HPE BladeSystem c7000 Enclosures - 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



Server blades



Device bay blank



Device bay shelf



Enclosure front bezels



Power supply



HPE Bladesystem Insight Display



Location discovery services board



Insight Display interconnect



Back view



Interconnect bay divider



Midplane assembly



Insight Display pass thru



Onboard Administrator



Onboard Administrator tray



Rear cage



AC control module



AC input module



Active Cool 200 Fan



Interconnect blank



Interconnect switch



Precautions

Before performing service procedures, review all the safety information.

Preventing electrostatic discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Warning and caution messages

WARNING! To reduce the risk of personal injury or damage to equipment, heed all warnings and cautions throughout the installation instructions.

WARNING! To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizing feet are attached to the rack if it is a single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack may become unstable if more than one component is extended for any reason.

WARNING! To reduce the risk of personal injury or equipment damage when unloading a rack:

- At least two people are needed to safely unload the rack from the pallet. An empty 42U rack can weigh as much as 115 kg (253 lb), can stand more than 2.1 m (7 ft) tall, and might become unstable when being moved on its casters.
- Never stand in front of the rack when it is rolling down the ramp from the pallet. Always handle the rack from both sides.

WARNING! The enclosure is very heavy. To reduce the risk of personal injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual material handling.
- Remove all installed enclosure components from their enclosures before installing or moving the enclosures.
- Use caution and get help to lift and stabilize enclosures during installation or removal, especially when the enclosure is not fastened to the rack.

WARNING! To reduce the risk of personal injury or damage to the equipment in a rack-free environment:

- Never stack the enclosure on top of another enclosure.
- Never place equipment on top of the enclosure.
- Never place the enclosure on a surface that cannot support up to 217.7 kg (480.0 lb).

WARNING! To reduce the risk of personal injury or damage to the equipment, you must adequately support enclosures during installation and removal.

WARNING! Always use at least two people to lift an enclosure into the rack. If the enclosure is being loaded into the rack above chest level, a third person must assist with aligning the enclosure with the rails while the other two people support the weight of the enclosure.

WARNING! Before installing an enclosure in the rack, be sure that all hot-plug power supplies, server blades, and interconnects are removed from the enclosure. Blanks can be left in the enclosure.

WARNING! Be sure to install enclosures starting from the bottom of the rack and work your way up the rack.

WARNING! To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.

- Each enclosure has two or more power supply cords. A single rack or cabinet may contain more than one enclosure. Power may be supplied in a redundant fashion. Removing any single source of power does not necessarily remove power from any portion of the system. When performing any service other than hot-plug module replacement, you must completely disconnect all power to that portion of the system.
- When performing service procedures on enclosures, shut off the circuit breakers to both A and B AC power feeds and then disconnect all power cords from the outlets before servicing.

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

WARNING! To reduce the risk of electric shock or damage to the equipment, enter enclosures or perform service on system components only as instructed in the user documentation.

WARNING! A risk of electric shock from high leakage current exists. Before connecting the AC supply to the power enclosures, be sure that the electrical outlets are properly grounded (earthed).

CAUTION! Always be sure that equipment is properly grounded and that you follow proper grounding procedures before beginning any installation procedure. Improper grounding can result in ESD damage to electronic components.

CAUTION! When performing non-hot-plug operations, you must power down the server blade and/or the system. Use caution when performing other operations, such as hot-plug installations or troubleshooting.

CAUTION! Protect the equipment from AC power fluctuations and temporary interruptions with a regulating facility UPS device. This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

Tools And Materials

Tools used in removal and replacement

- Torx T-10 screwdriver
- Torx T-15 screwdriver

Preparing The Enclosure

Preparing the enclosure

To service any internal enclosure component, complete the following actions:

- If installed, unlock the security panel.

