support. **This ends the procedure.**

Yes: Continue with the next step.

8. Perform the following steps:

- a. Set the enclosure feature code by using the ASMI. For instructions, see Setting the system enclosure type.
- b. The service processor is automatically reset after you complete the Setting the system enclosure type procedure.
- c. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

Perform the following steps:

1. Record the reason code (the last 4 characters of word 11) from the reference code by looking at the operator panel or accessing the error log with the ASMI.

2. Is the reason code A435 or A491?

No: Go to step 5.

Yes: Continue with the next step.

3. Check for and apply any server firmware updates. Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.

4. Perform the following steps:

- a. Power off the system. For instructions, see Powering on and powering off the system.
- b. Replace the system backplane at location *Un-P1*.
- c. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

5. Is the reason code A41C or A44C?

No: Go to step 7 on page 189.

Yes: Continue with the next step.

6. Perform the following steps:

- a. Set the enclosure serial number by using the ASMI. For instructions, see Setting the system enclosure type. The enclosure is indicated by the last 4 characters of word 6 of the reference code:
 - If word 6 is *xxxx1E01*, the enclosure is system node 1.
 - If word 6 is *xxxx1E02*, the enclosure is system node 2.
 - If word 6 is *xxxx1E03*, the enclosure is system node 3.
 - If word 6 is *xxxx1E04*, the enclosure is system node 4.

Note: The enclosure serial number can be found on the label that is on the system node chassis.

- b. The service processor is automatically reset after you complete the Setting the system enclosure type procedure.

- c. Power on the system. For instructions, see Powering on and powering off the system.
Does the problem persist?
No: This ends the procedure.
Yes: Contact your next level of support. **This ends the procedure.**
7. Is the reason code A41B or A44B?
No: Contact your next level of support. **This ends the procedure.**
Yes: Continue with the next step.
8. Perform the following steps:
 - a. Set the enclosure feature code by using the ASMI. For instructions, see Setting the system enclosure type. The enclosure is indicated by the last 4 characters of word 6 of the reference code:
 - If word 6 is xxxx1E01, the enclosure is system node 1.
 - If word 6 is xxxx1E02, the enclosure is system node 2.
 - If word 6 is xxxx1E03, the enclosure is system node 3.
 - If word 6 is xxxx1E04, the enclosure is system node 4.
 - b. The service processor is automatically reset after you complete the Setting the system enclosure type procedure.
 - c. Power on the system. For instructions, see Powering on and powering off the system.
Does the problem persist?
No: This ends the procedure.
Yes: Contact your next level of support. **This ends the procedure.**

FSPSP33

A problem has been detected in the connection with the management console.

1. Ensure that the cable connectors to the network from the management console, managed system, managed system partitions, and other management consoles are securely connected. If the connections are not secure, plug the cables back into the proper locations and make sure that the connections are good.
2. Check to see if the management console is working correctly or if the management console was disconnected incorrectly from the managed system, managed system partitions, and other management consoles. If either has happened, reboot the management console.
3. Verify that the network connection between the HMC, managed system, managed system partitions, and other HMCs is working properly.
4. If applicable, service the next FRU. See Part locations and location codes for instructions.
5. If the problem continues to persist, contact your next level of support. **This ends the procedure.**

FSPSP34

Memory modules are plugged in a configuration that is not valid.

See Part locations and location codes for instructions for removing and replacing FRUs.

1. Is the reference code BC20090F?

Yes: There are one or more memory modules that could not be configured due to memory plugging rules. To correct the error, remove the failing items identified in the failing item list or add additional memory to satisfy the requirements for this system. **This ends the procedure.**

No: Continue with the next step.
2. Return to Starting a repair action. **This ends the procedure.**

FSPSP35

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP36

The SMP cables that connect the system nodes are plugged incorrectly, broken, or are not the correct type of cable for this system configuration.

For a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E, this isolation procedure is not supported. Continue with the next failing item in the failing item list.

For a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME, complete the following steps:

1. Is the reference code B1504909 or B1504922?

Yes: Go to step 4.

No: Continue with the next step.

2. Use the Exchange FRU procedure on the Hardware Management Console (HMC) to reseal the SMP cables that are listed in the failing item list of this reference code in the serviceable event view. Do not replace the SMP cables during this procedure. For information about cabling the system, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.

3. After you reseal the cables, validate the cable status of the SMP cables again. For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. Do the SMP cables have a status of **OK**?

Yes: This ends the procedure.

No: Continue with the next step.

4. Use the Exchange FRU procedure on the HMC to replace the SMP cables that are listed in the failing item list of this reference code in the serviceable event view. For information about cabling the system, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.

5. After you replace the cables, validate the cable status of the SMP cables again. For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. Do the SMP cables have a status of **OK**?

Yes: This ends the procedure.

No: Continue with the next step.

6. Use the Exchange FRU procedure on the HMC to replace the remaining failing items in the failing item list one at a time. If the problem persists, contact your next level of support. **This ends the procedure.**

FSPSP38

The system has detected an error within the JTAG path.

Replace all failing items, if any, in the failing item list of the service processor error log entry. If the replacement of all failing items in the failing item list does not fix the problem, contact your next level of support.

See Part locations and location codes for information about locating FRUs.

This ends the procedure.

FSPSP40

This procedure is a warning due to an attempt to log in to the service processor that was not valid.

No service action is required. Disregard any failing items in the failing item list that is associated with this reference code.

FSPSP41

The service processor firmware detected an I2C error. Power must be removed from the system to resolve the problem.

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Disconnect power cords from the system.
3. Reconnect power cords to the system.
4. Power on the system. For instructions, see Powering on and powering off the system.
5. If the problem persists, contact your next level of support. **This ends the procedure.**

FSPSP42

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP45

The system detected an error with the FSI path.

Select the system that you are servicing:

- 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A
- 8408-44E, 8408-E8E, 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A

1. Replace the processor modules one at a time (*Un*-P1-C32, then *Un*-P1-C33 if present). For information about locations, see Part locations and location codes.
2. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.

3. Have all processor modules been replaced?

No: Go back to step 1 and replace another processor module.

Yes: Continue with the next step.

4. Replace the system backplane (*Un*-P1).
5. Power on the system. For instructions, see Powering on and powering off the system. **This ends the procedure.**

8408-44E, 8408-E8E, 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Replace the failing items in the serviceable event view one at a time. For information about locating the failing items, see Part locations and location codes.
3. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.

4. Power off the system. For instructions, see Powering on and powering off the system.

5. If the system is an 8408-44E or 8408-E8E, replace the system backplane at location *Un-P2*. Otherwise, replace the backplane at location *Un-P1* in the enclosure where the failing items were replaced in step 2 on page 191. For information about locating the failing item, see Part locations and location codes.
6. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

FSPSP46

A problem was detected with some of the areas of flash or NVRAM on the service processor.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

1. Use the following table to determine the action to perform.

System	Action
5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A	Replace the system backplane at location <i>Un-P1</i> . For information about locations, see Part locations and location codes.
8408-44E or 8408-E8E	Replace the service processor card at location <i>Un-P1-C5</i> . For information about locations, see Part locations and location codes.
9080-MHE, 9080-MME, 9119-MHE, or 9119-MME	Replace the service processor card. <ul style="list-style-type: none"> • If the reference code is B151xxxx, replace the service processor card at location <i>Un-P1-C7</i> of the system control unit. • If the reference code is B152xxxx, replace the service processor card at location <i>Un-P1-C10</i> of the system control unit.

2. Power on the system. For instructions, see Powering on and powering off the system. **This ends the procedure.**

FSPSP47

The system detected an error within the PSI link. To resolve the problem, perform the following steps:

For information about removing and replacing FRUs, see Part locations and location codes.

Select the system that you are servicing:

- 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A
- 8408-44E, 8408-E8E, 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A

1. Replace the system backplane at location *Un-P1*.
2. Power on the system. For instructions, see Powering on and powering off the system.
3. Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.

4. Replace the processor modules one at a time (*Un-P1-C32*, then *Un-P1-C33* if present). For information about removing and replacing FRUs, see Part locations and location codes.
5. Power on the system. For instructions, see Powering on and powering off the system.
6. Does the problem persist?
 - No: This ends the procedure.**
 - Yes:** Continue with the next step.
7. Have all processor modules been replaced?
 - No:** Go back to step 4 and replace another processor module.
 - Yes:** Contact your next level of support. **This ends the procedure.**

8408-44E, 8408-E8E, 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

1. Replace the failing items in the failing item list of the reference code one at a time.
2. Power on the system. For instructions, see Powering on and powering off the system.
3. Does the problem persist?
 - No: This ends the procedure.**
 - Yes:** Contact your next level of support. **This ends the procedure.**

FSPSP48

A diagnostic function detected a problem with an external processor interface.

For a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E, this isolation procedure is not supported. Continue with the next failing item in the failing item list.

For a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME, complete the following steps:

1. Is the system reference code B114E504?

If	Then
Yes:	Go to SMP cable isolation for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. This ends the procedure.
No:	Continue with the next step.

2. The location codes of the system backplanes associated with the problem are displayed in the failing item list of the error log entry in the format *Un-P1*. Identify the system nodes by using the location codes of the system backplanes. For information about using location codes to identify a system node, see Identifying the enclosure or server that contains the part.
3. Use the Exchange FRU procedure on the Hardware Management Console (HMC) to replace the SMP cables that are connected between the system nodes that you identified in step 2. For information about cabling, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
4. After you replace the cables, validate the cable status of the SMP cables. For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
Do the SMP cables have a status of **OK**?

If	Then
Yes:	Continue with the next step.
No:	Repeat steps 3 and 4 until the SMP cables have a status of OK .

5. Complete the following steps:
 - a. Access the Advanced System Management Interface (ASMI). For instructions, see Setting up and accessing the ASMI.

- b. Click on **System Service Aids > Deconfiguration Records**.
 - c. Clear the records that are related to the system nodes that you identified with a location code of *Un-P1* in the failing item list.
6. Power on the system. For instructions, see Powering on and powering off the system. Does the problem persist?

If	Then
Yes:	Continue with the next step.
No:	This ends the procedure.

7. Use the HMC to replace the remaining failing items for this error, one at a time, until the problem is resolved. For information about using the HMC to replace failing items, see Manage Serviceable Events. **This ends the procedure.**

FSPSP49

A diagnostic function detected an internal processor interface problem.

Select the system that you are servicing:

- 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A
- 8408-44E or 8408-E8E
- 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A

Complete the following steps:

1. Replace the FRUs listed in the failing item list. Does the problem still exist?
 - No: This ends the procedure.**
 - Yes:** Continue with the next step.
2. Power off the system. For instructions, see Powering on and powering off the system.
3. Complete the following steps:
 - a. Replace the processor modules at locations *Un-P1-C32* and *Un-P1-C33* if present, one at a time.
 - b. Replace the system backplane at location *Un-P1*. For information about locations, see Part locations and location codes.
4. Power on the system. For instructions, see Powering on and powering off the system. **This ends the procedure.**

8408-44E or 8408-E8E

Complete the following steps:

1. Replace the FRUs listed in the failing item list. Does the problem still exist?
 - No: This ends the procedure.**
 - Yes:** Continue with the next step.
2. Power off the system. For instructions, see Powering on and powering off the system.
3. Complete the following steps:
 - a. Replace the processor modules at locations *Un-P2-C2*, *Un-P2-C3*, *Un-P2-C6*, and *Un-P2-C7* if present, one at a time.
 - b. Replace the system backplane at location *Un-P2*. For information about locations, see Part locations and location codes.
4. Power on the system. For instructions, see Powering on and powering off the system. **This ends the procedure.**

9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

Complete the following steps:

1. Replace the FRUs listed in the failing item list. Does the problem still exist?
No: This ends the procedure.
Yes: Continue with the next step.
2. Power off the system. For instructions, see Powering on and powering off the system.
3. Replace the system backplane at location U_n -P1 in the same system node as the FRUs in the failing item list that were replaced in step 1. For information about locations, see Part locations and location codes.
4. Power on the system. For instructions, see Powering on and powering off the system. **This ends the procedure.**
5. Does the problem still exist?
No: This ends the procedure.
Yes: Contact your next level of support. **This ends the procedure.**

FSPSP50

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP51

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP52

A problem was detected on a memory bus. If you replaced the FRUs previously listed in the failing item list and the problem was not resolved, perform the following steps:

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Use the following table to determine the action to perform.

System	Action
5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A	Replace all of the memory DIMMs starting with memory DIMM 1: U_n -P1-C x , where $x = 16$ through 31. For information about locations, see Part locations and location codes.
8408-44E or 8408-E8E	Replace all of the memory DIMMs starting with memory DIMM 1: U_n -P2-C x , where $x = 10$ through 41. For information about locations, see Part locations and location codes.

System	Action
9080-MHE, 9080-MME, 9119-MHE, or 9119-MME	<p>Replace the processor module that is associated with the DIMMs that were previously replaced. For information about locations, see Part locations and location codes.</p> <ul style="list-style-type: none"> • If the replaced DIMMs had location codes in the range <i>Un-P1-C21</i> through <i>Un-P1-C28</i>, replace the processor module at location code <i>Un-P1-C15</i>. • If the replaced DIMMs had location codes in the range <i>Un-P1-C29</i> through <i>Un-P1-C36</i>, replace the processor module at location code <i>Un-P1-C19</i>. • If the replaced DIMMs had location codes in the range <i>Un-P1-C37</i> through <i>Un-P1-C44</i>, replace the processor module at location code <i>Un-P1-C18</i>. • If the replaced DIMMs had location codes in the range <i>Un-P1-C45</i> through <i>Un-P1-C52</i>, replace the processor module at location code <i>Un-P1-C14</i>.

3. Power on the system. For instructions, see Powering on and powering off the system. **This ends the procedure.**

FSPSP54

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP55

An error occurred on a bus between two FRUs in the failing item list.

Complete the following steps:

1. Is the system reference code B114E504?

If	Then
Yes:	Go to SMP cable isolation for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. This ends the procedure.
No:	Continue with the next step.

2. All FRUs in the failing path are included in the failing item list. Any of the FRUs in the failing item list might be the cause of the error. Replace the items in the failing item list, one at a time, until the problem is resolved. **This ends the procedure.**

FSPSP56

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP57

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP58

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP59

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP60

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP61

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP62

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP63

The system has experienced a power error. Please review previous error logs for power-related issues.

FSPSP64

All the processor support interface (PSI) links of the system are either nonfunctional or unconfigured, so the system cannot perform an IPL appropriately. Look for previous error logs that unconfigure hardware.

FSPSP65

The network cabling or network configuration is incorrect. As a result, both service processor Ethernet ports have the same IP subnet.

The possible causes of the problem are:

- A configuration error occurred in the static IP address assignment mode. If the private LAN is set up for static IPs, the system administrator might have selected IPs that are on the same subnet.
- A physical connection error occurred in DHCP mode. The HMC ports of the service processor are connected to the same hub or switch, resulting in both of the ports connecting to the same HMC.
- A VLAN configuration error occurred. The HMC ports of the service processor that are connected to switch ports on a managed switch are incorrectly configured to be on the same VLAN.

To resolve the problem, complete the following steps:

1. Ensure that the Ethernet port cabling of the managed system is correct. For more information, see *Cabling the HMC and FSP*.
2. Ensure that the VLANs on the managed switch are configured correctly.
3. For static configuration of IP addresses, ensure that the IP addresses for the HMC ports are chosen from different subnets.

This ends the procedure.

FSPSP66

Use this procedure when a system with redundant service processors was powered on with service processor fail-over disabled.

For a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E, this isolation procedure is not supported. Continue with the next failing item in the failing item list.

For a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME, if you are servicing a system that contains redundant service processors and you powered on the system with the fail-over disabled, complete the following steps:

1. Power off the system.
2. Use the management console to enable fail-over.
3. Power on the system. Verify that the reference code that sent you here was not logged during power on.

FSPSP67

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP68

A problem occurred during a service action.

For a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E, this isolation procedure is not supported. Continue with the next failing item in the failing item list. **This ends the procedure.**

For a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME, perform a service processor dump. For instructions, see Performing a service processor dump. Report the dump to your next level of support. For instructions, see Reporting a dump. **This ends the procedure.**

FSPSP70

Look for 1100xxxx errors in the serviceable event view that were logged at about the same time as this error and resolve them. If there are no 1100xxxx errors logged, contact your next level of support.

FSPSP71

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP73

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP75

This isolation procedure is not supported on these models. Continue with the next failing item in the failing item list.

FSPSP76

A unique CCIN associated with the failing item in the failing item list was not found in this system.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm). Select your machine type and model number to see applicable procedures for your system.

1. Go to your serviceable event view and find other failing items that read "FSPxxxx" where xxxx is a 4 digit hex number that represents the resource ID (RID). Do not perform any actions on these failing items.
2. Record all failing items, RID numbers, and the model of the system and contact your next level of support. **This ends the procedure.**


FSPSP78

The service processor detected a problem while it was attempting to use an idle processor core.

Perform one of the following actions:

- If you have access to the Advanced System Management Interface (ASMI), log on and display the details of the service processor error log. Look for previous logs with the same Platform Log ID as the problem that sent you here.
- If you have access to a Hardware Management Console (HMC), log in as PE user. Choose one of the following navigation options depending on the interface type:
 - If you are using an HMC Classic or HMC Enhanced interface, complete the following steps:
 1. In the navigation area, click **Service Management > Manage Serviceable Events**. The Manage Serviceable Events - Select Serviceable Events window is displayed.
 2. Display the events for the corresponding service processor system. Double-click the system to see the details. Look for previous logs with the same Platform Log ID as the problem that sent you here.
 - If you are using an HMC Enhanced+ interface, complete the following steps:



1. In the navigation area, click the **Serviceability** icon , and then select **Serviceable Events Manager**. The Manage Serviceable Events window is displayed.
2. Display the events for the corresponding service processor system. Double-click the system to see the details. Look for previous logs with the same Platform Log ID as the problem that sent you here.

This ends the procedure.

FSPSP79

Look for uncorrectable memory errors in the serviceable event view that were logged at about the same time as this error and resolve them. If there are no uncorrectable memory errors logged, replace the processor module.

FSPSP80

Save any error log and dump data and contact your next level of support for assistance.

FSPSP83

The service processor detected that service processor failover cannot be initiated or that hardware is garded or deconfigured.

Reference code B150F138 continues to be logged every IPL and once a month after the last IPL until the hardware problem is resolved or until the logging for a specific deconfiguration event is disabled.

To resolve the problem, complete the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.

Note: To perform this operation, your authority level must be administrator or authorized service provider.

- Is the system firmware at level FW860.00 or later?

Note: For instructions about viewing system firmware levels, see Viewing existing firmware levels.

- **Yes:** Continue with the next step.
- **No:** Continue with step 4.

- Using the following table, complete the service action indicated for each of the reference code words, one at a time, until all of the problems are resolved.

Reference code word	Meaning	Service action
Word 6	Number of system gard records that occurred Note: A system gard record does not indicate whether the hardware is configured or deconfigured.	Continue with step 4.
Word 7	Number of cabling errors that occurred	In the navigation area, expand System Service Aids > Cable Validation . Fix any cable problems that are identified. For information about cabling, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
Word 8	Number of fan, power supply, or voltage regulator module errors that were detected by the power subsystem that occurred since the last power on of the system	Continue with step 4.
Word 9	A value of 00000001 indicates that a backup service processor is in a standby or termination state when the primary service processor is in a runtime state and the redundancy policy is enabled. Service processor failover cannot be initiated and concurrent firmware update cannot be completed.	Collect all of the service processor dumps for the system with the reference code that sent you here and contact your next level of support.

- In the navigation area, expand **System Service Aids > Deconfiguration Records**. Are there any deconfiguration record entries listed?
 - **Yes:** Continue with the next step.
 - **No:** In the navigation area, expand **System Service Aids > Error/Event Logs**. Look for errors that were detected by the power subsystem, and replace any failing items that are indicated for these errors. **This ends the procedure.**
- Are there any memory or processor deconfiguration record entries listed?
 - **Yes:** Continue with the next step.
 - **No:** Continue with step 8.
- Memory or processor resources are deconfigured on the system. If the following criteria are met, hardware replacement might not be necessary:
 - Sufficient spare capacity (unlicensed resources) is available.
 - The customer determined that hardware maintenance is not necessary.
 - System firmware 830.00 or later is installed.

Are all of the preceding criteria met?

- **Yes:** Continue with the next step.
 - **No:** Continue with step 8.
7. Reference code B150F138 continues to be logged every IPL and once a month after the last IPL until hardware is replaced. To disable reference code B150F138 from being logged for the specific deconfiguration event that sent you here, complete the following steps:
 - a. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.

Note: To perform this operation, your authority level must be administrator or authorized service provider.
 - b. In the navigation area, expand **System Service Aids > Deconfigured Resources**.
 - c. Find and select the entry that is associated with the deconfigured memory or processor that does not require hardware replacement.
 - d. Under the Customer Alert column, change the selection to **Disabled**.
 - e. Click **Change customer alerts** to save the changes.

This ends the procedure.
 8. Use the Advanced System Management Interface (ASMI) to determine the hardware to be replaced and schedule maintenance at your earliest convenience. To determine the hardware to replace, complete the following steps:
 - a. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.

Note: To perform this operation, your authority level must be administrator or authorized service provider.
 - b. In the navigation area, expand **System Service Aids > Deconfiguration Records**.
 - c. Use the system reference code (SRC) associated with the deconfigured hardware to resolve the problem.

This ends the procedure.

FSPSP85

The service processor detected a problem during the early boot process.

Perform LICCODE. **This ends the procedure.**

FSPSP86

A diagnostic function detected a problem with the time of day or clock function.

Complete the following steps:

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Replace the failing items in the serviceable event view one at a time. For information about locating the failing items, see Part locations and location codes.
3. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.
4. Power off the system. For instructions, see Powering on and powering off the system.
5. If the system is an 8408-44E or 8408-E8E, replace the system backplane at location Un-P2. Otherwise, replace the backplane at location Un-P1 in the enclosure where the failing items were replaced in step 2. For information about locating the failing item, see Part locations and location codes.
6. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

FSPSP87

A diagnostic function detected a problem with the reference clock function.

Select the system that you are servicing:

- 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A
- 8408-44E or 8408-E8E
- 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Replace the system backplane at location *Un*-P1.
3. Power on the system. For instructions, see Powering on and powering off the system.
4. Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

8408-44E or 8408-E8E

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Replace the system backplane at location *Un*-P2.
3. Power on the system. For instructions, see Powering on and powering off the system.
4. Does the problem persist?

No: This ends the procedure.

Yes: Contact your next level of support. **This ends the procedure.**

9080-MHE, 9080-MME, 9119-MHE, or 9119-MME

1. Power off the system. For instructions, see Powering on and powering off the system.
2. Ensure that the clock flex cables at locations *Un*-P1-T7 and *Un*-P1-T8 of the system node are securely connected. Use the locations of failing items in the serviceable event view to determine which system node to check. For information about cabling, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
3. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.

4. Power off the system. For instructions, see Powering on and powering off the system.
5. Replace the clock flex cables at locations *Un*-P1-T7 and *Un*-P1-T8 of the system node that was identified in step 2. For information about cabling, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
6. Power on the system. For instructions, see Powering on and powering off the system.

Does the problem persist?

No: This ends the procedure.

Yes: Continue with the next step.

7. Power off the system. For instructions, see Powering on and powering off the system.
8. Replace the failing items in the serviceable event view one at a time. For information about locating the failing items, see Part locations and location codes.

9. Power on the system. For instructions, see Powering on and powering off the system.
Does the problem persist?
No: This ends the procedure.
Yes: Continue with the next step.
10. Power off the system. For instructions, see Powering on and powering off the system.
11. Replace the system backplane at location $Un-P1$ in the system control unit.
12. Power on the system. For instructions, see Powering on and powering off the system.
Does the problem persist?
No: This ends the procedure.
Yes: Continue with the next step.
13. Power off the system. For instructions, see Powering on and powering off the system.
14. Replace the system backplane at location $Un-P1$ of the system node identified in step 2 on page 202.
15. Power on the system. For instructions, see Powering on and powering off the system.
Does the problem persist?
No: This ends the procedure.
Yes: Contact your next level of support. **This ends the procedure.**

FSPSP88

A diagnostic function detected a problem with the UPIC cables.

For a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E, this isolation procedure is not supported. Continue with the next failing item in the failing item list.

For a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME, complete the following steps:

1. Validate the cable status of the UPIC cables. For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. For information about cabling the system, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. Do the UPIC cables have a status of **OK**?
Yes: Use the Exchange FRU procedure on the Hardware Management Console (HMC) to replace the remaining failing items in the failing item list one at a time. If the problem persists, contact your next level of support. **This ends the procedure.**
No: Continue with the next step.
2. Use the Exchange FRU procedure on the HMC to reseal the UPIC cables that do not have a status of **OK**. Do not replace the UPIC cables during this procedure. For information about cabling the system, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
3. After you reseal the cables, validate the cable status of the UPIC cables again. For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. Do the UPIC cables have a status of **OK**?
Yes: This ends the procedure.
No: Continue with the next step.
4. Use the Exchange FRU procedure on the HMC to replace the UPIC cables that do not have a status of **OK**. For information about cabling the system, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
5. After you replace the cables, validate the cable status of the UPIC cables again. For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. Do the UPIC cables have a status of **OK**?
Yes: This ends the procedure.
No: Continue with the next step.

6. Use the Exchange FRU procedure on the HMC to replace the remaining failing items in the failing item list one at a time. If the problem persists, contact your next level of support. **This ends the procedure.**

FSPSP89

A diagnostic function detected a problem with the clock flex cables.

For a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E, this isolation procedure is not supported. Continue with the next failing item in the failing item list.

For a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME, complete the following steps:

1. Validate the cable status of the clock flex cables (also known as clock cables). For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. For information about cabling the system, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. Do the clock flex cables have a status of **OK**?

Yes: Use the Exchange FRU procedure on the Hardware Management Console (HMC) to replace the remaining failing items in the failing item list one at a time. If the problem persists, contact your next level of support. **This ends the procedure.**

No: Continue with the next step.

2. Use the Exchange FRU procedure on the HMC to reseat the clock flex cables that do not have a status of **OK**. Do not replace the clock flex cables during this procedure. For information about cabling the system, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
3. After you reseat the cables, validate the cable status of the clock flex cables again. For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. Do the clock flex cables have a status of **OK**?

Yes: This ends the procedure.

No: Continue with the next step.

4. Use the Exchange FRU procedure on the HMC to replace the clock flex cables that do not have a status of **OK**. For information about cabling the system, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
5. After you replace the cables, validate the cable status of the clock flex cables again. For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. Do the clock flex cables have a status of **OK**?

Yes: This ends the procedure.

No: Continue with the next step.

6. Use the Exchange FRU procedure on the HMC to replace the remaining failing items in the failing item list one at a time. If the problem persists, contact your next level of support. **This ends the procedure.**

FSPSP90

A diagnostic function detected a problem with the GFSP interface between the system control unit and the system nodes.

For a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E, this isolation procedure is not supported. Continue with the next failing item in the failing item list.

For a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME, complete the following steps:

1. Validate the cable status of the GFSP cables (also known as FSP cables). For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. For information about cabling the system, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. Do the GFSP cables have a status of **OK**?
 - Yes:** Use the Exchange FRU procedure on the Hardware Management Console (HMC) to replace the remaining failing items in the failing item list one at a time. If the problem persists, contact your next level of support. **This ends the procedure.**
 - No:** Continue with the next step.
2. Use the Exchange FRU procedure on the HMC to reseal the GFSP cables that do not have a status of **OK**. Do not replace the GFSP cables during this procedure. For information about cabling the system, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
3. After you reseal the cables, validate the cable status of the GFSP cables again. For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. Do the GFSP cables have a status of **OK**?
 - Yes: This ends the procedure.**
 - No:** Continue with the next step.
4. Use the Exchange FRU procedure on the HMC to replace the GFSP cables that do not have a status of **OK**. For information about cabling the system, see Cabling for 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME.
5. After you replace the cables, validate the cable status of the GFSP cables again. For instructions, see Validating cables in 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME. Do the GFSP cables have a status of **OK**?
 - Yes: This ends the procedure.**
 - No:** Continue with the next step.
6. Use the Exchange FRU procedure on the HMC to replace the remaining failing items in the failing item list one at a time. If the problem persists, contact your next level of support. **This ends the procedure.**

FSPSP91

The service processor firmware detected an error. The system must be powered off and then powered on to resolve the problem.

1. Power off and then power on the system. For instructions, see Powering on and powering off the system.
2. If the problem persists, contact your next level of support. **This ends the procedure.**

FSPSP92

The service processor detected an over temperature condition.

Perform OVERTMP. **This ends the procedure.**

FSPSP96

A diagnostic function detected a reference clock error.

For a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E system, this isolation procedure is not supported. Continue with the next failing item that is included in the failing item list.

For a 9080-MHE, 9080-MME, 9119-MHE, or 9119-MME system, complete the following steps:

1. Does the failing item list of the reference code that sent you here include only one clock card and one system processor module?

Yes: Continue with the next step.

- No:** Continue with step 7.
2. Did an unexpected outage occur?
Yes: Continue with the next step.
No: Continue with step 4.
3. Use the hardware management console (HMC) to replace the following items at the same time:
- Clock card in the failing item list
 - System processor module in the failing item list
 - Clock flex cable that connects the clock card to the system node that has the system processor module that is identified in the failing item list
- Does the problem persist?
Yes: Continue with step 6.
No: This ends the procedure.
4. Use the HMC to replace the following items at the same time:
- Clock card in the failing item list
 - Clock flex cable that connects the clock card to the system node that has the system processor module that is identified in the failing item list
- Does the problem persist?
Yes: Continue with the next step.
No: This ends the procedure.
5. Use the HMC to replace the system processor module that is included in the failing item list. Does the problem persist?
Yes: Continue with the next step.
No: This ends the procedure.
6. Use the HMC to replace the system backplane of the same system node as the system processor module that is included in the failing item list. Does the problem persist?
Yes: Contact your next level of support. **This ends the procedure.**
No: This ends the procedure.
7. Is only one clock card and more than one system processor module included in the failing item list of the reference code that sent you here?
Yes: Continue with the next step.
No: Continue with step 11.
8. Are all of the system processor modules that are included in the failing item list located in the same system node?
Yes: Continue with the next step.
No: Continue with step 11.
9. Use the HMC to replace the following items at the same time:
- Clock card in the failing item list
 - Clock flex cable that connects the clock card to the system node that has the system processor modules that are identified in the failing item list
- Does the problem persist?
Yes: Continue with the next step.
No: This ends the procedure.
10. Use the HMC to replace the system backplane of the same system node as the system processor modules that are included in the failing item list. Does the problem persist?
Yes: Contact your next level of support. **This ends the procedure.**
No: This ends the procedure.

11. Use the HMC to replace all of the clock cards that are included in the failing item list. Does the problem persist?

Yes: Contact your next level of support. **This ends the procedure.**

No: **This ends the procedure.**

FSPSPC1

If the system hangs after the code that sent you to this procedure appears in the control panel, perform these steps to reset the service processor.

Attention: You should periodically check the system firmware level on all your servers and update the firmware to the latest level, if appropriate. If you were directed to this procedure because the server displayed B1817201, C1001014, or C1001020, or a combination of these codes, the latest firmware can help avoid a recurrence of this problem.

Even if the customer cannot update the firmware on this system at this time, all of their systems should be updated to the latest firmware level as soon as possible to help prevent this problem from occurring on other systems.

Resetting the service processor on systems with a physical control panel

1. If the Advanced System Management Interface (ASMI) is available, reset the service processor using the ASMI menus.

Were you able to use the ASMI menus to reset the service processor?

Yes: This ends the procedure.

No: Continue with the next step.

2. Activate the service processor pinhole reset switch on the system's control (operator) panel by carefully performing these steps:
 - a. Using an insulated paper clip, unbend the paper clip so that it has a straight section about 2 inches long.
 - b. Insert the clip straight into the hole, keeping the clip perpendicular to the plastic bezel.
 - c. When you engage the reset switch, you should feel the detent of the switch. Pressing the reset switch resets the service processor and causes the system to shut down.
3. Reboot the system from the permanent side, using control panel function 02 or the ASMI menus, if available.
4. If the hang repeats, verify whether there is a firmware update that is available that fixes the problem; apply if available. For more information, see:
 - If the system is managed by a Hardware Management Console (HMC), see Upgrading the machine code on an HMC.
 - If the system is not managed by a management console, see the Managing the Advanced System Management Interface.
5. Choose from the following options:
 - If no firmware update is available, continue with the next step.
 - If a firmware update is available, use the management console to apply, if attached.

Did the update resolve the problem so that the system now boots?

Yes: This ends the procedure.

No: You are here because there is no management console attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.

6. Choose from the following options:
 - If you are a customer, contact your authorized hardware service provider. **This ends the procedure.**
 - If you are the authorized hardware service provider, continue with the next step.

7. Replace the service processor (see Part locations and location codes).
8. If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

Resetting the service processor on systems with a logical control panel

1. Reset the service processor. Use the Advanced System Management Interface (ASMI) menus, if available, or the management console first to remove then to reapply power to the service processor.
2. Using the setting in the ASMI menu, reboot the system from the permanent side.
3. If the hang repeats, check with service support to see if a firmware update is available that fixes the problem. For the Hardware Management Console (HMC), see Upgrading the machine code on an HMC.
4. Choose from the following options:
 - If no firmware update is available, continue with the next step.
 - If a firmware update is available, apply it using the management console. Did the update resolve the problem so that the system now boots?
No: You are here because there is no management console attached to the system, the flash update failed, or the updated firmware did not fix the hang. Continue with the next step.
Yes: **This ends the procedure.**
5. Choose from the following options:
 - If you are a customer, contact your authorized hardware service provider. This ends the procedure.
 - If you are a customer and your system has a secondary service processor, use the management console to initiate a service processor failover and continue to power on the system. Contact your authorized service provider to schedule deferred maintenance on the service processor that is not working. **This ends the procedure.**
 - If you are the authorized hardware service provider, continue with the next step.
6. Replace the service processor. See Part locations and location codes for information about the FRU location for the system that you are servicing.
7. If replacing the service processor does not fix the problem, contact your next level of support. **This ends the procedure.**

FSPSPD1

If the system hangs after the code that sent you to this procedure appears in the control panel, perform these steps to reset the service processor.

Perform “FSPSPC1” on page 207.

Tape unit isolation procedures

This topic contains the procedures necessary to isolate a failure in a tape device.

In these procedures, the term *tape unit* may be any one of the following:

- An internal tape drive, including its electronic parts and status indicators
- An internal tape drive, including its tray, power regulator, and AMDs
- An external tape drive, including its power supply, power switch, power regulator, and AMDs

You should interpret the term *tape unit* to mean the tape drive you are working on. However, these procedures use the terms *tape drive* and *enclosure* to indicate a more specific meaning.

Read and observe all safety procedures before servicing the system and while performing the procedures in this topic. Unless instructed otherwise, always power off the system or expansion unit where the FRU is located (see Powering on and powering off the system) before removing, exchanging, or installing a field-replaceable unit (FRU).

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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
 - For AC power, disconnect all power cords from their AC power source.
 - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
 - For racks with AC power, 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.
 - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.

5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

TUPIP03

You were directed here because you may need to exchange a failing part.

