HPE ProLiant DL560 Gen8 Server - Parts Support Guide

Part Number: External
Published: 2020
Edition: 1

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Abstract
This document will help you identify parts of the product and also gives a step-by-step instruction on how to remove and replace the components.

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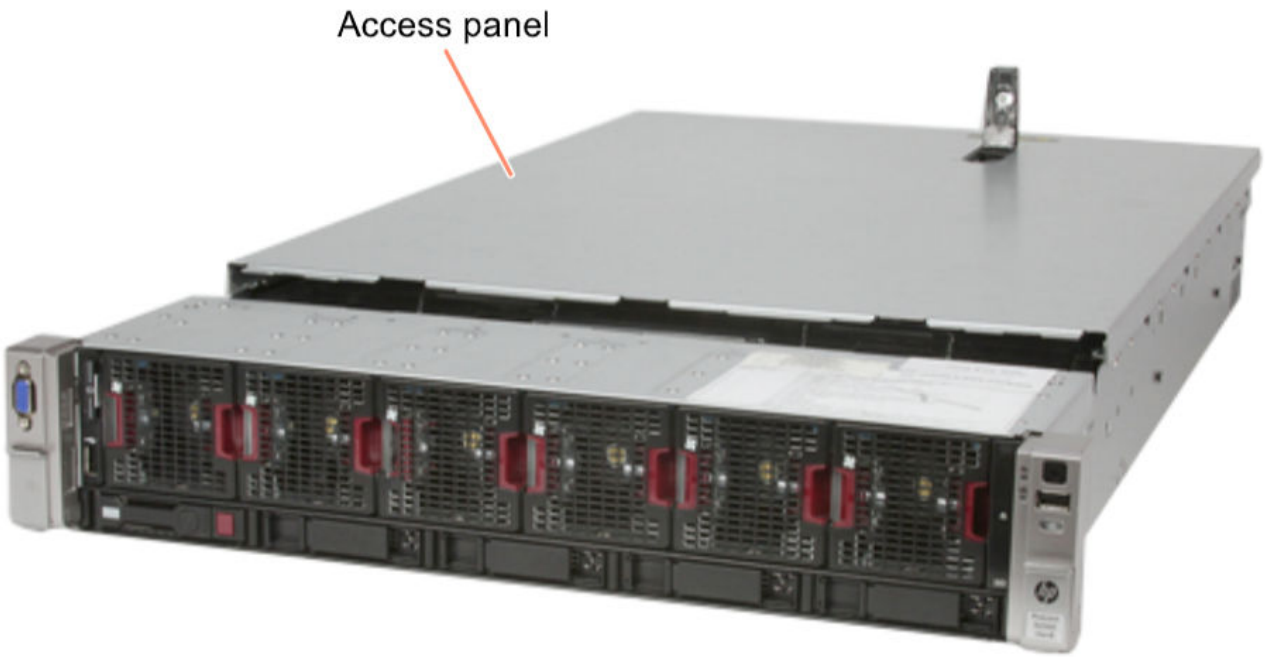
Front view



