



Service Guide for DM120S, DM240S, and DM600S



Machine Types: 7Y58, 7Y59, 7Y43, 7D7Y, 7D7X, 7D7Z

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Chapter 1. Hot-swapping a disk drive in a DM240S or DM120S disk shelf

You can hot-swap a failed disk drive in a DM240S or DM120S disk shelf—nondisruptively replace a disk drive in a system that is powered on and serving data (I/O is in progress). When a disk drive fails, the system logs a warning message to the system console indicating which disk drive has failed. In addition, the attention (amber) LED on the operator display panel and the attention (amber) LED on the failed disk drive illuminate.

Before you begin

- The disk drive that you are installing must be supported by the DM240S or DM120S disk shelf.

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- All other components in the system must be functioning properly; if not, contact technical support.
- The disk drive you are removing must be failed. You can verify the disk drive is failed by running the `storage disk show -broken` command. The failed disk drive appears in the list of failed disk drives. If it does not, you should wait, and run the command again.

Note: It can take up to several hours for the disk drive to appear in the list of failed disk drives.

- If you are replacing a self-encrypting disk (SED), you must follow the instructions for replacing an SED in the *Disks and Aggregates Power Guide*. The instructions describe additional steps you must perform before and after replacing an SED.

[ONTAP 9 Disks and Aggregates Power Guide](#)

About this task

- You should take steps to avoid electrostatic discharge (ESD):
 - Keep the disk drive in the ESD bag until you are ready to install it.
 - Open the ESD bag by hand or cut the top off with a pair of scissors.

Attention: Do not insert a metal tool or knife into the ESD bag.

- Always wear an ESD wrist strap grounded to an unpainted surface on your storage enclosure chassis. If a wrist strap is unavailable, touch an unpainted surface on your storage enclosure chassis before handling the disk drive.
 - You should take steps to handle disk drives carefully:
 - Always use two hands when removing, installing, or carrying a disk drive to support its weight.
- Attention:** Do not place hands on the disk drive boards exposed on the underside of the disk drive carrier.
- You should place disk drives on cushioned surfaces, and never stack disk drives on top of each other.
 - You should be careful not to bump disk drives against other surfaces.
- Disk drives should be kept away from magnetic devices.

Attention: Magnetic fields can destroy all data on the disk drive and cause irreparable damage to the disk drive circuitry.

- Best practice is to have the current version of the Disk Qualification Package (DQP) installed before hot-swapping a disk drive. Having the current version of the DQP installed allows your system to recognize and utilize newly qualified disk drives; therefore, avoiding system event messages about having non-

current disk drive information. You also avoid the possible prevention of disk partitioning because disk drives are not recognized. The DQP also notifies you of non-current disk drive firmware.

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- Best practice is to have the current versions of disk shelf (IOM) firmware and disk drive firmware on your system before adding new disk shelves, shelf FRU components, or SAS cables. Current versions of firmware can be found on the Lenovo Support Web site.

[Lenovo Data Center Support](#)

- Disk drive firmware is automatically updated (nondisruptively) on new disk drives with non current firmware versions.

Note: Disk drive firmware checks occur every two minutes.

- If needed, you can turn on the disk shelf's location (blue) LEDs to aid in physically locating the affected disk shelf:

```
storage shelf location-led modify -node node_name -shelf -name shelf_name -led-status on
```

A disk shelf has three location (blue) LEDs: one on the operator display panel and one on each IOM12 module. Location LEDs remain illuminated for 30 minutes. You can turn them off by entering the same command, but using the *off* option.

- If needed, you can refer to the Monitoring disk shelf LEDs section for information about the meaning and location of disk shelf LEDs on the operator display panel and FRU components.

The video for this task is available at:

- Youtube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-BI5q5uqIV0US3rLkIB5GOP>
- Youku: https://list.youku.com/albumlist/show/id_51948223

- Step 1. If you want to manually assign disk ownership for the replacement disk drive, you need to disable disk ownership automatic assignment if it is enabled; otherwise, go to the next step.

Note: You need to manually assign disk ownership if disk drives in the stack are owned by both controllers in an HA pair.

Note: You manually assign disk ownership and then reenables disk ownership automatic assignment later in this procedure.

- a. Verify if disk ownership automatic assignment is enabled: `storage disk option show`

If you have an HA pair, you can enter the command at the console of either controller.

If disk ownership automatic assignment is enabled, the output shows “on” (for each controller) in the “Auto Assign” column.

- b. If disk ownership automatic assignment is enabled, you need to disable it:
`storage disk option modify -node node_name -autoassign off`

You need to disable disk ownership automatic assignment on both controllers in an HA pair.

- Step 2. Properly ground yourself.

- Step 3. Unpack the new disk drive, and set it on a level surface near the disk shelf. Save all packaging materials for use when returning the failed disk drive.

Note: Lenovo requires that all returned disk drives be in a ESD-rated bag.

- Step 4. Physically identify the failed disk drive from the system console warning message and the illuminated attention (amber) LED on the disk drive.

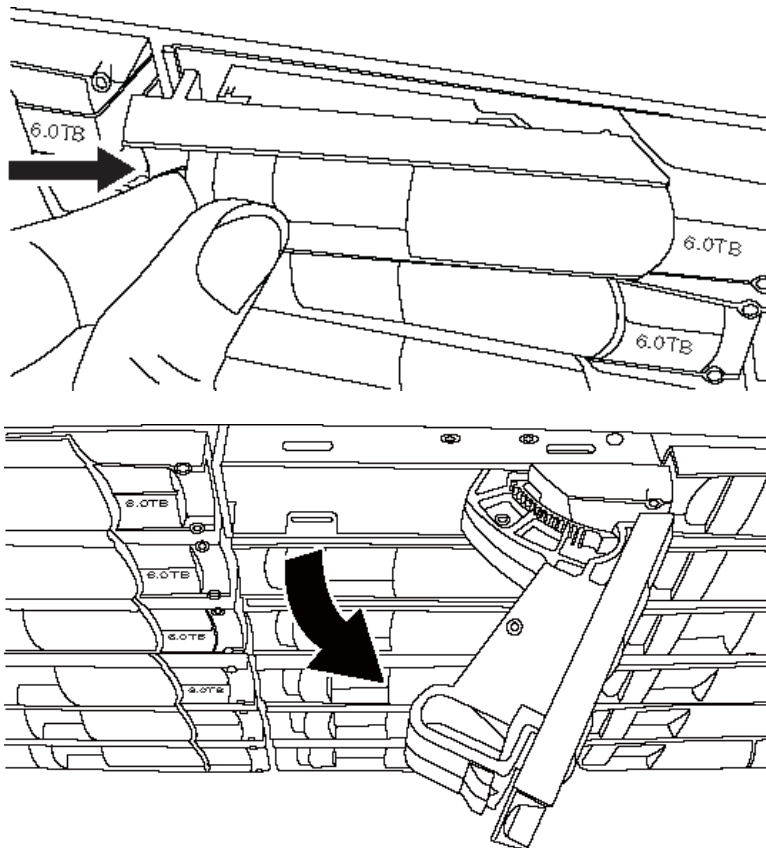
Note: The activity (green) LED on a failed disk drive can be illuminated (solid), which indicates the disk drive has power, but should not be blinking, which indicates I/O activity. A failed disk drive has no I/O activity.

