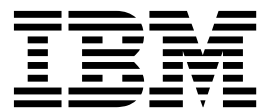


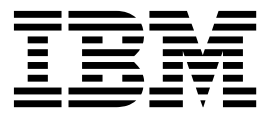
Power Systems

*Installing the IBM Power System L922
(9008-22L)*



Power Systems

*Installing the IBM Power System L922
(9008-22L)*



Note

Before using this information and the product it supports, read the information in “Safety notices” on page v, “Notices” on page 43, 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.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. For AC power, remove the power cords from the outlets.
3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
4. Remove the signal cables from the connectors.
5. Remove all cables from the devices.

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

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

(R001 part 1 of 2):

DANGER: Observe the following precautions when working on or around your IT rack system:

- Heavy equipment–personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet 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).



- 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 (compliance ID RACK-001 or 22U (compliance ID RR001) and above.
 - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.
 - Ensure that there are little-to-no empty U-levels between devices installed in the rack cabinet below the 32U (compliance ID RACK-001 or 22U (compliance ID RR001) level, unless the received configuration specifically allowed it.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- If the rack cabinet you are relocating was supplied with removable outriggers they must be reinstalled before the cabinet is relocated.
- Inspect the route that you plan to take to eliminate potential hazards.
- Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).
- Ensure that all devices, shelves, drawers, doors, and cables are secure.
- Ensure that the four leveling pads are raised to their highest position.
- Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
 - Lower the four leveling pads.
 - Install stabilizer brackets on the rack cabinet 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)



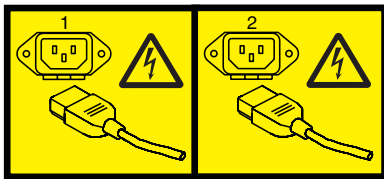
DANGER: Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)

(L002)

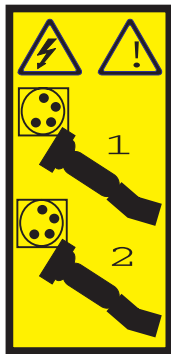


DANGER: Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices. In addition, do not lean on rack-mounted devices and do not use them to stabilize your body position (for example, when working from a ladder). (L002)

(L003)



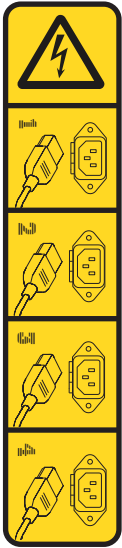
or



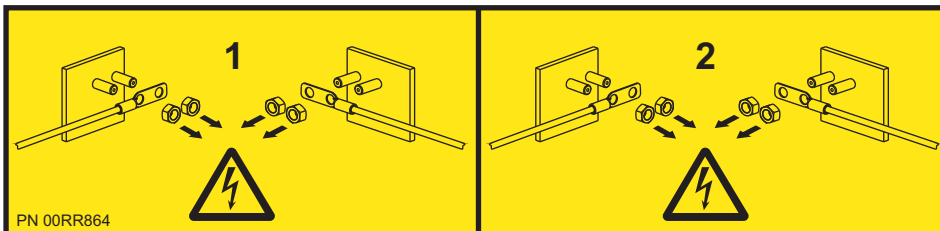
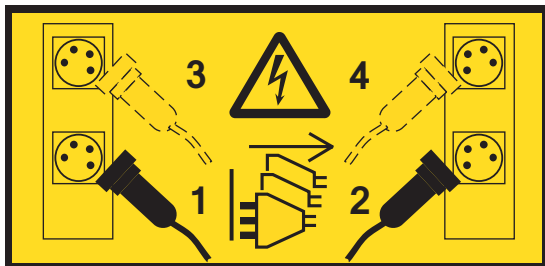
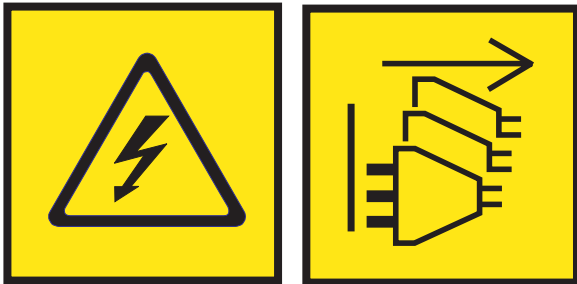
or



or



or



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

(L007)



CAUTION: A hot surface nearby. (L007)

(L008)



CAUTION: Hazardous moving parts nearby. (L008)

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:

This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

(C026)

CAUTION:

Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. Although shining light into one end and looking into the other end of a disconnected optical fiber to verify the continuity of optic fibers may not injure the eye, this procedure is potentially dangerous. Therefore, verifying the continuity of optical fibers by shining light into one end and looking at the other end is not recommended. To verify continuity of a fiber optic cable, use an optical light source and power meter. (C027)

CAUTION:

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

CAUTION:

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information:

- Laser radiation when open.
- Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

(C030)

CAUTION:

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

Do Not:

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

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

CAUTION:

Regarding IBM provided VENDOR LIFT TOOL:

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

TOOL if inadequate. (C048)

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

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

The equipment is suitable for installation in the following:

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

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

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

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

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

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

Installing the IBM Power System L922 (9008-22L)

Use this information to learn about installing the IBM Power[®] System L922 (9008-22L) server.

Installing a rack-based server

Use this information to learn about installing a rack-based 9008-22L server.

Prerequisite for installing the rack-mounted server

Use the information to understand the prerequisites that are required for installing the server.

About this task

You might need to read the following documents before you begin to install the server:

- The latest version of this document is maintained online. See Installing the IBM Power System L922 (9008-22L) (http://www.ibm.com/support/knowledgecenter/POWER9/p9egj/p9egj_roadmap.htm).
- To plan your server installation, see Planning for the system (http://www.ibm.com/support/knowledgecenter/POWER9/p9had/p9had_90x_kickoff.htm).
- If you are using a Hardware Management Console (HMC), see Update the Hardware Management Console (http://www.ibm.com/support/knowledgecenter/POWER9/p9eh6/p9eh6_updatehmc.htm).

Consider the following prerequisites before you install the server:

Procedure

1. Ensure that you have the following items before you start your installation:
 - Phillips screwdriver
 - Flat-head screwdriver
 - Rack with four units of space

Note: If you do not have a rack that is installed, install the rack. For instructions, see Racks and rack features (http://www.ibm.com/support/knowledgecenter/POWER9/p9hbf/p9hbf_9xx_kickoff.htm).

2. Ensure that you have one of the following consoles:
 - Hardware Management Console (HMC): To manage POWER9 processor-based systems, the HMC must be at version 9 release 1, or later.
 - Graphic monitor with keyboard and mouse.
 - Teletype (tty) monitor with keyboard.

Completing inventory for your server

Use this information to complete inventory for your server.

About this task

To complete the inventory, complete the following steps:

Procedure

1. Verify that you received all the boxes you ordered.
2. Unpack the server components as needed.
3. Complete a parts inventory before you install each server component by following these steps:

- a. Locate the inventory list for your server.
- b. Ensure that you received all the parts that you ordered.

Note: Your order information is included with your product. You can also obtain the order information from your marketing representative or the IBM Business Partner.

If you have incorrect, missing, or damaged parts, consult any of the following resources:

- Your IBM reseller.
- IBM Rochester manufacturing automated information line at 1-800-300-8751 (United States only).
- The Directory of worldwide contacts website <http://www.ibm.com/planetwide>. Select your location to view the service and support contact information.

Determining and marking the location in the rack

You might need to determine where to install the system unit into the rack.

About this task

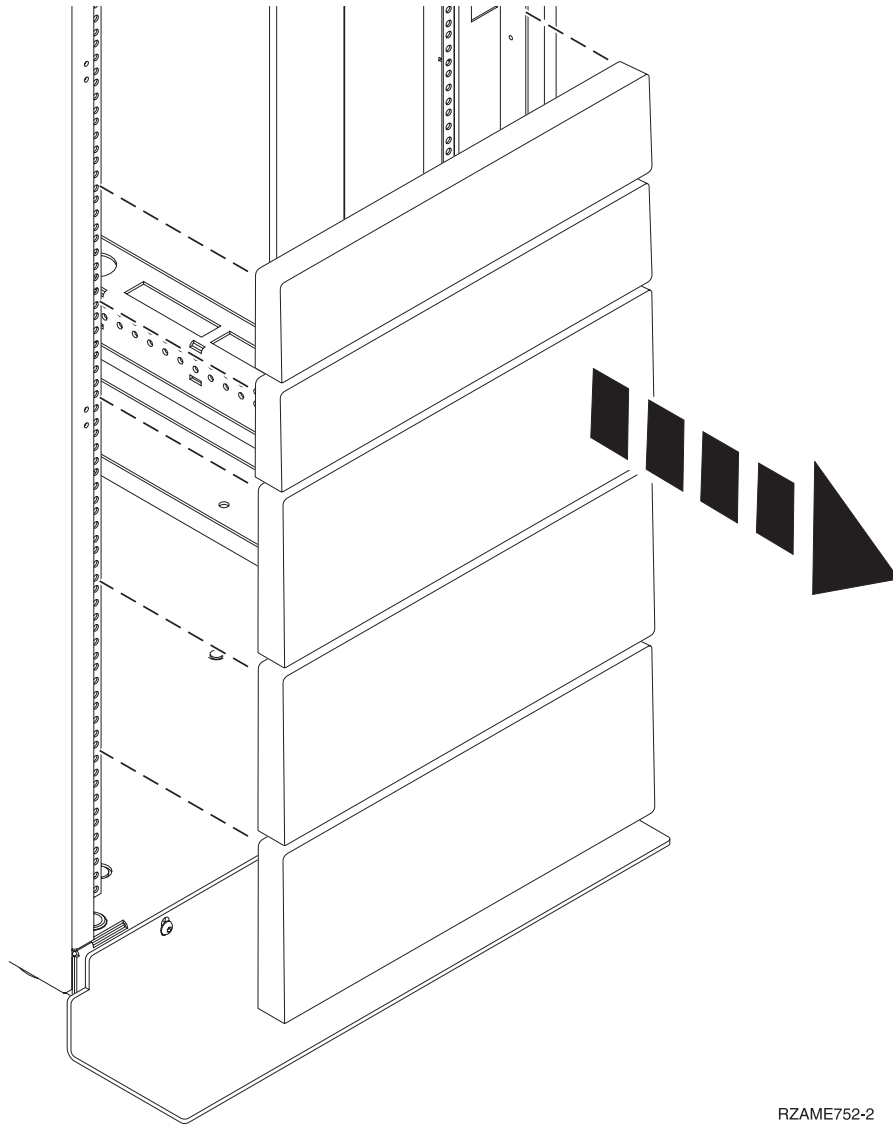
To determine where to install the system unit into a rack, complete the following steps:

Procedure

1. Read the Rack safety notices (http://www.ibm.com/support/knowledgecenter/POWER9/p9hbf/p9hbf_racksafety.htm).
2. Determine where to place the system unit in the rack. As you plan for installing the system unit in a rack, consider the following information:
 - Organize larger and heavier units into the lower part of the rack.
 - Plan to install system units into the lower part of the rack first.
 - Record the Electronic Industries Alliance (EIA) locations in your plan.

Note: The server is two EIA units high. An EIA unit is 44.55 mm (1.75 in.) in height. The rack contains three mounting holes for each EIA unit of height. This system unit, therefore, is 89 mm (3.5 in.) high and covers six mounting holes in the rack.

3. If necessary, remove the filler panels to allow access to the inside of the rack enclosure where you plan to place the unit. For details, see Figure 1 on page 3.



RZAME752-2

Figure 1. Removing the filler panels

4. Determine to place the system in the rack. Record the EIA location.
- Note:** An EIA unit on your rack consists of a grouping of three holes.
5. Facing the front of the rack and working from the right side of the rack, use tape, a marker, or pencil to mark the lowest two holes of the lowest EIA unit. Next, mark the lowest hole on the EIA unit directly above this EIA unit.
 6. Repeat step 5 for the corresponding holes located on the left side of the rack.
 7. Go to the rear of the rack.
 8. On the right side, find the EIA unit that corresponds to the bottom EIA unit marked on the front of the rack.
 9. Mark the bottom hole in the EIA unit and the top hole in the EIA unit.
 10. Mark the corresponding holes on the left side of the rack.

Attaching the mounting hardware to the rack

You might need to attach the mounting hardware to the rack. Use the procedure to complete this task. The information is intended to promote safety and reliable operation, and includes illustrations of the related hardware components and shows how these components relate to each other.

About this task

Attention: To avoid rail failure and potential danger to yourself and to the unit, ensure that you have the correct rails and fittings for your rack. If your rack has square support flange holes or screw-thread support flange holes, ensure that the rails and fittings match the support flange holes that are used on your rack. Do not install mismatched hardware by using washers or spacers. If you do not have the correct rails and fittings for your rack, contact your IBM reseller.