The failing part was determined from one of the following:

- Other problem isolation procedures
- The *Failing item* column of the tape unit reference code table
- Tape unit service information

Note: Occasionally, the system is available but not performing an alternate IPL (type D IPL). In this instance, any hardware failure of the tape unit I/O processor, or any device attached to it is not critical. With the exception of the loss of the affected devices, the system remains available.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see Determining whether the system has logical partitions).
2. Do you need to exchange a possible failing device?
 - **No:** Do you need to exchange the tape unit I/O processor?
 - No:** Continue with the next step.
 - Yes:** Exchange the tape unit I/O processor. See Part locations and location codes. When you have completed the remove and replace procedure, continue with the next step.
 - **Yes:** Perform the following steps:
 - For an internal tape unit, go to Part locations and location codes for information about system FRU locations.
 - For an external tape unit, go to the remove and replace procedures in the device service information.
3. Are you working with a tape unit in the system unit or in an expansion unit?
 - **Yes:** Is the system available, and can you enter commands on the command line?
 - No:** Continue with the next step.
 - Yes:** Go to step 9 on page 211.
 - **No:** Continue with the next step.
4. Display the selected IPL type.

Is the displayed IPL type D?

 - **No:** Do you want to perform an alternate IPL (type D)?
 - No:** Continue with the next step.
 - Yes:** Go to step 6.
 - **Yes:** Go to step 6.
5. Perform an IPL from disk by doing the following:
 - a. Power off the system. See Powering on and powering off the system.
 - b. Select IPL type A in manual mode.
 - c. Power on the system.
 - d. Go to step 8 on page 211.
6. Place the first tape of the latest set of SAVSYS tapes or SAVSTG tapes, or the first Software Distribution tape in the alternate IPL tape drive. The tape drive automatically becomes ready for the IPL operation (this may take several minutes).

7. Perform an alternate IPL by doing the following:

- a. Power off the system.
- b. Select IPL type D in Manual mode.
- c. Power on the system.

8. The IPL may take one or more hours to complete.

Does an unexpected reference code appear on the control panel, and is the System Attention light on?

- **No:** Does the IPL complete successfully?

Yes: Continue with the next step.

No: Perform problem analysis to continue analyzing the problem. **This ends the procedure.**

- **Yes:** Go to step 10.

9. Perform the following steps to test the tape unit:

- a. Enter VFYTAP (the Verify Tape command) on the command line.
- b. Follow the prompts on the Verify Tape displays, then return here and answer the following question.

Does the VFYTAP command end successfully?

No: Continue with the next step.

Yes: **This ends the procedure.**

10. Record the SRC.

Is the SRC the same one that sent you to this procedure?

Yes: You cannot continue to analyze the problem. Use the original SRC and exchange the FRUs. Begin with the FRU which has the highest percent of probable failure (see the failing item list for this reference code). **This ends the procedure.**

No: A different SRC occurred. Use the new SRC to correct the problem. **This ends the procedure.**

TUPIP04

Use this procedure to reset an IOP and its attached tape units. Read the (overview) before continuing with this procedure.

If disk units are attached to an IOP, you must power off the system, then power it on to reset the IOP.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem (see Determining whether the system has logical partitions).

2. Is the tape unit powered on?

- **No:** Continue with the next step.

- **Yes:** Perform the following steps:

- a. Press the Unload switch on the front of the tape unit you are working on.
- b. If a data cartridge or a tape reel is present, do not load it until you need it.
- c. Continue with the next step of this procedure.

3. Verify the following:

- If the external device has a power switch, ensure that it is set to the **On** position.
- Ensure that the power and external signal cables are connected correctly.

Note: For every 8mm and 1/4 inch tape unit, the I/O bus terminating plug for the SCSI external signal cable is connected internally. These devices do not need and should not have an external terminating plug.

4. Did you press the Unload switch in step 2?

- **Yes:** Can you enter commands on the command line?

Yes: Continue with the next step.

No: Go to step 11 on page 213.

- **No:** Press the **Unload** switch on the front of the tape unit you are working on. If a data cartridge or a tape reel is present, do not load it until you need it. Continue with the next step of this procedure.
5. Has the tape unit operated correctly since it was installed? If you do not know, continue with the next step of this procedure.
- Yes:** Continue with the next step.
- No:** Go to step 11 on page 213.
6. If a system message displayed an I/O processor name, a tape unit resource name, or a device name, record the name for use in the next step. You may continue without a name.
- Does the I/O processor give support to only one tape unit? If you do not know, continue with the next step of this procedure.
- **No:** Continue with the next step.
 - **Yes:** Perform the following. You must complete all parts of this step before you press **Enter**.
 - a. Enter
WRKCFGSTS *DEV *TAP ASTLVL(*INTERMED)

(the Work with Configuration Status command) on the command line.
 - b. If the device is not varied off, select **Vary off** before continuing.
 - c. Select **Vary on** for the failing tape unit.
 - d. Enter
RESET(*YES)

(the Reset command) on the command line.
 - e. Press **Enter**. **This ends the procedure.**
7. This step determines if the I/O processor for the tape unit gives support to other tape units or to a disk unit.

Notes:

- a. If you cannot determine the tape unit you are attempting to use, go to step **11** (See 11 on page 213).
- b. System messages refer to other tape units that the I/O processor gives support to as *associated devices*.

Enter WRKHDWRSC *STG (the Work with Hardware Resources command) on the command line.

Did you record an I/O processor (IOP) resource name in step 6?

- **No:** Perform the following steps:
 - a. Select **Work with resources** for each storage resource IOP (CMB01, SIO1, and SIO2 are examples of storage resource IOPs).
 - b. Find the Configuration Description name of the tape unit you are attempting to use, and then record the Configuration Description names of all tape units that the I/O processor gives support to.
 - c. Record whether the I/O processor for the tape unit also gives support to any disk unit resources.
 - d. Continue with the next step.
- **Yes:** Perform the following steps:
 - a. Select **Work with resources** for that resource.
 - b. Record the Configuration description name of all tape units for which the I/O processor provides support.

- c. Record whether the I/O processor for the tape unit also gives support to any disk unit resources.
 - d. Continue with the next step.
8. Does the I/O processor give support to any disk unit resources?
- No:** Continue with the next step.
 - Yes:** The **Reset** option is not available. Go to step 11.
9. Does the I/O processor give support to only one tape unit?
- **No:** Continue with the next step.
 - **Yes:** Perform the following steps:
 - a. Select **Work with configuration description** and press **Enter**.
 - b. Select **Work with status** and press **Enter**.

Note: You must complete the remaining parts of this step before you press **Enter** again.

 - c. If the device is not varied off, select **Vary off** before continuing.
 - d. Select **Vary on** for the failing tape unit.
 - e. Enter **RESET(*YES)** (the Reset command) on the command line.
 - f. Press **Enter**. **This ends the procedure.**
10. Perform the following steps:
- a. Enter


```
WRKCFGSTS *DEV *TAP ASTLVL(*INTERMED)
```

(the Work with Configuration Status command) on the command line.
 - b. Select **Vary off** for the failing tape unit and associated devices (the devices you identified in step 7 on page 212), and then press **Enter**.
- Note:** You must complete the remaining parts of this step before you press **Enter** again.
- c. Select **Vary on** for the failing tape unit.
 - d. Enter


```
RESET(*YES)
```

(the Reset command) on the command line.
 - e. Press **Enter**.
 - f. Select **Vary on** for the associated devices (tape units) you identified in step 7 on page 212. It is not necessary to use the **Reset** option again.
- Does a system message indicate that the vary on operation failed?
- Yes:** Continue with the next step.
 - No: This ends the procedure.**
11. The **Reset** is not available, or you were not able to find the Configuration Description name when using
- ```
WRKHDWRSC *STG
```
- (the Work with Hardware Resources command).
- You can perform an I/O processor (IOP) reset by performing an IPL of the I/O processor. All devices that are attached to the IOP will reset.
- The following steps describe how to load an IOP, how to configure a tape drive, how to vary on tape devices, and how to make tape devices available.
12. Is a data cartridge or a tape reel installed in the tape device?
- No:** Continue with the next step.

**Yes:** Remove the data cartridge or tape reel. Continue with the next step.

13. Can you enter commands on the command line?

- **Yes:** Continue with the next step.
- **No:** Perform the following steps:
  - a. Power off the system. See Powering on and powering off the system.
  - b. Power on the system.

The system performs an IPL and resets all devices. If the tape device responds to SCSI address 7, the system configures the tape device. **This ends the procedure.**

14. Verify that automatic configuration is on by entering

DSPSYSVAL QAUTOCFG

(the Display System Value command) on the command line.

Is the **Autoconfigure device** option set to **1**?

- **Yes:** Continue with the next step.
- **No:** Perform the following steps:
  - a. Press **Enter** to return to the command line.
  - b. Set automatic configuration to On by entering  
CHGSYSVAL QAUTOCFG '1'  
(the Change System Value command) on the command line.

**Note:** QAUTOCFG resets to its initial value in step 20 on page 215.

c. Continue with the next step.

15. Perform the following steps:

a. Enter  
STRSST

(the Start SST command) on the command line.

- b. On the Start Service Tools Sign On display, type in a User ID with QSRV authority and Password.
- c. Select **Start a Service Tool > Hardware Service Manager > Logical Hardware Resources > System Bus Resources**. The Logical Hardware Resources on System Bus display shows all of the IOPs.
- d. Find the IOP you want to reset. You **must** ensure that no one is using any of the tape units, communication channels, or display stations that are attached to the IOP you want to reset.

Does a "\*" indicator appear to the right of the IOP description?

- **No:** Continue with the next step.
- **Yes:** Disk units are attached to the IOP.

Perform the following steps:

- a. Press **F3** until the Exit System Service Tools display appears.
- b. Press **Enter**.
- c. Power off the system. See Powering on and powering off the system.
- d. Power on the system.

The system performs an IPL and resets all devices. **This ends the procedure.**

16. Perform the following steps:

- a. Select **I/O debug > IPL the I/O processor**.
- b. When the IOP reset is complete, continue with the next step of this procedure.

17. Perform the following steps:

- a. Press **F12** to return to the Logical Hardware Resources on System Bus display.
- b. Select **Resources associated with IOP** for the IOP you reset.

Did the IOP detect the tape unit?

- **Yes:** Continue with the next step.
- **No:** The IOP did not detect the tape unit. Consider the following:
  - Ensure that the tape unit is powered on and that the signal cables are connected correctly. If you find and correct a power or a signal cable problem, return to step 15 on page 214.
  - The tape unit may be failing. Go to the tape unit service information and perform the procedures for analyzing device problems. If you find and correct a tape unit problem, return to step 15 on page 214.
  - If none of the above are true, ask your next level of support for assistance. **This ends the procedure.**

18. Press **F3** until the Exit System Service Tools display appears. Then press **Enter**.

19. Was automatic configuration Off before you performed step 14 on page 214?

**Yes:** Continue with the next step.

**No:** **This ends the procedure.**

20. Enter

```
CHGSYSVAL QAUTOCFG '0'
```

(the Change System Value command) on the command line to reset QAUTOCFG to its initial value. **This ends the procedure.**

## TUPIP06

Use this procedure to isolate a Device Not Found message during installation from an alternate device.

There are several possible causes:

- The alternate installation device was not correctly defined.
- The alternate installation device was not made ready.
- The alternate installation device does not contain installation media.
- The alternate installation device is not powered on.
- The alternate installation device is not connected properly.
- There is a hardware error on the alternate installation device or the attached I/O processor.

Read the danger notices in “Tape unit isolation procedures” on page 208 before continuing with this procedure.

1. Is the device that you are using for alternate installation defined as the alternate installation device?

- **Yes:** Is the alternate installation device ready?

**Yes:** Continue with the next step.

**No:** Make the alternate installation device ready and try the alternate installation again. **This ends the procedure.**

- **No:** Correct the alternate installation device information and try the alternate installation again. **This ends the procedure.**

2. Is there installation media in the alternate installation device?

- **Yes:** Is the alternate installation device an external device?

**Yes:** Continue with the next step.

**No:** Go to step 5.

- **No:** Load the correct media and try the alternate installation again. **This ends the procedure.**

3. Is the alternate installation device powered on?

- **Yes:** Make sure that the alternate installation device is properly connected to the I/O processor or I/O adapter card.

Is the alternate installation device properly connected?

**Yes:** Go to step 5.

**No:** Correct the problem and try the alternate installation again. **This ends the procedure.**

- **No:** Continue with the next step.

4. Ensure that the power cable is connected tightly to the power cable connector at the back of the alternate device. Ensure that the power cable is connected to a power outlet that has the correct voltage. Set the alternate device Power switch to the Power On position.

The Power light should go on and remain on. If a power problem is present, one of the following power failure conditions may occur:

- The Power light flashes, then remains off.
- The Power light does not go on.
- Another indication of a power problem occurs.

Does one of the above power failure conditions occur?

- **No:** The alternate device is powered on and runs its power-on self-test. Wait for the power-on self-test to complete.

Does the power-on self-test complete successfully?

**No:** Go to the service information for the specific alternate installation device to correct the problem. Then try the alternate installation again. **This ends the procedure.**

**Yes:** Try the alternate installation again. **This ends the procedure.**

- **Yes:** Perform the following steps:
  - a. Go to the service information for the specific alternate device to correct the power problem.
  - b. When you have corrected the power problem, try the alternate installation again. **This ends the procedure.**

5. Was a device error recorded in the Product Activity Log?

**No:** Contact your next level of support. **This ends the procedure.**

**Yes:** See Reference codes to look up the device error record and correct the problem. **This ends the procedure.**

---

## Twinaxial workstation I/O processor isolation procedure

Use the procedure below to isolate a failure which has been detected by the twinaxial workstation I/O processor. If you are using a personal computer, an emulation program must be installed and working.

Read and observe all safety procedures before servicing the system and while performing the procedure below.

**Attention:** Unless instructed otherwise, always power off the system or expansion unit where the FRU is located (see Powering on and powering off the system) before removing, exchanging, or installing a field-replaceable unit (FRU).

**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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.

- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
  - For AC power, disconnect all power cords from their AC power source.
  - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
  - For racks with AC power, 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.
  - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

**DANGER:**

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

**Attention:** When instructed, remove and connect cables carefully. You may damage the connectors if you use too much force.

**TWSIP01**

The workstation IOP detected an error.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

Read the danger notices in “Twinaxial workstation I/O processor isolation procedure” on page 216 before performing this procedure.

One of the following occurred:

- All of the workstations on one port are not working.
  - All of the workstations on the system are not working.
  - One of the workstations on the system is not working.
  - The reference code table instructed you to perform this procedure.
  - The Remote Operations Console is not working.
1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions before continuing with this procedure.
  2. Are you using a workstation adapter console?

**Note:** A personal computer (used as a console) that is attached to the system by using a console cable feature is known as a workstation adapter console. The cable (part number 46G0450, 46G0479, or 44H7504) connects the system port on the personal computer to a communications I/O adapter on the system.

**No:** Continue with the next step.

**Yes:** Go to “WSAIP01” on page 224. **This ends the procedure.**

3. Is the device you are attempting to repair a personal computer (PC)?

**No:** Continue with the next step.

**Yes:** PC emulation programs operate and report system-to-PC communications problems differently. See the PC emulation information for details on error identification. Then, continue with the next step.

4. Perform the following steps:

- a. Verify that all the devices you are attempting to repair, the primary console, and any alternative consoles are powered on.
- b. Verify that all the devices you are attempting to repair, the primary console, and any alternative consoles have an available status. For more information about displaying the device status, see Hardware service manager.
- c. Verify that the workstation addresses of all workstations on the failing port are correct. Each workstation on the port must have a separate address, from 0 through 6. See the workstation service information for details on how to check addresses.
- d. Verify that the last workstation on the failing port is terminated. All other workstations on that port must not be terminated.
- e. Ensure that the cables that are attached to the device or devices are tight and are not visibly damaged.
- f. If there were any cable changes, check them carefully.
- g. If all of the workstations on the system are not working, disconnect them by terminating at the console.
- h. Verify the device operation (see the device information for instructions).
- i. The cursor position can assist in problem analysis.
  - If the cursor is in the upper right corner, it indicates a communication problem between the workstation IOP and the device. Continue with the next step.



- If the cursor is in the upper left corner, it indicates a communication problem between the workstation IOP and the operating system. Perform the following steps:
    - 1) Verify that all current PTFs are loaded.
    - 2) Ask your next level of support for assistance. **This ends the procedure.**
5. Is the system powered off?
    - Yes:** Continue with the next step.
    - No:** Go to step 8.
  6. Perform the following steps:
    - a. Power on the system in **Manual** mode. See IPL type, mode, and speed options for details.
    - b. Wait for a display to appear on the console or a reference code to appear on the control panel.  
Does a display appear on the console?
      - **No:** Continue with the next step.
      - **Yes:** If you disconnected any devices after the console in step 4 on page 218, perform the following:
        - a. Power off the system.
        - b. Reconnect one device.

**Note:** Ensure that you terminate the device you just reconnected and remove the termination from the device previously terminated.
    - c. Power on the system.
    - d. If a reference code appears on the control panel, go to step 9.
    - e. If no reference code appears, repeat steps a through d of this step until you have checked all devices disconnected previously.
    - f. Continue to perform the initial program load (IPL). **This ends the procedure.**
  7. Does the same reference code that sent you to this procedure appear on the control panel?
    - Yes:** Continue with the next step.
    - No:** Perform problem analysis for this new problem. **This ends the procedure.**
  8. Perform the following steps to make DST available:
    - a. Ensure that **Manual** mode on the control panel is selected.
    - b. Select function 21 **Make DST Available**.
    - c. Check the console and any alternative consoles for a display.  
Does a display appear on any of the console displays?
      - **No:** Continue with the next step.
      - **Yes:** If you disconnected any devices after the console in step 4 on page 218, perform the following:
        - a. Power off the system.
        - b. Reconnect one device.

**Note:** Ensure that you terminate the device you just reconnected and remove the termination from the previously terminated device.
    - c. Power on the system.
    - d. If a reference code appears on the control panel or on the management console, go to step 9.
    - e. If no reference code, repeat steps a through d of this step until you have checked all devices disconnected previously.
    - f. Continue to perform the initial program load (IPL). **This ends the procedure.**
  9. Ensure that the following conditions are met:
    - The workstation addresses of all workstations on the failing port must be correct.

Each workstation on the port must have a separate address, from 0 through 6. See the workstation service information if you need help with checking addresses.

Did you find a problem with any of the above conditions?

**Yes:** Continue with the next step.

**No:** Go to step 11.

10. Perform the following steps:

- a. Correct the problem.
- b. Select function 21 **Make DST Available**.
- c. Check the console and any alternative consoles for a display.

Does a display appear on any of the consoles?

- **Yes:** Continue to perform the IPL. **This ends the procedure.**
- **No:** Does the same reference code appear on the control panel?

**Yes:** Continue with the next step.

**No:** Perform problem analysis for this new problem. **This ends the procedure.**

11. Is the reference code one of the following: 0001, 0003, 0004, 0005, 0006, 0101, 0103, 0104, 0105, 0106, 5004, 5082, B000, D010, or D023?

**No:** Continue with the next step.

**Yes:** Go to step 15 on page 221.

12. Does the system have an alternative console on a second workstation IOP?

**Yes:** Continue with the next step.

**No:** Go to step 14.

13. There is either a Licensed Internal Code problem, or there are two device failures on the workstation IOPs, consoles, or cables. The console and any alternative consoles are the most probable causes for this failure.

- See the service information for the failing display to attempt to correct the problem. If a display is connected to the system by a link protocol converter, use the link protocol converter information to attempt to correct the problem. The link protocol converter may be the failing item.
- If you have another working display, you can exchange the console and alternative consoles and perform an IPL to attempt to correct the problem.
- Exchange the following parts one at a time until you determine the failing item:
  - a. Console
  - b. Alternative console
  - c. Cables
  - d. Workstation IOA for the console. **This ends the procedure.**

14. The console, cables, or the workstation IOP card is the most probable causes for this failure. If the console is connected to the system by a link protocol converter, the link protocol converter is possibly the failing item. Use one or more of the following options to correct the problem:

- a. See the service information for the failing displays for more information. If a display is connected to the system by a link protocol converter, see the link protocol converter information to attempt to correct the problem.
- b. If you have another working display, you can exchange the console and perform an IPL to attempt to correct the problem.
- c. Exchange the following parts one at a time until you determine the failing item:
  - 1) Console
  - 2) Workstation IOA
  - 3) Twinaxial attachment (cable). **This ends the procedure.**

15. To continue problem analysis, use a port tester, part 93X2040 or 59X4262, which you may have with your tools or the customer may have one. The port tester has either two or three lights.  
Is a port tester available?
  - **Yes:** Continue with the next step.
  - **No:** Check or exchange the cables from the system to the failing display. Did this correct the problem?
    - Yes:** You corrected the problem. **This ends the procedure.**
    - No:** Go to step 12 on page 220.
16. To use the port tester to isolate the problem, perform the following steps:
  - Verify that the port tester is operating correctly by doing a self-test. A self-test can be made at any time, even when the port tester is attached to a port or cable. Perform the following steps to do a self-test:
    - a. Move the selector switch to the center (0) position.
    - b. Push and hold the test button until all lights go on. The yellow lights should go on immediately, and the green light should go on approximately 5 seconds later. The port tester is ready for use if all lights go on.
  - Leave the system power on.
17. Find the input cable to the failing console or port.  
Is the failing console or the failing port attached to a protocol converter?
  - **No:** Perform the following steps:
    - a. Disconnect the input cable from the failing console.
    - b. Connect the port tester to the input cable.
    - c. Continue with the next step.
  - **Yes:** Perform the following steps:
    - a. Disconnect the cable that comes from the system at the protocol converter.
    - b. Connect the port tester to the cable.
    - c. Continue with the next step.
18. Perform the following steps:
  - a. Set the selector switch on the port tester to the left (1) position for a twinaxial connection. Set the switch to the right (2) position for a twisted pair connection.
  - b. Press and hold the test switch on the port tester for 15 seconds and observe the lights.
  - c. Choose from the following options:
    - If the port tester has **three** lights, do the following:
      - If only the top (green) light is on, go to step 27 on page 222.
      - If both the top (green) and center (yellow) lights are on, go to step 20 on page 222.
    - Note:** The center (yellow) light is always on for twisted pair cable and may be on for fiber-optical cable.
      - If only the bottom (yellow) light is on, go to step 21 on page 222.
      - If all lights are off, go to step 22 on page 222.
      - If all lights are on, go to step 19.
    - If the port tester has **two** lights, do the following:
      - If only the top (green) light is on, go to step 27 on page 222.
      - If only the bottom (yellow) light is on, go to step 21 on page 222.
      - If both lights are off, go to step 22 on page 222.
      - If both lights are on, continue with the next step.
19. The tester is in the self-test mode. Check the position of the selector switch.

- If the selector switch is not in the correct position, go to step 18 on page 221.
  - If the selector switch is already in the correct position, the port tester is not working correctly. Exchange the port tester, and go to step 16 on page 221.
20. The cable you are testing has an open shield.
- Note:** The open shield can be checked only on the cable from the twinaxial workstation attachment to the device or from device to device. Only one section of cable can be checked at a time. See the SA41-3136, Port Tester Use information.
- This ends the procedure.**
21. The cable network is bad. The wires in the cable between the console and the twinaxial workstation attachment are reversed. Go to step 26.
22. Perform the following steps:
- a. Find the twinaxial workstation attachment to which the failing console is attached.
  - b. Disconnect the cable from port 0 on that twinaxial workstation attachment.
  - c. Connect the port tester to port 0 on the attachment.
  - d. Set the selector switch on the port tester to the left (1) position.
23. Perform the following steps:
- a. Press and hold the test switch on the port tester for 15 seconds and observe the lights.
  - b. If the port tester has **three** lights, do the following:
    - If both the top (green) and center (yellow) lights are on, continue with step 24.

**Note:** The center (yellow) light is always on for twisted pair cable and may be on for fiber-optical cable.

    - If only the bottom (yellow) light is on, continue with step 24.
    - If all lights are off, continue with step 24.
    - If only the top (green) light is on, go to step 26.
    - If all lights are on, go to step 25.
  - c. If the port tester has **two** lights, do the following:
    - If only the top (green) light is on, go to step 26.
    - If only the bottom (yellow) light is on, continue with step 24.
    - If both lights are off, continue with step 24.
    - If both lights are on, go to step 25.
24. The test indicated that there was no signal from the system. Reconnect the cable you disconnected and perform the following steps:
- a. Exchange the Twinaxial workstation IOA card.
  - b. Power on the system to perform an IPL. **This ends the procedure.**
25. The tester is in the self-test mode. Check the position of the selector switch:
- If the selector switch is not in the left (1) position, set the switch to the left (1) position. Then go to step 23.
  - If the selector switch is already in the left (1) position, the port tester is not working correctly. Exchange the port tester and go to step 22.
26. The cable to the workstation is the failing item. Cable maintenance is a customer responsibility. The cable must be repaired or exchanged. Then, power on the system to perform an IPL. **This ends the procedure.**
27. The port tester detects most problems, but it does not always detect an intermittent problem or some cable impedance problems. The tester may indicate a good condition, although there is a problem with the workstation IOP card or cables.

- a. If the failing display is connected to a link protocol converter, the link protocol converter is the failing item. See the link protocol converter service information to correct the problem.
- b. Exchange the following parts:
  - 1) Console
  - 2) Twinaxial workstation IOA
  - 3) Cables
- c. If you have another working display, you can exchange the console and perform an IPL to attempt to correct the problem. See the service information for the failing display for more information.
- d. If exchanging the failing items did not correct the problem and the reference code was a 5002, 5082, or 50FF, there may be a Licensed Internal Code problem. Go to “LICIP03” on page 58.
- e. The problem may be caused by devices that are attached after the console on port 0. **This ends the procedure.**

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## Workstation adapter isolation procedure

Isolates a failure that is detected by the workstation adapter, and is used when no display is available with which to perform on-line problem analysis.

The workstation adapter detected a problem while communicating with the workstation that is used as the primary console.

**Note:** If you are using a PC, you must install an emulation program.

Read and observe all safety procedures before servicing the system and while performing the procedure below.

**Attention:** Unless instructed otherwise, always power off the system or expansion unit where the FRU is located (see Powering on and powering off the system) before removing, exchanging, or installing a field-replaceable unit (FRU).

**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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
  - For AC power, disconnect all power cords from their AC power source.
  - For racks with a DC power distribution panel (PDP), disconnect the customer’s DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
  - For racks with AC power, 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.
  - For racks with a DC power distribution panel (PDP), connect the customer’s DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

**DANGER:**

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

## WSAIP01

Isolate a console keyboard error that contains a "K" on the display.

**Note:** If the console has a keyboard error, there may be a "K" on the display. See the workstation service information for more information.

Perform the following procedure from the logical partition that reported the problem:

1. Select the icon on the workstation to make it the console (you may have already done this). You must *save* the console selection.
2. Access Dedicated Service Tools (DST) by performing the following:
  - a. Select **Manual** mode on the control panel.
  - b. Use the selection switch on the control panel to display function 21, **Make DST Available**, and press **Enter** on the control panel.
  - c. Wait for a display to appear on the console or for a reference code to appear on the control panel.

Does a display appear on the console?

**No:** Continue with the next step.

**Yes:** The problem is corrected. **This ends the procedure.**

3. Isolate the problem to one server and one workstation (console) by performing the following:
  - a. Disconnect the power cable from the workstation.

- b. Eliminate all workstations, cables, and connector boxes from the network except for one server, one console, two connector boxes, and one cable.
  - c. Ensure that the cables that are connected to the console, the keyboard, and the server are connected correctly and are not damaged.
4. Perform the following steps:
- a. Ensure that the server console is terminated correctly.
  - b. Set the Power switch on the console to the **On** position.
  - c. Select the **SNA\*PS** icon on the console.
  - d. See the workstation information for more information.
5. Access DST by performing the following:
- a. Select **Manual** mode on the control panel.
  - b. Use the selection switch on the control panel to display function 21, **Make DST Available**, and press **Enter** on the control panel.
  - c. Wait for a display to appear on the console or for a reference code to appear on the control panel.
- Does a display appear on the console?

**No:** Continue with the next step.

**Yes:** The problem is in a cable, connector box, or device you disconnected in step 3 on page 224.

**This ends the procedure.**

6. Does the reference code A600 5005 appear on the control panel?
- Yes:** Continue with the next step.
- No:** Perform problem analysis using this reference code. **This ends the procedure.**
7. Do you have another workstation, cable, and two connector boxes you can exchange with the workstation connected to the server?
- **Yes:** Continue with the next step.
  - **No:** One of the following is causing the problem:

**Note:** The items at the top of the list have a higher probability of fixing the problem than the items at the bottom of the list.

- Workstation adapter Licensed Internal Code
- Workstation adapter configuration
- Workstation
- Cable
- Connector box
- Workstation IOA
- Workstation IOP

If you still have not corrected the problem, ask your next level of support for assistance. **This ends the procedure.**

8. Repeat steps 3 on page 224 through 7 of this procedure, using a different workstation, cable, and connector boxes.

Do you still have a problem?

**Yes:** Continue with the next step.

**No:** The problem is in the cable, connector boxes, or workstation you disconnected. **This ends the procedure.**

9. One of the following is causing the problem:

**Note:** The items at the top of the list have a higher probability of fixing the problem than the items at the bottom of the list.

- Workstation adapter Licensed Internal Code

- Workstation adapter configuration
- Workstation IOA
- Communications IOP

To bring up a workstation other than the console, perform the following:

- a. Connect another workstation into this network.
- b. Select **Normal** mode on the control panel.
- c. Perform an IPL.

If the sign-on display appears, the following parts are good:

- Communications IOP
- Workstation IOA

**Note:** If a printer connected to this assembly is not working correctly, it may look like the display is bad. Perform a self-test on the printer to ensure that it prints correctly (see the printer service information).

If you still have not corrected the problem, ask your next level of support for assistance. **This ends the procedure.**

## Workstation adapter console isolation procedure

Contains the procedure necessary to isolate a failure that is detected by the workstation adapter console.

Use this procedure when no display is available with which to perform online problem analysis.

**Note:** If you are using a PC, you must install an emulation program.

Read all safety procedures before servicing the system. Observe all safety procedures when performing a procedure. Unless instructed otherwise, always power off the system or expansion unit where the FRU is located, see Powering on and powering off the system before removing, exchanging, or installing a field-replaceable unit (FRU).

**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:

- If IBM supplied the power cord(s), connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
  - For AC power, disconnect all power cords from their AC power source.
  - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
  - For racks with AC power, 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.
  - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

**DANGER:**

- 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. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

Read and understand the following service procedures before using this section:

- Powering on and powering off the system
- Primary consoles or alternative consoles
- Part locations and location codes

**Note:** If the console has a keyboard error, there may be a K on the display. See the workstation service information for more information.

1. If the system has logical partitions, perform this procedure from the logical partition that reported the problem. To determine if the system has logical partitions, go to Determining whether the system has logical partitions.
2. Ensure that your workstation meets the following conditions:
  - The workstation that you are using for the console is powered on.
  - The emulation program is installed and is working.
  - The input/output adapter (IOA) is installed and the workstation console cable is attached.

**Notes:**

- a. Card information: Hardware that is associated with 6A59 feature is the type 2745 card.
- b. Cable information: The cable attaches directly to the IOA.

Did you find a problem with any of the conditions listed above?

**No:** Continue with the next step.

**Yes:** Correct the problem. Then, perform an IPL of the system. **This ends the procedure.**

3. Perform the following steps to make dedicated service tool (DST) available:
  - a. If there is an alternative console, ensure that it is powered on.
  - b. Ensure that **Manual** mode on the control panel is selected.
  - c. Select function 21, **Make DST Available** on the control panel, and press **Enter**.

Does a display appear on either the console or any alternative console?

**No:** Continue with the next step.

**Yes:** Complete the IPL. When the operating system display appears, use the Work with Problem command (WRKPRB) or Analyze Problem command (ANZPRB) to analyze and correct or report any console problems. **This ends the procedure.**

4. Do you have SRC A600 5001, A600 5004, A600 5007, or B075 xxxx (where xxxx is any value)?
  - **No:** Continue with the next step.
  - **Yes:** Perform the following steps:
    - a. Disconnect any cables that are attached to the IOA.
    - b. Install the wrap plug on the IOA. The 2745 wrap plug label is QQ.
    - c. Perform an IPL in Manual mode.
5. Does SRC 6A59 5007 occur?
  - **No:** Continue with the next step.
  - **Yes:** One of the following is causing the problem:
    - Workstation emulation program
    - Workstation
    - Workstation console cable

**This ends the procedure.**

6. Did SRC A600 5001, A600 5004, or 6A59 5008 occur?

**No:** This is a new problem. Use the new reference code to perform problem analysis for the problem, or ask your next level of support for assistance. **This ends the procedure.**

**Yes:** The Type 2745 workstation adapter is the failing item. **This ends the procedure.**

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## Isolating problems on servers that run AIX or Linux

Use the procedures for AIX or Linux servers if there is not a management console attached to the server. If the server is connected to a management console, use the procedures that are available on the management console to continue FRU isolation.

### MAP 0210: General problem resolution

Replace the FRUs in the failing item list one at a time in the order that they are listed.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

### Problems with loading and starting the operating system (AIX and Linux)

If the system is running partitions from partition standby (LPAR), the following procedure addresses the problem in which one partition will not boot AIX or Linux while other partitions boot successfully and run the operating system successfully.

It is the customer's responsibility to move devices between partitions. If a device must be moved to another partition to run standalone diagnostics, contact the customer or system administrator. If the optical drive must be moved to another partition, all SCSI devices connected to that SCSI adapter must be moved because moves are done at the slot level, not at the device level.

Depending on the boot device, a checkpoint may be displayed on the operator panel for an extended period of time while the boot image is retrieved from the device. This is particularly true for tape and network boot attempts. If booting from an optical drive or tape drive, watch for activity on the drive's LED indicator. A flashing LED indicates that the loading of either the boot image or additional information required by the operating system being booted is still in progress. If the checkpoint is displayed for an extended period of time and the drive LED is not indicating any activity, there might be a problem loading the boot image from the device.

**Notes:**

1. For network boot attempts, if the system is not connected to an active network or if the target server is inaccessible (which can also result from incorrect IP parameters being supplied), the system will still attempt to boot. Because time-out durations are necessarily long to accommodate retries, the system may appear to be hung. Refer to checkpoint CA00 E174.
2. If the partition hangs with a 4-character checkpoint in the display, the partition must be deactivated, then reactivated before attempting to reboot.
3. If a BA06 000x error code is reported, the partition is already deactivated and in the error state. Reboot by activating the partition. If the reboot is still not successful, go to step 3.

This procedure assumes that a diagnostic CD-ROM and an optical drive from which it can be booted are available, or that diagnostics can be run from a NIM (Network Installation Management) server. Booting the diagnostic image from an optical drive or a NIM server is referred to as running standalone diagnostics.

1. Is a management console attached to the managed system?  
**Yes:** Continue with the next step.  
**No:** Go to step 3.
2. Look at the service action event error log on the management console. Perform the actions necessary to resolve any open entries that affect devices in the boot path of the partition or that indicate problems with I/O cabling. Then try to reboot the partition. Does the partition reboot successfully?  
**Yes: This ends the procedure.**  
**No:** Continue with the next step.
3. Boot to the SMS main menu:
  - If you are rebooting a partition from partition standby (LPAR), go to the properties of the partition and select **Boot to SMS**, then activate the partition.
  - If you are rebooting from platform standby, access the ASMI. See Setting up and accessing the ASMI. Select **Power/Restart Control**, then **Power On/Off System**. In the AIX/Linux partition mode boot box, select **Boot to SMS menu > Save Settings and Power On**.