- Step 5. Press the release button on the disk drive face, and then pull the cam handle to its fully open position to release the disk drive from the mid plane.

When you press the release button, the cam handle on the disk drive springs open partially.

Note: Disk drives in a DM120S disk shelf are arranged horizontally with the release button located on the left of the disk drive face. Disk drives in a DM240S disk shelf are arranged vertically with the release button located at the top of the disk drive face.

The following illustrations show disk drives in a DM120S disk shelf:



- Step 6. Slide out the disk drive slightly to allow the disk to safely spin down, and then remove the disk drive from the disk shelf. A disk can take up to one minute to safely spin down.

Note: When handling a disk drive, always use two hands to support its weight.

- Step 7. Using two hands, with the cam handle in the open position, insert the replacement disk drive into the disk shelf, firmly pushing until the disk drive stops.

Note: Wait a minimum of 10 seconds before inserting a new disk drive. This allows the system to recognize that a disk drive was removed.

Note: Do not place hands on the disk drive boards that are exposed on the underside of the disk carrier.

- Step 8. Close the cam handle so that the disk drive is fully seated into the mid plane and the handle clicks into place. Be sure to close the cam handle slowly so that it aligns correctly with the face of the disk drive.
- Step 9. If you are replacing another disk drive, repeat Steps 3 through 8.
- Step 10. Verify the disk drive's activity (green) LED is illuminated. When the disk drive's activity LED is solid green, it means the disk drive has power. When the disk drive's activity LED is blinking, it means the disk drive has power and I/O is in progress.
- Step 11. If you disabled disk ownership automatic assignment in Step 1, manually assign disk ownership, and then reenable disk ownership automatic assignment if needed:
- Display all unowned disks: `storage disk show -container-type unassigned`
 - Assign each disk: `storage disk assign -disk disk_name -owner owner_name`
- You can use the wildcard character to assign more than one disk at once.
- Reenable disk ownership automatic assignment if needed:
`storage disk option modify -node node_name -autoassign on`
- You need to reenable disk ownership automatic assignment on both controllers in an HA pair.
- Step 12. If you are instructed to return the failed part, follow all packaging instructions and use any packaging materials that are provided.

Chapter 2. Hot-swapping a disk drive in a DM600S disk shelf

You can hot-swap a failed disk drive in a DM600S disk shelf—nondisruptively replace a disk drive in a system that is powered on and serving data (I/O is in progress). When a disk drive fails, the system logs a warning message to the system console indicating which disk drive has failed. In addition, the attention (amber) LED on the operator display panel, the attention LED on the drawer containing the failed disk, and the attention LED on the failed disk drive (visible when the drawer is open) illuminate.

Before you begin

- The replacement disk drive must be supported by the DM600S disk shelf.

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- All other components in the system must be functioning properly; if not, contact technical support.
- The disk drive you are removing must be failed. You can verify the disk drive is failed by running the `storage disk show -broken` command. The failed disk drive appears in the list of failed disk drives. If it does not, you should wait, and run the command again.

Note: It can take up to several hours for the disk drive to appear in the list of failed disk drives.

- If you are replacing a self-encrypting disk (SED), you must follow the instructions for replacing an SED in the *Disks and Aggregates Power Guide*. The instructions describe additional steps you must perform before and after replacing an SED.

[ONTAP 9 Disks and Aggregates Power Guide](#)

About this task

- You should take steps to avoid electrostatic discharge (ESD):
 - Keep the disk drive in the ESD bag until you are ready to install it.
 - Open the ESD bag by hand or cut the top off with a pair of scissors.

Attention: Do not insert a metal tool or knife into the ESD bag.

- Always wear an ESD wrist strap grounded to an unpainted surface on your storage enclosure chassis. If a wrist strap is unavailable, touch an unpainted surface on your storage enclosure chassis before handling the disk drive.
- You should take steps to handle disk drives carefully:
 - Always use two hands when removing, installing, or carrying a disk drive to support its weight.
- You should place disk drives on cushioned surfaces, and never stack disk drives on top of each other.
- You should be careful not to bump disk drives against other surfaces.
- Disk drives should be kept away from magnetic devices.

Attention: Magnetic fields can destroy all data on the disk drive and cause irreparable damage to the disk drive circuitry.

- Best practice is to have the current version of the Disk Qualification Package (DQP) installed before hot-swapping a disk drive. Having the current version of the DQP installed allows your system to recognize and utilize newly qualified disk drives; therefore, avoiding system event messages about having non-current disk drive information. You also avoid the possible prevention of disk partitioning because disk drives are not recognized. The DQP also notifies you of non-current disk drive firmware.

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- Best practice is to have the current versions of disk shelf (IOM) firmware and disk drive firmware on your system before adding new disk shelves, shelf FRU components, or SAS cables. Current versions of firmware can be found on the Lenovo Support Web site.

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- Disk drive firmware is automatically updated (nondisruptively) on new disk drives with non current firmware versions.

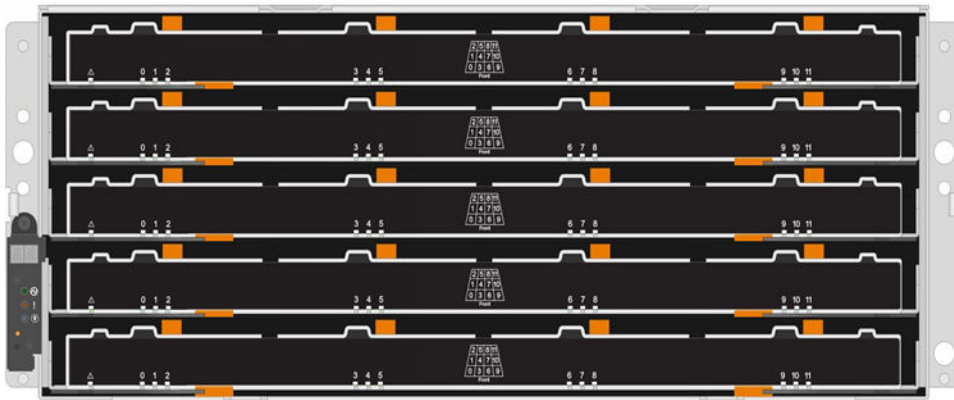
Note: Disk drive firmware checks occur every two minutes.