Powering down the server blades or workstation blades

Before powering down the server blades or workstation blades for any upgrade or maintenance procedures, perform a backup of critical server data and programs. Depending on the Onboard Administrator configuration, use one of the following methods to power down the server blades or workstation blades:

- Use a virtual power button selection through iLO.This method initiates a controlled remote shutdown of applications and the OS before the server blades or workstation blades enters standby mode.
- Press and release the Power On/Standby button.This method initiates a controlled shutdown of applications and the OS before the server blades or workstation blades enters standby mode.
- Press and hold the Power On/Standby button for more than 4 seconds to force the server blades or workstation blades to enter standby mode.This method forces the server blades or workstation blades to enter standby mode without properly exiting applications and the OS. It provides an emergency shutdown method if an application stops responding.
- Execute one of the following commands using the Onboard Administrator CLI:
  ```
  poweroff server [bay number]
  ```
  or
  ```
  poweroff server [bay number] force
  ```
  The first command initiates a controlled shutdown of applications and the OS before the server blades or workstation blades enters standby mode. The second form of the command forces the server blades or workstation blades to enter standby mode without exiting applications and the OS. This emergency method forces a shutdown if an application stops responding.
- Use the Onboard Administrator GUI to initiate a shutdown:
  1. Select the Enclosure Information tab, and then select the Overall checkbox in the Device Bays item.
  2. Initiate a shutdown from the Virtual Power menu:
     - Select Momentary Press to initiate a controlled shutdown of applications and the OS.
     - Select Press and Hold to initiate an emergency shutdown of applications and the OS.

IMPORTANT! When the server blades or workstation blades is in standby mode, auxiliary power is still being provided. To remove all power from the server blades or workstation blades, remove the server blades or workstation blades from the enclosure.

After initiating a virtual power down command, be sure that the server blades or workstation blades is in standby mode by observing that the system power LED is amber.

Power down the storage blade

In systems that use storage blade as external data storage, be sure that the partner server blades or workstation blades are the first to be powered down and the last to be powered back up. Taking this precaution enables the system to initialize the storage blade when they are powered up and to shut down the storage blade and the OS in an orderly manner when they are powered down.

IMPORTANT! If installing a hot-plug device, it is not necessary to power down the storage blade.

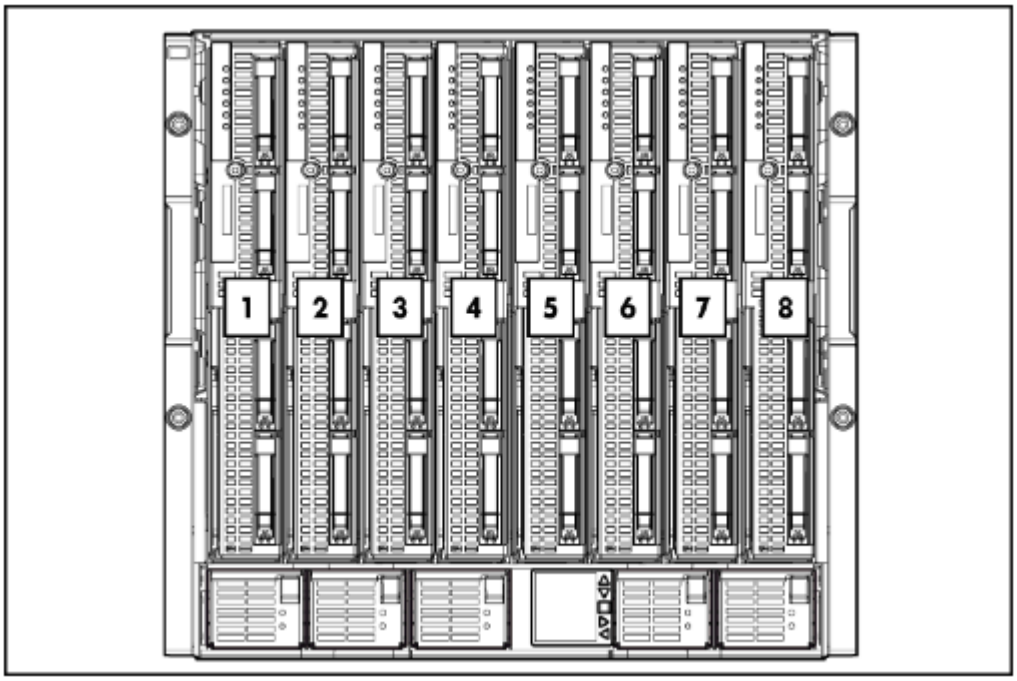
To power down the storage blade, power down the partner server blades or workstation blades. The storage blade automatically switch to standby mode. The storage blade remains in standby mode as long as power is available to the enclosure.

