

Power Systems

*Hardware Management Console service
(Machine Type 7042)*



Note

Before using this information and the product it supports, read the information in [“Safety notices” on page v](#), [“Notices” on page 59](#), 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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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.
- 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)



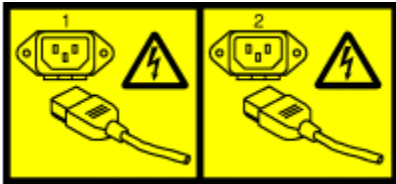
DANGER: Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices. In addition, do not lean on rack-mounted devices and do not use them to stabilize your body position (for example, when working from a ladder). Stability hazard:

- 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

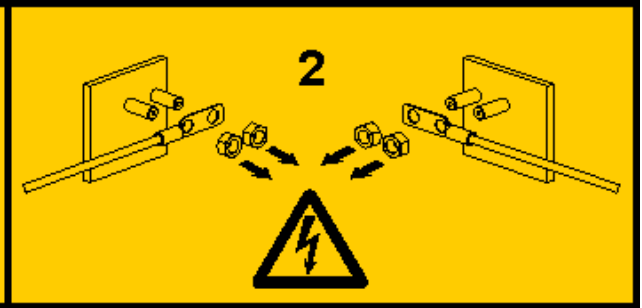
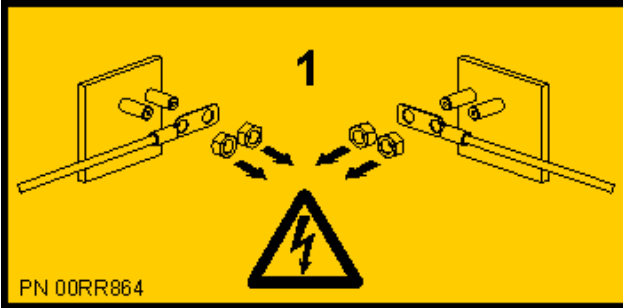


or



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 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.

Hardware Management Console service (7042-CR7, 7042-CR8, or 7042-CR9)

Use this information for troubleshooting, service, and support of your 7042-CR7, 7042-CR8, or 7042-CR9 Hardware Management Console (HMC).

The HMC connects to one or more managed systems to complete various functions. The HMC's primary functions include:

- Providing a console for system administrators and service providers to manage server hardware.
- Creating and maintaining a multiple partitioned environment on a managed system.
- Detecting, reporting, and storing changes in hardware conditions.
- Acting as a service focal point for service providers to determine an appropriate service strategy.
- Displaying operating system session terminals for each partition.

The HMC is delivered with its machine code preinstalled on the disk drive. After the system is installed and connected to a managed system, you can complete system management tasks.

The HMC machine code does not have provisions for loading or running additional applications that are not related to hardware management or service. All the tasks that you need to maintain the managed system, the underlying operating system, and the HMC machine code are available by using the HMC management interface.

Identifying your HMC

This information supports HMC machine types 7042-CR7, 7042-CR8, and 7042-CR9.

The following illustrations identify each of the machine type 7042 models and show the cable connections that are located on the rear of each HMC model.

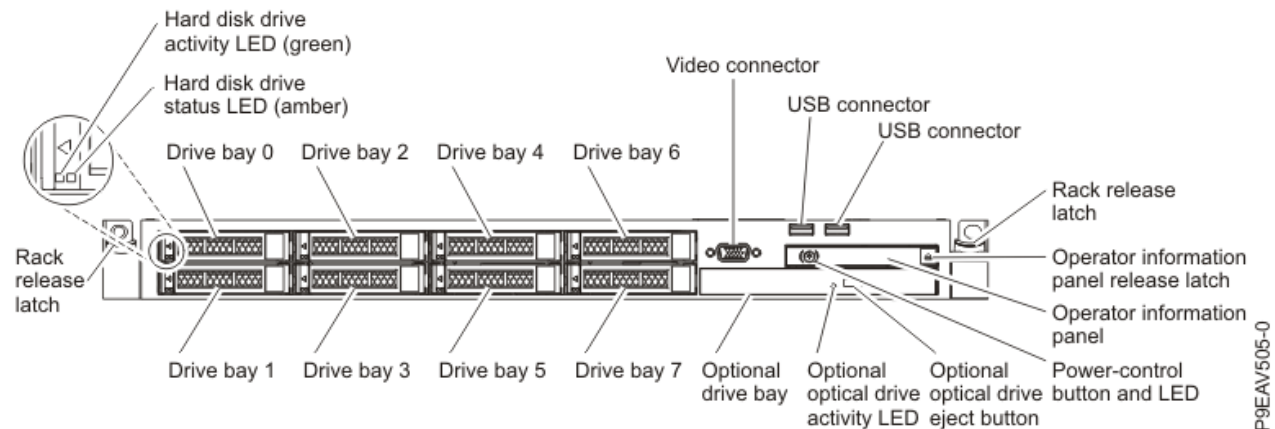


Figure 1. Model 7042-CR7 or 7042-CR8 (Front view of the server model with a 2.5-inch hard disk drive)

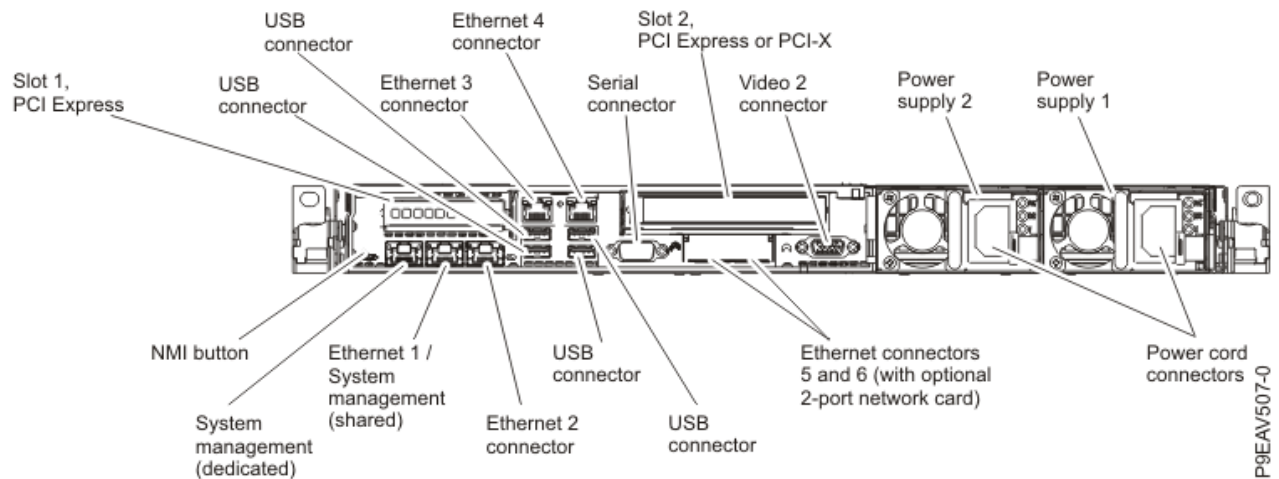


Figure 2. Model 7042-CR7 or 7042-CR8 (Rear view)

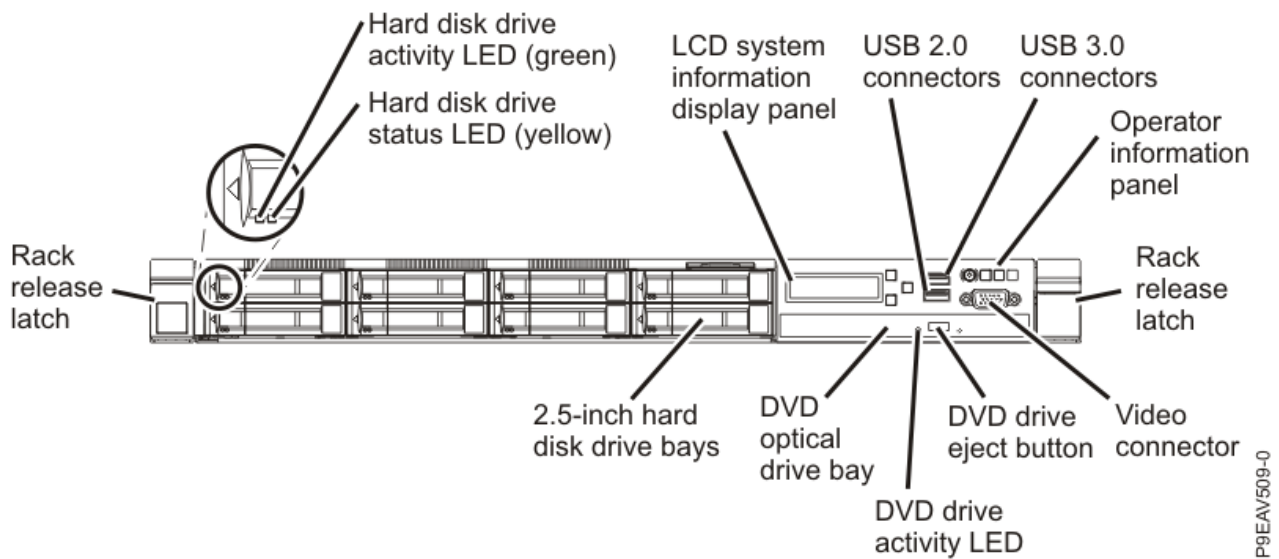


Figure 3. Model 7042-CR9 (Front view of the server model with 2.5-inch hard disk drives)

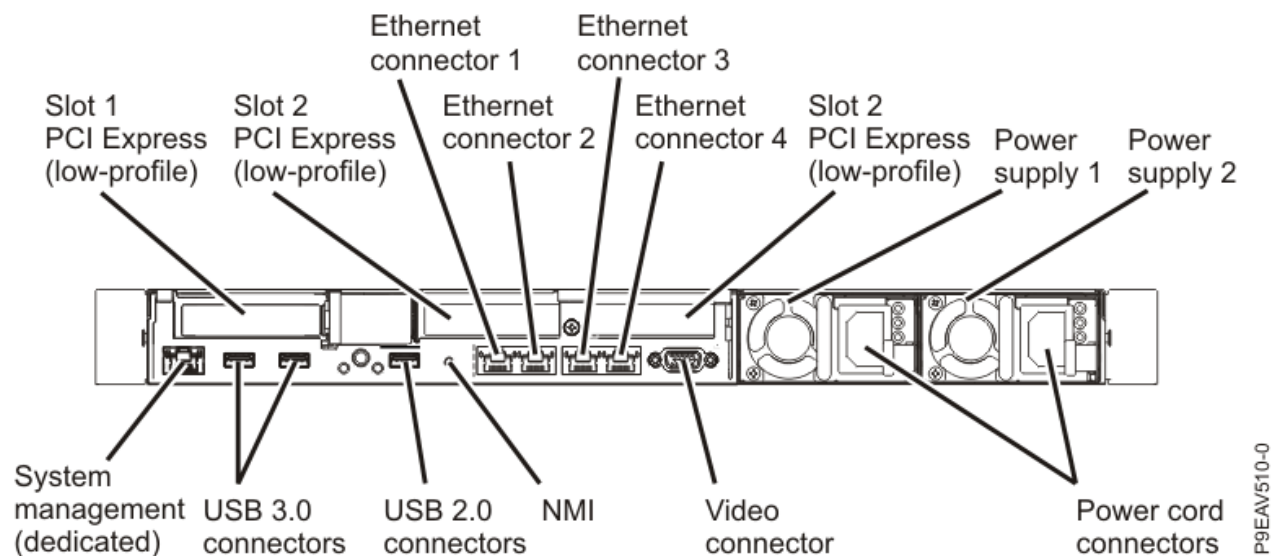


Figure 4. Model 7042-CR9 (Rear view)

Managed system operation

The HMC graphical interface provides the functions that are needed to create and maintain a partitioned environment on a managed system. Using the interface allows for direct manipulation of HMC-defined objects and increased information regarding detected changes in hardware conditions.

The managed system can be run as a partitioned system, sometimes referred to as *logically partitioned*. This means that the managed system can run multiple operating systems simultaneously. The system can also run as a large single partition, which is known as the *manufacturing default configuration* when the system is delivered. If the system is partitioned, then the single partition that uses all the system resources is referred to as a *full system partition*.

Partitioning provides users with the ability to divide a single managed system into several systems. Each of these systems, running in a partition, can run applications in multiple, independent environments simultaneously. Logical partitioning makes it possible for a user to run a single application by using different sets of data on separate partitions, as if that application were running independently on separate physical systems. By creating partitions, for example, a company can test its programs in one partition while it develops the same program in another, at the same time, all using the same system. This same system partitioning method is more cost-effective, potentially eliminating the need for a separate test system.

The full system partition is no different from the traditional way of using a system. The single server uses all of its resources as one system.

HMC system diagnostics

Your HMC system also provides a set of diagnostic procedures to be used when you are troubleshooting HMC problems. For more information about accessing the HMC diagnostics, see [“HMC diagnostics” on page 4](#).

Power on the HMC

For HMC power-on procedures, see [“Power on the HMC” on page 33](#).

Power off the HMC

For HMC power-off procedures, see [“Power off the HMC” on page 33](#).

Power-on self-test

To complete power-on self-test procedures, see [“Power-on self-test” on page 33](#).

Specifications and system unit locations

Your HMC system is based on a model of server. For information about system specifications and system unit locations, use the appropriate server hardware maintenance manuals. See [“Equivalent maintenance information for the HMC server hardware” on page 4](#).

Cable the HMC

For HMC power off procedures, see [“Cabling the HMC” on page 20](#).

External AC power cable for the HMC

To avoid electrical shock, a power cable with a grounded attachment plug is provided. Use only properly grounded outlets.

Power cables that are used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA). These power cords consist of the following parts:

- Electrical cables, type ST
- Attachment plugs that comply with National Electrical Manufacturers Association (NEMA) L6-30P.
- Appliance couplers that comply with International Electrotechnical Commission (IEC) Standard 320, Sheet C13 and C14.

Power cables that are used in other countries consist of the following parts:

- Electrical cables, type HD21 or HD22
- Attachment plugs that are approved by the appropriate testing organization for the specific countries where they are used.
- Appliance couplers that comply with the International Electrotechnical Commission (IEC) Standard 320, Sheet C13 and C14.

For a listing of power cables that are used by the HMC, see [“Power cords” on page 18](#).

For a more complete listing of power cords, see [Planning for power](#).

HMC diagnostics

Learn to use the HMC diagnostics when determining the state or capability of a component found in the HMC to complete its functions.

If a problem is determined to be in your HMC, read, understand, and then complete the procedures that are found in this topic.

The HMC problem analysis procedure guides you to the appropriate repair action. Occasionally, you are directed to the maintenance documentation for the HMC base server. When this occurs, the maintenance documentation for the server is used to complete the repair action.

HMC system reference code

System reference codes (SRCs) are the foundation of the Hardware Management Console diagnostics.

All SRCs, also known as error codes, that pertain to the function of the HMC can be found in [System reference codes \(Cxxx-Hxxx\)](#).

HMC connection error codes are 6 digits and begin with a 0. All other HMC error codes are 8 digits and begin with the alphabetic characters HSC. The HMC error codes are organized in the following categories:

- 0xxxxx connection error codes
- HSCExxxx console events error codes
- HSCFxxxx Licensed Internal Code error codes
- HSCIxxxx Inventory Scout Services error codes
- HSCLxxxx partition and system management error codes
- HSCPxxxx platform management error codes
- HSCSxxxx Service Focal Point error codes

Equivalent maintenance information for the HMC server hardware

Use the information that is provided to help cross-reference your HMC equivalent machine type and model number for the base server. You can use the entries in this table to link directly to the base server maintenance documentation.

<i>Table 1. Equivalent maintenance information for server hardware used for each HMC model</i>		
HMC machine type and model number (available on the serial number plate of your HMC)	Equivalent server machine type and model number	Hardware maintenance manuals (HMM)
7042-CR7 and 7042-CR8	7914 Model PCH	See Problem determination and service guide
7042-CR9	5463 Model AC1	See Problem determination and service guide

For the latest information regarding maintenance of your HMC server, system board specifications, and parts, see server hardware maintenance manuals. To obtain the latest versions of these publications, complete the following steps:

1. Go to the [IBM Support Portal](#).
2. In the **Product finder** field, type the equivalent server machine type and model number that corresponds to your HMC machine type and model number. Then, press enter.
3. Select the product that matches your equivalent server machine type and model. Click **Operating system independent**. Then, click **Go**.
4. In the product support content area, click **Troubleshooting documentation**.
5. Select the problem determination and service guide.

