

Power Systems

*Problem analysis, system parts, and  
locations for the IBM Power Systems HMC  
(7063-CR2)*



**Note**

Before using this information and the product it supports, read the information in [“Safety notices” on page v](#), [“Notices” on page 25](#), 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 POWER9™ processor and to all associated models.

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# Contents

- Safety notices.....V**
  
- Beginning troubleshooting and problem analysis..... 1**
  - Determining the problem analysis procedure to perform..... 1
  - Resolving a BMC access problem..... 2
  - Resolving a power problem..... 4
  - Resolving a system firmware boot failure..... 5
  - Resolving a VGA monitor problem..... 6
  - Resolving an operating system boot failure..... 6
  - Resolving a hardware problem..... 7
  - Resolving a PCIe adapter or device problem..... 7
    - Resolving a network adapter problem..... 9
    - Resolving a storage device problem..... 10
  - Identifying a service action by using system event logs.....10
  - Verifying a repair..... 11
  - Collecting diagnostic data..... 11
  - Contacting IBM service and support..... 12
  
- Finding parts and locations ..... 15**
  - 7063-CR2 locations..... 15
  - 7063-CR2 parts..... 18
  
- Notices.....25**
  - Accessibility features for IBM Power Systems servers..... 26
  - Privacy policy considerations ..... 27
  - Trademarks..... 27
  - Electronic emission notices..... 27
    - Class A Notices..... 27
    - Class B Notices..... 31
  - Terms and conditions.....33



# Safety notices

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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.
- When performing a machine inspection: 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 attempt to switch power to the machine until all possible unsafe conditions are corrected. 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.
- 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 if provided, unless the earthquake option is to be installed.
- 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).



- Stability hazard:
  - The rack may tip over causing serious personal injury.
  - Before extending the rack to the installation position, read the installation instructions.
  - Do not put any load on the slide-rail mounted equipment mounted in the installation position.
  - Do not leave the slide-rail mounted equipment in the installation position.
- 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 1 of 2)

**(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 or if the rack is not bolted to the floor. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.



- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack. (R001 part 2 of 2)



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

- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:
  - Remove all devices in the 32U position and above.
  - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.

- Ensure that there are little-to-no empty U-levels between devices installed in the rack cabinet below the 32U 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 2083 mm (30 x 82 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 or in an earthquake environment bolt the rack to the floor.
  - 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. 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). Stability hazard:

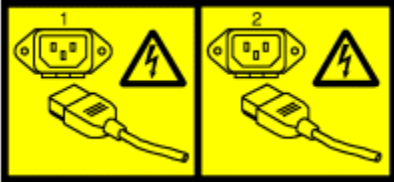
- The rack may tip over causing serious personal injury.
- Before extending the rack to the installation position, read the installation instructions.



- Do not put any load on the slide-rail mounted equipment mounted in the installation position.
- Do not leave the slide-rail mounted equipment in the installation position.

(L002)

(L003)



or



or

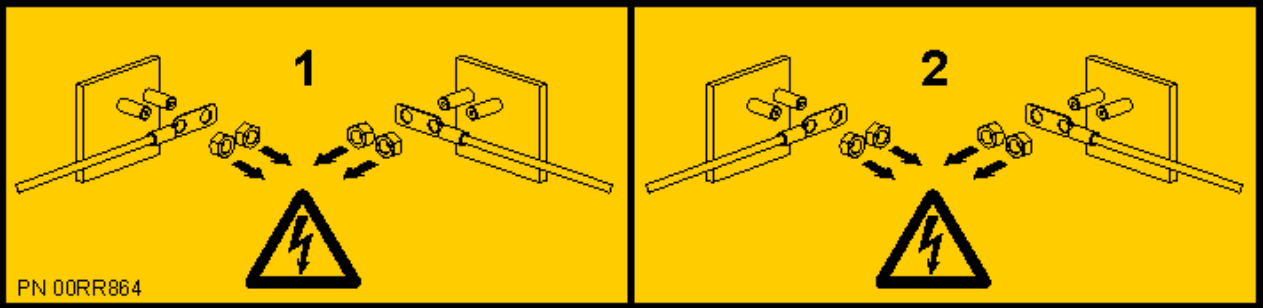



or



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 may 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)

(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 degrees C (212 degrees 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 raise, lower or slide platform load shelf unless stabilizer (brake pedal jack) is fully engaged. Keep stabilizer brake engaged when not in use or motion.
- 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 platforms, tilt riser, angled unit install wedge or other such accessory options. Secure such platforms -- riser tilt, wedge, etc options to main lift shelf or forks in all four (4x or all other provisioned mounting) 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 [adjustable angling platform] option flat at all times except for final minor angle 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 (unless the specific allowance is provided for one following qualified procedures for working at elevations with this 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.
- This TOOL must be maintained correctly for IBM Service personnel to use it. IBM shall inspect condition and verify maintenance history before operation. Personnel reserve the right not to use TOOL if inadequate. (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 metallically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

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

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

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

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



# Beginning troubleshooting and problem analysis

This information provides a starting point for analyzing problems.

This information is the starting point for diagnosing and repairing systems. From this point, you are guided to the appropriate information to help you diagnose problems, determine the appropriate repair action, and then complete the necessary steps to repair the system.

## Notes:

- Update the system firmware to the latest level before you start problem analysis. If you update the system firmware, you have the latest available fixes and improvements for error handling, reporting, and isolation. For instructions about updating the system firmware, see [Getting fixes](#).
- Some service procedures use OpenBMC tool commands. To download and install the OpenBMC tool, see [Downloading and installing the OpenBMC tool](#).

What type of problem are you dealing with?	Problem analysis procedure
You do not know the type of problem.	Go to <a href="#">“Determining the problem analysis procedure to perform”</a> on page 1.
You have an FQPSPxxxxxxx event code.	Go to <a href="#">FQPSPxxxxxxx Event Codes</a> .
A baseboard management controller (BMC) access problem occurred.	Go to <a href="#">“Resolving a BMC access problem”</a> on page 2.
The system does not power on (the power button or the BMC power on command does not power on the system).	Go to <a href="#">“Resolving a power problem”</a> on page 4.
A system firmware boot failure occurred (the system started but was not able to boot to the Petitboot menu).	Go to <a href="#">“Resolving a system firmware boot failure”</a> on page 5.
A video graphics array (VGA) monitor problem occurred (the system started but no video is displayed on the monitor).	Go to <a href="#">“Resolving a VGA monitor problem”</a> on page 6.
An operating system boot failure occurred (the system booted to the Petitboot menu but the operating system did not start).	Go to <a href="#">“Resolving an operating system boot failure”</a> on page 6.
A processor, memory, power, or cooling hardware failure occurred.	Go to <a href="#">“Resolving a hardware problem”</a> on page 7.
Missing or faulty PCIe adapter or device.	Go to <a href="#">“Resolving a PCIe adapter or device problem”</a> on page 7.

## Determining the problem analysis procedure to perform

Learn how to identify the correct problem analysis procedure to perform.

### About this task

To determine the correct problem analysis procedure to perform, complete the following steps:

### Procedure

1. After you apply power to the system, are the power supply LEDs green?

<b>If</b>	<b>Then</b>
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Go to <a href="#">“Resolving a power problem”</a> on page 4.