To install the rack-mounting hardware into the rack, complete the following steps:

Procedure

1. At the front of the rack, align the pins on end of the left rail (1) with the rear of the rack.

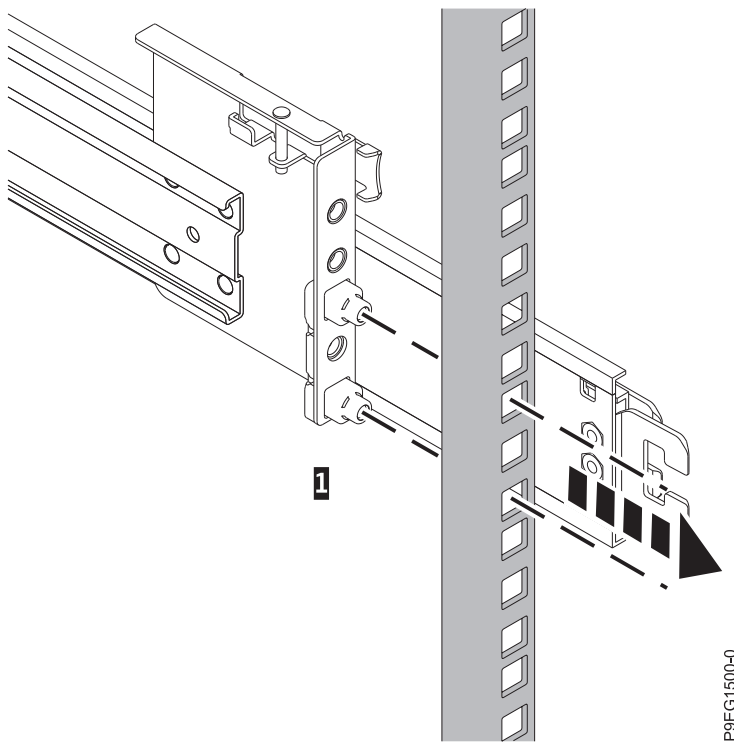
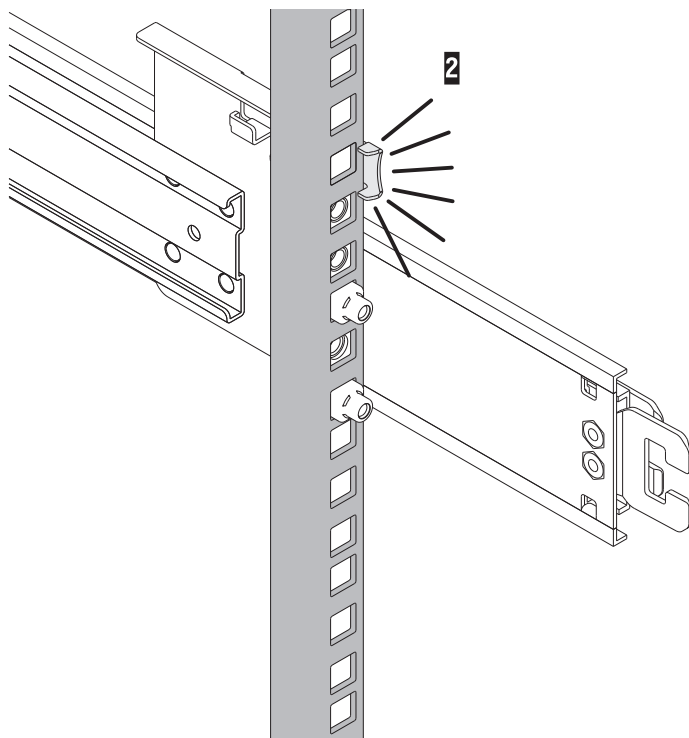


Figure 2. Align the end of the left rail to the rear of the rack

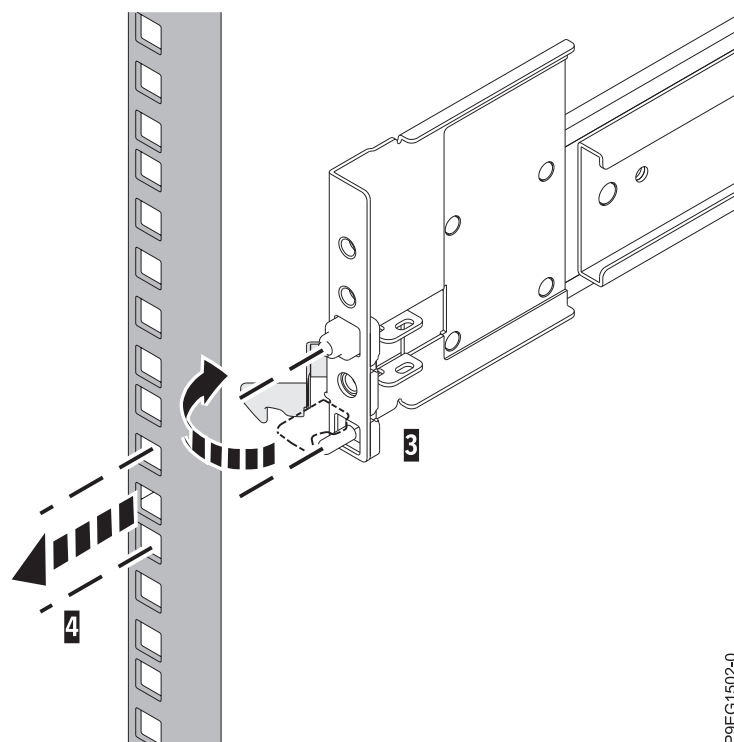
2. Push the rails into the rear rack flanges until they click into place (2).



P9EG1501-0

Figure 3. Push the rails into the rear rack flanges until they click into place

3. Swivel the rail retention bracket out (3) and pull the front of the rail toward the front of the rack, until the pins are aligned with the correct holes in the rack (4).



P9EG1502-0

Figure 4. Swivel the retention bracket and align the pins

- Swivel the rail retention bracket so that it locks onto the rack flange (5).

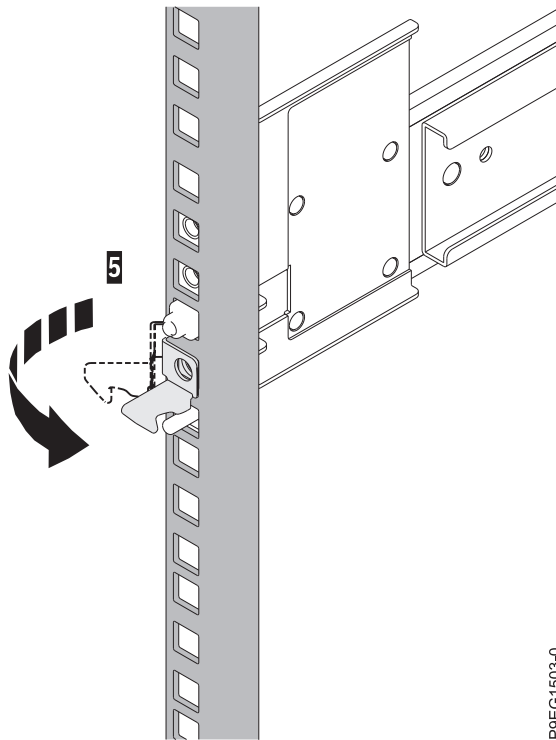


Figure 5. Lock the rail retention bracket onto the rack flange

- Repeat these steps for the right rail.

Installing the system into the rack

Use the procedure to install the system into the rack.

About this task

Attention:

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

CAUTION:

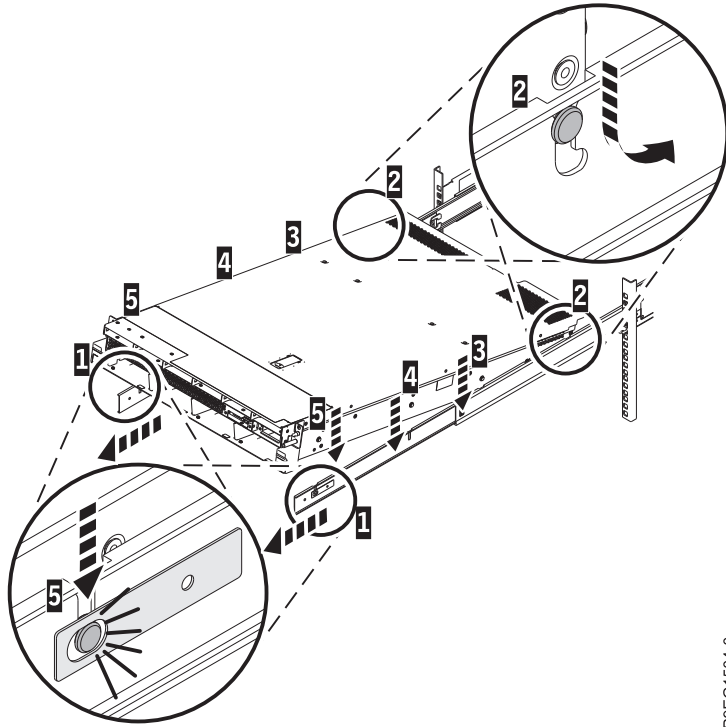
This system requires two people to install the system into the rack.

To install the system into the rack, complete the following steps:

Procedure

- Remove the shipping cover on the rear and the front of the system, if present.

2. Extend the slide rails forward (1) until they click into place twice. Carefully lift the server and tilt it into position over the slide rails so that the rear nail heads (2) on the server line up with the rear slots (2) on the slide rails. Slide the server down until the rear nail heads slip into the two rear slots. Then, slowly lower the front of the server (3), (4) until the other nail heads slip into the other slots on the slide rails. Ensure that the front latch (5) slides over the nail heads until it clicks into place.



P9EG1504-0

Figure 6. Place the server onto the mounting hardware

3. Push the release buttons on both rails (1) and push the server (2) all the way into the rack until it clicks into place.

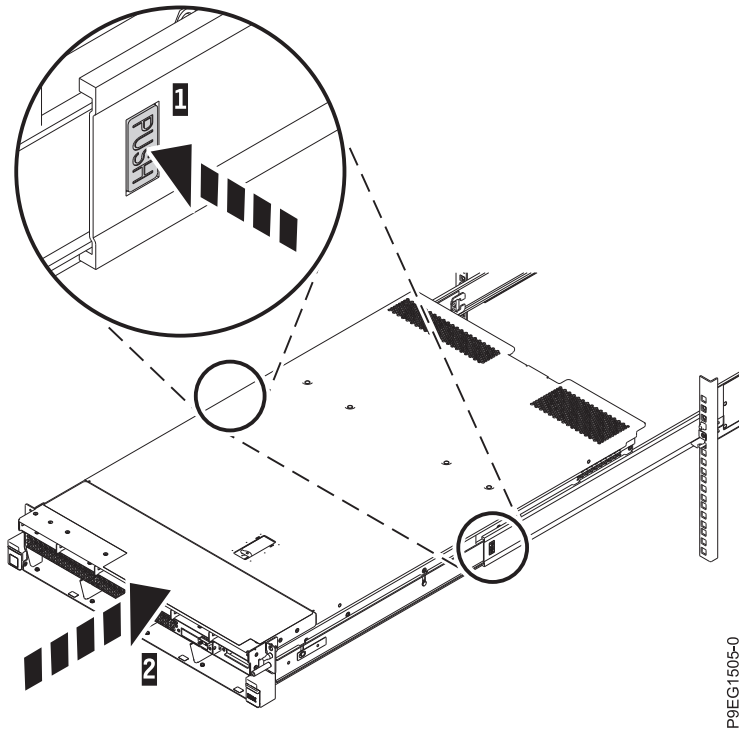


Figure 7. Push the release buttons on both rails and push the server into the rack

Installing the cable-management arm

The cable-management arm is used to efficiently route cables so that you have proper access to the rear of the system. Use the procedure to install the cable-management arm.

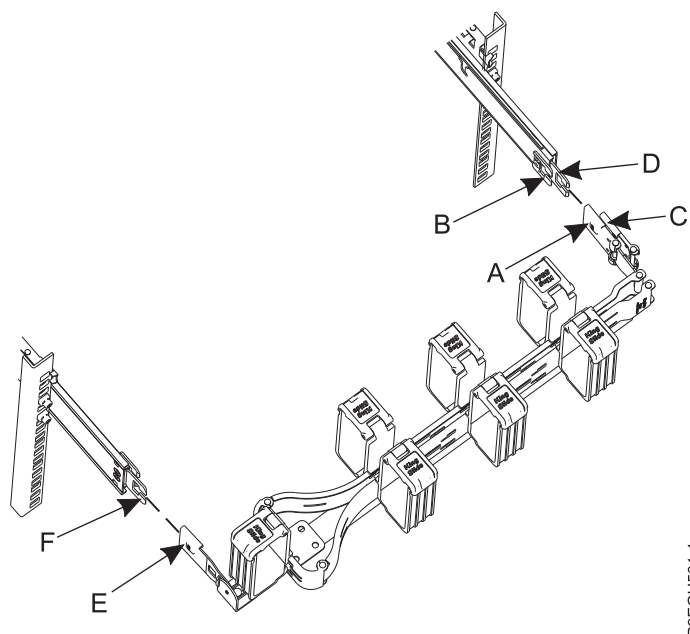
About this task

To install the cable-management arm, complete the following steps:

Procedure

1. Ensure that you have the following parts.

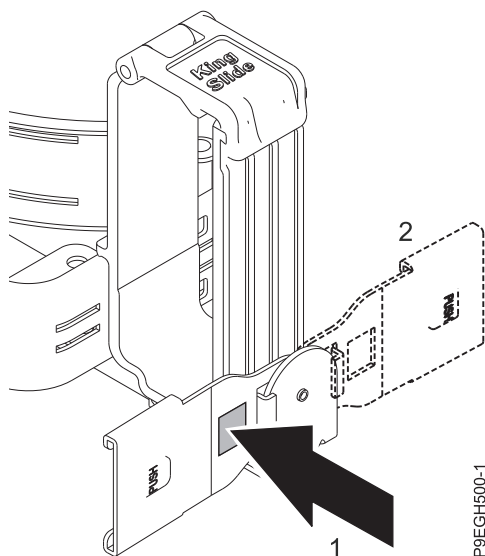
Item	Description
A	Inner cable management arm tab
B	Inner mounting bracket
C	Outer cable management arm tab
D	Outer mounting bracket
E	Extension tab
F	Outer cable management arm tab



P9EGH501-1

Figure 8. Relative positions of the parts of the cable-management arm before assembly

2. The cable-management arm can be installed on either side of the server. For this procedure, it is illustrated that you are installing it on the right side, while you are facing the server from the rear. If you want to install the cable management arm on the other side of the rack, you can press the button on the extension tab (1) so that it swivels in the opposite direction (2).