Diagnostics, test, and recovery

Describes some of the diagnostic tools available for use on your HMC hardware-related problems.

Choose from one of the following procedures to help in diagnosing a hardware-related problem.

- Power-on self-test (POST)

- POST beep codes
- Error code format

Note: For more information about POST, see the appropriate server hardware maintenance information. To access the server hardware maintenance information, see [“Equivalent maintenance information for the HMC server hardware”](#) on page 4.

- Sector disk drive scanning procedure

To scan your HMC disk drive, complete the following steps:

1. Power off the HMC.
2. Power on the HMC.
3. As the HMC is rebooting, watch the HMC display. After the second BroadCom Ethernet driver screen is displayed, press CTRL+A.
4. From the list of options, select **Disk Utilities**.
5. Select **Verify Disk Media**. The HMC scans your disk drive.

- Dynamic System Analysis

Note: For more information about Dynamic System Analysis, see [Diagnostic tools](#).

Removal and replacement procedures

Select and then perform the part removal and replacement procedures for the personal computer on which your Hardware Management Console (HMC) is based.

Depending on the system configuration, when you are directed to exchange parts, run tests, or change configuration data, the interface to the managed systems will be unavailable. If possible, before starting any of these tasks, ensure that all system management tasks are completed and all critical data is backed up.



Attention:

- Removing power from an HMC might cause loss of data on the disk drives. If power must be removed, select Power Off from the HMC user interface. This action shuts down the operating system and turns off the power to the HMC. See [“HMC and system power-on and power-off procedures” on page 33](#) before proceeding with any of the removal procedures.
- The system board, adapters, memory modules, and processor modules can be damaged by electrostatic discharge. If you are directed to exchange FRUs in an HMC, see the information about handling electro-static discharge (ESD) sensitive devices in the appropriate PC maintenance information manuals.

When you are referred to the hardware maintenance manual for the personal computer, use the hardware maintenance manual for the appropriate personal computer machine type. To find documentation about the base HMC personal computer and its components, see [“Equivalent maintenance information for the HMC server hardware” on page 6](#).

Equivalent maintenance information for the HMC server hardware

Use the information that is provided to help cross-reference your HMC equivalent machine type and model number for the base server. You can use the entries in this table to link directly to the base server maintenance documentation.

Table 2. Equivalent maintenance information for server hardware used for each HMC model		
HMC machine type and model number (available on the serial number plate of your HMC)	Equivalent server machine type and model number	Hardware maintenance manuals (HMM)
7042-CR7 and 7042-CR8	7914 Model PCH	See Problem determination and service guide
7042-CR9	5463 Model AC1	See Problem determination and service guide

For the latest information regarding maintenance of your HMC server, system board specifications, and parts, see server hardware maintenance manuals. To obtain the latest versions of these publications, complete the following steps:

1. Go to the [IBM Support Portal](#).
2. In the **Product finder** field, type the equivalent server machine type and model number that corresponds to your HMC machine type and model number. Then, press enter.
3. Select the product that matches your equivalent server machine type and model. Click **Operating system independent**. Then, click **Go**.
4. In the product support content area, click **Troubleshooting documentation**.
5. Select the problem determination and service guide.

Recovering the HMC

If the HMC has had a problem and you need to recover the HMC, see [“Reinstalling the HMC machine code” on page 34](#).



Attention: This procedure will restore the HMC image onto the disk drive in the HMC personal computer. Before performing this procedure, contact HMC support and also ensure that there are backups for all critical console data.

Backing up partition profiles

Ensure that critical data that is stored on the HMC is also regularly maintained on backup media.

To back up partition profiles, see [“Backing up partition profiles” on page 34](#).

HMC machine code updates

For information about updates or upgrades for the HMC machine code, see [“Upgrading the machine code on an HMC” on page 39](#).

Recovering an HMC after replacing a disk drive

If you have to replace a disk drive, you must recover the HMC image and restore your stored profile data. For more information, see [“Reinstalling the HMC machine code” on page 34](#).

Rebuilding a Redundant Array of Independent Disks (RAID) 1 array

For information about how to rebuild a RAID 1 array on your HMC that has a failed disk drive or solid-state drive, see [Rebuilding a RAID 1 array](#).

Performing the firmware (BIOS/VPD) update procedure (after replacing the system board)

When you replace the system board, perform the firmware update procedure for your HMC personal computer.



Attention: Refer to the information label located inside the system unit cover for any model-specific information.

To perform the firmware (BIOS/VPD) update procedure, perform the following steps:

1. To find documentation about the base HMC personal computer and its components, see [“Equivalent maintenance information for the HMC server hardware” on page 6](#).
2. Review the section in your HMC personal computer information for *Updating the firmware*.
3. Perform the procedures to update the new system board with the latest BIOS firmware.
4. Perform the procedures to update the vital product data (VPD) information with the machine type, model, and serial number for the HMC.
5. Return the HMC to normal operations.

Hardware Management Console parts

Contains illustrations, part descriptions, and part numbers that are used when you order replacement parts for your Hardware Management Console (HMC).

Server parts

Contains part number information for parts that are used in assembling your HMC.

Note: FRU parts and part numbers are subject to update due to our parts system substitution-update policy. With our parts system substitution-update policy, we make every effort to supply you with the latest components available for your model HMC.

The following table contains a cross-reference equivalent of the HMC machine type and model number to the server machine type and model number. For server parts information not listed in the following tables, see hardware maintenance manual for your server.

<i>Table 3. Equivalent maintenance information for server hardware used for each HMC model</i>		
HMC machine type and model number (available on the serial number plate of your HMC)	Equivalent server machine type and model number	Hardware maintenance manuals (HMM)
7042-CR7 and 7042-CR8	7914 Model PCH	See Problem determination and service guide
7042-CR9	5463 Model AC1	See Problem determination and service guide

For the latest information regarding maintenance of your HMC server, system board specifications, and parts, see server hardware maintenance manuals. To obtain the latest versions of these publications, complete the following steps:

1. Go to the [IBM Support Portal](#).
2. In the **Product finder** field, type the equivalent server machine type and model number that corresponds to your HMC machine type and model number. Then, press enter.
3. Select the product that matches your equivalent server machine type and model. Click **Operating system independent**. Then, click **Go**.
4. In the product support content area, click **Troubleshooting documentation**.
5. Select the problem determination and service guide.

7042-CR7 or 7042-CR8

Machine type 7042-CR7 or 7042-CR8 uses a server machine type of 7914-PCH for its base configuration. To access the server hardware maintenance manuals, see [“Server parts” on page 7](#).

Note: Each server hardware maintenance manual might reference more than one machine type in its title. If necessary, to cross-reference to the original server hardware maintenance manual, ensure that you find the hardware maintenance manual for the server machine type and model for the HMC that you are servicing.

The following illustration and table identifies the major components of the model 7042-CR7 or 7042-CR8.

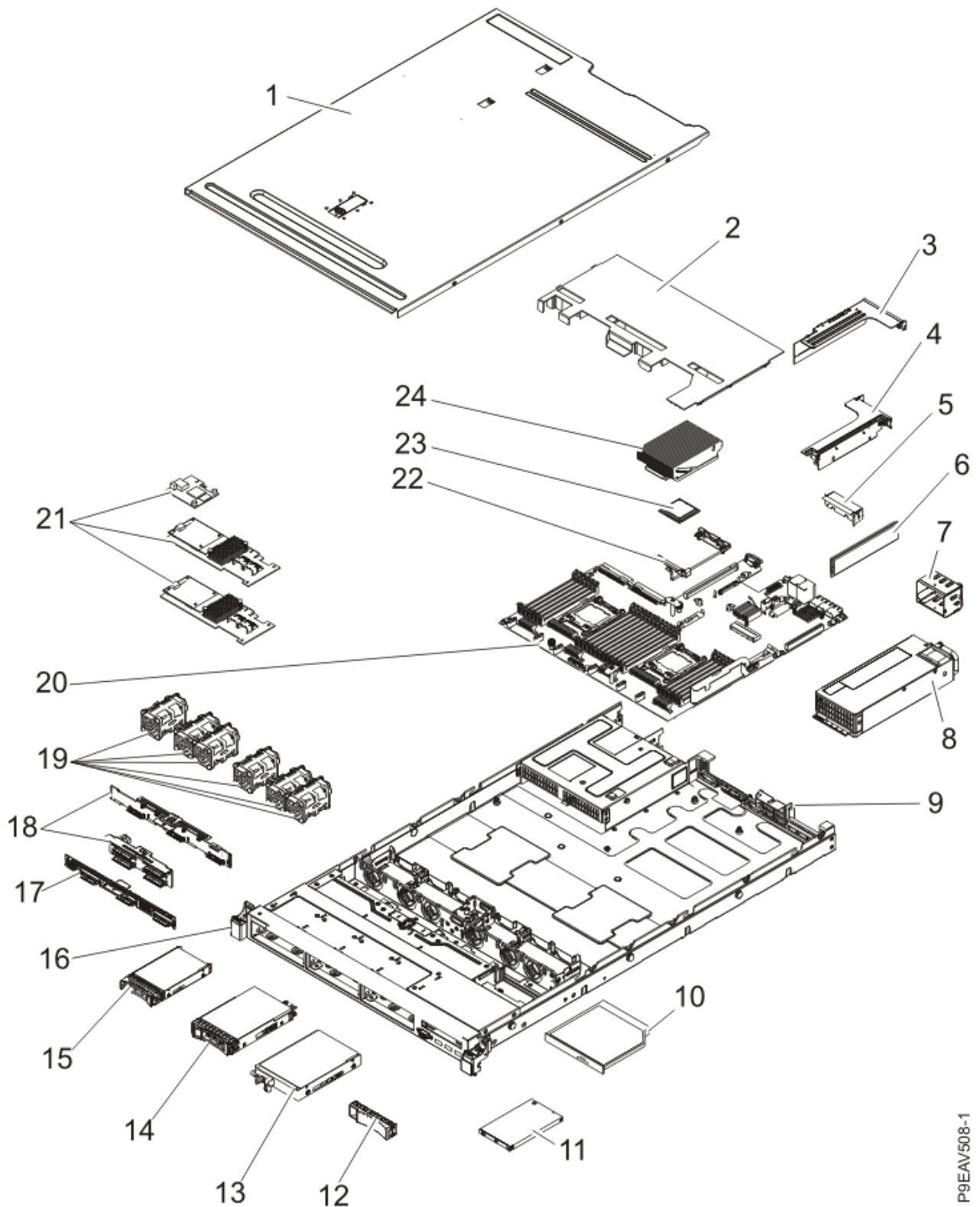


Figure 5. Model 7042-CR7 or 7042-CR8 parts

Notes:

1. Field replaceable units (FRUs) must be serviced only by an authorized service provider.
2. Customer replaceable units (CRUs) can be replaced by the customer. Definitions of tier 1 and tier 2 CRUs for this model HMC follow:

Tier 1 CRU

A procedure that a customer can complete without input from a service provider. The procedure that is used to service this type of component is usually required to be completed by the customer.

Tier 2 CRU

A procedure that a customer can complete, but might require support from a service provider. The procedure that is used to service this component is not usually required to be completed by the customer.

3. If the part you are replacing is not identified as being either tier 1 or tier 2, call your service provider to service the FRU.

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	Part number
1	Top cover			94Y7569
2	Air baffle			94Y7568
3	PCI bracket 2	94Y7566		
3	PCI-X riser card	94Y7590		
4	PCI Express riser card, Gen3 x16	94Y7588		
5	Filler, PCI			94Y7608
6	Memory, 8 GB dual-rank 1.35 V, DDR3, 1333 MHz, RDIMM Note: This part number applies only to 7042-CR7.	49Y1415		
6	Memory, 8 GB single-rank 1.35 V, DDR3, 1600 MHz, RDIMM Note: This part number applies only to 7042-CR8.	00D503 8		
7	Power supply bay filler			94Y7610
8	Power supply, 550 W, AC	43X331 2		
9	Chassis assembly, 2.5-inch hard disk drive (HDD) (without front bezel)			94Y7573
10	DVD-RW drive	44W325 6		
11	Operator information panel assembly	90Y5821		
11	Operator information panel assembly, advanced	90Y5822		
	USB assembly, front	94Y7621		
	USB assembly, front dual-port	00D333 8		
12	Not applicable to this model			
13	Not applicable to this model			
14	Not applicable to this model			
15	HDD, 2.5-inch hot-swap, 500 GB, 7.2 K	81Y9727		
16	EIA bracket			94Y7570
17	Not applicable to this model			

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	Part number
18	Backplane, 2.5-inch hot-swap HDD	94Y7587		
19	Fan module, hot-swap	94Y7564		
20	System board	00Y8375		
21	ServeRAID M5110 SAS/SATA adapter	81Y4482		
21	ServeRAID M5100 series 512 MB flash (RAID 5 upgrade)	81Y4488		
21	ServeRAID M5110 series battery Kit	81Y4491		
22	Retention module, heat sink	94Y7739		
23	Microprocessor installation tool	94Y9955		
23	Microprocessor, Intel Xeon E5-2640, 2.50 GHz, 15 MB, 1333 MHz, 95 W (6-core) Note: This part number applies only to 7042-CR7.	81Y5166		
23	Microprocessor, Intel Xeon E5-2640, 2.0 GHz, 20 MB, 1600 MHz, 95 W (8-core) Note: This part number applies only to 7042-CR8.	00Y2782		
24	Heat sink assembly, 95 W	94Y7602		

The 7042-CR7 or 7042-CR8 parts that are listed in the following table are not illustrated.

Description	CRU part number (Tier 1)	CRU part number (Tier 2)	Part number
Battery, 3.0 V	33F8354		
Battery, ServeRAID	81Y4579		
Cable, power cord	39M537 7		
Cable, mini SAS 1 meter (3.3 feet)	39R653 0		
Cable, USB	81Y6659		
Cable, USB conversion	39M290 9		
Cable, serial conversion	46M402 7		
Cable, virtual media Gen 2	46M402 8		
Cable, power, 2.5-inch HDD	81Y6663		
Cable, backplane, 2.5-inch hot-swap HDD	81Y6667		
Cable, operator information panel	81Y6669		

Description	CRU part number (Tier 1)	CRU part number (Tier 2)	Part number
Cable, SATA DVD	81Y6671		
Cable, video	81Y6673		
Cable, adapter power	81Y6676		
Cable, ServeRAID battery	90Y7309		
Cable, ServeRAID power module	90Y7310		
Cable, SPECpower	00D333 4		
Panel, light path diagnostics	00D386 3		
Labels, chassis	94Y7604		
Labels, system service	94Y7605		
Bezel, 2.5-inch hard disk bays, and 1 optical drive bay	94Y7606		
Thermal grease kit		41Y9292	
Alcohol wipes		59P473 9	
Miscellaneous parts kit			94Y7571
Filler, EMC			44T2248
Filler, DVD drive bay			49Y4868
Filler, HDD bay			59Y3925
Filler, fan			94Y7572
Remote RAID battery tray			94Y7609
CMA kit			49Y4817
Slide rail kit, Gen-III			94Y6625
CMA kit, Gen-III			94Y6626
Slide rail kit, universal			94Y6719

For a complete listing of power cords for the HMC, see [Planning for power](#).

7042-CR9 parts

Machine type 7042-CR9 uses a server machine type of 5463-AC1 for its base configuration. To access the server hardware maintenance manuals, see [“Server parts” on page 7](#).

Note: Each server hardware maintenance manual might reference more than one machine type in its title. If necessary, to cross-reference to the original server hardware maintenance manual, ensure that you find the hardware maintenance manual for the server machine type and model for the HMC that you are servicing.

The following illustration and table identifies the major components of the model 7042-CR9.