2. Can you access the baseboard management controller (BMC) across the network?

<b>If</b>	<b>Then</b>
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Go to <a href="#">“Resolving a BMC access problem”</a> on page 2.

3. Can you boot the system to the Petitboot menu?

<b>If</b>	<b>Then</b>
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Go to <a href="#">“Resolving a system firmware boot failure”</a> on page 5.

4. Is video displayed on the video graphics array (VGA) monitor?

<b>If</b>	<b>Then</b>
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Go to <a href="#">“Resolving a VGA monitor problem”</a> on page 6.

5. Can you start the operating system?

<b>If</b>	<b>Then</b>
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Go to <a href="#">“Resolving an operating system boot failure”</a> on page 6.

6. Go to [“Resolving a hardware problem”](#) on page 7. **This ends the procedure.**

## Resolving a BMC access problem

Learn how to identify the service action that is needed to resolve a baseboard management controller (BMC) access problem.

### Procedure

1. Ensure that the BMC password is not set to the default password. For information about changing the default password, see [Logging on to the OpenBMC GUI](#). Does the problem persist?

<b>If</b>	<b>Then</b>
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	<b>This ends the procedure.</b>

2. Are both ends of the network cable seated securely?


<b>If</b>	<b>Then</b>
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Seat both ends of the cable securely. If the problem persists, continue with the next step.

3. Is the operating system available?

<b>If</b>	<b>Then</b>
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Continue with step <a href="#">“5”</a> on page 3.



4. Verify that the BMC network settings are correct.

- a) In the navigation area, click the **HMC Management** icon , and then select **Console Settings**.
- b) In the content pane, click **Change BMC/IPMI network settings**.
- c) Verify that the MAC address and the IP address settings are correct.

Does the BMC access problem persist?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	<b>This ends the procedure.</b>

5. Power off the system and disconnect all AC power cords for 30 seconds. Then, reconnect the AC power cords and power on the system. Does the BMC access problem persist?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	<b>This ends the procedure.</b>

6. Verify that the BMC network settings are correct.

**Note:** To verify the BMC network settings, you must have a cabled serial connection or a monitor and keyboard.

- a) Power on the system by using the power button on the front of the system. Wait 1 - 2 minutes for the system to display the Petitboot menu.
- b) When the Petitboot menu is displayed, press any key to interrupt the boot process. Then, select Exit to Shell.
- c) For a shared BMC Ethernet port, type the following command and press Enter:

```
ipmitool lan print 1
```

For a dedicated BMC Ethernet port, type the following command and press Enter:

```
ipmitool lan print 2
```

To determine the location of the shared and dedicated BMC Ethernet ports, see [Table 1 on page 3](#).

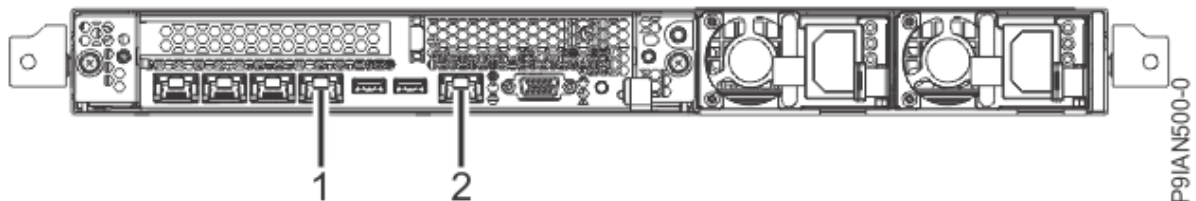


Figure 1. Rear BMC Ethernet ports

Identifier	Description
1	Shared BMC Ethernet
2	Dedicated BMC Ethernet

- d) Verify that the MAC address and the IP address settings are correct. Then, continue with the next step.

**Note:** If the IP address setting is incorrect, go to [Configuring the BMC IP address](#). If the MAC address is 00:00:00:00:00:00, go to [“Contacting IBM service and support” on page 12](#).

7. Complete the following actions:
  - a. Power on to the Petitboot menu.
  - b. Update the system firmware. For instructions, see [Getting fixes](#).

Are you able to access the BMC?

If	Then
<b>Yes:</b>	<b>This ends the procedure.</b>
<b>No:</b>	Continue with the next step.

8. Replace the system backplane. Go to [“7063-CR2 locations”](#) on page 15 to identify the physical location and the removal and replacement procedure. **This ends the procedure.**

## Resolving a power problem

Learn how to identify the service action that is needed to resolve a power problem.

### Procedure

1. Is the amber LED (bottom LED) of a power supply on solid and is the amber LED on the front of the system turned off?

If	Then
<b>Yes:</b>	Ensure that the power cords for both power supplies are fully seated and that the power distribution units (PDUs) and power outlets are supplying electricity. <b>This ends the procedure.</b>
<b>No:</b>	Continue with the next step.

2. Are the power supply LEDs turned off?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Continue with step <a href="#">“4”</a> on page 4.

3. Perform the following actions, one at a time until the problem is resolved:

- a. Ensure that all of the power cords are fully seated in the power supplies.
- b. Ensure that all of the power cords are fully seated in the power distribution units (PDUs) or wall outlets.
- c. If the power cords are plugged into PDUs, ensure that the PDUs are turned on.
- d. Ensure that all of the power cords are plugged into PDUs or wall outlets that are supplying electricity.
- e. Replace the power cords.
- f. Replace the power supplies. Go to [“7063-CR2 locations”](#) on page 15 to identify the physical location and the removal and replacement procedure. **This ends the procedure.**

4. Is the amber LED of a power supply on solid and is the amber system attention LED on the front of the system on solid?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Go to <a href="#">“Contacting IBM service and support”</a> on page 12. <b>This ends the procedure.</b>

5. Perform the following actions, one at a time until the problem is resolved:

- a. Resolve any serviceable alerts that are in the event log. Go to [“Resolving a hardware problem”](#) on page 7.

- b. Ensure that the power supply is fully seated in the system.
- c. Ensure that the power supply fan is not blocked.
- d. Replace the power supply. Go to “7063-CR2 locations” on page 15 to identify the physical location and the removal and replacement procedure. **This ends the procedure.**

## Resolving a system firmware boot failure

Learn how to identify the service action that is needed to resolve a failure while booting your system firmware.

### Procedure

1. After you press the power button, did the system turn on but fail to display the Petitboot menu?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Continue with step “6” on page 5.

2. Does the baseboard management controller (BMC) respond to commands?

**Note:** To determine whether the BMC responds to commands, run the following OpenBMC tool command:

```
openbmctool -U <username> -P <password> -H <BMC IP address or BMC host name> chassis power status
```

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Continue with step “4” on page 5.

3. Complete the following actions:

- a. Update the system firmware. For instructions, see [Getting fixes](#).
- b. Check the system event logs. For instructions, see “[Identifying a service action by using system event logs](#)” on page 10. Then, continue with step “6” on page 5.

4. Disconnect the power cords from the system for 30 seconds. Reconnect the power cords, wait 5 minutes, and then continue with the next step.