- If needed, you can turn on the disk shelf's location (blue) LEDs to aid in physically locating the affected disk shelf:

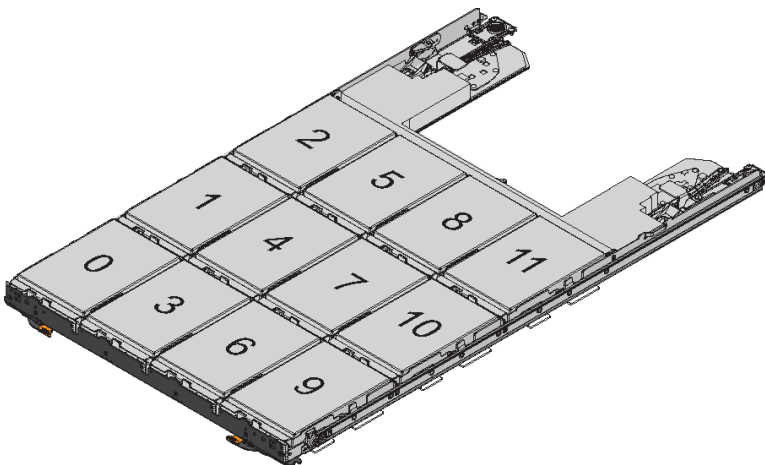
```
storage shelf location-led modify -node node_name -shelf -name shelf_name -led-status on
```

A disk shelf has three location (blue) LEDs: one on the operator display panel and one on each IOM12 module. Location LEDs remain illuminated for 30 minutes. You can turn them off by entering the same command, but using the *off* option.

- If needed, you can refer to the Monitoring disk shelf LEDs section for information about the meaning and location of disk shelf LEDs on the operator display panel and FRU components.
- The DM600S drive shelf consist of five drive drawers (drive drawer 1 at the top through drive drawer 5 at the bottom) that each contain 12 drive slots.



- The following illustration shows how the drives are numbered from 0 to 11 in each drive drawer within the shelf.



The video for this task is available at:

- Youtube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-BDPWjJVZFuHRfNWPEOhFWJ>
- Youku: https://list.youku.com/albumlist/show/id_51950116

Step 1. If you want to manually assign disk ownership for the replacement disk drive, you need to disable disk ownership automatic assignment if it is enabled; otherwise, go to the next step.

Note: You need to manually assign disk ownership if disk drives in the stack are owned by both controllers in an HA pair.

Note: You manually assign disk ownership and then reenables disk ownership automatic assignment later in this procedure.

- Verify if disk ownership automatic assignment is enabled: `storage disk option show`

If you have an HA pair, you can enter the command at the console of either controller.

If disk ownership automatic assignment is enabled, the output shows “on” (for each controller) in the “Auto Assign” column.

- If disk ownership automatic assignment is enabled, you need to disable it:
`storage disk option modify -node node_name -autoassign off`

You need to disable disk ownership automatic assignment on both controllers in an HA pair.

Step 2. Properly ground yourself.

Step 3. Unpack the new disk drive, and set it on a level surface near the disk shelf. Save all packaging materials for use when returning the failed disk drive.

Note: Lenovo requires that all returned disk drives be in a ESD-rated bag.

Step 4. Identify the failed disk drive from the system console warning message and the illuminated amber attention LED on the drive drawer.

The 2.5-inch and 3.5-inch SAS drive carriers do not contain LEDs. Instead, you must look at the Attention LEDs on the drive drawers to determine which drive has failed.

The drive drawer's Attention LED (amber) blinks so you can open the correct drive drawer to identify which drive to replace.

The drive drawer's Attention LED is on the front-left side of the drawer. There is a warning symbol on the drive handle just behind the LED to help locate the failing drive.

Step 5. Open the drawer containing the failed drive:

- Unlatch the drive drawer by pulling on both levers.
- Using the extended levers, carefully pull the drive drawer out until it stops.
- Look at the top of the drive drawer to find the Attention LED that resides on the drawer in front of each drive.

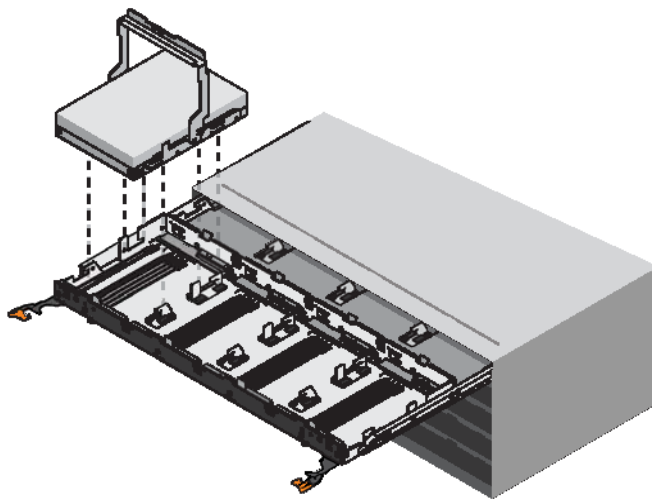
Step 6. Remove the failed drive from the open drawer:

- a. Gently pull back the orange release latch that is in front of the drive you want to remove.



1	Orange release latch
---	----------------------

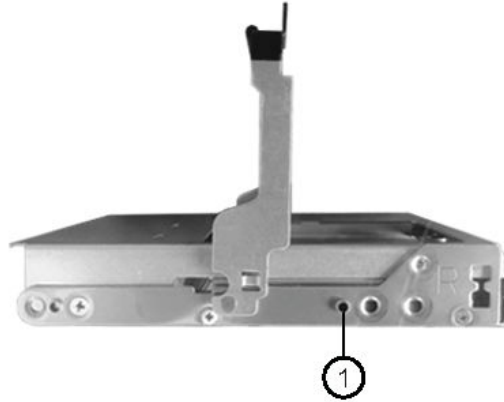
- b. Open the cam handle, and lift out the drive slightly.
- c. Wait 30 seconds.
- d. Use the cam handle to lift the drive from the shelf.



- e. Place the drive on an antistatic, cushioned surface away from magnetic fields.

Step 7. Insert the replacement drive in the drawer:

- a. Raise the cam handle on the new drive to vertical.
- b. Align the two raised buttons on each side of the drive carrier with the matching gap in the drive channel on the drive drawer.



1	Raised button on the right side of the drive carrier
---	--

- c. Lower the drive straight down, and then rotate the cam handle down until the drive snaps into place under the orange release latch.
- d. Carefully push the drive drawer back into the enclosure.