Access panel



Front panel assembly



Hot-plug fan



Hot-plug drive



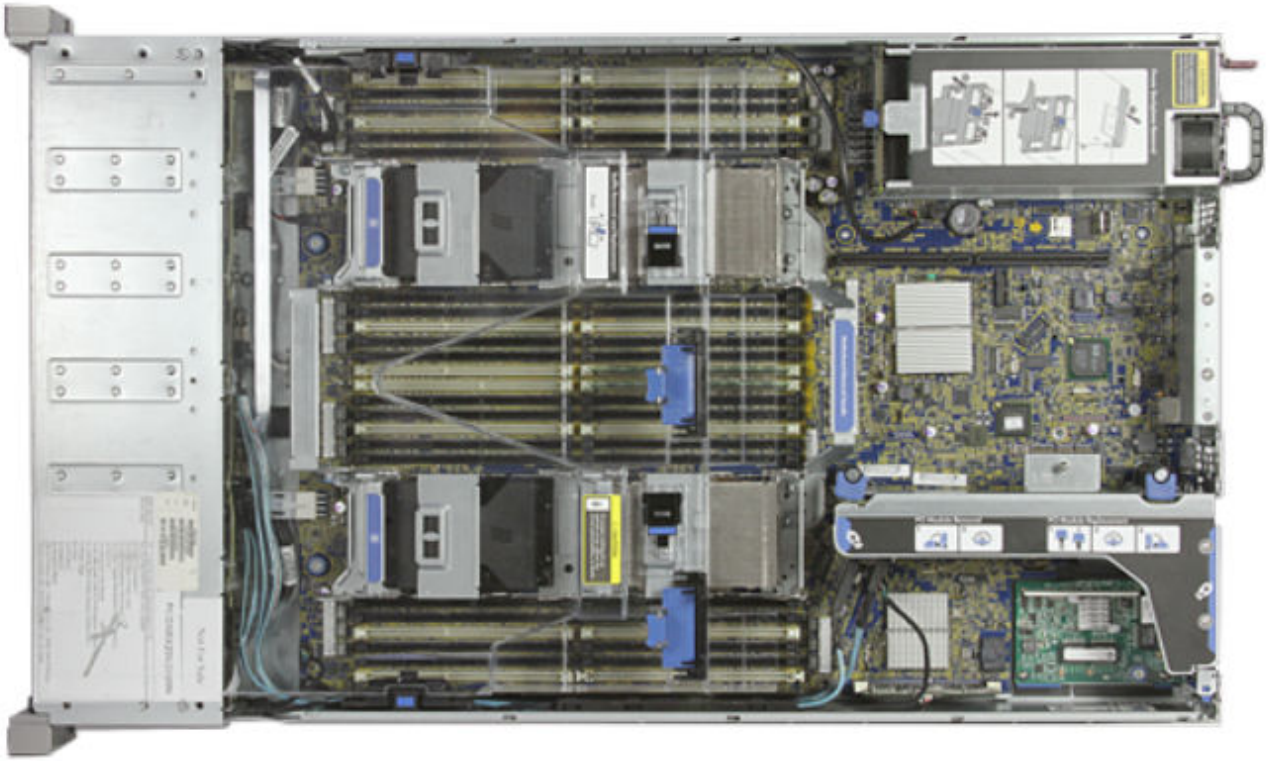
Back view



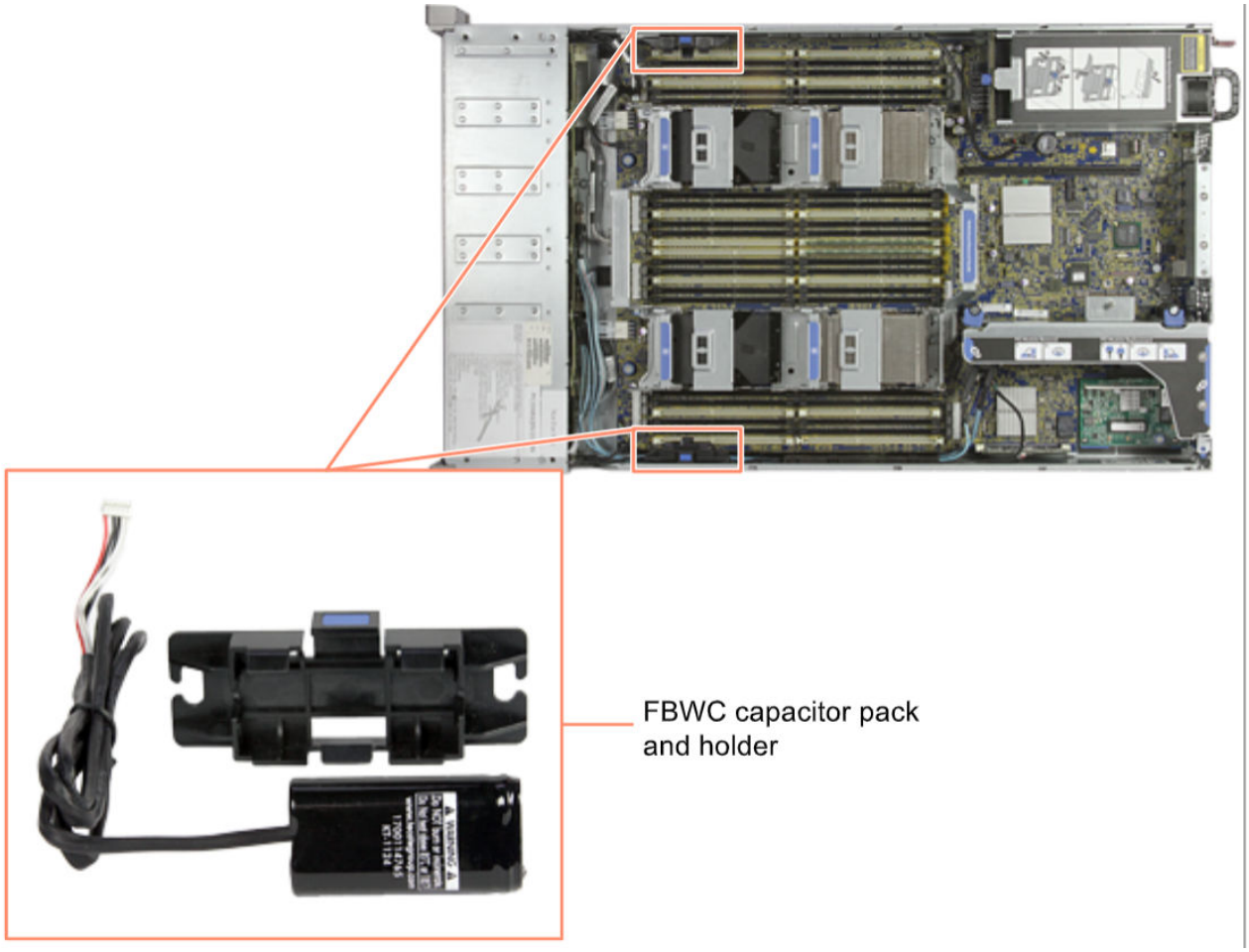
Hot-plug power supply



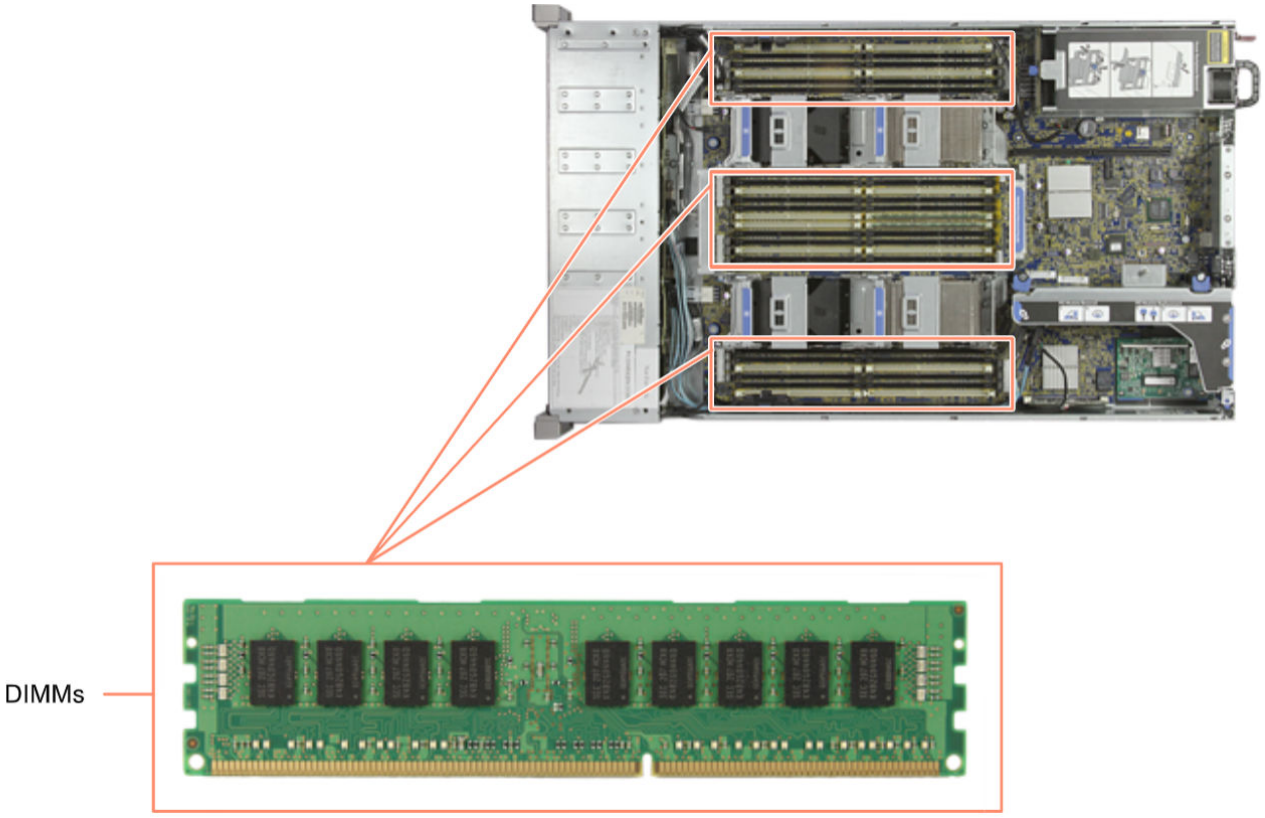
Internal view