5. Does the baseboard management controller (BMC) respond to commands?

**Note:** To determine whether the BMC responds to commands, run the following OpenBMC tool command:

```
openbmctool -U <username> -P <password> -H <BMC IP address or BMC host name> chassis power status
```

If	Then
<b>Yes:</b>	Update the system firmware. For instructions, see <a href="#">Getting fixes</a> . <b>This ends the procedure.</b>
<b>No:</b>	Replace the system backplane. Go to “7063-CR2 locations” on page 15 to identify the physical location and the removal and replacement procedure. <b>This ends the procedure.</b>

6. Power off the system and disconnect all AC power cords for 30 seconds. Then, reconnect the AC power cords and power on the system. Does the system boot successfully?

If	Then
<b>Yes:</b>	<b>This ends the procedure.</b>

If	Then
<b>No:</b>	Go to <a href="#">“Resolving a hardware problem”</a> on page 7. <b>This ends the procedure.</b>

## Resolving a VGA monitor problem

Learn how to identify the service action that is needed to resolve a video graphics array (VGA) monitor problem.

### Procedure

1. Is the system powered on and is the VGA monitor connected to the VGA display port, but no video is displayed?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Power on the system. <b>This ends the procedure.</b>

2. Complete the following steps, one at a time until the problem is resolved:
  - a) Ensure that the network image that is specified is a valid boot image.
  - b) Ensure that the VGA cable is properly seated to the server port and to the monitor port.
  - c) Verify that your monitor and your VGA cable are working properly by testing them on a system that is known to be working properly. If the monitor or the VGA cable does not work properly, replace it.
  - d) Verify that the system is powered on by activating a serial over LAN (SOL) session through the baseboard management controller (BMC). If the system is not active, go to [“Resolving a system firmware boot failure”](#) on page 5.
  - e) Replace the system backplane. Go to [“7063-CR2 locations”](#) on page 15 to identify the physical location and the removal and replacement procedure. **This ends the procedure.**

## Resolving an operating system boot failure

Learn how to identify the service action that is needed to resolve a failure while booting your operating system.

### Procedure

1. Was the system recently installed, serviced, moved, or upgraded?

If	Then
<b>Yes:</b>	Ensure that all cables are properly seated in the connection path to the designated boot device. <b>This ends the procedure.</b>
<b>No:</b>	Continue with the next step.

2. Petitboot displays all recognized bootable images to use by default. Is the boot image recognized by Petitboot?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Select the Petitboot menu option to refresh the boot images. If the problem persists, go to <a href="#">“Resolving a storage device problem”</a> on page 10. <b>This ends the procedure.</b>

3. Does an operating system error occur during the boot?

If	Then
<b>Yes:</b>	Recover the operating system with the tools provided for the operating system. If that does not resolve the problem, reinstall the operating system. <b>This ends the procedure.</b>
<b>No:</b>	Reinstall the operating system. <b>This ends the procedure.</b>

## Resolving a hardware problem

Learn how to identify the service action that is needed to resolve a hardware problem.

### Procedure

1. If you have not already done so, manually boot the system.
2. Go to “[Identifying a service action by using system event logs](#)” on page 10. Then, continue with the next step.
3. Was a service action identified?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Go to step “5” on page 7.

4. Did the service action fix the problem?

If	Then
<b>Yes:</b>	<b>This ends the procedure.</b>
<b>No:</b>	Go to step “5” on page 7.

5. Go to “[Resolving a PCIe adapter or device problem](#)” on page 7. Then, continue with the next step.
6. Was a service action identified?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Go to “ <a href="#">Collecting diagnostic data</a> ” on page 11. Then, go to “ <a href="#">Contacting IBM service and support</a> ” on page 12. <b>This ends the procedure.</b>

7. Did the service action fix the problem?

If	Then
<b>Yes:</b>	<b>This ends the procedure.</b>
<b>No:</b>	Go to “ <a href="#">Collecting diagnostic data</a> ” on page 11. Then, go to “ <a href="#">Contacting IBM service and support</a> ” on page 12. <b>This ends the procedure.</b>

## Resolving a PCIe adapter or device problem

Learn how to access log files, information to identify types of events, and a list of potential problems and service actions.

### Procedure

1. To identify the correct service procedure to perform by using operating system log information, complete the following steps:
  - a) Log in as the **hscroot** user.
  - b) To display the operating system logs, type `less /var/log/messages` and press **Enter**.

2. Scan the operating system logs that occurred around the time that the problem started for the first occurrence of keywords, such as fail, failure, or failed. When you find a keyword that accompanies one or more of the resource names in the following table, a service action is required. Use the following table to determine the service procedure to perform for your type of problem.

*Table 2. Resource names, examples, and service procedures for different types of operating system logs.*

<b>Resource name</b>	<b>Example of a log requiring a service action</b>	<b>Type of problem</b>	<b>Service procedure</b>
eth1, eth2, eth3, enPxxxx, where xxxx indicates the network port.	Failed to re-initialize device	Network	Go to <a href="#">“Resolving a network adapter problem”</a> on page 9.
tg3	PCI I/O error detected. Link is Down	Network	Go to <a href="#">“Resolving a network adapter problem”</a> on page 9.
sda, sdb, sdc	FAILED Result	Storage	Go to <a href="#">“Resolving a storage device problem”</a> on page 10.
EEH	Detected error on PHB# <i>xxxx</i> , where <i>xxx</i> is the PHB number.	PCIe bus or adapter	Resolve any device driver errors that are related to I/O and that occurred near the time of this operating system log entry.
	<i>xxxx</i> has failed 6 times in the last hour and has been permanently disabled, where <i>xxx</i> is the PCI bus number.	PCIe bus or adapter	Ensure that the correct device drivers are properly installed for the device. If the problem persists, replace the adapter in the PCIe slot that is specified in the operating system log entry.

## Resolving a network adapter problem

Learn about the possible problems and service actions that you can perform to resolve a network adapter problem.

### About this task

Problem	Service action
System unable to find adapter	<ol style="list-style-type: none"><li>1. Verify that the most recent firmware is installed on the system. Otherwise, install the most recent firmware if it is not already installed.</li><li>2. Restart the system.</li><li>3. Replace the adapter.</li><li>4. Replace the system backplane.</li><li>5. Replace the central processing unit (CPU).</li></ol>
Adapter stops working suddenly	<ol style="list-style-type: none"><li>1. If the system was recently installed, moved, serviced, or upgraded, verify that the adapter is seated properly and all associated cables are correctly connected.</li><li>2. Inspect the PCIe socket and verify that there is no dirt or debris in the socket.</li><li>3. Inspect the card and verify that it is not physically damaged.</li><li>4. Verify that all cables are properly seated and are not physically damaged.</li><li>5. Replace the adapter.</li><li>6. Replace the system backplane.</li><li>7. Replace the CPU.</li></ol>
Link indicator light on the adapter is off	<ol style="list-style-type: none"><li>1. Verify that the cable functions properly by testing it with a known working connection.</li><li>2. Verify that the port or ports on the switch are enabled and functional.</li><li>3. Verify that the switch and adapter are compatible.</li><li>4. Replace the adapter.</li></ol>
Link light on the adapter is on, but there is no communication from the adapter	<ol style="list-style-type: none"><li>1. Verify that the most recent driver is installed, or install the most recent driver if it is not already installed.</li><li>2. Verify that the adapter and its link have compatible settings, such as speed and duplex configuration.</li></ol>

## Resolving a storage device problem

Learn about the possible problems and service actions that you can perform to resolve a storage device problem.