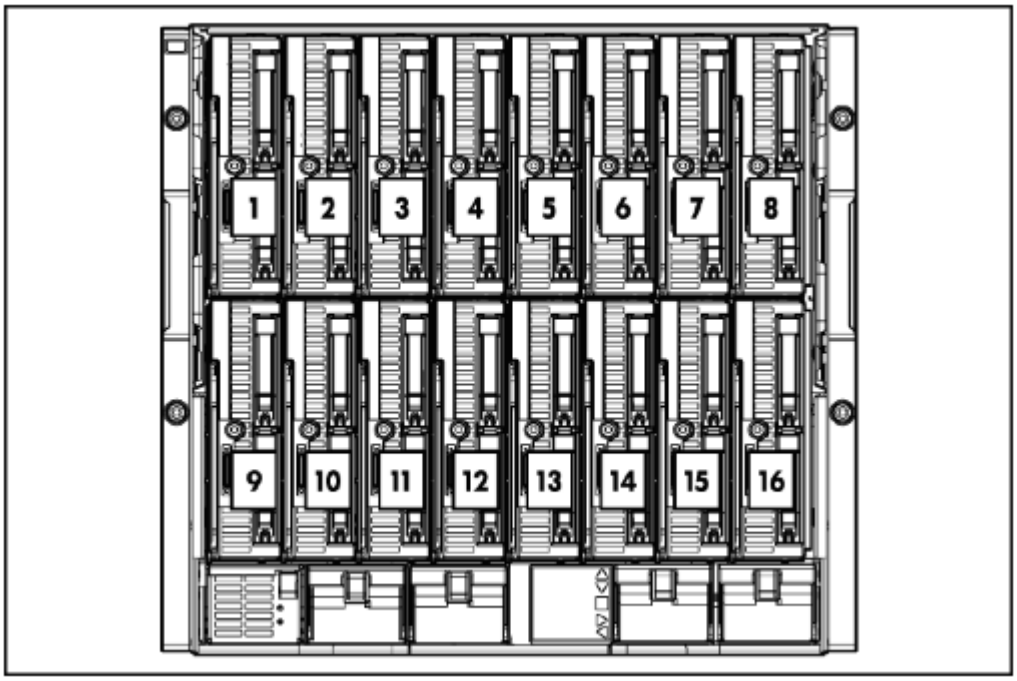
Power down the enclosure

1. Power down all of the server and/or workstation blades.
2. Power down all storage blades.
3. Disconnect all of the power cables.

Device Bay Numbering

Full-height and half-height device bay numbering





Midplane Assembly Procedures

Midplane assembly procedures

Before replacing the midplane assembly, locate and record the enclosure serial number and part number using one of the following methods:

- Locate the enclosure tag on the front, side, or rear of the enclosure.
- Access the Onboard Administrator
- Log in to the CLI and run the command `Show Enclosure Info`. For additional information on accessing the CLI, see the**HP BladeSystem Onboard Administrator Command Line Interface User Guide** on the HP website (http://www.hp.com/go/bladesystem/documentation).

CAUTION! The firmware included in Onboard Administrator version 3.20 and later automatically restores the enclosure identity, including the serial number, PID, and PDU type, if a midplane assembly replacement is detected. This firmware feature requires that the original Onboard Administrator modules and all original fans be reinstalled along with all power supplies before installing any other blade or interconnect module. All power supply modules can be replaced while the enclosure is powered off without affecting the ability of the Onboard Administrator to automatically restore enclosure identity. VC, Virtual Connect Enterprise Manager, and Insight Control use the enclosure serial number as a critical key. If you replace the midplane assembly without ensuring that the serial number is restored prior to installing the VC modules and server blades, then the VC domain is deleted and all server network and SAN connections are disabled.

After replacing the midplane assembly, complete the following procedure:

CAUTION! Failure to complete the following procedure might cause inaccurate or incomplete information to appear in HP SIM and Onboard Administrator.

1. Using the Insight Display, navigate to the Enclosure Info screen.
2. Verify that the enclosure serial number matches the enclosure serial number on the label on the enclosure mounting bracket.
   - If the enclosure serial number matches the label, continue to step 7.
   - If the enclosure serial number does not appear or does not match the label, continue to step 3 to manually update the enclosure identity using the Onboard Administrator CLI.
3. Use the Onboard Administrator service port address found on the Enclosure Info screen to log in to the Onboard Administrator CLI with the Administrator local account password by using one of the following options:
   - A serial cable attached to the Onboard Administrator serial port
   - An Ethernet CAT5 cable attached to the enclosure service port that is the enclosure link uplink port
4. Enter the `SET ENCLOSURE PART_NUMBER X`

command, where**X** represents the 10-digit enclosure PID number found on the enclosure front label.