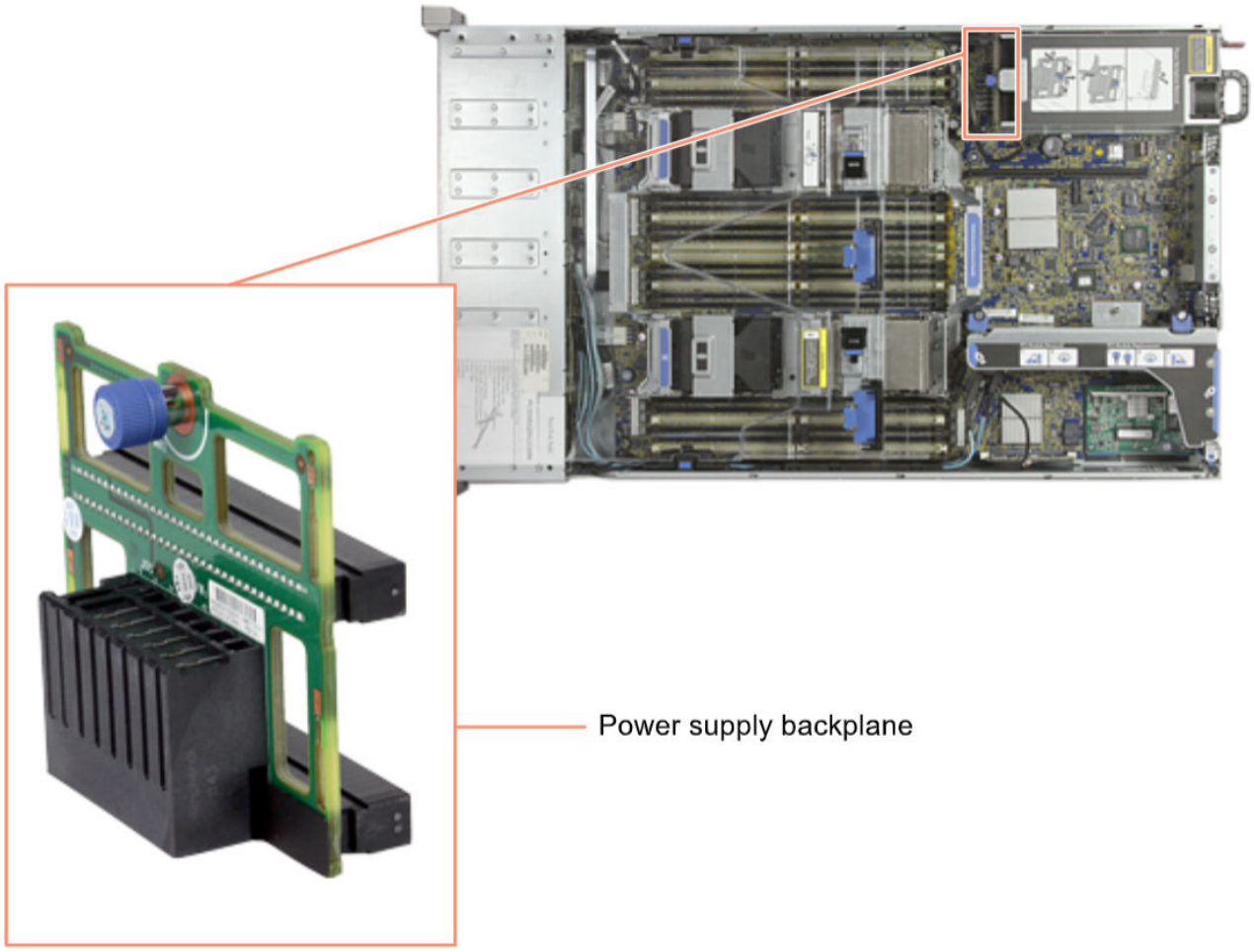
FBWC capacitor pack and holder



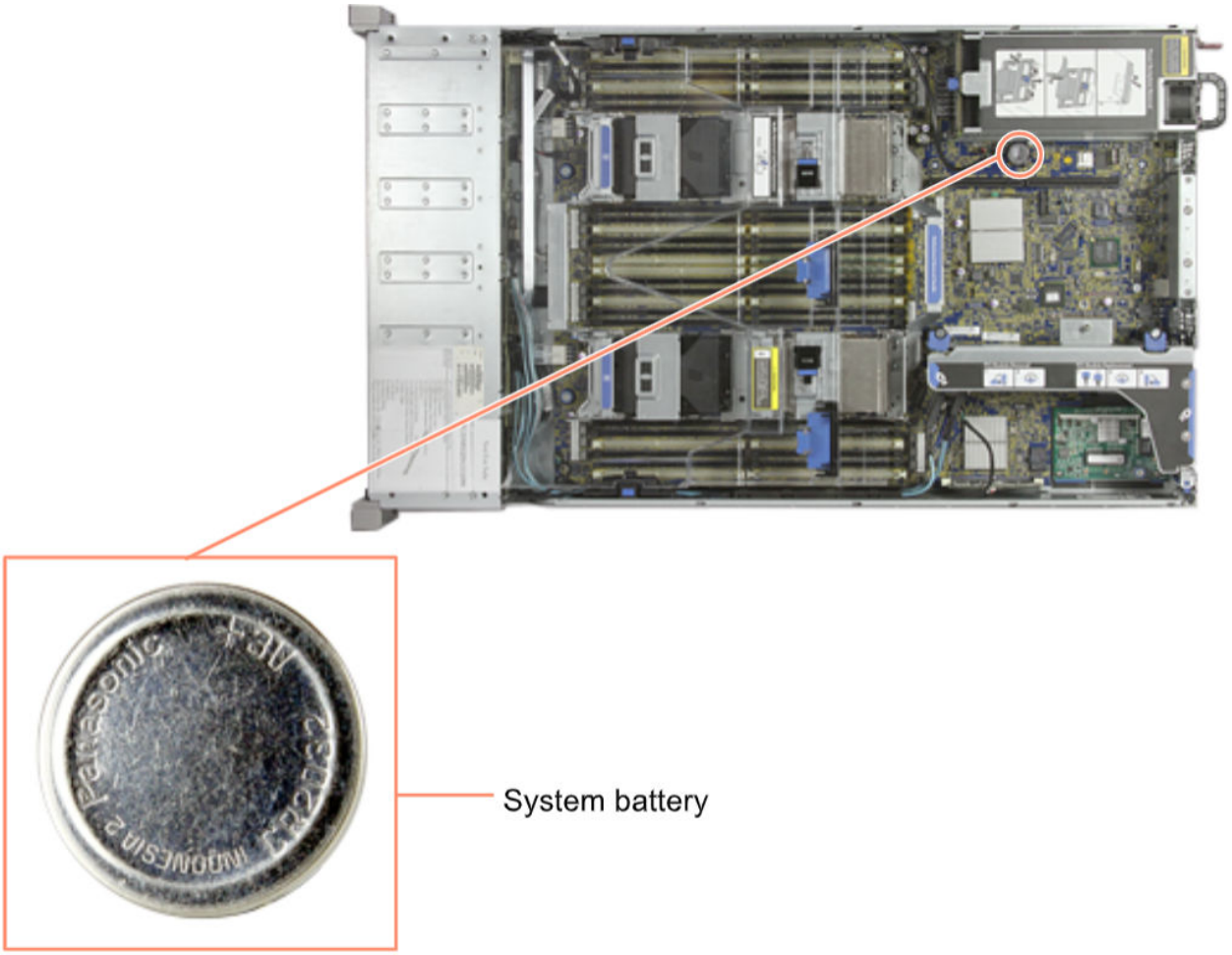
DIMMs



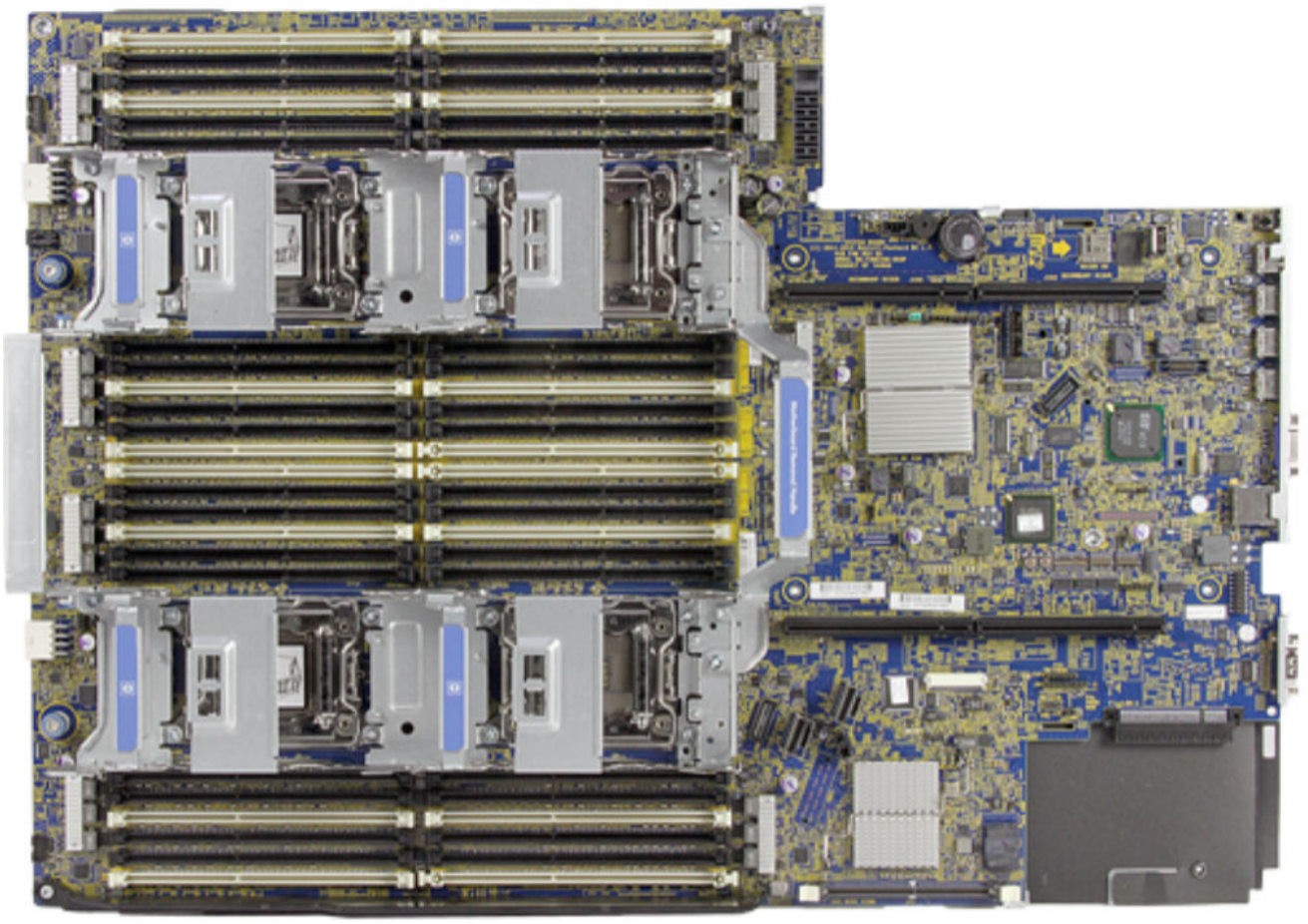
Power supply backplane



System battery

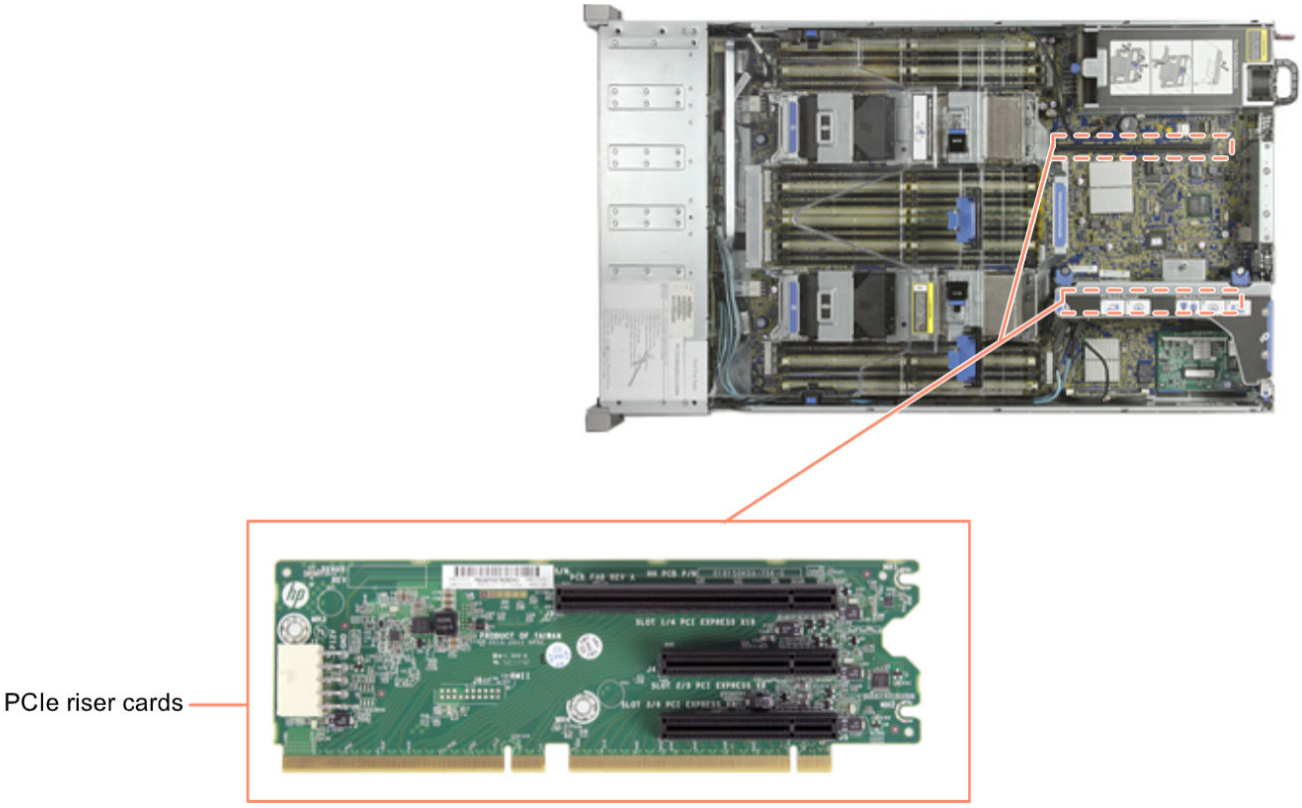