### About this task

**Note:** To determine the location of the storage device, see [Removing and replacing a drive in the 7063-CR2](#).

Problem	Service action
System unable to find a storage device that is at the front of the system	<ol style="list-style-type: none"><li>1. If the system was recently installed, moved, serviced, or upgraded, verify that the device is seated and installed properly.</li><li>2. Verify that the device is compatible with your system.</li><li>3. Verify that all internal cables are properly seated and are not physically damaged.</li><li>4. Verify that the most recent firmware is installed on the system. Otherwise, install the most recent firmware if it is not already installed.</li><li>5. Replace the drive.</li><li>6. Replace the cable.</li><li>7. Replace the drive holder.</li></ol>
Drive stops working suddenly	<ol style="list-style-type: none"><li>1. Verify that all internal cables are properly seated and are not physically damaged.</li><li>2. Check the system logs to verify whether the system detected a problem.</li><li>3. Replace the drive.</li><li>4. Replace the cable.</li></ol>
Other problems	Check the messages and resolve any other problems that were detected. Then, test the drive again. If the drive continues not to function, refer to the documentation for the drive.

## Identifying a service action by using system event logs

Use the OpenBMC tool to examine system event logs (SELs) to identify a service action.

### Procedure

1. From a system that has the OpenBMC tool installed, type the following command and press Enter:  

```
openbmctool -U <username> -P <password> -H <BMC IP address or BMC host name>  
sel print
```
2. Is there an **Active Alerts** section displayed in the output of the command?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No</b>	No service action is required. <b>This ends the procedure.</b>



If	Then
	<b>Note:</b> Alerts that are displayed in the <b>Historical Alerts</b> section do not require service.

3. Is there an entry in the **Active Alerts** section with a value of **Yes** in the **Serviceable** column?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No</b>	No service action is required. <b>This ends the procedure.</b> <b>Note:</b> Alerts with a value of <b>No</b> that are displayed in the <b>Serviceable</b> column do not require service.

4. Starting with the first entry in the **Active Alerts** section with a value of **Yes** in the **Serviceable** column, complete the following steps until all entries are resolved:

- a. Record the log number that is displayed in the **Entry** column.
- b. Record the FQPSPxxxxxx value that is displayed in the **ID** column. Then, go to [FQPSPxxxxxx Event Codes](#) and complete the service action that is indicated for the FQPSPxxxxxx event code.
- c. After the service action is complete and the problem is resolved, type the following command and press Enter:  
  

```
openbmctool -U <username> -P <password> -H <BMC IP address or BMC host name> sel resolve -n x, where x is the log number that you recorded in step "4.a" on page 11.
```

**This ends the procedure.**

## Verifying a repair

Learn how to verify hardware operation after you make repairs to the system.

### Procedure

1. Power on the system.
2. Scan the system event logs (SELs) for serviceable events that occurred after system hardware was replaced. For information about SELs that require a service action, see ["Identifying a service action by using system event logs"](#) on page 10.
3. Did any serviceable SEL events occur after hardware was replaced?

If	Then
<b>Yes:</b>	The problem is not resolved. Go to <a href="#">"Identifying a service action by using system event logs"</a> on page 10 and complete the service actions indicated. <b>This ends the procedure.</b>
<b>No:</b>	The problem is resolved. <b>This ends the procedure.</b>

## Collecting diagnostic data

Learn how to collect diagnostic data to send to IBM service and support.

### About this task

To collect diagnostic data, complete the following steps:

### Procedure

1. Are you able to log on to the Hardware Management Console (HMC)?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Go to step “3” on page 12.

2. Collect diagnostic data from the 7063-CR2 by using the **PEDBG** command on the HMC. To collect diagnostic data, go to HMC Enhanced View: Collecting PEDBG from the HMC (<http://www.ibm.com/support/pages/hmc-enhanced-view-collecting-pedbg-hmc>) and complete the steps that are indicated. Send the data that you collected during this procedure to IBM service and support. **This ends the procedure.**
3. Can you boot the system to the Petitboot menu or is another system available that has the Linux® operating system?

If	Then
<b>Yes:</b>	Continue with the next step.
<b>No:</b>	Go to “Contacting IBM service and support” on page 12.

4. To collect system event logs, complete the following steps:
  - a) Go to the [IBM Support Portal](http://www.ibm.com/mysupport/s/) (<http://www.ibm.com/mysupport/s/>).
  - b) In the search field, type Scale-out LC System Event Log Collection Tool.
  - c) Click the **Scale-out LC System Event Log Collection Tool** entry and follow the instructions to install and run the system event log collection tool. Then, continue with the next step.
5. Send the data that you collected during this procedure to IBM service and support. **This ends the procedure.**

## Contacting IBM service and support

You can contact IBM service and support by telephone or through the IBM Support Portal.

Before you contact IBM service and support, go to “Beginning troubleshooting and problem analysis” on page 1 and complete all of the service actions indicated. If the service actions do not resolve the problem, or if you are directed to contact support, go to “Collecting diagnostic data” on page 11. Then, use the information below to contact IBM service and support.

Customers in the United States, United States territories, or Canada can place a hardware service request online. To place a hardware service request online, go to the [IBM Support Portal](http://www.ibm.com/support/entry/portal/product/power/scale-out_lc) ([http://www.ibm.com/support/entry/portal/product/power/scale-out\\_lc](http://www.ibm.com/support/entry/portal/product/power/scale-out_lc)).

For up-to-date telephone contact information, go to the [Directory of worldwide contacts](http://www.ibm.com/planetwide/) website ([www.ibm.com/planetwide/](http://www.ibm.com/planetwide/)).

Type of problem	Call
<ul style="list-style-type: none"> <li>• Advice</li> <li>• Migrating</li> <li>• "How to"</li> <li>• Operating</li> <li>• Configuring</li> <li>• Ordering</li> <li>• Performance</li> <li>• General information</li> </ul>	<ul style="list-style-type: none"> <li>• 1-800-IBM-CALL (1-800-426-2255)</li> <li>• 1-800-IBM-4YOU (1-800-426-4968)</li> </ul>

Table 5. Service and support contacts (continued)

<b>Type of problem</b>	<b>Call</b>
Software: <ul style="list-style-type: none"><li>• Fix information</li><li>• Operating system problem</li><li>• IBM application program</li><li>• Loop, hang, or message</li></ul> Hardware: <ul style="list-style-type: none"><li>• IBM system hardware broken</li><li>• Hardware reference code</li><li>• IBM input/output (I/O) problem</li><li>• Upgrade</li></ul>	1-800-IBM-SERV (1-800-426-7378)



# Finding parts and locations

Locate physical part locations and identify parts with system diagrams.

## Locate the FRU

Use the graphics and tables to locate the field-replaceable unit (FRU) and identify the FRU part number.

## 7063-CR2 locations

Use this information to find the location of a field-replaceable unit (FRU) in the system unit.

### Rack views

The following diagrams show FRU layouts in the system. Use these diagrams with the following tables.