At the SMS main menu, select **Select Boot Options** and verify whether the intended boot device is correctly specified in the boot list. Is the intended load device correctly specified in the boot list?

- **Yes:** Perform the following steps:
    - a. Remove all removable media from devices in the boot list from which you do not want to load the operating system.
    - b. If you are attempting to load the operating system from a network, go to step 4.
    - c. If you are attempting to load the operating system from a disk drive or an optical drive, go to step 7 on page 230.
    - d. **No:** Go to step 5 on page 230.
4. If you are attempting to load the operating system from the network, perform the following steps:

- Verify that the IP parameters are correct.
- Use the SMS ping utility to attempt to ping the target server. If the ping is not successful, have the network administrator verify the server configuration for this client.
- Check with the network administrator to ensure that the network is up. Also ask the network administrator to verify the settings on the server from which you are trying to load the operating system.
- Check the network cabling to the adapter.

Restart the partition and try loading the operating system. Does the operating system load successfully?

**Yes:** This ends the procedure.

**No:** Go to step 7.

5. Use the SMS menus to add the intended boot device to the boot sequence. Can you add the device to the boot sequence?

**Yes:** Restart the partition. **This ends the procedure.**

**No:** Continue with the next step.

6. Ask the customer or system administrator to verify that the device you are trying to load from is assigned to the correct partition. Then select **List All Devices** and record the list of bootable devices that displays. Is the device from which you want to load the operating system in the list?

**Yes:** Go to step 7.

**No:** Go to step 10.

7. Try to load and run standalone diagnostics against the devices in the partition, particularly against the boot device from which you want to load the operating system. You can run standalone diagnostics from an optical drive or a NIM server. To boot standalone diagnostics, follow the detailed procedures in Running the online and stand-alone diagnostics.

**Note:** When attempting to load diagnostics on a partition from partition standby, the device from which you are loading standalone diagnostics must be made available to the partition that is not able to load the operating system, if it is not already in that partition. Contact the customer or system administrator if a device must be moved between partitions in order to load standalone diagnostics.

Did standalone diagnostics load and start successfully?

**Yes:** Go to step 8.

**No:** Go to step 14 on page 231.

8. Was the intended boot device present in the output of the option **Display Configuration and Resource List**, that is run from the Task Selection menu?

- **Yes:** Continue with the next step.

- **No:** Go to step 10.

9. Did running diagnostics against the intended boot device result in a **No Trouble Found** message?

**Yes:** Go to step 12 on page 231.

**No:** Go to the list of service request numbers and perform the repair actions for the SRN reported by the diagnostics. When you have completed the repair actions, go to step 13 on page 231.

10. Perform the following actions:

- a. Perform the first item in the action list below. In the list of actions below, choose SCSI or IDE based on the type of device from which you are trying to boot the operating system.

- b. Restart the system or partition.

- c. Stop at the SMS menus and select **Select Boot Options**.

- d. Is the device that was not appearing previously in the boot list now present?

**Yes:** Go to Verifying a repair. **This ends the procedure.**

**No:** Perform the next item in the action list and then return to step 10b on page 230. If there are no more items in the action list, go to step 11.

**Action list:**

**Note:** See Part locations and location codes for part numbers and links to exchange procedures.

- a. Verify that the SCSI or IDE cables are properly connected. Also verify that the device configuration and address jumpers are set correctly.
  - b. Do one of the following:
    - **SCSI boot device:** If you are attempting to boot from a SCSI device, remove all hot-swap disk drives (except the intended boot device, if the boot device is a hot-swap drive). If the boot device is present in the boot list after you boot the system to the SMS menus, add the hot-swap disk drives back in one at a time, until you isolate the failing device.
    - **IDE boot device:** If you are attempting to boot from an IDE device, disconnect all other internal SCSI or IDE devices. If the boot device is present in the boot list after you boot the system to the SMS menus, reconnect the internal SCSI or IDE devices one at a time, until you isolate the failing device or cable.
  - c. Replace the SCSI or IDE cables.
  - d. Replace the SCSI backplane (or IDE backplane, if present) to which the boot device is connected.
  - e. Replace the intended boot device.
  - f. Replace the system backplane.
11. Choose from the following:
- If the intended boot device is not listed, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 306. **This ends the procedure.**
  - If an SRN is reported by the diagnostics, go to the list of service request numbers and follow the action listed. **This ends the procedure.**
12. Have you disconnected any other devices?
- Yes:** Reinstall each device that you disconnected, one at a time. After you reinstall each device, reboot the system. Continue this procedure until you isolate the failing device. Replace the failing device, then go to step 13.
- No:** Perform an operating system-specific recovery process or reinstall the operating system. **This ends the procedure.**
13. Is the problem corrected?
- Yes:** Go to Verifying a repair. **This ends the procedure.**
- No:** If replacing the indicated FRUs did not correct the problem, or if the previous steps did not address your situation, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 306. **This ends the procedure.**
14. Is a SCSI boot failure (where you cannot boot from a SCSI-attached device) also occurring?
- **Yes:** Go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 306. **This ends the procedure.**
  - **No:** Continue to the next step.
15. Perform the following actions to determine if another adapter is causing the problem:
- a. Remove all adapters except the one to which the optical drive is attached and the one used for the console.
  - b. Reload the standalone diagnostics. Can you successfully reload the standalone diagnostics?
    - **Yes:** Perform the following steps:
      - 1) Reinstall the adapters that you removed (and attach devices as applicable) one at a time. After you reinstall each adapter, try the boot operation again until the problem recurs.
      - 2) Replace the adapter or device that caused the problem.
      - 3) Go to Verifying a repair. **This ends the procedure.**

- **No:** Continue with the next step.
16. The graphics adapter (if installed), optical drive, IDE or SCSI cable, or system board is most likely defective. Does your system have a PCI graphics adapter installed?
    - Yes:** Continue with the next step.
    - No:** Go to step 18
  17. Perform the following steps to determine if the graphics adapter is causing the problem:
    - a. Remove the graphics adapter.
    - b. Attach a TTY terminal to the system port.
    - c. Try to reload standalone diagnostics. Do the standalone diagnostics load successfully?
      - Yes:** Replace the graphics adapter. **This ends the procedure.**
      - No:** Continue with the next step.
  18. Replace the following (if not already replaced), one at a time, until the problem is resolved:
    - a. Optical drive
    - b. IDE or SCSI cable that goes to the optical drive
    - c. System board that contains the integrated SCSI or IDE adapters.

If this resolves the problem, go to Verifying a repair. If the problem still persists or if the previous descriptions did not address your particular situation, go to “PFW1548: Memory and processor subsystem problem isolation procedure” on page 306.

**This ends the procedure.**

## SCSI service hints

Use one or more of the following procedures when servicing SCSI adapter or devices.

### General SCSI configuration checks

With any type of SCSI problem, begin with the following steps:

1. Verify that all SCSI devices on the SCSI bus have a unique address.
2. Verify that all cables are connected securely and that there is proper termination at both ends of the SCSI bus.
3. Verify that the cabling configuration does not exceed the maximum cable length for the adapter in use.
4. Verify that the adapters and devices that you are working with are at the appropriate microcode levels for the customer situation. If you need assistance with microcode issues, contact your service support structure.
5. If there are multiple SCSI adapters on the SCSI bus, verify that the customer is using the appropriate software to support such an arrangement. If the correct software is not in use, some SCSI errors should be expected when multiple adapters attempt to access the same SCSI device. Also, each adapter should have a unique address.

### High availability or multiple SCSI system checks

If you have a high-availability configuration, or if more than one system is attached to the same SCSI bus, do the following:

1. Verify that the adapters and devices have unique SCSI addresses. The default SCSI adapter address is always 7. If you have more than one adapter on the bus, change the address of at least one by using SMIT (**SMIT Devices > SCSI Adapter > Change/Show characteristics of an adapter**). You must make the changes to the database only, then reboot the system in order for the change to take effect.
  - Note:** Diagnostics defaults to using ID 7 (do not use this ID in high availability configurations).
2. If RAID devices such as the 7135 or 7137 are attached, run the appropriate diagnostics for the device. If problems occur, contact your service support structure for assistance. If the diagnostics are run incorrectly on these devices, misleading SRNs can result.

3. Diagnostics cannot be run against OEM devices; doing so results in misleading SRNs.
4. Verify that all cables are connected securely and that both ends of the SCSI bus is terminated correctly.
5. Verify that the cabling configuration does not exceed the maximum cable length for the adapter in use. See the SCSI Cabling section in the *RS/6000® eServer™ pSeries Adapters, Devices, and Cable Information for Multiple Bus Systems* for more details on SCSI cabling issues.
6. Verify that the adapter and devices are at the appropriate microcode levels for the customer situation. If you need assistance with microcode issues, contact your service support structure.

### **SCSI-2 single-ended adapter PTC failure isolation procedure**

Before replacing a SCSI-2 single-ended adapter, use these procedures to determine if a short-circuit condition exists on the SCSI bus. The same positive temperature coefficient (PTC) resistor is used for both the internal and external buses. The PTC protects the SCSI bus from high currents due to short-circuiting on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. Unless instructed to do so by these procedures, do not replace the adapter because of a tripped PTC resistor.

A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off. Wait 5 minutes for the PTC resistor to fully cool, then retest.

These procedures determine if the PTC resistor is still tripped and then determine if there is a short-circuit somewhere on the SCSI bus.

### **Determining where to start**

Use the following steps to determine the adapter configuration and select the appropriate procedure:

- If there are external cables attached to the adapter, start with the External Bus PTC Isolation Procedure for your type of adapter.
- If there are no external cables attached, start with the "Internal SCSI-2 single-ended bus PTC isolation procedure" on page 234.
- If there is a combination of external and internal cables start with the External Bus PTC Isolation Procedure for your type of adapter. If this procedure does not resolve the problem, continue with the Internal Bus PTC Isolation Procedure for your type of adapter.

### **External SCSI-2 single-ended bus PTC isolation procedure**

Isolate the external SCSI bus PTC fault with the following procedure:

**Note:** The external bus is of single-ended design.

1. Ensure the system power and all externally attached device power is turned off. All testing is accomplished with the power off.
2. Disconnect any internal and external cables from the adapter and remove the adapter from the system.
3. Verify with a digital ohmmeter that the internal PTC resistor, labeled Z1, (see the illustration after Internal SCSI-2 Single-Ended Bus PTC Isolation Procedure, step 3 on page 234) is cool and in a low resistance state, typically less than 1/2 Ohm. Measuring across, be sure to probe both sides of the PTC where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC resistor to cool and measure again.
4. Locate Capacitor C1 and measure the resistance across it by using the following procedure:
  - a. Connect the positive lead to the side of the capacitor where the + is indicated on the board near C1. Be sure to probe at the solder joint where the capacitor and board come together.
  - b. Connect the negative lead to the opposite side of the capacitor marked *GND*. Be sure to probe at the solder joint where the capacitor and board come together.
  - c. If there is no short-circuit present, then the resistance reading is high, typically hundreds of Ohms.

**Note:** Because this is a measurement across unpowered silicon devices, the reading is a function of the ohmmeter used.

- If there is a fault, the resistance reading is low, typically below 10 Ohms. Because there are no cables attached, the fault is on the adapter. Replace the adapter.

**Note:** Some multi-function meters label the leads specifically for voltage measurements. When using this type of meter to measure resistance, the plus lead and negative lead may not be labeled correctly. If you are not sure that your meter leads accurately reflect the polarity for measuring resistance, repeat this step with the leads reversed. If the short-circuit is not indicated with the leads reversed, the SCSI bus is not faulted (short-circuited).

- If the resistance measured was high, proceed to the next step.
5. Reattach the external cable to the adapter, then do the following:
    - a. Measure across C1 as previously described.
    - b. If the resistance is still high, in this case above 10 Ohms, then there is no apparent cause for a PTC failure from this bus. If there are internal cables attached, continue to the "Internal SCSI-2 single-ended bus PTC isolation procedure."
    - c. If the resistance is less than 10 Ohms, there is a possibility of a fault on the external SCSI bus. Troubleshoot the external SCSI bus by disconnecting devices and terminators. Measure across C1 to determine whether the fault has been removed. Replace the failing component. Go to Verifying a repair.

### **External SCSI-2 single-ended bus probable tripped PTC causes**

The following list provides some suggestions of things to check when the PTC is tripped:

- A short-circuited terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by improperly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- Plugging or unplugging a cable or terminator while the system is turned on (hot plugging).
- A short-circuited device.
- Differential devices or terminators are attached to the single-ended SCSI bus.

**Note:** The SCSI-2 Fast/Wide and Ultra PCI Adapters use an onboard electronic terminator on the external SCSI bus. When power is removed from the adapter, as in the case of this procedure, the terminator goes to a high impedance state and the resistance measured cannot be verified, other than it is high. Some external terminators use an electronic terminator, which also goes to a high impedance state when power is removed. Therefore, this procedure is designed to find a short-circuited or low resistance fault as opposed to the presence of a terminator or a missing terminator.

### **Internal SCSI-2 single-ended bus PTC isolation procedure**

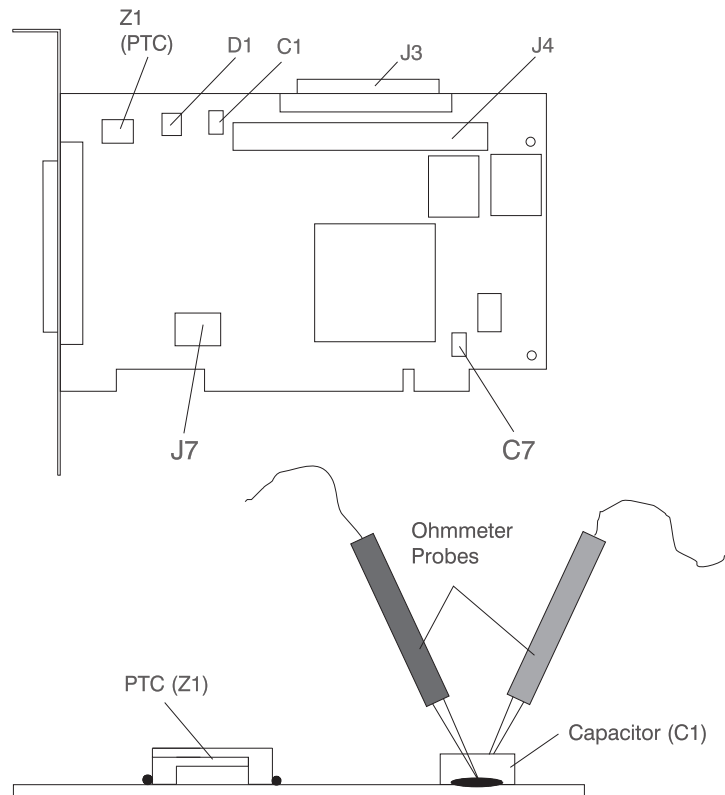
Isolate the internal SCSI bus PTC resistor fault with the following procedure:

**Note:** The internal bus is single-ended.

1. Ensure that system power and all externally attached device power is turned off.
2. Disconnect any internal and external cables from the adapter, then remove the adapter from the system.
3. Verify with a digital ohmmeter, that the internal PTC resistor, labeled Z1, is cool and in a low resistance state, typically less than 1/2 Ohm. Measuring across, be sure to probe both sides of the PTC where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC to cool and measure again. See the following illustration.



### SCSI-2 Fast/Wide PCI Single-Ended Adapter



**Note:** Ensure that only the probe tips are touching the solder joints. Do not allow the probes to touch any other part of the component.

4. Locate capacitor C1 and measure the resistance across it using the following procedure:
  - a. Connect the positive lead to the side of the capacitor where the + is indicated. Be sure to probe at the solder joint where the capacitor and board come together.
  - b. Connect the negative lead to the opposite side of the capacitor. Be sure to probe at the solder joint where the capacitor and board come together.
  - c. If there is no short-circuit present, the resistance reading is high, typically hundreds of Ohms.

**Note:** Because this is a measurement across unpowered silicon devices, the reading is a function of the ohmmeter used.

- If there is a fault, the resistance reading is low, typically below 10 Ohms. Because there are no cables attached, the fault is on the adapter. Replace the adapter.

**Note:** Some multi-function meters label the leads specifically for voltage measurements. When using this type of meter to measure resistance, the plus lead and negative lead may not be labeled correctly. If you are not sure that your meter leads accurately reflect the polarity for measuring resistance, repeat this step with the leads reversed. Polarity is important in this measurement to prevent forward-biasing diodes, which lead to a false low resistance reading. If the short circuit is not indicated with the leads reversed, the SCSI bus is not faulted (short-circuited).

- If the resistance is high and there is no internal cable to reattach, there is no apparent cause for the PTC resistor diagnostic failure.
  - If the resistance is high and there is an internal cable to reattach, proceed to the next step.
5. Reattach the internal cable to the adapter, then do the following:
    - a. Measure across C1 as described previously.
    - b. If the resistance is still high, above 25 Ohms, there is no apparent cause for a PTC failure.

- c. If the resistance is less than 10 Ohms, a fault on the internal SCSI bus is possible. Troubleshoot the internal SCSI bus by disconnecting devices and terminators. Measure across C1 to determine if the fault has been removed.

**Note:** Some internal cables have nonremovable terminators.

### **Internal SCSI-2 single-ended bus probable tripped PTC resistor causes**

The following list provides some suggestions of things to check when the PTC is tripped:

- A short-circuited terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by incorrectly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- A short-circuited device.
- On some systems, the terminator is fixed to the internal cable and cannot be removed. If all devices are removed from the cable and the resistance is still low, then the cable should be replaced.

**Note:** The SCSI-2 Fast/Wide and Ultra PCI adapters use an onboard electronic terminator on the internal SCSI bus. When power is removed from the adapter, as in the case of this procedure, the terminator goes to a high impedance state and the resistance measured cannot be verified, other than it is high. Some internal terminators use an electronic terminator, which also goes to a high impedance state when power is removed. Therefore, this procedure is designed to find a short-circuit or low resistance fault as opposed to the presence of a terminator or a missing terminator.

### **SCSI-2 differential adapter PTC failure isolation procedure**

Use this procedure when SRN *xxx-240* or *xxx-800* has been indicated.

The differential adapter can be identified by the 4-B or 4-L on the external bracket plate.

Before replacing a SCSI-2 differential adapter, use these procedures to determine if a short-circuit condition exists on the SCSI Bus. The PTC protects the SCSI bus from high currents due to short-circuits on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. Unless instructed to do so by these procedures, do not replace the adapter because of a tripped PTC resistor.

A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off. Wait 5 minutes for the PTC resistor to fully cool, then retest.

These procedures determine if the PTC resistor is still tripped and then determine if there is a short-circuit somewhere on the SCSI bus.

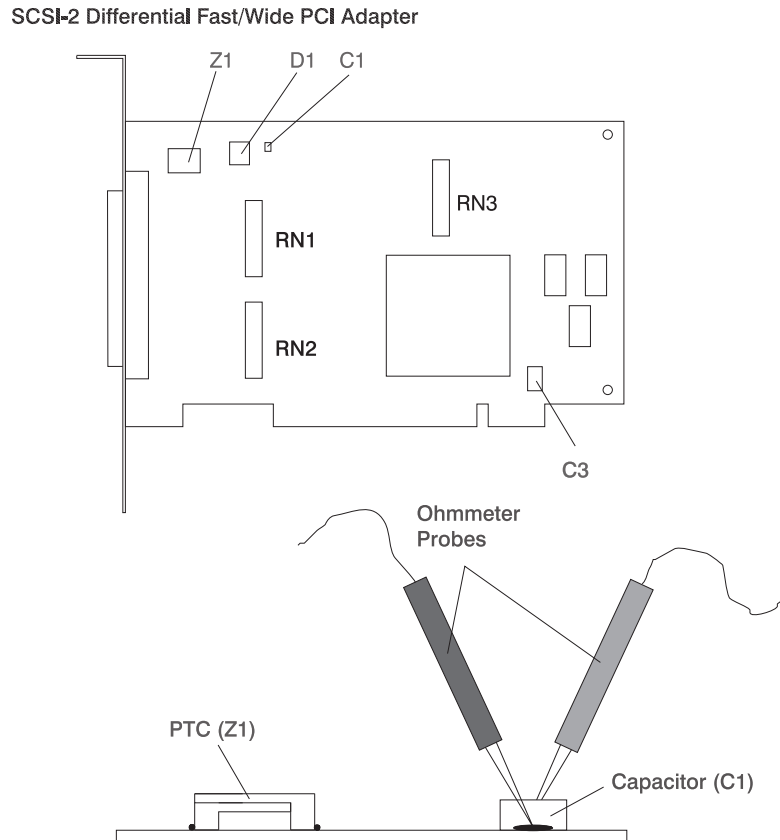
### **External SCSI-2 differential adapter bus PTC isolation procedure**

Isolate the external SCSI bus PTC fault with the following procedure:

#### **Notes:**

1. Ensure that only the probe tips are touching the solder joints. Do not allow the probes to touch any other part of the component.
2. The external bus is differential.
  1. Ensure that system power and all externally attached device power is turned off.
  2. Check to ensure all devices are marked SCSI Differential and that the terminator on the end of the SCSI bus is also marked differential. If not, you may have a single-ended SCSI device or terminator on the differential SCSI bus. Single-ended devices do not work on a differential SCSI bus and may cause a PTC type error to be reported. The entire SCSI bus may appear to be intermittent. After ensuring the system is completely differential, continue.

3. Disconnect the external cables from the adapter and remove the adapter from the system.
4. Verify with a digital ohmmeter that the internal PTC resistor, labeled Z1, is cool and in a low resistance state, typically less than 1/2 Ohm. See the following illustration. Measuring across, be sure to probe both sides of the PTC resistor where the solder joints and board come together. The polarity of the test leads is not important. If necessary, allow the PTC resistor to cool and measure again.



5. Locate capacitor C1 and measure the resistance across it using the following procedure:
  - a. Connect the negative lead to the side of the capacitor marked *GND*. Be sure to probe at the solder joint where the capacitor and board come together.
  - b. Connect the positive lead to the side of the capacitor marked *Cathode D1* on the board near C1. Be sure to probe at the solder joint where the capacitor and board come together.
    - If there is no fault present, then the resistance reading is 25 to 35 Ohms. The adapter is not faulty. Continue to the next step.
    - If the resistance measured is higher than 35 Ohms, check to see if RN1, RN2, and RN3 are plugged into their sockets. If these sockets are empty, you are working with a Multi-Initiators or High-Availability system. With these sockets empty, a resistive reading across C1 cannot be verified other than it measures a high resistance (not a short-circuit). If the resistance measurement is not low enough to be suspected as a fault (lower than 10 Ohms), continue to the next step.
    - If the resistance is high and there is no external cable to reattach, there is no apparent cause for the PTC diagnostic failure.
    - If the resistance reading is low, typically below 10 Ohms, there is a fault. Because there are no cables attached, the fault is on the adapter. Replace the adapter.
    - If the resistance measured was high and there is an external cable to reattach, proceed to the next step.
6. Reattach the external cable to the adapter.

- a. Measure across C1 as previously described.
- b. If the resistance is between 10 to 20 Ohms, there is no apparent cause for a PTC resistor failure.
- c. If the resistance is less than 10 Ohms, there is a possibility of a fault on the external SCSI bus. Troubleshoot the external SCSI bus by disconnecting devices and terminators. Measure across C1 to determine if the fault has been removed.

### **SCSI-2 differential adapter probable tripped PTC causes**

The following list provides some suggestions of things to check when the PTC is tripped:

- A short-circuited terminator or cable. Check for bent pins on each connector and removable terminator.
- Intermittent PTC failures can be caused by incorrectly seated cable connectors. Reseat the connector and flex the cable in an attempt to duplicate the fault condition across C1.
- Plugging or unplugging a cable or terminator while the system is turned on (hot-plugging).
- A short-circuited device.
- Single-ended devices are attached to the differential SCSI bus.

### **Dual-channel ultra SCSI adapter PTC failure isolation procedure**

Use the following procedures if diagnostics testing indicates a potential positive temperature coefficient (PTC) resistor fault or the TERMPWR short-circuited LED is lit.

This procedure is used for SRNs 637-240 and 637-800 on the Dual-Channel Ultra SCSI Adapter. If the TERMPWR short-circuited LED is lit, use this procedure to help isolate the source of the problem on the failing channel.

1. Identify the adapter by its label of 4-R on the external bracket. Then, determine if the failure is on channel A or channel B.
2. The same PTC is used for both the internal and external buses. The PTC protects the SCSI bus from high currents due to short-circuits on the cable, terminator, or device. It is unlikely that the PTC can be tripped by a defective adapter. A fault (short-circuit) causes an increase in PTC resistance and temperature. The increase in resistance causes the PTC to halt current flow. The PTC returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off.

Wait 5 minutes for the PTC resistor to fully cool, then retest.

3. If this same error persists, or the TERMPWR short-circuited LED is lit, replace the components of the failing channel in the following order (wait five minutes between steps):
  - a. If the failure is on the external cable, replace the following:
    - 1) Cable
    - 2) Device
    - 3) Attached subsystem
    - 4) Adapter
  - b. If the failure is on the internal cable, replace the following:
    - 1) Cable
    - 2) Device
    - 3) Backplane
    - 4) Adapter
  - c. If the failure persists, verify that the parts exchanged are in the correct channel (internal or external, A or B).

### **64-bit PCI-X dual channel SCSI adapter PTC failure isolation procedure**

Use the following procedures if diagnostics testing indicates a potential self-resetting thermal fuse problem. This procedure is used for SRN 2524-702 on the integrated dual-channel SCSI adapter in a 7039/651 system.

1. Identify the adapter as the one embedded in the system board. Then, determine if the failure is on channel 0 or channel 1.
2. The thermal fuse protects the SCSI bus from high currents due to short-circuits on the terminator, cable, or device. It is unlikely that the thermal fuse can be tripped by a defective adapter. A fault (short-circuit) causes an increase in resistance and temperature of the thermal fuse. The increase in temperature causes the thermal fuse to halt current flow. The thermal fuse returns to a low resistive and low temperature state when the fault is removed from the SCSI bus or when the system is turned off.  
Wait 10 seconds for the thermal fuse to reset itself and recover, then retest.
3. If the same error persists, replace the components of the failing channel in the following order. Wait 10 seconds for the thermal fuse to reset itself between steps.
  - a. Cable
  - b. Device
  - c. DASD backplane (if present)
  - d. System board (adapter)
4. If the failure persists, verify that the parts exchanged are in the correct channel (0 or 1). If the errors are still occurring, contact your next level of support.

## MAP 0020

Use this MAP to get a service request number (SRN) if the customer or a previous MAP provided none.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

**Note:** If you are unable to power the system on, see the “Power isolation procedures” on page 102.

- **Step 0020-1**

Visually check the server for obvious problems such as unplugged power cables or external devices that are powered off.

**Did you find an obvious problem?**

**No** Go to Step 0020-2.

**Yes** Fix the problem, then go to Verifying a repair.

- **Step 0020-2**

**Are the AIX online diagnostics installed?**

**Note:** If AIX online diagnostics are not installed on the server or partition, answer no to the above question.

**No** If the operating system is running, perform its shutdown procedure. Get help if needed. Go to Step 0020-4.

**Yes** Go to Step 0020-3.

- **Step 0020-3**

**Note:** When possible, run online diagnostics in service mode. Online diagnostics perform additional functions compared to standalone diagnostics.

Run online diagnostics in concurrent mode when the customer does not let you power-off the system unit. To run online diagnostics in service mode, go to substep5. If the system unit is already running in the service mode and you want to run online diagnostics, proceed to the question at the bottom of this MAP step. Otherwise, continue with 1 on page 240 through 4 on page 240 in the following procedure.

1. Log in with root authority or use CE login. If necessary, ask the customer for the password.
2. Enter the **diag -a** command to check for missing resources.
  - a. If you see a command line prompt, proceed to substep 3 below.
  - b. If the DIAGNOSTIC SELECTION menu is displayed, with the letter M shown next to any resource, select that resource, then press Commit (F7 key). Follow any instructions displayed. If you are prompted with a message Do you want to review the previously displayed error select **Yes** and press Enter. If an SRN displays, record it, and go to Step 0020-15. If there is no SRN, go to substep 3 below.
  - c. If the MISSING RESOURCE menu is displayed, follow any instructions displayed. If you are prompted with a message Do you want to review the previously displayed error select **Yes** and press Enter. If an SRN displays, record it, and go to Step 0020-15. If there is no SRN, go to substep 3 below.
3. Enter the **diag** command.
4. Go to Step 0020-5.
5. If the operating system is running, perform its shutdown procedure (get help if needed).
6. Turn off the system unit power and wait 45 seconds before proceeding.
7. Turn on the system unit power.
8. Load the online diagnostics in service mode.
9. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped. Are the Diagnostic Operating Instructions displayed?

**No** Go to Step 0020-16.

**Yes** Go to Step 0020-5.

• **Step 0020-4**

**Note:** If you are working on a partition, do not remove the power as directed in the following procedure. Remove the power only if you are working on a server that does not have multiple partitions.

1. If the server does not have multiple partitions, disconnect the power from the server, wait 45 seconds, then reconnect the power.
2. Power on the system. See Powering on and powering off the system.
3. See Running the stand-alone hardware diagnostics to load the standalone diagnostics. Before continuing to the next step, ensure that the server power is turned on, or if you are working on a partition, the partition is started. The server or partition should be booting the standalone diagnostics from a CD-ROM or a network server.
4. Wait until the Diagnostic Operating Instructions display or the server boot appears to have stopped. Are the Diagnostic Operating Instructions displayed?

**No** Go to Step 0020-16.

**Yes** Go to Step 0020-5.

• **Step 0020-5**

Are the Diagnostic Operating Instructions displayed (screen number 801001) with no obvious problem (for example, blurred or distorted)?

**No** For display problems, go to Step 0020-12.

**Yes** To continue with diagnostics, go to Step 0020-6.

• **Step 0020-6**

Press the Enter key.

Is the FUNCTION SELECTION menu displayed (screen number 801002)?

**No** Go to Step 0020-13.

**Yes** Go to Step 0020-7.

• **Step 0020-7**

1. Select the option **ADVANCED DIAGNOSTICS ROUTINES**.

**Notes:**

- a. If the terminal type is not defined, do so now. You cannot proceed until this is complete.
  - b. If you have SRNs from a Previous Diagnostics Results screen, process these Previous Diagnostics Results SRNs prior to processing any SRNs you may have received from an SRN reporting screen.
2. If the **DIAGNOSTIC MODE SELECTION** menu (screen number 801003) displays, select the option **PROBLEM DETERMINATION**.
  3. Find your system response in the following table. Follow the instructions in the Action column.

| <b>System Response</b>                                                                                                       | <b>Action</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Previous Diagnostic Results. Do you want to review the previously displayed error?                                           | You have a pending item in the error log for which there is no corresponding Log Repair Action. To see this error, select <b>YES</b> at the prompt.<br><br>Information from the error log is displayed in order of last event first. Record the error code, the FRU names and the location code of the FRUs.<br><br>Go to Step 0020-15.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| The <b>RESOURCE SELECTION</b> menu or the <b>ADVANCED DIAGNOSTIC SELECTION</b> menu is displayed (screen number 801006).     | Go to Step 0020-8.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| The system halted while testing a resource.                                                                                  | Record SRN 110-xxxx, where xxxx is the first four digits of the menu number displayed in the upper-right corner of the diagnostic menu. Go to Step 0020-15.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| The <b>MISSING RESOURCE</b> menu is displayed or the letter <b>M</b> is displayed alongside a resource in the resource list. | If the <b>MISSING RESOURCE</b> menu is displayed, follow the displayed instructions until either the <b>ADVANCED DIAGNOSTIC SELECTION</b> menu or an SRN is displayed. If an <b>M</b> is displayed in front of a resource (indicating that it is missing) select that resource then choose the Commit (F7 key).<br><b>Note:</b><br><ol style="list-style-type: none"> <li>1. Run any supplemental media that may have been supplied with the adapter or device, and then return to substep 1 of Step 0020-7.</li> <li>2. If the SCSI enclosure services device appears on the missing resource list along with the other resources, select it first.</li> <li>3. ISA adapters cannot be detected by the system. The ISA adapter configuration service aid in standalone diagnostics allows the identification and configuration of ISA adapters.</li> </ol><br>If the <b>ADVANCED DIAGNOSTIC SELECTION</b> menu is displayed, go to Step 0020-11.<br><br>If an 8-digit error code is displayed, record it and go to Starting a repair action.<br><br>If an SRN is displayed, record it, and go to Step 0020-15. |
| The message The system will now continue the boot process is displayed continuously on the system unit's console.            | Go to Step 0020-4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| System Response                                                                                                                                                                                                                                                              | Action                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The message Processing supplemental diagnostic diskette media is displayed continuously on the system unit's console.                                                                                                                                                        | Call your service support.                                                                                                                                                                                                                                                                                                                                                 |
| The diagnostics begin testing a resource.<br><b>Note:</b> If the option <b>Problem Determination</b> was selected from the DIAGNOSTIC MODE SELECTION menu, and if a recent error has been logged in the error log, the diagnostics automatically begin testing the resource. | Follow the displayed instructions.<br>If the No Trouble Found screen is displayed, press Enter.<br>If another resource is tested, repeat this step.<br>If the ADVANCED DIAGNOSTIC SELECTION menu is displayed, go to Step 0020-11.<br>If an SRN is displayed, record it, and go to Step 0020-15.<br>If an 8-digit error code is displayed, go to Starting a repair action. |
| The system did not respond to selecting the advanced diagnostics option.                                                                                                                                                                                                     | Go to Step 0020-13.                                                                                                                                                                                                                                                                                                                                                        |
| A system unit with a beeper did not beep while booting.                                                                                                                                                                                                                      | Record SRN 111-947 and then go to Step 0020-15                                                                                                                                                                                                                                                                                                                             |
| The system unit emits a continuous sound from the beeper.                                                                                                                                                                                                                    | Record SRN 111-947 and then go to Step 0020-15.                                                                                                                                                                                                                                                                                                                            |
| An SRN or an eight-digit error code is displayed.                                                                                                                                                                                                                            | Record the error code, the FRU names, and the location code for the FRUs.<br>If a SRN is displayed, go to Step 0020-15.<br>If an 8-digit error code is displayed, go to Starting a repair action.                                                                                                                                                                          |
| The system stopped with a 3-digit or 4-digit code displayed in the operator panel display.                                                                                                                                                                                   | Record SRN 101-xxx (where xxx is the rightmost three digits of the displayed code). Go to Step 0020-15.                                                                                                                                                                                                                                                                    |
| An 888 message is displayed in the operator panel display.<br><b>Note:</b> The 888 may or may not be flashing.                                                                                                                                                               | Go to "MAP 0070" on page 251.                                                                                                                                                                                                                                                                                                                                              |

- **Step 0020-8**

On the DIAGNOSTIC SELECTION or ADVANCED DIAGNOSTIC SELECTION menu, look through the list of resources to make sure that all adapters and SCSI devices are listed including any new resources.

**Notes:**

1. Resources attached to serial and parallel ports may not appear in the resource list.
2. If running diagnostics in a partition within a partitioned system, resources assigned to other partitions will not be displayed on the resource list.

Did you find all the adapters or devices on the list?