	<p>Attention: Possible loss of data access – Never slam the drawer shut. Push the drawer in slowly to avoid jarring the drawer and causing damage to the storage array.</p>
--	--

- e. Close the drive drawer by pushing both levers towards the center. The green Activity LED for the replaced drive on the front of the drive drawer comes on when the drive is inserted correctly.

Step 8. If you are replacing another disk drive, repeat Steps 4 through 7.

Step 9. Check the Activity LED and the Attention LED on the drive you replaced.

LED status	Description
The Activity LED is on or blinking, and the Attention LED is off	The new drive is working correctly.
The Activity LED is off	The drive might not be installed correctly. Remove the drive, wait 30 seconds, and then reinstall it.
The Attention LED is on	The new drive might be defective. Replace it with another new drive. Note: When you first insert a drive, its Attention LED might be on. However, the LED should go off within a minute.

Step 10. If you disabled disk ownership automatic assignment in Step 1, manually assign disk ownership, and then reenable disk ownership automatic assignment if needed:

- a. Display all unowned disks: `storage disk show -container-type unassigned`
- b. Assign each disk: `storage disk assign -disk disk_name -owner owner_name` You can use the wildcard character to assign more than one disk at once.

- c. Reenable disk ownership automatic assignment if needed: `storage disk option modify -node node_name -autoassign on` You need to reenable disk ownership automatic assignment on both controllers in an HA pair.

Step 11. If you are instructed to return the failed part, follow all packaging instructions and use any packaging materials that are provided.

Chapter 3. Hot-swapping a power supply

You can hot-swap a failed power supply in a DM600S, DM240S, or DM120S disk shelf—nondisruptively replace a power supply in a system that is powered on and serving data (I/O is in progress). When a power supply fails, the system logs a warning message to the system console indicating which power supply failed. In addition, the attention (amber) LED on the operator display panel and the attention (amber) LED on the failed power supply should illuminate.

Before you begin

All other components in the system, including the other power supply, must be functioning properly.

About this task

- If you are replacing more than one power supply, you must do so one at a time so that the disk shelf maintains power.
- You must replace a power supply within two minutes of removal to minimize disruption to the disk shelf's airflow.
- Always use two hands when removing, installing, or carrying a power supply to support its weight.
- Best practice is to have the current versions of disk shelf (IOM) firmware and disk drive firmware on your system before adding new disk shelves, shelf FRU components, or SAS cables. Current versions of firmware can be found on the Lenovo Support Web site.

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- If needed, you can turn on the disk shelf's location (blue) LEDs to aid in physically locating the affected disk shelf:

```
storage shelf location-led modify -node node_name -shelf -name shelf_name -led-status on
```

A disk shelf has three location (blue) LEDs: one on the operator display panel and one on each IOM12 module. Location LEDs remain illuminated for 30 minutes. You can turn them off by entering the same command, but using the *off* option.

- If needed, you can refer to the Monitoring disk shelf LEDs section for information about the meaning and location of disk shelf LEDs on the operator display panel and FRU components.

For DM120S and DM240S, the video for this task is available at:

- Youtube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-BI5q5uqIV0US3rLkIB5GOP>
- Youku: https://list.youku.com/albumlist/show/id_51948223

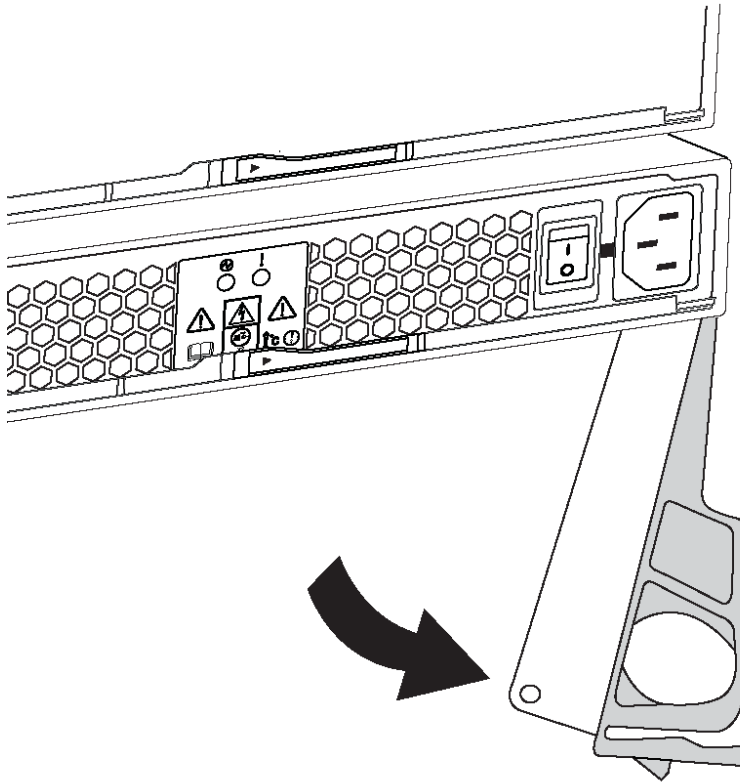
For DM600S, the video for this task is available at:

- Youtube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-BDPWjJVZFuHRfNWPEOhFWJ>
- Youku: https://list.youku.com/albumlist/show/id_51950116

- Step 1. Properly ground yourself.
- Step 2. Unpack the new power supply and set it on a level surface near the shelf. Save all packing materials for use when returning the failed power supply.
- Step 3. Physically identify the failed power supply from the system console warning message and the illuminated attention (amber) LED on the power supply.
- Step 4. Turn off the failed power supply and disconnect the power cable:
 - a. Turn off the power switch on the power supply.

- b. Open the power cord retainer and unplug the power cord from the power supply.
- c. Unplug the power cord from the power source.

Step 5. Press the orange latch on the power supply cam handle until it releases, and then open the cam handle to fully release the power supply from the mid plane. The following illustration is for a power supply used in a DM240S or DM120S disk shelf; however, the latch operates the same way for power supplies used in DM600S disk shelves:



Step 6. Use the cam handle to slide the power supply out of the disk shelf. If you have a DM240S or DM120S disk shelf, as you remove the power supply, a flap swings into place to block the empty bay, helping to maintain air flow and cooling.

Note: When handling a power supply, always use two hands to support its weight.

Step 7. Make sure that the on/off switch of the new power supply is in the Off position.

Step 8. Using two hands, with the cam handle of the new power supply in the open position, support and align the edges of the new power supply with the opening in the disk shelf, and then firmly push the new power supply until it meets the mid plane.

Attention: Do not use excessive force when sliding the power supply into the disk shelf; you might damage the connectors.

Step 9. Close the cam handle so that the latch clicks into the locked position and the power supply is fully seated.

Step 10. Reconnect the power supply cable and turn on the new power supply:

- a. Reconnect the power cord to the power source.
- b. Reconnect the power cord to the power supply and secure the power cord with the power cord retainer.