P9EGH500-1

Figure 9. Swiveling the cable management arm extension tab

3. Insert the inner cable management arm tab (A) to the inner mounting bracket (B) until the outer mounting bracket (D) clicks into place.

Note: To avoid damage when the system is placed in the service position, ensure that the middle pin is between each arm.

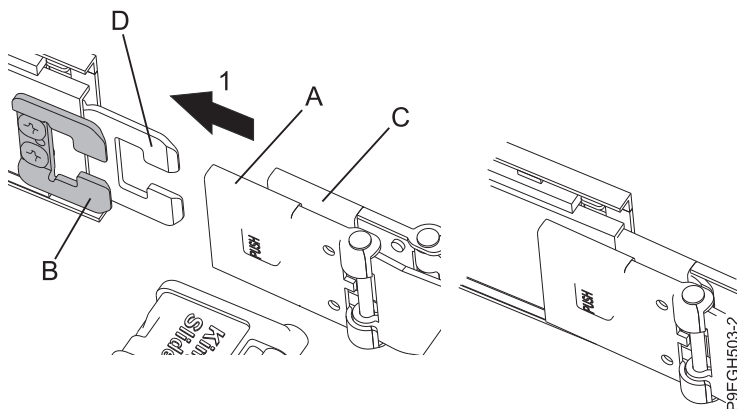


Figure 10. Inserting the mounting brackets

4. On the opposite side of the rack, insert the extension tab (E) to the outer cable management arm tab (F) until it clicks into place.

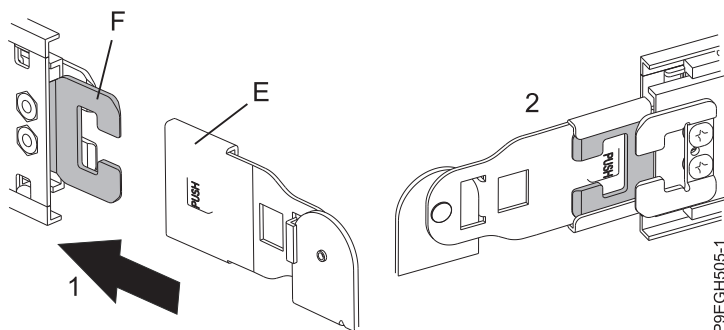


Figure 11. Attaching the extension tab to the cable management arm to the outer cable management arm tab

5. To route the cables through the cable management arm, press the latches on the cable management arm to open the baskets, route the cables through the arm, and then re-latch the baskets until they are fully seated.

Cabling the server and setting up a console

Your console, monitor, or interface choices are guided by whether you create logical partitions, which operating system you install in your primary partition, and whether you install a Virtual I/O Server (VIOS) in one of your logical partitions.

Determining which console to use

Your console, monitor, or interface choices are guided by whether you create logical partitions, which operating system you install in your primary partition, and whether you install a Virtual I/O Server (VIOS) in one of your logical partitions.

Go to the instructions for the applicable console, interface, or terminal in the following table.

Table 1. Available console types

Console type	Operating system	Logical partitions	Cable required	Cabling setup instructions
ASCII terminal	AIX®, Linux, or VIOS	Yes for VIOS, no for AIX and Linux	Serial cable equipped with a null modem	"Cabling the server with an ASCII terminal" on page 11

Table 1. Available console types (continued)

Console type	Operating system	Logical partitions	Cable required	Cabling setup instructions
Hardware Management Console (HMC)	AIX, IBM i, Linux, or VIOS	Yes	Ethernet (or cross-over cable)	"Cabling the server to the HMC" on page 12.
Operations Console	IBM i	Yes Use your Operations Console to manage existing IBM i partitions.	Ethernet cable for LAN connection	"Cabling the server and accessing Operations Console" on page 13
Keyboard, video, and mouse (KVM)	Linux or VIOS	Yes	Monitor and USB cables equipped with KVM	"Cabling the server with keyboard, video, and mouse" on page 18

Cabling the server with an ASCII terminal:

If you are not creating logical partitions, you can use an ASCII terminal to manage a server that is running the AIX, Linux, or VIOS operating systems. From the ASCII terminal, you can access the Advanced System Management Interface (ASMI) to complete more installation tasks.

About this task

The ASCII terminal is connected to the server through a serial link. The ASCII interface to the ASMI provides a subset of the web interface functions. The ASCII terminal for the ASMI interface is available only when the system is in the standby state. It is not available during the initial program load (IPL) or run time.

Note: If you are using a serial connection to the ASMI terminal, you must use a conversion cable. This cable (part number 46K5108) is used to convert the ASCII terminal 9-pin Dshell connector to an RJ45 serial port connector on the system. For information about the locations of the connectors on the system, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER9/p9ecs/p9ecs_locations.htm).

To cable an ASCII terminal to the server, complete the following steps:

Procedure

1. Using a serial cable that is equipped with a null modem, connect the ASCII terminal to the serial port on the rear of the server.
2. Complete the following steps:
 - a. Plug the power cord into the power supply.
 - b. Plug the system power cords and the power cords for any other attached devices into the power source.
 - c. If your system uses a power distribution unit (PDU), complete the following steps:
 - 1) Connect the system power cords from the server and I/O drawers to the PDU with an IEC 320 type receptacle.
 - 2) Attach the PDU input power cord and plug it into the power source.
 - 3) If your system uses two PDUs for redundancy, complete the following steps:
 - If your system has two power supplies, attach one power supply to each of the two PDUs.

- If your system has four power supplies, plug E1 and E2 to **PDU A** and E3 and E4 to **PDU B**.

Note: Confirm that the system is in standby mode. The green power status indicator on the front control panel is flashing, and the dc out indicator lights on the power supplies are flashing. If none of the indicators are flashing, check the power cord connections.

3. Wait for the green light on the control panel to start flashing.

4. Ensure that your ASCII terminal is set to the following general attributes.

These attributes are the default settings for the diagnostic programs. Be sure that your terminal is set according to these attributes before proceeding to the next step.

Table 2. Default settings for the diagnostic programs

General setup attributes	3151 /11/31/41 settings	3151 /51/61 settings	3161 /64 settings	Description
Line speed	19,200	19,200	19,200	Uses the 19,200 (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects 8 bits as a data word length (byte).
Parity	No	No	No	Does not add a parity bit and is used together with the word length attribute to form the 8-bit data word (byte).
Stop bit	1	1	1	Places a bit after a data word (byte).

5. Press a key on the ASCII terminal to allow the service processor to confirm the presence of the ASCII terminal.
6. When the login display appears for the ASMI, enter admin for the user ID and password.
7. Change the default password when you are prompted.
8. Press Enter until the server information appears. You have completed the setup for an ASCII terminal, and have started the ASMI.
9. Continue with “Completing the server setup” on page 18.

Cabling the server to the HMC:

The Hardware Management Console (HMC) controls managed systems, including the management of logical partitions, the creation of a virtual environment, and the use of capacity on demand. Using service applications, the HMC can also communicate with managed systems to detect, consolidate, and forward information to IBM service for analysis.

Before you begin

If you have not installed and configured your HMC, do so now. For instructions, see Installation and configuration tasks (http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_taskflow.htm).

To manage POWER9 processor-based systems, the HMC must be at version 9 release 1, or later. To view the HMC version and release, complete the following steps:

1. In the navigation area, click **Updates**.
2. In the work area, view and record the information that appears in the HMC Code Level section, including the HMC version, release, Service Pack, build level, and base versions.

To cable the server to the HMC, complete the following steps:

Procedure

1. If you want to directly attach your HMC to the managed system, connect **Ethernet Connector 1** on the HMC to the **HMC1** port on the managed system. See Figure 12.

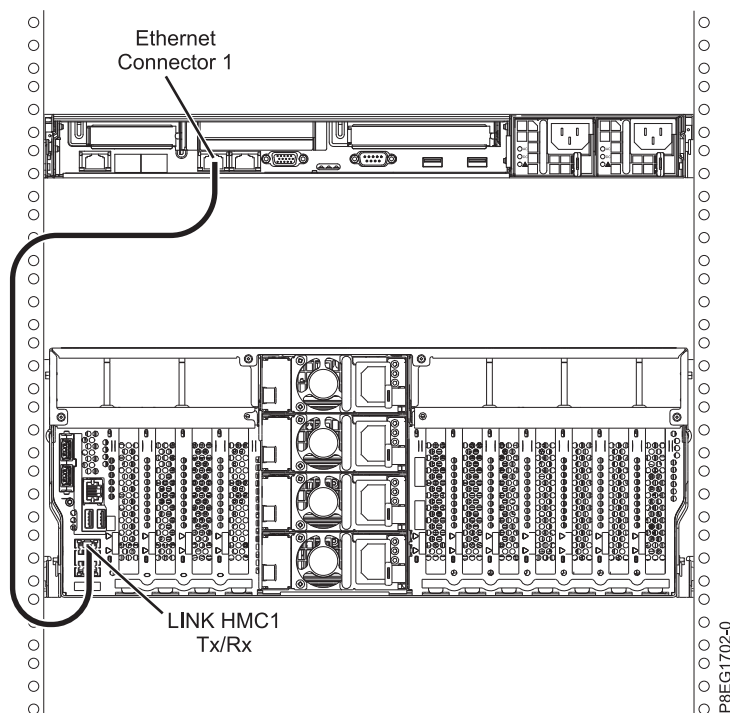


Figure 12. Attaching the HMC to the managed system

2. To learn how to connect an HMC to a private network so that it can manage more than one managed system, see HMC network connections(http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_netconhmc.htm).

Notes:

- You can also have multiple systems that are attached to a switch that is then connected to the HMC. For instructions, see HMC network connections (http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_netconhmc.htm).
 - If you are using a switch, ensure that the speed in the switch is set to **Autodetection**. If the server is directly attached to the HMC, ensure the Ethernet adapter speed on the HMC is set to **Autodetection**. For information about how to set media speeds, see [Setting the media speed](http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_lanmediaspeed_enh.htm)(http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_lanmediaspeed_enh.htm).
3. If you are connecting a second HMC to your managed server, connect it to the Ethernet port that is labeled **HMC2** on the managed server.
 4. Continue with “Cabling the server and connecting expansion units” on page 18.

Cabling the server and accessing Operations Console:

You can use Operations Console to manage a server that is running the IBM i operating system whether you have logical partitions or not. However, you must first use a different console to create the logical partitions.

Before you begin

Operations Console is a component of IBM i Access for Windows. You can install the complete product or select any of the console components - Operations Console support and the 5250 emulator support.

To cable the server and access the Operations Console, complete the following steps:

1. Ensure that your server is powered off.
2. Obtain a static IP address that is assigned to the LAN console adapter on the server for use by the console, including information about the IP, subnet mask, and default gateway.
3. Select a unique host name and register the host name and the IP address in your site's Domain Name System (DNS).

Note: This IP address is used by the Operations Console and different from the IP address that is used to connect a normal Telnet session. The IP address must not be in use by another server. Ping the IP address to verify that no other device is using the IP address.

To set up the Operations Console, complete the following steps:

1. Install IBM i Access for Windows and the latest service pack.

Note: For information about the list of Microsoft Windows operating systems that are supported for Operations Console LAN, see IBM i Access (<http://www-03.ibm.com/systems/i/software/access/windows/supportedos.html>).

- a. Log on to the system as a local administrator.
 - b. Ensure that you install the latest IBM i Access service pack. The website to download the latest service pack for IBM i Access can be found at IBM i Access (<http://www-03.ibm.com/systems/i/software/access/windows/casp.html>).
2. Cable the PC to server. Plug a Cat 5e or Cat 6 (recommended) Ethernet cable from the PC directly into a valid Ethernet adapter port. To determine the server adapter port that you must use, refer to the following table:

Table 3. Server Operations Console LAN ports

Server	Operations Console - LAN port
9009-41A	C5, C6, C7, C8, C9, C10, C11, C12
9009-42A and 9223-42H	C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12

Table 4. Server Operations Console LAN ports

Server	Operations Console - LAN port
9009-41A	C5, C6, C7, C8, C9, C10, C11, C12
9009-42A and 9223-42H	C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12

Note: Make the initial connection with the PC directly cabled to the server. The PC and server can be recabled to the network after the initial connection is made. A cross-over cable is not needed. For information, see Adapter requirements (http://www.ibm.com/support/knowledgecenter/POWER9/p9hbx/hardwarereq_adapter.htm).