**No** Go to Step 0020-9.

**Yes** Go to Step 0020-11.

- **Step 0020-9**

Is the new device or adapter an exact replacement for a previous one installed at same location?

**No** Go to Step 0020-10.

**Yes** The replacement device or adapter may be defective. If possible, try installing it in an alternate location if one is available; if it works in that location, then suspect that the location where it



failed to appear has a defective slot. Schedule time to replace the hardware that supports that slot. If it does not work in alternate location, suspect a bad replacement adapter or device. If you are still unable to detect the device or adapter, contact your service support structure.

• **Step 0020-10**

Is the operating system software to support this new adapter or device installed?

**No** Load the operating system software.

**Yes** The replacement device or adapter may be defective. If possible, try installing it in an alternate location if one is available; if it works in that location, then suspect that the location where it failed to appear has a defective slot. Schedule time to replace the hardware that supports that slot. If it does not work in alternate location, suspect a bad replacement adapter or device. If you are still unable to detect the device or adapter, contact your service support structure.

• **Step 0020-11**

Select and run the diagnostic test problem determination or system verification on one of the following:

- The resources with which the customer is having problems. If the resource is not shown on the DIAGNOSTIC SELECTION menu, then run diagnostics on its parent (the adapter or controller to which the resource is attached).
- The resources you suspect are causing a problem.
- All resources.

**Note:** When choosing **All Resources**, interactive tests are not done. If no problem is found running **All Resources**, select each of the individual resources on the selection menu to run diagnostics tests on to do the interactive tests

Find the response in the following table, or follow the directions on the test results screen.

| Diagnostic Response                                                                                                         | Action                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| An SRN or an eight-digit error code is displayed on the screen.                                                             | Record the error code, the FRU names, and the location code for the FRUs. If an SRN is displayed, go to Step 0020-15. If an 8-digit error code is displayed, go to the knowledge center, and perform a search on the error code to obtain the name and location of the failing FRU. Perform the listed action.                                     |
| The TESTING COMPLETE menu and the No trouble was found message are displayed, and you have not tested all of the resources. | Press Enter and continue testing other resources.                                                                                                                                                                                                                                                                                                  |
| The TESTING COMPLETE menu and the No trouble was found message are displayed, and you have tested all of the resources.     | Go to Step 0020-14.<br><b>Note:</b> If you have not run the <b>sysplanar</b> test, do so before going to Step 0020-14.                                                                                                                                                                                                                             |
| The system halted while testing a resource.                                                                                 | Record SRN 110-xxxx, where xxxx is the first three or four digits of the menu number displayed in the upper-right corner of the diagnostic menu screen.<br><br>Go to Step 0020-15.                                                                                                                                                                 |
| When running the Online Diagnostics, an installed device does not appear in the test list.                                  | Ensure that the diagnostic support for the device was installed. The display configuration service aid can be used to determine whether diagnostic support is installed for the device.<br><br>Record SRN 110-101. Go to Step 0020-15.<br><b>Note:</b> Supplemental diskettes may be required if service aids are run from standalone diagnostics. |

| Diagnostic Response                                                                                                                                       | Action                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The IBM ARTIC960 Quad T1/E1 adapter diagnostics display a message indicating that the interface board (PMC) is either not installed or is malfunctioning. | <p>Install a PMC board if not already installed.</p> <p>When running online diagnostics on any of the IBM ARTIC960 family of adapters and the message indicates that the PMC is not installed, but it is installed, do the following:</p> <ul style="list-style-type: none"> <li>• Reseat the PMC board, then run diagnostics.</li> <li>• If the response is the same, replace the PMC and then go to Verifying a repair.</li> </ul> |
| The symptom was not found in the table.                                                                                                                   | Return to the Starting a repair action.                                                                                                                                                                                                                                                                                                                                                                                              |

• **Step 0020-12**

The following step analyzes a console display problem.

Find your type of console display in the following table. Follow the instructions given in the Action column.

| Type of Console Display | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TTY-type terminal       | <p>Be sure the TTY terminal attributes are set correctly.</p> <p>If you did not find a problem with the attributes, go to the documentation for this type of TTY terminal, and continue problem determination. If you do not find the problem, record SRN 111-259, then go the Step 0020-15.</p>                                                                                                                                                                                                                                                                                                                                                                                                      |
| Graphics display        | Go to the documentation for this type of graphics display, and continue problem determination. If you do not find the problem, record SRN 111-82c, then go to Step 0020-15.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Management console      | For a Hardware Management Console (HMC), go to the service procedures in Troubleshooting the HMC. If management console tests find no problem, there may be a problem with the communication between the management console and the managed system. If the management console communicates with the managed system through a network interface, verify whether the network interface is functional. If the management console communicates with the managed system through the management console interface, check the cable between the management console and the managed system. If it is not causing the problem, suspect a configuration problem of the management console communications setup. |

• **Step 0020-13**

There is a problem with the keyboard.

Find the type of keyboard you are using in the following table. Follow the instructions given in the Action column.

| Keyboard Type                                                                                                         | Action                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Type 101 keyboard (U.S.). Identify by the size of the Enter key. The Enter key is in only one horizontal row of keys. | Record SRN 111-736, then go to Step 0020-15.                                              |
| Type 102 keyboard (W.T.). Identify by the size of the Enter key. The Enter key extends into two horizontal rows.      | Record SRN 111-922; then go to Step 0020-15.                                              |
| Kanji-type keyboard. (Identify by the Japanese characters.)                                                           | Record SRN 111-923; then go to Step 0020-15.                                              |
| TTY terminal keyboard                                                                                                 | Go to the documentation for this type of TTY terminal and continue problem determination. |

| Keyboard Type                     | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hardware Management Console (HMC) | Go to the HMC service procedures in Troubleshooting the HMC. If HMC tests find no problem, there may be a problem with the communication between the HMC and the managed system. If the HMC communicates with the managed system through a network interface, verify whether the network interface is functional. If the HMC communicates with the managed system through the HMC interface, check the cable between the HMC and the managed system. If it is not causing the problem, suspect a configuration problem of the HMC communications setup. |

- **Step 0020-14**

The diagnostics did not detect a problem.

If the problem is related to either the system unit or the I/O expansion box, see the service documentation for that unit.

If the problem is related to an external resource, use the problem determination procedures, if available, for that resource.

If a problem occurs when running online diagnostics but not when running the stand-alone diagnostics, suspect a software problem.

Check for the presence of supplemental diagnostic material, such as diskettes or documentation.

This is possibly a problem with software or intermittent hardware. If you think that you have an intermittent hardware problem, go to "MAP 0040" on page 247.

- **Step 0020-15**

Take the following actions:

1. Handle multiple SRNs and error codes in the following order:

- 8-digit error codes.
- SRNs with a source code other than F or G.
- SRNs with a source code of F. Run online diagnostics in advanced and problem determination mode to obtain maximum isolation.
- SRNs with a source code of G.

**Note:** The priority for multiple SRNs with a source of G is determined by the time stamp of the failure. Follow the action for the SRN with the earliest time stamp first.

- Device SRNs and error codes (5-digit SRNs).

If a group has multiple SRNs, it does not matter which SRN is handled first.

2. Find the SRN.

If the SRN is not listed, look for it in the following:

- Any supplemental service information for the device
- The diagnostic problem report screen for additional information
- The "Service Hints" service aid in Tasks and service aids

3. Perform the action listed.

4. If you replace a part, go to Verifying a repair.

- **Step 0020-16**

Look up the AIX IPL progress codes for definitions of configuration program indicators. They are normally 0xxx or 2xxx.

Is a configuration program indicator displayed?

**No** Go to the "Problems with loading and starting the operating system (AIX and Linux)" on page 228.

**Yes** Record SRN 101-xxxx (where xxxx is the rightmost three or four digits or characters of the configuration program indicator). Go to Step 0020-17.

- **Step 0020-17**

Is a location information displayed on the operator panel display?

**No** Go to Step 0020-15.

**Yes** Record the location code, then go to Step 0020-15.

## MAP 0030

This MAP is used for problems that still occur after all FRUs indicated by the SRN or error code have been exchanged.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

**Note:** Check the action text of the SRN before proceeding with this MAP. If there is an action listed, perform that action before proceeding with this MAP.

- **Step 0030-1**

Some external devices (including rack drawers that contain devices) have their own problem determination procedures. If the problem is related to an external device that has its own problem determination procedure, run those procedures if not already run. If they do not correct the problem, continue with this MAP.

- **Step 0030-2**

The problem may have been caused by a resource that has not been tested. System Checkout tests all resources. If the online Diagnostics are installed and you are able to load them, then **All Resources** under the Diagnostic Selection menu should be run. If you get a different SRN, look up the SRN in the SRN topic collections and perform the listed action. If you are unable to run **All Resources** under the Diagnostic Selection menu or you do not get another SRN when running it, continue with this MAP.

- **Step 0030-3**

1. Find the resources that are identified by the SRN or error code in the following table.
2. Perform the first action listed for the resource.
3. If you exchange a FRU or change a switch setting, test the resource again.
4. If the action does not correct the problem, perform the next action until all actions have been tried. If an action says to exchange a FRU that you have already exchanged, go to the next action. If an action corrects the problem, go to Verifying a repair.
5. If you perform all of the actions and do not correct the problem, check the Service Hints service aid for information. If the service aid does not help, call your service support structure.

| Failing Resource                                         | Repair Action                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SCSI Device                                              | Exchange the SCSI controller. Replace the power supply.                                                                                                                                                                                                                                                                                                                        |
| Pluggable SCSI or IDE controller                         | Exchange the backplane into which the adapter is plugged.                                                                                                                                                                                                                                                                                                                      |
| Keyboard, tablet, mouse, dials, LPF keys, diskette drive | Check the cable attaching the device to its adapter. If you do not find a problem, exchange the device's adapter.                                                                                                                                                                                                                                                              |
| Pluggable adapters, CPU cards, and controllers           | Determine whether the adapter contains any attached FRUs such as fuses, DRAMs, and crossover cables. <ol style="list-style-type: none"> <li>1. Check or exchange any attached FRU on the resource.</li> <li>2. If the adapter is plugged into a riser card, check or exchange the riser card.</li> <li>3. Exchange the backplane into which the adapter is plugged.</li> </ol> |
| System and I/O backplanes                                | Contact your service support structure.                                                                                                                                                                                                                                                                                                                                        |

| Failing Resource                                           | Repair Action                                                                                                                                                                                       |
|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Built-In system ports                                      | Replace the service processor if present.                                                                                                                                                           |
| A device attached to the system by a cable and an adapter. | <ol style="list-style-type: none"> <li>1. Replace the adapter for the device.</li> <li>2. Replace the cable to the device.</li> </ol>                                                               |
| IDE Device                                                 | Replace the cable between the IDE controller and the device. If the IDE controller is packaged on a backplane, replace that backplane, otherwise replace the adapter containing the IDE controller. |

## MAP 0040

This MAP provides a structured way of analyzing intermittent problems.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

This MAP consists of two tables: Hardware Symptoms and Software Symptoms.

Because software or hardware can cause intermittent problems, consider all symptoms relevant to your problem.

### How to use this MAP

This MAP contains information about causes of intermittent symptoms. In the following tables, find your symptoms, and read the list of things to check.

When you exchange a FRU, go to Verifying a repair to check out the system.

### Hardware symptoms

**Note:** This table spans several pages.

| Symptom of hardware problem              | Things to check for                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Any hardware log entry in the error log. | <p>Use the Hardware Error Report service aid to view the error log and check for:</p> <ul style="list-style-type: none"> <li>• Multiple errors on devices attached to the same SCSI bus.</li> <li>• Multiple errors on devices attached to the same async adapter.</li> <li>• Multiple errors on internally installed devices only.</li> </ul> <p>Contact your service support structure for assistance with error report interpretation.</p> |
| Hardware-caused system crashes           | <ul style="list-style-type: none"> <li>• The connections on the CPU backplane or CPU card</li> <li>• Memory modules for correct connections</li> <li>• Connections to the system backplane.</li> <li>• Cooling fans operational</li> <li>• The environment for a too-high or too-low operating temperature.</li> <li>• Vibration: proximity to heavy equipment.</li> </ul>                                                                    |

| Symptom of hardware problem                                       | Things to check for                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System unit powers off a few seconds after powering.              | <ul style="list-style-type: none"> <li>Fan speed. Some fans contain a speed-sensing circuit. If one of these fans is slow, the power supply powers the system unit off.</li> <li>Correct voltage at the outlet into which the system unit is plugged.</li> <li>Loose power cables and fan connectors, both internal and external.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| System unit powers off after running for more than a few seconds. | <ul style="list-style-type: none"> <li>Excessive temperature in the power supply area.</li> <li>Loose cable connectors on the power distribution cables.</li> <li>Fans turning at full speed after the system power has been on for more than a few seconds.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Only internally installed devices are failing.                    | <p>Check the following items that are common to more than one device:</p> <ul style="list-style-type: none"> <li>Ground connections on all of the disk drives and other types of drives installed.</li> <li>Loose connections on the power cables to the backplanes, drives, fans, and battery.</li> <li>System unit cooling. Is the input air temperature within limits? Are all the fans running at full speed? Are any of the vent areas blocked?</li> <li>Signal cables to the diskette drives, and the power supply.</li> <li>SCSI device signal cables for loose connectors and terminators.</li> <li>Loose SCSI device address jumpers.</li> <li>Possible contamination of any device that has a cleaning procedure. See the operator guide for cleaning instructions.</li> <li>Excessive static electricity.</li> <li>Correct voltage at the system unit power outlet</li> </ul> |
| Only externally attached devices are failing.                     | <p>Check the following items that are common to more than one device.</p> <ul style="list-style-type: none"> <li>Check the SCSI signal cables to the devices for loose connectors and terminators.</li> <li>Check devices that use jumpers to set the SCSI address for loose jumpers.</li> <li>Check any device that has a cleaning procedure for contamination. See the operator guide for cleaning instructions.</li> <li>Check for excessive static electricity.</li> <li>Check the outlet that the device is plugged into for correct voltage.</li> <li>Check the error log for entries for the adapter driving the failing devices.</li> <li>Check the temperature of the devices. Are the cooling vents blocked? Are the fans running?</li> <li>Check for other devices near the failing device that may be radiating noise (displays, printers, and so on).</li> </ul>            |

## Software symptoms

| Symptom of software problem                     | Things to check for                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Any symptom you suspect is related to software. | Use the software documentation to analyze software problems.                                                                                                                                                                                                                                                                                                                                                                                                               |
| Software-caused system crashes                  | <p>Check the following software items:</p> <ul style="list-style-type: none"> <li>Is the problem only with one application program?</li> <li>Is the problem only with one device?</li> <li>Does the problem occur on a recently installed program?</li> <li>Was the program recently patched or modified in any way?</li> <li>Is the problem associated with any communication lines?</li> <li>Check for static discharge occurring at the time of the failure.</li> </ul> |

## MAP 0054

Use this MAP to determine which FRUs may need to be replaced in order to solve a SCSI bus-related problem on a PCI-X SCSI or PCI-X SCSI RAID adapter.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

### Considerations

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Note that some systems have SCSI and PCI-X bus interface logic integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for these SCSI and PCI-X buses. An example of such a RAID enablement card is FC 5709. For these configurations, replacement of the RAID enablement card is unlikely to solve a SCSI bus-related problem, because the SCSI bus interface logic is on the system board.
- Some adapters provide two connectors, one internal and one external, for each SCSI bus. For this type of adapter, it is not acceptable to use both connectors for the same SCSI bus at the same time. SCSI bus problems are likely to occur if this is done. However, it is acceptable to use an internal connector for one SCSI bus and an external connector for another SCSI bus. The internal and external connectors are labeled to indicate which SCSI bus they correspond to.

**Attention:** RAID adapters should not be replaced when SCSI bus problems exist, except with assistance from your service support structure. Because the adapter may contain non-volatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter when SCSI bus problems exist.

**Attention:** Do not remove functioning disks in a disk array without assistance from your service support structure. A disk array may become degraded or failed if functioning disks are removed, and additional problems may be created.

Follow the steps in this MAP to isolate a PCI-X SCSI bus problem.

#### • Step 0054-1

Identify the SCSI bus on which the problem is occurring on by examining the hardware error log. To view the hardware error log, do the following:

1. Invoke diagnostics and select **Task Selection** on the Function Selection display.
2. Select **Display Hardware Error Report**.
3. Choose one of the following options:
  - If the type of adapter is not known, select **Display Hardware Errors for Any Resource**.
  - If the adapter is a PCI-X SCSI adapter, select **Display Hardware Errors for PCI-X SCSI Adapters**.
  - If the adapter is a PCI-X SCSI RAID adapter, select **Display Hardware Errors for PCI-X SCSI RAID Adapters**.
4. Select the resource, or select **All Resources** if the resource is not known. If you had previously selected **Display Hardware Errors for Any Resource**, then select **All Resources**.
5. On the Error Summary screen, look for an entry with a SRN corresponding to the problem which sent you here, and select it.

**Note:** If multiple entries exist for the SRN, some entries might be old or the problem has occurred on multiple entities (adapters, disk arrays, or devices). Older entries can be ignored; however, this MAP may need to be used multiple times if the same problem has occurred on multiple entities.

6. Select the hardware error log to view.

While viewing the hardware error log, under the Detail Data and SENSE DATA headings, identify the first four bytes of the hexadecimal data (for example, nnnn nnnn nnnn nnnn ...). The four bytes identified in the error log can be interpreted as:

00bb ssLL

where:

- bb, when not FF, identifies the adapter's SCSI bus
- ss, when not FF, identifies the SCSI ID of a device
- LL, when not FF, identifies the logical unit number (LUN) of a device

Go to Step 0540-2.

• **Step 0054-2**

Are the last two bytes of the four bytes identified in Step 0540-1, equal to FFFF (for example, 00bb FFFF, where bb identifies the adapter's SCSI bus)?

**No** Go to Step 0540-4.

**Yes** Go to Step 0540-3.

• **Step 0054-3**

While the error persists, replace the components of the failing SCSI bus in the following order:

1. Cable on bus bb (if present)
2. Adapter (if SCSI bus interface logic is on the adapter) or system board (if SCSI bus interface logic is on the system board)

To replace a component, and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to Verifying a repair.

• **Step 0054-4**

Are the last two bytes of the four bytes identified in Step 0540-1, equal to FF00 (for example, 00bb FF00, where bb identifies the adapter's SCSI bus)?

**No** Go to Step 0540-6.

**Yes** Go to Step 0540-5.

• **Step 0054-5**

While the error persists, replace the components of the failing SCSI bus in the following order:

1. Cable on bus bb (if present)
2. Adapter (if SCSI bus interface logic is on the adapter) or system board (if the SCSI bus interface logic is on the system board)
3. DASD backplane attached to bus bb (if present)

To replace a component, and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to Verifying a repair.

• **Step 0054-6**

While the error persists, replace the components of the failing SCSI bus in the following order:



1. Device on bus bb with SCSI ID ss
2. Cable on bus bb (if present)
3. Adapter (if SCSI bus interface logic is on the adapter) or system board (if SCSI bus interface logic is on the system board)

To replace a component and see if the problem was corrected, do the following:

1. Follow the removal and replacement procedure for the component as previously described in this step.
2. Run diagnostics in system verification mode on the adapter.

When the problem is resolved, go to Verifying a repair.

## MAP 0070

Use this MAP when you receive an 888 sequence on the operator panel display or monitor.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

An 888 sequence in operator panel display suggests that either a hardware or software problem has been detected and a diagnostic message is ready to be read.

**Note:** The 888 will not necessarily flash on the operator panel display.

- **Step 0070-1**

Perform the following steps to record the information contained in the 888 sequence message.

1. Wait until the 888 sequence displays.
2. Record, in sequence, every code displayed after the 888. On systems with a 3-digit or a 4-digit operator panel, you may need to press the system's "reset" button to view the additional digits after the 888. Stop recording when the 888 digits reappear.
3. Go to Step 0070-2.

- **Step 0070-2**

Using the first code that you recorded, use the following list to determine the next step to use.

**Type 102**

Go to Step 0070-3.

**Type 103**

Go to Step 0070-4.

- **Step 0070-3**

A type 102 message generates when a software or hardware error occurs during system execution of an application. Use the following information to determine the content of the type 102 message.

The message readout sequence is:

102 = Message type RRR = Crash code (the three-digit code that immediately follows the 102) SSS = Dump status code (the three-digit code that immediately follows the Crash code).

Record the crash code and the dump status code from the message you recorded in Step 0070-1.

Are there additional codes following the dump status?

**No** Go to Step 0070-5.

**Yes** The message also has a type 103 message included in it. Go to Step 0070-4 to decipher the SRN and field replaceable unit (FRU) information in the type 103 message.

**Note:** Type 102 messages have no associated SRNs.

- **Step 0070-4**

A type 103 message is generated by the hardware when certain types of hardware errors are detected. Use the following steps and information you recorded in Step 0070-1 to determine the content of the type 103 message.

The message readout sequence is:

103 = Message type (x)xxx (y)yyy = SRN (where (x)xxx = the three- or four-digit code following the 103 and (y)yyy is the three- or four-digit code following the (x)xxx code).

1. Record the SRN and FRU location codes from the recorded message.
2. Find the SRN in the Service Request Number List and perform the indicated action.

**Note:** The only way to recover from an 888 type of halt is to turn off the system unit.

- **Step 0070-5**

Perform the following steps:

1. Turn off the system unit power.
2. Turn on the system unit power, and load the online diagnostics in service mode.
3. Wait until one of the following conditions occurs:
  - You are able to load the diagnostics to the point where the Diagnostic Mode Selection menu displays.
  - The system stops with an 888 sequence.
  - The system appears to hang.

Is the Diagnostic Mode Selection menu displayed?

**No** Go to Starting a repair action.

**Yes** Go to Step 0070-6.

- **Step 0070-6**

Run the **All Resources** options under Advanced Diagnostics in Problem Determination Mode.

Was an SRN reported by the diagnostics?

**No** This is possibly a software-related 888 sequence. Follow the procedure for reporting a software problem.

**Yes** Record the SRN and its location code information. Find the SRN in the SRN Listing and do the indicated action.

## MAP 0220

Use this procedure to exchange hot-swappable field replaceable units (FRUs).

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

**Note:** The FRU you want to hot plug might have a defect on it that can cause the hot-plug operation to fail. If, after following the hot-plug procedure, you continue to get an error message that indicates that the hot-plug operation has failed, schedule a time for deferred maintenance when the system containing the FRU can be powered off. Then go to MAP 0210: General problem resolution, Step 0210-2 and answer NO to the question **Do you want to exchange this FRU as a hot-plug FRU?**

**Attention:** If the FRU is a disk drive or an adapter, ask the system administrator to perform the steps necessary to prepare the device for removal.

- **Step 0220-1**

1. If the system displayed a FRU part number on the screen, use that part number to exchange the FRU.

If there is no FRU part number displayed on the screen, see the SRN listing. Record the SRN source code and the failing function codes in the order listed.

2. Find the failing function codes in the FFC listing, and record the FRU part number and description of each FRU.
3. To determine if the part is hot-swappable, see the Part locations and location codes procedure for the part.

Does this system unit support hot-swapping of the first FRU listed?

**No** Go to “MAP 0210: General problem resolution” on page 228.

**Yes** Go to Step 0220-2.

• **Step 0220-2**

Is the FRU a hot-swap power supply or fan?

**No** Go to Step 0220-4.

**Yes** Go to Step 0220-3.

• **Step 0220-3**

**Note:** See Part locations and location codes for the part.

1. Remove the old FRU.
2. Install the new FRU.
3. Enter the **diag** command.

Go to Step 0220-14.

• **Step 0220-4**

Is the FRU a hot-plug PCI adapter?

**No** Go to Step 0220-5.

**Yes** Go to Step 0220-12.

• **Step 0220-5**

Is the FRU a SCSI hot-plug device?

**No** Go to Step 0220-11.

**Yes** Go to Step 0220-6.

• **Step 0220-6**

Is the hot-plug drive located within a system unit?

**No** Go to Step 0220-8.

**Yes** Go to Step 0220-7.

• **Step 0220-7**

See the removal and replacement procedures for your system in Part locations and location codes.

Go to Step 0220-13.

• **Step 0220-8**

Does the hot-plug drive's enclosure have procedures for removing and replacing SCSI disk drives?

**No** Go to Step 0220-9.

**Yes** If a hot-plug procedure exists, use that procedure to remove the old hot-plug SCSI disk drive and replace it with a new hot-plug SCSI disk drive. Otherwise, if no hot-plug procedure exists, use the power off procedure to remove the old SCSI disk drive and replace it with a new SCSI disk drive. Go to Step 0220-13.

• **Step 0220-9**

1. Ask the customer to back up the data on the drive that you intend to replace onto another drive.

2. Verify that the disk drive is in the defined state. The amber LED on the hot-plug disk drive should be off.

Is the hot-plug disk drive's amber LED unlit?

**No** Ask the customer to remove the hot-plug disk drive from the operating system configuration (refer the customer to the system management guide for more information).

**Yes** Go to Step 0220-10.

- **Step 0220-10**

Using the hot-plug task service aid, replace the hot-plug drive using the following procedure:

1. Use the option **List the SES Devices** to show the configuration of the hot-plug slots. Identify the slot number of the adapter for the FRU you want to replace.
2. Select the option **REPLACE/REMOVE a Device Attached to an SES Device**.
3. Select the slot which contains the SCSI hot-plug drive you want to replace. Press Enter. You will see a fast flashing green light on the front on the hot-plug drive indicating that it is ready for removal.

**Note:** See the "Installing hardware" section of the information; locate the server information that you are servicing and follow the tables to locate the correct removal or replacement procedure.

4. Remove the old hot-plug drive.
5. Install the new hot-plug drive. After the hot-plug drive is in place, press Enter.
6. Press Exit. Wait while configuration is done on the drive, until you see the "hot-plug task" on the service aid menu.

Go to Step 0220-15.

- **Step 0220-11**

**Attention:** Do not remove functioning disks in a disk array attached to a PCI-X SCSI RAID controller without assistance from your service support structure. A disk array may become degraded or failed if functioning disks are removed and additional problems may be created. If you still need to remove a RAID array disk attached to a PCI-X SCSI RAID controller, use the SCSI and SCSI RAID hot-plug manager.

Using the hot-plug task service aid, replace the hot-plug drive using the hot plug RAID service aid:

**Note:** The drive you want to replace must be either a SPARE or FAILED drive. Otherwise, the drive would not be listed as an "Identify and remove resources selection" within the RAID HOT-PLUG DEVICES screen. In that case you must ask the customer to put the drive into FAILED state. Refer the customer to the *Operating System and Device management* for more information. Ask the customer to back up the data on the drive that you intend to replace.

1. Select the option **RAID HOT-PLUG DEVICES** within the **HOT-PLUG TASK** under **DIAGNOSTIC SERVICE AIDS**.
2. Select the RAID adapter that is connected to the RAID array containing the RAID drive you want to remove, then select **COMMIT**.
3. Choose the option **IDENTIFY** in the IDENTIFY AND REMOVE RESOURCES menu.
4. Select the physical disk which you want to remove from the RAID array and press Enter.
5. The disk will go into the **IDENTIFY** state, indicated by a flashing light on the drive. Verify that it is the physical drive you want to remove, then press Enter.
6. At the IDENTIFY AND REMOVE RESOURCES menu, choose the option **REMOVE** and press Enter.
7. A list of the physical disks in the system that may be removed will be displayed. If the physical disk you want to remove is listed, select it and press Enter. The physical disk will go into the REMOVE state, as indicated by the LED on the drive. If the physical disk you want to remove is not listed, it is not a SPARE or FAILED drive. Ask the customer to put the drive in the FAILED state before you can proceed to remove it. Refer the customer to the *Operating System and Device management* for more information.

8. See the service information for the system unit or enclosure that contains the physical drive for removal and replacement procedures for the following substeps:
  - a. Remove the old hot-plug RAID drive.
  - b. Install the new hot-plug RAID drive. After the hot-plug drive is in place, press Enter. The drive will exit the REMOVE state, and will go to the NORMAL state after you exit diagnostics.

**Note:** There are no elective tests to run on a RAID drive itself under diagnostics (the drives are tested by the RAID adapter).

9. This completes the repair. Return the system to the customer. Ask the customer to add the physical disk drive to the original configuration within the RAID. Refer them to system management guide for more information.

- **Step 0220-12**

1. Remove the old adapter FRU and replace it with the new adapter FRU. See the Part locations and location codes procedure for the part.
2. Enter the diag command.
3. Go to the FUNCTION SELECTION menu, and select the option **Advanced Diagnostics Routines**.
4. When the DIAGNOSTIC MODE SELECTION menu displays, select the option **System Verification**.
5. Go to Step 0220-14.

- **Step 0220-13**

1. If not already running diagnostics, enter the diag command.

**Note:** If you are already running service mode diagnostics and have just performed the task **Configure Added/Replaced Devices** (under the SCSI Hot Swap manager of the Hot Plug Task service aid), you must use the F3 key to return to the DIAGNOSTIC OPERATING INSTRUCTIONS menu before proceeding with the next step, or else the drive might not appear on the resource list.

2. Go to the FUNCTION SELECTION menu, and select the option **Advanced Diagnostics Routines**.
  3. When the DIAGNOSTIC MODE SELECTION menu displays, select the option **System Verification**.
- Does the hot-plug SCSI disk drive you just replaced appear on the resource list?

**No** Verify that you have correctly followed the procedures for replacing hot-plug SCSI disk drives in the system service information. If the disk drive still does not appear in the resource list, go to "MAP 0210: General problem resolution" on page 228 to replace the resource that the hot-plug SCSI disk drive is plugged into.

**Yes** Go to Step 0220-14.

- **Step 0220-14**

Run the diagnostic test on the FRU you just replaced.

**Did the diagnostics run with no trouble found?**

**No** Go to Step 0220-15.

**Yes** Go to Verifying a repair. Before returning the system to the customer, if a hot-plug disk has been removed, ask the customer to add the hot-plug disk drive to the operating system configuration. See *Operating System and Device Management* for more information.

- **Step 0220-15**

1. Use the option **Log Repair Action** in the TASK SELECTION menu to update the error log. If the repair action was reseating a cable or adapter, select the resource associated with your repair action. If it is not displayed on the resource list, select **sysplanar0**.

**Note:** On systems with a fault indicator LED, this changes the fault indicator LED from the fault state to the normal state.

2. While in diagnostics, go to the FUNCTION SELECTION menu. Select the option **Advanced Diagnostics Routines**.

3. When the DIAGNOSTIC MODE SELECTION menu displays, select the option **System Verification**.  
Run the diagnostic test on the FRU you just replaced, or **sysplanar0**.

Did the diagnostics run with no trouble found?

**No** Go to Step 0220-16.

**Yes** If you changed the service processor or network settings, restore the settings to the value they had prior to servicing the system. If you performed service on a PCI RAID subsystem involving changing of the RAID adapter cache card or changing the configuration on RAID disks, ask the customer to run "PCI SCSI disk array manager" using smitty to resolve the PCI SCSI RAID adapter configuration. The following is an example of how the customer would resolve the configuration:

1. At the command line, type `smitty pdam`.
2. On the PCI SCSI Disk Array Manager screen, select **RECOVERY OPTIONS**.
3. If a previous configuration exists on the replacement adapter, this must be cleared. Select **Clear PCI SCSI RAID Adapter Configuration**. Press F3.
4. On the Recovery Options screen, select **RESOLVE PCI SCSI RAID ADAPTER CONFIGURATION**.
5. On the Resolve PCI SCSI RAID Adapter Configuration screen, select **ACCEPT CONFIGURATION on DRIVES**.
6. On the PCI SCSI RAID Adapter selection menu, select the adapter that you changed.
7. On the next screen, press Enter.
8. On the "Are You Sure?" selection menu, press Enter to continue.
9. You receive an OK status message when the recovery is complete. If you get a Failed status message, verify that you are performing recovery on the correct adapter, then do this complete procedure. When you complete the recovery, exit smitty to return to the command line.

Go to Verifying a repair.

- **Step 0220-16**

Does the original problem persist?

**No** If a FRU was replaced, run the log repair action service aid under the online diagnostics for the resource that was replaced. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**. If steps were taken to make the device ready for removal, inform the system administrator of the steps required to return the system to the original state. Go to Verifying a repair.

**Yes** Go to Step 0220-17.

- **Step 0220-17**

Have you exchanged all the FRUs that correspond to the failing function codes?

**No** Go to Step 0220-18.

**Yes** The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to "MAP 0030" on page 246.

- **Step 0220-18**

**Note:** Before proceeding, remove the FRU you just replaced and install the original FRU in its place.

Does the system unit support hot-swapping of the next FRU listed?

**No** Go to "MAP 0210: General problem resolution" on page 228.

**Yes** The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to Step 0220-14.

## MAP 0230

Use this MAP to resolve problems reported by SRNs A00-xxx to A25-xxxx.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

### Step 0230-1

1. The last character of the SRN is bit-encoded as follows:

|   |   |   |   |                                         |
|---|---|---|---|-----------------------------------------|
| 8 | 4 | 2 | 1 |                                         |
|   |   |   |   |                                         |
|   |   |   |   | Replace all FRUs listed                 |
|   |   |   |   | Hot-swap is supported                   |
|   |   |   |   | Software or Firmware could be the cause |
|   |   |   |   | Reserved                                |

2. See the last character in the SRN. A 4, 5, 6, or 7 indicates a possible software or firmware problem.

Does the last character indicate a possible software or firmware problem?

**No** Go to Step 0230-4

**Yes** Go to Step 0230-2.

### Step 0230-2

Ask the customer if any software or firmware has been installed recently.

Has any software or firmware been installed recently?

**No** Go to Step 0230-4.

**Yes** Go to Step 0230-3.

### Step 0230-3

Check with your support center for any known problems with the new software or firmware.

Are there any known problems with the software or firmware?

**No** Go to Step 0230-4.

**Yes** Obtain and follow the procedure to correct the software problem. This completes the repair.

### Step 0230-4

Were any FRUs or location codes reported with the SRN?

**No** Go to Step 0230-5.

**Yes** Go to Step 0230-9

### Step 0230-5

Run the diagnostics in problem determination mode on **sysplanar0**.

Were there any FRUs reported with the SRN?

**No** Go to Step 0230-6.

**Yes** Go to Step 0230-9

### Step 0230-6

Did the system display: "Previous Diagnostic Results - Do you want to review the previously displayed error?"

**No** Go to Step 0230-7.

**Yes** You have a pending item in the error log for which there is no corresponding log repair action. To see this error, select **YES** at the prompt. Information from the error log displays in order of last event first. Record the error code, the FRU names and the location code of the FRUs. Go to Step 0230-7

### Step 0230-7

Were there any other SRNs that begin with an A00 to A1F reported?

**No** Go to Step 0230-8.

**Yes** Go to Step 0230-1 and use the new SRN.

### Step 0230-8

Power on the system. See Powering on and powering off the system.

If the system boots, run the diagnostics in problem determination mode on **sysplanar0**.

Were any new error codes or SRNs reported?

**No** Call your support center.

**Yes** Follow the procedure for the new error code or SRN.

### Step 0230-9

1. Obtain the list of physical location codes and FRU numbers that were listed on the Problem Report Screen. The list can be obtained by running the **sysplanar0** diagnostics or using the task **Display Previous Diagnostic Results**.
2. Record the physical location codes and FRU numbers.
3. See the last character in the SRN. A 2, 3, 6, or 7 indicates that hot-swap is possible.

Does the last character indicate that hot-swap is possible?