- c. Turn on the power switch. The power supply's power (green) LED and attention (amber) LED illuminate, and then within 40 seconds, the attention (amber) LED turns off.

Step 11. If you are instructed to return the failed part, follow all packaging instructions and use any packaging materials that are provided.

Chapter 4. Replacing a fan module in a DM600S disk shelf

Each DM600S drive shelf includes two fan modules. If a fan module fails, you must replace it as soon as possible to ensure that the shelf has adequate cooling. When you remove the failed fan module, you do not have to turn off power to your disk shelf.

About this task

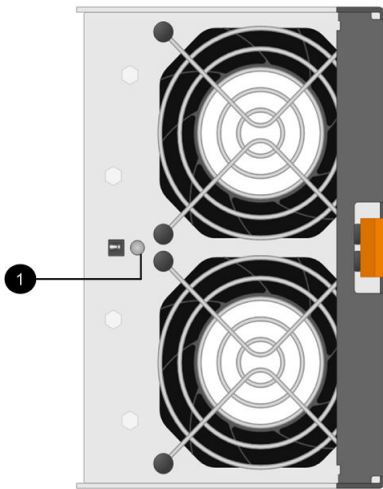
The video for this task is available at:

- Youtube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-BDPWjJVZFuHRfNWPEOhFWJ>
- Youku: https://list.youku.com/albumlist/show/id_51950116

You must ensure that you remove and replace the fan module within 30 minutes to prevent the system from overheating.

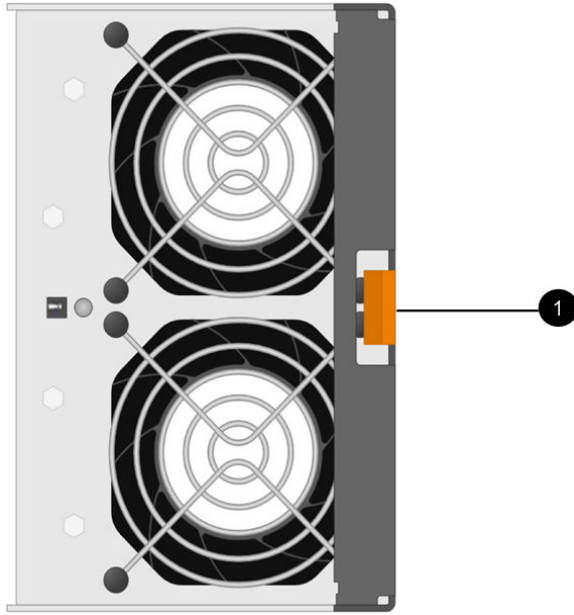
- Step 1. Put on antistatic protection.
- Step 2. Unpack the new fan module, and place it on a level surface near the shelf. Save all packing material for use when returning the failed fan.
- Step 3. From the back of the disk shelf, look at the Attention LEDs to locate the fan module you need to remove.

You must replace the fan module that has its Attention LED on.



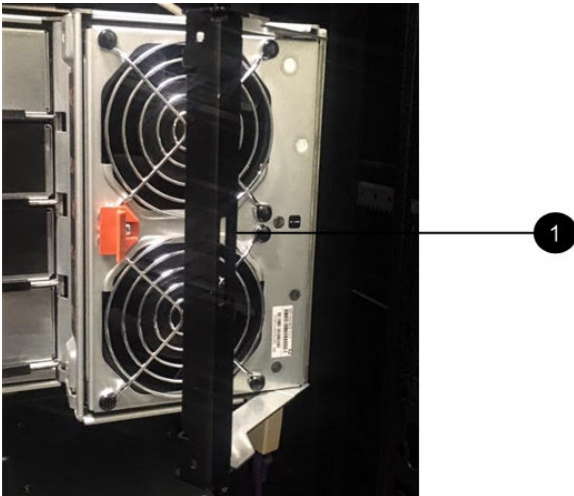
Item	LED name	State	Description
1	Attention	Solid amber	The fan has a fault.

- Step 4. Press the orange tab to release the fan module handle.



1	Tab that you press to release the fan module handle
---	---

Step 5. Use the fan module handle to pull the fan module out of the shelf.



1	Handle to pull the fan module out
---	-----------------------------------

Step 6. Slide the replacement fan module all the way into the shelf, moving the fan module handle to the side until it latches with the orange tab.

Step 7. Check the amber Attention LED on the new fan module.

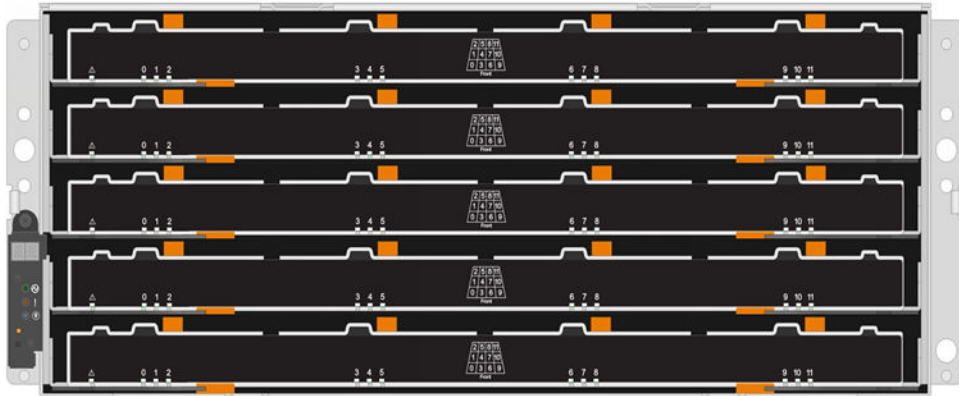
Note: After you replace the fan module, the Attention LED stays on (solid amber) while the firmware checks that the fan module was installed correctly. The LED goes off after this process is complete.

Step 8. If you are instructed to return the failed part, follow all packaging instructions and use any packaging materials that are provided.

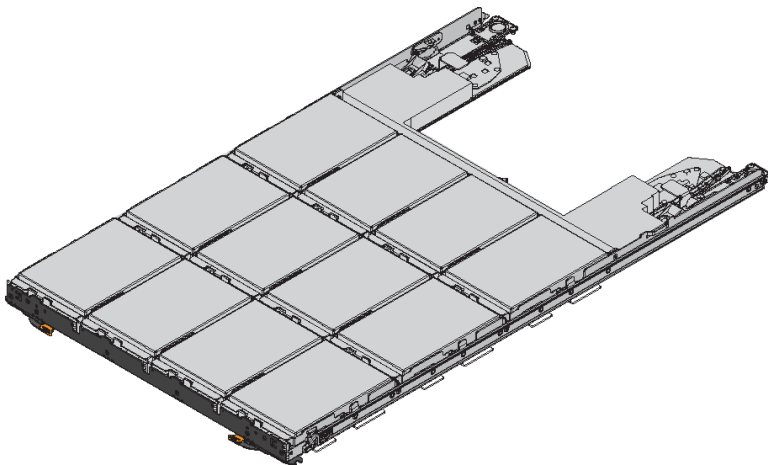
Chapter 5. Replacing a drive drawer in a DM600S disk shelf

You must stop all host I/O activity and power off the shelf before replacing the drive drawer.