System board

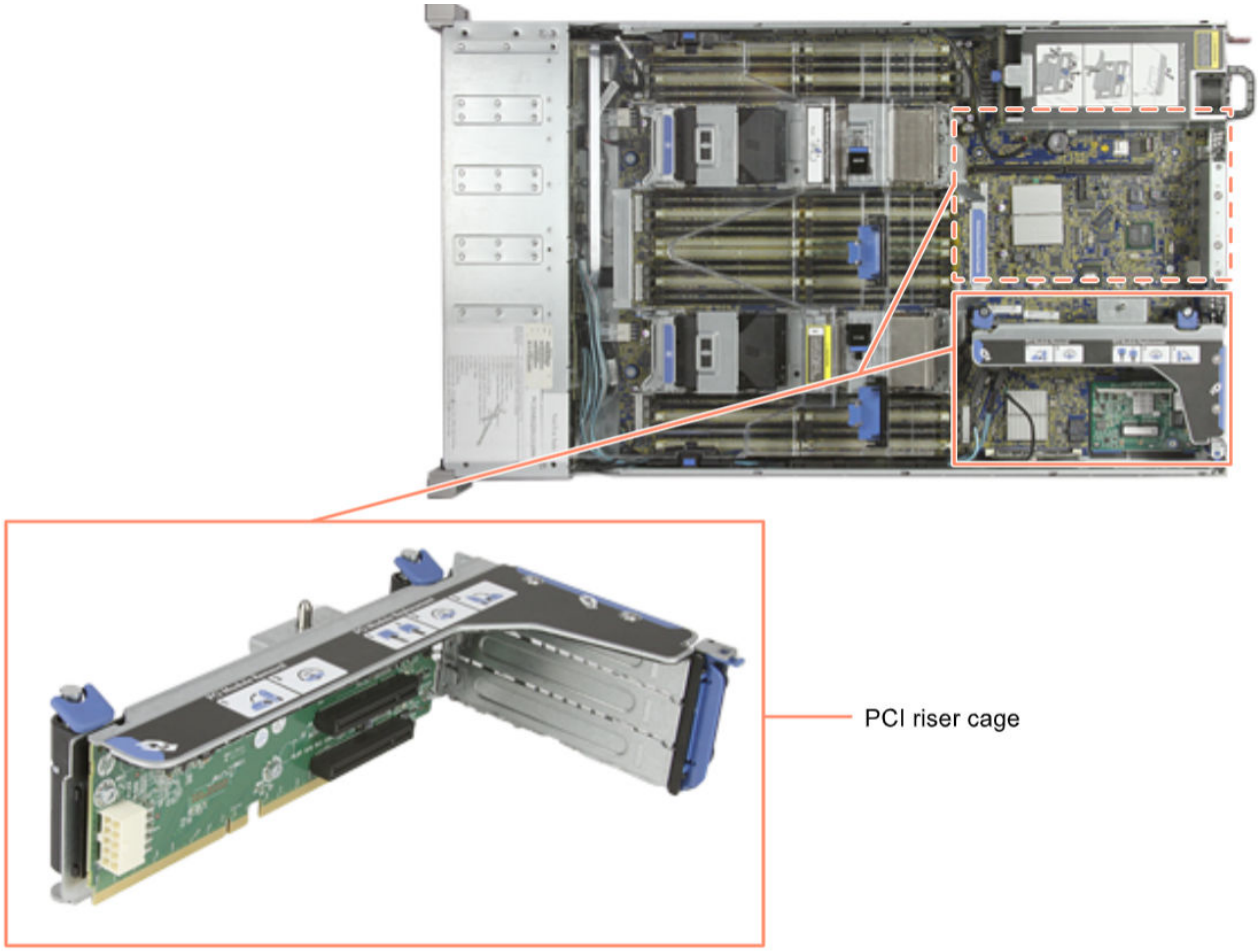


System board

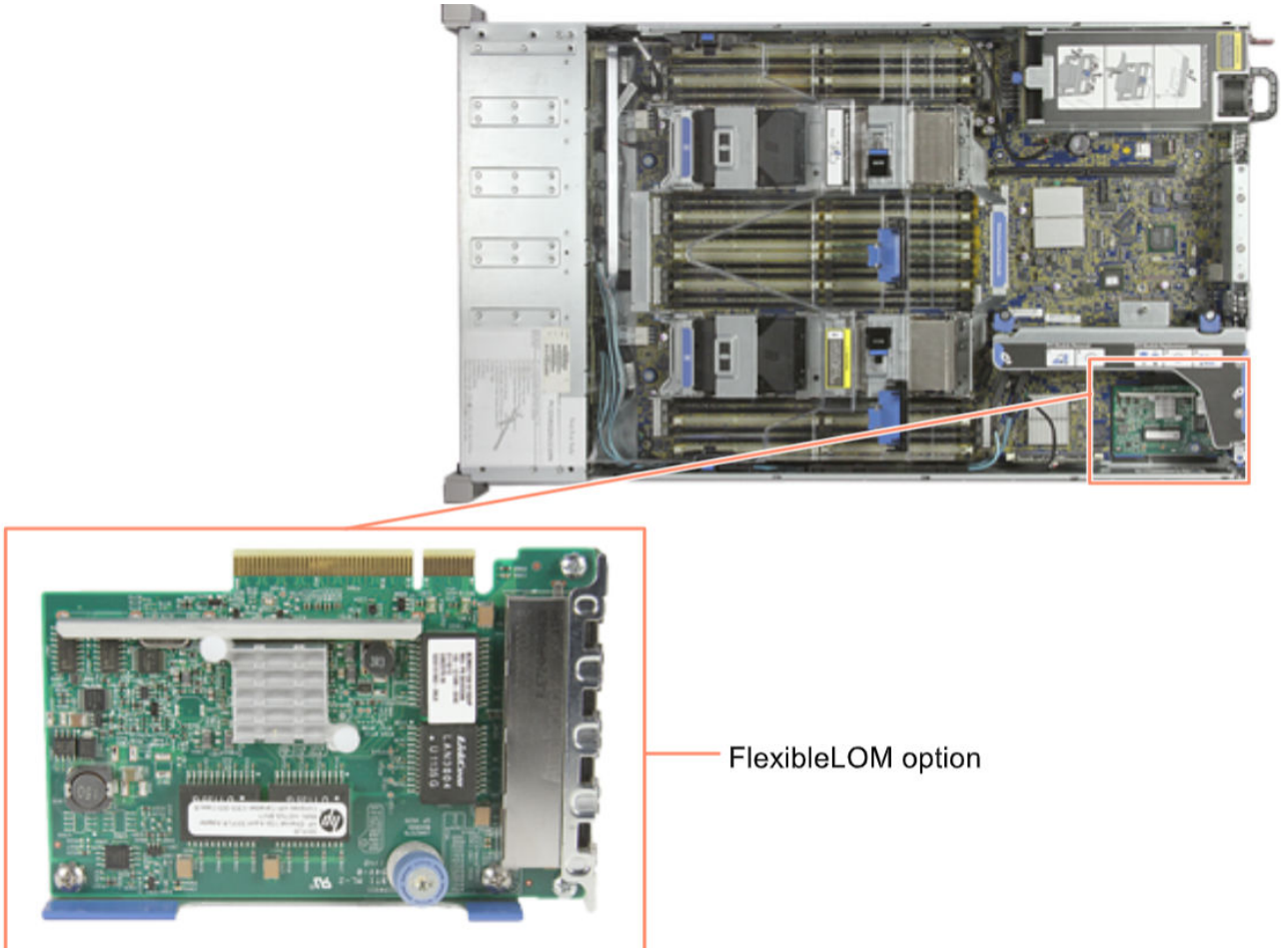
PCIe riser cards



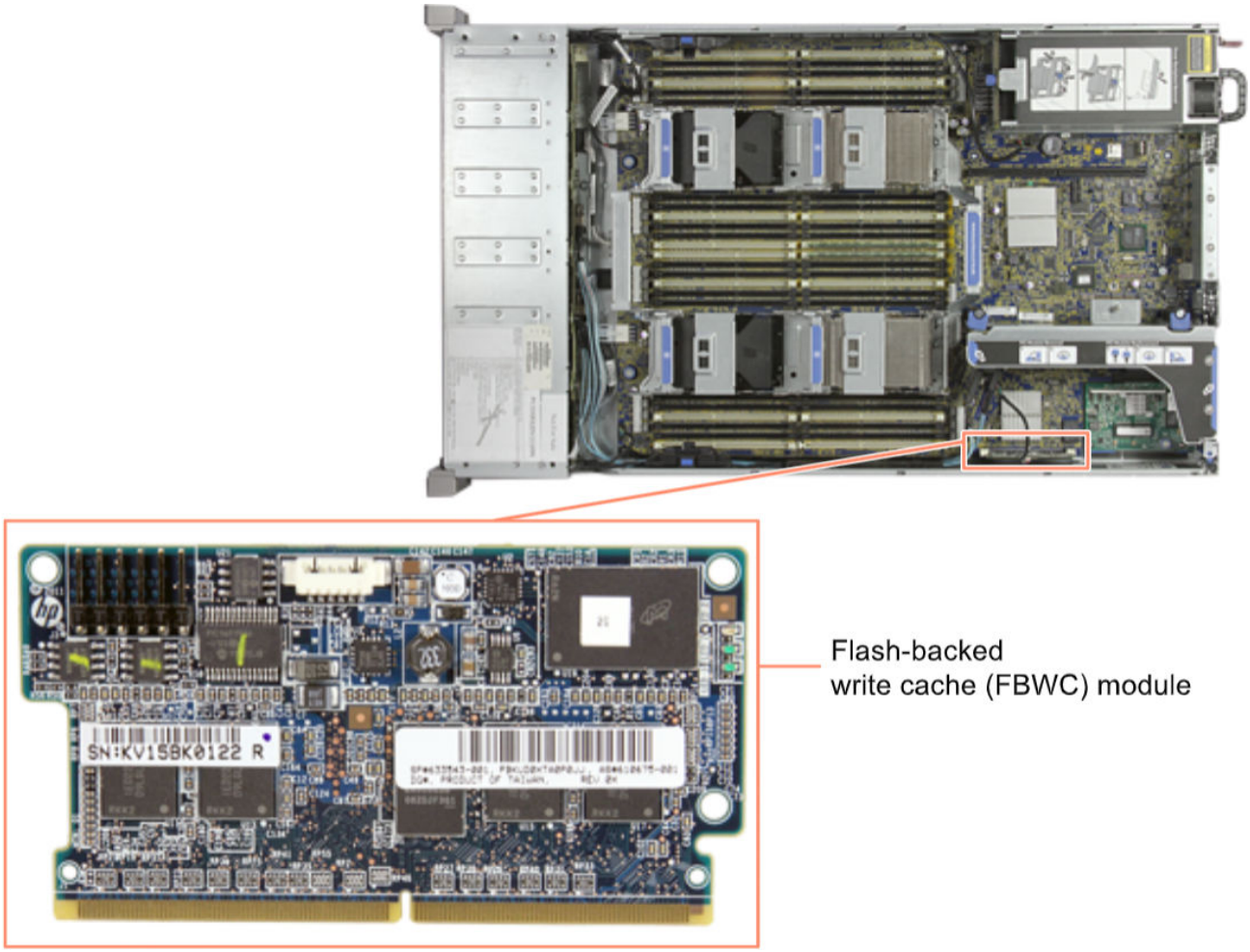
PCI riser cage



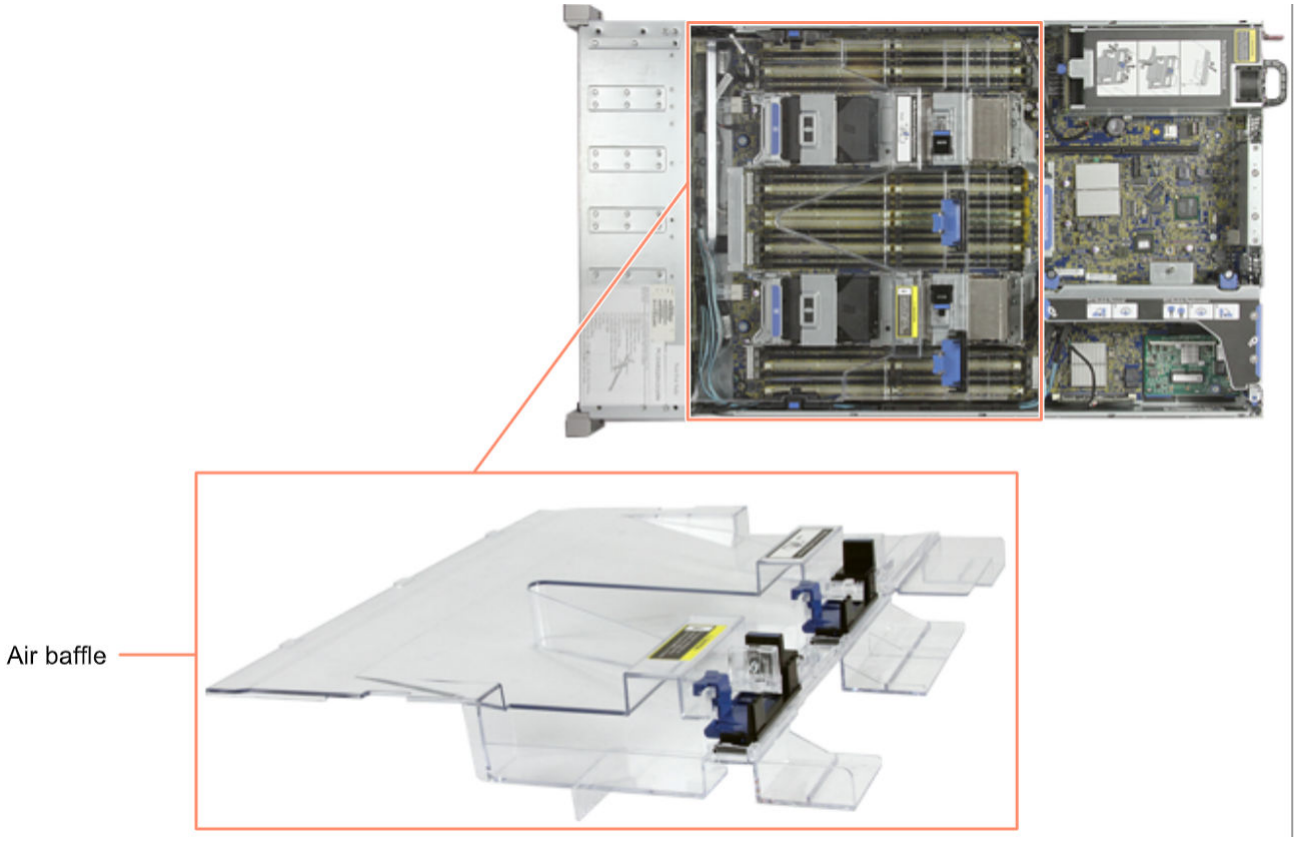