**No** Go to Step 0230-10.

**Yes** Go to Step 0230-14

### Step 0230-10

**Note:** If necessary, see Powering on and powering off the system for information about system shutdown and powering the system on and off.

1. If the operating system is running, perform the operating system's shutdown procedure.
2. Turn off power to the system.
3. See the last character in the SRN. A 1, 3, 5, or 7 indicates that all FRUs listed on the Problem Report Screen need to be replaced. For SRNs ending with any other character, exchange one FRU at a time, in the order listed.
4. Turn on power to the system.



5. If you are running the AIX operating system, load the online diagnostics in service mode. See Running the online diagnostics in service mode

**Note:** If the Diagnostics Operating Instructions do not display or you are unable to select the option **Task Selection**, check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020" on page 239 and get a new SRN.

6. Wait until the **Diagnostics Operating Instructions** are displayed or the system appears to stop.
7. Press Enter.
8. Select **Diagnostic Routines** at the function selection menu.
9. Select **System Verification**.
10. If a missing options exist, particularly if it is related to the device that was replaced, resolve the missing options before proceeding
11. Select the option **Task Selection**.
12. Select the option **Log Repair Action**.
13. Log a repair action for each replaced resource.
14. If the resource associated with your repair action is not displayed on the resource list, select **sysplanar0**.
15. Return to the Task Selection Menu.
16. If the FRU that was replaced was memory and the system is running as a full system partition, select **Run Exercisers** and run the short exerciser on all the resources, otherwise proceed to Step 0230-15.
17. If you ran the exercisers in Step 0230-10, substep 16, return to the Task Selection menu.
18. Select **Run Error Log Analysis** and run analysis on all the resources.

Was a problem reported?

- No** The repair is complete. Go to Verifying a repair.  
**Yes** Go to Step 0230-11.

#### **Step 0230-11**

Is the problem the same as the original problem?

- No** The symptom has changed. Check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020" on page 239 and get a new SRN.  
**Yes** Go to Step 0230-12.

#### **Step 0230-12**

Look at the physical location codes and FRU part numbers you recorded.

Have you exchanged all the FRUs that were listed?

- No** Go to Step 0230-13.  
**Yes** The SRN did not identify the failing FRU. Call your support person for assistance.

#### **Step 0230-13**

1. After performing a shutdown of the operating system, turn off power to the system.
2. Remove the new FRU and install the original FRU.
3. Exchange the next FRU in list.
4. Turn on power to the system.

5. If you are running the AIX operating system, load the online diagnostics in service mode. See Running the online diagnostics in service mode

**Note:** If the Diagnostics Operating Instructions do not display or you are unable to select the option **Task Selection**, check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020" on page 239 and get a new SRN.

6. Wait until the Diagnostics Operating Instructions are displayed or the system appears to stop.
7. Press Enter.
8. Select **Diagnostic Routines** at the function selection menu.
9. Select **System Verification**.
10. If a missing options exist, particularly if it is related to the device that was replaced, resolve the missing options before proceeding.
11. Select the option **Task Selection**.
12. Select the option **Log Repair Action**.
13. Log a repair action for each replaced resource.
14. If the resource associated with your action does not appear on the Resource List, select **sysplanar0**.
15. Return to the Task Selection Menu.
16. If the FRU that was replaced was memory and the system is running as a full system partition, select **Run Exercisers** and run the short exerciser on all the resources, otherwise proceed to Step 0230-15.
17. If you ran the exercisers in Step 0230-13, substep 16, return to the Task Selection menu.
18. Select **Run Error Log Analysis** and run analysis on all the resources.

Was a problem reported?

**No** The repair is complete. Go to Verifying a repair.

**Yes** Go to Step 0230-11.

#### Step 0230-14

The FRUs can be hot-swapped. If you do not want to use the hot-swap, go to Step 0230-10.

1. See the last character in the SRN. A 1, 3, 5, or 7 indicates that all FRUs listed on the Problem Report Screen must be replaced. For SRNs ending with any other character, exchange one FRU at a time, in the order listed.
2. If available, use the CE Login and enter the **diag** command.

**Note:** If CE Login is not available, have the system administrator enter superuser mode and then enter the **diag** command.

3. After the Diagnostics Operating Instructions display, press Enter.
4. Select the option **Task Selection**.
5. Select the option **Log Repair Action**.
6. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.
7. Log a repair action for each replaced resource.
8. Return to the Task Selection menu.
9. For systems running as a full system partition, select **Run Exercisers** and run the short exerciser on all resources.
10. Use the option **Log Repair Action** in the Task Selection menu to update the error log. If the repair action was reseating a cable or adapter, select the resource associated with your repair action. If it is not displayed on the resource list, select **sysplanar0**.

**Note:** On systems with a Fault Indicator LED, this changes the Fault Indicator LED from the fault state to the normal state.

Was a problem reported?

**No** The repair is complete. Return the system to the customer.

**Yes** Go to Step 0230-15.

#### **Step 0230-15**

Is the problem the same as the original problem?

**No** The symptom has changed. Check for loose cards, cables, and obvious problems. If you do not find a problem, go to "MAP 0020" on page 239 and get a new SRN.

**Yes** Go to Step 0230-16.

#### **Step 0230-16**

Look at the physical location codes and FRU part numbers you recorded.

Have you exchanged all the FRUs that were listed?

**No** Go to Step 0230-17.

**Yes** The SRN did not identify the failing FRU. Call your support person for assistance.

#### **Step 0230-17**

1. Remove the new FRU and install the original FRU.
2. Exchange the next FRU in the list.
3. Return to the Task Selection Menu.
4. Select the option **Log Repair Action**.
5. Log a repair action for each replaced resource.
6. If the resource associated with your action is not displayed on the Resource List, select **sysplanar0**.
7. Return to the Task Selection Menu.
8. For systems running as a full system partition, select **Run Exercisers** and run the short exerciser on all resources.
9. If you ran the exercisers in substep Step 0230-17, substep 8.
10. Select **Run Error Log Analysis** and run analysis on all exchanged resources.

Was a problem reported?

**No** The repair is complete. Return the system to the customer.

**Yes** Go to Step 0230-15.

## **MAP 0235**

Use this MAP to resolve problems reported by SRNS A11-560 to A11-580.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

**Note:** The following steps may require that the system be rebooted to invoke Array bit steering, so you may wish to schedule deferred maintenance with the system administrator to arrange a convenient time to reboot their system.

#### Step 0235-1

Was the SRN A11-560?

**No** Go to Step 0235-3.

**Yes** Go to Step 0235-2.

#### Step 0235-2

Logged in as root or using CE Login, at the command line type `diag` then press enter. Use the **Log Repair Action** option in the TASK SELECTION menu to update the error log. Select `sysplanar0`.

**Note:** On systems with fault indicator LED, this changes the fault indicator LED from the FAULT state to the NORMAL state.

Were there any other errors on the resource reporting the array bit steering problem?

**No** Step 0235-4.

**Yes** Resolve those errors before proceeding.

#### Step 0235-3

Logged in as root or using CE Login, at the command line type `diag` then press enter. Use the **Log Repair Action** option in the TASK SELECTION menu to update the error log. Select `procx`, where x is the processor number of the processor that reported the error.

**Note:** On systems with fault indicator LED, this changes the fault indicator LED from the FAULT state to the NORMAL state.

Were there any other errors on `procx`?

**No** Step 0235-4.

**Yes** Resolve those errors before proceeding.

#### Step 0235-4

Schedule deferred Maintenance with the customer. When it is possible, reboot the system to invoke Array Bit steering.

#### Step 0235-5

After the system has been rebooted, log in as root or use CE Login. At the command line, run diagnostics in problem determination mode to determine if the array bit steering was able to correct the problem.

If diagnostics are not run (for instance, if the system returns to **Resource Selection** menu after running diagnostics in problem determination mode) or there is no problem on the resource that originally reported the problem, then array bit steering was able to correct the problem. Go to Verifying a repair.

## MAP 0260

Use this MAP when the system unit hangs while configuring a resource.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

This MAP handles problems when the system unit hangs while configuring a resource.

- **Step 0260-1**

The last three or four digits of the SRN following the dash (-) match a failing function code number.

Look at the System parts and find the failing function code that matches the last three or four digits of your SRN, following the dash. Record the FRU part number and description (use the first FRU part listed when multiple FRUs are listed).

The location information or device name is displayed on the operator panel.

Do you have a location code displayed?

**No** Go to Step 0260-4.

**Yes** Go to Step 0260-2.

- **Step 0260-2**

Are there any FRUs attached to the device described by the location code?

**No** Go to Step 0260-6.

**Yes** Go to Step 0260-3.

- **Step 0260-3**

Remove this kind of FRU attached to the device described in the location code one at a time. Note whether the system still hangs after each device is removed. Repeat this step until you no longer get a hang, or all attached FRUs have been removed from the adapter or device.

Has the symptom changed?

**No** Go to Step 0260-4.

**Yes** Use the location code of the attached device that you removed when the symptom changed, and go to Step 0260-6.

- **Step 0260-4**

Does your system unit contain only one of this kind of FRU?

**No** Go to Step 0260-5.

**Yes** Go to Step 0260-6.

- **Step 0260-5**

One of the FRUs of this kind is defective.

Remove this kind of FRU one at a time. Test the system unit after each FRU is removed. Stop when the test completes successfully or when you have removed all of the FRUs of this kind.

Were you able to identify a failing FRU?

**No** Go to "PFW1540: Problem isolation procedures" on page 301.

**Yes** Go to Step 0260-6.

- **Step 0260-6**

1. Turn off the system unit.

2. Exchange the FRU identified by the location code or Step 0260-5.

Is this system capable of running online diagnostics in service mode?

**No** Go to Step 0260-7.

**Yes** Go to Step 0260-8.

- **Step 0260-7**

1. Turn on the system unit.
2. Load the standalone diagnostics. See Running the stand-alone hardware diagnostics.
3. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped.  
Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?

**No** Go to Step 0260-9.

**Yes** Go to Verifying a repair.

• **Step 0260-8**

1. Turn on the system unit.
2. Load the standalone diagnostics. See Running the stand-alone hardware diagnostics.
3. Wait until the Diagnostic Operating Instructions display or the system appears to have stopped.  
Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?

**No** Go to Step 0260-9.

**Yes** Go to Verifying a repair.

• **Step 0260-9**

Look at the operator panel display.

Is the number displayed the same as the last three or four digits after the dash (-) of your SRN?

**No** The symptom changed. Check for loose cards, cables, and obvious problems. If you do not find a problem, go to “MAP 0020” on page 239 and get a new SRN.

**Yes** Go to Step 0260-10.

• **Step 0260-10**

Was the FRU you exchanged an adapter or a backplane?

**No** Go to Step 0260-11.

**Yes** Go to “PFW1540: Problem isolation procedures” on page 301.

• **Step 0260-11**

Was the FRU you exchanged a device?

**No** Go to “PFW1540: Problem isolation procedures” on page 301.

**Yes** Go to Step 0260-12.

• **Step 0260-12**

The adapter for the device may be causing the problem.

1. Turn off the system unit.
2. Exchange the adapter for the device.
3. Turn on the system unit. If c31 is displayed, follow the instructions to select a console display.
4. Load the standalone diagnostics. See Running the stand-alone hardware diagnostics.
5. Wait until the DIAGNOSTIC OPERATING INSTRUCTIONS display or the system appears to have stopped.

Are the DIAGNOSTIC OPERATING INSTRUCTIONS displayed?

**No** Go to “PFW1540: Problem isolation procedures” on page 301.

**Yes** Go to Verifying a repair.

## **MAP 0270**

Use this MAP to resolve SCSI RAID adapter, cache, or drive problems.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

**Notes:**

1. This MAP assumes that the RAID adapter and drive microcode is at the correct level.
2. This MAP applies only to PCI, not PCI-X, RAID adapters.

**Attention:** If the FRU is a disk drive or an adapter, ask the system administrator to perform the steps necessary to prepare the device for removal.

• **Step 0270-1**

1. If the system displayed a FRU part number on the screen, use that part number. If there is no FRU part number displayed on the screen, see the SRN listing. Record the SRN source code and the failing function codes in the order listed.
2. Find the failing function codes in the FFC listing, and record the FRU part number and description of each FRU.

Go to Step 0270-2.

• **Step 0270-2**

Is the FRU a RAID drive?

**No** Go to Step 0270-6.

**Yes** Go to Step 0270-3.

• **Step 0270-3**

If the RAID drive you want to replace is not already in the **failed** state, then ask the customer to run the PCI SCSI Disk Array Manager using `smit` to fail the drive that you want to replace. An example of this procedure is:

1. Log in as root user.
2. Type `smit pdam`.
3. Select **Fail a Drive in a PCI SCSI Disk Array**.
4. Select the appropriate disk array by placing the cursor over that array and press Enter.
5. Select the appropriate drive to fail based on the Channel and ID indicated in diagnostics. The **Fail a Drive** screen will appear.
6. Verify that you are failing the correct drive by looking at the Channel ID row. Press Enter when verified correct. Press Enter again.
7. Press **F10** and type `smit pdam`
8. Select **Change/Show PCI SCSI RAID Drive Status > Remove a Failed Drive**.
9. Select the drive that just failed.

Go to Step 0270-4.

• **Step 0270-4**

Replace the RAID drive using the RAID HOT PLUG DEVICES service aid:

**Note:** The drive you want to replace must be either a SPARE or FAILED drive. Otherwise, the drive would not be listed as an IDENTIFY AND REMOVE RESOURCES selection within the RAID HOT PLUG DEVICES screen. In that case you must ask the customer to put the drive into FAILED state. For information about putting the drive in a FAILED state, refer the customer to the SAS RAID controllers for AIX or SAS RAID controllers for Linux topic.

1. Select the option **RAID HOT PLUG DEVICES** within the HOT PLUG TASK under DIAGNOSTIC SERVICE AIDS.

2. Select the RAID adapter that is connected to the RAID array containing the RAID drive you want to remove, then select COMMIT.
3. Choose the option **IDENTIFY** in the IDENTIFY AND REMOVE RESOURCES menu.
4. Select the physical disk which you want to remove from the RAID array and press Enter. The disk will go into the IDENTIFY state, indicated by a flashing light on the drive.
5. Verify that it is the physical drive you want to remove, then press Enter.
6. At the IDENTIFY AND REMOVE RESOURCES menu, choose the option **REMOVE** and press Enter. A list of the physical disks in the system that may be removed will be displayed.
7. If the physical disk you want to remove is listed, select it and press Enter. The physical disk will go into the REMOVE state, as indicated by the LED on the drive. If the physical disk you want to remove is not listed, it is not a SPARE or FAILED drive. Ask the customer to put the drive in the FAILED state before you can proceed to remove it. For information about putting the drive in a FAILED state, refer the customer to the SAS RAID controllers for AIX or SAS RAID controllers for Linux topic.
8. See the service information for the system unit or enclosure that contains the physical drive for removal and replacement procedures for the following substeps:
  - a. Remove the old hot-swap RAID drive.
  - b. Install the new hot-swap RAID drive. After the hot-swap drive is in place, press Enter. The drive will exit the REMOVE state, and will go to the NORMAL state after you exit diagnostics.

**Note:** There are no elective tests to run on a RAID drive itself under diagnostics (the drives are tested by the RAID adapter).

Go to Step 0270-5.

- **Step 0270-5**

If the RAID did not begin reconstructing automatically, perform the following steps.

**Adding a Disk to the RAID array and Reconstructing:**

Ask the customer to run the PCI SCSI Disk Array Manager using **smit**. An example of this procedure is:

1. Log in as root user.
2. Type `smit pdam`.
3. Select **Change/Show PCI SCSI RAID Drive Status**.
4. Select **Add a Spare Drive**.
5. Select the appropriate adapter.
6. Select the channel and ID of the drive that was replaced.
7. Press Enter when verified.
8. Press F3 until you return to the **Change/Show PCI SCSI RAID Drive Status** screen.
9. Select **Add a Hot Spare**.
10. Select the drive you just added as a spare.

If there was no hot spare previously installed in the array, the array will begin reconstructing immediately. Reconstruction time will vary based on the size of the RAID array. Allow 1-2 hours for completion.

To check the progress of the reconstruction:

1. Log in as root user.
2. Type `smit pdam`.
3. Select **List PCI SCSI RAID Arrays**.
4. Choose the array containing the drive you replaced.

If the state of the RAID array is reconstructing, then it is in process of reconstructing. If it is optimal, then reconstruction has completed.



5. Press F10 to exit.  
Go to Step 027017.
- **Step 0270-6**  
Is the FRU a RAID adapter base card, RAID adapter cache card, or RAID adapter battery?  
**No** Go to Step 0270-15.  
**Yes** Go to Step 0270-7.
  - **Step 0270-7**  
Do you want to change the FRU using a hot-swap operation?  
**No** Power off the system, and remove the RAID adapter. Go to Step 0270-8.  
**Yes** Remove the RAID adapter. Go to Step 0270-8.
  - **Step 0270-8**  
Is the FRU you want to replace a RAID adapter cache card or RAID adapter battery?  
**No** Go to Step 0270-10.  
**Yes** Go to Step 0270-9.
  - **Step 0270-9**  
Replace the FRU onto the existing base card.  
Go to Step 0270-11.
  - **Step 0270-10**  
After physically removing the base card from the system, remove any other good FRUs (RAID cache card or cache battery) from the RAID base card adapter. Plug these FRUs on to the replacement RAID base card adapter FRU.  
Go to Step 0270-11.
  - **Step 0270-11**  
Did you change the FRU using a hot-swap operation?  
**No** Install the RAID adapter assembly into the system. Power on the system. Go to Step 0270-12.  
**Yes** Install the RAID adapter assembly into the system. Go to Step 0270-12.
  - **Step 0270-12**  
Was the replacement FRU a RAID base card?  
**No** Go to Step 0270-14.  
**Yes** Go to Step 0270-13.
  - **Step 0270-13**  
**Attention:** Prior to cabling the SCSI RAID adapter to the subsystem, check for preexisting configurations on the replacement SCSI RAID base card. The replacement base card can overwrite your system's configuration data if it already has a configuration written to it. Check it before cabling the SCSI RAID subsystem array.  
Ask to customer to check for preexisting configuration on the SCSI RAID base card. Below is an example of this procedure:
    1. Log in as root (if not already root).
    2. Type `smit pdam`.
    3. Select **List PCI SCSI RAID Arrays**.
    4. If no RAID arrays are listed, then there are no preexisting configurations on the base card.
    5. Press F10 key to exit.If a preexisting configuration exists on the base card, ask the customer to run the PCI SCSI Disk Array Manager using **smitty**.

1. Log in as root (if not already root).
2. Type `smi t pdam` from the command prompt (if not already in the RAID manager).
3. Select **Recovery Options**.
4. Select **Clear PCI SCSI RAID Adapter Configuration**. Select the adapter that you just installed. Press Enter to confirm.
5. Return to the **Recovery Options** menu (if not already there). Select **Resolve PCI SCSI RAID Adapter Configuration**. Select **Accept Configuration on Drives**. Select the adapter that you just installed. Press Enter to confirm. The configuration on the new adapter should now match the configuration existent on the drives.
6. Press F10 to exit.

You may now proceed to cable the RAID system array.

Go to Step 0270-16.

- **Step 0270-14**

Ask the customer to resynchronize the RAID array configuration:

1. Log in as root (if not already root).
2. Type `smi t pdam`.
3. Select **Recovery Options**.
4. Select **Resolve PCI SCSI RAID Adapter Configuration**.
5. Select **Retry Current Configuration**.
6. Select the appropriate `scraid` (SCSI RAID) adapter. A message will be displayed as to the success of the operation.
7. Press F10 to exit.

Go to Step 0270-16.

- **Step 0270-15**

Other RAID FRUs require that the system be shut down prior to replacement.

1. If the operating system is running, perform the operating system shutdown procedure (get help if needed).
2. Turn off the system power.
3. Replace the FRU indicated by the FFC.

Go to Step 0270-16.

- **Step 0270-16**

Run the diagnostics in system verification mode on the RAID subsystem.

Did the diagnostics run with no trouble found?

**No** Go to Step 0270-18.

**Yes** Go to Step 0270-17.

- **Step 0270-17**

1. Use the option **Log Repair Action** in the TASK SELECTION menu to update the error log. Select `scraidX` (where X is the RAID adapter number of the RAID subsystem you have been working on).

**Note:** On systems with fault indicator LED, this changes the fault indicator LED from the Fault state to the Normal state.

2. While in diagnostics, go to the FUNCTION SELECTION menu. Select the option **Advanced Diagnostics Routines**.
3. When the DIAGNOSTIC MODE SELECTION menu displays, select the option **System Verification**. Run the diagnostic test on `scraidX` (where X is the RAID adapter number).

Did the diagnostics run with no trouble found?

**No** Go to the Step 0270-18.

**Yes** If you changed the service processor or network settings, restore the settings to the value they had prior to servicing the system.

This completes the repair; return the system to the customer. Go to Closing a service call.

- **Step 0270-18**

Have you exchanged all the FRUs that correspond to the failing function codes?

**No** Go to Step 0270-19.

**Yes** The SRN did not identify the failing FRU. Schedule a time to run diagnostics in service mode. If the same SRN is reported in service mode, go to “MAP 0030” on page 246.

- **Step 0270-19**

**Note:** Note: Before proceeding, remove the FRU you just replaced and install the original FRU in its place.

Use the next FRU on the list and go to Step 0270-2.

## MAP 0280

Use this MAP to resolve console and keyboard problems when the system is booting.

Use this MAP to resolve console and keyboard problems when the system is booting. For other boot problems and concerns, go to “Problems with loading and starting the operating system (AIX and Linux)” on page 228.

| Entry table             |                    |
|-------------------------|--------------------|
| Keyboard problem        | Go to Step 0280-1. |
| Graphic adapter problem | Go to Step 0280-2. |
| Terminal problem        | Go to Step 0280-3. |

- **Step 0280-1**

The system fails to respond to keyboard entries.

This problem is most likely caused by a faulty keyboard, keyboard adapter, or keyboard cable.

Try the FRUs in the following order. Test each FRU by trying the failing operation again.

1. Keyboard.
2. Keyboard adapter, typically located on the system board.
3. Keyboard cable, if not included with the keyboard.

Were you able to resolve the problem?

**No** Go to “MAP 0030” on page 246.

**Yes** Go to Verifying a repair.

- **Step 0280-2**

1. Some systems have a graphic adapter POST. If a graphic adapter POST is supported and it indicates a failure, follow the procedures in the system guide to resolve the problem.
2. If a graphic adapter POST is supported and it does not indicate a failure, suspect the display or display cable.
3. If the system does not have a graphic adapter POST, go to the display's problem determination procedures. If you do not find a problem, replace the graphics adapter.

Were you able to resolve the problem?

**No** Go to “MAP 0030” on page 246.

**Yes** Go to Verifying a repair.

- **Step 0280-3**

Go to the problem determination procedure for the terminal. If you do not find a problem, suspect the serial port adapter or terminal cable.

Were you able to resolve the problem?

**No** Call your support person.

**Yes** Go to Verifying a repair.

## MAP 0285

Use this MAP to handle SRN A23-001 and ssss-640 (where ssss is the 3 or 4 digit Failing Function Code (FFC) of an SCSD drive) to check the path from adapter to device.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

**Note:** Not all devices support MPIO. Before proceeding with this MAP, make sure that the devices on both ends of the missing path support MPIO.

- **Step 0285-1**

Look at the problem report screen for the missing path. After the resource name and FRU, the next column identifies the missing path between resources (for example, scsi0 -> hdisk1). This indicates the missing path between the two resources, scsi0 (the parent resource) and hdisk1 (the child resource).

Is the cabling present between the two resources?

**No** Go to Step 0285-2.

**Yes** Go to Step 0285-4.

**Note:** In the following MAP steps, if no path previously existed between a parent and child device, the child device will have to be changed from the defined to the available state, otherwise you will be unable to select the child device to which you want to establish a path.

- **Step 0285-2**

1. Power off the system.
2. Connect the correct cable between the two resources.
3. Power on the system.
4. At the command line, type `smitty mpio`.
5. Choose **MPIO Path Management**.
6. Select **Enable Paths**.
7. Select **Enable Paths for a Device**.
8. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
9. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
10. Press Enter.

Did the smitty menu complete with no errors?

**No** Go to Step 0285-4.

**Yes** Go to Step 0285-3.

- **Step 0285-3**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the

resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

Do you still have a path problem?

**No** Go to Verifying a repair.

**Yes** Go to Step 0285-4.

• **Step 0285-4**

1. Power off the system.
2. Reseat the cables between the device and the adapter that have the missing path.
3. Power on the system.
4. At the command line, type `smitty mpio`.
5. Choose **MPIO Path Management**.
6. Select **Enable Paths**.
7. Select **Enable Paths for a Device**.
8. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
9. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
10. Press Enter.

Did the smitty menu complete with no errors?

**No** Go to Step 0285-6.

**Yes** Go to Step 0285-5.

• **Step 0285-5**

To verify that the device path is present, rerun `diag -a`

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

Do you still have a path problem?

**No** Go to Verifying a repair.

**Yes** Go to Step 0285-6.

• **Step 0285-6**

You may have a problem with the driver interface or connector on either the parent or child device.

1. Power off the system (see the system service information if necessary).
2. Remove the cables to the parent device.
3. Replace the cables that go between the parent and child device (if present).
4. Reattach the cables to the parent device.
5. Power on the system.
6. At the command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.
8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press Enter.

Did the smitty menu complete with no errors?

**No** Go to Step 0285-7.

**Yes** Go to Step 0285-8.

• **Step 0285-7**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If the letter P is not shown in front of the resource, or if the system returns to the command prompt, or you get a message without the resource list being displayed, then the problem has been resolved.

Do you still have a problem?

**No** Go to Verifying a repair.

**Yes** Go to Step 0285-8.

• **Step 0285-8**

You may have a problem with the driver interface or connector on either the parent or child device.

1. Power off the system.
2. Remove the cables to the parent device.
3. Replace the parent device.
4. Reattach the cables to the parent device.
5. Power on the system.
6. At the command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.
8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press Enter.

Did the smitty menu complete with no errors?

**No** Go to Step 0285-9.

**Yes** Go to Step 0285-10.

• **Step 0285-9**

To verify that the device path is present, rerun `diag -a`.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

Do you still have a path problem?

**No** Go to Verifying a repair.

**Yes** Go to Step 0285-10.

• **Step 0285-10**

You may have a problem with the driver interface or connector on the child device.

1. Power off the system.
2. Remove the cables to the child device.
3. Replace the child device (in the case of a SCSI or SAF-TE backplane, replace the backplane first, followed by the child device).
4. Reattach the cables to the child device.

5. Power on the system.
6. At the command line, type `smitty mpio`.
7. Choose **MPIO Path Management**.
8. Select **Enable Paths**.
9. Select **Enable Paths for a Device**.
10. In the **Device Name** selection, choose the name of the child device (the device at the end of the path).
11. In the **Paths to Enable** selection, select the missing path (between the parent and child device).
12. Press Enter.

Did the smitty menu complete with no errors?

**No** Neither the cabling, nor the parent, nor the child seem to be causing the problem. Contact your service support structure.

**Yes** Go to Step 0285-11.

- **Step 0285-11**

Rerun `diag -a` to verify that the device path is present.

When the resource list displays, select the child resource that had the missing path. If the letter P is shown in front of the resource, you still have a path problem. If no letter P is shown in front of the resource or if the system returns to the command prompt or you get a message without the resource list being displayed, then the problem has been resolved.

Do you still have a path problem?

**No** Go to Verifying a repair.

**Yes** Neither the cabling, nor the parent, nor the child seem to be causing the problem. Contact your service support structure.

## MAP 0291

Use this MAP when a bus or device (such as a disk drive) is reported as a missing resource by the diagnostics.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

- **Step 0291-1**

The device may be missing because of a power problem.

If the missing device is located in a drawer or enclosure, do the following:

1. Check for any environmental problem indicators such as power or cooling that may indicate a problem.
2. If a problem is indicated, follow the service documentation to resolve the problem.

Go to Step 0291-2.

- **Step 0291-2**

Inspect the cables (signal and power) of the missing device. Be sure all connections are in place and power is present. See the system or enclosure documentation containing the power wiring diagram or system cable diagram to locate specific cables, determine the cable numbering, and check for a problem-determination procedure. Look for obvious power cabling problems, such as missing or loose cable connectors.

Power problems can sometimes be identified by checking other devices that use the same power source (such as a diskette drive and a SCSI tape drive, even though they have different controllers). If other devices that share a power source are reported as missing devices, suspect the power source as the problem.

If there is a power problem, see “Power problems” on page 103.

Did you find a problem?

**No** Go to Step 0291-3.

**Yes** Correct the problem, then go to Verifying a repair.

• **Step 0291-3**

Is the missing device a SCSI device installed in a SCSI Enclosure Services (resource SESx) or SAF-TE (resource SAFTE<sub>x</sub>), or a SCSI device installed in either type of enclosure?

**No** Go to “MAP 0210: General problem resolution” on page 228.

**Yes** Go to Step 0291-4.

• **Step 0291-4**

Run the advanced diagnostics in problem determination mode on the SCSI Enclosure Services or SAF-TE device.

**Note:** A no trouble found result, or if you get another SRN with the same digits before the dash as you previously had from the diagnostics, indicates that you did *not* get a different SRN.

Did you get a different SRN than when you ran the diagnostics previously?

**No** Go to Step 0291-5.

**Yes** Take the following action:

1. Look up the SRN.

**Note:** If the SRN is not listed in the Reference codes look for additional information in the following:

- Any supplemental service manual for the device.
- The diagnostic Problem Report screen.
- The Service Hints service aid in Running the online and standalone diagnostics log.

2. Perform the action listed.

• **Step 0291-5**

Power off the system. Disconnect all hot-swap devices attached to the adapter. Reconnect the hot-swap devices one at a time. After reconnecting each device, do the following:

1. Power on the system and boot the system in the same mode that you were in when you received the symptom that led you to this MAP Powering on and powering off the system.
2. At a command prompt, run the **diag -a** command to check for missing options.
3. Verify that the device you just added to the system is present in the system configuration. If other devices are now missing, the problem may be with the last device that was reconnected or reinstalled. Perform these substeps:
  - a. If the device that was just reinstalled in the system is missing, or if additional devices are now missing, replace the last device that was reinstalled.
  - b. Rerun **diag -a** to check for missing options.
  - c. If devices are no longer missing, go to Verifying a repair. Otherwise, contact your support center.

**Note:** A device problem can cause other devices attached to the same SCSI adapter to go into the defined state. Ask the system administrator to make sure that all devices attached to the same SCSI adapter as the device that you replaced are in the available state.



- If no devices were missing, the problem could be intermittent. Make a record of the problem. Running the diagnostics for each device on the bus may provide additional information. If you have not replaced FFCs B88, 190, and 152 go to "MAP 0210: General problem resolution" on page 228, using FFCs (in order): B88, 190, and 152.

## MAP 4040

Use this MAP to resolve the following problem: Multiple controllers connected in an invalid configuration (SRN *nnnn* - 9073)

A configuration error occurred. See "SAS RAID configurations" on page 331 to determine the allowable configurations. Then correct the configuration. If correcting the configuration does not resolve the error, contact your hardware service provider.

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4041

Use this MAP to resolve the following problem: Multiple controllers not capable of controlling the same set of devices (SRN *nnnn* - 9074)

### Step 4041-1

This error relates to adapters connected in a multi-initiator and high availability configuration. To obtain the reason or description for this failure, you must find the formatted error information in the error log. The log also contains information about the attached adapter (**Remote Adapter** fields).

Display the hardware error log. View the hardware error log as follows:

- Follow the steps in Examining the hardware error log and return here.
- Select the hardware error log to view. In the hardware error log, the **Detail Data** section contains the **reason for failure** and the **Remote Adapter Vendor ID, Product ID, Serial Number, and World Wide ID**.
- Go to "Step 4041-2."

### Step 4041-2

Find the **reason for failure** and information for the attached adapter (remote adapter) shown in the error log, and perform the action listed for the reason in the following table.

Table 22. RAID array reason for failure

| Reason for failure                                        | Description                                                             | Action                                                                                                                                                                                                                                                       | Adapter on which to perform the action |
|-----------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Secondary is unable to find devices found by the primary. | Secondary adapter cannot discover all the devices that the primary has. | Verify the connections to the devices from the adapter that is logging the error.<br><br>View the disk array configuration screens to determine the SAS port that has the problem.<br><br>See "SAS fabric identification" on page 328 to verify connections. | Adapter that logged the error.         |

Table 22. RAID array reason for failure (continued)

| Reason for failure                                       | Description                                                                                                                   | Action                                                                                                                                                                                                                                                                  | Adapter on which to perform the action     |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Secondary found devices not found by the primary.        | Secondary adapter has discovered more devices than the primary. After this error is logged, an automatic failover will occur. | Verify the connections to the devices from the remote adapter as indicated in the error log.<br><br>View the disk array configuration screens to determine the SAS port that has the problem.<br><br>See "SAS fabric identification" on page 328 to verify connections. | Remote adapter indicated in the error log. |
| Primary lost contact with disks accessible by secondary. | Link failure from primary adapter to devices. An automatic failover will occur.                                               | Verify the connections to the devices from the adapter that is logging the error.<br><br>View the disk array configuration screens to determine the SAS port that has the problem.<br><br>See "SAS fabric identification" on page 328 to verify connections.            | Adapter that logged the error.             |
| Other                                                    | Not currently defined.                                                                                                        | Contact your hardware service provider.                                                                                                                                                                                                                                 |                                            |

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4044

Use this MAP to resolve an incorrect or incomplete multipath connection problem.

Use this MAP to resolve the following problems:

- Configuration error, incorrect multipath connection (SRN *nnnn* – 4030)
- Configuration error, incomplete multipath connection between controller and enclosure detected (SRN *nnnn* – 4040)

The possible causes are:

- Incorrect cabling to device enclosure.

**Note:** Pay special attention to the requirement that a YI-cable must be routed along the right side of the rack frame (as viewed from the rear) when connecting to a disk expansion unit. Review the device enclosure cabling and correct the cabling as required. To see example device configurations with SAS cabling, see Serial-attached SCSI cable planning.

- A failed connection caused by a failing component in the SAS fabric between, and including, the controller and device enclosure.

Considerations:

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Some systems have SAS and PCI-X or PCIe bus interface logic integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for these integrated buses. See the feature comparison tables for PCIe and PCI-X cards. For these configurations, replacement of the RAID enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations the SAS connections are integrated onto the system boards, and a failed connection can be the result of a failed system board or integrated device enclosure.
- When using SAS adapters in either an HA two-system RAID or HA single-system RAID configuration, ensure that the actions taken in this MAP are against the primary adapter and not the secondary adapter.
- An adapter reset might occur during the system verification step of this procedure. To avoid potential data loss, reconstruct any degraded disk arrays if possible, before performing system verification.

**Attention:** Obtain assistance from your Hardware Service Support organization before you replace RAID adapters when SAS fabric problems exist. Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter when SAS fabric problems exist. Appropriate service procedures must be followed when replacing the cache RAID - dual IOA enablement card (for example, FC5662) because removal of this card can cause data loss if incorrectly performed and can also result in a nondual storage IOA (non-HA) mode of operation.

### Step 4044-1

Was the SRN *nnnn-4030*?

**No** Go to "Step 4044-4."

**Yes** Go to "Step 4044-2."

### Step 4044-2

Review the device enclosure cabling and correct the cabling as required. To see example device configurations with SAS cabling, see "Serial-attached SCSI cable planning."