Each of these 60-drive shelves has five drive drawers.



And each of the five drawers can hold up to 12 drives.



Before you begin

You need these items for this procedure:

- Antistatic protection

Attention: Possible hardware damage – To prevent electrostatic discharge damage to the drive shelf, use proper antistatic protection when handling drive shelf components.

- Replacement drive drawer
- Replacement left and right cable chains
- Flashlight
- Permanent marker

The video for this task is available at:

- Youtube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-BDPWjJVZFuHRfNWPEOhFWJ>

- Youku: https://list.youku.com/albumlist/show/id_51950116

Steps

- “Removing the cable chains” on page 18
- “Removing a drive drawer” on page 23
- “Installing a drive drawer” on page 25
- “Attaching the cable chains” on page 28

Removing the cable chains

Left and right cable chains for each drive drawer in the DM600S drive shelf allow the drawers to slide in and out. Before you can remove a drive drawer, you must remove both cable chains.

Before you begin

- You have stopped host I/O activity and powered off the shelf.
- You have obtained the following items:
 - Antistatic protection

Attention: Possible hardware damage – To prevent electrostatic discharge damage to the shelf, use proper antistatic protection when handling shelf components.

- Flashlight

About this task

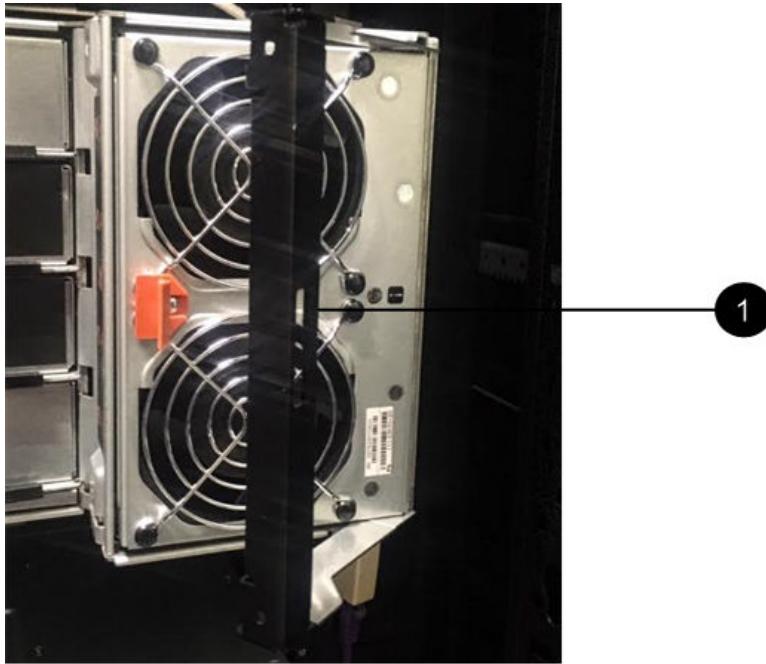
Each drive drawer has left and right cable chains. The metal ends on the cable chains slide into corresponding vertical and horizontal brackets inside the enclosure, as follows:

- The left and right vertical brackets connect the cable chain to the enclosure's midplane.
- The left and right horizontal brackets connect the cable chain to the individual drawer.

Step 1. Put on antistatic protection.

Step 2. From the rear of the drive shelf, remove the right fan module, as follows:

- a. Press the orange tab to release the fan module handle. The figure shows the handle for the fan module extended and released from the orange tab on the left.



1	fan module handle
---	-------------------

- b. Using the handle, pull the fan module out of the drive shelf, and set it aside.

Step 3. Manually determine which of the five cable chains to disconnect.

The figure shows the right side of the drive shelf with the fan module removed. With the fan module removed, you can see the five cable chains and the vertical and horizontal connectors for each drawer. The callouts for drive drawer 1 are provided.



1	Cable chain
2	Vertical connector (connected to the midplane)
3	Horizontal connector (connected to the drive drawer)

The top cable chain is attached to drive drawer 1. The bottom cable chain is attached to drive drawer 5.

Step 4. Use your finger to move the cable chain on the right side to the left.

Step 5. Follow these steps to disconnect any of the right cable chains from its corresponding vertical bracket.

- a. Using a flashlight, locate the orange ring on the end of the cable chain that is connected to the vertical bracket in the enclosure.



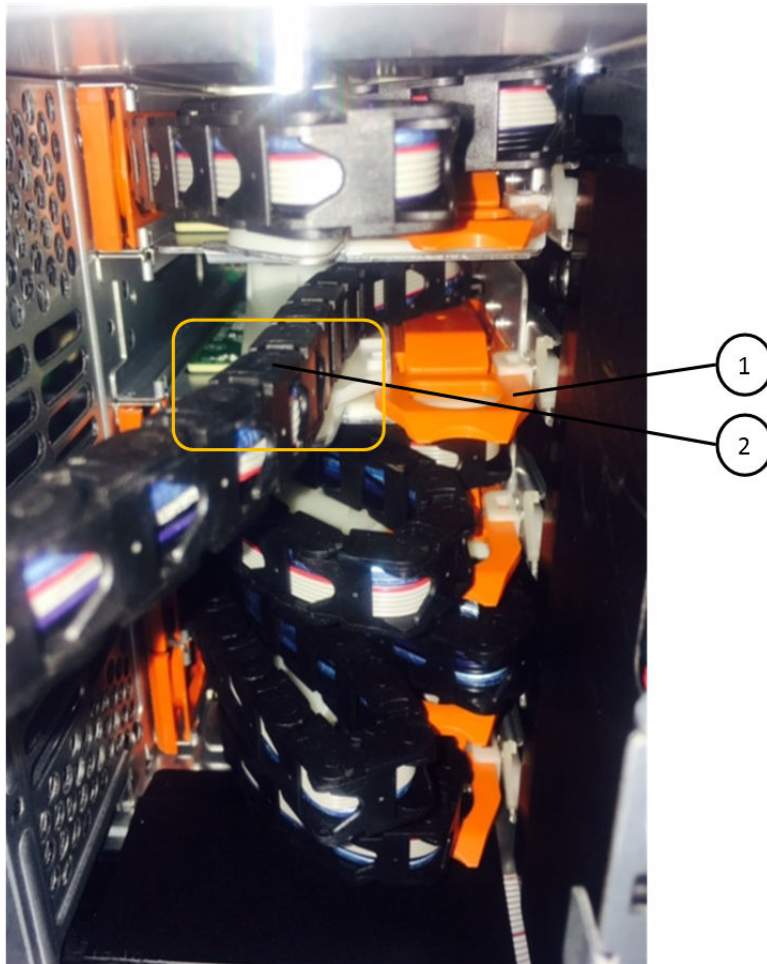
1	Orange ring on the vertical bracket
---	-------------------------------------

- b. Disconnect the vertical connector (connected to the midplane) by gently pressing on the center of the orange ring and pulling the left side of the cable out of the enclosure.
- c. To unplug the cable chain, carefully pull your finger toward you approximately 1 inch (2.5 cm), but leave the cable chain connector within the vertical bracket.