5. Enter the
   `SET ENCLOSURE SERIAL_NUMBER Y`
   command, where**Y** represents the 10-digit serial number found on the enclosure front label.

6. Enter the
   `SET ENCLOSURE PDU_TYPE Z`
   command, where**Z** represents the number of the appropriate power configuration:

   - 1:Single phase power, U.S.
   - 2:Three-phase power, U.S.
   - 3:Three-phase power, International
   - 4:DC power
   - 5:Single Phase Intelligent PDU

7. Install all VC Ethernet modules, VC-FC modules, and all other interconnect modules in the same bay they were removed from.
8. Reconnect all cables to those modules to the same ports they were removed from.
9. Wait two minutes.
10. Install all the server blades into the same bays they were removed from.

Power Supply

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Power supply removal

Before you begin : Review and follow Precautions .

CAUTION! This procedure provides instructions for replacement of a failed part only. To change the configuration of components, see the appropriate HP BladeSystem c-Class enclosure setup and installation guide.

CAUTION! Do not mix HP 2250W, HP 2400W High Efficiency, HP BL7000 2400W Platinum, or -48vDC power supplies in one enclosure. Install only one type of power supply in a single enclosure.

NOTE: To access the two center power supply bays, slide the HP BladeSystem Insight Display to the right or left.

1. Press the release button to release the handle.
2. Grasp the handle, and while supporting the power supply with your other hand, slide the power supply out of the power supply bay in the front of the enclosure.**CAUTION! For best cooling practices, do not operate the enclosure for extended periods with more than one component or blank removed. When removing an active component, replace it with a blank.**

Power supply replacement

1. Align the power supply locking mechanism with the metal locking tab in the lower right corner of the power supply bay.
2. While supporting the power supply with both hands, slide it partially into the power supply bay.
3. With the handle in the open, released position, slide the power supply in until the handle begins to engage.
4. Close and lock the power supply handle to fully engage and seat the power supply in the enclosure.

Device Bay Blank

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Device bay blank removal

Before you begin : Review and follow Precautions .

CAUTION! For best cooling practices, do not operate the enclosure for extended periods with more than one component or blank removed. When removing an active component, replace it with a blank.

1. Squeeze and hold the release tab on the device bay blank handle.
2. Slide the device bay blank out of the device bay in the enclosure.

Device bay blank replacement

1. Align the device bay blank locking mechanism with the metal locking tab in the lower left corner of the device bay.
2. Slide the device bay blank into the empty device bay until it locks into place.

Device Bay Shelf

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Device bay shelf removal

NOTE: The c7000 enclosure is divided into four quadrants by the vertical support metal work. Within each quadrant, a removable shelf supports half-height blades. To install a full-height blade in any quadrant, this shelf must be removed. Therefore, a quadrant can only contain either two full-height blades or four half-height blades.

Before you begin : Review and follow Precautions . If a server blade needs to be removed, review Device bay numbering to identify the proper half-height or full-height blade to be replaced. Back up all data from the appropriate blade. Review and follow procedures in Preparing the enclosure to power down the server blade. Remove surrounding server blades and server blade blanks.

CAUTION! Failure to install the divider in a quadrant when installing half-height blades can result in damage to the connectors on the server blades.

1. Slide the device bay shelf locking tab to the left to the unlocked position.
2. Push the shelf back until it stops.
3. Lift the left side of the shelf to disengage it from the left divider wall.
4. Rotate the shelf clockwise to disengage its tabs from the right divider wall.
5. Carefully, pull the device bay shelf out of the enclosure.

Device bay shelf replacement

1. Ensure that the device bay shelf locking tab is in the unlocked position.
2. Insert the shelf at a 45 degree angle and align the left tabs with the large open slots in the left divider wall.
3. Rotate the shelf counter-clockwise to engage the tabs on the left and the tabs on the right divider walls.
4. Pull the shelf forward to partially lock the shelf into place.
5. Push the device bay shelf locking tab to the locked position to fully secure the shelf into place.

Server Blade

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Server blade removal

CAUTION! This procedure provides instructions for replacement of a failed part only. To change the configuration of components, see the appropriate HP BladeSystem c-Class enclosure setup and installation guide.

NOTE: The c7000 enclosure is divided into four quadrants by the vertical support metal work. Within each quadrant, a removable shelf supports half-height blades. To install a full-height blade in any quadrant, this shelf must be removed. Therefore, a quadrant can only contain either two full-height blades or four half-height blades. The removal and replacements procedures for server blades are the same.