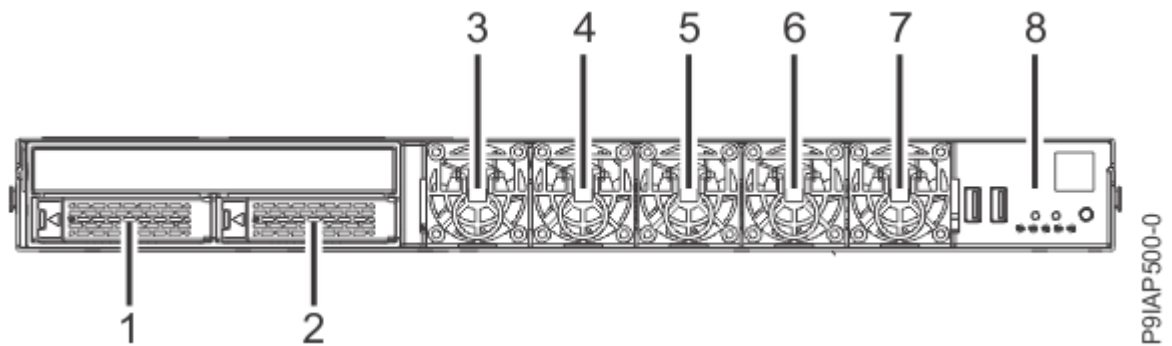


Figure 2. Front view

Index number	FRU description	FRU removal and replacement procedures
1	Drive 0	See <a href="#">Removing and replacing a drive in the 7063-CR2.</a>
2	Drive 1	
3	Fan 0	See <a href="#">Removing and replacing fans in the 7063-CR2.</a>
4	Fan 1	
5	Fan 2	
6	Fan 3	
7	Fan 4	
8	Control panel	See <a href="#">Removing and replacing the control panel in the 7063-CR2.</a>

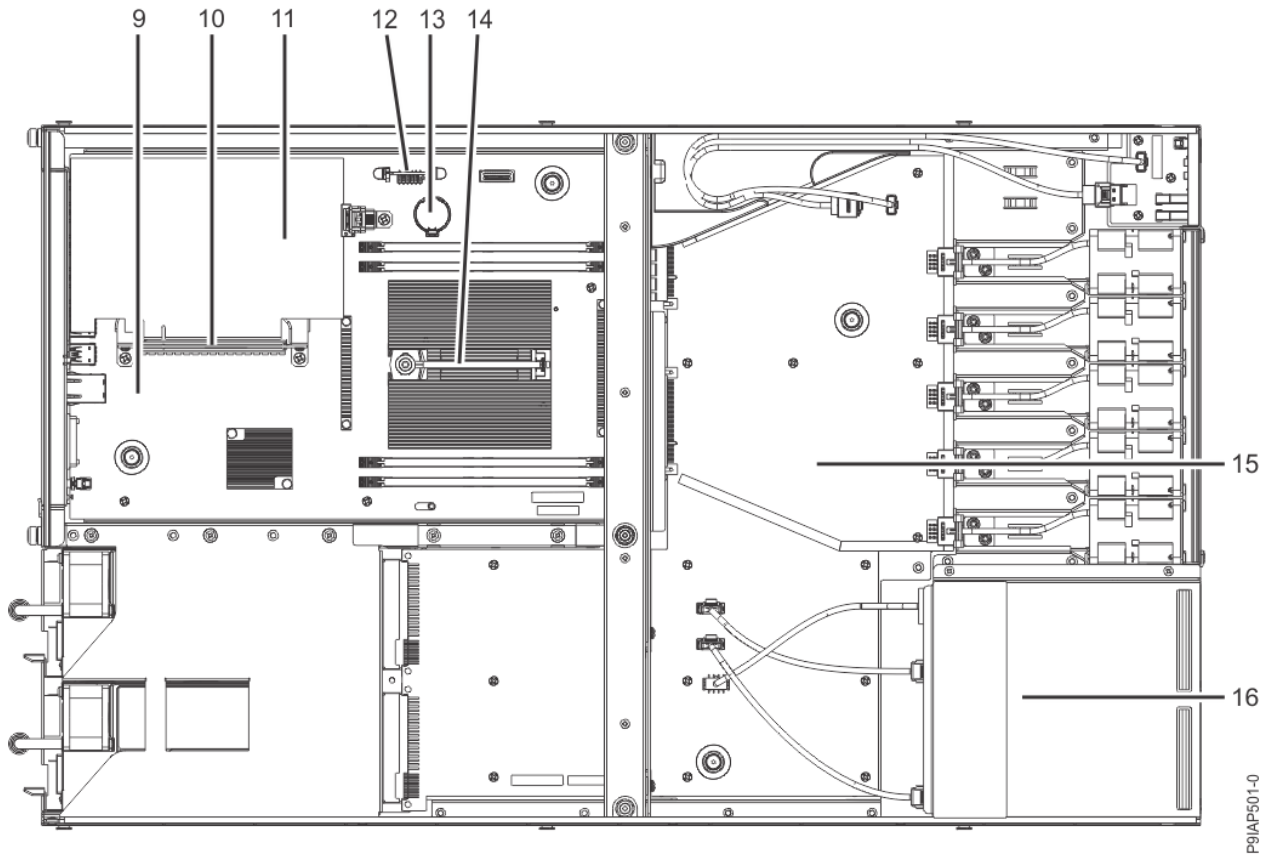


Figure 3. Top view

Index number	FRU description	FRU removal and replacement procedures
9	System backplane	See <a href="#">Removing and replacing the system backplane in the 7063-CR2</a> .
10	Riser	See <a href="#">Removing and replacing the PCIe riser in the 7063-CR2</a> .
11	PCIe adapter	See <a href="#">Removing and replacing PCIe adapters in the 7063-CR2</a> .
12	Trusted platform module	See <a href="#">Removing and replacing the trusted platform module in the 7063-CR2</a> .
13	Time-of-day battery	See <a href="#">Removing and replacing the time-of-day battery in the 7063-CR2</a> .
14	CPU 0	See <a href="#">Removing and replacing the system processor module in the 7063-CR2</a> .
15	Power distribution board	See <a href="#">Removing and replacing the power distribution board in the 7063-CR2</a> .

Table 7. Top view locations (continued)

Index number	FRU description	FRU removal and replacement procedures
16	Drive holder	See Removing and replacing the drive holder in the 7063-CR2.

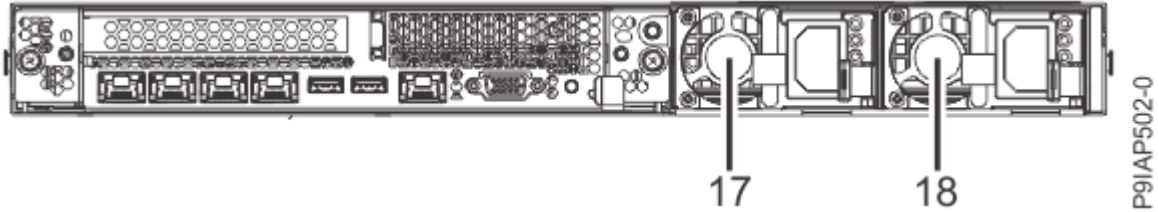


Figure 4. Rear view

Table 8. Rear view locations

Index number	FRU description	FRU removal and replacement procedures
17	Power supply unit 1 (PSU 1)*	See Removing and replacing a power supply in the 7063-CR2.
18	Power supply unit 0 (PSU 0)*	

\* The Ex labels on the chassis do not match the power supply unit number.