Step 6. Follow these steps to disconnect the other end of the cable chain:

- a. Using a flashlight, locate the orange ring on the end of the cable chain that is attached to the horizontal bracket in the enclosure.

The figure shows the horizontal connector on the right and the cable chain disconnected and partially pulled out on the left side.



1	Orange ring on horizontal bracket
2	Cable chain

- b. Gently insert your finger into the orange ring. The figure shows the orange ring on the horizontal bracket being pushed down so that the rest of the cable chain can be pulled out of the enclosure.
- c. Pull your finger toward you to unplug the cable chain.

Step 7. Carefully pull the entire cable chain out of the drive shelf.

Step 8. From the back of the drive shelf, remove the left fan module.

Step 9. Follow these steps to disconnect the left cable chain from its vertical bracket:

- a. Using a flashlight, locate the orange ring on the end of the cable chain attached to the vertical bracket.
- b. Insert your finger into the orange ring.
- c. To unplug the cable chain, pull your finger toward you approximately 1 inch (2.5 cm), but leave the cable chain connector within the vertical bracket.

Step 10. Disconnect the left cable chain from the horizontal bracket, and pull the entire cable chain out of the drive shelf.

Removing a drive drawer

After removing the right and left cable chains, you can remove the drive drawer from the drive shelf. Removing a drive drawer entails sliding the drawer part of the way out, recording the locations of the drives, removing the drives, and removing the drive drawer.

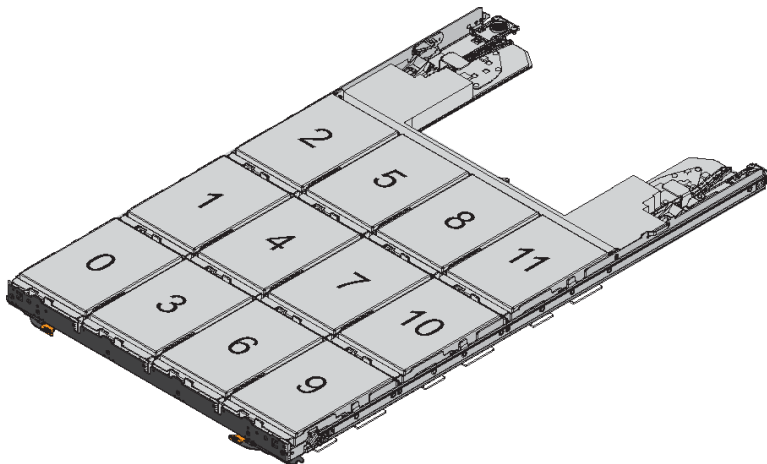
Before you begin

- You have removed the right and left cable chains for the drive drawer.
- You have replaced the right and left fan modules.
- You have obtained a permanent marker to note the exact location of each drive as you remove the drive from the drawer.

The video for this task is available at:

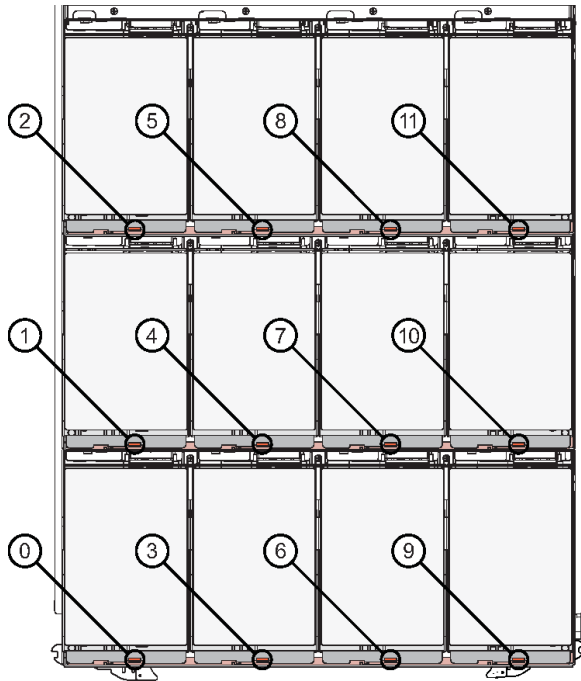
- Youtube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-BDPWjJVZFuHRfNWPEOhFWJ>
- Youku: https://list.youku.com/albumlist/show/id_51950116

- Step 1. Remove the bezel from the front of the drive shelf.
- Step 2. Unlatch the drive drawer by pulling out on both levers.
- Step 3. Using the extended levers, carefully pull the drive drawer out until it stops. Do not completely remove the drive drawer from the drive shelf.
- Step 4. If any disks have been configured, use a permanent marker to note the exact location of each drive. For example, using the following drawing as a reference, write the appropriate slot number on the top of each drive.

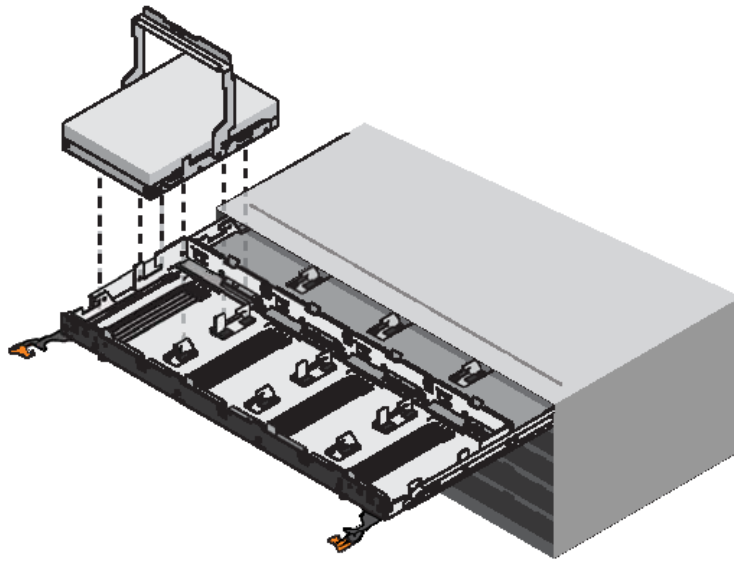


Attention: Possible loss of data access – Make sure to record the exact location of each drive before removing it.