### Step 4044-3

Run diagnostics in system verification mode on the adapter to rediscover the devices and connections.

1. Start Diagnostics and select **Task Selection** on the Function Selection display.
2. Select **Run Diagnostics**.
3. Select the adapter resource.
4. Select **System Verification**.

Examine the error log. See Examining the hardware error log. Did the error occur again?

**No** Go to "Step 4044-9" on page 279.

**Yes** Contact your hardware service provider.

### Step 4044-4

The SRN is *nnnn-4040*.

Determine if a problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.

Do all expected devices appear in the list and are all paths marked as Operational?

**No** Go to "Step 4044-5."

**Yes** Go to "Step 4044-9" on page 279.

### **Step 4044-5**

Run diagnostics in System Verification mode on the adapter to rediscover the devices and connections.

1. Start Diagnostics and select **Task Selection** on the Function Selection display.
2. Select **Run Diagnostics**.
3. Select the adapter resource.
4. Select **System Verification**.

**Note:** At this point, ignore any problems found and continue with the next step.

### **Step 4044-6**

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4044-7."

**Yes** Go to "Step 4044-9" on page 279.

### **Step 4044-7**

Go to "SAS fabric identification" on page 328. Then continue with the next step.

## Step 4044-8

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4044-7" on page 278.

**Yes** Go to "Step 4044-9."

## Step 4044-9

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4047

Use this MAP to resolve the following problem: Missing remote controller (SRN *nnnn* - 9076)

An adapter attached in a multi-initiator and high availability configuration was not discovered in the allotted time. Determine which of the following items is the cause of your specific error and take the appropriate actions listed. If this action does not correct the error, contact your hardware service provider.

The possible causes are:

- An attached adapter for the configuration is not installed or is not powered on. Some adapters are required to be part of a high availability RAID configuration. Verify this requirement in the feature comparison tables for PCIe and PCI-X cards. Ensure that both adapters are properly installed and powered on.
- If the configuration is a high availability single-system RAID configuration, both adapters might not be in the same partition. Ensure that both adapters are assigned to the same partition.
- An attached adapter does not support the desired configuration. See "SAS RAID configurations" on page 331 to determine the allowable configurations. Then correct the configuration. If correcting the configuration does not resolve the error, contact your hardware service provider.
- An attached adapter for the configuration failed. Take action on the other errors that have occurred at the same time as this error.
- Adapter microcode levels are not up to date or are not at the same level of supported function. Ensure that the microcode for both adapters is at the latest level.

**Note:** The adapter that is logging this error will run in a performance degraded mode, without caching, until the problem is resolved.

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4049

This MAP is not supported on these models. Continue with the next failing item in the failing item list.

## MAP 4050

Use this MAP to perform SAS fabric problem isolation.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

### Considerations:

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Some systems have SAS and PCI-X or PCIe bus interface logic integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for these integrated-logic buses. See the feature comparison tables for PCIe and PCI-X cards. For these configurations, replacement of the RAID enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.

**Attention:** When SAS fabric problems exist, obtain assistance from your hardware service provider before performing any of the following actions:

- Before you replace a RAID adapter: Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Before you remove functioning disks in a disk array: The disk array might become degraded or failed and additional problems might be created if functioning disks are removed from a disk array.

**Attention:** Do not remove functioning disks in a disk array without assistance from your hardware service support organization. A disk array might become degraded or might fail if functioning disks are removed, and additional problems might be created.

## Step 4050-1

Was the SRN *nnnn-3020*?

**No** Go to "Step 4050-3" on page 281.

**Yes** Go to "Step 4050-2."

## Step 4050-2

The possible causes are:

- More devices are connected to the adapter than the adapter supports. Change the configuration to the allowable number of devices.
- A SAS device has been improperly moved from one location to another. Either return the device to its original location or move the device while the adapter is powered off or unconfigured.
- A SAS device has been improperly replaced by a SATA device. A SAS device must be used to replace a SAS device.

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

### Step 4050-3

Determine if any of the disk arrays on the adapter are in a **Degraded** state as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **List SAS Disk Array Configuration**.
3. Select the IBM SAS RAID Controller identified in the hardware error log.

Does any disk array have a state of **Degraded**?

**No** Go to "Step 4050-5."

**Yes** Go to "Step 4050-4."

### Step 4050-4

Other errors might have occurred related to the disk array being in a **Degraded** state. Take action on these errors to replace the failed disk and restore the disk array to an **Optimal** state.

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

### Step 4050-5

Have other errors occurred at the same time as this error?

**No** Go to "Step 4050-7."

**Yes** Go to "Step 4050-6."

### Step 4050-6

Take action on the other errors that have occurred at the same time as this error.

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

### Step 4050-7

Was the SRN *nnnn-FFFF*?

**No** Go to "Step 4050-10" on page 282.

**Yes** Go to "Step 4050-8."

### Step 4050-8

Ensure device, device enclosure, and adapter microcode levels are up to date.

Did you update to newer microcode levels?

**No** Go to "Step 4050-10" on page 282.

Yes Go to "Step 4050-9."

## Step 4050-9

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## Step 4050-10

Is the problem in a disk expansion unit?

No Go to "SAS fabric identification" on page 328.

Yes Go to "Step 4050-11."

## Step 4050-11

Identify the adapter SAS port that is associated with the problem by examining the hardware error log. The hardware error log might be viewed as follows:

1. Follow the steps in Examining the hardware error log and return here.
2. Select the hardware error log to view. In the hardware error log under the **Disk Information** heading, the **Resource** field can be used to identify which controller port the error is associated with.

**Note:** If you do not see the **Disk Information** heading in the error log, obtain the **Resource** field from the **Detail Data / PROBLEM DATA** section as illustrated in the following example:

```
Detail Data
PROBLEM DATA
0000 0800 0004 FFFF 0000 0000 0000 0000 0000 0000 1910 00F0 0408 0100 0101 0000
 ^
 |
Resource is 0004FFFF
```

Go to "Step 4050-12."

## Step 4050-12

Using the resource found in the previous step, see SAS resource locations to understand how to identify the port of the controller to which the device, or device enclosure, is attached.

For example, if the resource were equal to 0004FFFF, port 04 on the adapter is used to attach the device or device enclosure that is experiencing the problem.

The resource found in the previous step can also be used to identify the device. To identify the device, you can attempt to match the resource with the one found on the display, that is displayed by performing the following steps.

1. Start the IBM SAS Disk Array Manager:
  - a. Start the diagnostics program and select **Task Selection** from the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Physical Resource Locations**.



## Step 4050-13

Because the problem persists, some corrective action is needed to resolve the problem. Using the port or device information found in the previous step, proceed by doing the following steps.

1. Power off the system or logical partition.
2. Perform only one of the following corrective actions, which are listed in the order of preference. If one of the corrective actions has previously been attempted, proceed to the next one in the list.

**Note:** Before replacing parts, consider using a complete power off of the entire system, including any external device enclosures, to provide a reset of all possible failing components. This action might correct the problem without replacing parts.

- Reseat cables on adapter and device enclosure.
- Replace cable from adapter to device enclosure.
- Replace the device.

**Note:** If there are multiple devices with a path that is not **Operational**, the problem is not likely to be with a device.

- Replace the internal device enclosure or see the service documentation for an external expansion unit.
  - Replace the adapter.
  - Contact your hardware service provider.
3. Power on the system or logical partition.

**Note:** In some situations, it might be acceptable to unconfigure and reconfigure the adapter instead of powering off and powering on the system or logical partition.

## Step 4050-14

Does the problem still occur after performing the corrective action?

**No** Go to "Step 4050-15."

**Yes** Go to "Step 4050-13."

## Step 4050-15

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4052

Use this MAP to resolve device bus fabric problems.

Use this MAP to resolve the following problems:

- Device bus fabric error (SRN *nnnn* – 4100)
- Temporary device bus fabric error (SRN *nnnn* – 4101)

The possible causes are:

- A failed connection caused by a failing component in the SAS fabric between, and including, the adapter and device enclosure.
- A failed connection caused by a failing component within the device enclosure, including the device itself.

Considerations:

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Some systems have SAS and PCI-X or PCIe bus interface logic integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for such integrated-logic buses. See the feature comparison tables for PCIe and PCI-X cards. For these configurations, replacement of the RAID enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.
- When using SAS adapters in either an HA two-system RAID or HA single-system RAID configuration, ensure that the actions taken in this MAP are against the primary adapter (not the secondary adapter).
- An adapter reset might occur during the system verification step of this procedure. To avoid potential data loss, reconstruct any degraded disk arrays if possible, before performing system verification.

**Attention:** When SAS fabric problems exist, obtain assistance from your hardware service provider before performing any of the following actions:

- Before you replace a RAID adapter: Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Before you remove functioning disks in a disk array: The disk array might become degraded or failed and additional problems might be created if functioning disks are removed from a disk array.

## Step 4052-1

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.

Do all expected devices appear in the list and are all paths marked as Operational?

**No** Go to "Step 4052-2."

**Yes** Go to "Step 4052-6" on page 285.

## Step 4052-2

Run diagnostics in system verification mode on the adapter to rediscover the devices and connections.

1. Start Diagnostics and select **Task Selection** on the Function Selection display.
2. Select **Run Diagnostics**.
3. Select the adapter resource.
4. Select **System Verification**.

**Note:** Disregard any trouble found for now, and continue with the next step.

### Step 4052-3

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4052-4."

**Yes** Go to "Step 4052-6."

### Step 4052-4

Go to "SAS fabric identification" on page 328. Then continue with the next step.

### Step 4052-5

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4052-4."

**Yes** Go to "Step 4052-6."

### Step 4052-6

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4053

Use this MAP to resolve the following problem: Multipath redundancy level got worse (SRN *nnnn* - 4060)

The possible causes are:

- A failed connection caused by a failing component in the SAS fabric between, and including, the adapter and device enclosure.
- A failed connection caused by a failing component within the device enclosure, including the device itself.

**Note:** The failed connection was previously working, and might have already recovered.

Considerations:

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Some systems have SAS and PCI-X or PCIe bus interface logic integrated onto the system boards and use a pluggable RAID enablement card (a non-PCI form factor card) for such integrated-logic buses. See the feature comparison tables for PCIe and PCI-X cards. For these configurations, replacement of the RAID enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.
- When using SAS adapters in either an HA two-system RAID or HA single-system RAID configuration, ensure that the actions taken in this MAP are against the primary adapter and not the secondary adapter.
- An adapter reset might occur during the system verification step of this procedure. To avoid potential data loss, reconstruct any degraded disk arrays if possible, before performing system verification.

**Attention:** When SAS fabric problems exist, obtain assistance from your hardware service provider before performing any of the following actions:

- Before you replace a RAID adapter: Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Before you remove functioning disks in a disk array: The disk array might become degraded or failed and additional problems might be created if functioning disks are removed from a disk array.

### Step 4053-1

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4053-2" on page 287.

**Yes** Go to “Step 4053-6” on page 288.

## Step 4053-2

Run diagnostics in system verification mode on the adapter to rediscover the devices and connections.

1. Start Diagnostics and select **Task Selection** on the Function Selection display.
2. Select **Run Diagnostics**.
3. Select the adapter resource.
4. Select **System Verification**.

**Note:** Disregard any trouble found for now, and continue with the next step.

## Step 4053-3

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to “Step 4053-4.”

**Yes** Go to “Step 4053-6” on page 288.

## Step 4053-4

Go to “SAS fabric identification” on page 328. Then continue with the next step.

## Step 4053-5

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4053-4" on page 287.

**Yes** Go to "Step 4053-6."

## Step 4053-6

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4140

Use this MAP to resolve the following problem: Multiple controllers connected in an invalid configuration (SRN *nnnn* - 9073)

One adapter, of a connected pair of adapters, is not operating under the same operating system type as the other adapter. Connected adapters must both be controlled by the same type of operating system. Correct the configuration. If correcting the configuration does not resolve the error, contact your hardware service provider.

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4141

Use this MAP to resolve the following problem: Multiple controllers not capable of controlling the same set of devices (SRN *nnnn* - 9074)

### Step 4141-1

This error relates to adapters connected in a multi-initiator and high availability configuration. To obtain the reason or description for this failure, you must find the formatted error information in the error log. The log also contains information about the attached adapter (**Remote Adapter** fields).

Display the hardware error log. View the hardware error log as follows:

1. Follow the steps in Examining the hardware error log and return here.
2. Select the hardware error log to view. In the hardware error log, the **Detail Data** section contains the **reason for failure** and the **Remote Adapter Vendor ID, Product ID, Serial Number, and World Wide ID**.
3. Go to "Step 4141-2."

### Step 4141-2

Find the **reason for failure** and information for the attached adapter (remote adapter) shown in the error log, and perform the action listed for the reason in the following table.

Table 23. RAID array reason for failure

| Reason for failure                                        | Description                                                                                                                   | Action                                                                                                                                                                                                                                                                  | Adapter on which to perform the action     |
|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Secondary is unable to find devices found by the primary. | Secondary adapter cannot discover all the devices that the primary has.                                                       | Verify the connections to the devices from the adapter that is logging the error.<br><br>View the disk array configuration screens to determine the SAS port that has the problem.<br><br>See "SAS fabric identification" on page 328 to verify connections.            | Adapter that logged the error.             |
| Secondary found devices not found by the primary.         | Secondary adapter has discovered more devices than the primary. After this error is logged, an automatic failover will occur. | Verify the connections to the devices from the remote adapter as indicated in the error log.<br><br>View the disk array configuration screens to determine the SAS port that has the problem.<br><br>See "SAS fabric identification" on page 328 to verify connections. | Remote adapter indicated in the error log. |
| Primary lost contact with disks accessible by secondary.  | Link failure from primary adapter to devices. An automatic failover will occur.                                               | Verify the connections to the devices from the adapter that is logging the error.<br><br>View the disk array configuration screens to determine the SAS port that has the problem.<br><br>See "SAS fabric identification" on page 328 to verify connections.            | Adapter that logged the error.             |
| Other                                                     | Not currently defined.                                                                                                        | Contact your hardware service provider.                                                                                                                                                                                                                                 |                                            |

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4144

Use this MAP to resolve an incorrect or incomplete multipath connection problem.

Use this MAP to resolve the following problems:

- Configuration error, incorrect multipath connection (SRN *nnnn* – 4030)
- Configuration error, incomplete multipath connection between controller and enclosure detected (SRN *nnnn* – 4040)

The possible causes are:

- Incorrect cabling to device enclosure.

**Note:** Pay special attention to the requirement that a YI-cable must be routed along the right side of the rack frame (as viewed from the rear) when connecting to a disk expansion unit. Review the device enclosure cabling and correct the cabling as required. To see example device configurations with SAS cabling, see Serial-attached SCSI cable planning.

- A failed connection caused by a failing component in the SAS fabric between, and including, the controller and device enclosure.

Considerations:

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.
- Some systems have SAS RAID adapters integrated onto the system boards and use a cache RAID - dual IOA enablement card (for example, FC5662) to enable storage adapter write cache and dual storage I/O adapter (IOA) mode (HA RAID mode). For these configurations, replacement of the Cache RAID - dual IOA enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board. Additionally, appropriate service procedures must be followed when replacing the Cache RAID - dual IOA enablement card because removal of this card can cause data loss if incorrectly performed and can also result in a nondual storage IOA (non-HA) mode of operation.
- When using SAS adapters in either an HA two-system RAID or HA single-system RAID configuration, ensure that the actions taken in this MAP are against the primary adapter and not the secondary adapter.
- An adapter reset might occur during the system verification step of this procedure. To avoid potential data loss, reconstruct any degraded disk arrays if possible, before performing system verification.

**Attention:** Obtain assistance from your Hardware Service Support organization before you replace RAID adapters when SAS fabric problems exist. Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter when SAS fabric problems exist. Appropriate service procedures must be followed when replacing the cache RAID - dual IOA enablement card (for example, FC5662) because removal of this card can cause data loss if incorrectly performed and can also result in a nondual storage IOA (non-HA) mode of operation.

## Step 4144-1

Was the SRN *nnnn*-4030?

**No** Go to "Step 4144-4" on page 291.

**Yes** Go to "Step 4144-2."

## Step 4144-2

Review the device enclosure cabling and correct the cabling as required. To see example device configurations with SAS cabling, see "Serial-attached SCSI cable planning."

## Step 4144-3

Run diagnostics in system verification mode on the adapter to rediscover the devices and connections.

1. Start Diagnostics and select **Task Selection** on the Function Selection display.
2. Select **Run Diagnostics**.



3. Select the adapter resource.
4. Select **System Verification**.

Referring to the steps in Examining the hardware error log, did the error occur again?

**No** Go to “Step 4144-9” on page 292.

**Yes** Contact your hardware service provider.

### **Step 4144-4**

The SRN is *nnnn-4040*.

Determine if a problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.

Do all expected devices appear in the list and are all paths marked as Operational?

**No** Go to “Step 4144-5.”

**Yes** Go to “Step 4144-9” on page 292.

### **Step 4144-5**

Run diagnostics in System Verification mode on the adapter to rediscover the devices and connections.

1. Start Diagnostics and select **Task Selection** on the Function Selection display.
2. Select **Run Diagnostics**.
3. Select the adapter resource.
4. Select **System Verification**.

**Note:** At this point, ignore any problems found and continue with the next step.

### **Step 4144-6**

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4144-7."

**Yes** Go to "Step 4144-9."

### Step 4144-7

Go to "SAS fabric identification" on page 328. Then continue with the next step.

### Step 4144-8

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4144-7."

**Yes** Go to "Step 4144-9."

### Step 4144-9

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4147

Use this MAP to resolve the following problem: Missing remote controller (SRN *nnnn* - 9076)

An adapter attached in a multi-initiator and high availability configuration was not discovered in the allotted time. Determine which of the following items is the cause of your specific error and take the appropriate actions listed. If this action does not correct the error, contact your hardware service provider.

The possible causes are:

- An attached adapter for the configuration is not installed or is not powered on. Some adapters are required to be part of a high availability RAID configuration. Verify this requirement in the feature comparison tables for PCIe and PCI-X cards. Ensure that both adapters are properly installed and powered on.
- If the configuration is a high availability single-system RAID configuration, both adapters might not be in the same partition. Ensure that both adapters are assigned to the same partition.
- An attached adapter for the configuration failed. Take action on the other errors that have occurred at the same time as this error.
- Adapter microcode levels are not up to date or are not at the same level of supported function. Ensure that the microcode for both adapters is at the latest level.

**Note:** The adapter that is logging this error will run in a performance degraded mode, without caching, until the problem is resolved.

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4149

This MAP is not supported on these models. Continue with the next failing item in the failing item list.

## MAP 4150

Use this MAP to perform SAS fabric problem isolation.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8secs/p8secs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

Considerations:

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.
- Some systems have SAS RAID adapters integrated onto the system boards and use a cache RAID - dual IOA enablement card (for example, FC5662) to enable storage adapter write cache and dual storage I/O adapter (IOA) mode (HA RAID mode). For these configurations, replacement of the Cache RAID - dual IOA enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board. Additionally, appropriate service procedures must be followed when replacing the Cache RAID - dual IOA enablement card because removal of this card can cause data loss if incorrectly performed and can also result in a nondual storage IOA (non-HA) mode of operation.

**Attention:** When SAS fabric problems exist, obtain assistance from your hardware service provider before performing any of the following actions:

- Before you replace a RAID adapter: Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Before you remove functioning disks in a disk array: The disk array might become degraded or failed and additional problems might be created if functioning disks are removed from a disk array.

**Attention:** Do not remove functioning disks in a disk array without assistance from your hardware service support organization. A disk array might become degraded or might fail if functioning disks are removed, and additional problems might be created.

### Step 4150-1

Was the SRN *nnnn-3020*?

**No** Go to "Step 4150-3" on page 294.

**Yes** Go to "Step 4150-2."

### Step 4150-2

The possible causes are:

- More devices are connected to the adapter than the adapter supports. Change the configuration to the allowable number of devices.
- A SAS device has been improperly moved from one location to another. Either return the device to its original location or move the device while the adapter is powered off or unconfigured.
- A SAS device has been improperly replaced by a SATA device. A SAS device must be used to replace a SAS device.

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

### Step 4150-3

Determine if any of the disk arrays on the adapter are in a **Degraded** state as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **List SAS Disk Array Configuration**.
3. Select the IBM SAS RAID Controller identified in the hardware error log.

Does any disk array have a state of **Degraded**?

**No** Go to "Step 4150-5."

**Yes** Go to "Step 4150-4."

### Step 4150-4

Other errors might have occurred related to the disk array being in a **Degraded** state. Take action on these errors to replace the failed disk and restore the disk array to an **Optimal** state.

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

### Step 4150-5

Have other errors occurred at the same time as this error?

**No** Go to "Step 4150-7."

**Yes** Go to "Step 4150-6."

### Step 4150-6

Take action on the other errors that have occurred at the same time as this error.

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

### Step 4150-7

Was the SRN *mmnn-FFFE*?

**No** Go to "Step 4150-10" on page 295.

**Yes** Go to "Step 4150-8" on page 295.

## Step 4150-8

Ensure device, device enclosure, and adapter microcode levels are up to date.

Did you update to newer microcode levels?

**No** Go to "Step 4150-10."

**Yes** Go to "Step 4150-9."

## Step 4150-9

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## Step 4150-10

Is the problem in a disk expansion unit?

**No** Go to "SAS fabric identification" on page 328.

**Yes** Go to "Step 4150-11."

## Step 4150-11

Identify the adapter SAS port that is associated with the problem by examining the hardware error log. The hardware error log might be viewed as follows:

1. Follow the steps in Examining the hardware error log and return here.
2. Select the hardware error log to view. In the hardware error log under the **Disk Information** heading, the **Resource** field can be used to identify which controller port the error is associated with.

**Note:** If you do not see the **Disk Information** heading in the error log, obtain the **Resource** field from the **Detail Data / PROBLEM DATA** section as illustrated in the following example:

```
Detail Data
PROBLEM DATA
0000 0800 0004 FFFF 0000 0000 0000 0000 0000 0000 1910 00F0 0408 0100 0101 0000
 ^
 |
Resource is 0004FFFF
```

Go to "Step 4150-12."

## Step 4150-12

Using the resource found in the previous step, see SAS resource locations to understand how to identify the port of the controller to which the device, or device enclosure, is attached.

For example, if the resource were equal to 0004FFFF, port 04 on the adapter is used to attach the device or device enclosure that is experiencing the problem.

The resource found in the previous step can also be used to identify the device. To identify the device, you can attempt to match the resource with the one found on the display, that is displayed by performing the following steps.

1. Start the IBM SAS Disk Array Manager:
  - a. Start the diagnostics program and select **Task Selection** from the Function Selection display.
  - b. Select **RAID Array Manager**.

- c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Physical Resource Locations**.

### Step 4150-13

Because the problem persists, some corrective action is needed to resolve the problem. Using the port or device information found in the previous step, proceed by doing the following steps.

1. Power off the system or logical partition.
2. Perform only one of the following corrective actions, which are listed in the order of preference. If one of the corrective actions has previously been attempted, proceed to the next one in the list.

**Note:** Before replacing parts, consider using a complete power off of the entire system, including any external device enclosures, to provide a reset of all possible failing components. This action might correct the problem without replacing parts.

- Reseat cables on adapter and device enclosure.
- Replace cable from adapter to device enclosure.
- Replace the device.

**Note:** If there are multiple devices with a path that is not **Operational**, the problem is not likely to be with a device.

- Replace the internal device enclosure or see the service documentation for an external expansion unit.
  - Replace the adapter.
  - Contact your hardware service provider.
3. Power on the system or logical partition.

**Note:** In some situations, it might be acceptable to unconfigure and reconfigure the adapter instead of powering off and powering on the system or logical partition.

### Step 4150-14

Does the problem still occur after performing the corrective action?

**No**     Go to "Step 4150-15."

**Yes**    Go to "Step 4150-13."

### Step 4150-15

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4152

Use this MAP to resolve device bus fabric problems.

Use this MAP to resolve the following problems:

- Device bus fabric error (SRN *nnnn* – 4100)
- Temporary device bus fabric error (SRN *nnnn* – 4101)

The possible causes are:

- A failed connection caused by a failing component in the SAS fabric between, and including, the adapter and device enclosure.
- A failed connection caused by a failing component within the device enclosure, including the device itself.

Considerations:

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.
- Some systems have SAS RAID adapters integrated onto the system boards and use a cache RAID - dual IOA enablement card (for example, FC5662) to enable storage adapter write cache and dual storage I/O adapter (IOA) mode (HA RAID mode). For these configurations, replacement of the Cache RAID - dual IOA enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board. Additionally, appropriate service procedures must be followed when replacing the Cache RAID - dual IOA enablement card since removal of this card can cause data loss if incorrectly performed and can also result in a nondual storage IOA (non-HA) mode of operation.
- When using SAS adapters in either an HA two-system RAID or HA single-system RAID configuration, ensure that the actions taken in this MAP are against the primary adapter (not the secondary adapter).
- An adapter reset might occur during the system verification step of this procedure. To avoid potential data loss, reconstruct any degraded disk arrays if possible, before performing system verification.

**Attention:** When SAS fabric problems exist, obtain assistance from your hardware service provider before performing any of the following actions:

- Before you replace a RAID adapter: Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Before you remove functioning disks in a disk array: The disk array might become degraded or failed and additional problems might be created if functioning disks are removed from a disk array.

## Step 4152-1

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.

Do all expected devices appear in the list and are all paths marked as Operational?

**No** Go to "Step 4152-2."

**Yes** Go to "Step 4152-6" on page 299.

## Step 4152-2

Run diagnostics in system verification mode on the adapter to rediscover the devices and connections.

1. Start Diagnostics and select **Task Selection** on the Function Selection display.

2. Select **Run Diagnostics**.
3. Select the adapter resource.
4. Select **System Verification**.

**Note:** Disregard any trouble found for now, and continue with the next step.

### Step 4152-3

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4152-4."

**Yes** Go to "Step 4152-6" on page 299.

### Step 4152-4

Go to "SAS fabric identification" on page 328. Then continue with the next step.

### Step 4152-5

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4152-4."

**Yes** Go to "Step 4152-6" on page 299.



## Step 4152-6

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 4153

Use this MAP to resolve the following problem: Multipath redundancy level got worse (SRN *nnnn* - 4060)

The possible causes are:

- A failed connection caused by a failing component in the SAS fabric between, and including, the adapter and device enclosure.
- A failed connection caused by a failing component within the device enclosure, including the device itself.

**Note:** The failed connection was previously working, and might have already recovered.

Considerations:

- Remove power from the system before connecting and disconnecting cables or devices, as appropriate, to prevent hardware damage or erroneous diagnostic results.
- Some systems have the disk enclosure or removable media enclosure integrated in the system with no cables. For these configurations, the SAS connections are integrated onto the system boards. A failed connection can be the result of a failed system board or integrated device enclosure.
- Some systems have SAS RAID adapters integrated onto the system boards and use a cache RAID - dual IOA enablement card (for example, FC 5662) to enable storage adapter write cache and dual storage I/O adapter (IOA) mode (HA RAID mode). For these configurations, replacement of the Cache RAID - dual IOA enablement card is unlikely to solve a SAS-related problem because the SAS interface logic is on the system board. Additionally, appropriate service procedures must be followed when replacing the Cache RAID - dual IOA enablement card since removal of this card can cause data loss if incorrectly performed and can also result in a nondual storage IOA (non-HA) mode of operation.
- When using SAS adapters in either an HA two-system RAID or HA single-system RAID configuration, ensure that the actions taken in this MAP are against the primary adapter and not the secondary adapter.
- An adapter reset might occur during the system verification step of this procedure. To avoid potential data loss, reconstruct any degraded disk arrays if possible, before performing system verification.

**Attention:** When SAS fabric problems exist, obtain assistance from your hardware service provider before performing any of the following actions:

- Before you replace a RAID adapter: Because the adapter might contain nonvolatile write cache data and configuration data for the attached disk arrays, additional problems can be created by replacing an adapter.
- Before you remove functioning disks in a disk array: The disk array might become degraded or failed and additional problems might be created if functioning disks are removed from a disk array.

## Step 4153-1

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.

3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4153-2."

**Yes** Go to "Step 4153-6" on page 301.

## Step 4153-2

Run diagnostics in system verification mode on the adapter to rediscover the devices and connections.

1. Start Diagnostics and select **Task Selection** on the Function Selection display.
2. Select **Run Diagnostics**.
3. Select the adapter resource.
4. Select **System Verification**.

**Note:** Disregard any trouble found for now, and continue with the next step.

## Step 4153-3

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4153-4."

**Yes** Go to "Step 4153-6" on page 301.

## Step 4153-4

Go to "SAS fabric identification" on page 328. Then continue with the next step.

## Step 4153-5

Determine if the problem still exists for the adapter that logged this error by examining the SAS connections as follows:

1. Start the IBM SAS Disk Array Manager.
  - a. Start Diagnostics and select **Task Selection** on the Function Selection display.
  - b. Select **RAID Array Manager**.
  - c. Select **IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.

3. Select **Show SAS Controller Physical Resources**.
4. Select **Show Fabric Path Graphical View**.
5. Select a device with a path that is not **Operational** (if one exists) to obtain additional details about the full path from the adapter port to the device. See Viewing SAS fabric path information for an example of how this additional detail can be used to help isolate where in the path the problem exists.

Do all expected devices appear in the list and are all paths marked as **Operational**?

**No** Go to "Step 4153-4" on page 300.

**Yes** Go to "Step 4153-6."

## Step 4153-6

When the problem is resolved, see the removal and replacement procedures topic for the system unit on which you are working and do the "Verifying the repair" procedure.

## MAP 5000

Use this MAP to resolve the following problem: The disk has failed and must be replaced.

1. Access a root shell prompt on any of the I/O nodes of the cluster.
2. Run the following command to release the carrier by using the recovery group name and location codes shown in the error log. If multiple location codes are given, they must refer to disks in the same carrier.

```
mmchcarrier RecoveryGroupName --release --location "location-code1;location-code2;..."
```

This command unlocks the disk carrier.

3. Pull out the carrier. This action switches on the indicator lights of the disks given in the previous command. These lights are powered by a supercapacitor and continue to be switched on after the carrier has been removed.
4. Replace the disks with disks of the same FRU part number.

**Note:** Select the force flag to override the FRU part number.

5. Replace the carrier.
6. Run the following command to complete the disk replacements:

```
mmchcarrier RecoveryGroupName --replace --location "location-code1;location-code2;..."
```

## MAP 5001

This event notifies the system administrator that there might be a data loss if the previously reported REPLACE\_DISK events are not handled promptly.

Repair all the disks that were indicated in previous replacement requests.

## PFW1540: Problem isolation procedures

The PFW1540 procedures are used to locate problems in the processor subsystem or I/O subsystem.

If a problem is detected, these procedures help you isolate the problem to a failing unit. Find the symptom in the following table; then follow the instructions given in the Action column.

| Problem Isolation Procedures                                                                                                                                                                                                                 |                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Symptom/Reference Code/Checkpoint                                                                                                                                                                                                            | Action                                                                                   |
| You have or suspect an I/O card or I/O subsystem failure. You received one of the following SRNs or reference codes: 101-000, 101-517, 101-521, 101-538, 101-551 to 101-557, 101-559 to 101-599, 101-662, 101-727, 101-c32, 101-c33, 101-c70 | Go to "PFW1542: I/O problem isolation procedure."                                        |
| You have or suspect a memory or processor subsystem problem. You received the following SRN or reference code: 101-185                                                                                                                       | Go to "PFW1548: Memory and processor subsystem problem isolation procedure" on page 306. |
| If you were directed to the PFW1540 procedure by an SRN and that SRN is not listed in this table.                                                                                                                                            | Go to "PFW1542: I/O problem isolation procedure."                                        |

## FRU identify LEDs

Your system is configured with an arrangement of LEDs that help identify various components of the system. These include but are not limited to:

- Rack identify beacon LED (optional rack status beacon)
- Processor subsystem drawer identify LED
- I/O drawer identify LED
- FRU identify LED
- Power subsystem FRUs
- Processor subsystem FRUs
- I/O subsystem FRUs
- I/O adapter identify LED
- DASD identify LED

The identify LEDs are arranged hierarchically with the FRU identify LED at the bottom of the hierarchy, followed by the corresponding processor subsystem or I/O drawer identify LED, and the corresponding rack identify LED to locate the failing FRU more easily. Any identify LED in the system may be flashed; see Managing the Advanced system Management Interface (ASMI).

Any identify LED in the system may also be flashed by using the AIX diagnostic programs task "Identify and Attention Indicators". The procedure to use the AIX diagnostics task "Identify and Attention Indicators" is outlined in "diagnostic and service aids" in Running the online and stand-alone diagnostics.

## PFW1542: I/O problem isolation procedure

This I/O problem-determination procedure isolates I/O card and I/O subsystem failures. When I/O problem isolation is complete, all cables and cards that are failing will have been replaced or reseated.

For more information about failing part numbers, location codes, or removal and replacement procedures, see Part locations and location codes ([http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs\\_locations.htm](http://www.ibm.com/support/knowledgecenter/POWER8/p8ecs/p8ecs_locations.htm)). Select your machine type and model number to see applicable procedures for your system.

### Notes:

1. To avoid damage to the system or subsystem components, unplug the power cords before removing or installing a part.
2. This procedure assumes either of the following items:

- An optical drive is installed and connected to the integrated EIDE adapter, and a stand-alone diagnostic CD-ROM is available.
  - Stand-alone diagnostics can be booted from a NIM server.
3. If a power-on password or privileged-access password is set, you are prompted to enter the password before the stand-alone diagnostic CD-ROM can load.
  4. The term POST indicators refers to the device mnemonics that appear during the power-on self-test (POST).
  5. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these options while you diagnose and service the system. If these settings are disabled, make notes of their current settings so that they can be restored before the system is turned back over to the customer.

The following settings may be of interest.

#### **Monitoring**

(also called surveillance) From the ASMI menu, expand the System Configuration menu, then click **Monitoring**. Disable both types of surveillance.

#### **Auto power restart**

(also called unattended start mode) From the ASMI menu, expand **Power/Restart Control**, then click **Auto Power Restart**, and set it to disabled.

#### **Wake on LAN**

From the ASMI menu, expand **Wake on LAN**, and set it to disabled.

#### **Call Out**

From the ASMI menu, expand the Service Aids menu, then click **Call-Home/Call-In Setup**. Set the call-home system port and the call-in system port to disabled.

6. Verify that the system has not been set to boot to the SMS menus or to the open firmware prompt. From the ASMI menu, expand **Power/Restart Control** to view the menu, then click **Power On/Off System**. The AIX/Linux partition mode boot indicates **Continue to Operating System**.

Use this procedure to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

Perform the following procedure:

- **PFW1542-1**

1. Ensure that the diagnostics and the operating system are shut down.
2. Turn off the power.
3. Turn on the power.
4. Insert the stand-alone diagnostic CD-ROM into the optical drive.

Does the optical drive appear to operate correctly?

**No** Go to "Problems with loading and starting the operating system (AIX and Linux)" on page 228.

**Yes** Continue to PFW1542-2.

- **PFW1542-2**

1. When the keyboard indicator is displayed (the word "keyboard"), if the system or partition gets that far in the IPL process, press the 5 key on the firmware console.
2. If you are prompted to do so, enter the appropriate password.

Is the "Please define the System Console" screen displayed?