3. Configure the PC networking. To configure the PC networking, complete the following steps:
 - a. Disable any additional connections listed, except the local area connection.
 - b. Record current TCP/IP settings:
 - 1) Access the adapter properties. Select **Internet Protocol**, then click **Properties**.
 - 2) Record the current settings, including IP address, subnet mask, and gateway, if applicable.
 - c. Change the TCP/IP settings.

Note: Some versions of IBM i require that the gateway address respond to pings before the console LAN adapter activates.

4. To configure the PC with the default gateway IP address complete the following steps:
 - a. Set the IP address to the opcon LAN adapter gateway.
 - b. Set the subnet mask to the opcon LAN adapter subnet.
 - c. Set the default gateway to the opcon LAN adapter primary router, or gateway address. This address is the same address as the IP address.
5. To disable the PC firewall, complete the following steps.

Note: All PC firewalls must be disabled for the initial connection.

- a. In the Windows control panel, click **Firewall settings** and disable the firewall.
- b. In the Windows control panel, click **Security center**. Check for a firewall and, if present, disable it.
- c. Scan all tasks that are running on the PC for any other software firewalls and disable the firewall.
6. To configure the Operations Console on your system, complete the following steps:
 - a. Start Operations Console. To start the Operations Console, select **Start > All Programs > IBM iSeries > Access > Operations Console**.
 - b. Start the Configuration Wizard. If the Operations Console is started for the first time, the connection wizard starts automatically. If it does not start automatically, click **Connection > New Connection** to manually start the wizard. Read the notifications, and click **Next**.
 - c. Select the local console on a network. Click **Next**.
 - d. Specify a service host name and IP address by completing the following types:
 - 1) Enter a name for your session. The name must be one of the following names:
 - A valid host name that was registered in the site Domain Name Service (DNS) for the console IP address.
 - A unique name that is not currently registered in the DNS for any other IP address.
 - 2) If you are using IBM i V6R1, or later, press the Tab key. The **Service TCP/IP Address** field is enabled.
 - 3) Specify the service TCP/IP address. Enter the LAN console adapter IP address.
 - 4) Click **Next**.
 - e. Specify the LAN console interface information.
 - 1) In the **Service TCP/IP Address** field, type the IP address that you recorded.
 - 2) In the **Service Subnet Mask** field, type the subnet mask that you recorded.
 - 3) In the **Service gateway address** field, type the default gateway that you recorded.
 - 4) The system serial number must match the tag on the server. It must be 7 characters long, without a dash.
 - 5) Set the **Target partition** to 1.
 - 6) Click **Next**.
 - f. Specify the device ID. If you are prompted to specify a service tools device ID, enter QCONSOLE. Click **Next**.
 - g. Click **Next > Finish**. Your session is now ready to connect. Double-click the session name to start the connection.
7. Power on the server by completing the following steps:
 - a. Set the manual initial program load (IPL) by completing the following steps:
 - 1) Locate the server's control panel. Look for the blue tab on the front of the server. Push it to the side, and pull the control panel out slowly.
 - 2) Press the Up arrow key until you see **02**, and press Enter.
 - 3) Press Enter again. A < (less than symbol) appears next to **N**.

- 4) Press the Up Arrow key. The N changes to an M.
 - 5) Press Enter.
 - 6) Press Enter twice. A 02 is displayed on the control panel.
- b. After you have the server set to a manual IPL, push the white power button to power on the server.

Note: You must watch the control panel while the system is trying to power on. During the IPL, the system displays C6004031 indicating that it is searching for console. The system might take 20 - 30 minutes to complete this action. If A6005008 is displayed, this means that no console is available. This might indicate that the system is not preinstalled with IBM i and you must set the console type to LAN.

8. Perform this step if the system is not preinstalled with IBM i. For setting the console type to LAN, complete the following steps:
- a. Set the control panel to manual mode. If the system is in Normal mode (function 01 shows 01 B N), select function 02 on the control panel and press Enter.
 - b. Enable control panel functions by completing the following steps:
 - 1) Select function 25 on the control panel and press Enter. The return code must be 00.
 - 2) Select function 26 on the control panel and press Enter.

Note: If you see a FF return code, go back to function 25 and press Enter, then return to function 26 and press Enter.

- c. Check your current setting(s). Use console service functions (65+21+11) to check the current setting.
- A600 500A = No console defined
 - A601 500A = Twinax console
 - A602 500A = Direct cable console
 - A603 500A = LAN console
 - A604 500A = HMC console

If the system reference code (SRC) = A603500A, skip to step e. For all others SRCs, continue with the next step.

- d. Set console type to LAN by completing the following steps.
- 1) Use the 65+21+11 sequences until it returns A603500B. This indicates that the console type will be changed to LAN.
 - 2) Use the 21+11 sequences, if it returns A6C3500C. This indicates that settings have been saved successfully. If not, repeat function 11 until it returns A6C3500C.
- e. Clear the adapter configuration from the profile by completing the following steps:
- 1) Use the 65+21+11 sequences until it returns A6C3500B. This indicates that the adapter configuration will be cleared.
 - 2) Use the 21+11 sequences, if it returns A6C3500C. This indicates that settings have been saved successfully. If not, repeat function 11 until it returns A6C3500C.
- f. Enable and set the console adapter location. Select the console adapter location - external PCI card.
- 1) Use the 65-21+11 sequences until it returns A6E2500B. Use the 21+11 sequence, if it returns A6E2500C. This indicates that the add-on adapter has been enabled and the settings have been saved successfully. If not, repeat function 11 until it returns A6E2500C.
 - 2) Use the 65-21+11 sequences until it returns A6D1500B. Use the 21+11 sequence, if it returns A6D1500C. This indicates that the internal embedded port has been disabled and the settings have been saved successfully. If not, repeat function 11 until it returns A6D1500C.

- 3) Use the 65-21+11 sequences until it returns A6Bn500B. This indicates that the LAN Adapter will be enabled in location Cn, where n= the location code of the "Console adapter location". Use the 21+11 sequence, if it returns A6Bn500C, the settings have been saved successfully.

Table 5. Console settings and functions

Console Setting	Function
E2	Enable add-on adapter (OPSCONSOLE ENBEXTLAN)
D1	Disable embedded port (OPSCONSOLE DISINTLAN)
Bn	Enable LAN adapter in slot Cn (OPSCONSOLE ENBLSLOT n) Note: This setting requires that the embedded (internal) LAN flag is turned off and the external flag is turned on. Otherwise, you will not see this series.

Notes:

- 1) Use the earlier recorded slot number to determine which Bn function must be selected. For example, if you are using the I/O adapter in slot C2, you can select console setting B2 to configure the location of the adapter.
- 2) The Bn function might advance from search order rather than numerically. For example, if the search order is C4,C3,C1, the Bn numbers might display 4 instead of a lower number. This is determined by the model, and not all models are affected.
- 3) If A60x500D is displayed on the console, the Bn function has timed out because the function has been entered slowly). You have a minute to complete a 65-21-11 sequence. After you start the console, select the required settings with no pauses.
9. Restart the console. Use the 65+21+11 sequences until the console displays A6A3500B. This indicates a console restart. The system searches for a console resource based upon the current configuration (E1/E2, D1/D2, Bn) and the resource activates. Use the 21+11 sequences. If the console displays A6A3500C, a console search and activate has been requested. If the console displays A6A3500C, repeat function 11 until the console does display A603500C.
10. Connect the console by completing the following steps:
 - a. Monitor the console status. After the status changes to Pending Authorization, the Service Tools Sign-On window opens.

Note: The Service Tools Sign-On window might open behind the Operations Console window. Resize or move the Operations Console window to locate the Service Tools Sign-On window.
 - b. Sign on to the Service Tools application. To sign on to the Service Tools application, enter 11111111 for the user ID and password.
 - c. Load the initial program and configure the system.
 - d. If your session does not connect, wait for the power-on process to stop on an attention or IPL failure system reference code (SRC), such as A6005008 or B2xxxx. If the power-on stops at A6005008, call your IBM service provider for assistance.

Note: You must configure and start an IBM i TCP interface on a second port (T2, T3, T4) before moving the console. This action ensures that there is an alternative method to access the server. Reset the PC to its original TCP/IP settings.

Note: The PC IP configuration must be reset before cabling the PC back to the network because the PC is configured with the gateway IP address.

The PC and server console port (T1) can now be recabled to the network.

Continue with "Completing the server setup" on page 18.

Cabling the server with keyboard, video, and mouse:

Before you start the system, you might need to connect the keyboard, video, and mouse to the system, if a graphics card is present.

About this task

To connect the keyboard, video, and mouse, complete the following steps:

Procedure

1. Locate the graphics card and Universal Serial Bus (USB) ports at the rear of the system. You might need a connector converter.
2. Connect the monitor cable to the graphics card.
3. Connect a keyboard and mouse to the blue USB 3.0 ports.
4. Power on the console.
5. Continue with "Cabling the server and connecting expansion units."

Cabling the server and connecting expansion units

Learn how to cable the server and to connect expansion units.

About this task

To cable the server and to connect expansion units, complete the following steps:

Procedure

1. Complete the following steps:
 - a. Plug the power cord into the power supply.
 - b. Plug the system power cords and the power cords for any other attached devices into the power source.
 - c. If your system uses a power distribution unit (PDU), complete the following steps:
 - 1) Connect the system power cords from the server and I/O drawers to the PDU with an IEC 320 type receptacle.
 - 2) Attach the PDU input power cord and plug it into the power source.
 - 3) If your system uses two PDUs for redundancy, complete the following steps:
 - If your system has two power supplies, attach one power supply to each of the two PDUs.
 - If your system has four power supplies, plug E1 and E2 to **PDU A** and E3 and E4 to **PDU B**.

Note: Confirm that the system is in standby mode. The green power status indicator on the front control panel is flashing, and the dc out indicator lights on the power supplies are flashing. If none of the indicators are flashing, check the power cord connections.

2. For information about connecting enclosures and expansion units, see Enclosures and expansion units (http://www.ibm.com/support/knowledgecenter/POWER9/p9ham/p9ham_kickoff.htm).

Completing the server setup

Learn about the tasks you must complete to set up your managed system.

Select from the following options:

- "Completing the server setup by using an HMC" on page 19
- "Completing the server setup without using an HMC" on page 21

Completing the server setup by using an HMC

Perform these tasks to complete the server setup by using a Hardware Management Console (HMC). You can also begin to use virtualization to consolidate multiple workloads onto fewer systems to increase server use, and to reduce cost.

Before you begin

To manage POWER9 processor-based systems, the HMC must be at version 9 release 1, or later.

If your system was preinstalled with an operating system, you must exit MDC (manufacturing default configuration) mode so that you can open a console and access your operating system. To exit MDC mode, complete the following steps:

1. Select **Resources > All Systems**.
2. Select **System > Actions > View System Partitions**.
3. Under Properties, select **General Settings**.
4. Select **Power On Parameters** and set the Partition Start Policy to **User-Initiated**.
5. Under System Actions, select **Operations > Power On**.
6. Once the system is in the *partition standby* state and the default partition is in the *Not Activated* state, select the default partition and choose **Activate**.

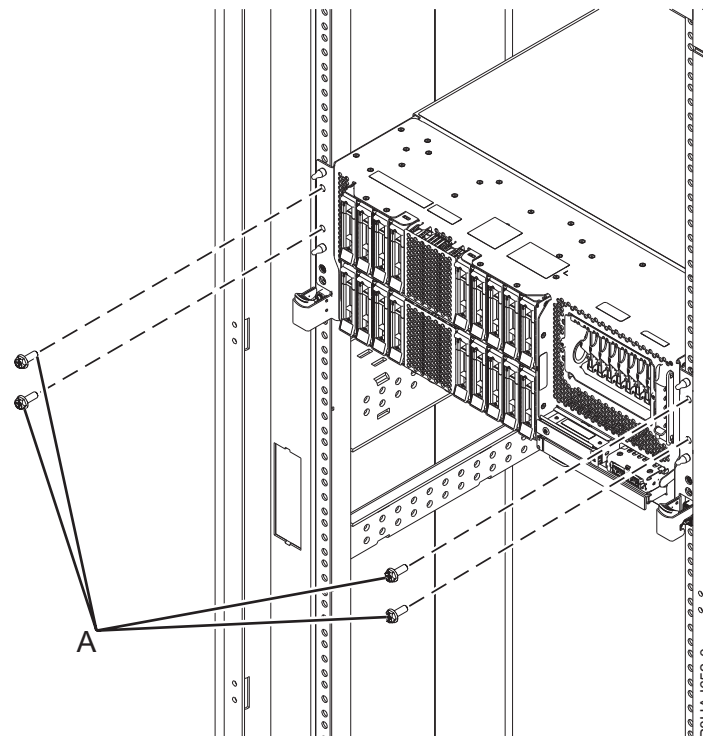
For more information about starting a system or logical partition by using the HMC, see [Starting a system or logical partition by using the HMC](#).