FlexibleLOM option



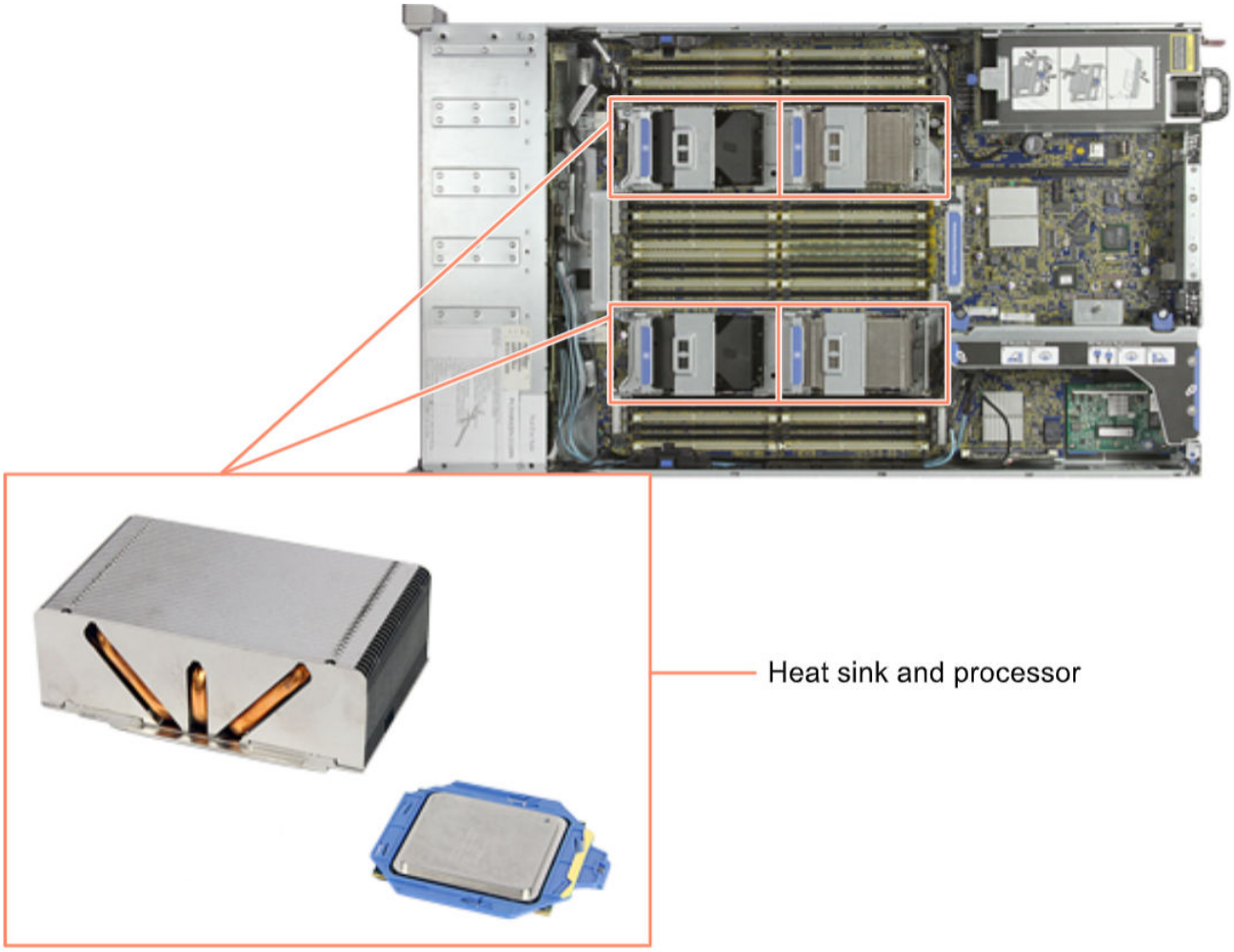
FBWC module



Air baffle



Heatsink and processor



Precautions

To prevent damage to the unit, protect data, and avoid personal injury, review and follow these precautions.