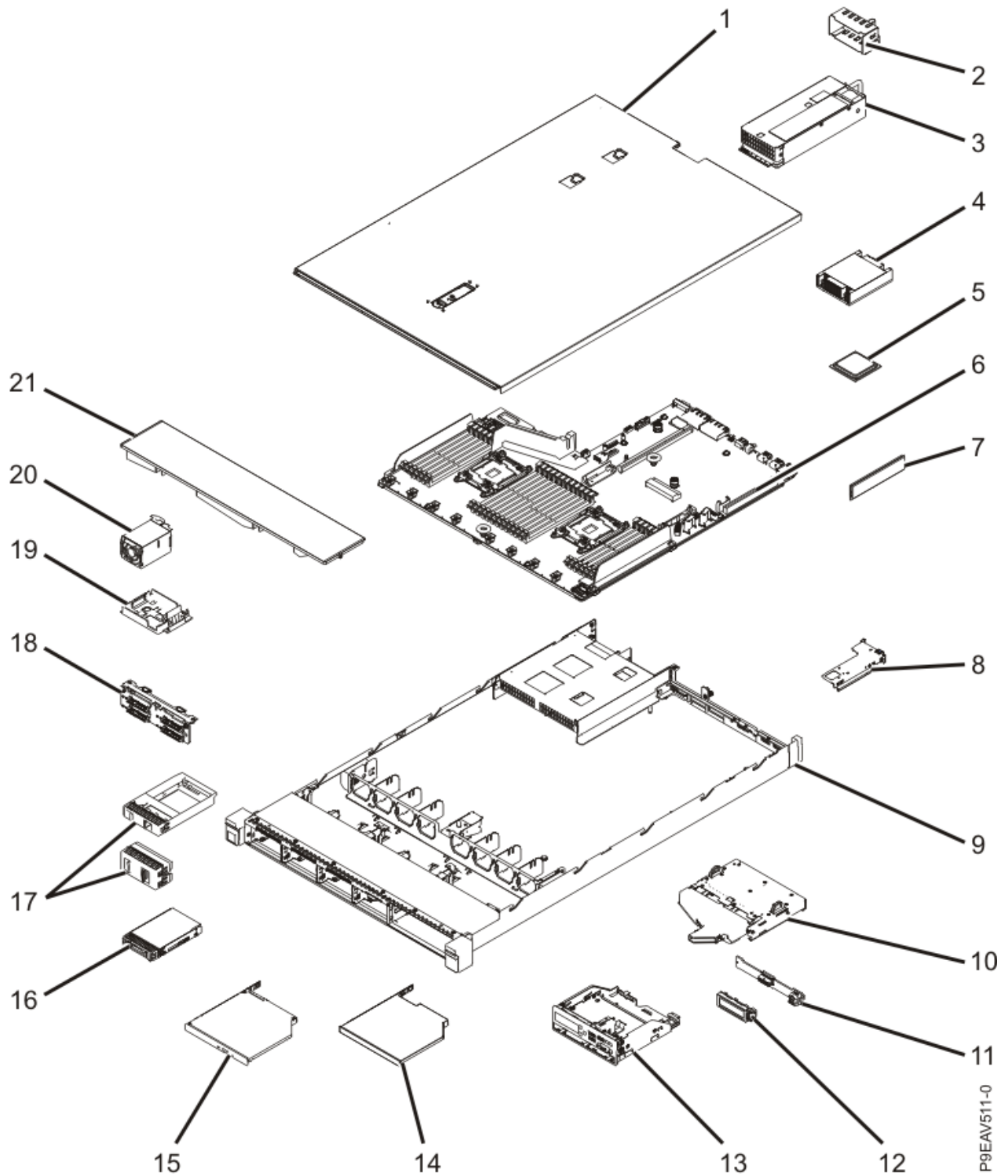


Figure 6. Model 7042-CR9 parts

Notes:

1. Field replaceable units (FRUs) must be serviced only by an authorized service provider.
2. Customer replaceable units (CRUs) can be replaced by the customer. Definitions of tier 1 and tier 2 CRUs for this model HMC follow:

Tier 1 CRU

A procedure that a customer can complete without input from a service provider. The procedure that is used to service this type of component is usually required to be completed by the customer.

Tier 2 CRU

A procedure that a customer can complete, but might require support from a service provider. The procedure that is used to service this component is not usually required to be completed by the customer.

3. If the part you are replacing is not identified as being either tier 1 or tier 2, call your service provider to service the FRU.

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	Part number
1	Top cover			00KF667
2	Power supply bay filler			94Y7610
3	Power supply, 550 Watt, high efficiency, platinum, AC	94Y8137		
3	Power supply, 550 Watt, high efficiency, platinum, AC	94Y8139		
3	Power supply, 550 Watt, high efficiency, platinum, AC	94Y8173		
4	Heat sink		00KC912	
5	Microprocessor, Intel E5-2620 v3, 2.4 GHz, 15 MB, 1866 MHz, 85 W (6-core)		00AE690	
6	System board		00MV248	
7	Memory, 16 GB, 2Rx4, 1.2 V, DDR4, 2133 MHz, RDIMM	46W0798		
8	Not applicable to this model			
9	Not applicable to this model			
10	Not applicable to this model			
11	Not applicable to this model			
12	LCD system information display panel	00D0464		
13	Media cage, eight 2.5-inch hard disk drives	00KF670		
14	Not applicable to this model			
15	Ultraslim enhanced SATA multi-burner	00FL353		
16	Hard disk drive, 2.5-inch hot-swap, Near-Line SATA, 500 GB, 7.2 K	00AJ137		
16	Hard disk drive, 2.5-inch hot-swap, Near-Line SATA, 1 TB, 7.2 K	00AJ142		
17	Filler, 2.5-inch hard disk drive bay			00FW856
17	Filler, 2.5-inch hard disk drive bay (rear)			00KF683
18	Backplane, four 2.5-inch hard disk drives	00FJ755		
19	Battery holder			00KF677
20	Thermal kit (hot-swap fan)	00KC909		

Index	Description	CRU part number (Tier 1)	CRU part number (Tier 2)	Part number
21	Air baffle, 2.5-inch hard disk drive bay			00KF666

The 7042-CR9 parts that are listed in the following table are not illustrated.

Description	CRU part number (Tier 1)	CRU part number (Tier 2)	Part number
Front USB assembly, eight 2.5-inch hard disk drives	00KF674		
ServeRAID M5210 SAS/SATA Controller	46C9111		
ServeRAID M5200 series 1 GB flash (RAID 5 upgrade)	47C8661		
ServeRAID M5200 power card			
Cable, backplane, four 2.5-inch hot-swap hard disk drive	00KC960		
Operator information panel, 2.5-inch hard disk drive bay	00KF673		
PCIe Riser 1, low-profile bracket	00KF687		
PCIe Riser 2, 2 x low-profile bracket	00KF688		
Bezel, eight 2.5-inch hard disk drives (no LCD system information display panel)			00KF672
Bracket, four 2.5-inch backplane			00KF692
Filler, thermal kit (hot-swap fan)			00KF682
Alcohol wipes			59P4739
Cable, SAS 750 mm			00KC952
Cable, DVD 480 mm			00KC958
Miscellaneous parts kit			00KF685
Cable, video 2.5 inches			00KG408
Cable, LCD system information display panel			00MU415
Battery, 3.0 volt			33F8354
Thermal grease kit			41Y9292
Cable, flash power module			46C9793
Power card			00JY023

For a complete listing of power cords for the HMC, see [Planning for power](#).

HMC keyboard CRUs

The keyboards that are identified in the following table can be attached to any HMC.

Notes:

1. All keyboards are considered a Tier 1 CRU.
2. You must have the specific character set designed for each language that is installed on your HMC.

Keyboard country code	FRU/CRU part number
US English	10N6956
Arabic	10N6984
Belgian/French	89P8302
Belgian/UK	10N6969
Bulgarian	10N6972
Brazilian Portuguese	10N6963
Chinese/US	10N6966
Czech	10N6981
Danish	10N6971
Dutch	10N6975
English/EMEA	10N6988
French	10N6957
French Canadian 445	10N6967
French Canadian 58	10N6968
German	10N6959
Greek	10N6977
Hebrew	10N6978
Hungarian	10N6964
Icelandic	89P8317
Italian 141	89P8318
Italian 142	10N6958
Japanese 194	10N6962
Korean	10N6965
LA Spanish	10N6983
Norwegian	10N6974
Polish	10N6979
Portuguese	10N6976
Romanian	89P8326
Russian	10N6986

Keyboard country code	FRU/CRU part number
Russian/Cyrillic	89P8328
Serbian/Cyrillic	89P8329
Slovak	10N6980
Spanish	10N6961
Swedish/Finnish	10N6870
Swiss/French/German	10N6973
Thailand	89P8334
Turkish 440	10N6982
Turkish 179	89P8336
UK English	10N6960
US	89P8338
Yugoslav/Latin	89P8339

HMC modem cable part numbers

The following tables contain part number information for HMC modem cables, along with the name of the country or region where used, and a listing of countries along with the telephone cable name and part number where used.

If you are using a cable other than one of the cables listed in the following table, read the following caution statement.

Note: For a more complete listing of power cords for the HMC, see [Planning for power](#).



CAUTION: To reduce the risk of fire, use only No. 26 AWG or larger (for example, 24 AWG) UL-listed or CSA certified telecommunication line cord. (C035)

Primary country or region	Cable name	Cable part number
Austria	AUS	21H4902
Australia	AUZ	75G3807
Belgium	BEL	21H4903
Denmark	DN	75G3812
Finland	FN	75G3809
France	FR	75G3803
Germany	GE	75G3804
Hong Kong S.A.R. of the PRC	HK	75G3808
Israel	ISR	21H4905
Italy	IT	75G3802
Netherlands	NL	75G3810
South Africa	SAF	21H4904
Sweden	SW	75G3806
Switzerland	SZ	75G3811

Primary country or region	Cable name	Cable part number
United Kingdom	UK	75G3805
United States	US	87G6236

External modems

Contains a list of external modem part number along with the primary country or region where used.

Note: 7042-CR8 and 7042-CR9 do not support external modems.

Primary country or region	Modem part number
United States	03N7035
Australia	03N7036
Europe	03N7037
United Kingdom	03N7038
China	03N7039
Taiwan	03N7040
All geographies	03N7041

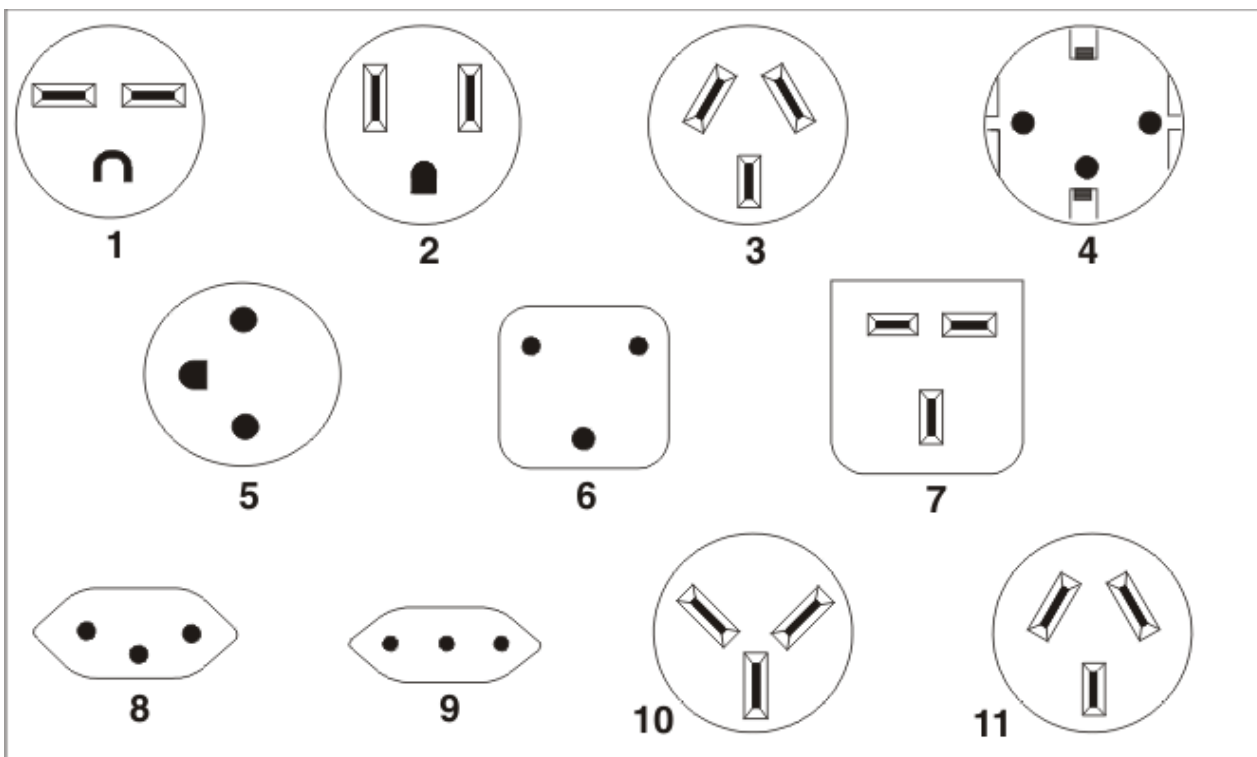
Power cords

The manufacturer provides a power cord with a grounded attachment plug to use with this product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

Power cords that are used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

- For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.
- For units intended to be operated at 230 volts (within the US): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.
- For units intended to be operated at 230 volts (outside the US): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment is installed.
- The power cords that are listed in the following table are specifically designed for a country or region and are usually available only in that country or region.

Note: All power cords are considered a Tier 1 CRU.



Index	Power cord part number	Used in these countries and regions
1	1838574	Thailand, Bahamas, Barbados, Bolivia, Brazil, Canada, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Netherlands Antilles, Panama, Peru, Philippines, Taiwan, Trinidad (West Indies), Tobago, United States of America, Venezuela
2	6952301	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), United States of America, Venezuela
3	13F9940	Argentina, Australia, China (PRC), New Zealand, Papua New Guinea, Paraguay, Uruguay, Western Samoa
4	13F9979	Afghanistan, Algeria, Andorra, Angola, Austria, Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Macao S.A.R. of the PRC, Malagasy, Mali, Martinique, Mauritania, Mauritius, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Romania, Senegal, Slovakia, Spain, Sudan, Sweden, Syria, Togo, Tunisia, Turkey, former USSR, Vietnam, former Yugoslavia, Zaire, Zimbabwe
5	13F9997	Denmark
6	14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka

Index	Power cord part number	Used in these countries and regions
7	14F0033	Antigua, Bahrain, Brunei, Channel Islands, Cyprus, Dubai, Fiji, Ghana, Hong Kong S.A.R. of the PRC, India, Iraq, Ireland, Kenya, Kuwait, Malawi, Malaysia, Malta, Nepal, Nigeria, Polynesia, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Kingdom, Yemen, Zambia
8	14F0051	Liechtenstein, Switzerland
9	14F0069	Chile, Ethiopia, Italy, Libya, Somalia
10	14F0087	Israel

Cabling the HMC

Connect the Hardware Management Console (HMC) cables, connect the Ethernet cable, and connect the HMC to a power source.

Before you begin

If the physical HMC is not located within 8 meters (25 feet) away from the managed system, you must supply a separate system that can access the internet by using a browser. This system must be within 8 meters (25 feet) of the managed system. This setup allows service personnel remote access to the HMC. The HMC must also be configured to allow for this remote access.

About this task



DANGER: Electrical voltage and current from power, telephone, and communication cables are hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or complete installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that is attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described below when you install, move, or open covers on this product or attached devices.

To Disconnect:

1. Turn everything OFF (unless instructed otherwise).
2. Remove power cords from the outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

To Connect:

1. Turn everything OFF (unless instructed otherwise).
2. Attach all cables to devices.

3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

(D005)

Use the following instructions to help you cable your rack-mounted or stand-alone HMC.



Attention: Do not plug the power cords into the electrical outlet until you are instructed to do so.