## Memory locations

The following diagram shows memory DIMMs and their corresponding field-replaceable unit (FRU) layouts in the system. Use this diagram with the following table.

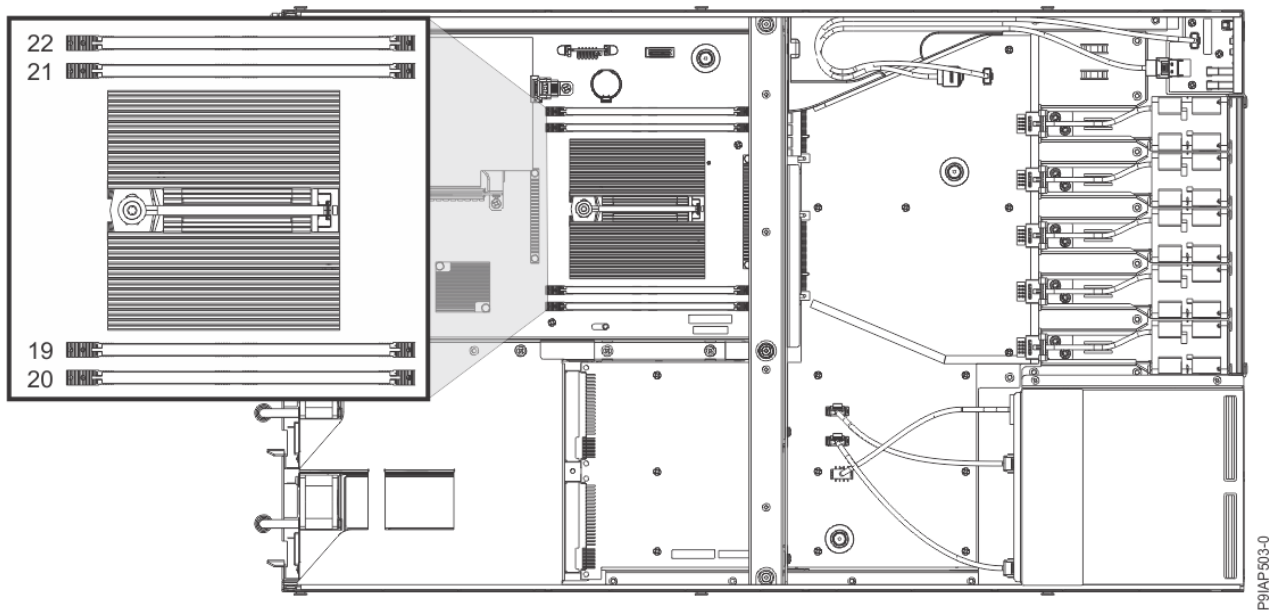


Figure 5. Memory locations

Table 9. Memory locations

Index number	FRU description	FRU removal and replacement procedures
19	DIMM 0	See <a href="#">Removing and replacing memory in the 7063-CR2</a> .
20	DIMM 1	
21	DIMM 2	
22	DIMM 3	

## 7063-CR2 parts

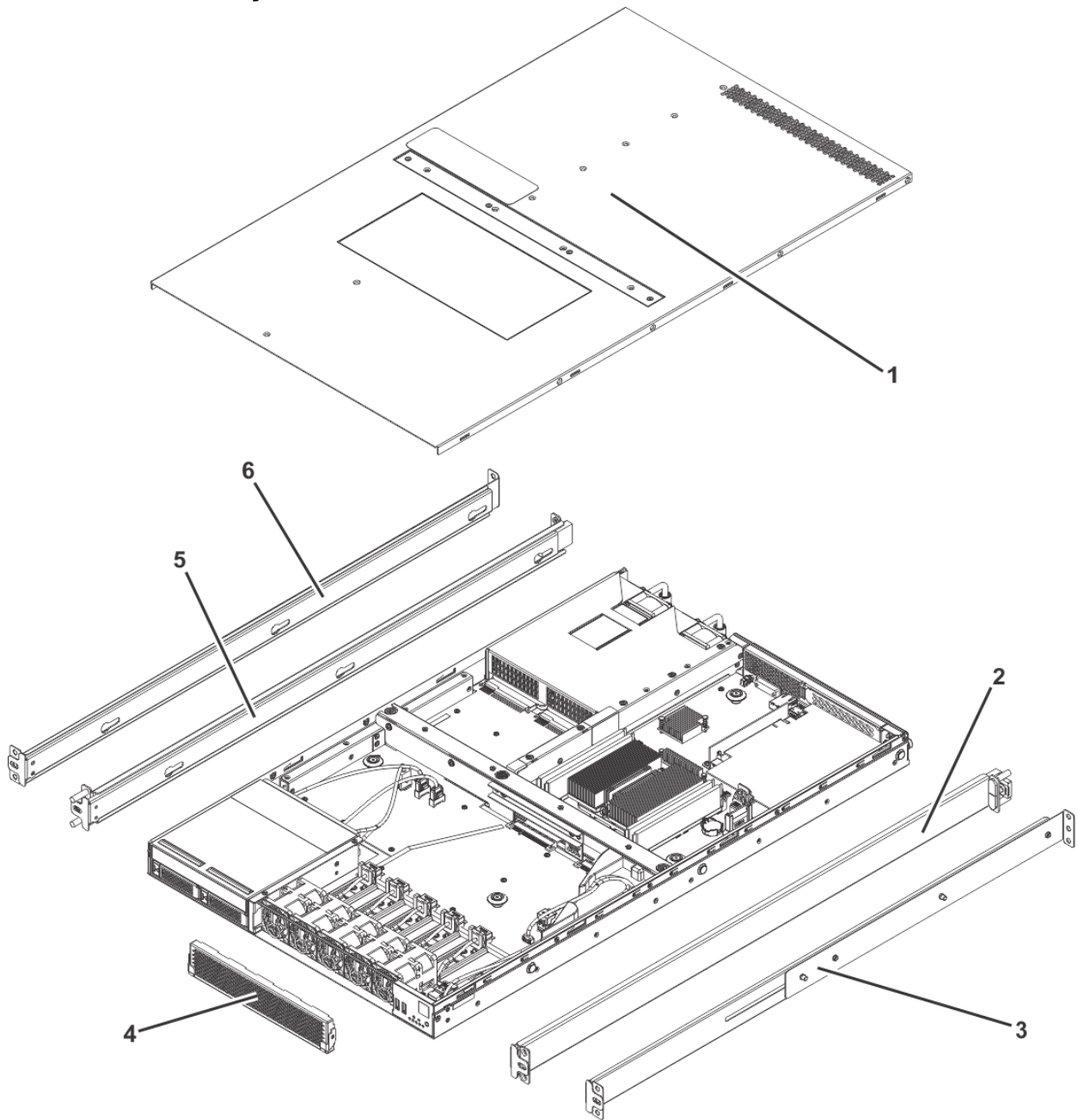
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Use this information to find the field-replaceable unit (FRU) part number.

After you identify the part number of the part that you want to order, go to [Advanced Part Exchange Warranty Service](#). Registration is required. If you are not able to identify the part number, go to [Contacting IBM service and support](#).