About this task

To complete the server setup by using an HMC, complete the following steps:

Procedure

1. Attach the server to the rack using the shipping screws (A) that were provided with your system.



2. Change the managed system passwords by completing the following steps: For more information about setting passwords for the managed system by using the HMC, see [Setting passwords for the managed system \(http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_setpassword_enh.htm\)](http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_setpassword_enh.htm).
3. Update the time of day on the managed system by using the Advanced System Management Interface (ASMI).
To access ASMI by using the HMC, complete the following steps:
 - a. In the contents area, select the managed system.
 - b. Select **Actions > View All Actions > Launch Advanced System Management (ASM)**.
 - c. Log on to the ASMI by using the administrator user ID and password.
 - d. Select **System Config > Time of Day**.
 - e. Adjust the time of day.
 - f. Select **Save Settings**.
4. Control speculative execution by using the ASMI to address the "Spectre" and "Meltdown" vulnerabilities. To control speculative execution by using the ASMI to address the Spectre and Meltdown vulnerabilities, complete the following steps:
 - a. In the ASMI interface, select **System Configuration > Speculative Execution Control**.
 - b. Choose the control option that you want to use. For more information about Speculative Execution Control, see [Protecting your POWER9 servers against the "Spectre" and "Meltdown" vulnerabilities \(http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/p9hby_speculative_execution_control.htm\)](http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/p9hby_speculative_execution_control.htm).
5. Check the firmware level on the managed system.
 - a. In the navigation area, click **Updates**.
 - b. In the contents area, select the managed system.
 - c. Select **Actions > Updates > Change Licensed Internal Code > for the Current Release**.
 - d. Select **View system information** and then click **OK**.
 - e. In the Specify LIC Repository window, select **None - Display current values** and then click **OK**.
 - f. Record the level that appears in the **EC Number** field and the **Activated Level** field. For example, if the **EC Number** is 01EM310 and the **Activated Level** is 77, the firmware level is 01EM310_77.
6. Compare your installed firmware level with available firmware levels. If necessary, update your firmware levels.
 - a. Compare your installed firmware level with available firmware levels. For more information, see the Fix Central website (<http://www.ibm.com/support/fixcentral>) .
 - b. If necessary, update your managed system firmware levels. In the navigation area, select **Updates**.
 - c. In the contents area, select your managed system.
 - d. Click **Change Licensed Internal Code for the current release**.
7. To power on a managed system, complete the following steps:
 - a. In the contents area, select the managed system.
 - b. Select **Actions > View All Actions > Power Management**.
 - c. Select the power on options that you want to use and click **OK**.
8. Create partitions using templates.
 - If you are creating new partitions, you can use the templates that are on your HMC. For more information, see [Accessing the template library \(http://www.ibm.com/support/knowledgecenter/POWER9/p9efc/p9efc_accessing_template_library.htm\)](http://www.ibm.com/support/knowledgecenter/POWER9/p9efc/p9efc_accessing_template_library.htm).

- If you have existing partitions on another system, you can capture those configurations, save it to the template library and deploy the partition template. For more information, see Partition templates (http://www.ibm.com/support/knowledgecenter/POWER9/p9efc/p9efc_partition_template_concept.htm).
 - If you want to use an existing template from another source, you can import that and use it. For more information, see Importing a partition template (http://www.ibm.com/support/knowledgecenter/POWER9/p9efc/p9efc_import_partition_template.htm).
9. Install an operating system and update the operating system.
 - Install the AIX operating system. For instructions, see Installing AIX (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installaix.htm).
 - Install the Linux operating system. For instructions, see Installing Linux (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installlinux.htm).
 - Install the VIOS operating system. For instructions, see Installing VIOS (http://www.ibm.com/support/knowledgecenter/POWER9/p9hch/p9hch_installvios.htm).
 10. You have now completed the steps to install the server.

Completing the server setup without using an HMC

If you do not have an Hardware Management Console (HMC), use this procedure to complete the server setup.

About this task

To complete the server setup without using a management console, complete the following steps:

Procedure

1. To check the firmware level on the managed system and to update the time of day, complete the following steps:
 - a. Access the Advanced System Management Interface (ASMI). For instructions, see Accessing the ASMI without an HMC (http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/connect_asmi.htm).
 - b. On the ASMI Welcome pane, note the existing level of server firmware in the upper-right corner under the copyright statement.
 - c. Update the time of day. In the navigation area, expand **System Configuration**.
 - d. Click **Time of Day**. The content pane displays a form that shows the current date (month, day, and year) and time (hours, minutes, and seconds).
 - e. Change the date value, the time value, or both, and click **Save settings**.
2. To start a system, complete the following steps:
 - a. Open the front door of the managed system.
 - b. Press the power button on the control panel.

The power-on light begins to flash faster.

- a. The system cooling fans are activated after approximately 30 seconds and begin to accelerate to operating speed.
- b. Progress indicators appear on the control panel display while the system is being started.
- c. The power-on light on the control panel stops flashing and remains on, indicating that the system is powered on.

For instructions, see Starting a system that is not managed by an HMC (<http://www.ibm.com/support/knowledgecenter/POWER9/p9haj/startsysnohmc.htm>).

3. Control speculative execution by using the ASMI to address the "Spectre" and "Meltdown" vulnerabilities. To control speculative execution by using the ASMI to address the Spectre and Meltdown vulnerabilities, complete the following steps:

- a. In the ASMI interface, select **System Configuration > Speculative Execution Control**.
 - b. Choose the control option that you want to use. For more information about Speculative Execution Control, see Protecting your POWER9 servers against the “Spectre” and “Meltdown” vulnerabilities (http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/p9hby_speculative_execution_control.htm)
 4. Install an operating system and update the operating system.
 - Install the AIX operating system. For instructions, see Installing AIX (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installaix.htm).
 - Install the Linux operating system. For instructions, see Installing Linux (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installlinux.htm).
 - Install the VIOS operating system. For instructions, see Installing VIOS (http://www.ibm.com/support/knowledgecenter/POWER9/p9hch/p9hch_installvios.htm).
 5. Update the system firmware, if required.
 - For instructions to get firmware fixes through the AIX or Linux operating system, see Getting server firmware fixes through AIX or Linux without a management console (http://www.ibm.com/support/knowledgecenter/POWER9/p9ha5/fix_firm_no_hmc_aix.htm).
 - If you are using VIOS, see Updating the Virtual I/O Server (http://www.ibm.com/support/knowledgecenter/POWER9/p9hb1/p9hb1_vios_managing_updating.htm).
 6. You have now completed the steps to install the server.
-

Setting up a stand-alone server

Learn how to set up a stand-alone server.

Prerequisite for installing the stand-alone server

Use the information to understand the prerequisites that are required for setting up the preinstalled server.

About this task

You might need to read the following documents before you begin to install the server:

- The latest version of this document is maintained online. See Installing the IBM Power System L922 (9008-22L) (http://www.ibm.com/support/knowledgecenter/POWER9/p9egj/p9egj_roadmap.htm).
- To plan your server installation, see Planning for the system (http://www.ibm.com/support/knowledgecenter/POWER9/p9ia4/p9ia4_90x_kickoff.htm).
- If you are using a Hardware Management Console (HMC), see Update the Hardware Management Console (http://www.ibm.com/support/knowledgecenter/POWER9/p9eh6/p9eh6_updatehmc.htm).

Consider the following prerequisites before you install the server:

Procedure

1. Ensure that you have the following items before you start your installation:
 - Phillips screwdriver
 - Flat-head screwdriver
2. Ensure that you have one of the following consoles:
 - Hardware Management Console (HMC): To manage POWER9 processor-based systems, the HMC must be at version 9 release 1, or later.
 - Graphic monitor with keyboard and mouse.
 - Teletype (tty) monitor with keyboard.

Moving the server to the installation site

Move the stand-alone server to the installation site.

About this task

After you have unpacked your stand-alone server and have taken inventory, move the server to the installation site.

Completing inventory for your stand-alone server

Use this information to complete inventory for your server.

About this task

To complete the inventory, complete the following steps:

Procedure

1. Verify that you received all the boxes you ordered.
2. Unpack the server components as needed.
3. Complete a parts inventory before you install each server component by following these steps:
 - a. Locate the inventory list for your server.
 - b. Ensure that you received all the parts that you ordered.

Note: Your order information is included with your product. You can also obtain the order information from your marketing representative or the IBM Business Partner.

If you have incorrect, missing, or damaged parts, consult any of the following resources:

- Your IBM reseller.
- IBM Rochester manufacturing automated information line at 1-800-300-8751 (United States only).
- The Directory of worldwide contacts website <http://www.ibm.com/planetwide>. Select your location to view the service and support contact information.

Cabling the server and setting up a console

Your console, monitor, or interface choices are guided by whether you create logical partitions, which operating system you install in your primary partition, and whether you install a Virtual I/O Server (VIOS) in one of your logical partitions.

Determining which console to use

Your console, monitor, or interface choices are guided by whether you create logical partitions, which operating system you install in your primary partition, and whether you install a Virtual I/O Server (VIOS) in one of your logical partitions.

Go to the instructions for the applicable console, interface, or terminal in the following table.

Table 6. Available console types

Console type	Operating system	Logical partitions	Cable required	Cabling setup instructions
ASCII terminal	AIX, Linux, or VIOS	Yes for VIOS, no for AIX and Linux	Serial cable equipped with a null modem	"Cabling the server with an ASCII terminal" on page 24
Hardware Management Console (HMC)	AIX, IBM i, Linux, or VIOS	Yes	Ethernet (or cross-over cable)	"Cabling the server to the HMC" on page 25.

Table 6. Available console types (continued)

Console type	Operating system	Logical partitions	Cable required	Cabling setup instructions
Operations Console	IBM i	Yes Use your Operations Console to manage existing IBM i partitions.	Ethernet cable for LAN connection	"Cabling the server and accessing Operations Console" on page 26
Keyboard, video, and mouse (KVM)	Linux or VIOS	Yes	Monitor and USB cables equipped with KVM	"Cabling the server with keyboard, video, and mouse" on page 26

Cabling the server with an ASCII terminal:

If you are not creating logical partitions, you can use an ASCII terminal to manage a server that is running the AIX, Linux, or VIOS operating systems. From the ASCII terminal, you can access the Advanced System Management Interface (ASMI) to complete more installation tasks.

About this task

The ASCII terminal is connected to the server through a serial link. The ASCII interface to the ASMI provides a subset of the web interface functions. The ASCII terminal for the ASMI interface is available only when the system is in the standby state. It is not available during the initial program load (IPL) or run time.

Note: If you are using a serial connection to the ASMI terminal, you must use a conversion cable. This cable (part number 46K5108) is used to convert the ASCII terminal 9-pin Dshell connector to an RJ45 serial port connector on the system. For information about the locations of the connectors on the system, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER9/p9ecs/p9ecs_locations.htm).

To cable an ASCII terminal to the server, complete the following steps:

Procedure

1. Using a serial cable that is equipped with a null modem, connect the ASCII terminal to the serial port on the rear of the server.
2. Complete the following steps:
 - a. Plug the power cord into the power supply.
 - b. Plug the system power cords and the power cords for any other attached devices into the power source.
 - c. If your system uses a power distribution unit (PDU), complete the following steps:
 - 1) Connect the system power cords from the server and I/O drawers to the PDU with an IEC 320 type receptacle.
 - 2) Attach the PDU input power cord and plug it into the power source.
 - 3) If your system uses two PDUs for redundancy, complete the following steps:
 - If your system has two power supplies, attach one power supply to each of the two PDUs.
 - If your system has four power supplies, plug E1 and E2 to **PDU A** and E3 and E4 to **PDU B**.

Note: Confirm that the system is in standby mode. The green power status indicator on the front control panel is flashing, and the dc out indicator lights on the power supplies are flashing. If none of the indicators are flashing, check the power cord connections.

3. Wait for the green light on the control panel to start flashing.
4. Ensure that your ASCII terminal is set to the following general attributes.
These attributes are the default settings for the diagnostic programs. Be sure that your terminal is set according to these attributes before proceeding to the next step.

Table 7. Default settings for the diagnostic programs

General setup attributes	3151 /11/31/41 settings	3151 /51/61 settings	3161 /64 settings	Description
Line speed	19,200	19,200	19,200	Uses the 19,200 (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects 8 bits as a data word length (byte).
Parity	No	No	No	Does not add a parity bit and is used together with the word length attribute to form the 8-bit data word (byte).
Stop bit	1	1	1	Places a bit after a data word (byte).

5. Press a key on the ASCII terminal to allow the service processor to confirm the presence of the ASCII terminal.
6. When the login display appears for the ASMI, enter admin for the user ID and password.
7. Change the default password when you are prompted.
8. Press Enter until the server information appears. You have completed the setup for an ASCII terminal, and have started the ASMI.
9. Continue with “Completing the server setup” on page 31.

Cabling the server to the HMC:

The Hardware Management Console (HMC) controls managed systems, including the management of logical partitions, the creation of a virtual environment, and the use of capacity on demand. Using service applications, the HMC can also communicate with managed systems to detect, consolidate, and forward information to IBM service for analysis.

Before you begin

If you have not installed and configured your HMC, do so now. For instructions, see Installation and configuration tasks (http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_taskflow.htm).

To manage POWER9 processor-based systems, the HMC must be at version 9 release 1, or later. To view the HMC version and release, complete the following steps:

1. In the navigation area, click **Updates**.
2. In the work area, view and record the information that appears in the HMC Code Level section, including the HMC version, release, Service Pack, build level, and base versions.

To cable the server to the HMC, complete the following steps:

Procedure

1. If you want to directly attach your HMC to the managed system, connect **Ethernet Connector 1** on the HMC to the **HMC1** port on the managed system.