Procedure

1. Ensure that you position the HMC in the correct location.
2. Choose from the following options:
 - If you are installing a rack-mounted HMC, continue with step “3” on page 21.
 - If you are installing a stand-alone HMC, continue with step “4” on page 22.
3. Complete the following steps to install the cables on a rack-mounted HMC:
 - a. Use the following illustration to identify the location of the connectors that are described in these instructions:

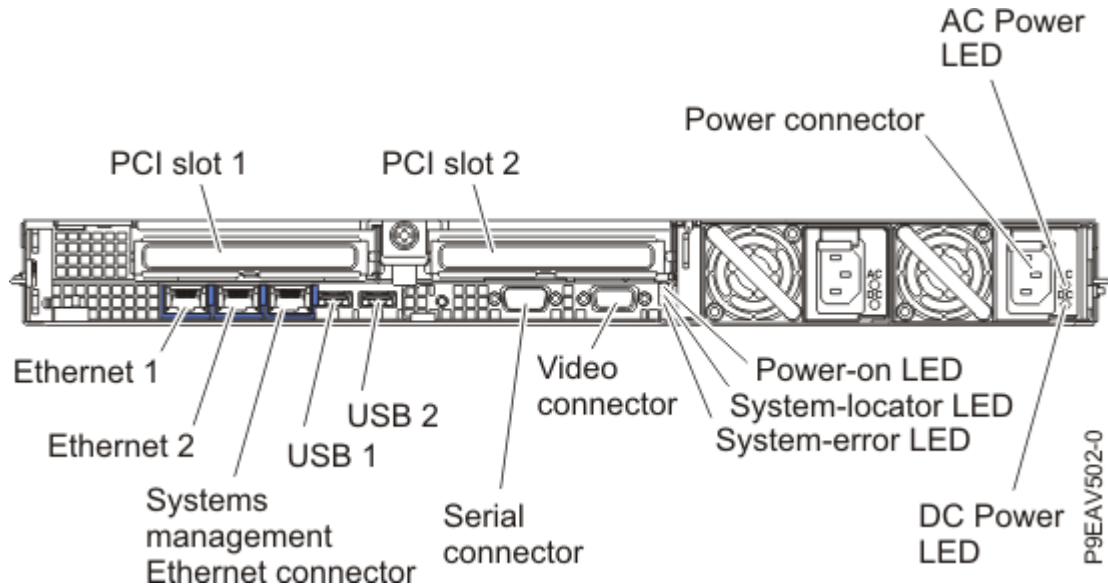


Figure 7. Rear view of a typical rack-mounted HMC

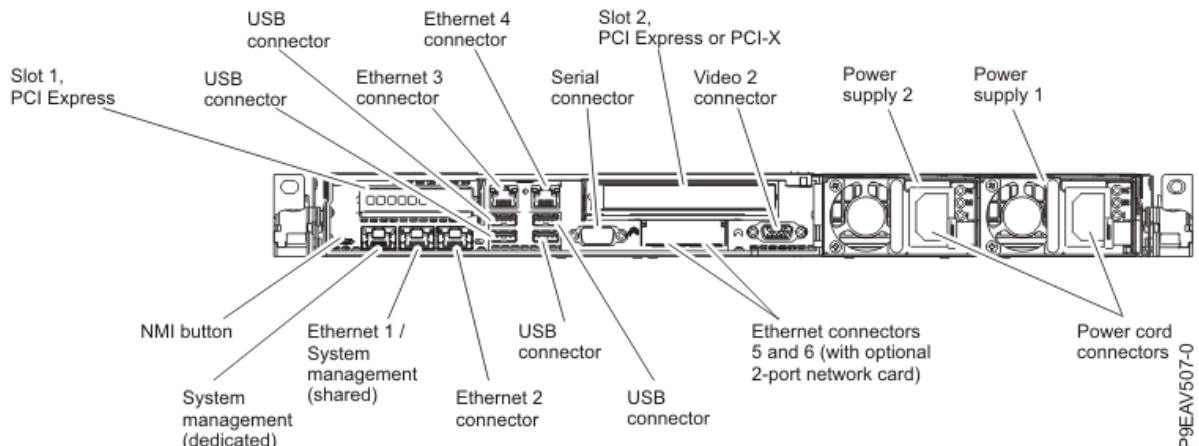


Figure 8. Rear view of a 7042-CR7 or 7042-CR8

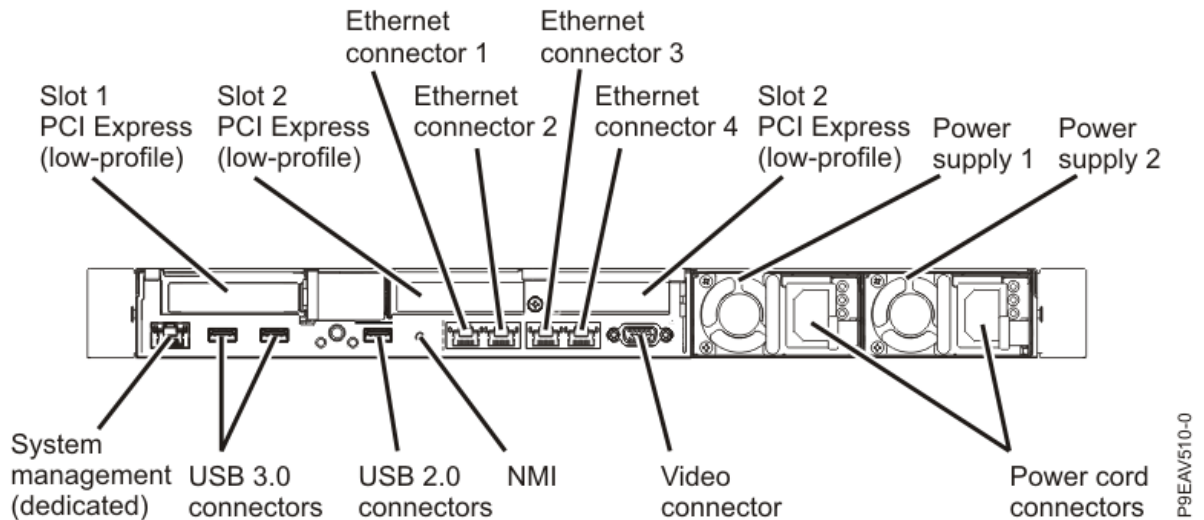


Figure 9. Rear view of a 7042-CR9 model

- b. If you are installing your HMC into a rack, see [Installing and configuring the Hardware Management Console](#). When you finish installing the HMC into a rack, continue with the next step.
 - c. Connect the keyboard, display, and mouse by using the USB conversion option cable.
 - d. Continue with step “5” on page 23.
4. If you are installing a stand-alone HMC, complete the following steps:
- a. Use the following illustration to identify the location of the connectors that are described in these instructions:

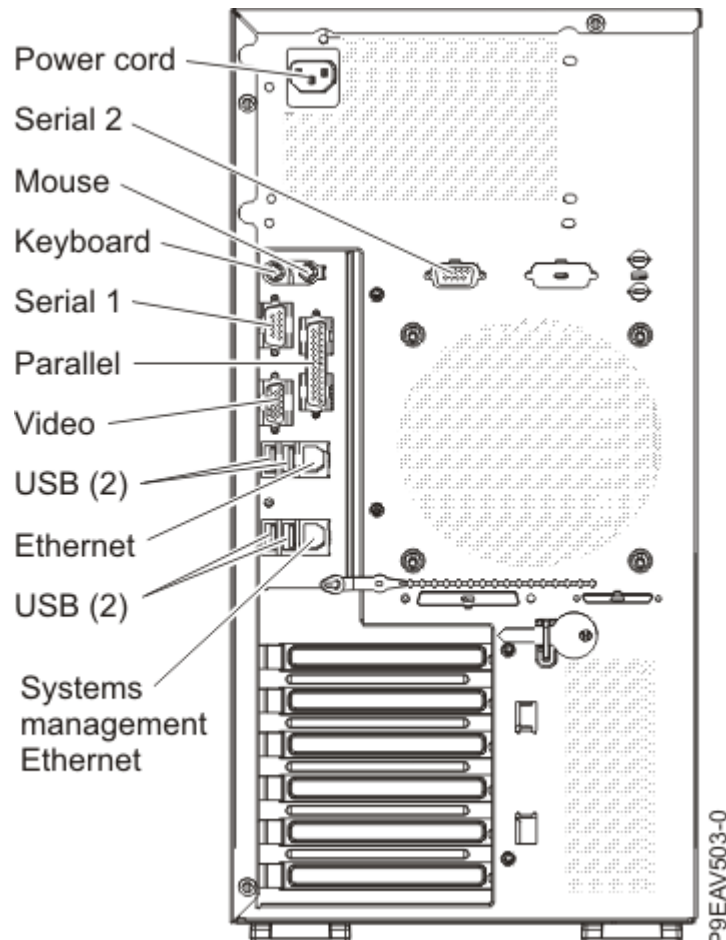


Figure 10. Rear view of a typical stand-alone (tower) HMC

Table 4. Supported HMC ports	
Port	Description
Video	The Video port is used as monitor connection.
PS/2 Keyboard/Mouse	A PS/2 keyboard or mouse is not included with the HMC, but you can attach either.
Serial 1	Serial 1 is supported for an external modem.
USB	These ports are supported for a USB keyboard, mouse, flash memory, or USB diskette drive.
Ethernet	The Ethernet port is used as the HMC's primary network connection.

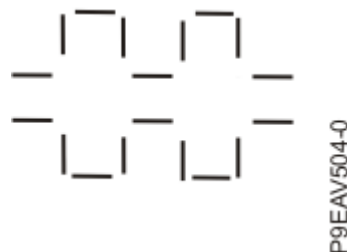
The HMC does not support the use of parallel or Serial 2 ports.

- b. Attach the monitor cable to the monitor connector, and tighten the screws.
 - c. Attach the power cord to the monitor.
 - d. Ensure that the voltage selection switch on the HMC is set to the voltage used in your world region. The voltage selection switch is red and is located near the power connector. Move the switch so that the voltage that is used in your world region is displayed.
 - e. Plug the power cord into the HMC.
 - f. Connect the keyboard and mouse to the Universal Serial Bus (USB) ports on the HMC. You can connect the keyboard and mouse to the USB ports on the front or rear panels.
5. Connect the modem:

Note: During the installation and configuration of the HMC, the modem might automatically dial out as the HMC follows routine call-out procedures. This is usual behavior.

If you are connecting an external modem, complete the following steps:

- a. Optional: Install the external modem into a rack.
- b. If you have not already done so, connect the modem data cable to the external HMC modem.
- c. Connect the modem data cable to the system port on the HMC labeled with the following symbol:



- d. Use the telephone cable to connect the line port of the external modem to the analog telephone jack on your wall.

If you are connecting to an integrated modem, use the data cable to connect the integrated HMC modem to the appropriate data source. For example, use the telephone cable to connect the HMC modem line port to the analog jack on your wall.

6. Connect the Ethernet (or crossover) cable from the HMC to the managed server.

Note:

- In general, connect your HMC to the managed server in a private service DHCP network. If you did not install any additional Ethernet adapters in the PCI slots on your HMC, use the primary integrated Ethernet port. Use the previous illustrations to identify the location of the HMC ports.
- You can verify that the Ethernet cable connection is active by observing the green status lights at both the HMC and managed system Ethernet ports while your installation progresses.

- Connect the Ethernet port on the HMC to the Ethernet port that is labeled **HMC1** on the managed server.

If you are connecting a second HMC to your managed server, connect to the Ethernet port that is labeled **HMC2** on the managed server.

7. If you use an external modem, plug the modem power supply cord into the HMC modem.
8. Plug the power cords for the monitor, HMC, and HMC external modem into electrical outlets.

Note: Do not connect the managed system to a power source now.

9. If you are setting up the HMC to manage an existing server, continue with [“Preparing for HMC configuration”](#) on page 56.

Note: For a complete list of HMC supported external cables, see [Serial attached SCSI cable planning](#) topic.

Troubleshooting the HMC

Learn how to correct a *No connection*, *Incomplete*, *Recovery*, or *Error* state on a system managed by an HMC.

Correcting a *No connection* state for a managed system

The *No connection* state can occur when the HMC is not connected, or the connection with the managed system failed.

About this task

Use this procedure for a system that was previously connected to the same HMC and is now in *No connection* state. If you have a new system, a new HMC, or have moved your system to a different HMC, see [“Correcting a connection problem between the HMC and a managed system”](#) on page 28.

Procedure

1. Obtain the IP address for the managed system's service processor by performing the following steps.
 - a. On the HMC, right-click the desktop and select **terminal > xterm**. The restricted shell command line interface opens.
 - b. At the terminal, issue the command: `lssysconn -r all`

Information similar to the following is displayed:

```
resource_type=sys,type_model_serial_num=9117-570*100729E,sp=unavailable,ipaddr=10.0.0.247,alt_ipaddr=unavailable,state=No Connection,connection_error_code=Connecting 0000-0000-00000000
```

- c. At the terminal, issue the ping command to the address of the failing system. In the previous example, you would type: `ping 10.0.0.247`.
2. Choose from the following options:
 - If the ping is successful, go to step [“3”](#) on page 24.
 - If the ping is *not* successful, go to step [“4”](#) on page 25.
 3. If the ping test is successful, perform the following steps:
 - a. If your system is equipped with a control panel, ensure that there are no steady (nonscrolling) reference codes displayed on the panel.

Note: A steady reference code might indicate a hardware problem. Contact your next level of support or your hardware service provider.
 - b. Restart the HMC. For instructions about restarting the HMC, see [“Shutting down, restarting, logging off, and disconnecting the HMC”](#) on page 57.

- c. If restarting the HMC does not resolve the problem, contact your next level of support or your hardware service provider.
4. If the ping test *is not* successful, perform the following steps:
 - a. If your system is equipped with a control panel, ensure that there are no steady (nonscrolling) reference codes displayed on the panel.

Note: A steady reference code might indicate a hardware problem. Contact your next level of support or your hardware service provider.
 - b. If your system has a control panel, check to see if the power light is on.
 - c. Choose from the following options:
 - If there is power to the managed system, go to step “5” on page 25.
 - If there is no power to the managed system, see “HMC and system power-on and power-off procedures” on page 33. After the power is restored, wait 5 minutes for the service processor to restart and the HMC to re-establish contact. If the system is equipped with redundant service processors, allow up to 20 minutes for this step.
5. Verify physical network connectivity by performing the following steps:
 - a. Verify that the HMC and the service processor are correctly connected to your Ethernet network.
 - b. Verify that Ethernet link status is good on all network segments which exist between the HMC and the managed system.
 - c. If you think the network might be the problem, connect a cable from the HMC to the service processor and try pinging the failing system. Then choose from the following options:
 - If the ping is successful, replace the cables the way they were and correct the network problem. After the network problem is resolved, repeat this entire procedure.
 - If the ping is not successful, replace the cables the way they were and continue with step “5.d” on page 25.
 - d. Reset the service processor. See “Resetting the service processor” on page 32.
6. If the problem is not resolved by any of the above steps, contact your next level of support or your hardware service provider.

Correcting an *Incomplete* state for a managed system


The *Incomplete* state can occur when the Hardware Management Console (HMC) failed to get all of the necessary information from the managed system.

About this task

To correct an *Incomplete* state, perform the following steps:

Procedure



1. In the navigation area, click the **Resources** icon , and then select **All Systems**.
2. In the content pane, select the system name that contains the partition, and then select the partition.
3. In the navigation area, select **System Actions > Operations > Rebuild System**.
4. Select **Yes** to refresh the internal representation of the managed system.
5. Choose from the following options:
 - If the state remains as *Incomplete*, rebuild the managed system several more times.
 - If the state goes to *Recovery*, see “Correcting a Recovery state for a managed system” on page 26.
 - If the state does *not* remain as *Incomplete* or go to *Recovery*, continue with the next step.

6. Reset the connection from the HMC. See [“Resetting the managed system connection from the HMC” on page 32.](#)

If the connection still fails, continue with the next step.

7. Restart the HMC.

Then choose from the following options (This next step might take several minutes to complete):

- If the state goes to *Recovery*, see [“Correcting a Recovery state for a managed system” on page 26.](#)
- If the state remains *Incomplete*, perform the following steps:
 - a. Verify that there is a redundant HMC.
 - b. Verify that no one is entering commands from the alternate HMC.
 - c. Repeat step [“1” on page 25](#) through [“7” on page 26](#). If the connection still fails, continue with the next step.
- 8. If the problem persists, contact your next level of support or your hardware service provider.

Correcting a *Recovery* state for a managed system

The Recovery state can occur when the save area in the service processor assembly is not synchronized with the HMC database.

About this task

To recover from the Recovery state, perform the following steps:

Procedure

1. Recover partition data.

For more information, see [“Recovering partition data on a managed system” on page 26.](#) If this resolves the problem, this ends the procedure.

2. If the problem is not resolved after recovering profile data, choose one of the following:

- If the state remains in *Recovery*, retry recovering partition data. If it fails a second time, follow the problem determination procedure for any reference codes you receive.
- If the state changed to *Incomplete*, see [“Correcting an Incomplete state for a managed system” on page 25.](#)
- If the state changed to *No Connection*, see [“Correcting a No connection state for a managed system” on page 24.](#)
- If the problem persists, contact your next level of support or your hardware service provider.