Before you begin

1. If the unit contains heated components, wait until the components have cooled off before proceeding. Refer to the service manual for details on how long each component requires to adequately cool off.
2. Put on your electrostatic discharge (ESD) wrist or shoe strap to avoid damaging any circuitry.
3. Place an ESD mat on a suitably grounded surface, and then place the unit on the mat.
4. Remove any devices from the unit being serviced, such as diskettes, tape cartridges, or CD-ROMs.
5. Power off the unit and any peripheral devices that are connected to it.**Note: Replacing a hot-plug device does not require powering down the unit.**

6. Disconnect the power cord from the electrical outlet and then from the unit. When a unit is plugged into an AC power source, voltage is always applied to the unit. You must therefore disconnect the power cord from the power source before opening the unit.
7. Disconnect all peripheral device cables from the unit.

Static electricity

Static electricity can damage electrical components. Before removing or replacing a component, observe the following precautions to prevent damage to electric components and accessories:

- Remove all ESD-generating materials from your work area.
- To avoid hand contact, transport and store all electrostatic parts and assemblies in conductive or approved ESD packaging such as ESD tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations. Before removing items from their containers, place the containers on a grounded surface.
- Do not take the new component out of its ESD package or handle any component before connecting your ESD wrist or shoe strap to a suitably grounded surface.
- Always use an ESD-protected work station when servicing the unit. If an ESD work station is not available, ground yourself to discharge body static by touching the metal chassis of the unit you are servicing.
- Avoid contact with pins, leads, or circuitry.
- Use the ESD package provided with the new part to return the old part.

Disassembly

Ensure that you take the following precautions when disassembling a unit:

- Label each cable as you remove it, noting its position and routing. This will make replacing the cables much easier and will ensure that the cables are rerouted properly.
- Keep all screws with the component removed, if applicable. The screws used in each component can be of different thread sizes and lengths. Using the wrong screw in a component could damage the unit.
- If the unit contains light-sensitive components such as toner cartridges, store the component in its original packaging or in a dark location to avoid damage.

Tools And Materials

Tools used in removal and replacement

- Torx T-10/T-15 Torx screwdriver (included with the server)

Preparation Procedures

Preparation procedures

To access some components and perform certain service procedures, you must perform one or more of the following procedures:

- Extend the server from the rack.
- If you are performing service procedures in an HP, Compaq branded, telco, or third-party rack cabinet, you can use the locking feature of the rack rails to support the server and gain access to internal components.
- For more information about telco rack solutions, refer to the RackSolutions.com website (**http://www.racksolutions.com/hp**).
- Power down the server.
- If you must remove a server from a rack or a non-hot-plug component from a server, power down theserver.
- Remove the server from the rack.
- If the rack environment, cabling configuration, or the server location in the rack creates awkward conditions, remove the server from the rack.
- Access the product rear panel.
- Access the Systems Insight Display.
- Release the full-length expansion board retainer.

Power down the server

Before powering down the server for any upgrade or maintenance procedures, perform a backup of critical server data and programs.

IMPORTANT: When the server is in standby mode, auxiliary power is still being provided to the system.

To power down the server, use one of the following methods:

- Press and release the Power On/Standby button. This method initiates a controlled shutdown of applications and the OS before the server enters standby mode.
- Press and hold the Power On/Standby button for more than 4 seconds to force the server to enter standby mode. This method forces the server to enter standby mode without properly exiting applications and the OS. If an application stops responding, you can use this method to force a shutdown.
- Use a virtual power button selection through HP iLO. This method initiates a controlled remote shutdown of applications and the OS before the server enters standby mode.
- Before proceeding, verify the server is in standby mode by observing that the system power LED is amber.

Extend the server from the rack

1. Pull down the quick release levers on each side of the server.
2. Extend the server from the rack.**WARNING: To reduce the risk of personal injury or equipment damage, be sure that the rack is adequately stabilized before extending a component from the rack.**
3. After performing the installation or maintenance procedure, slide the server back into the rack, and then press the server firmly into the rack to secure it in place.**WARNING: To reduce the risk of personal injury, be careful when pressing the server rail-release latches and sliding the server into the rack. The sliding rails could pinch your fingers.**

Remove the server from the rack

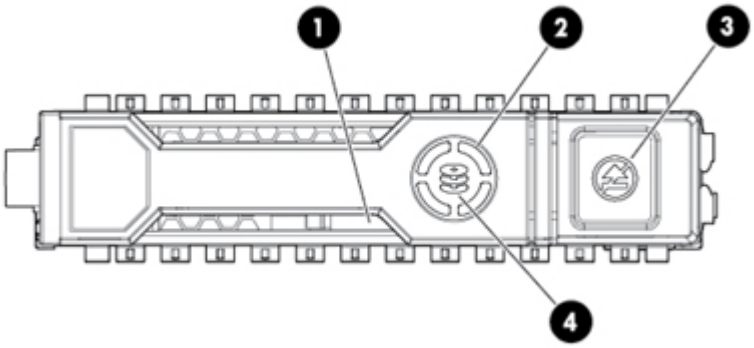
To remove the server from an HP, Compaq branded, telco, or third-party rack:

1. Power down the server.
2. Extend the server from the rack.

3. Disconnect the cabling and remove the server from the rack. For more information, refer to the documentation that ships with the rack mounting option.
4. Place the server on a sturdy, level surface.

Drive LED Definitions

Hard drive LED definitions



Item	LED	Status	Definition
1	Locate	Solid blue	The drive is being identified by a host application.
		Flashing blue	The drive carrier firmware is being updated or requires an update.
2	Activity ring	Rotating green	Drive activity
		Off	No drive activity
3	Do not remove	Solid white	Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.
		Off	Removing the drive will not cause a logical drive to fail.
4	Drive status	Solid green	The drive is a member of one or more logical drives.
		Flashing green	The drive is rebuilding or performing a RAID migration, stripe size migration, capacity expansion, erasing, or logical drive extension.
		Flashing amber/green	The drive is a member of one or more logical drives and predicts the drive will fail.
		Flashing amber	The drive is not configured and predicts the drive will fail.

		Solid amber	The drive has failed.
		Off	The drive is not configured by a RAID controller.

Hot-Plug Fan Considerations

Hot-plug fan considerations

CAUTION: To avoid damage to server components, all fan modules must be installed in fan bays for any processor configuration.

The HP ProLiant DL560 Gen8 Server uses single rotor fan modules. For all processor configurations, six fan modules are required for redundancy. A fan module failure or missing fan module causes a loss of redundancy. A second fan module failure or missing fan module causes an orderly shutdown of the server.

The server supports variable fan speeds. The fans operate at minimum speed until a temperature change requires a fan speed increase to cool the server.

The server shuts down in the following temperature-related scenarios:

At POST:

- The BIOS suspends the server for 5 minutes if it detects a cautionary temperature level. If the cautionary temperature level is still detected after 5 minutes, the BIOS performs an orderly shutdownand enters Standby mode.
- The BIOS performs an orderly shutdown if two or more fans have failed. The server performs an immediate shutdown if it detects a critical temperature level.**IMPORTANT: An immediate shutdown is a hardware-controlled function and it overrides any firmware or software actions.**

In the operating system:

- The Health Driver performs an orderly shutdown if it detects a cautionary temperature level. If the server detects a critical temperature level before the orderly shutdown occurs, the server performs an immediate shutdown. Additionally, the Health Driver performs an orderly shutdown if more than one fan is failed or removed.
- When Thermal Shutdown is disabled in RBSU, the server performs an immediate shutdown if it detects a critical temperature level.**IMPORTANT: An immediate shutdown is a hardware-controlled function and it overrides any firmware or software actions.**

System Battery Consideration

System battery consideration

WARNING: The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace only with the spare designated for this product.

Flash-Backed Write Cache LEDs And Procedures

Flash-backed write cache module LEDs and procedures

Flash-backed write cache module LEDs

1 Amber	2 Green	3 Green	Interpretation
Off	Off	Off	The cache module is not powered.
Off	Flashing 0.5 Hz	Flashing 0.5 Hz	The cache microcontroller is executing from within its boot loader and receiving new flash code from the ho st controller.
Off	Flashing 1 Hz	Flashing 1 Hz	The cache module is powering up, and the capacitor p ack is charging.
Off	Off	Flashing 1 Hz	The cache module is idle, and the capacitor pack is ch arging.

Off	Off	On	The cache module is idle, and the capacitor pack is ch arged.
Off	On	On	The cache module is idle, the capacitor pack is charge d, and the cache contains data that has not yet been written to the drives.
Off	Flashing 1 Hz	Off	A backup is in progress.
Off	On	Off	The current backup is complete with no errors.
Flashing 1 Hz	Flashing 1 Hz	Off	The current backup failed, and data has been lost.
Flashing 1 Hz	Flashing 1 Hz	On	A power error occurred during the previous or current boot. Data may be corrupt.
Flashing 1 Hz	On	Off	An overtemperature condition exists.
Flashing 2 Hz	Flashing 2 Hz	Off	The capacitor pack is not attached.
Flashing 2 Hz	Flashing 2 Hz	On	The capacitor has been charging for 10 minutes, but has not reached sufficient charge to perform a full bac kup.
On	On	Off	The current backup is complete, but power fluctuatio ns occurred during the backup.
On	On	On	The cache module microcontroller has failed.