2. To learn how to connect an HMC to a private network so that it can manage more than one managed system, see HMC network connections (http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_netconhmc.htm).

Notes:

- You can also have multiple systems that are attached to a switch that is then connected to the HMC. For instructions, see HMC network connections (http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_netconhmc.htm).
 - If you are using a switch, ensure that the speed in the switch is set to **Autodetection**. If the server is directly attached to the HMC, ensure the Ethernet adapter speed on the HMC is set to **Autodetection**. For information about how to set media speeds, see Setting the media speed (http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_lanmediaspeed_enh.htm).
3. If you are connecting a second HMC to your managed server, connect it to the Ethernet port that is labeled **HMC2** on the managed server.
 4. Continue with “Completing the server setup by using an HMC” on page 31.

Cabling the server with keyboard, video, and mouse:

Before you start the system, you might need to connect the keyboard, video, and mouse to the system, if a graphics card is present.

About this task

To connect the keyboard, video, and mouse, complete the following steps:

Procedure

1. Locate the graphics card and Universal Serial Bus (USB) ports at the rear of the system. You might need a connector converter.
2. Connect the monitor cable to the graphics card.
3. Connect a keyboard and mouse to the blue USB 3.0 ports.
4. Power on the console.
5. Continue with “Cabling the server and connecting expansion units” on page 30.

Cabling the server and accessing Operations Console

You can use Operations Console to manage a server that is running the IBM i operating system whether you have logical partitions or not. However, you must first use a different console to create the logical partitions.

Before you begin

Operations Console is a component of IBM i Access for Windows. You can install the complete product or select any of the console components - Operations Console support and the 5250 emulator support.

To cable the server and access the Operations Console, complete the following steps:

1. Ensure that your server is powered off.
2. Obtain a static IP address that is assigned to the LAN console adapter on the server for use by the console, including information about the IP, subnet mask, and default gateway.
3. Select a unique host name and register the host name and the IP address in your site's Domain Name System (DNS).

Note: This IP address is used by the Operations Console and different from the IP address that is used to connect a normal Telnet session. The IP address must not be in use by another server. Ping the IP address to verify that no other device is using the IP address.

To set up the Operations Console, complete the following steps:

1. Install IBM i Access for Windows and the latest service pack.

Note: For information about the list of Microsoft Windows operating systems that are supported for Operations Console LAN, see IBM i Access (<http://www-03.ibm.com/systems/i/software/access/windows/supportedos.html>).

- a. Log on to the system as a local administrator.
 - b. Ensure that you install the latest IBM i Access service pack. The website to download the latest service pack for IBM i Access can be found at IBM i Access (<http://www-03.ibm.com/systems/i/software/access/windows/casp.html>).
2. Cable the PC to server. Plug a Cat 5e or Cat 6 (recommended) Ethernet cable from the PC directly into a valid Ethernet adapter port. To determine the server adapter port that you must use, refer to the following table:

Table 8. Server Operations Console LAN ports

Server	Operations Console - LAN port
9009-41A	C5, C6, C7, C8, C9, C10, C11, C12
9009-42A and 9223-42H	C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12

Table 9. Server Operations Console LAN ports

Server	Operations Console - LAN port
9009-41A	C5, C6, C7, C8, C9, C10, C11, C12
9009-42A and 9223-42H	C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12

Note: Make the initial connection with the PC directly cabled to the server. The PC and server can be recabled to the network after the initial connection is made. A cross-over cable is not needed. For information, see Adapter requirements (http://www.ibm.com/support/knowledgecenter/POWER9/p9hbx/hardwarereq_adapter.htm).

3. Configure the PC networking. To configure the PC networking, complete the following steps:
 - a. Disable any additional connections listed, except the local area connection.
 - b. Record current TCP/IP settings:
 - 1) Access the adapter properties. Select **Internet Protocol**, then click **Properties**.
 - 2) Record the current settings, including IP address, subnet mask, and gateway, if applicable.
 - c. Change the TCP/IP settings.

Note: Some versions of IBM i require that the gateway address respond to pings before the console LAN adapter activates.

4. To configure the PC with the default gateway IP address complete the following steps:
 - a. Set the IP address to the opcon LAN adapter gateway.
 - b. Set the subnet mask to the opcon LAN adapter subnet.
 - c. Set the default gateway to the opcon LAN adapter primary router, or gateway address. This address is the same address as the IP address.
5. To disable the PC firewall, complete the following steps.

Note: All PC firewalls must be disabled for the initial connection.

- a. In the Windows control panel, click **Firewall settings** and disable the firewall.
- b. In the Windows control panel, click **Security center**. Check for a firewall and, if present, disable it.
- c. Scan all tasks that are running on the PC for any other software firewalls and disable the firewall.
6. To configure the Operations Console on your system, complete the following steps:
 - a. Start Operations Console. To start the Operations Console, select **Start > All Programs > IBM iSeries > Access > Operations Console**.
 - b. Start the Configuration Wizard. If the Operations Console is started for the first time, the connection wizard starts automatically. If it does not start automatically, click **Connection > New Connection** to manually start the wizard. Read the notifications, and click **Next**.
 - c. Select the local console on a network. Click **Next**.
 - d. Specify a service host name and IP address by completing the following types:
 - 1) Enter a name for your session. The name must be one of the following names:
 - A valid host name that was registered in the site Domain Name Service (DNS) for the console IP address.
 - A unique name that is not currently registered in the DNS for any other IP address.
 - 2) If you are using IBM i V6R1, or later, press the Tab key. The **Service TCP/IP Address** field is enabled.
 - 3) Specify the service TCP/IP address. Enter the LAN console adapter IP address.
 - 4) Click **Next**.
 - e. Specify the LAN console interface information.
 - 1) In the **Service TCP/IP Address** field, type the IP address that you recorded.
 - 2) In the **Service Subnet Mask** field, type the subnet mask that you recorded.
 - 3) In the **Service gateway address** field, type the default gateway that you recorded.
 - 4) The system serial number must match the tag on the server. It must be 7 characters long, without a dash.
 - 5) Set the **Target partition** to 1.
 - 6) Click **Next**.
 - f. Specify the device ID. If you are prompted to specify a service tools device ID, enter QCONSOLE. Click **Next**.
 - g. Click **Next > Finish**. Your session is now ready to connect. Double-click the session name to start the connection.
7. Power on the server by completing the following steps:
 - a. Set the manual initial program load (IPL) by completing the following steps:
 - 1) Locate the server's control panel. Look for the blue tab on the front of the server. Push it to the side, and pull the control panel out slowly.
 - 2) Press the Up arrow key until you see **02**, and press Enter.
 - 3) Press Enter again. A < (less than symbol) appears next to **N**.
 - 4) Press the Up Arrow key. The **N** changes to an **M**.
 - 5) Press Enter.
 - 6) Press Enter twice. A **02** is displayed on the control panel.
 - b. After you have the server set to a manual IPL, push the white power button to power on the server.

Note: You must watch the control panel while the system is trying to power on. During the IPL, the system displays C6004031 indicating that it is searching for console. The system might take 20 - 30

minutes to complete this action. If A6005008 is displayed, this means that no console is available. This might indicate that the system is not preinstalled with IBM i and you must set the console type to LAN.

8. Perform this step if the system is not preinstalled with IBM i. For setting the console type to LAN, complete the following steps:
 - a. Set the control panel to manual mode. If the system is in Normal mode (function 01 shows 01 B N), select function **02** on the control panel and press Enter.
 - b. Enable control panel functions by completing the following steps:
 - 1) Select function 25 on the control panel and press Enter. The return code must be 00.
 - 2) Select function 26 on the control panel and press Enter.

Note: If you see a FF return code, go back to function 25 and press Enter, then return to function 26 and press Enter.

- c. Check your current setting(s). Use console service functions (65+21+11) to check the current setting.
 - A600 500A = No console defined
 - A601 500A = Twinax console
 - A602 500A = Direct cable console
 - A603 500A = LAN console
 - A604 500A = HMC console

If the system reference code (SRC) = A603500A, skip to step **e**. For all others SRCs, continue with the next step.

- d. Set console type to LAN by completing the following steps.
 - 1) Use the 65+21+11 sequences until it returns A603500B. This indicates that the console type will be changed to LAN.
 - 2) Use the 21+11 sequences, if it returns A6C3500C. This indicates that settings have been saved successfully. If not, repeat function 11 until it returns A6C3500C.
- e. Clear the adapter configuration from the profile by completing the following steps:
 - 1) Use the 65+21+11 sequences until it returns A6C3500B. This indicates that the adapter configuration will be cleared.
 - 2) Use the 21+11 sequences, if it returns A6C3500C. This indicates that settings have been saved successfully. If not, repeat function 11 until it returns A6C3500C.
- f. Enable and set the console adapter location. Select the console adapter location - external PCI card.
 - 1) Use the 65-21+11 sequences until it returns A6E2500B. Use the 21+11 sequence, if it returns A6E2500C. This indicates that the add-on adapter has been enabled and the settings have been saved successfully. If not, repeat function 11 until it returns A6E2500C.
 - 2) Use the 65-21+11 sequences until it returns A6D1500B. Use the 21+11 sequence, if it returns A6D1500C. This indicates that the internal embedded port has been disabled and the settings have been saved successfully. If not, repeat function 11 until it returns A6D1500C.
 - 3) Use the 65-21+11 sequences until it returns A6Bn500B. This indicates that the LAN Adapter will be enabled in location Cn, where n= the location code of the "Console adapter location". Use the 21+11 sequence, if it returns A6Bn500C, the settings have been saved successfully.

Table 10. Console settings and functions

Console Setting	Function
E2	Enable add-on adapter (OPSCONSOLE ENBEXTLAN)
D1	Disable embedded port (OPSCONSOLE DISINTLAN)

Table 10. Console settings and functions (continued)

Console Setting	Function
Bn	<p>Enable LAN adapter in slot Cn (OPSCONSOLE ENBLSLOT n)</p> <p>Note: This setting requires that the embedded (internal) LAN flag is turned off and the external flag is turned on. Otherwise, you will not see this series.</p>

Notes:

- 1) Use the earlier recorded slot number to determine which Bn function must be selected. For example, if you are using the I/O adapter in slot C2, you can select console setting B2 to configure the location of the adapter.
- 2) The Bn function might advance from search order rather than numerically. For example, if the search order is C4,C3,C1, the Bn numbers might display 4 instead of a lower number. This is determined by the model, and not all models are affected.
- 3) If A60x500D is displayed on the console, the Bn function has timed out because the function has been entered slowly). You have a minute to complete a 65-21-11 sequence. After you start the console, select the required settings with no pauses.
9. Restart the console. Use the 65+21+11 sequences until the console displays A6A3500B. This indicates a console restart. The system searches for a console resource based upon the current configuration (E1/E2, D1/D2, Bn) and the resource activates. Use the 21+11 sequences. If the console displays A6A3500C, a console search and activate has been requested. If the console displays A6A3500C, repeat function 11 until the console does display A603500C.
10. Connect the console by completing the following steps:
 - a. Monitor the console status. After the status changes to Pending Authorization, the Service Tools Sign-On window opens.

Note: The Service Tools Sign-On window might open behind the Operations Console window. Resize or move the Operations Console window to locate the Service Tools Sign-On window.
 - b. Sign on to the Service Tools application. To sign on to the Service Tools application, enter 11111111 for the user ID and password.
 - c. Load the initial program and configure the system.
 - d. If your session does not connect, wait for the power-on process to stop on an attention or IPL failure system reference code (SRC), such as A6005008 or B2xxxx. If the power-on stops at A6005008, call your IBM service provider for assistance.

Note: You must configure and start an IBM i TCP interface on a second port (T2, T3, T4) before moving the console. This action ensures that there is an alternative method to access the server. Reset the PC to its original TCP/IP settings.

Note: The PC IP configuration must be reset before cabling the PC back to the network because the PC is configured with the gateway IP address.

The PC and server console port (T1) can now be recabled to the network.

Continue with “Completing the server setup” on page 18.

Cabling the server and connecting expansion units

Learn how to cable the server and to connect expansion units.

About this task

To cable the server and to connect expansion units, complete the following steps:

Procedure

1. Ensure that you have cabled and set up a console. For more information, see “Cabling the server and setting up a console” on page 23.
2. Complete the following steps:
 - a. Plug the power cord into the power supply.
 - b. Plug the system power cords and the power cords for any other attached devices into the power source.
 - c. If your system uses a power distribution unit (PDU), complete the following steps:
 - 1) Connect the system power cords from the server and I/O drawers to the PDU with an IEC 320 type receptacle.
 - 2) Attach the PDU input power cord and plug it into the power source.
 - 3) If your system uses two PDUs for redundancy, complete the following steps:
 - If your system has two power supplies, attach one power supply to each of the two PDUs.
 - If your system has four power supplies, plug E1 and E2 to **PDU A** and E3 and E4 to **PDU B**.

Note: Confirm that the system is in standby mode. The green power status indicator on the front control panel is flashing, and the dc out indicator lights on the power supplies are flashing. If none of the indicators are flashing, check the power cord connections.

3. For information about connecting enclosures and expansion units, see Enclosures and expansion units (http://www.ibm.com/support/knowledgecenter/POWER9/p9ham/p9ham_kickoff.htm).

Completing the server setup

Learn about the tasks you must complete to set up your managed system.