**No** Continue to PFW1542-3.

**Yes** Go to PFW1542-4.

• **PFW1542-3**

The system is unable to boot stand-alone diagnostics.

Did powering on the system generate a different error code or partition firmware hang from the one that originally sent you to PFW1542?

**No** If you were sent here by an error code, and the error code did not change as the result of powering on the system, you have a processor subsystem problem. Go to "PFW1548: Memory and processor subsystem problem isolation procedure" on page 306. If you were sent here because the system is hanging on a partition firmware checkpoint, and the hang condition did not change as a result of powering on the system, go to PFW1542-5.

**Yes** Look up the new error code in the reference code index and perform the listed actions.

• **PFW1542-4**

The system stopped with the **Please define the System Console** prompt on the system console. Stand-alone diagnostics can be booted. Perform the following steps:

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. If the terminal type has not been defined, you must use the option **Initialize Terminal** on the FUNCTION SELECTION menu to initialize the AIX operating system environment before you can continue with the diagnostics. This is a separate operation from selecting the firmware console.
4. Select **Advanced Diagnostic Routines**.
5. When the DIAGNOSTIC MODE SELECTION menu displays, select **System Verification** to run diagnostics on all resources.

Did running diagnostics produce a different symptom?

**No** Continue with the following sub-step.

**Yes** Return to the Problem Analysis procedures with the new symptom.

6. Record any devices missing from the list of all adapters and devices. Continue with this procedure. When you have fixed the problem, use this record to verify that all devices appear when you run system verification.

Are there any devices missing from the list of all adapters and devices?

**No** Reinstall all remaining adapters, if any, and reconnect all devices. Return the system to its original configuration. Go to Verifying a repair.

**Yes** The boot attempts that follow will attempt to isolate any remaining I/O subsystem problems with missing devices. Ignore any codes that may display on the operator panel unless stated otherwise. Continue to PFW1542-5.

• **PFW1542-5**

Are there any adapters in the PCI slots in the base system?

**No** Go to PFW1542-6.

**Yes** Go to PFW1542-8.

• **PFW1542-6**

Replace the system backplane, U<sub>n</sub>-P1. Continue to PFW1542-7.

• **PFW1542-7**

1. Boot stand-alone diagnostics from CD.
2. If the "Please define the System Console" screen is displayed, follow directions to select the system console.
3. Use the Display Configuration and Resource List to list all adapters and attached devices.

4. Check that all adapters and attached devices are listed.

Did the "Please define the System Console" screen display and are all attached devices and adapters listed?

**No** Go to PFW1542-11.

**Yes** Go to PFW1542-12.

• **PFW1542-8**

1. If it is not already off, turn off the power.
2. Label and record the location of any cables attached to the adapters.
3. Record the slot number of the adapters.
4. Remove all adapters from slots 1, 2, 3, 4, 5, and 6 in the base system that are not attached to the boot device.
5. Turn on the power to boot stand-alone diagnostics from CD-ROM.
6. If the ASCII terminal displays **Enter 0 to select this console**, press the 0 key on the ASCII terminal's keyboard.
7. If the "Please define the System Console" screen is displayed, follow directions to select the system console.
8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

Did the "Please define the System Console" screen display and are all attached devices and adapters listed?

**No** Go to PFW1542-11.

**Yes** Continue to PFW1542-9.

• **PFW1542-9**

If the "Please define the System Console" screen does display and all adapters and attached devices are listed, the problem is with one of the adapters or devices that was removed or disconnected from the base system.

1. Turn off the power.
2. Reinstall one adapter and device that was removed. Use the original adapters in their original slots when reinstalling adapters.
3. Turn on the power to boot stand-alone diagnostics from the optical drive.
4. If the "Please define the System Console" screen is displayed, follow the directions to select the system console.
5. Use the Display Configuration and Resource List to list all adapters and attached devices.
6. Check that all adapters and attached devices are listed.

Did the "Please define the System Console" screen display and are all attached devices and adapters listed?

**No** Continue to PFW1542-10.

**Yes** Return to the beginning of this step to continue reinstalling adapters and devices.

• **PFW1542-10**

Replace the adapter you just installed with a new adapter and try the boot to stand-alone diagnostics from CD-ROM again.

1. If the "Please Define the System Console" screen is displayed, follow directions to select the system console.
2. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
3. Check that all adapters and attached devices are listed.

Did the "Please define the System Console" screen display and are all attached devices and adapters listed?

**No** Go to PFW1542-6.

**Yes** The adapter you just replaced was defective. Go to PFW1542-12.

• **PFW1542-11**

1. Turn off the power.
2. Disconnect the base system power cables.
3. Replace the following parts, one at a time, in the sequence listed:
  - a. Optical drive
  - b. Removable media backplane and cage assembly
  - c. Disk drive backplane and cage assembly
  - d. System backplane, location *Un-P1*
  - e. Service processor
4. Reconnect the base system power cables.
5. Turn on the power.
6. Boot stand-alone diagnostics from CD.
7. If the "Please define the System Console" screen is displayed, follow directions to select the system console.
8. Use the option **Display Configuration and Resource List** to list all adapters and attached devices.
9. Check that all adapters and attached devices are listed.

Did the "Please define the System Console" screen display and are all adapters and attached devices listed?

**No** Replace the next part in the list and return to the beginning of this step. Repeat this process until a part causes the Please define the System Console screen to be displayed and all adapters and attached devices to be listed. If you have replaced all the items listed above and the Please define the System Console screen does not display or all adapters and attached devices are not listed, check all external devices and cabling. If you do not find a problem, contact your next level of support for assistance.

**Yes** Go to PFW1542-12.

• **PFW1542-12**

The item you just replaced fixed the problem.

1. Turn off the power.
2. If a display adapter with keyboard and mouse were installed, reinstall the display adapter, keyboard, and mouse.
3. Reconnect the tape drive (if previously installed) to the internal SCSI bus cable.
4. Plug in all adapters that were previously removed but not reinstalled.
5. Reconnect the I/O subsystem power cables that were previously disconnected.

Return the system to its original condition. Go to Verifying a repair.

## **PFW1548: Memory and processor subsystem problem isolation procedure**

Use this problem isolation procedure to aid in solving memory and processor problems that are not found by normal diagnostics.

**Notes:**

1. To avoid damage to the system or subsystem components, unplug the power cords before removing or installing any part.



2. This procedure assumes that either:
  - An optical drive is installed and connected to the integrated EIDE adapter, and a stand-alone diagnostic CD-ROM is available.
  - OR
  - Stand-alone diagnostics can be booted from a NIM server.
3. If a power-on password or privileged-access password is set, you are prompted to enter the password before the stand-alone diagnostic CD-ROM can load.
4. The term POST indicators refers to the device mnemonics that appear during the power-on self-test (POST).
5. The service processor might have been set by the user to monitor system operations and to attempt recoveries. You might want to disable these options while you diagnose and service the system. If these settings are disabled, make notes of their current settings so that they can be restored before the system is turned back over to the customer. The following settings may be of interest.

#### **Monitoring**

(also called surveillance) From the ASMI menu, expand the **System Configuration** menu, then click **Monitoring**. Disable both types of surveillance.

#### **Auto power restart**

(also called unattended start mode) From the ASMI menu, expand **Power/Restart Control**, then click **Auto Power Restart**, and set it to disabled.

#### **Wake on LAN**

From the ASMI menu, expand **Wake on LAN**, and set it to disabled.

#### **Call Out**

From the ASMI menu, expand the **Service Aids** menu, then click **Call-Home/Call-In Setup**. Set the call-home system port and the call-in system port to disabled.

6. Verify that the system has not been set to boot to the System Management Services (SMS) menus or to the open firmware prompt. From the ASMI menu, expand **Power/Restart Control** to view the menu, then click **Power On/Off System**. The AIX/Linux partition mode boot should say "Continue to Operating System".
7. The service processor might have recorded one or more symptoms in its error/event log. Use the Advanced System Management Interface (ASMI) menus to view the error/event log.
  - Look for a possible new error that occurred during power on of the system. If there is a new error, and its actions call for a FRU replacement, perform those actions. If this does not resolve the problem, go to PFW1548-1.
  - If powering on the system did not yield a new error code, look at the error that occurred just before the original error. Perform the actions associated with that error. If this does not resolve the problem, go to PFW1548-1.
  - If powering on the system results in the same error code, and there are no error codes before the original error code, go to PFW1548-1.

Perform the following procedure:

#### • **PFW1548-1**

1. Ensure that the diagnostics and the operating system are shut down.  
Is the system at "service processor standby", indicated by 01 in the control panel?
  - No** Replace the system backplane. Return to the beginning of this step.
  - Yes** Continue with substep 2.
2. Turn on the power using either the white button or the ASMI menus.

If an HMC is attached, does the system reach hypervisor standby as indicated on the management console? If a management console is not attached, does the system reach an operating system login prompt, or if booting the stand-alone diagnostic CD-ROM, is the Please define the System Console screen displayed?

**No** Go to PFW1548-3.

**Yes** Go to PFW1548-2.

3. Insert the stand-alone diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to PFW1548-2.

4. When the word *keyboard* is displayed on an ASCII terminal, a directly attached keyboard, or management console, press the number 5 key.

5. If you are prompted to do so, enter the appropriate password.

Is the "Please define the System Console" screen displayed?

**No** Go to PFW1548-2.

**Yes** Go to PFW1548-14.

- **PFW1548-2**

Insert the stand-alone diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the stand-alone diagnostic CD-ROM, go to step PFW1548-3.

Turn on the power using either the white button or the ASMI menus. (If the stand-alone diagnostic CD-ROM is not in the optical drive, insert it now.) If a management console is attached, after the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the stand-alone diagnostic CD-ROM.

If you are prompted to do so, enter the appropriate password.

Is the "Please define the System Console" screen displayed?

**No** Go to PFW1548-3.

**Yes** Go to PFW1548-14.

- **PFW1548-3**

1. Turn off the power.
2. If you have not already done so, configure the service processor (using the ASMI menus) with the instructions in note 6 at the beginning of this procedure, then return here and continue.
3. Exit the service processor (ASMI) menus and remove the power cords.
4. Disconnect all external cables (parallel, system port 1, system port 2, keyboard, mouse, USB devices, SPCN, Ethernet, and so on). Also disconnect all of the external cables attached to the service processor except the Ethernet cable going to the management console, if a management console is attached.

Go to the next step.

- **PFW1548-4**

Perform the following steps:

1. Place the drawer into the service position and remove the service access cover.
2. Record the slot numbers of the PCI adapters and I/O expansion cards if present. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.
3. Slide the media or disk drive enclosure out approximately three centimeters.
4. Remove and label the disk drives from the media or disk drive enclosure assembly.
5. Remove all memory DIMMs except for one pair.

6. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
7. Turn on the power using either the management console or the white button.

- **PFW1548-5**

Were any memory DIMMs removed from system backplane?

**No** Go to PFW1548-8.

**Yes** Go to the next step.

- **PFW1548-6**

1. Turn off the power, and remove the power cords.
2. Replug the memory DIMMs that were removed in PFW1548-4 in their original locations.
3. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
4. Turn on the power using either the management console or the white button.

If a management console is attached, does the managed system reach power on at hypervisor standby as indicated on the management console? If a management console is not attached, does the system reach an operating system login prompt, or if booting the stand-alone diagnostic CD-ROM, is the Please define the System Console screen displayed?

**No:**

A memory DIMM in the pair you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMM pair with new or previously removed memory DIMM pair. Repeat this step until the defective memory DIMM pair is identified, or all memory DIMM pairs have been replaced.

If your symptom did not change and all the memory DIMM pairs have been exchanged, call your service support person for assistance. If the symptom changed, check for loose cards and obvious problems.

If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

**Yes:** Go to PFW1548-7.1.

- **PFW1548-7.1**

No failure was detected with this configuration.

1. Turn off the power and remove the power cords.
2. Reinstall the next DIMM pair.
3. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
4. Turn on the power using either the management console or the white button.

If a management console is attached, does the managed system reach power on at hypervisor standby as indicated on the management console? If a management console is not attached, does the system reach an operating system login prompt, or if booting the stand-alone diagnostic CD-ROM, is the Please define the System Console screen displayed?

**No:** One of the FRUs remaining in the system is defective. Exchange the FRUs (that have not already been changed) in the following order:

- a. Memory DIMMs (if present). Exchange the DIMM pairs, one at a time, with new or previously removed DIMM pairs.
- b. System backplane
- c. Power supplies
- d. Processor modules

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

**Yes:** If all of the processor cards have been reinstalled, go to step PFW1548-8. Otherwise, repeat this step.

- **PFW1548-8**

1. Turn off the power.
2. Reconnect the system console.

**Notes:**

- a. If an ASCII terminal has been defined as the firmware console, attach the ASCII terminal cable to the S1 connector on the rear of the system unit.
  - b. If a display attached to a display adapter has been defined as the firmware console, install the display adapter and connect the display to the adapter. Plug the keyboard and mouse into the keyboard connector on the rear of the system unit.
3. Turn on the power using either the management console or the white button. (If the stand-alone diagnostic CD-ROM is not in the optical drive, insert it now.) If a management console is attached, after the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the stand-alone diagnostic CD-ROM.
  4. If the ASCII terminal or graphics display (including display adapter) is connected differently from the way it was previously, the console selection screen appears. Select a firmware console.
  5. Immediately after the word *keyboard* is displayed, press the number 1 key on the directly attached keyboard, an ASCII terminal or management console. This activates the system management services (SMS).
  6. Enter the appropriate password if you are prompted to do so.

Is the SMS screen displayed?

**No** One of the FRUs remaining in the system unit is defective.

If you are using an ASCII terminal, go to the problem determination procedures for the display.  
If you do not find a problem, replace the system backplane.

**Yes** Go to the next step.

- **PFW1548-9**

1. Make sure the stand-alone diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Use the cam levers to reconnect the disk drive enclosure assembly to the I/O backplane.
4. Reconnect the removable media or disk drive enclosure assembly.
5. Plug in the power cords and wait for 01 in the upper-left corner of the operator panel display.
6. Turn on the power using either the management console or the white button. (If the stand-alone diagnostic CD-ROM is not in the optical drive, insert it now.) If a management console is attached, after the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the stand-alone diagnostic CD-ROM.
7. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No:** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs in the order listed that have not been exchanged.

1. Optical drive
2. Removable media enclosure
3. System backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

**Yes:** Go to the next step.

• **PFW1548-10**

The system is working correctly with this configuration. One of the disk drives that you removed from the disk drive backplanes may be defective.

1. Make sure the stand-alone diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Install a disk drive in the media or disk drive enclosure assembly.
4. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
5. Turn on the power.
6. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** Exchange the FRUs in the order listed that have not been exchanged.

1. Last disk drive installed
2. Disk drive backplane

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

**Yes** Repeat this step with all disk drives that were installed in the disk drive backplane.

After all of the disk drives have been reinstalled, go to the next step.

• **PFW1548-11**

The system is working correctly with this configuration. One of the devices that was disconnected from the system backplane may be defective.

1. Turn off the power and remove the power cords.
2. Attach a system backplane device (for example: system port 1, system port 2, USB, keyboard, mouse, Ethernet) that had been removed.

After all of the I/O backplane device cables have been reattached, reattached the cables to the service processor one at a time.

3. Plug in the power cords and wait for 01 in the upper-left corner on the operator panel display.
4. Turn on the power using either the management console or the white button. (If the stand-alone diagnostic CD-ROM is not in the optical drive, insert it now.) If a management console is attached, after the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the

**Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the stand-alone diagnostic CD-ROM.

5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** The last device or cable that you attached is defective.

To test each FRU, exchange the FRUs in the order listed.

1. Device and cable (last one attached).
2. System backplane

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

**Yes** Repeat this step until all of the devices are attached. Go to the next step.

• **PFW1548-12**

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed may be defective.

1. Turn off the power and remove the power cords.
2. Install a FRU (adapter) and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
4. Turn on the power using either the management console or the white button. (If the stand-alone diagnostic CD-ROM is not in the optical drive, insert it now.) If a management console is attached, after the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the stand-alone diagnostic CD-ROM.
5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** Go to the next step.

**Yes** Repeat this step until all of the FRUs (adapters) are installed. Go to Verifying a repair.

• **PFW1548-13**

The last FRU installed or one of its attached devices is probably defective.

1. Make sure the stand-alone diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for the 01 in the upper-left corner on the operator panel display.
5. Turn on the power using either the management console or the white button. (If the stand-alone diagnostic CD-ROM is not in the optical drive, insert it now.) If a management console is attached, after the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the Advanced activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the stand-alone diagnostic CD-ROM.
6. If the Console Selection screen is displayed, choose the system console.

7. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** Repeat this step until the defective device or cable is identified or all devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the order listed.

1. Adapter (last one installed)
2. System backplane

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis and follow the instructions for the new symptom.

**Yes** The last device or cable that you disconnected is defective. Exchange the defective device or cable then go to the next step.

- **PFW1548-14**

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. Select **Advanced Diagnostics Routines**.
4. If the terminal type has not been defined, you must use the option **Initialize Terminal** on the FUNCTION SELECTION menu to initialize the diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the console display.
5. If the NEW RESOURCE screen is displayed, select an option from the bottom of the screen.

**Note:** Adapters and devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require supplemental media, select option 1.

6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select **All Resources**. (If you were sent here from step PFW1548-18, select the adapter or device that was loaded from the supplemental media).

Did you get an SRN?

**No** Go to step PFW1548-16.

**Yes** Go to the next step.

- **PFW1548-15**

Look at the FRU part numbers associated with the SRN.

Have you exchanged all the FRUs that correspond to the failing function codes (FFCs)?

**No** Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged. Go to Verifying a repair.

**Yes** If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-16**

Does the system have adapters or devices that require supplemental media?

**No** Go to step the next step.

**Yes** Go to step PFW1548-18.

- **PFW1548-17**

Consult the PCI adapter configuration documentation for your operating system to verify that all adapters are configured correctly.

Go to Verifying a repair.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-18**

1. Select **Task Selection**.

2. Select **Process Supplemental Media** and follow the on-screen instructions to process the media. Supplemental media must be loaded and processed one at a time.

Did the system return to the TASKS SELECTION SCREEN after the supplemental media was processed?

**No** Go to the next step.

**Yes** Press F3 to return to the FUNCTION SELECTION screen. Go to step PFW1548-14 substep 4.

- **PFW1548-19**

The adapter or device is probably defective.

If the supplemental media is for an adapter, replace the FRUs in the following order:

1. Adapter
2. System backplane

If the supplemental media is for a device, replace the FRUs in the following order:

1. Device and any associated cables
2. The adapter to which the device is attached

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis and follow the instructions for the new symptom.

Go to Verifying a repair.

**This ends the procedure.**

## **PFW1548: Memory and processor subsystem problem isolation procedure when a management console is attached**

This procedure is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

Perform the following procedure:

- **PFW1548-1**

1. Ensure that the diagnostics and the operating system are shut down.

Is the system at "service processor standby", indicated by 01 in the control panel?

**No** Replace the system backplane, location: *Un-P1*. Return to step PFW1548-1.

**Yes** Continue with substep 2 on page 315.



2. Turn on the power using either the white button or the ASMI menus.  
Does the system reach hypervisor standby as indicated on the management console?

**No** Go to PFW1548-3.

**Yes** Go to PFW1548-2.

3. Insert the stand-alone diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to PFW1548-2.

4. When the word *keyboard* is displayed on an ASCII terminal, a directly attached keyboard, or management console, press the number 5 key.

5. If you are prompted to do so, enter the appropriate password.

Is the "Please define the System Console" screen displayed?

**No** Go to PFW1548-2.

**Yes** Go to PFW1548-14.

- **PFW1548-2**

Insert the stand-alone diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to step PFW1548-3.

Turn on the power using either the white button or the ASMI menus. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.

If you are prompted to do so, enter the appropriate password.

Is the "Please define the System Console" screen displayed?

**No** Go to PFW1548-3.

**Yes** Go to PFW1548-14.

- **PFW1548-3**

1. Turn off the power.
2. If you have not already done so, configure the service processor (using the ASMI menus), follow the instructions in note 6 located in "PFW1548: Memory and processor subsystem problem isolation procedure" on page 306 and then return here and continue.
3. Exit the service processor (ASMI) menus and remove the power cords.
4. Disconnect all external cables (parallel, system port 1, system port 2, keyboard, mouse, USB devices, SPCN, Ethernet, and so on). Also disconnect all of the external cables attached to the service processor except the Ethernet cable going to the management console.

Go to the next step.

- **PFW1548-4**

1. If this is a deskside system, remove the service access cover. If this is a rack-mounted system, place the drawer into the service position and remove the service access cover. Also remove the front cover.
2. Record the slot numbers of the PCI adapters and I/O expansion cards if present. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.
3. Remove the removable media or disk drive enclosure assembly by pulling out the blue tabs at the bottom of the enclosure, then sliding the enclosure out approximately three centimeters.
4. Remove and label the disk drives from the media or disk drive enclosure assembly.
5. Remove one of the two memory DIMM pairs.
6. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.

7. Turn on the power using either the management console or the white button.

Does the managed system reach power on at hypervisor standby as indicated on the management console?

**No** Go to PFW1548-7.

**Yes** Go to the next step.

• **PFW1548-5**

Were any memory DIMMs removed from system backplane?

**No** Go to PFW1548-8.

**Yes** Go to the next step.

• **PFW1548-6**

1. Turn off the power, and remove the power cords.
2. Replug the memory DIMMs that were removed from system backplane in PFW1548-2 in their original locations.
3. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
4. Turn on the power using either the management console or the white button.

Does the managed system reach power on at hypervisor standby as indicated on the management console?

**No** A memory DIMM in the pair you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMM pair with new or previously removed memory DIMM pair. Repeat this step until the defective memory DIMM pair is identified, or both memory DIMM pairs have been exchanged.

If your symptom did not change and both the memory DIMM pairs have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Go to the next step.

• **PFW1548-7**

One of the FRUs remaining in the system unit is defective.

**Note:** If a memory DIMM is exchanged, ensure that the new memory DIMM is the same size and speed as the original memory DIMM.

1. Turn off the power, remove the power cords, and exchange the following FRUs, one at a time, in the order listed:
  - a. Memory DIMMs. Exchange one pair at a time with new or previously removed DIMM pairs
  - b. System backplane, location:  $U_n$ -P1
  - c. Power supplies, locations:  $U_n$ -E1 and  $U_n$ -E2.
2. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
3. Turn on the power using either the management console or the white button.

Does the managed system reach power on at hypervisor standby as indicated on the management console?

**No** Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Go to Verifying a repair.

• **PFW1548-8**

1. Turn off the power.
2. Reconnect the system console.

**Notes:**

- a. If an ASCII terminal has been defined as the firmware console, attach the ASCII terminal cable to the S1 connector on the rear of the system unit.
  - b. If a display attached to a display adapter has been defined as the firmware console, install the display adapter and connect the display to the adapter. Plug the keyboard and mouse into the keyboard connector on the rear of the system unit.
3. Turn on the power using either the management console or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.
  4. If the ASCII terminal or graphics display (including display adapter) is connected differently from the way it was previously, the console selection screen appears. Select a firmware console.
  5. Immediately after the word *keyboard* is displayed, press the number 1 key on the directly attached keyboard, an ASCII terminal or management console. This activates the system management services (SMS).
  6. Enter the appropriate password if you are prompted to do so.

Is the SMS screen displayed?

**No** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. If you are using an ASCII terminal, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - a. Replace the system backplane, location: *Un-P1*.
2. If you are using a graphics display, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - a. Replace the display adapter.
  - b. Replace the backplane in which the graphics adapter is plugged.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Go to the next step.

• **PFW1548-9**

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Use the cam levers to reconnect the disk drive enclosure assembly to the I/O backplane.

4. Reconnect the removable media or disk drive enclosure assembly by sliding the media enclosure toward the rear of the system, then pressing the blue tabs.
5. Plug in the power cords and wait for 01 in the upper-left corner of the operator panel display.
6. Turn on the power using either the management console or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.
7. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. Optical drive
2. Removable media enclosure.
3. System backplane, Un-P1.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Go to the next step.

• **PFW1548-10**

The system is working correctly with this configuration. One of the disk drives that you removed from the disk drive backplanes may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Install a disk drive in the media or disk drive enclosure assembly.
4. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
5. Turn on the power.
6. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** Exchange the FRUs that have not been exchanged, in the following order:

1. Last disk drive installed
2. Disk drive backplane.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Repeat this step with all disk drives that were installed in the disk drive backplane.

After all of the disk drives have been reinstalled, go to the next step.

• **PFW1548-11**

The system is working correctly with this configuration. One of the devices that was disconnected from the system backplane may be defective.

1. Turn off the power and remove the power cords.
2. Attach a system backplane device (for example: system port 1, system port 2, USB, keyboard, mouse, Ethernet) that had been removed.

After all of the device cables have been reattached, reattached the cables to the service processor one at a time.

3. Plug in the power cords and wait for 01 in the upper-left corner on the operator panel display.
4. Turn on the power using either the management console or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.
5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** The last device or cable that you attached is defective.

To test each FRU, exchange the FRUs in the following order:

1. Device and cable (last one attached)
2. System backplane, location: Un-P1.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Repeat this step until all of the devices are attached. Go to the next step.

• **PFW1548-12**

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed may be defective.

1. Turn off the power and remove the power cords.
2. Install a FRU (adapter) and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
4. Turn on the power using either the management console or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.
5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** Go to the next step.

**Yes** Repeat this step until all of the FRUs (adapters) are installed. Go to Verifying a repair.

• **PFW1548-13**

The last FRU installed or one of its attached devices is probably defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for the 01 in the upper-left corner on the operator panel display.
5. Turn on the power using either the management console or the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.) After the system has reached hypervisor standby, activate a Linux or AIX partition by clicking the **Advanced** button on the Advanced activation screen. On the Advanced activation screen, select **Boot in service mode using the default boot list** to boot the diagnostic CD-ROM.
6. If the Console Selection screen is displayed, choose the system console.
7. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** Repeat this step until the defective device or cable is identified or all devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:

1. Adapter (last one installed)
2. System backplane, location: *Un-P1*.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** The last device or cable that you disconnected is defective. Exchange the defective device or cable then go to the next step.

• **PFW1548-14**

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. Select **Advanced Diagnostics Routines**.
4. If the terminal type has not been defined, you must use the option **Initialize Terminal** on the FUNCTION SELECTION menu to initialize the stand-alone diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the console display.
5. If the NEW RESOURCE screen is displayed, select an option from the bottom of the screen.

**Note:** Adapters and devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require supplemental media, select option 1.

6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select **All Resources**. (If you were sent here from step PFW1548-18, select the adapter or device that was loaded from the supplemental media).

Did you get an SRN?

- No** Go to step PFW1548-16.
- Yes** Go to the next step.
- **PFW1548-15**  
 Look at the FRU part numbers associated with the SRN.  
 Have you exchanged all the FRUs that correspond to the failing function codes (FFCs)?  

**No** Exchange the FRU with the highest failure percentage that has not been changed.  
 Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged. Go to Verifying a repair.

**Yes** If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.
  - **PFW1548-16**  
 Does the system have adapters or devices that require supplemental media?  

**No** Go to step the next step.

**Yes** Go to step PFW1548-18.
  - **PFW1548-17**  
 Consult the PCI adapter configuration documentation for your operating system to verify that all adapters are configured correctly.  
 Go to Verifying a repair.  
 If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.
  - **PFW1548-18**
    1. Select **Task Selection**.
    2. Select **Process Supplemental Media** and follow the on-screen instructions to process the media. Supplemental media must be loaded and processed one at a time.
 Did the system return to the TASKS SELECTION SCREEN after the supplemental media was processed?  

**No** Go to the next step.

**Yes** Press F3 to return to the FUNCTION SELECTION screen. Go to step PFW1548-14, substep 4 on page 320.
  - **PFW1548-19**  
 The adapter or device is probably defective.  
 If the supplemental media is for an adapter, replace the FRUs in the following order:
    1. Adapter
    2. System backplane, location: Un-P1.
 If the supplemental media is for a device, replace the FRUs in the following order:
    1. Device and any associated cables
    2. The adapter to which the device is attached
 Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.  
 If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.  
 If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.  
 Go to Verifying a repair.  
 This ends the procedure.

## **PFW1548: Memory and processor subsystem problem isolation procedure without a management console attached**

This procedure is used to locate defective FRUs not found by normal diagnostics. For this procedure, diagnostics are run on a minimally configured system. If a failure is detected on the minimally configured system, the remaining FRUs are exchanged one at a time until the failing FRU is identified. If a failure is not detected, FRUs are added back until the failure occurs. The failure is then isolated to the failing FRU.

Perform the following procedure:

### • **PFW1548-1**

1. Ensure that the diagnostics and the operating system are shut down.

Is the system at "service processor standby", indicated by 01 in the control panel?

**No** Replace the system backplane, location: *Un-P1*. Return to step PFW1548-1.

**Yes** Continue with substep 2.

2. Turn on the power using either the white button or the ASMI menus.

Does the system reach an operating system login prompt, or if booting the stand-alone diagnostic CD-ROM, is the "Please define the System Console" screen displayed?

**No** Go to PFW1548-3.

**Yes** Go to PFW1548-2.

3. Insert the stand-alone diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to PFW1548-2.

4. When the word *keyboard* is displayed on an ASCII terminal or a directly attached keyboard, press the number 5 key.

5. If you are prompted to do so, enter the appropriate password.

Is the "Please define the System Console" screen displayed?

**No** Go to PFW1548-2.

**Yes** Go to PFW1548-14.

### • **PFW1548-2**

1. Insert the stand-alone diagnostic CD-ROM into the optical drive.

**Note:** If you cannot insert the diagnostic CD-ROM, go to step PFW1548-3.

2. Turn on the power using either the white button or the ASMI menus. If the diagnostic CD-ROM is not in the optical drive, insert it now. If you are prompted to do so, enter the appropriate password.

Is the "Please define the System Console" screen displayed?

**No** Go to PFW1548-3.

**Yes** Go to PFW1548-14.

### • **PFW1548-3**

1. Turn off the power.
2. If you have not already done so, configure the service processor (using the ASMI menus) with the instructions in note 6 on page 307 at the beginning of this procedure, then return here and continue.
3. Exit the service processor (ASMI) menus and remove the power cords.
4. Disconnect all external cables (parallel, system port 1, system port 2, keyboard, mouse, USB devices, SPCN, Ethernet, and so on). Also disconnect all of the external cables attached to the service processor.



Go to the next step.

• **PFW1548-4**

1. If this is a desktide system, remove the service access cover. If this is a rack-mounted system, place the drawer into the service position and remove the service access cover. Also remove the front cover.
2. Record the slot numbers of the PCI adapters and I/O expansion cards if present. Label and record the locations of all cables attached to the adapters. Disconnect all cables attached to the adapters and remove all of the adapters.
3. Remove the removable media or disk drive enclosure assembly by pulling out the blue tabs at the bottom of the enclosure, then sliding the enclosure out approximately three centimeters.
4. Remove and label the disk drives from the media or disk drive enclosure assembly.
5. Remove a memory DIMM pair.
6. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
7. Turn on the power using the white button.

Does the system reach an operating system login prompt, or if booting the stand-alone diagnostic CD-ROM, is the "Please define the System Console" screen displayed?

**No** Go to PFW1548-7.

**Yes** Go to the next step.

• **PFW1548-5**

Were any memory DIMMs removed from system backplane?

**No** Go to PFW1548-8.

**Yes** Go to the next step.

• **PFW1548-6**

1. Turn off the power, and remove the power cords.
2. Replug the memory DIMMs that were removed from the system backplane in PFW1548-2 in their original locations.
3. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
4. Turn on the power using the white button.

Does the system reach an operating system login prompt, or if booting the stand-alone diagnostic CD-ROM, is the "Please define the System Console" screen displayed?

**No** A memory DIMM in the pair you just replaced in the system is defective. Turn off the power, remove the power cords, and exchange the memory DIMMs pair with new or previously removed memory DIMM pair. Repeat this step until the defective memory DIMM pair is identified, or both memory DIMM pairs have been exchanged.

If your symptom did not change and both the memory DIMM pairs have been exchanged, call your service support person for assistance.

If the symptom changed, check for loose cards and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Go to the next step.

• **PFW1548-7**

One of the FRUs remaining in the system unit is defective.

**Note:** If a memory DIMM is exchanged, ensure that the new memory DIMM is the same size and speed as the original memory DIMM.

1. Turn off the power, remove the power cords, and exchange the following FRUs, one at a time, in the order listed:

- a. Memory DIMMs. Exchange one pair at a time with new or previously removed DIMM pairs.
  - b. System backplane, location:  $Un-P1$
  - c. Power supplies, locations:  $Un-E1$  and  $Un-E2$ .
2. Plug in the power cords and wait for 01 in the upper-left corner of the control panel display.
  3. Turn on the power using the white button.

Does the system reach an operating system login prompt, or if booting the stand-alone diagnostic CD-ROM, is the "Please define the System Console" screen displayed?

**No** Reinstall the original FRU.

Repeat the FRU replacement steps until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Go to Verifying a repair.

• **PFW1548-8**

1. Turn off the power.
2. Reconnect the system console.

**Notes:**

- a. If an ASCII terminal has been defined as the firmware console, attach the ASCII terminal cable to the S1 connector on the rear of the system unit.
  - b. If a display attached to a display adapter has been defined as the firmware console, install the display adapter and connect the display to the adapter. Plug the keyboard and mouse into the keyboard connector on the rear of the system unit.
3. Turn on the power using the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.)
  4. If the ASCII terminal or graphics display (including display adapter) is connected differently from the way it was previously, the console selection screen appears. Select a firmware console.
  5. Immediately after the word *keyboard* is displayed, press the number 1 key on the directly attached keyboard, or an ASCII terminal. This action activates the system management services (SMS).
  6. Enter the appropriate password if you are prompted to do so.

Is the SMS screen displayed?

**No** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. If you are using an ASCII terminal, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - a. Replace the system backplane, location:  $Un-P1$ .
2. If you are using a graphics display, go to the problem determination procedures for the display. If you do not find a problem, do the following:
  - a. Replace the display adapter.
  - b. Replace the backplane in which the graphics adapter is plugged.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Go to the next step.

• **PFW1548-9**

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Use the cam levers to reconnect the disk drive enclosure assembly to the I/O backplane.
4. Reconnect the removable media or disk drive enclosure assembly by sliding the media enclosure toward the rear of the system, then pressing the blue tabs.
5. Plug in the power cords and wait for 01 in the upper-left corner of the operator panel display.
6. Turn on the power using the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.)
7. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** One of the FRUs remaining in the system unit is defective.

Exchange the FRUs that have not been exchanged, in the following order:

1. Optical drive
2. Removable media enclosure.
3. System backplane, *Un-P1*.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Go to the next step.

• **PFW1548-10**

The system is working correctly with this configuration. One of the disk drives that you removed from the disk drive backplanes may be defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Install a disk drive in the media or disk drive enclosure assembly.
4. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
5. Turn on the power.
6. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** Exchange the FRUs that have not been exchanged, in the following order:

1. Last disk drive installed
2. Disk drive backplane.

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Repeat this step with all disk drives that were installed in the disk drive backplane.

After all of the disk drives have been reinstalled, go to the next step.

• **PFW1548-11**

The system is working correctly with this configuration. One of the devices that was disconnected from the system backplane may be defective.

1. Turn off the power and remove the power cords.
2. Attach a system backplane device (for example: system port 1, system port 2, USB, keyboard, mouse, Ethernet) that had been removed.