Flash-backed write cache module procedures

CAUTION: Do not detach the cable that connects the battery pack or capacitor pack to the cache module. Detaching the cable causes any unsaved data in the cache module to be lost.

CAUTION: The cache module connector does not use the industry-standard DDR3 mini-DIMM pinout. Do not use this controller with cache modules designed for other controller models, because the controller can malfunction and you can lose data. Also, do not transfer this cache module to an unsupported controller model, because you can lose data.

1. Back up all data.
2. Close all applications.
3. Power down the server.

4. Remove all power:
    a. Disconnect each power cord from the power source.
    b. Disconnect each power cord from the server.**CAUTION: In systems that use external data storage, be sure that the server is the first unit to be powered down and the last to be powered back up. Taking this precaution ensures that the system does not erroneously mark the drives as failed when the server is powered up.**
5. Extend the server from the rack.
6. Remove the access panel.
7. If it is populated with expansion boards, remove the PCIe riser cage for better access.
8. If the existing cache module is connected to a capacitor pack, observe the FBWC module LEDs:
    - If the amber LED is flashing, data is trapped in the cache. Restore system power, and restart this procedure.
    - If the amber LED is not illuminated, remove the controller from the server, and then continue with the procedure.

Hot-Plug Drive

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Hot-plug drive removal

CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all drive bays are populated with either drive or a blank.

Before you begin : Review and follow Precautions . Determine the status of the drive from the. Back up all server data on the hard drive, if possible.

1. Press the hot-plug button to release the handle.
2. Pull the handle back and use it to slide the hard drive out of the drive bay.
3. If removing a drive blank, pinch the release tabs together and slide the drive blank out of the drive bay.

Hot-plug drive replacement

To replace the hot-plug drive or drive blank, reverse the removal procedure.

Hot-Plug Fan

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Hot-plug fan removal

CAUTION: To avoid damage to server components, all fan modules must be installed in fan bays for any processor configuration.

Before you begin : Review and follow Precautions . Review Hot-plug fan considerations .

1. Grasp the hot-plug fan by the finger grooves.
2. Squeeze and pull the hot-plug fan out the front of the server.

CAUTION : Do not operate the server for long periods without all of the hot-plug fans installed in the fan bays. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

Hot-plug fan replacement

To replace the hot-plug fan, reverse the removal procedure.

Hot-Plug Power Supply

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Hot-plug power supply removal

WARNING: To reduce the risk of personal injury from hot surfaces, allow the power supply or power supply blank to cool before touching it.**CAUTION:** Do not attempt to remove and replace a power supply as a hot-plug procedure unless both bays are populated with hot-plug power supplies.**CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a power supply or a blank.

Before you begin : Review and follow Precautions . If only one hot-plug power supply is installed, follow Preparation procedures to power down, extend or remove the server from the rack.

1. Remove the power cord from the hot-plug power supply.

2. Press the release tab toward the power cord connector.
3. Grasp the power supply handle and pull the power supply out of the power supply bay.
4. If removing a power supply blank, pinch the blank in the center and pull it out of the power supply bay.

Hot-plug power supply replacement

WARNING: To reduce the risk of electric shock or damage to the equipment, do not connect the power cord to the power supply until the power supply is installed.

1. Slide the hot-plug power supply into the power supply bay until it is fully seated and clicks into place.
2. Connect the power cord to the hot-plug power supply.
3. Connect the power cord to the power source.
4. Power on the server if it was not already on.
5. Confirm that the hot-plug power supply LED is green.
6. If replacing a power supply blank, insert the blank into the power supply until it is fully seated and flush with the rear of the server chassis.

Access Panel

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Access panel removal

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them. WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until power is removed.

CAUTION: For proper cooling, do not operate the server without the access panel, air baffle, expansion slot covers, or blanks installed.

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server.

1. If the retaining latch is locked, use a Torx-15 screwdriver to unlock it.**NOTE:** A Torx 10/15 tool is included at the rear of the server.

2. Open the retaining latch fully. The access panel slides back releasing it from the system chassis.
3. Lift access panel up and off of the server.

Access panel replacement

To replace the access panel, reverse the removal procedure.

Power Supply Backplane

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Power supply backplane removal

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove all hot-plug power supplies and access panel.

1. Loosen the thumbscrew that secures the power supply backplane to the power supply cage.
2. Lift the power supply backplane up to disconnect it from the system board.
3. Pull the power supply backplane out and off of the guide hooks on the power supply cage, and remove.

Power supply backplane replacement

To replace the power supply backplane, reverse the removal procedure.

PCIe Riser Cage

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PCIe riser cage removal

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove the access panel.

WARNING : To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until power is removed.

NOTE: Shown here is the primary PCIe riser cage. The removal/replacement procedure is the same for the secondary PCIe riser cage.

NOTE: If a full-length expansion card is installed, you may need to release the end support on the air baffle.

1. Disconnect all external or internal cables connected to installed expansion boards.
2. If a full-length expansion board is installed, release the full-length expansion board retainer on the air baffle.
3. Loosen the two PCIe riser cage thumbscrews by lifting the tabs and rotating them counter clockwise, 180 degrees until the thumbscrews pop up and disengage from the system board.
4. Lift up evenly on the PCIe riser cage and remove.
5. Remove all expansion boards if installed.

PCIe riser cage replacement

To replace the PCIe riser cage, reverse the removal procedure.

Expansion Board

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Expansion board removal

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove all external cables to expansion boards in the affected PCIe rise cage. Remove the access panel and the PCIe riser cage.

1. Press the blue release tab and open the expansion board locking mechanism.
2. Carefully pull the expansion board out of PCIe riser card expansion slot.

Expansion board replacement

To replace the expansion board, reverse the removal procedure.

PCIe Riser Cards

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PCIe riser cards removal

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove all external cables to expansion boards in the affected PCIe rise cage. Remove the access panel, PCIe riser cage, and if necessary, all installed expansion boards.

1. Remove the two T-15 Torx screws that secure the PCIe riser card to the PCIe riser cage.
2. Remove the PCIe riser card from the notched guide pins and out of the PCI riser cage.

PCIe riser cards replacement

To replace the PCIe riser card, reverse the removal procedure.

System Battery

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System battery removal

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove the access panel, and if installed, the secondary PCIe riser cage. Review System battery consideration .

1. Push back on the release tab that secures the system battery in place.
2. Grasp the system battery and lift it out of its retaining bracket.

System battery replacement

With the positive (+) side of the battery facing up, place the battery fully into its retaining bracket with the release tab holding the battery in place.

Air Baffle

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Air baffle removal

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove the access panel.

IMPORTANT : If a full length expansion board is installed in either the primary or secondary PCIe riser cage, release the affected expansion board retainer and remove the affected PCIe riser cage.

1. Pinch both locking latches to unlock the air baffle from the rear heat sink cages.
2. Lift the air baffle up just enough to then pull the air baffle front tabs out from under the notches in the rear of the front panel assembly.**CAUTION : Use care to avoid breaking off the air baffle front tabs.**

Air baffle replacement

1. While pinching the locking latches, toe the air baffle front tabs into the notches in the rear of the front panel assembly.
2. Lower the air baffle into place over the heat sink cages and DIMM slots.
3. Stop pinching the locking latches to lock the air baffle to the top of the rear heat sink cages.

FlexibleLOM Option

https://support.hpe.com/hpesc/public/videoDisplay?videoId=vpsg00002190en_us&noframe

FlexibleLOM option removal

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove the access panel and the primary PCIe riser cage.

1. Remove all network cables from the FlexibleLOM option.
2. Loosen the thumbscrew that secures the FlexibleLOM option to the server chassis.
3. Carefully pull the FlexibleLOM option away from the system board to disengage its connector to the system board.**NOTE** : Pull the FlexibleLOM toward the front of the server while removing it, to avoid catching it on the rear chassis.**CAUTION: To avoid damaging the FlexibleLOM option, only handle the FlexibleLOM by its metal frame and handle, never by the board components.**
4. Lift the FlexibleLOM option up and out of the server chassis.

FlexibleLOM option replacement

To replace the FlexibleLOM option, reverse the removal procedure.

DIMMs

https://support.hpe.com/hpesc/public/videoDisplay?videoId=vpsg00002191en_us&noframe

DIMMs removal

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove the access panel and air baffle.

IMPORTANT : If a full length expansion board is installed in either the primary or secondary PCIe riser cage, the affected PCIe riser cage will need to be removed prior to the air baffle.

1. Open the DIMM slot latches.
2. Lift the DIMM up and out of the DIMM slot.

DIMMs replacement

1. Ensure that the DIMM slot latches are open.
2. Locate the alignment notch on the DIMM and align it with the key in the DIMM slot.

3. Push the DIMM down firmly into the slot until the DIMM slot latches snap into place.
4. Ensure that the DIMM is fully inserted and properly seated in the slot.

Heat Sink And Processor

https://support.hpe.com/hpesc/public/videoDisplay?videoId=vpsg00002192en_us&noframe

Heat sink and processor removal

IMPORTANT: This server can accommodate up to four processors. Processor 1 must always be installed. Dual processor or quad processor configurations are optional. A three processor configuration is not supported.

CAUTION : To prevent possible server malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number.