Recovering partition data on a managed system

Learn how to recover the partition data on your managed system if the partition becomes corrupted.

About this task

Through the Hardware Management Console (HMC) interface, you can recover partition data on your managed system if the data becomes damaged. This partition data includes information about logical partitions, partition profiles, and system profiles. If the partition data on your managed system becomes damaged, the managed system is in *Recovery* state. You can either restore the partition data from a backup file that is saved automatically on your HMC, or clear all partition configuration.

This procedure recovers the partition data that is saved automatically in the service processor of your server. To recover the partition data from a specific version of the backup data on your managed system, use this procedure to restore or initialize the partition data, and then restore the profile data from the backup file. For information about how to restore profile data from a backup file, see [“Restoring profile data” on page 27.](#)

Note: The HMC might not show *operating* state for the managed system after completing this recovery procedure. After a partition is activated, the managed system changes to an *operating* state and clears the A700 4091 or C700 4091 system reference code (SRC).

To recover the partition data on your managed system, you must be a member of one of the following roles:


- Super administrator
- Operator



Attention: The bootlists of all logical partitions are lost during this procedure, and the HMC rebuilds default bootlists for the logical partitions. If a logical partition uses a mirrored system boot disk, you must re-create the bootlist for the logical partition before you start the operating system on the logical partition.

To recover the partition data on your managed system, complete the following steps:



1. In the navigation area, click the **Resources** icon , and then click **All Systems**.
2. In the content pane, select the system name that contains the partition.
3. In the navigation area, click **System Actions** > **Legacy**, and then select one of the following options:
 - **Restore:** This option restores the partition data by using the backup file that is saved automatically on the HMC.
 - **Initialize:** This option clears all partition configuration data. This option can be used only if all partitions are in the *Not Activated* state.
4. Click **OK**.

Restoring profile data

Learn how to read the profile data from the previously backed-up file on the Hardware Management Console (HMC), and load this data to the managed system.

About this task

Selecting this menu item restores profile data to the HMC from a backup file stored on the HMC hard drive.


Note: This is not a concurrent procedure. To restore profile data, the managed system must be in a *partition standby* or *operating* state. After the data is restored, the managed system powers on to the *partition standby* state.

To restore stored profile data on the HMC hard drive, you must be a member of one of the following roles:

- Super administrator
- Service representative

To restore profile data, choose one of the following navigation options. complete the following steps:



1. In the navigation area, click the **Resources** icon , and then click **All Systems**.
2. In the content pane, select the system name that contains the partition.
3. In the navigation area, click **System Actions** > **Legacy** > **Restore**.
4. From the list of backup files, select the profile information that you want to restore.
5. Select a restore option.
6. Click **OK**.

Correcting an *Error* state for a managed system

The *Error* state automatically generates a call to the service support center if the automatic call support function is enabled.

About this task

If the automatic call support function is not enabled, contact your next level of support or your hardware service provider.

Correcting a *Failed Authentication* state for a managed system

The *Failed Authentication* state can occur when the HMC access password for the managed system is not valid.

Before you begin

Perform the following procedure to correct a failed authentication state on your HMC.

Procedure

1. Do you have an HMC password?
 - **Yes:** Enter the HMC password and choose from the following options:
 - If the managed system goes to *Operating*, *Power Off*, or *Standby*, the authentication was successful. **This ends the procedure.**
 - If the managed system goes to *No connection*, *Incomplete*, *Recovery*, or *Error* state, see [“Troubleshooting the HMC” on page 24.](#)
 - **No:** Do you have an ASMI admin password?
 - **Yes:** Continue with step [“2” on page 28.](#)
 - **No:** Contact your next level of support to request CE login. Then continue with step [“2” on page 28,](#) using CE login instead of admin password for step [“2.a” on page 28.](#)
2. Perform the following steps:
 - a. Log in to the ASMI with admin authority.
 - b. Select **Login Profile.**
 - c. Select **Change Password.**
 - d. In the User ID to change field, select **HMC.**
 - e. Enter the ASMI's admin password in the **Current Password** for user ID admin field.

Note: Do not enter the HMC user password. Enter the ASMI's *admin* password.
 - f. Enter a new HMC access password twice and click **Continue.**
 - g. From the HMC Server Management window, select **Update the managed system password.**
 - h. Enter the new password that was set in step [“2.f” on page 28.](#) **This ends the procedure.**
3. If the problem is not resolved, contact your next level of support or your hardware service provider.

Correcting a connection problem between the HMC and a managed system

Learn how to correct a connection problem between the Hardware Management Console (HMC) and a managed system.

About this task

Use this procedure in the following situations:

- You have a new HMC.
- You have a new system.
- You are using a different HMC to manage your system.

If your system was previously connected to the same HMC and is now in *No connection* state, see [“Correcting a No connection state for a managed system” on page 24.](#)

Procedure

1. Choose from the following options:

- If the system uses DHCP addressing, go to step [“2” on page 29.](#)
- If the system uses static addressing, go to step [“6” on page 29.](#)

Note: To find out whether your system uses DHCP or static addressing, choose one of the following options:

- Use the ASMI by selecting **Network Services > Network Configuration** and viewing whether the IP address field shows *Static* or *Dynamic*.
- If you have a control panel, use function 30.

2. If your system uses DHCP addressing, add a system automatically by entering the following command:
mksysconn -o auto.

Is the system displayed?

- **Yes: This ends the procedure.**
- **No:** Continue with step [“3” on page 29.](#)

3. Check for network problems, cables, switches, link lights on the service processor, and so on.

Was there a problem?

- **Yes:** Correct the problem and return to step [“2” on page 29.](#)
- **No:** Continue with step [“4” on page 29.](#)

4. Connect to ASMI and reset the network configuration to force the service processor to request a new IP address.


For more information about how to connect to ASMI and reset the network configuration, see [Configuring network interfaces.](#)

5. Did the network configuration reset resolve the problem?

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

6. If your system uses static IP addressing, add a system manually by completing the following steps:



- In the navigation area, click the **Resources** icon , and then click **All Systems**.
- In the upper-left corner of the content pane, click **Connect Systems**.
- Enter the IP address/Hostname and password, and then click **OK**.

Is the system displayed under system management?

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

Correcting a version mismatch state in a managed system

Learn how to correct a version mismatch problem in a managed system.

About this task

The version mismatch problem might occur in the following situations:

The service processor firmware and Hardware Management Console (HMC) versions are incompatible.

Use the reference code and update to the compatible service processor and HMC configurations.

An HMC Version 7.7.8, or later is connected to a server that is managed by a newer version of HMC.

If an HMC Version 7.7.8, or later is used to manage a server with a newer configuration, it might display a new connection error state **Version Mismatch** with the reference code as **Save Area Version Mismatch**. If you want to continue to use the lower version of HMC, initialize the managed system in the lower version of HMC and then run any operations.

For more information, see [Correcting a Version mismatch state for a managed system](#).

Creating a virtual drive on a 7042-CR7 installed with a single drive

Learn how to create a virtual drive on a 7042-CR7 installed with a single drive.

About this task

To create a virtual drive on a 7042-CR7 installed with a single drive, complete the following steps:

Procedure

1. Power on or restart the system.
2. When the system prompt is displayed, press the F1 key to access **Setup Utility**.
3. In the System Configuration and Boot Management window, use the up or down arrow keys to highlight **System Settings** and then press Enter.
4. In the System Settings window, use the up or down arrow keys to highlight **Storage** and then press Enter.
5. In the Storage window, use the up or down arrow keys to highlight **LSI MegaRAID Configuration Utility** and then press Enter.
6. In the Configuration Options window, use the up or down arrow keys to highlight **Virtual Drive Management** and then press Enter.
7. In the Virtual Drive Management window, use the up or down arrow keys to highlight **Create Configuration** and then press Enter.
8. In the Create Configuration window, use the up or down arrow keys to highlight **Select Drives** and then press Enter.
9. In the Select Drives window, use the up or down arrow keys to highlight **Check All** and then press Enter.
10. Use the up or down arrow keys to highlight **Apply Changes** and then press Enter.
The Success window is displayed with **OK** highlighted.
11. Press Enter.
12. In the Create Configuration window, use the up or down arrow keys to highlight **Save Configuration** and then press Enter.
13. In the Warning window, use the up or down arrow keys to highlight **Confirm** and then press Enter.
14. Use the up or down arrow keys to highlight **Yes** and then press Enter. The Success window is displayed with **OK** highlighted.
15. Press Enter.

The Create Configuration window displays additional information.

16. Press Esc to exit the Create Configuration window.
17. Press Esc twice to go to the Configuration Options window.
18. In the Configuration Options window, use the up or down arrow keys to highlight **Virtual Drive Management** and then press Enter.
19. In the Virtual Drive Management window, use the up or down arrow keys to highlight **Select Virtual Drive Operation** and then press Enter.
20. In the Select Virtual Drive Operations window, use the up or down arrow keys to highlight **Start Operation** and then press Enter.
21. In the Warning window, use the up or down arrow keys to highlight **Confirm** and then press Enter.
22. Use the up or down arrow keys to highlight **Yes** and then press Enter.

The Success window is displayed with **OK** highlighted.

23. Press Enter.
24. Press Esc until the exit Setup Utility prompt is displayed.
25. Press **Y** to save the changes and exit the **Setup Utility**.

This step ends the procedure.

Creating a virtual drive on a 7042-CR9

Learn how to create a virtual drive on a 7042-CR9.

About this task

To create a virtual drive on a 7042-CR9, complete the following steps:

Procedure

1. Power on or restart the system.
2. When the system prompt is displayed, press the F1 key to access **Setup Utility**.
3. In the System Configuration and Boot Management window, use the up or down arrow keys to highlight **System Settings** and then press Enter.
4. In the System Settings window, use the Up Arrow Key or Down Arrow Key to select **Storage** and then press Enter.
5. In the Storage window, use the Up Arrow Key or Down Arrow Key to select **AVAGO MegaRAID <ServeRAID M5210> Configuration Utility** and then press Enter.
6. In the Dashboard View window, use the Up Arrow Key or Down Arrow Key to select **Main Menu** and then press Enter.
7. In the Main menu window, use the Up Arrow Key or Down Arrow Key to select **Configuration Management** and then press Enter.
8. In the Configuration Management window, use the Up Arrow Key or Down Arrow Key to select **Create Virtual Drive** and then press Enter.
9. In the Create Virtual Drive window, use the Up Arrow Key or Down Arrow Key to select **Generic RAID 1** and then press Enter.
10. In the Generic R1 window, use the Up Arrow Key or Down Arrow Key to select **Save Configuration** and then press Enter.
11. In the Warning window, use the Up Arrow Key or Down Arrow Key to navigate to **Confirm**, then use the space bar to highlight **Yes**, and press Enter.

The Success window is displayed with **OK** highlighted.

12. Press Enter.
13. Press Esc until the **Main Menu** window is displayed.

14. In the Main Menu window, use the Up Arrow Key or Down Arrow Key to select **Virtual Drive Management** and then press Enter.
15. In the Virtual Drive Management window, use the Up Arrow Key or Down Arrow Key to select **Virtual Drive 0** and then press Enter.
16. In the Virtual Drive 0 window, use the Up Arrow Key or Down Arrow Key to select **View Associated Drives** and then press Enter.
17. If you have a 7042-CR9 system on which one drive is installed, ensure that the drive is displayed. If you have a 7042-CR9 system on which two drives are installed, ensure that both drives are displayed.
18. Press Esc until the exit Setup Utility prompt is displayed.
19. Press **Y** to save the changes and exit the **Setup Utility**.

This step ends the procedure.


Resetting the managed system connection from the HMC

Use this procedure to reset the managed system connection from the Hardware Management Console (HMC).

About this task

To reset the managed system connection, complete the following steps:



1. In the navigation pane, click the **Resources** icon , and then select **All Systems**.
2. In the content area, select the managed system for which you want to reset the connection.
3. Select **Actions > Reset or Remove Connection**.
4. Select **Reset Connection**.
5. Click **OK**.

Resetting the service processor

Use this procedure to reset the service processor.

About this task

Note: Use this procedure only under the direction of your next level of support or your hardware service provider. During this procedure, you are powering off the system, removing AC power, and reapplying AC power.

Procedure

1. Inform anyone that is using the server that it will be shut down.
2. Stop all applications that are running on the server.
3. Stop the operating system and server by choosing from the following options:
 - If you have an HMC, shut down all logical partitions and the server. For instructions, see [“HMC and system power-on and power-off procedures” on page 33](#). Then, continue with step [“5” on page 32](#).
 - If you do *not* have an HMC, continue with the next step.
4. Stop the system. For instructions, see [Stopping a system that is not managed by an HMC](#).
5. Unplug the AC power cord and then plug it back in.
6. Start the server.

For instruction, see [Starting a system that is not managed by an HMC](#). The service processor is reset.
This ends the procedure.

HMC and system power-on and power-off procedures

Use one or more of the following procedures to power on or power off your Hardware Management Console (HMC) or system.

Power on the HMC

During the process of powering on, the HMC checks to see which managed systems are available and communicating with the console. To ensure that each managed system is available before you power on the HMC, managed systems must be in standby mode or actively operating. Standby mode is indicated by the OK shown in the operator panel after the managed system has the power connected and the initial tests are complete.


Note: If the managed system is in an emergency power off (EPOW) condition, you must power off the managed system before you use the HMC to power on the system.

To power on the HMC, complete the following steps:

1. Press the power button once to turn on the power.
2. When the system finishes the power-on self-test (POST), log in to the HMC.

Power off the HMC

To power off the HMC, complete the following steps:


1. In the navigation area, click the **HMC Management** icon , and then click **Console Management**.
2. In the **Management** area of the content pane, click **Shut Down or Restart the Management Console**.
3. Click **Shutdown HMC**, and then click **OK**.

Power-on self-test

After power is turned on and before the operating system is loaded, the system does a power-on self-test (POST). This test checks to ensure that the hardware is functioning correctly before the operating system is loaded. During the POST, codes that indicate the progress of the POST might be displayed. After the POST is complete, the HMC operating machine code loads and a login prompt is displayed.

Power on a system by using an HMC

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

1. In the navigation area, click the **Resources** icon , and then click **All Systems**.
2. In the content pane, select the managed system name.
3. In the navigation area, click **System Actions > Operations > Power On**.
4. Follow any additional on-screen instructions.


Power off a system by using an HMC



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

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



1. In the navigation area, click the **Resources** icon , and then click **All Systems**.
2. In the content pane, select the managed system name.
3. In the navigation area, click **System Actions** > **Operations** > **Power Off**.
4. Follow any additional on-screen instructions.

After the managed system completes its power off sequence, you can remove the power cords if needed. For more information about how to remove the power cords, see [“Remove the power cords” on page 34](#).

Install the power cords

Before you power on a system, ensure that the power cords are plugged in to all of the power supplies on all of the processor enclosures.

Remove the power cords

The system might be equipped with a second power supply. Before you continue with this procedure, ensure that all power sources to the system are completely disconnected.

1. Unplug any power cables that are attached to the unit from electrical outlets.
2. Remove all power cords from all of the processor enclosures, starting with the primary processor enclosure (topmost) and then each secondary enclosure, working from top to bottom.

Reinstalling the HMC machine code

Learn how to reinstall the interface and HMC machine code prior to restoring critical backup data.

About this task

If the HMC is not responding, you can install Hardware Management Console (HMC) version 8 by using recovery media or over a network. See [Upgrading or restoring HMC Version 8](#).

After you reinstall the HMC machine code, you can restore the backup data that you created to recover your critical console information. For information about how to restore the HMC backup data, see [“Restoring critical HMC data” on page 35](#).

Backing up partition profiles

Refer to this procedure when needing to back up a partition profile.


You can back up partition profile data for a managed system only when the managed system is powered on.

To back up partition profile data, you must be a member of one of the following roles:

- Super administrator
- Service representative

To back up partition profile data, complete the following steps:



1. In the navigation area, click the **Resources** icon , and then click **All Systems**.
2. In the content pane, select the system name that contains the partition, and then select the partition.
3. In the navigation area, click **System Actions** > **Legacy** > **Backup**.
4. Enter the required backup profile name, and then click **OK**.

Restoring critical HMC data

Learn how to restore critical HMC data.