Before you begin: Review and follow Precautions . Review Device bay numbering to identify the proper half-height or full-height blade to be replaced. Back up all data from the appropriate blade. Review and follow procedures in Preparing the enclosure to power down the server blade.

CAUTION! Failure to install the divider in a quadrant when installing half-height blades can result in damage to the connectors on the server blades.

1. Press the release tab to release the blade handle.
2. Grasp the blade handle, and while supporting the server blade with your other hand, slide the server blade out of the device bay in the enclosure.

CAUTION! For best cooling practices, do not operate the enclosure for extended periods with more than one component or blank removed. When removing an active component, replace it with a blank.

Server blade replacement

1. Align the server blade locking mechanism with the metal locking tab in the lower left corner of the device bay.
2. While supporting the server blade with both hands, slide the server blade partially into the device bay.
3. With the blade handle in the open, released position, slide the server blade as far as you can into the device bay and the handle begins to engage.
4. Close and lock the server blade handle to fully engage and seat the server blade in the enclosure.

Enclosure Front Bezels

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Enclosure front bezels removal

NOTE: The enclosure has three front bezels, an upper and lower bezel on the left side, and one upper bezel on the right. Both upper bezels are removed and replaced in the same way.

1. Slide the upper bezels up and then forward to remove.
   NOTE : Removing the upper bezels gains access to the enclosure pull handles at the front of the enclosure.

   NOTE : Removing the upper left bezel is necessary to gain access to remove the lower left bezel.

2. Press down on the release tab of the lower bezel and tilt it forward, and then up and out to remove it from the enclosure.

Enclosure front bezels replacement

1. Insert the bottom tab into the slot at the front of the enclosure and then tilt the lower left bezel back until it snaps into place.
   NOTE: The lower left bezel needs to be replaced before replacing the upper left bezel.

   NOTE: The pull handles need to be tucked behind the metal flanges before replacing the upper front bezels.

2. Press the upper front bezels onto the appropriate ears with just enough space at the top for the top tabs to clear the top of the ears.

3. Slide the upper front bezels down to lock them into place.

Active Cool 200 Fan

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Active Cool 200 Fan removal

CAUTION! This procedure provides instructions for replacement of a failed part only. To change the configuration of components, see the appropriate HP BladeSystem c-Class enclosure setup and installation guide.

Before you begin : Review and follow Precautions .

1. Twist the handle towards the unlocked position and slide the fan out of the fan bay in the enclosure.
   CAUTION! For best cooling practices, do not operate the enclosure for extended periods with more than one component or blank removed. When removing an active component, replace it with a blank.

Active Cool 200 Fan replacement

NOTE: When installing a fan in the top row of fan bays, orient the fan so that the LED is in the lower right corner. When installing a fan in the bottom row of fan bays, orient the fan so the LED is in the upper left corner.

1. Orient the fan LED appropriately and slide the fan into the fan bay until it locks into place.

Interconnect Blank

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Interconnect blank removal

1. Squeeze the release tab.
2. Slide the Interconnect blank out of the interconnect bay in the enclosure.**CAUTION! For best cooling practices, do not operate the enclosure for extended periods with more than one component or blank removed. When removing an active component, replace it with a blank.**

Interconnect blank replacement

1. Align the Interconnect blank locking mechanism with the metal locking tab in the upper left corner of the empty interconnect bay.
2. Slide the Interconnect blank into the empty interconnect bay until it locks into place.

Interconnect Switch

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Interconnect switch removal

CAUTION! This procedure provides instructions for replacement of a failed part only. To change the configuration of components, see the appropriate HP BladeSystem c-Class enclosure setup and installation guide.

CAUTION! To prevent data loss, redirect network activity or be sure that all critical network activity has stopped before removing the interconnect module.

IMPORTANT! An SFP port must be occupied by an SFP transceiver or an SFP dust cover at all times.

Before you begin: Review and follow Precautions .

1. Disconnect all cables from the component.
2. Press the release tab and open the handle.
3. Grasp the handle, and while supporting the assembly with your other hand, slide the Interconnect switch out of the interconnect bay in the enclosure.**CAUTION! For best cooling practices, do not operate the enclosure for extended periods with more than one component or blank removed. When removing an active component, replace it with a blank.**

Interconnect switch replacement

1. Partially slide the interconnect switch into an empty interconnect bay in the enclosure.
2. If necessary, press the release tab and open the handle.
3. Slide the Interconnect switch into the interconnect bay until the handle becomes engaged.
4. Close the handle to fully seat the Interconnect bay into the enclosure.