## Rack final assembly



PSIAP510-0

Figure 6. Rack final assembly

Index number	Part number	Units per assembly	Description
1		1	Top cover assembly
2	03GM910	1	Fixed rail kit - contains left rail, right rail, attaching screws, and shipping brackets
3	03GM955	1	Fixed rail kit (adjustable in length) - contains left rail, right rail, and attaching screws
4	03GM764	1	Front bezel

Table 10. Rack final assembly part numbers (continued)

Index number	Part number	Units per assembly	Description
5	03GM910	1	Fixed rail kit - contains left rail, right rail, attaching screws, and shipping brackets
6	03GM955	1	Fixed rail kit (adjustable in length) - contains left rail, right rail, and attaching screws

### System parts

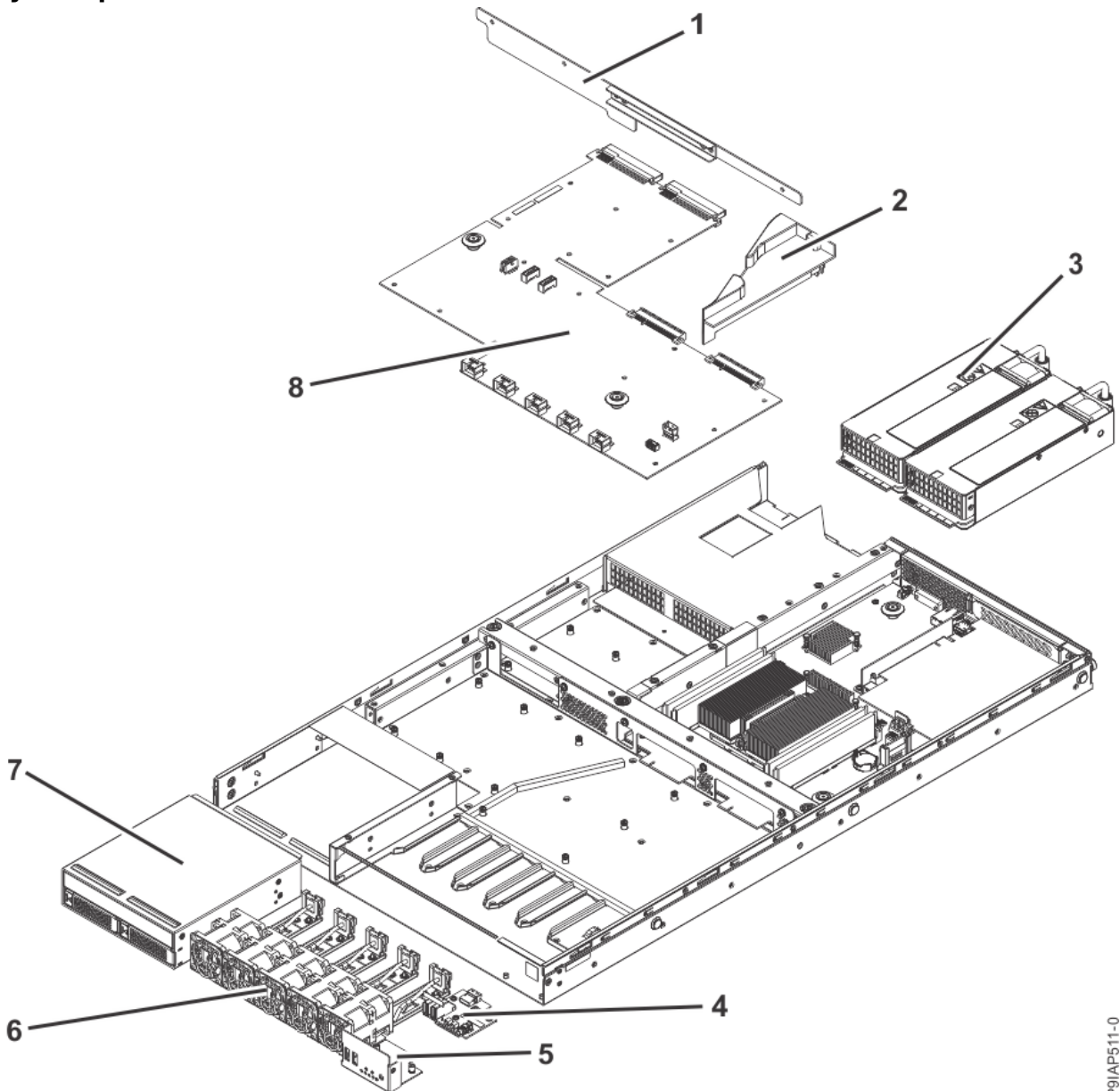


Figure 7. System parts

P9IAP511-0

Table 11. System parts

<b>Index number</b>	<b>Part number</b>	<b>Units per assembly</b>	<b>Description</b>
1	03GM757	1	Air baffle (left)
2	03GM759	1	Air baffle (right)
3	03FP372	2	Power supply
4	02WF445	1	Control panel card
5		1	Control panel cover
6	03GM774	5	Fan
7	03GM776	1	Drive holder
	03GM792	2	1.8 TB 2.5 inch SAS disk drive (includes drive and carrier)
	03GM803	2	Drive carrier
8	02WF441	1	Power distribution board