About this task

Restore HMC backup data *only* in conjunction with a reinstallation of the HMC. For information about how to reinstall the HMC, see [“Reinstalling the HMC machine code”](#) on page 34.



Attention: Data that is backed up by using the **Save Upgrade Data** or **Backup Critical Console Data** tasks can be restored only to the same HMC. For information about how to replace an HMC with another HMC, see [“Replacing an HMC”](#) on page 53.

Note: For this operation, you must have one of the following:

- The backup DVD media
- Access to the remote server where the archive was created by using the procedure in [“Backing up critical HMC data”](#) on page 55

To restore the HMC data, you must be a member of one of the following roles:

- Super administrator
- Operator
- Service representative

Select the data-restoration procedure based on the data archiving method used:

If the critical console data has been archived on a DVD, complete the following steps:

1. Select **1 - Restore Critical Console Data** from the menu displayed at the end of the HMC reinstallation.
2. Insert the DVD containing the archived console data. On the first boot of the newly installed HMC, the data is automatically restored.

If the critical console data has been archived on a remote repository, see [Restore Management Console Data](#).

This ends the procedure.

Rebuilding a RAID 1 array

Use this information to rebuild a RAID 1 array on a Hardware Management Console (HMC) that has a failed disk drive or solid-state drive.

About this task

Before you begin, ensure that you replace the failed disk drive or solid-state drive. For instructions about replacing a drive, see the Problem determination and service guide for your HMC model.

To rebuild a RAID 1 array on the HMC, complete the following steps:

Note: If your system is an 7042-CR9, see [“Rebuilding a RAID 1 array after a drive failed on a 7042-CR9”](#) on page 37.

Procedure

1. Power on or restart the system.
2. When the system prompt is displayed, press the F1 key to access the **Setup** utility.
3. In the System Configuration and Boot Management window, use the up arrow key or the down arrow key to select **System Settings** and then press Enter.
4. In the System Settings window, use the up arrow key or the down arrow key to select **Storage** and then press Enter.

5. In the Storage window, use the up arrow key or the down arrow key to select **LSI MegaRAID <ServeRAID M5210> Configuration Utility** and then press Enter.
6. In the Dashboard View window of the **LSI MegaRAID <ServeRAID M5210> Configuration** utility, does the status have a value of <Optimal>?
 - **Yes:** The array does not need to be rebuilt. **This ends the procedure**
 - **No:** Continue with next step.
7. In the Dashboard View window of the **LSI MegaRAID <ServeRAID M5210> Configuration** utility, use the up arrow key or the down arrow key to select **Main Menu** and then press Enter.
8. In the Main Menu window, use the up arrow key or the down arrow key to select **Drive Management** and then press Enter.
9. In the Drive Management window, is the drive listed as rebuilding?
 - **Yes:** The array is rebuilding. You can now exit the utility and allow the HMC to boot normally. The rebuild operation will continue until the entire array is rebuilt. **This ends the procedure.**
 - **No:** Continue with the next step.
10. In the Drive Management window, use the up arrow key or the down arrow key to select the drive that is listed as **Unconfigured Bad** and then press Enter.
11. In the Unconfigured Bad window, use the up arrow key or the down arrow key to select **<Select operation>** and then press Enter.
12. From the Select operation menu, select **Make Unconfigured Good** and then press Enter. Use the up arrow key or the down arrow key to select **Go** and then press Enter.
13. A window is displayed with the message "The operation has been performed successfully." Press Enter.
14. Exit to the Main Menu window. In the Main Menu window, use the up arrow key or the down arrow key to select **Drive Management** and then press Enter.
15. In the Drive Management window, is the drive listed as **(Foreign) Unconfigured Good**?
 - **Yes:** The drive must be initialized. Continue with the next step.
 - **No:** The drive is listed as **Unconfigured Good** and does not need to be initialized. Continue with step 20.
16. In the Drive Management window, use the up arrow key or the down arrow key to select the drive that is listed as **(Foreign) Unconfigured Good** and then press Enter.
17. In the (Foreign) Unconfigured Good window, use the up arrow key or the down arrow key to select **<Select operation>** and then press Enter.
18. From the Select operation menu, select **Initialize Drive** and then press Enter. Use the up arrow key or the down arrow key to select **Go** and then press Enter.
19. In the Warning screen, select **Confirm** and press the space bar. Select **Yes** and then press Enter. Continue with the next step after the initialization of the drive is complete.

Note: The Initialize Drive operation can take up to an hour to complete.
20. In the Drive Management window, use the up arrow key or the down arrow key to select the drive that is listed as **Unconfigured Good** and then press Enter.
21. In the Unconfigured Good window, use the up arrow key or the down arrow key to select **<Select operation>** and then press Enter.
22. From the Select operation menu, select **Assign Global Hot Spare Drive** and then press Enter.
23. In the Unconfigured Good window, use the up arrow key or the down arrow key to select **Go** and then press Enter.
24. In the Warning screen, select **Confirm** and press the space bar. Select **Yes** and then press Enter.
25. In the Unconfigured Good window, ensure that the progress field has a value of Rebuild x%, where x indicates percent complete. The rebuild operation has started. You can now exit the utility and allow the HMC to boot normally. The rebuild operation will continue until the entire array is rebuilt. **This ends the procedure.**

Rebuilding a RAID 1 array after a drive failed on a 7042-CR9

Use this information to rebuild a RAID 1 array on a 7042-CR9 that has a failed disk drive or solid-state drive.

About this task

Before you begin, ensure that you replace the failed disk drive or solid-state drive. For instructions about replacing a drive, see the Problem determination and service guide for your HMC model.

To rebuild a RAID 1 array on the 7042-CR9, complete the following steps:

Procedure

1. Power on or restart the system.
2. When the system prompt is displayed, press the F1 key to access the **Setup** utility.
3. In the System Configuration and Boot Management window, use the up arrow key or the down arrow key to select **System Settings** and then press Enter.
4. In the System Settings window, use the up arrow key or the down arrow key to select **Storage** and then press Enter.
5. In the Storage window, use the up arrow key or the down arrow key to select **LSI MegaRAID <ServeRAID M5210> Configuration Utility** and then press Enter.
6. In the Dashboard View window of the **LSI MegaRAID > ServeRAID M5210 > Configuration Utility** utility, does the status have a value of <Optimal>?
 - **Yes:** The array does not need to be rebuilt. **This ends the procedure**
 - **No:** Continue with next step.
7. In the Dashboard View window of the **LSI MegaRAID <ServeRAID M5210> Configuration** utility, use the up arrow key or the down arrow key to select **Main Menu** and then press Enter.
8. In the Main Menu window, use the up arrow key or the down arrow key to select **Drive Management** and then press Enter.
9. In the Drive Management window, is the drive listed as rebuilding?
 - **Yes:** The array is rebuilding. You can now exit the utility and allow the HMC to boot normally. The rebuild operation will continue until the entire array is rebuilt. **This ends the procedure.**
 - **No:** Continue with the next step.
10. In the Drive Management window, use the up arrow key or the down arrow key to select the drive that is listed as **Unconfigured Bad** and then press Enter.
11. In the Unconfigured Bad window, use the up arrow key or the down arrow key to select **<Select operation>** and then press Enter.
12. From the Select operation menu, select **Make Unconfigured Good** and then press Enter. Use the up arrow key or the down arrow key to select **Go** and then press Enter.
13. A window is displayed with the message The operation has been performed successfully. Press Enter.
14. Exit to the Main Menu window. In the Main Menu window, use the up arrow key or the down arrow key to select **Drive Management** and then press Enter.
15. In the Drive Management window, is the drive listed as **(Foreign) Unconfigured Good**?
 - **Yes:** The drive must be initialized. Continue with the next step.
 - **No:** The drive is listed as **Unconfigured Good** and does not need to be initialized. Continue with [step 21](#).
16. In the Drive Management window, use the up arrow key or the down arrow key to select the drive that is listed as **(Foreign) Unconfigured Good** and then press Enter.
17. In the (Foreign) Unconfigured Good window, use the up arrow key or the down arrow key to select **<Select operation>** and then press Enter.

18. From the Select operation menu, select **Initialize Drive** and then press Enter.
19. In the confirmation window, use the up arrow key or the down arrow key to select **Go** and then press Enter.
20. In the Warning screen, select **Confirm** and press the space bar. Select **Yes** and then press Enter. Continue with the next step after the initialization of the drive is complete.
Note: The Initialize Drive operation can take up to an hour to complete.
21. In the Drive Management window, use the up arrow key or the down arrow key to select the drive that is listed as **Unconfigured Good** and then press Enter.
22. In the Unconfigured Good window, use the up arrow key or the down arrow key to select **<Select operation>** and then press Enter.
23. From the Select operation menu, select **Assign Global Hot Spare Drive** and then press Enter.
24. In the Unconfigured Good window, use the up arrow key or the down arrow key to select **Go** and then press Enter.
25. In the Warning screen, select **Confirm** and press the space bar. Select **Yes** and then press Enter.
26. In the Unconfigured Good window, ensure that the progress field has a value of Rebuild x%, where x indicates percent complete. The rebuild operation has started. You can now exit the utility and allow the HMC to boot normally. The rebuild operation will continue until the entire array is rebuilt.
This ends the procedure.

Deleting a virtual drive on a 7042-CR9

Learn how to delete a virtual drive on a 7042-CR9 installed with a single drive.

About this task

To delete a virtual drive on a 7042-CR9 installed with a single drive, complete the following steps:

Note: Deleting the virtual drive on the HMC destroys all of the data stored on the drive. Perform this procedure only if you have a backup of the data on that drive, or if you have been instructed to do so by IBM support.

Procedure

1. Power on or restart the system.
2. When the system prompt is displayed, press the F1 key to access **Setup Utility**.
3. In the System Configuration and Boot Management window, use the up or down arrow keys to highlight **System Settings** and then press Enter.
4. In the System Settings window, use the up or down arrow keys to highlight **Storage** and then press Enter.
5. In the Storage window, use the up or down arrow keys to highlight **LSI MegaRAID <ServeRAID M5210> Configuration Utility** and then press Enter.
6. In the Main menu window, use the up or down arrow keys to highlight **Virtual Drive Management** and then press Enter.
7. In the Virtual Drive Management window, use the up or down arrow keys to highlight **Virtual Drive 0:** and then press Enter.
8. In the Virtual Drive 0: window, use the up or down arrow keys to highlight **<Select operation>** and then press Enter.
9. From the Select operation menu, select **Delete Virtual Drive** and then press Enter. Use the up arrow key or the down arrow key to select **Go** and then press Enter.
10. In the Warning window, use the up or down arrow keys to navigate to **Confirm**, then use the space bar to highlight **Yes**, and press Enter.
The Success window is displayed with **OK** highlighted.
11. Press Enter.

After the drive is deleted, the following message is displayed: Unable to display Virtual Drive summary as there are no Virtual Drives currently available.

12. Press Esc.

This step ends the procedure.

Upgrading the machine code on an HMC

Learn how to upgrade the machine code on an HMC while you maintain your HMC configuration data.

About this task

To upgrade machine code on an HMC, complete the following steps:

Step 1. Obtain the upgrade

You can order the HMC machine code upgrade through the Fix Central website, by contacting service and support, or by downloading it to an FTP server.

Note: If you do not have access to the internet, contact service and support to order the upgrade on DVD.

1. From a computer or server with an internet connection, go to the [Fix Central](#).
2. Select the appropriate family in the Product family list.
3. Select **Hardware Management Console** in the Product or fix type list.
4. Click **Continue**. The Hardware Management Console website is displayed.
5. Navigate to the HMC version that you want.
6. Locate the Recovery CD download and ordering section.
7. Follow the on-screen prompts to submit your order.
8. After you receive the upgrade, continue with [Step 2. Back up critical HMC data](#).

Step 2. Back up critical HMC data


Back up critical HMC data before you install a new version of HMC software so that previous levels can be restored in the event of a problem while you upgrade the software. Do not use this critical HMC data after a successful upgrade to a new version of the HMC software.

1. Complete the steps in [“Backing up critical HMC data”](#) on page 55.
2. Continue with [Step 3. Record the current HMC configuration information](#).

Step 3. Record the current HMC configuration information

Before you upgrade to a new version of HMC software, as a precautionary measure, record HMC configuration information.


To record HMC configuration information, complete the following steps:

1. In the navigation area, click the **Resources** icon , and then click **All Systems**.
2. To view the actions for the server, select the server name of the server in the content pane.
3. In the navigation area, click **System Actions** > **Operations** > **Schedule Operations**. All scheduled operations for the HMC are displayed.
4. Click **Sort** > **By Object**.
5. Select each object and record the following details:
 - Object Name
 - Schedule date
 - Operation Time (displayed in 24-hour format)
 - Repetitive. If Yes, complete the following steps:
 - a. Click **View** > **Schedule Details**.

- b. Record the interval information.
- c. Close the scheduled operations window.
- d. Repeat for each scheduled operation.

Step 4. Record remote command status

To record remote command status, complete the following steps:


1. In the navigation area, click the **Users and Security** icon , and then click **Systems and Console Security**.
2. In the **Remote Control** area of the content pane, click **Enable/Disable Remote Command Execution**.
3. Record whether the **Enable remote command execution using the ssh facility** check box is selected.
4. Click **Cancel**.
5. Continue with [Step 5. Save upgrade data](#).

Step 5. Save upgrade data

You can save the current HMC configuration on either a locally mounted USB flash memory drive or a designated disk partition on the HMC. Save upgrade data immediately before you upgrade your HMC software to a new release. Use this action to restore HMC configuration settings after you upgrade the HMC.

Note: Only one level of backup data is allowed on the selected media. Each time that you save upgrade data, the previous level of data is overwritten.

To save the current HMC configuration, complete the following steps:

1. In the navigation area, click the **HMC Management** icon , and then click **Console Management**.
 2. In the **Maintenance and Data** area of the content pane, click **Save Upgrade Data**. The Save Upgrade Data Wizard window is displayed.
 3. From the **Media** list, click **Hard drive** and then click **Next**.
 4. Click **Finish**.
 5. Wait for the task to complete. If the Save Upgrade Data task fails, contact your next level of support before proceeding.
- Note:** If the Save Upgrade Data task fails, do not continue the upgrade process.
6. Click **OK**.
 7. Continue with [Step 6. Upgrade the HMC software](#).

Step 6. Upgrade the HMC software

To upgrade the HMC software, complete the following steps:

1. Insert the HMC Product Installation DVD-RAM into the DVD-RAM drive.
2. Select **Upgrade** and click **Next**.
3. When the message is displayed, choose from the following options:
 - If you saved upgrade data during the previous task, continue with the next step.
 - If you did not save upgrade data previously in this procedure, you must save the upgrade data now before you continue.
4. Select **Upgrade from media** and click **Next**.
5. Confirm the settings and click **Finish**.

6. Follow the on-screen prompts.

Notes:

- If the screen goes blank, press the space bar to view the information.
 - The first DVD can take approximately 20 minutes to install.
7. When prompted, remove the first media and then insert the second media into the DVD-RAM drive.
 8. Select **1. Install additional software from media** and press Enter. Press any key to confirm the installation. The HMC displays status messages while it installs the packages.
 9. When the second media installation is complete, remove the media from the drive and close the drawer.
 10. Select **Option 2 Finish the installation** and press Enter. The HMC completes the booting process.
 11. Accept the License Agreement for Machine Code twice.
 12. At the login prompt, log in using your user ID and password. The HMC code installation is complete.
 13. Continue with [Step 7. Verify that the HMC machine code upgrade installed successfully](#).

Step 7. Verify that the HMC machine code upgrade installed successfully

1. Verify that the version and release match the update that you installed.
2. If the level of code that is displayed is not the level that you installed, complete the following steps:
 - a. Try again to update the HMC machine code by using a different DVD.
 - b. If the problem persists, contact your next level of support.

HMC problem analysis

Use this information to diagnose and repair problems that are related to the Hardware Management Console (HMC).