CAUTION : To prevent possible server overheating, always populate processor socket 2, 3 and 4 with a processor and a heat sink or a processor socket cover and a heat sink blank.

CAUTION: To avoid thermal shutdown, all fans must be installed in a dual or quad processor configuration.NOTE: When installing a processor as a new option:

- Update the system ROM before installing the processor option. Refer to Maintenance Service Guide for download locations and procedure to install the latest ROM.
- Remove and retain for future use, the heat sink blank and processor cover.

WARNING: To reduce the risk of personal injury from hot surfaces and the internal system components to cool before touching them.

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove the access panel and air baffle.

IMPORTANT : If a full length expansion board is installed in either the primary or secondary PCIe riser cage, the affected PCIe riser cage will need to be removed prior to the air baffle.

1. Lift the handle to open the heat sink retaining bracket, and rotate the bracket to the open position.
2. Lift the heat sink straight up and out of the server chassis, being careful not to touch or spread the remaining thermal grease on the bottom.**IMPORTANT:** If the processor may be reused in this or any other system, remove the thermal grease with an alcohol swab. Allow the alcohol to evaporate before you continue.
3. If you are replacing the processor, open the processor locking lever, labeled 'open lever 1st', then begin to open the second processor locking lever.

4. Continue to lift the second processor locking lever to release the spring-loaded processor retaining bracket.

5. Being careful not to touch the processor contacts, grasp the tab of the processor housing and slide the processor out of the processor retaining bracket.**CAUTION: To avoid damage to the processor: Handle the processor only by the front tab of its housing. Do not touch the bottom of the processor, especially the contact area.**

Heat sink and processor replacement

CAUTION: To prevent possible server malfunction and damage to the equipment, multiprocessor configurations must contain processors with the same part number. CAUTION : To prevent possible server overheating, always populate processor socket 2, 3 and 4 with a processor and a heat sink or a processor socket cover and a heat sink blank. CAUTION: THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED. To avoid damage to the system board:

- Never remove the processor from its housing.
- Do not touch the processor socket contacts.
- Do not place the processor directly into its socket use the processor socket retaining bracket.

CAUTION: To avoid damage to the processor: Handle the processor only by the front tab of its housing. Do not touch the bottom of the processor, especially the contact area.

1. Carefully slide the processor into the processor socket retaining bracket until it is full seated. Notice the position of the bracket alignment pins on either side of the processor housing.

2. Close the processor socket retaining bracket.**NOTE:** When the processor is installed properly inside the processor retaining bracket, the processor retaining bracket clears the flange on the front to the socket.**CAUTION:** Do not press down on the processor. Pressing down on the processor may cause damage to the processor socket and the system board. Press only in the area indicated on the processor retaining bracket.

3. Press and hold processor retaining bracket while closing and latching the processor locking lever, labeled 'Close lever 1st'.

4. Close and latch the second processor locking lever.**CAUTION: The heat sink thermal interface media is not reusable and must be replaced if the heat sink is removed from the processor after it has been installed.NOTE:** If you are installing a new heat sink and it comes with a factory-applied layer of thermal interface media, remove the cover from the bottom and skip the application of thermal grease to the processor.If you are reinstalling the old heat sink, use an alcohol wipe to clean off the old thermal grease from the heat sink. Allow the alcohol to evaporate before you continue.

5. Apply thermal grease in a pattern of five big dots.

6. Align and lower the heat sink into position over the guide pins on the processor cage.

7. Close and lock the heat sink retaining bracket.

Flash-Backed Write Cache Module

https://support.hpe.com/hpesc/public/videoDisplay?videoId=vpsg00002193en_us&noframe

Flash-backed write cache module removal

Before you begin: Review and follow Precautions . Backup all data. Follow Preparation procedures to extend the server from the rack. Remove all power cords, first from the source, and then from the server. Remove the access panel. Review and follow Flash-backed Write Cache LEDs and Procedures to avoid data loss.**NOTE:** If an installed PCIe expansion board is blocking access, remove the PCIe riser cage.

1. Disconnect the FBWC (Flash-backed write cache) capacitor pack cable from the connector on the cache module.
2. Open the cache module slot latches.
3. Lift the cache module up and out of the cache module slot.**NOTE:** To recover cached data from a failed server, refer to the maintenance service guide.

Flash-backed write cache module replacement

1. Ensure that the cache module slot latches are open.
2. Locate the alignment notch on the cache module and align it with the key in the cache module slot.
3. Push the cache module down firmly into the slot until the cache module slot latches snap into place.
4. Ensure that the cache module is fully inserted and properly seated in the slot.**CAUTION:** To prevent damage to the cache module during installation, be sure the cache module is fully inserted.
5. Reconnect the FBWC capacitor pack connector to the cache module.

FBWC Capacitor Pack And Holder

https://support.hpe.com/hpesc/public/videoDisplay?videoId=vpsg00002194en_us&noframe

FBWC capacitor pack and holder removal

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove the access panel and air baffle. Review and follow Flash-backed Write Cache LEDs and Procedures to avoid data loss.

IMPORTANT : If a full length expansion board is installed in either the primary or secondary PCIe riser cage, the affected PCIe riser cage will need to be removed prior to the air baffle. NOTE: The FBWC (Flash-backed write cache) capacitor pack can be on the right or the left side of the server chassis, and can connect to a system board cache module or a cache module located on a SAS controller card. Refer to the Maintenance Service Guide for the proper routing of the cable.

1. If necessary, disconnect the FBWC (Flash-backed write cache) capacitor pack cable from the cache module.
2. Press open the four locking tabs that secure the door to the cable channel compartment and pull out the FBWC capacitor pack cable.
3. Unhook the cable from the FBWC capacitor pack holder.
4. Gently push back the plastic locking tabs of the FBWC capacitor pack holder.
5. Lift the FBWC capacitor pack out of its holder.
6. Remove the FBWC capacitor pack and cable.
7. To remove the holder, gently press the holder release tab and slide the holder up and out of the server chassis.

FBWC capacitor pack and holder replacement

To replace the FBWC capacitor pack, reverse the removal procedure.**NOTE** : Refer to the Maintenance Service Guide to choose the appropriate path for the cable.

Front Panel Assembly

https://support.hpe.com/hpesc/public/videoDisplay?videoId=vpsg00002195en_us&noframe

Front panel assembly removal

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove all hot-plug hard drives, all hot-plug fans, access panel, and air baffle.

IMPORTANT : If a full length expansion board is installed in either the primary or secondary PCIe riser cage, the affected PCIe riser cage will need to be removed prior to the air baffle.

IMPORTANT : If any cables in the front panel assembly need replacing, the entire front panel assembly must be replaced.

1. Slide out and remove the serial label pull tab at the left end of the front panel assembly and retain it for the new front panel assembly.
2. Disconnect the USB cables from system board, one on each side.**NOTE** : The mini-SAS next to one of the USB cable connectors may temporarily be removed to gain access to the USB cable connector.
3. Press open the four locking tabs that secure the door to the cable channel compartments on both sides of the server chassis and pull out the USB cables from each of them.
4. Temporarily remove both FBWC capacitor pack holders to access the USB cables underneath.
5. Disconnect all additional cables that cannot be removed from the rear of front panel assembly, noting their location for replacement.**NOTE** : Also note which cables are removed from the side cable clamps for later replacement.
6. Disconnect the all cables from the hard drive backplane, noting their location for later replacement.
7. Remove the eight T-10 Torx screws, four on each side, that secure the front panel assembly to the server chassis.
8. Slide the front panel assembly forward to release the bottom from the guide tabs in the server chassis.
9. Lift the front panel assembly up and out of the server chassis.

Front panel assembly replacement

To replace the front panel assembly, reverse the removal procedure.

System Board

https://support.hpe.com/hpesc/public/videoDisplay?videoId=vpsg00002196en_us&noframe

System board removal

Before you begin: Review and follow Precautions . Follow Preparation procedures to power down, extend or remove the server from the rack. Remove all power cords, first from the source, and then from the server. Remove all remaining external cables. Remove all power supplies, access panel, PCIe riser cages,

FlexibleLOM option, air baffle, FBWC capacitor packs and holders with the FBWC cache module, power supply backplane, DIMMs, heat sinks, and processors.

CAUTION: Keep the processor socket covers from the replacement system board and put them into the system board being returned to keep inadvertent socket pin damage from occurring.

1. Disconnect all cables from the system board, making note of where each cable connected.
2. Remove the cables from the cable clamps on at the rear ends of the front panel assembly.
3. Disconnect the power cables from the hard drive backplane to make it easier to remove the system board.
4. Remove the cable compartment above the mini-SAS cables:
    - Lift the cable compartment release latch.
    - Slide the cable compartment back and off the guide tabs that secure it to the side of the server chassis.
5. Lift the mini-SAS cables out of the routing channel along the system board.
6. Loosen the two thumbscrews that secure the system board to the chassis.
7. While holding the system board by the system board handles, slide the system board toward the front of the server until it stops.
8. Carefully lift the system board out of the chassis.

System board replacement

To replace the system board, reverse the removal procedure.**CAUTION:** Take care not to pinch any cables during replacement.

NOTE : Be sure to attach port 1 mini-SAS cable to port 1 connector the system board, and port 2 mini-SAS cable to port 2 on the system board. The ports are printed on the system board and on the hard drive backplane.

IMPORTANT: After replacing all of the components removed during the process, power up the server and run the procedure to re-enter the server serial number and product ID. Refer the Maintenance Service Guide for this procedure.