## Additional system parts

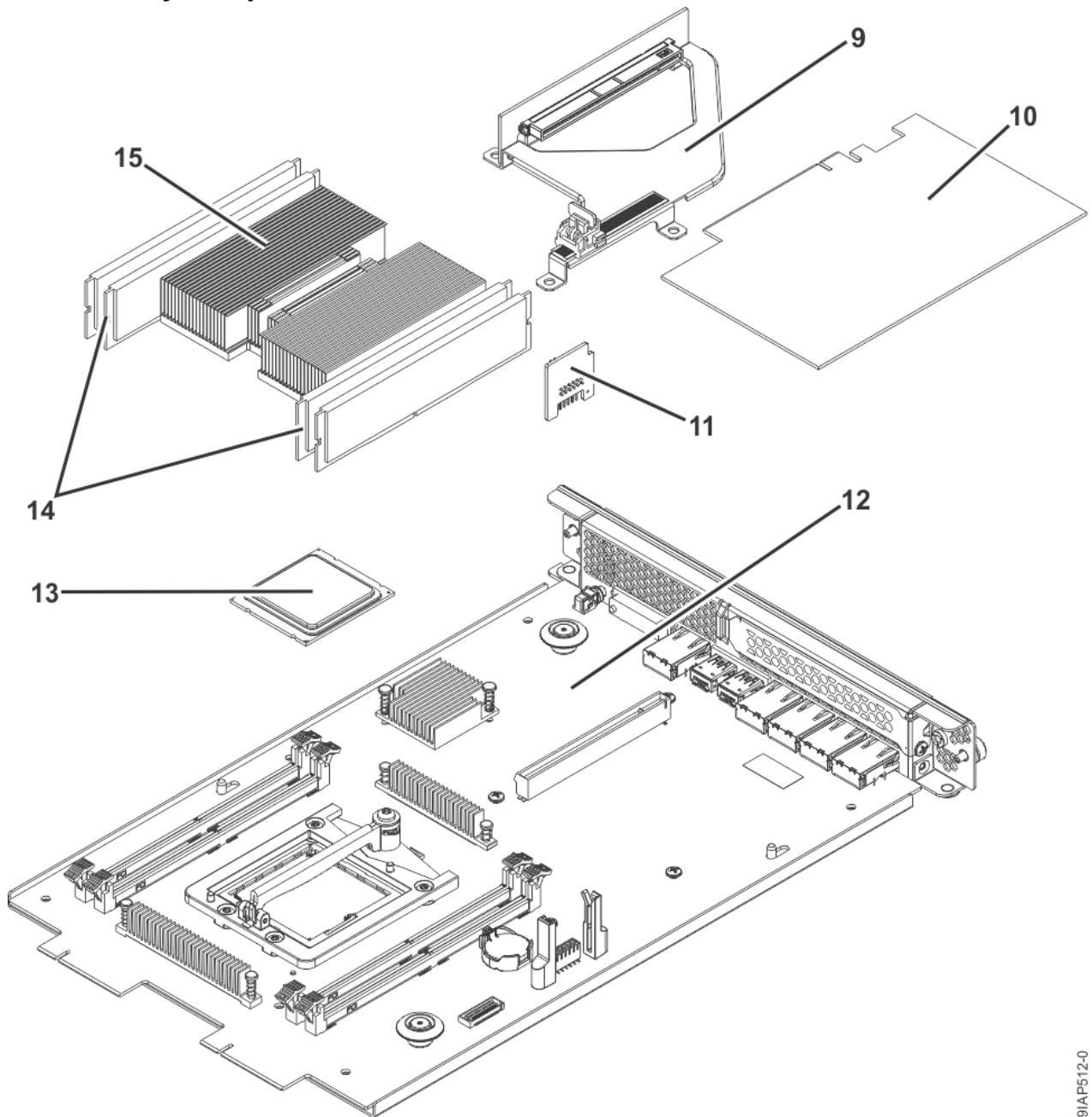


Figure 8. Additional system parts

Index number	Part number	Units per assembly	Description
9	02WF443	1	PCIe riser
10	02JD569	1	PCIe2 2-port 10 GbE BaseT RJ45 adapter
	01FT753	1	PCIe3 2-port 25/10 Gb NIC & RoCE SFP28 adapter
11	00VK865	1	Trusted platform module

P9IAP512-0

Table 12. Additional system parts (continued)

<b>Index number</b>	<b>Part number</b>	<b>Units per assembly</b>	<b>Description</b>
12	02WF439	1	System backplane kit (includes time-of-day battery, PCIe riser, PCIe tailstock filler, system processor module removal tool, and thermal interface material)
13	03GM808	1	6 core 3.0 GHz system processor module kit (includes system processor module, thermal interface material, tweezers, and system processor module removal tool)
14	78P6722	4	16 GB 2RX4 DDR4 IS RDIMM (Micron Technology, Inc.)
	78P4197	4	16 GB 2RX4 DDR4 IS RDIMM (Samsung Electronics Co., Ltd. or SK hynix, Inc.)
	78P4198	4	32 GB 2RX4 DDR4 IS RDIMM (Micron Technology, Inc., Samsung Electronics Co., Ltd., or SK hynix, Inc.)
15	03GM989	1	Heat sink kit (includes heat sink and thermal interface material)

Table 13. Miscellaneous parts

<b>Description</b>	<b>Part number</b>
USB cable	03GM778
Control panel cable	03GM780
Drive signal cable	03GM782
Drive power cable	03GM784
CR2032 Lithium time-of-day battery	00RY543
Chassis crossbar	03GM755



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## Accessibility features for IBM Power Systems servers

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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](http://www.w3.org/TR/wai-aria/) ([www.w3.org/TR/wai-aria/](http://www.w3.org/TR/wai-aria/)), to ensure compliance with [US Section 508](http://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards) ([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](http://www.w3.org/TR/WCAG20/) ([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.

The IBM Power Systems servers online product documentation in IBM Knowledge Center is enabled for accessibility. The accessibility features of IBM Knowledge Center are described in the [Accessibility](http://www.ibm.com/support/knowledgecenter/doc/kc_help.html#accessibility) section of the IBM Knowledge Center help ([www.ibm.com/support/knowledgecenter/doc/kc\\_help.html#accessibility](http://www.ibm.com/support/knowledgecenter/doc/kc_help.html#accessibility)).

### Keyboard navigation

This product uses standard navigation keys.

### 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.



## Vendor software

The IBM Power Systems servers include certain vendor software that is not covered under the IBM license agreement. IBM makes no representation about the accessibility features of these products. Contact the vendor for accessibility information about its products.

## Related accessibility information

In addition to standard IBM help desk and support websites, IBM has a TTY telephone service for use by deaf or hard of hearing customers to access sales and support services:

TTY service  
800-IBM-3383 (800-426-3383)  
(within North America)

For more information about the commitment that IBM has to accessibility, see [IBM Accessibility \(www.ibm.com/able\)](http://www.ibm.com/able).

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## Electronic emission notices

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### Class A Notices

The following Class A statements apply to the IBM servers that contain the POWER9 processor and its features unless designated as electromagnetic compatibility (EMC) Class B in the feature information.

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

## Canada Notice

CAN ICES-3 (A)/NMB-3(A)

## European Community and Morocco Notice

This product is in conformity with the protection requirements of Directive 2014/30/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

Warning: This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

## Germany Notice

### **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.

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"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.**

### **Japan Electronics and Information Technology Industries Association (JEITA) Notice**

(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 applies to 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 applies to 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 applies to products greater than 20 A per phase, three-phase.

高調波電流規格 JIS C 61000-3-2 準用品

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- 回路分類 : 5 (3相、PFC回路付)
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VCCI-A

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## People's Republic of China Notice

### 声 明

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

## Russia Notice

**ВНИМАНИЕ!** Настоящее изделие относится к классу А.  
В жилых помещениях оно может создавать  
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## Taiwan Notice

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此為甲類資訊技術設備，  
於居住環境中使用時，可  
能會造成射頻擾動，在此  
種情況下，使用者會被要  
求採取某些適當的對策。

### 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

## United States Federal Communications Commission (FCC) Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

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

Responsible Party:  
International Business Machines Corporation  
New Orchard Road  
Armonk, NY 10504  
Contact for FCC compliance information only: fccinfo@us.ibm.com

## Class B Notices

The following Class B statements apply to features designated as electromagnetic compatibility (EMC) Class B in the feature installation information.

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

### Canada Notice

CAN ICES-3 (B)/NMB-3(B)

### European Community and Morocco Notice

This product is in conformity with the protection requirements of Directive 2014/30/EU of the European Parliament and of the Council on the harmonization 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.

### German Notice

#### **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.

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#### **Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten**

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

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Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:  
International Business Machines Corp.  
New Orchard Road  
Armonk, New York 10504  
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Der verantwortliche Ansprechpartner des Herstellers in der EU ist:  
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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 55032 Klasse B**

## **Japan Electronics and Information Technology Industries Association (JEITA) Notice**

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This statement applies to products less than or equal to 20 A per phase.

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This statement applies to products greater than 20 A, single phase.

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

This statement applies to 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

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VCCI-B

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

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

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

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