Completing the server setup by using an HMC

Perform these tasks to complete the server setup by using a Hardware Management Console (HMC). You can also begin to use virtualization to consolidate multiple workloads onto fewer systems to increase server use, and to reduce cost.

About this task

To complete the server setup by using an HMC, complete the following steps:

Procedure

1. Change the managed system passwords by completing the following steps: For more information about setting passwords for the managed system by using the HMC, see Setting passwords for the managed system (http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_setpassword_enh.htm).
2. Update the time of day on the managed system by using the Advanced System Management Interface (ASMI).

To access ASMI by using the HMC, complete the following steps:

 - a. In the contents area, select the managed system.
 - b. Select **Actions > View All Actions > Launch Advanced System Management (ASM)**.
 - c. Log on to the ASMI by using the administrator user ID and password.
 - d. Select **System Config > Time of Day**.
 - e. Adjust the time of day.
 - f. Select **Save Settings**.

3. Control speculative execution by using the ASMI to address the "Spectre" and "Meltdown" vulnerabilities. To control speculative execution by using the ASMI to address the Spectre and Meltdown vulnerabilities, complete the following steps:
 - a. In the ASMI interface, select **System Configuration > Speculative Execution Control**.
 - b. Choose the control option that you want to use. For more information about Speculative Execution Control, see Protecting your POWER9 servers against the "Spectre" and "Meltdown" vulnerabilities (http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/p9hby_speculative_execution_control.htm)
4. Check the firmware level on the managed system.
 - a. In the navigation area, click **Updates**.
 - b. In the contents area, select the managed system.
 - c. Select **Actions > Updates > Change Licensed Internal Code > for the Current Release**.
 - d. Select **View system information** and then click **OK**.
 - e. In the Specify LIC Repository window, select **None - Display current values** and then click **OK**.
 - f. Record the level that appears in the **EC Number** field and the **Activated Level** field. For example, if the **EC Number** is 01EM310 and the **Activated Level** is 77, the firmware level is 01EM310_77.
5. Compare your installed firmware level with available firmware levels. If necessary, update your firmware levels.
 - a. Compare your installed firmware level with available firmware levels. For more information, see the Fix Central website (<http://www.ibm.com/support/fixcentral>) .
 - b. If necessary, update your managed system firmware levels. In the navigation area, select **Updates**.
 - c. In the contents area, select your managed system.
 - d. Click **Change Licensed Internal Code for the current release**.
6. If your system was preinstalled with an operating system, you must exit MDC (manufacturing default configuration) mode so that you can open a console and access your operating system. To exit MDC mode, complete the following steps:
 - a. Select **Resources > All Systems**.
 - b. Select **System > Actions > View System Partitions**.
 - c. Under Properties, select **General Settings** .
 - d. Select **Power On Parameters** and set the Partition Start Policy to **User-Initiated**.
 - e. Under System Actions, select **Operations > Power On**.
 - f. Once the system is in the *partition standby* state and the default partition is in the *Not Activated* state, select the default partition and choose **Activate**.

For more information about starting a system or logical partition by using the HMC, see Starting a system or logical partition by using the HMC.

7. To power on a managed system, complete the following steps:
 - a. In the contents area, select the managed system.
 - b. Select **Actions > View All Actions > Power Management**.
 - c. Select the power on options that you want to use and click **OK**.
8. Create partitions using templates.
 - If you are creating new partitions, you can use the templates that are on your HMC. For more information, see Accessing the template library (http://www.ibm.com/support/knowledgecenter/POWER9/p9efc/p9efc_accessing_template_library.htm).
 - If you have existing partitions on another system, you can capture those configurations, save it to the template library and deploy the partition template. For more information, see Partition templates (http://www.ibm.com/support/knowledgecenter/POWER9/p9efc/p9efc_partition_template_concept.htm).

- If you want to use an existing template from another source, you can import that and use it. For more information, see Importing a partition template (http://www.ibm.com/support/knowledgecenter/POWER9/p9efc/p9efc_import_partition_template.htm).
9. Install an operating system and update the operating system.
 - Install the AIX operating system. For instructions, see Installing AIX (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installaix.htm).
 - Install the Linux operating system. For instructions, see Installing Linux (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installlinux.htm).
 - Install the VIOS operating system. For instructions, see Installing VIOS (http://www.ibm.com/support/knowledgecenter/POWER9/p9hch/p9hch_installvios.htm).
 10. Install the door onto the system.

Completing the server setup without using an HMC

If you do not have an Hardware Management Console (HMC), use this procedure to complete the server setup.

About this task

To complete the server setup without using a management console, complete the following steps:

Procedure

1. To check the firmware level on the managed system and to update the time of day, complete the following steps:
 - a. Access the Advanced System Management Interface (ASMI). For instructions, see Accessing the ASMI without an HMC (http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/connect_asmi.htm).
 - b. On the ASMI Welcome pane, note the existing level of server firmware in the upper-right corner under the copyright statement.
 - c. Update the time of day. In the navigation area, expand **System Configuration**.
 - d. Click **Time of Day**. The content pane displays a form that shows the current date (month, day, and year) and time (hours, minutes, and seconds).
 - e. Change the date value, the time value, or both, and click **Save settings**.
2. To start a system, complete the following steps:
 - a. Open the front door of the managed system.
 - b. Press the power button on the control panel.

The power-on light begins to flash faster.

- a. The system cooling fans are activated after approximately 30 seconds and begin to accelerate to operating speed.
- b. Progress indicators appear on the control panel display while the system is being started.
- c. The power-on light on the control panel stops flashing and remains on, indicating that the system is powered on.

For instructions, see Starting a system that is not managed by an HMC (<http://www.ibm.com/support/knowledgecenter/POWER9/p9haj/startsysnohmc.htm>).

3. Install an operating system and update the operating system.
 - Install the AIX operating system. For instructions, see Installing AIX (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installaix.htm).
 - Install the Linux operating system. For instructions, see Installing Linux (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installlinux.htm).
 - Install the VIOS operating system. For instructions, see Installing VIOS (http://www.ibm.com/support/knowledgecenter/POWER9/p9hch/p9hch_installvios.htm).

4. Update the system firmware, if required.
 - For instructions to get firmware fixes through the AIX or Linux operating system, see Getting server firmware fixes through AIX or Linux without a management console (http://www.ibm.com/support/knowledgecenter/POWER9/p9ha5/fix_firm_no_hmc_aix.htm).
 - If you are using VIOS, see Updating the Virtual I/O Server (http://www.ibm.com/support/knowledgecenter/POWER9/p9hb1/p9hb1_vios_managing Updating.htm).
5. You have now completed the steps to install your server.

Setting up a preinstalled server

Use this information to learn about setting up a server that is preinstalled in the rack.

Prerequisite for installing the preinstalled server

Use the information to understand the prerequisites that are required for setting up the preinstalled server.

About this task

Attention:

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

You might need to read the following documents before you begin to install the server:

- To plan your server installation, see Planning for the system (http://www.ibm.com/support/knowledgecenter/POWER9/p9ia4/p9ia4_90x_kickoff.htm).
- If you are using a Hardware Management Console (HMC), see Update the Hardware Management Console (http://www.ibm.com/support/knowledgecenter/POWER9/p9eh6/p9eh6_updatehmc.htm).

Consider the following prerequisites before you install the server:

Procedure

1. Ensure that you have the following items before you start your installation:
 - Phillips screwdriver
 - Flat-head screwdriver
2. Ensure that you have one of the following consoles:
 - Hardware Management Console (HMC): To manage POWER9 processor-based systems, the HMC must be at version 9 release 1, or later.
 - Graphic monitor with keyboard and mouse.
 - Teletype (tty) monitor with keyboard.

Completing inventory for your preinstalled server

Use this information to complete inventory for your server.

About this task

To complete the inventory, complete the following steps:

Procedure

1. Verify that you received all the boxes you ordered.
2. Unpack the server components as needed.
3. Complete a parts inventory before you install each server component by following these steps:
 - a. Locate the inventory list for your server.
 - b. Ensure that you received all the parts that you ordered.

Note: Your order information is included with your product. You can also obtain the order information from your marketing representative or the IBM Business Partner.

If you have incorrect, missing, or damaged parts, consult any of the following resources:

- Your IBM reseller.
- IBM Rochester manufacturing automated information line at 1-800-300-8751 (United States only).
- The Directory of worldwide contacts website <http://www.ibm.com/planetwide>. Select your location to view the service and support contact information.

Removing the shipping bracket and connecting power cords and power distribution unit (PDU) for your preinstalled server

Before you set up a console, you must remove the shipping bracket and connect power cords.

About this task

Attention:

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

To remove the shipping bracket and connect power cords, complete the following steps:

Procedure

1. Remove the screws that secure the shipping bracket to the chassis.
2. To cable the server, complete the following steps:
 - a. Ensure that the power cords are connected from the server and I/O drawers to the PDU with an IEC 320 type receptacle.
 - b. Attach the PDU input power cord and plug it into the power source.

Cabling the server and setting up a console

Your console, monitor, or interface choices are guided by whether you create logical partitions, which operating system you install in your primary partition, and whether you install a Virtual I/O Server (VIOS) in one of your logical partitions.

Determining which console to use

Your console, monitor, or interface choices are guided by whether you create logical partitions, which operating system you install in your primary partition, and whether you install a Virtual I/O Server (VIOS) in one of your logical partitions.

Go to the instructions for the applicable console, interface, or terminal in the following table.

Table 11. Available console types

Console type	Operating system	Logical partitions	Cable required	Cabling setup instructions
ASCII terminal	AIX, Linux, or VIOS	Yes for VIOS, no for AIX and Linux	Serial cable equipped with a null modem	"Cabling the server with an ASCII terminal" on page 11
Hardware Management Console (HMC)	AIX, IBM i, Linux, or VIOS	Yes	Ethernet (or cross-over cable)	"Cabling the server to the HMC" on page 12.
Operations Console	IBM i	Yes Use your Operations Console to manage existing IBM i partitions.	Ethernet cable for LAN connection	"Cabling the server and accessing Operations Console" on page 13
Keyboard, video, and mouse (KVM)	Linux or VIOS	Yes	Monitor and USB cables equipped with KVM	"Cabling the server with keyboard, video, and mouse" on page 18

Cabling the server with an ASCII terminal

If you are not creating logical partitions, you can use an ASCII terminal to manage a server that is running the AIX, Linux, or VIOS operating systems. From the ASCII terminal, you can access the Advanced System Management Interface (ASMI) to complete more installation tasks.

About this task

The ASCII terminal is connected to the server through a serial link. The ASCII interface to the ASMI provides a subset of the web interface functions. The ASCII terminal for the ASMI interface is available only when the system is in the standby state. It is not available during the initial program load (IPL) or run time.

Note: If you are using a serial connection to the ASMI terminal, you must use a conversion cable. This cable (part number 46K5108) is used to convert the ASCII terminal 9-pin Dshell connector to an RJ45 serial port connector on the system. For information about the locations of the connectors on the system, see Part locations and location codes (http://www.ibm.com/support/knowledgecenter/POWER9/p9ecs/p9ecs_locations.htm).

To cable an ASCII terminal to the server, complete the following steps:

Procedure

1. Using a serial cable that is equipped with a null modem, connect the ASCII terminal to the serial port on the rear of the server.
2. Ensure that your ASCII terminal is set to the following general attributes.
These attributes are the default settings for the diagnostic programs. Be sure that your terminal is set according to these attributes before proceeding to the next step.

Table 12. Default settings for the diagnostic programs

General setup attributes	3151 /11/31/41 settings	3151 /51/61 settings	3161 /64 settings	Description
Line speed	19,200	19,200	19,200	Uses the 19,200 (bits per second) line speed to communicate with the system unit.
Word length (bits)	8	8	8	Selects 8 bits as a data word length (byte).
Parity	No	No	No	Does not add a parity bit and is used together with the word length attribute to form the 8-bit data word (byte).
Stop bit	1	1	1	Places a bit after a data word (byte).

3. Press a key on the ASCII terminal to allow the service processor to confirm the presence of the ASCII terminal.
4. When the login display appears for the ASMI, enter admin for the user ID and password.
5. Change the default password when you are prompted.
6. Press Enter until the server information appears. You have completed the setup for an ASCII terminal, and have started the ASMI.
7. Continue with "Completing the server setup without using an HMC" on page 40.

Cabling the server to the HMC

The Hardware Management Console (HMC) controls managed systems, including the management of logical partitions, the creation of a virtual environment, and the use of capacity on demand. Using service applications, the HMC can also communicate with managed systems to detect, consolidate, and forward information to IBM service for analysis.

Before you begin

If you have not installed and configured your HMC, do so now. For instructions, see Installation and configuration tasks (http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_taskflow.htm).

To manage POWER9 processor-based systems, the HMC must be at version 9 release 1, or later. To view the HMC version and release, complete the following steps:

1. In the navigation area, click **Updates**.
2. In the work area, view and record the information that appears in the HMC Code Level section, including the HMC version, release, Service Pack, build level, and base versions.

To cable the server to the HMC, complete the following steps:

Procedure

1. If you want to directly attach your HMC to the managed system, connect **Ethernet Connector 1** on the HMC to the **HMC1** port on the managed system.
2. To learn how to connect an HMC to a private network so that it can manage more than one managed system, see HMC network connections (http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_netconhmc.htm).