About this task



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

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

If you were directed here from the Beginning problem analysis procedure because your HMC is not functioning correctly, continue with the [“Entry point for HMC problem determination” on page 42.](#)

To perform other maintenance tasks on your HMC, see following procedures:

- For general maintenance information on the base server that is used to build the HMC, see [“HMC diagnostics” on page 4.](#)
- For instructions to replace an HMC, see [Replacing an HMC.](#)
- For HMC parts information, see following:
 - [Hardware Management Console \(HMC\) parts.](#) Because the server that is used for your HMC can be serviced by the customer, you are the service provider for your HMC.
 - To find links to the appropriate server hardware maintenance information, see [“Equivalent maintenance information for the HMC server hardware” on page 4.](#)
- For removing and replacing HMC parts, see [“Removal and replacement procedures” on page 6.](#)
- For backing up critical disk drive information on the HMC, see [Backing up critical HMC data](#) topic.
- For restoring disk drive information on the HMC, see [Reinstalling the HMC machine code .](#)
- For checking modem settings, see [Cabling the HMC](#) topic.

Entry point for HMC problem determination

About this task

Find the symptom you are having in the Symptom column of the following table. Then perform the action described in the Action column.

Symptom	Action
Operator reported that the HMC did not start, but no other problems were reported.	Go to “Beginning HMC problem determination” on page 43.

Symptom	Action
Operator reported Communication not active on the HMC.	Go to “Testing the HMC Ethernet adapter” on page 48.
Operator reported communication problems with a remotely connected HMC or a managed system.	Go to “Testing the modem connection to the managed system” on page 46.
Power problems	Go to “Testing for a power problem” on page 45.
HMC boot problems	Go to “Beginning HMC problem determination” on page 43.
Display problem	Go to “Testing the HMC display” on page 52.
DVD-RAM drive problem	Go to “Testing the HMC DVD-RAM drive” on page 49.
Diskette drive problem	Go to “Testing the HMC diskette drive” on page 51.
Ethernet LAN problem	Go to “Testing the HMC Ethernet adapter” on page 48.
A problem with any of the following: <ul style="list-style-type: none"> • display • diskette drive • DVD-RAM Drive • disk drive • Ethernet LAN 	Perform Dynamic System Analysis. For more information about Dynamic System Analysis, see Diagnostic tools .
Eight character error code beginning with <i>HMC</i> was received when using the HMC graphical user interface.	Go to the “HMC system reference code” on page 4.
HMC does not communicate through the modem.	Go to “Testing the HMC modem connection” on page 46.
Problems understanding the usage of the HMC.	Go to Managing the Hardware Management Console .
All other problems (for example: HMC GUI is unresponsive, parity errors, power, POST codes, blank display, mouse, or keyboard).	Go to “Beginning HMC problem determination” on page 43.
Symptoms not in this list.	Go to “Beginning HMC problem determination” on page 43.

Beginning HMC problem determination

About this task

Use this procedure to determine if there is a problem with the HMC hardware. This procedure might direct you to procedures in various sections of this information or to server maintenance information.

Step 1. HMC problem determination

Procedure

1. If the HMC is running, shut down the console by exiting the graphical user interface. The server power turns off automatically. If the server cannot turn off the power, then turn the power switch off.
2. Turn on the HMC power.
3. Watch the console and allow enough time for the system to complete the POST and load the HMC machine code.
4. Watch and listen for the following failing symptoms during power-on:
 - POST error condition.
 - A series of beeps that indicate an error condition.
 - The HMC login screen and user interface fails to start.
 - A reference code or any other error information is displayed.
5. Do you have any of the failing symptoms during power on?
 - **No:** Continue with step [“Step 2. HMC problem determination” on page 44.](#)
 - **Yes:** Go to the [“Equivalent maintenance information for the HMC server hardware” on page 4.](#)

Step 2. HMC problem determination

Procedure

1. Perform Dynamic System Analysis. For more information about Dynamic System Analysis, see [Diagnostic tools.](#)
2. Did the system unit tests detect errors?
 - **No:** Go to [“Step 3. HMC problem determination” on page 44.](#)
 - **Yes:** Continue with step [“Step 3. HMC problem determination” on page 44.](#)
3. Use the Dynamic System Analysis and the maintenance procedures for the type of server that you are working on to isolate the failure and exchange customer replaceable units (CRUs).
Refer to the publications listed in the [“Equivalent maintenance information for the HMC server hardware” on page 4.](#)
4. When the problem is repaired, or if the problem cannot be isolated, continue with [“Step 4. HMC problem determination” on page 45.](#)

Step 3. HMC problem determination

About this task



Attention: This step requires HMC support assistance. Contact HMC support before continuing.

Procedure

1. If you are directed to reload the HMC from the recovery DVD and then reload the backup profile and configuration data, see [“Reinstalling the HMC machine code” on page 34.](#)
2. After reloading the machine code from the recovery DVD, does the HMC start correctly?
 - **No:** Contact your next level of support.
 - **Yes: This ends the procedure.**

Step 4. HMC problem determination

About this task

Note: If you reach this step and you have not been able to isolate a failure, contact your next level of support for assistance.

Procedure

1. Reinstall all CRUs that did not fix the problem.
2. You must have performed a repair action to continue. If you have not already done so, verify the repair. Perform Dynamic System Analysis. For more information about Dynamic System Analysis, see [Diagnostic tools](#).
3. Did the system unit tests run without errors?
 - **No:** Use the Dynamic System Analysis and the maintenance procedures for the type of server that you are working on to isolate the failure and exchange customer replaceable units (CRUs). Refer to the publications listed in the [“Equivalent maintenance information for the HMC server hardware”](#) on page 4. Then continue with step “4” on page 45.
 - **Yes:** Continue with step “4” on page 45.
4. Does the HMC communicate with all connected managed systems?
 - **No:** Go to [“Testing the modem connection to the managed system”](#) on page 46.
 - **Yes:** Did you exchange the system board or the system board battery?
 - **No: This ends the procedure.**
 - **Yes:** Recover the HMC. For details, see [“Reinstalling the HMC machine code”](#) on page 34. **This ends the procedure.**

Testing the HMC

About this task

Use these procedures when you are directed to them from the HMC problem analysis procedure to test the HMC. If a failure is detected, you will be instructed to fix the failing part and then verify the repair.

Testing for a power problem

About this task

To troubleshoot a power problem on the server, see service documentation for the server on which your HMC is based. For server hardware maintenance manuals to help isolate the problem to a failing part, see publications listed in [“Equivalent maintenance information for the HMC server hardware”](#) on page 4.

Performing diagnostic procedures

About this task

You should have been directed here to test a specific part of the HMC. For problems in the following areas, perform Dynamic System Analysis:

- Display
- Keyboard
- Mouse
- Floppy Drive
- DVD-RAM
- DASD (disk drive)

- Memory
- Power
- Run All Selected
- SCSI
- System Port/Modem
- 16/4 Port Serial
- Ethernet

To access the HMC diagnostic information, follow the procedures in [“HMC diagnostics” on page 4](#).

Testing the modem connection to the managed system

About this task

Use this procedure to test the modem connection to the server for the HMC.

Procedure

1. Can the HMC be used to communicate through the modem?
 - **No:** Go to step [“2” on page 46](#).
 - **Yes: This ends the procedure.**
2. Is a device other than a modem attached to system port 2 on the HMC?

Note: If the HMC is a rack-mounted model, answer no to this question.

 - **No:** Go to [“Testing the HMC modem connection” on page 46](#).
 - **Yes:** Go to step [“3” on page 46](#).
3. System port 2 of the HMC is reserved for external modem use only. Move the serial cable from serial port 2 of the HMC to another HMC system port. Connect the modem to system port 2 and go to step [“1” on page 46](#).

Testing the HMC modem connection

About this task

Use this procedure to test the modem connection to the server for the HMC.

Procedure

1. Verify that the modem and the telephone line are functioning correctly by performing the following steps:
 - a. On the HMC console, open the Service Agent application.
 - b. Select **Test Tools**.
 - c. Initiate a Test PMR.
 - d. Monitor the call log to verify that the call is completed successfully. If the call is completed successfully, the modem is functioning correctly.
2. Is the installed modem currently functioning on the HMC?
 - **No:** Go to step [“3” on page 46](#).
 - **Yes:** The problem is not in the modem. **This ends the procedure.**
3. Are the HMC configurations, relating to the modem operation, correct?
 - **No:** Correct the HMC configuration arguments. Return to step [“1” on page 46](#).
 - **Yes:** Continue with step [“4” on page 47](#).

4. Is the modem powered on? (Are any indicators lit?)

- **No:** Ensure the modem is powered on. For details, see [“1” on page 46](#). After power on verification is completed, continue with step [“5” on page 47](#).
- **Yes:** Go to step [“6” on page 47](#).

5. Is the serial cable between the serial (COM) port connector of the HMC and the modem attached?

- **No:** Attach the serial cable between the serial (COM) port connector of the HMC and the modem.
- **Yes:** Go to step [“6” on page 47](#).

6. Is the modem connected correctly to a working telephone line or an equivalent?

Note: This can be checked by connecting a known good telephone to the line in place of the modem and making a telephone call.

- **No:** Correctly connect the telephone line (or equivalent) to the modem. Go to step [“1” on page 46](#). After completing the telephone line and modem verification test, continue with step [“7” on page 47](#).
- **Yes:** Go to step [“7” on page 47](#).

7. Verify the COM port by performing the following steps:

- a. Disconnect the modem cable from the COM port of the HMC.
- b. Select **Diagnostics** from the top menu.
- c. Select **System Ports** from the pull-down menu. The *SERIAL PORT TEST CATEGORY* screen displays.
- d. Ensure the following:

- On desktop HMC models - IRQ numbers 4 and 3 are assigned to COM 1 and COM 2, and the planar to COM 2 connector cable is present and correctly installed.
- On rack-mounted models - IRQ number 4 is assigned from COM 1.

Note: If the preceding information is not correct, the COM port might be disabled, or might be incorrectly configured. This can be resolved by accessing the setup utility (by pressing the F1 key) during power on.

- e. Ensure all diagnostics except **External Loopback** are selected.
- f. Select **Run Screen** from the bottom menu.
- g. Ensure all selected diagnostics show Passed.

Note: If any diagnostics fail, replace the planar.

8. Verify the external modem by performing the following steps:

- a. Reconnect the modem cable to the correct COM port.
- b. Ensure that the modem is powered on, connected to a working telephone line, and is securely cabled to the communications cable.
- c. Shut down and restart the HMC.
- d. Select **Hardware Info** from the top menu.
- e. Select **COM and LPT Ports** from the menu. The hardware query displays COM and LPT port information.
- f. Verify the following:
 - A modem was detected on the correct COM port
 - The modem test returned Passed
 - Dial tone: Detected
 - ATI1: Displays the modem's model information

Note:

- a. If you were not able to get the desired results in step [“8.f” on page 47](#), see MultiTech MultiModem^{II} user's guide, installation guide, or reference guide for your modem. To access the MultiTech

MultiModem^{II} documentation, go to the [MultiTech Product Support](http://www.multitech.com/support) website (www.multitech.com/support).

- b. If necessary, after you have completed the MultiTech MultiModem^{II} documentation, return here to complete the final step of this procedure.
9. Choose from the following options:
- If the modem was not detected, replace and verify the following customer replaceable parts in the order listed:
 - a. Communications cable
 - b. Modem
 - If the modem test did not return with Passed, replace the modem.
 - If the dial tone did not return with Detected, verify the telephone line operation then retest. If the failure recurs, replace the modem.

Testing the HMC Ethernet adapter

About this task

Use this procedure to test the Ethernet adapter in the HMC.

Procedure

1. Is the Ethernet port currently functioning though normal operation of the HMC?
 - **No:** Go to step [“2”](#) on page 48.
 - **Yes: This ends the procedure.**
2. Are the Ethernet configuration values set correctly? (IP address, subnet mask, and so on.)
 - **No:** Set the Ethernet configuration values to their correct settings. Then go back to step [“1”](#) on page 48.
 - **Yes:** Go to step [“3”](#) on page 48.
3. Can the IP address of the HMC be 'pinged' by another system that should be able to 'see' the HMC on the network?
 - **No:** Go to step [“4”](#) on page 48.
 - **Yes:** Go to step [“8”](#) on page 48.
4. Is the Ethernet cable attached correctly to the HMC and the network?
 - **No:** Attach the HMC to the network using an Ethernet cable with the correct pinout. Then go to step [“1”](#) on page 48.
 - **Yes:** Go to step [“5”](#) on page 48.
5. Is the Ethernet cable the correct pinout? (There are two types of Ethernet cables in use, which are distinguished by different pinouts. The network will determine which version of cable to use.)
 - **No:** Replace the Ethernet cable with the correct version. Then go to step [“1”](#) on page 48.
 - **Yes:** Go to step [“6”](#) on page 48.
6. Refer to the Ethernet hardware's hardware maintenance manual to determine if there are any internal settings or jumpers that might disable the Ethernet port.

Are there any internal settings or jumpers?

 - **No:** Go to step [“7”](#) on page 48.
 - **Yes:** Go to step [“8”](#) on page 48.
7. Replace the Ethernet hardware in the HMC. (This might be a PCI card or system board replacement, depending on the HMC hardware.) Go to step [“1”](#) on page 48.
8. Set the internal settings/jumpers to enable the Ethernet port on the HMC. Go to step [“1”](#) on page 48.

The failure does not seem to be in the HMC.

Testing the HMC disk drive

Learn how to test and run diagnostics on a failing HMC disk drive.

About this task

To test for HMC disk drive problems, complete the following steps:

Procedure

1. Did the disk drive test fail?
 - **No:** Go to step [“5” on page 49](#).
 - **Yes:** Continue with the next step.
2. Perform the following steps:
 - a. Exchange the CRUs called by the diagnostics one at a time. For CRU removal and replacement instructions, see server hardware maintenance manual for the system on which you are working. See [“Equivalent maintenance information for the HMC server hardware” on page 4](#) to access the hardware maintenance manual for your HMC server model.
 - b. After each CRU is exchanged, test the repair. Perform Dynamic System Analysis on the disk drive. For more information about Dynamic System Analysis, see [Diagnostic tools](#).

Did the disk drive test fail?

 - **No:** Continue with the next step.
 - **Yes:** Contact your next level of support.
3. Ensure the following and then continue with the next step:
 - If you exchanged the disk drive and there are jumpers or tab settings on the new disk drive, ensure that the settings are the same as the old drive.
 - If there is a SCSI cable-terminating resistor device, ensure it is secured to the cable and (if necessary) reattached to its original location on the server.

Go to the information about hard disk jumper settings in the server hardware maintenance manual. See [“Equivalent maintenance information for the HMC server hardware” on page 4](#) to access the hardware maintenance manual for your HMC server model.
4. If you exchanged the disk drive, restore the HMC image to the new disk drive.
5. Perform Dynamic System Analysis to test the server. For more information about Dynamic System Analysis, see [Diagnostic tools](#).
 - If the tests fail, isolate the problem using the [“Beginning HMC problem determination” on page 43](#) procedure.
 - If the tests run without errors, turn off the server power and then turn on the power. Ensure that the system boots and the HMC screen is displayed. **This ends the procedure.**

Testing the HMC DVD-RAM drive

Learn how to test and run diagnostics on a failing DVD-RAM.

About this task

To test for HMC DVD-RAM drive problems, complete the following steps:

Procedure

1. Determine the media in the DVD-RAM drive:
 - Compact Disk Recordable (CD-R) similar to a CD
 - DVD-RAM media cartridge

Is the media a CD-R?

- **No:** Go to step [“4” on page 50](#).
- **Yes:** Continue with the next step.

2. Perform the following steps:

a. Clean the compact disk as follows:

- Hold the disk by its edges. Do not touch the surface.
- Remove dust and fingerprints from the surface by wiping from the center to the outside using a dry, soft cloth.

b. Reinstall the CD, with the label-side facing up.

c. Continue with the next step.

3. Try the failing task again by using the original media.

Does the failure occur again?

- **No: This ends the procedure.**
- **Yes:** Continue with the next step.

4. Ensure the write protect tab is in the "disabled" (down) position.

Was the write protect tab in the "disabled" (down) position?

- **No:** Go to step [“3” on page 50](#).
- **Yes:** Continue with the next step.

5. Perform the following steps:

a. With the original media in the drive, note the following:

- If you are attempting a restore procedure, turn off the server power.
- For any other operation, shut down the HMC, and then turn off the server power.

Note: For shutdown procedures, see [“HMC and system power-on and power-off procedures” on page 33](#).

b. Turn on the server power and perform Dynamic System Analysis to test the DVD-RAM drive. For more information about Dynamic System Analysis, see [Diagnostic tools](#).

c. When the test is complete, continue with the next step.

6. Did the DVD-RAM test fail while testing with the original media?

- **No:** Go to step [“15” on page 51](#).
- **Yes:** Continue with the next step.