After all of the device cables have been reattached, reattached the cables to the service processor one at a time.

3. Plug in the power cords and wait for 01 in the upper-left corner on the operator panel display.
4. Turn on the power using the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.)
5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** The last device or cable that you attached is defective.

To test each FRU, exchange the FRUs in the following order:

1. Device and cable (last one attached)
2. System backplane, location: Un-P1.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** Repeat this step until all of the devices are attached. Go to the next step.

• **PFW1548-12**

The system is working correctly with this configuration. One of the FRUs (adapters) that you removed may be defective.

1. Turn off the power and remove the power cords.
2. Install a FRU (adapter) and connect any cables and devices that were attached to the FRU.
3. Plug in the power cords and wait for the OK prompt to display on the operator panel display.
4. Turn on the power using the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.)
5. If the Console Selection screen is displayed, choose the system console.
6. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
7. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** Go to the next step.

**Yes** Repeat this step until all of the FRUs (adapters) are installed. Go to Verifying a repair.

• **PFW1548-13**

The last FRU installed or one of its attached devices is probably defective.

1. Make sure the diagnostic CD-ROM is inserted into the optical drive.
2. Turn off the power and remove the power cords.
3. Starting with the last installed adapter, disconnect one attached device and cable.
4. Plug in the power cords and wait for the 01 in the upper-left corner on the operator panel display.
5. Turn on the power using either the white button. (If the diagnostic CD-ROM is not in the optical drive, insert it now.)
6. If the Console Selection screen is displayed, choose the system console.
7. Immediately after the word *keyboard* is displayed, press the number 5 key on either the directly attached keyboard or on an ASCII terminal keyboard.
8. Enter the appropriate password if you are prompted to do so.

Is the "Please define the System Console" screen displayed?

**No** Repeat this step until the defective device or cable is identified or all devices and cables have been disconnected.

If all the devices and cables have been removed, then one of the FRUs remaining in the system unit is defective.

To test each FRU, exchange the FRUs in the following order:

1. Adapter (last one installed)
2. System backplane, location: *Un-P1*.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

**Yes** The last device or cable that you disconnected is defective. Exchange the defective device or cable and then go to the next step.

• **PFW1548-14**

1. Follow the instructions on the screen to select the system console.
2. When the DIAGNOSTIC OPERATING INSTRUCTIONS screen is displayed, press Enter.
3. Select **Advanced Diagnostics Routines**.
4. If the terminal type has not been defined, you must use the option **Initialize Terminal** on the FUNCTION SELECTION menu to initialize the stand-alone diagnostic environment before you can continue with the diagnostics. This is a separate operation from selecting the console display.
5. If the NEW RESOURCE screen is displayed, select an option from the bottom of the screen.

**Note:** Adapters and devices that require supplemental media are not shown in the new resource list. If the system has adapters or devices that require supplemental media, select option 1.

6. When the DIAGNOSTIC MODE SELECTION screen is displayed, press Enter.
7. Select **All Resources**. If you were sent here from step PFW1548-18, select the adapter or device that was loaded from the supplemental media.

Did you get an SRN?

**No** Go to step PFW1548-16.

**Yes** Go to the next step.

- **PFW1548-15**

Look at the FRU part numbers associated with the SRN.

Have you exchanged all the FRUs that correspond to the failing function codes (FFCs)?

**No** Exchange the FRU with the highest failure percentage that has not been changed.

Repeat this step until all the FRUs associated with the SRN have been exchanged or diagnostics run with no trouble found. Run diagnostics after each FRU is exchanged. Go to Verifying a repair.

**Yes** If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-16**

Does the system have adapters or devices that require supplemental media?

**No** Go to step the next step.

**Yes** Go to step PFW1548-18.

- **PFW1548-17**

Consult the PCI adapter configuration documentation for your operating system to verify that all adapters are configured correctly.

Go to Verifying a repair.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

- **PFW1548-18**

1. Select **Task Selection**.

2. Select **Process Supplemental Media** and follow the on-screen instructions to process the media. Supplemental media must be loaded and processed one at a time.

Did the system return to the TASKS SELECTION SCREEN after the supplemental media was processed?

**No** Go to the next step.

**Yes** Press F3 to return to the FUNCTION SELECTION screen. Go to step PFW1548-14, substep 4 on page 327.

- **PFW1548-19**

The adapter or device is probably defective.

If the supplemental media is for an adapter, replace the FRUs in the following order:

1. Adapter
2. System backplane, location: Un-P1.

If the supplemental media is for a device, replace the FRUs in the following order:

1. Device and any associated cables
2. The adapter to which the device is attached

Repeat this step until the defective FRU is identified or all the FRUs have been exchanged.

If the symptom did not change and all the FRUs have been exchanged, call service support for assistance.

If the symptom has changed, check for loose cards, cables, and obvious problems. If you do not find a problem, go to the Problem Analysis procedures and follow the instructions for the new symptom.

Go to Verifying a repair.

This ends the procedure.

## **SAS fabric identification**

Use this information to determine the FRUs to replace when there is a SAS fabric connection problem.

Determine if the connection problem is with a single device or multiple devices. For AIX or Linux operating systems, see Viewing SAS fabric path information to view the status of SAS fabric paths. For the IBM i operating system, see Viewing SAS fabric path information to view the status of SAS fabric paths. Then use the following tables to determine the service action to perform.

Table 24. Service actions for SAS fabric connection problems on a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A

| Location of device or devices                                                                    | Connection problem with a single device other than a tape device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Connection problem with multiple devices                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A                                    | <p>Replace the following FRUs, one at a time, in the order shown until the problem is resolved. See 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A locations to determine the location, part number, and replacement procedure to use for each FRU.</p> <ol style="list-style-type: none"> <li>1. Device at location <math>U_n</math>-P2-Dx.</li> <li>2. Device backplane at location <math>U_n</math>-P2.</li> <li>3. Front SAS cable.</li> <li>4. Replace the adapter that logged the error. The adapter might be any of the following possible failing items: <ul style="list-style-type: none"> <li>• PCIe3 x8 SAS RAID internal adapter (<math>U_n</math>-P1-C14 or <math>U_n</math>-P1-C15)</li> <li>• PCIe3 x8 cache SAS RAID internal adapter and backup power module card (<math>U_n</math>-P1-C14 and <math>U_n</math>-P1-C14-C1 or <math>U_n</math>-P1-C15 and <math>U_n</math>-P1-C15-C1)</li> </ul> </li> </ol> | <p>Replace the following FRUs, one at a time, in the order shown until the problem is resolved. See 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A locations to determine the location, part number, and replacement procedure to use for each FRU.</p> <ol style="list-style-type: none"> <li>1. Device backplane at location <math>U_n</math>-P2.</li> <li>2. Front SAS cable.</li> <li>3. Replace the adapter that logged the error. The adapter might be any of the following possible failing items: <ul style="list-style-type: none"> <li>• PCIe3 x8 SAS RAID internal adapter (<math>U_n</math>-P1-C14 or <math>U_n</math>-P1-C15)</li> <li>• PCIe3 x8 cache SAS RAID internal adapter and backup power module card (<math>U_n</math>-P1-C14 and <math>U_n</math>-P1-C14-C1 or <math>U_n</math>-P1-C15 and <math>U_n</math>-P1-C15-C1)</li> </ul> </li> </ol> |
| Disk expansion unit attached to an 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A | Replace the device located in the disk expansion drawer. If that does not resolve the problem, see the service information for the disk expansion unit for additional FRUs to replace.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Replace the rear SAS cable and the external cables to the disk expansion unit. If that does not resolve the problem, see the service information for the disk expansion unit for additional FRUs to replace.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

Table 24. Service actions for SAS fabric connection problems on a 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, or 8286-42A (continued)

| Location of device or devices                                      | Connection problem with a single device other than a tape device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Connection problem with multiple devices                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8247-42L, 8286-41A, or 8286-42A                                    | <p>Replace the following FRUs, one at a time, in the order shown until the problem is resolved. See 8247-42L, 8286-41A, or 8286-42A locations to determine the location, part number, and replacement procedure to use for each FRU.</p> <ol style="list-style-type: none"> <li>1. Device at location <math>U_n</math>-P2-Dx.</li> <li>2. Device backplane at location <math>U_n</math>-P2.</li> <li>3. Front SAS cable.</li> <li>4. Replace the adapter that logged the error. The adapter might be any of the following possible failing items: <ul style="list-style-type: none"> <li>• PCIe3 x8 SAS RAID internal adapter (<math>U_n</math>-P1-C14 or <math>U_n</math>-P1-C15)</li> <li>• PCIe3 x8 cache SAS RAID internal adapter (<math>U_n</math>-P1-C14 or <math>U_n</math>-P1-C15)</li> </ul> </li> </ol> | <p>Replace the following FRUs, one at a time, in the order shown until the problem is resolved. See 8247-42L, 8286-41A, or 8286-42A locations to determine the location, part number, and replacement procedure to use for each FRU.</p> <ol style="list-style-type: none"> <li>1. Device backplane at location <math>U_n</math>-P2.</li> <li>2. Front SAS cable.</li> <li>3. Replace the adapter that logged the error. The adapter might be any of the following possible failing items: <ul style="list-style-type: none"> <li>• PCIe3 x8 SAS RAID internal adapter (<math>U_n</math>-P1-C14 or <math>U_n</math>-P1-C15)</li> <li>• PCIe3 x8 cache SAS RAID internal adapter (<math>U_n</math>-P1-C14 or <math>U_n</math>-P1-C15)</li> </ul> </li> </ol> |
| Disk expansion unit attached to an 8247-42L, 8286-41A, or 8286-42A | <p>Replace the device located in the disk expansion drawer. If that does not resolve the problem, see the service information for the disk expansion unit for additional FRUs to replace.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>Replace the rear SAS cable and the external cables to the disk expansion unit. If that does not resolve the problem, see the service information for the disk expansion unit for additional FRUs to replace.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

Table 25. Service actions for SAS fabric connection problems on an 8408-44E or 8408-E8E

| Location of device or devices                           | Connection problem with a single device other than a tape device                                                                                                                                                                                                                                                                                                                                                                                   | Connection problem with multiple devices                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8408-44E or 8408-E8E                                    | <p>Replace the following FRUs, one at a time, in the order shown until the problem is resolved. See 8408-44E or 8408-E8E locations to determine the location, part number, and replacement procedure to use for each FRU.</p> <ol style="list-style-type: none"> <li>1. Device at location <math>U_n</math>-P4-Dx.</li> <li>2. Device backplane at location <math>U_n</math>-P4.</li> <li>3. RAID card at location <math>U_n</math>-P3.</li> </ol> | <p>Replace the following FRUs, one at a time, in the order shown until the problem is resolved. See 8408-44E or 8408-E8E locations to determine the location, part number, and replacement procedure to use for each FRU.</p> <ol style="list-style-type: none"> <li>1. Device backplane at location <math>U_n</math>-P4.</li> <li>2. RAID card at location <math>U_n</math>-P3.</li> </ol> |
| Disk expansion unit attached to an 8408-44E or 8408-E8E | <p>Replace the device located in the disk expansion drawer. If that does not resolve the problem, see the service information for the disk expansion unit for additional FRUs to replace.</p>                                                                                                                                                                                                                                                      | <p>Replace the rear SAS cable and the external cables to the disk expansion unit. If that does not resolve the problem, see the service information for the disk expansion unit for additional FRUs to replace.</p>                                                                                                                                                                         |



## SAS RAID configurations

Use this information to determine which configurations are valid on an 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8247-42L, 8284-21A, 8284-22A, 8286-41A, 8286-42A, 8408-44E, or 8408-E8E.

Select the system that you are servicing.

### SAS RAID configuration for system models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0T or EL3T

Use this information to determine which configurations are valid on system models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0T or EL3T.

System models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0T or EL3T have the following configuration. See the following figure.

- 12 small form-factor disk drives or solid-state drives
- One CCIN 57D7 storage controller
- Disk drive backplane CCIN 2B09

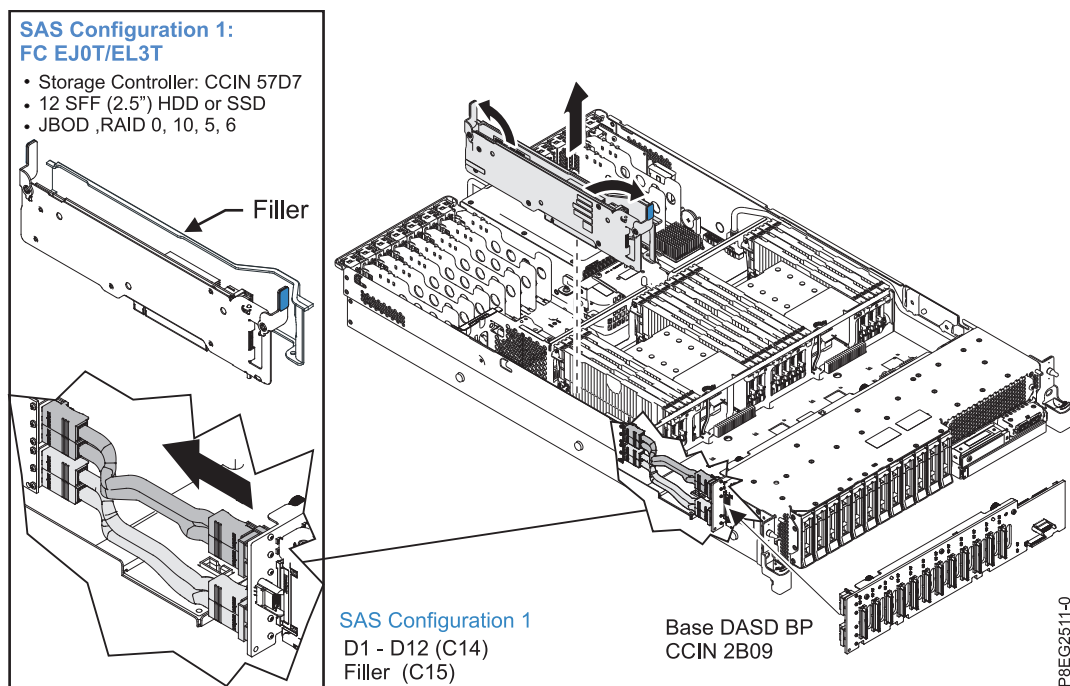


Figure 5. System models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0T or EL3T configuration

### SAS RAID configuration for system models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0V or EL3V

Use this information to determine which configurations are valid on system models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0V or EL3V.

System models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0V or EL3V have the following configuration. See the following figure.

- 12 small form-factor disk drives or solid-state drives
- Drives are split between two CCIN 57D7 storage controllers
- Disk drive backplane CCIN 2B09

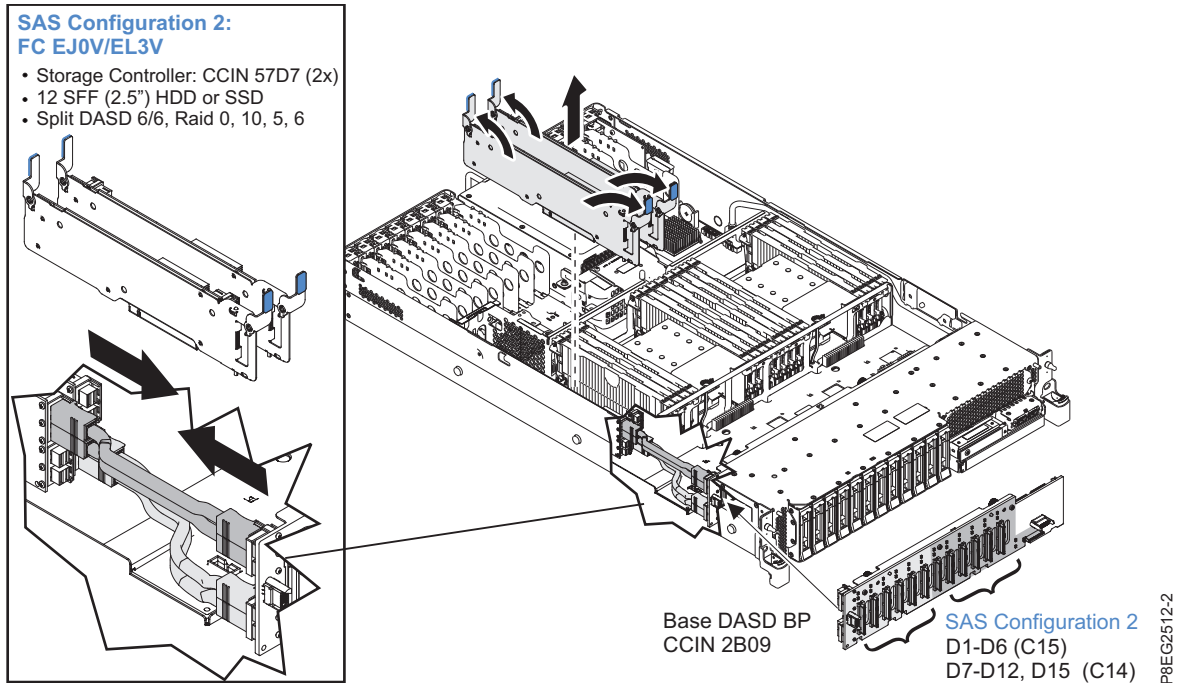


Figure 6. System models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0V or EL3V configuration

### SAS RAID configuration for system models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0U or EL3U

Use this information to determine which configurations are valid on system models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0U or EL3U.

System models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0U or EL3U have the following configuration. See the following figure.

- Eight small form-factor disk drives or solid-state drives
- Six 1.8 inch form-factor solid-state drives
- Two CCIN 57D8 storage controllers
- Disk drive backplane CCIN 2B5A

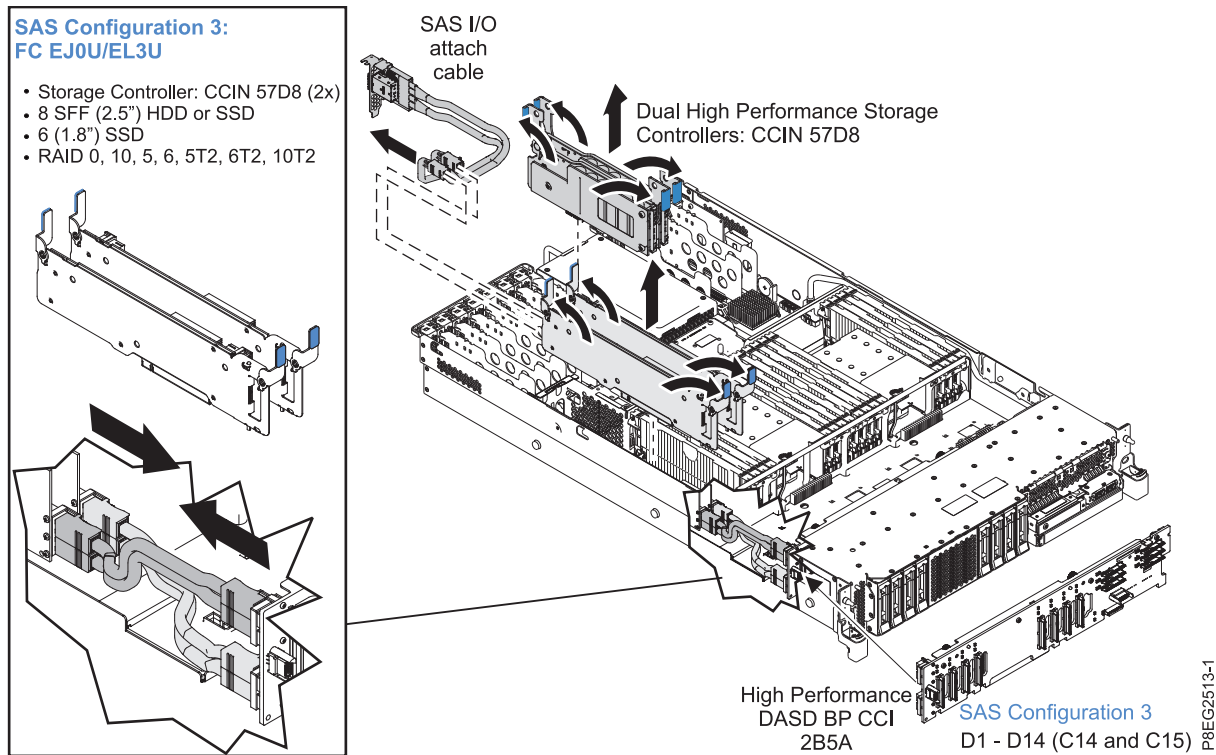


Figure 7. System models 5148-21L, 5148-22L, 8247-21L, 8247-22L, 8284-21A, or 8284-22A with feature code EJ0U or EL3U configuration

### SAS RAID configurations for system models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0N

Use this information to determine which configurations are valid on system models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0N.

System models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0N have the following configuration. See the following figure.

- 12 small form-factor disk drives or solid-state drives
- One CCIN 57D7 storage controller
- Disk drive backplane CCIN 2B09

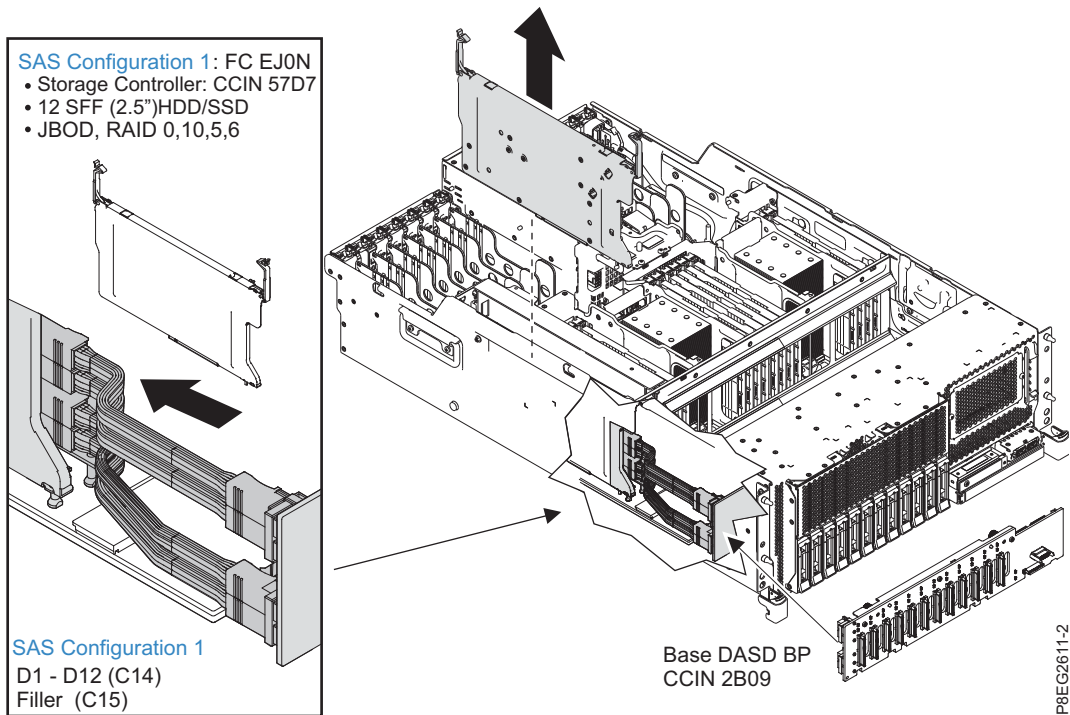


Figure 8. System models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0N configuration

## SAS RAID configurations for system models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0S

Use this information to determine which configurations are valid on system models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0S.

System models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0S have the following configuration. See the following figure.

- 12 small form-factor disk drives or solid-state drives
- Drives are split between two CCIN 57D7 storage controllers
- Disk drive backplane CCIN 2B09

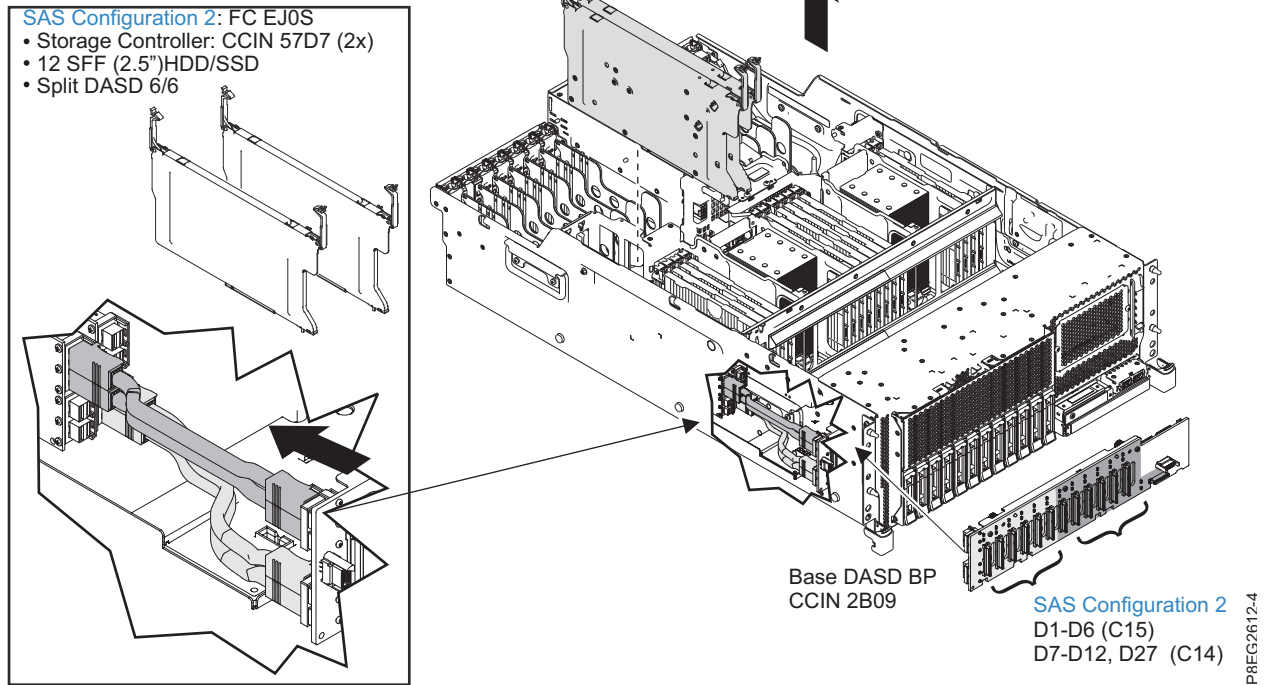


Figure 9. System models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0S configuration

### SAS RAID configuration for system models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0P

Use this information to determine which configurations are valid on system models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0P.

System models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0P has the following configuration. See the following figure.

- 18 small form-factor disk drives or solid-state drives
- Eight 1.8 inch form-factor solid-state drives
- Two CCIN 57D8 storage controllers
- Disk drive backplane CCIN 2B0F

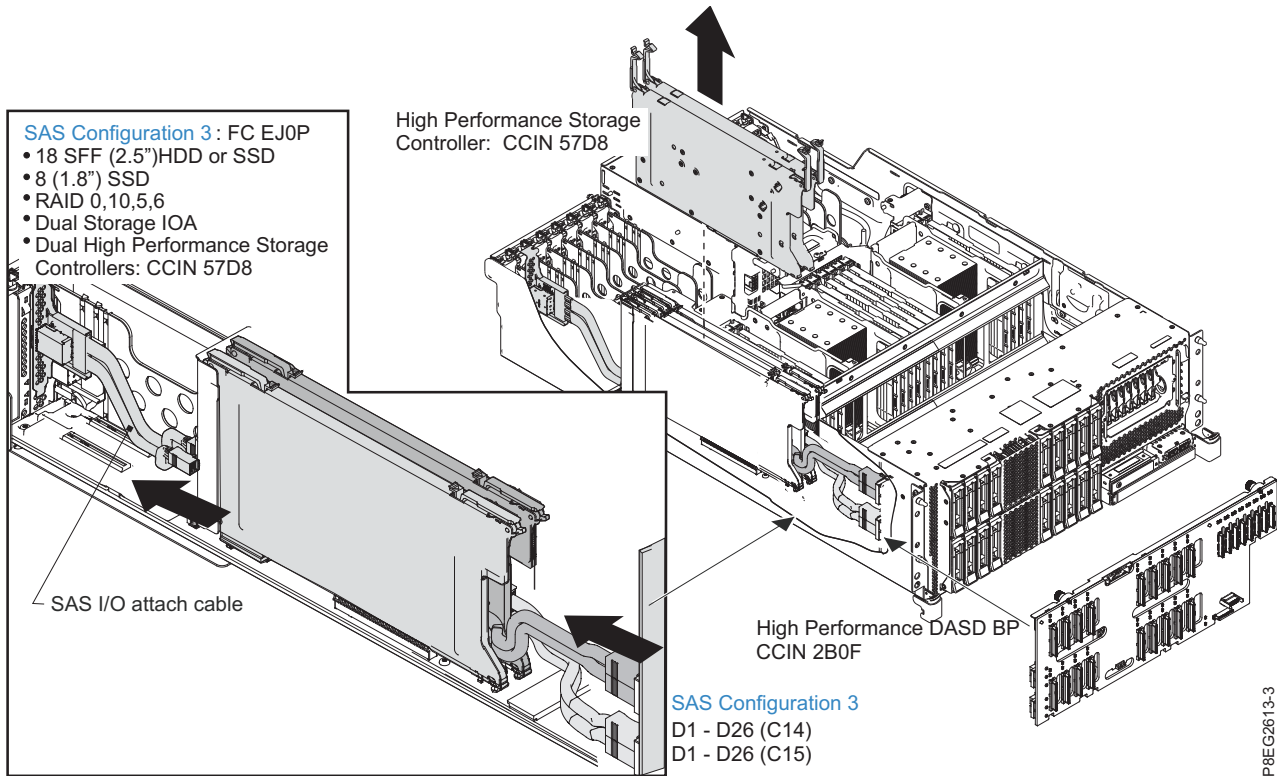


Figure 10. System models 8247-42L, 8286-41A, or 8286-42A with feature code EJ0P configuration

### SAS RAID configuration for system model 8408-44E or 8408-E8E with feature code EPVN

Use this information to determine which configurations are valid on system model 8408-44E or 8408-E8E with feature code EPVN.

Go to SAS subsystem with Dual RAID Controllers with Write Cache configuration for the 8408-44E or 8408-E8E.

### SAS RAID configuration for system model 8408-44E or 8408-E8E with feature code EPVP

Use this information to determine which configurations are valid on system model 8408-44E or 8408-E8E with feature code EPVP.

Go to SAS subsystem with Dual RAID Controllers without Write Cache configuration for the 8408-44E or 8408-E8E.

### SAS RAID configuration for system model 8408-44E or 8408-E8E with feature code EPVQ

Use this information to determine which configurations are valid on system model 8408-44E or 8408-E8E with feature code EPVQ.

Go to SAS subsystem configuration with Split Storage Backplane with two RAID Controllers without Write Cache for the 8408-44E or 8408-E8E.

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## Accessibility features for IBM Power Systems servers

Accessibility features assist users who have a disability, such as restricted mobility or limited vision, to use information technology content successfully.

### Overview

The IBM Power Systems servers include the following major accessibility features:

- Keyboard-only operation
- Operations that use a screen reader

The IBM Power Systems servers use the latest W3C Standard, WAI-ARIA 1.0 ([www.w3.org/TR/wai-aria/](http://www.w3.org/TR/wai-aria/)), to ensure compliance with US Section 508 ([www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards](http://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards)) and Web Content Accessibility Guidelines (WCAG) 2.0 ([www.w3.org/TR/WCAG20/](http://www.w3.org/TR/WCAG20/)). To take advantage of accessibility features, use the latest release of your screen reader and the latest web browser that is supported by the IBM Power Systems servers.

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## Keyboard navigation

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## Interface information

The IBM Power Systems servers user interfaces do not have content that flashes 2 - 55 times per second.

The IBM Power Systems servers web user interface relies on cascading style sheets to render content properly and to provide a usable experience. The application provides an equivalent way for low-vision users to use system display settings, including high-contrast mode. You can control font size by using the device or web browser settings.

The IBM Power Systems servers web user interface includes WAI-ARIA navigational landmarks that you can use to quickly navigate to functional areas in the application.

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

## Industry Canada Compliance Statement

CAN ICES-3 (A)/NMB-3(A)

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Technical Regulations, Abteilung M456  
IBM-Allee 1, 71139 Ehningen, Germany  
Tel: +49 800 225 5426  
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This statement explains the Japan JIS C 61000-3-2 product wattage compliance.

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要領に基づく定格入力電力値 : Knowledge Centerの各製品の  
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高調波電流規格 JIS C 61000-3-2 準用品

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- 回路分類 : 6 (単相、PFC回路付)
- 換算係数 : 0

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

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

**Electromagnetic Interference (EMI) Statement - Taiwan**

警告使用者：

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

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

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

**IBM Taiwan Contact Information:**

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

## **Electromagnetic Interference (EMI) Statement - Korea**

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

## **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 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 / EN 55032 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 von IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung von IBM gesteckt/eingebaut werden.

EN 55022 / EN 55032 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 2014/30/EU in der Bundesrepublik Deutschland.

### **Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse A**

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

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

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:  
IBM Deutschland GmbH  
Technical Relations Europe, Abteilung M456  
IBM-Allee 1, 71139 Ehningen, Germany  
Tel: +49 (0) 800 225 5426  
email: HalloIBM@de.ibm.com

Generelle Informationen:

**Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 / EN 55032 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 features designated as electromagnetic compatibility (EMC) Class B in the feature installation information.

### **Federal Communications Commission (FCC) Statement**

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

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

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

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

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

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

### **Industry Canada Compliance Statement**

CAN ICES-3 (B)/NMB-3(B)

### **European Community Compliance Statement**

This product is in conformity with the protection requirements of EU Council Directive 2014/30/EU 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.

European Community contact:  
IBM Deutschland GmbH  
Technical Regulations, Abteilung M456  
IBM-Allee 1, 71139 Ehningen, Germany  
Tel: +49 800 225 5426  
email: halloibm@de.ibm.com

## VCCI Statement - Japan

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

取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

## Japan Electronics and Information Technology Industries Association Statement

This statement explains the Japan JIS C 61000-3-2 product wattage compliance.

(一社) 電子情報技術産業協会 高調波電流抑制対策実施  
要領に基づく定格入力電力値 : Knowledge Centerの各製品の  
仕様ページ参照

This statement explains the Japan Electronics and Information Technology Industries Association (JEITA) statement for products less than or equal to 20 A per phase.

高調波電流規格 JIS C 61000-3-2 適合品

This statement explains the JEITA statement for products greater than 20 A, single phase.

高調波電流規格 JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。

- 回路分類 : 6 (単相、PFC回路付)
- 換算係数 : 0

This statement explains the JEITA statement for products greater than 20 A per phase, three-phase.

高調波電流規格 JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。

- 回路分類 : 5 (3相、PFC回路付)
- 換算係数 : 0

### IBM Taiwan Contact Information

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

### Germany Compliance Statement

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022/ EN 55032 Klasse B ein.

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

**Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten**

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

**Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse B**

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

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



Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:

IBM Deutschland GmbH  
Technical Relations Europe, Abteilung M456  
IBM-Allee 1, 71139 Ehningen, Germany  
Tel: +49 (0) 800 225 5426  
email: HalloIBM@de.ibm.com

Generelle Informationen:

**Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022/ EN 55032 Klasse B.**

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