Notes:

- You can also have multiple systems that are attached to a switch that is then connected to the HMC. For instructions, see HMC network connections (http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_netconhmc.htm).

- If you are using a switch, ensure that the speed in the switch is set to **Autodetection**. If the server is directly attached to the HMC, ensure the Ethernet adapter speed on the HMC is set to **Autodetection**. For information about how to set media speeds, see *Setting the media speed* (http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_lanmediaspeed_enh.htm).
3. If you are connecting a second HMC to your managed server, connect it to the Ethernet port that is labeled **HMC2** on the managed server.
 4. Continue with “Routing cables through the cable-management arm and connecting expansion units.”

Cabling the server with keyboard, video, and mouse

Before you start the system, you might need to connect the keyboard, video, and mouse to the system, if a graphics card is present.

About this task

To connect the keyboard, video, and mouse, complete the following steps:

Procedure

1. Locate the graphics card and Universal Serial Bus (USB) ports at the rear of the system. You might need a connector converter.
2. Connect the monitor cable to the graphics card.
3. Connect a keyboard and mouse to the blue USB 3.0 ports.
4. Power on the console.
5. Continue with “Routing cables through the cable-management arm and connecting expansion units.”

Routing cables through the cable-management arm and connecting expansion units

Use this procedure to route cables through the cable-management arm and to connect expansion units.

About this task

To route cables through the cable-management arm and to connect expansion units, complete the following steps:

Procedure

1. Route the console cable through the cable management arm.
2. Connect expansion units that were shipped with the system. For more information, see the expansion unit installation book that was shipped with the system. Complete the tasks associated with connecting a preinstalled expansion unit or disk drive enclosure, then return to this document to complete your server setup.
3. Continue with “Completing the server setup.”

Completing the server setup

Learn about the tasks you must complete to set up your managed system.

Select from the following options:

- “Completing the server setup by using an HMC” on page 39
- “Completing the server setup without using an HMC” on page 40

Completing the server setup by using an HMC

Perform these tasks to complete the server setup by using a Hardware Management Console (HMC). You can also begin to use virtualization to consolidate multiple workloads onto fewer systems to increase server use, and to reduce cost.

About this task

To complete the server setup by using an HMC, complete the following steps:

Procedure

1. Change the managed system passwords by completing the following steps: For more information about setting passwords for the managed system by using the HMC, see [Setting passwords for the managed system \(http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_setpassword_enh.htm\)](http://www.ibm.com/support/knowledgecenter/POWER9/p9hai/p9hai_setpassword_enh.htm).
2. Update the time of day on the managed system by using the Advanced System Management Interface (ASMI).
To access ASMI by using the HMC, complete the following steps:
 - a. In the contents area, select the managed system.
 - b. Select **Actions > View All Actions > Launch Advanced System Management (ASM)**.
 - c. Log on to the ASMI by using the administrator user ID and password.
 - d. Select **System Config > Time of Day**.
 - e. Adjust the time of day.
 - f. Select **Save Settings**.
3. Control speculative execution by using the ASMI to address the "Spectre" and "Meltdown" vulnerabilities. To control speculative execution by using the ASMI to address the Spectre and Meltdown vulnerabilities, complete the following steps:
 - a. In the ASMI interface, select **System Configuration > Speculative Execution Control**.
 - b. Choose the control option that you want to use. For more information about Speculative Execution Control, see [Protecting your POWER9 servers against the "Spectre" and "Meltdown" vulnerabilities \(http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/p9hby_speculative_execution_control.htm\)](http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/p9hby_speculative_execution_control.htm).
4. Check the firmware level on the managed system.
 - a. In the navigation area, click **Updates**.
 - b. In the contents area, select the managed system.
 - c. Select **Actions > Updates > Change Licensed Internal Code > for the Current Release**.
 - d. Select **View system information** and then click **OK**.
 - e. In the Specify LIC Repository window, select **None - Display current values** and then click **OK**.
 - f. Record the level that appears in the **EC Number** field and the **Activated Level** field. For example, if the **EC Number** is 01EM310 and the **Activated Level** is 77, the firmware level is 01EM310_77.
5. Compare your installed firmware level with available firmware levels. If necessary, update your firmware levels.
 - a. Compare your installed firmware level with available firmware levels. For more information, see the Fix Central website (<http://www.ibm.com/support/fixcentral>) .
 - b. If necessary, update your managed system firmware levels. In the navigation area, select **Updates**.
 - c. In the contents area, select your managed system.
 - d. Click **Change Licensed Internal Code for the current release**.
6. If your system was preinstalled with an operating system, you must exit MDC (manufacturing default configuration) mode so that you can open a console and access your operating system. To exit MDC mode, complete the following steps:

- a. Select **Resources > All Systems**.
- b. Select **System > Actions > View System Partitions**.
- c. Under Properties, select **General Settings**.
- d. Select **Power On Parameters** and set the Partition Start Policy to **User-Initiated**.
- e. Under System Actions, select **Operations > Power On**.
- f. Once the system is in the *partition standby* state and the default partition is in the *Not Activated* state, select the default partition and choose **Activate**.

For more information about starting a system or logical partition by using the HMC, see Starting a system or logical partition by using the HMC.

7. To power on a managed system, complete the following steps:
 - a. In the contents area, select the managed system.
 - b. Select **Actions > View All Actions > Power Management**.
 - c. Select the power on options that you want to use and click **OK**.
8. Create partitions using templates.
 - If you are creating new partitions, you can use the templates that are on your HMC. For more information, see Accessing the template library (http://www.ibm.com/support/knowledgecenter/POWER9/p9efc/p9efc_accessing_template_library.htm).
 - If you have existing partitions on another system, you can capture those configurations, save it to the template library and deploy the partition template. For more information, see Partition templates (http://www.ibm.com/support/knowledgecenter/POWER9/p9efc/p9efc_partition_template_concept.htm).
 - If you want to use an existing template from another source, you can import that and use it. For more information, see Importing a partition template (http://www.ibm.com/support/knowledgecenter/POWER9/p9efc/p9efc_import_partition_template.htm).
9. Install an operating system and update the operating system.
 - Install the AIX operating system. For instructions, see Installing AIX (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installaix.htm).
 - Install the Linux operating system. For instructions, see Installing Linux (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installlinux.htm).
 - Install the VIOS operating system. For instructions, see Installing VIOS (http://www.ibm.com/support/knowledgecenter/POWER9/p9hch/p9hch_installvios.htm).

Completing the server setup without using an HMC

If you do not have an Hardware Management Console (HMC), use this procedure to complete the server setup.

About this task

To complete the server setup without using a management console, complete the following steps:

Procedure

1. To check the firmware level on the managed system and to update the time of day, complete the following steps:
 - a. Access the Advanced System Management Interface (ASMI). For instructions, see Accessing the ASMI without an HMC (http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/connect_asmi.htm).
 - b. On the ASMI Welcome pane, note the existing level of server firmware in the upper-right corner under the copyright statement.
 - c. Update the time of day. In the navigation area, expand **System Configuration**.

- d. Click **Time of Day**. The content pane displays a form that shows the current date (month, day, and year) and time (hours, minutes, and seconds).
 - e. Change the date value, the time value, or both, and click **Save settings**.
2. To start a system, complete the following steps:
 - a. Open the front door of the managed system.
 - b. Press the power button on the control panel.

The power-on light begins to flash faster.

- a. The system cooling fans are activated after approximately 30 seconds and begin to accelerate to operating speed.
- b. Progress indicators appear on the control panel display while the system is being started.
- c. The power-on light on the control panel stops flashing and remains on, indicating that the system is powered on.

For instructions, see Starting a system that is not managed by an HMC (<http://www.ibm.com/support/knowledgecenter/POWER9/p9haj/startsysnohmc.htm>).

3. Control speculative execution by using the ASMI to address the "Spectre" and "Meltdown" vulnerabilities. To control speculative execution by using the ASMI to address the Spectre and Meltdown vulnerabilities, complete the following steps:
 - a. In the ASMI interface, select **System Configuration > Speculative Execution Control**.
 - b. Choose the control option that you want to use. For more information about Speculative Execution Control, see Protecting your POWER9 servers against the "Spectre" and "Meltdown" vulnerabilities (http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/p9hby_speculative_execution_control.htm)
4. Install an operating system and update the operating system.
 - Install the AIX operating system. For instructions, see Installing AIX (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installaix.htm).
 - Install the Linux operating system. For instructions, see Installing Linux (http://www.ibm.com/support/knowledgecenter/POWER9/p9hdx/p9hdx_installlinux.htm).
 - Install the VIOS operating system. For instructions, see Installing VIOS (http://www.ibm.com/support/knowledgecenter/POWER9/p9hch/p9hch_installvios.htm).
5. Update the system firmware, if required.
 - For instructions to get firmware fixes through the AIX or Linux operating system, see Getting server firmware fixes through AIX or Linux without a management console (http://www.ibm.com/support/knowledgecenter/POWER9/p9ha5/fix_firm_no_hmc_aix.htm).
 - If you are using VIOS, see Updating the Virtual I/O Server (http://www.ibm.com/support/knowledgecenter/POWER9/p9hb1/p9hb1_vios_managing_updating.htm).

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This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to actual people or business enterprises is entirely coincidental.

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IBM's computer systems contain mechanisms designed to reduce the possibility of undetected data corruption or loss. This risk, however, cannot be eliminated. Users who experience unplanned outages, system failures, power fluctuations or outages, or component failures must verify the accuracy of operations performed and data saved or transmitted by the system at or near the time of the outage or failure. In addition, users must establish procedures to ensure that there is independent data verification before relying on such data in sensitive or critical operations. Users should periodically check IBM's support websites for updated information and fixes applicable to the system and related software.

Homologation statement

This product may not be certified in your country for connection by any means whatsoever to interfaces of public telecommunications networks. Further certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions.

Accessibility features for IBM Power Systems servers

Accessibility features assist users who have a disability, such as restricted mobility or limited vision, to use information technology content successfully.

Overview

The IBM Power Systems servers include the following major accessibility features:

- Keyboard-only operation
- Operations that use a screen reader

The IBM Power Systems servers use the latest W3C Standard, WAI-ARIA 1.0 (www.w3.org/TR/wai-aria/), to ensure compliance with US Section 508 (www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards) and Web Content Accessibility Guidelines (WCAG) 2.0 (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 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 (www.ibm.com/able).

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Microsoft and Windows are trademarks of Microsoft Corporation in the United States, other countries, or both.

Electronic emission notices

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

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.

Federal Communications Commission (FCC) Statement

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

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

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

Industry Canada Compliance Statement

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

European Community Compliance Statement

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

European Community contact:
IBM Deutschland GmbH
Technical Regulations, Abteilung M456

IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 800 225 5426
email: halloibm@de.ibm.com

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

VCCI Statement - Japan

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

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

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

Japan Electronics and Information Technology Industries Association Statement

This statement explains the Japan JIS C 61000-3-2 product wattage compliance.

(一社) 電子情報技術産業協会 高調波電流抑制対策実施
要領に基づく定格入力電力値: Knowledge Centerの各製品の
仕様ページ参照

This statement explains the Japan Electronics and Information Technology Industries Association (JEITA) statement for products less than or equal to 20 A per phase.

高調波電流規格 JIS C 61000-3-2 適合品

This statement explains the JEITA statement for products greater than 20 A, single phase.

高調波電流規格 JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。

- 回路分類 : 6 (単相、PFC回路付)
- 換算係数 : 0

This statement explains the JEITA statement for products greater than 20 A per phase, three-phase.

高調波電流規格 JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。

- 回路分類 : 5 (3相、PFC回路付)
- 換算係数 : 0

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

声 明

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

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

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者：

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

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

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

IBM Taiwan Contact Information:

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

Electromagnetic Interference (EMI) Statement - Korea

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

Germany Compliance Statement

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 / EN 55032 Klasse A ein.

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

EN 55022 / EN 55032 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:
"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

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

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

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

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
International Business Machines Corp.
New Orchard Road

Armonk, New York 10504
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Relations Europe, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 (0) 800 225 5426
email: HalloIBM@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 / EN 55032 Klasse A.

Electromagnetic Interference (EMI) Statement - Russia

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

Class B Notices

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

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

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

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

Industry Canada Compliance Statement

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

European Community Compliance Statement

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

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IBM-Allee 1, 71139 Ehningen, Germany
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取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

Japan Electronics and Information Technology Industries Association Statement

This statement explains the Japan JIS C 61000-3-2 product wattage compliance.

(一社) 電子情報技術産業協会 高調波電流抑制対策実施
要領に基づく定格入力電力値 : Knowledge Centerの各製品の
仕様ページ参照

This statement explains the Japan Electronics and Information Technology Industries Association (JEITA) statement for products less than or equal to 20 A per phase.

高調波電流規格 JIS C 61000-3-2 適合品

This statement explains the JEITA statement for products greater than 20 A, single phase.

高調波電流規格 JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。

- 回路分類 : 6 (単相、P F C回路付)
- 換算係数 : 0

This statement explains the JEITA statement for products greater than 20 A per phase, three-phase.

高調波電流規格 JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。

- 回路分類 : 5 (3相、P F C回路付)
- 換算係数 : 0

IBM Taiwan Contact Information

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

Germany Compliance Statement

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022/ EN 55032 Klasse B ein.

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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

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

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Relations Europe, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 (0) 800 225 5426
email: HalloIBM@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022/ EN 55032 Klasse B.

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