7. Exchange the original media with a new one.

Note: If you are replacing DVD-RAM media, the new cartridge must be formatted. If possible, use another HMC to format the new cartridge.

8. Turn off the server power.

9. Turn on the server power, and perform Dynamic System Analysis to test the DVD-RAM drive with the new media. For more information about Dynamic System Analysis, see [Diagnostic tools](#).

10. Did the DVD-RAM test fail while testing with the new media?

- **No:** The original media was defective. **This ends the procedure.**
- **Yes:** Continue with the next step.

11. Verify the following:

- All DVD-RAM drive data and power cables are secure.
- The DVD-RAM drive is jumpered as "master" and is cabled to the secondary IDE bus.

12. If the diagnostics continue to fail, exchange the DVD-RAM drive.

When complete, run the DVD-RAM test again.

Note: If there are any jumpers or tab settings on the new drive, ensure that the settings match the old drive.

13. Did the DVD-RAM Drive test continue to fail?
 - **No:** The original DVD-RAM drive was defective. **This ends the procedure.**
 - **Yes:** Continue with the next step.
14. Continue exchanging CRU from the CRU list and running the DVD-RAM drive tests.
 - If the CRUs fix the problem, this ends the procedure.
 - If you cannot isolate the problem, call your next level of support for assistance.
15. The server resources (for example: interrupt, I/O address) might be configured incorrectly. Verify the server resources are correctly configured.
 - a. Select **System Unit** for the configuration area, and verify configuration for the system unit and all adapters.
 - b. When you complete the verification, try the failing procedure again and continue with the next step.
16. Does the failing procedure continue to fail?
 - **No:** The resource settings were incorrect. **This ends the procedure.**
 - **Yes:** If you cannot isolate the problem, contact your next level of support for assistance. **This ends the procedure.**

Testing the HMC diskette drive

Learn to run a diagnostic test to determine diskette drive problems.

About this task

To test for HMC diskette drive problems, complete the following steps:

Procedure

1. Perform the following steps:
 - a. Turn on the server power and perform the Dynamic System Analysis to test the diskette drive. For more information about Dynamic System Analysis, see [Diagnostic tools](#).

Note: Do not test with the diskette on which the errors occurred. Use a new diskette.
 - b. When the test is complete, continue with the next step.
2. Did the diskette test fail while testing with a new diskette?
 - **No:** Go to step [“6”](#) on page 51.
 - **Yes:** Continue with the next step.
3. Exchange the diskette drive and run the diskette test again.
4. Did the diskette test fail again?
 - **No:** The original diskette drive was failing. **This ends the procedure.**
 - **Yes:** Continue with the next step.
5. Continue exchanging CRUs from the CRU list and running tests. If one of the replaced CRUs fixes the problem, **this ends the procedure**. If you cannot resolve the problem, contact your next level of support for assistance.
6. Did the original failure occur while writing to a diskette?
 - **No:** Go to step [“8”](#) on page 52.
 - **Yes:** Continue with the next step.
7. Try the original task again by using a new diskette.

- If the failure occurs again, go to step “10” on page 52.
 - If no failures occur, the original diskette was failing. **This ends the procedure.**
8. Re-create the information on the diskette, or obtain a new diskette with the information.
 9. Try the original task again.
 - If the failure occurs again, continue with the next step.
 - If no failures occur, the original diskette was failing. **This ends the procedure.**
 10. Perform Dynamic System Analysis to test the diskette drive. For more information about Dynamic System Analysis, see [Diagnostic tools](#).
 - If the tests fail, isolate the problem using the procedures found in the server hardware maintenance manual. For additional server maintenance information, see “[Equivalent maintenance information for the HMC server hardware](#)” on page 4 to access the hardware maintenance manual for your HMC server model.
 - If the tests do not isolate the problem, contact your next level of support for assistance.
- This ends the procedure.**

Testing the HMC display

Learn to test and diagnose HMC display problems.

About this task

To test for HMC display problems, complete the following steps:

Procedure

1. Is the display type a 95xx (17P, 17X, 21P)?
 - **No:** Continue with the next step.
 - **Yes:** 95xx-xxx repairs might require replacing internal display CRUs.
Repair and test the display using the procedures in *Monitor Hardware Maintenance Manual Vol 2, S41G-3317*.
 2. Is the display type a 65xx (P70, P200)?
 - **No:** Continue with the next step.
 - **Yes:** 65xx-xxx repairs might require replacing the entire display. There are no internal display CRUs. Repair and test the display using the procedures in *Monitor Hardware Maintenance Manual Vol 3, P and G series, S52H-3679*.

When the test and repair are complete, continue with step “5” on page 52.
 3. Is the display type a 65xx (P72, P202)?
 - **No:** Continue with the next step.
 - **Yes:** 65xx-xxx repairs might require replacing the entire display. There are no internal display CRUs. Repair and test the display using the procedures in *Color Monitor Operating Instructions*.

When the test and repair are complete, continue with step “5” on page 52.
 4. Repair and test the display using the documentation included with the display.
When the test and repair are complete, continue with step “6” on page 52.
 5. Verify the repair. Perform Dynamic System Analysis to test the display. For more information about Dynamic System Analysis, see [Diagnostic tools](#).

When the test and repair are complete, continue to step “6” on page 52.
 6. Return the system to normal operations.
- This ends the procedure.**

Replacing an HMC

Identifies the prerequisites needed and the tasks that must be performed when you replace a Hardware Management Console (HMC).

Before you begin

If you are replacing an HMC that is set up as a DHCP server, you must first reinstall the HMC code base by using one of the following:

- The recovery media that was provided with your HMC
- The recovery media that you last used to upgrade your HMC

You must also reinstall your customized HMC configuration data by using backup media.

Procedures for replacing an HMC differ, depending on which HMC version you have installed. To determine your HMC version, see [“Determining your HMC machine code version and release” on page 56](#) and then return here.

About this task

These instructions assume that you have created a backup of your HMC configuration data from the HMC being replaced. For more information about backing up important HMC data, see [“Backing up critical HMC data” on page 55](#).

For HMC V4.5 or earlier

1. Insert the HMC recovery media, then power on or reboot the HMC. The HMC powers on and loads from the media.
2. Press F8 to select **Install/Recovery**.
3. Press F1 to continue. After the installation is complete, the HMC prompts you to insert the backup media.
4. Insert the backup media. When you are finished, the HMC is restored to the state that it was in at the time that the backup was created.
5. After the HMC interface has been restored, verify that your HMC DHCP private network is configured correctly. For more information, see [“Verifying that your HMC DHCP private network is configured correctly” on page 54](#).

For HMC V5.0 or later

1. Insert the HMC recovery media, then power on or reboot the HMC. The HMC powers on from the media and displays the **Backup/Upgrade/Restore/Install** panel.
2. Select **Install** and click **Next**. Wait for the installation to complete.
3. Select **1 - Install additional software from media** from the menu displayed to install the second HMC recovery media.
4. Remove the recovery media and insert the second media.
5. Press Enter to start the installation of the second recovery media.
6. After the installation is complete, remove the second recovery media, insert the backup media, and select **1 - Restore Critical Console Data** from the menu to restore data from the backup media. When you are finished, the HMC is restored to the state that it was in at the time that the backup was created.
7. After the HMC interface has been restored, verify that your HMC DHCP private network is configured correctly. For more information, see [“Verifying that your HMC DHCP private network is configured correctly” on page 54](#).

Verifying that your HMC DHCP private network is configured correctly

Learn how to verify that all of your HMC DHCP private networks are configured correctly.

About this task

If your HMC is configured as a DHCP server on a private network and is not communicating correctly with the managed system, or you recently modified your network configuration (moved a managed system, replaced an HMC, or added a second HMC), use the following instructions to determine whether your DHCP-managed private network is configured correctly.

Note: If your HMC is set up as a DHCP server on a private network, do not use the static IP commands **mksysconn** and **rmsysconn** to change HMC connection settings. These commands are intended for use on a public network only, where the HMC is not set up as DHCP server and managed servers use static IP addresses.

If a system administrator previously assigned an IP address to the system through a manually executed static IP command, Support must remove the manual connection and establish a DHCP connection between the HMC and the server. This section describes how to identify any manually assigned IP addresses so that an authorized service provider can remove them.

To identify a manually assigned IP address so that your HMC can communicate correctly with your managed systems, you must complete the following high-level tasks. The following are detailed step-by-step task descriptions.

- Identify the configured HMC IP connection addresses and compare them to the list of IP addresses assigned by the DHCP server.
- Identify the HMC IP connection addresses that were correctly assigned through the DHCP server, for which no further action is required.
- Identify any manually configured HMC IP connection addresses that DHCP did not assign and that need to be corrected by support.

To identify manually assigned IP addresses when the HMC is configured as a DHCP server, complete the following steps:

Procedure

1. Create a list of all of the configured HMC IP connections.
On the HMC command line, type the following command:

```
lssysconn -r all
```

This command displays the following information for service processors and Bulk Power Cards (BPCs) on the network for which the HMC configured IP connection:

```
element type, MTMS, IP address(es), connection state
```

2. Make a note of all IP addresses that are displayed.
You will need these addresses later.
3. To display a list of the DHCP IP addresses that were assigned, type the following HMC command:

```
lshmc -n -F clients
```

The output of this command lists all IP addresses that were assigned by the HMC's DHCP server.

4. Make a note of all IP addresses that are listed in the output.
5. Compare the **lssysconn** and **lshmc** lists.

If an IP address is displayed in the output for both the **lshmc -n -F clients** and **lssysconn -r all** commands, the IP address was assigned by the HMC DHCP server and the connection is being managed by the HMC DHCP server.

6. Remove from the list any address that is displayed in the output of the **lshmc -n -F clients** command but not displayed in the output of the **lssysconn -r all** command, and is not in the list of servers that use static IP addresses.

Note: If an IP address is displayed in the **lshmc -n** output and not in the **lssysconn -r all** output, that IP address was assigned by the HMC DHCP server. However, it is not a current connection on the HMC. The DHCP server keeps a history of all IP address assignments in the event that the connection is re-established. The DHCP server might also have assigned an IP address if an unknown device on the private network requested a DHCP IP address from the HMC.

7. If the HMC is managing servers on both a private and a public network, any connections to the service processor on the public network (not in the private network address range) must also be identified and removed from this list. If no IP addresses remain in the list that contains the **lssysconn -r all** output, the HMC DHCP server assigned all of the system IP addresses, and the network configuration is working correctly.
8. If any IP addresses are not removed from the list that is taken from the **lssysconn -r all** command, this address was not assigned by the HMC's DHCP server. These IP address assignments must be corrected so that they can be automatically reassigned by the HMC DHCP server. Contact an authorized service provider and request that someone correct the manually assigned IP addresses that you identified.

Results

If you followed this procedure and not all of your connections appear to be active, call an authorized service provider for additional support.

Backing up critical HMC data

You can back up important console information to a location separate from the Hardware Management Console (HMC).

About this task

Using the HMC, you can back up all important data, such as the following data:

- User-preference files
- User information
- HMC platform-configuration files
- HMC log files
- HMC updates through Install Corrective Service

The backup function saves the HMC data stored on the HMC hard disk to one of the following locations:

- Locally mounted USB flash memory drive
- Remote system mounted to the HMC file system (such as Network File System (NFS))
- Remote site through File Transfer Protocol (FTP)

Back up the HMC after you change the HMC or the information associated with logical partitions.

To back up the HMC, you must be a member of one of the following roles:

- Super administrator
- Operator
- Service representative

To back up the HMC critical data, complete the following steps:

1. In the navigation area, click the **HMC Management** icon , and then click **Console Management**.

2. In the **Maintenance and Data** area of the content pane, click **Backup Management Console Data**.
3. Select an archive option.
4. Follow the instructions on the window to back up the data.

Determining your HMC machine code version and release

The level of machine code on the Hardware Management Console (HMC) determines the available features while upgrading to a new release, including concurrent server firmware maintenance and enhancements.

About this task

For more information, see [Determining your HMC machine code version and release](#).

Preparing for HMC configuration

To configure the Hardware Management Console (HMC), you must understand the related concepts to gather the required configuration settings that you need to know before you begin the configuration steps.

To prepare for HMC configuration, complete the following steps:

1. Determine whether this is a new HMC supporting one or more new systems, or if this is a second new HMC supporting existing systems. This determines which installation path to follow.
2. Determine the physical location of the HMC in relation to the servers it will manage. If the HMC is more than 25 feet from its managed system, you must provide web browser access to the HMC from the managed system's location so that service personnel can access the HMC.
3. Identify the servers that the HMC will manage.
4. Determine whether you will use a private or an open network to manage servers. The HMC manages the servers through the service processor over a network connection. A *private* network is a non-routable network from the HMC to one or more service processors. An *open* network is any routable network that links the HMC to service processors, logical partitions, administrative workstations or other network devices, such as routers and firewalls. A private network is recommended for HMC management of all systems. Servers that have bulk power controllers require a private network with an HMC acting as a Dynamic Host Control Protocol server (DHCP). Review the available non-routable network subnet ranges that are available and determine which one you will use for each DHCP server. Each service processor can be connected to two HMCs acting as DHCP servers as long as they are using two different IP address ranges.
5. If you use an open network to manage a service processor, you must set the address of the service processor manually through the Advanced System Management Interface (ASMI) menus. A private, non-routable network is recommended.
6. Determine the open network settings that you will need to connect the HMC to workstations used by system administrators, logical partitions on the managed systems, and other network devices. Also, determine how the HMC will "call home." Call home options can include an outbound-only Secure Sockets Layer (SSL) Internet connection, a modem, or a Virtual Private Network (VPN) connection.
7. Determine the HMC users that you will create and their passwords, as well as which roles they will be given.
8. Document the following company contact information that will be needed when you configure call home:
 - Company name
 - Administrator contact
 - Email address
 - Telephone numbers
 - Fax numbers
 - The street address of the HMC physical location

9. If you plan to use email to notify operators or systems administrators when information is sent to IBM Service through call-home, identify the Simple Mail Transfer Protocol (SMTP) server and the email addresses you will use.
10. If this is a new HMC connecting to a new managed system, create a password that will be used to authenticate the HMC to the system's service processor. At the same time, create a password for the Advanced System Management Interface (ASMI) admin and general users. All three passwords can be set when you connect the first time from the HMC to a new server. If the new HMC is to be used as a redundant HMC, obtain the HMC user password from the already attached and configured HMC. Be prepared to enter the password when you first connect to the managed server's service processor.

Shutting down, restarting, logging off, and disconnecting the HMC

Learn how to shut down, restart, log off, and disconnect the Hardware Management Console (HMC) interface.

About this task

Shut down, restart, log off, and disconnect the HMC interface.




Attention: Only use the white button on the HMC to perform a manual shutdown if the server does not respond to any tasks performed from the console, such as shutting down the HMC.

If an operating system is running in a logical partition and you decide to shut down, restart, or log off the HMC interface, the operating system continues to run without interruption.

Shutting down or restarting the HMC

To shutdown the HMC, complete the following steps:

1. In the navigation area, click the **HMC Management** icon , and then select **Console Management**.
2. In the **Management** area of the content pane, select **Shut Down or Restart the Management Console**.
3. From the **Shut Down or Restart** window, you can:
 - Click **Shutdown** to end all tasks running on the console and shut down the HMC.
 - Click **Restart HMC** to end all tasks running on the console and restart the HMC.
4. Click **OK** to proceed or click **Cancel** to exit the task.

Logging off the HMC

To log off the HMC, complete the following steps:

1. In the main menu, select the user name, and then click **Logoff**.
2. Click **OK**.

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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](http://www.w3.org/TR/wai-aria/) (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) and [Web Content Accessibility Guidelines \(WCAG\) 2.0](http://www.w3.org/TR/WCAG20/) (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).

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](http://www.ibm.com/able) (www.ibm.com/able).

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Electronic emission notices

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.

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 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.

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、P F C回路付)
- 換算係数 : 0

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

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- 回路分類 : 5 (3相、P F C回路付)
- 換算係数 : 0

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VCCI-A

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People's Republic of China Notice

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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。

Russia Notice

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

警告使用者：

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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.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse B

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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
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 55032 Klasse B

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、P F C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、P F C回路付)
- 換算係数 : 0

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VCCI-B

Taiwan Notice

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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 B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM-authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables 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
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Contact for FCC compliance information only: fccinfo@us.ibm.com

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