Interconnect Bay Divider

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Interconnect bay divider removal

Before you begin: Review and follow Precautions . Remove Interconnect switches and/or interconnect blanks from both sides of the Interconnect bay divider.

1. Press and hold the bay divider release tab to the left and pull the Interconnect bay divider out of the Interconnect bay.

Interconnect bay divider replacement

1. Press and hold the bay divider release tab to the left and align the Interconnect bay divider in the guide track along the top of the shelf.

2. Push the Interconnect bay divider in until it locks into place.**NOTE:** Confirm that the top and bottom tabs are in place.

Onboard Administrator

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Onboard Administrator removal

Before you begin: Review and follow Precautions .

1. Disconnect all cables from the Onboard Administrator.
2. Press the release tab and open the handle.
3. Grasp the handle, and while supporting the assembly with your other hand, slide the Onboard Administrator out of the Onboard Administrator tray.**CAUTION! For best cooling practices, do not operate the enclosure for extended periods with more than one component or blank removed. When removing an active component, replace it with a blank.**

Onboard Administrator replacement

To replace the Onboard Administrator, reverse the removal procedure.

Onboard Administrator Tray

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Onboard Administrator tray removal

Before you begin: Review and follow Precautions . Remove all Onboard Administrators and Onboard Administrator blanks.

1. Press the release tab and open the handle.
2. Grasp the handle, and while supporting the assembly with your other hand, slide the Onboard Administrator tray out of the enclosure.**CAUTION! For best cooling practices, do not operate the**

enclosure for extended periods with more than one component or blank removed. When removing an active component, replace it with a blank.

Onboard Administrator tray replacement

To replace the Onboard Administrator tray, reverse the removal procedure.

AC Input Module

https://support.hpe.com/hpesc/public/videoDisplay?videoId=vpsg00000296en_us&noframe

AC input module removal

Before you begin: Review and follow Precautions . Review and follow procedures in Preparing the enclosure to power down the server, workstation, and storage blades. Disconnect all power cords from the rear of the enclosure. Remove or extend approximately 3 inches all of the power supplies.

1. Loosen the two slotted T-15 Torx thumbscrews that secure the AC input module to the bottom rear of the enclosure.
2. Grasp the AC input module by the two thumbscrews and slide it out of the enclosure to remove.

AC input module replacement

To replace the AC input module, reverse the removal procedure.

AC Control Module

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AC control module removal

Before you begin: Review and follow Precautions . Review and follow procedures in Preparing the enclosure to power down the server, workstation, and storage blades. Disconnect all power cords from the rear of the enclosure.

1. Disconnect any USB cables from the AC control module.

2. Loosen the two slotted T-15 Torx screws that secure the AC control module to the center of the AC input module.
3. Grasp the AC control module by the two thumbscrews and slide it out of the AC input module to remove.

AC control module replacement

To replace the AC control module, reverse the removal procedure.

Rear Cage

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Rear cage removal

Before you begin: Review and follow Precautions . Review and follow procedures in Preparing the enclosure to power down the server, workstation, and storage blades. Disconnect all power cords from the rear of the enclosure. Disconnect all cables to all components in the enclosure. Remove or extend approximately 3 inches, all half-height and full-height server blades and storage blades. Remove all fans, fan blanks, interconnect switches, Interconnect blanks, Onboard Administrators, Onboard Administrator blanks, and the Onboard Administrator tray.

WARNING! To reduce the risk of personal injury or equipment damage, at least two people are needed to safely move the enclosure or the rear cage.

1. Loosen the four thumbscrews on the rear cage assembly and open the hinges completely.
2. Use the handles on the sides of the rear cage to extend the rear cage until it hits the safety stops.
3. Grasp the handholds on the sides of the rear cage. The release levers are located above the handholds.
4. Disengage the release levers on both sides of the rear cage.
   WARNING! When removing and lifting the rear cage, always use the handholds on the sides of the rear cage. The front end of the rear cage is heavy and the handholds provide a more balanced location to distribute the weight of the cage during lifting.

   CAUTION! When removing the rear cage, the connectors on the midplane assembly are susceptible to damage. Use caution to avoid damage to the pins and connectors.
5. Use the handholds to extend and remove the rear cage from the enclosure.

Rear cage replacement

To replace the rear cage, reverse the removal procedure.