- Step 5. Remove the drives from the drive drawer:
 - a. Gently pull back the orange release latch that is visible on the center front of each drive. The following image shows the orange release latch for each of the drives.



- b. Raise the drive handle to vertical.
- c. Use the handle to lift the drive from the drive drawer.

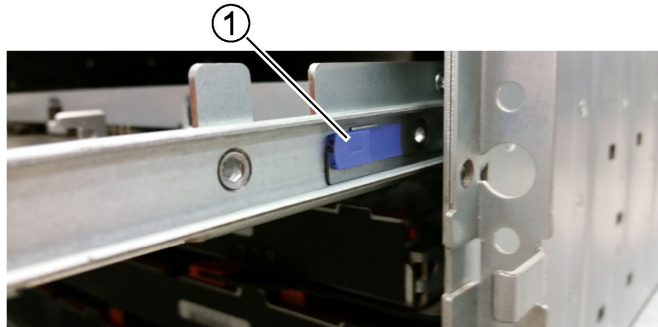


- d. Place the drive on a flat, static-free surface and away from magnetic devices.

Attention: Possible loss of data access – Magnetic fields can destroy all data on the drive and cause irreparable damage to the drive circuitry. To avoid loss of data access and damage to the drives, always keep drives away from magnetic devices.

Step 6. Follow these steps to remove the drive drawer:

- a. Locate the plastic release lever on each side of the drive drawer.



1	Drive drawer release lever
---	----------------------------

- b. Open both release levers by pulling the latches toward you.
- c. While holding both release levers, pull the drive drawer toward you.
- d. Remove the drive drawer from the drive shelf.

Installing a drive drawer

Installing a drive drawer into a drive shelf entails sliding the drawer into the empty slot, installing the drives, and replacing the front bezel.

Before you begin

- You know where to install each drive.
- You have obtained the following items:
 - Replacement drive drawer
 - Flashlight

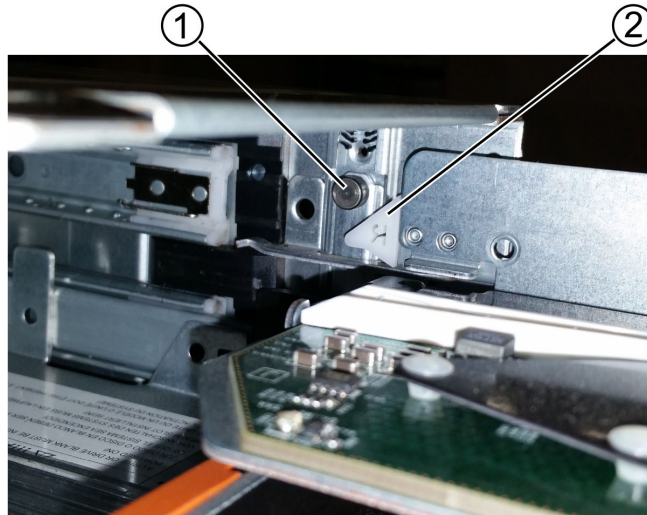
About this task

The video for this task is available at:

- Youtube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-BDPWjJVZFuHRfNWPEOhFWJ>
- Youku: https://list.youku.com/albumlist/show/id_51950116

Step 1. From the front of the drive shelf, shine a flashlight into the empty drawer slot, and locate the lock-out tumbler for that slot.

The lock-out tumbler assembly is a safety feature that prevents you from being able to open more than one drive drawer at one time.



1	Lock-out tumbler
2	Drawer guide

Step 2. Position the replacement drive drawer in front of the empty slot and slightly to the right of center. Positioning the drawer slightly to the right of center helps to ensure that the lock-out tumbler and the drawer guide are correctly engaged.

Step 3. Slide the drive drawer into the slot, and ensure that the drawer guide slides under the lock-out tumbler.

Attention: Risk of equipment damage – Damage occurs if the drawer guide does not slide under the lock-out tumbler.

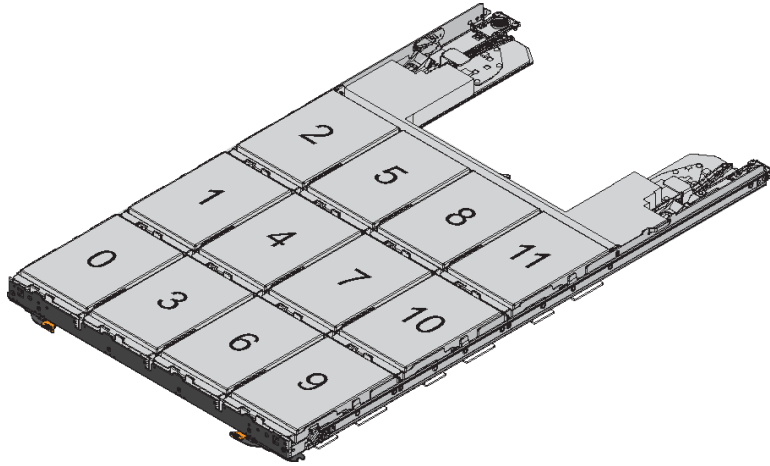
Step 4. Carefully push the drive drawer all the way in until the latch fully engages.

Attention: Risk of equipment damage – Stop pushing the drive drawer if you feel excessive resistance or binding. Use the release levers at the front of the drawer to slide the drawer back out. Then, reinsert the drawer into the slot, and ensure that it slides in and out freely.

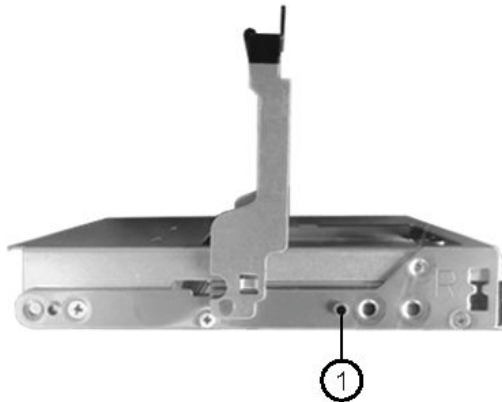
Step 5. Follow these steps to reinstall the drives in the drive drawer:

- a. Unlatch the drive drawer by pulling out on both levers at the front of the drawer.
- b. Using the extended levers, carefully pull the drive drawer out until it stops. Do not completely remove the drive drawer from the drive shelf.
- c. Determine which drive to install in each slot by using the notes you made when removing the drives.

Attention: Possible loss of data access – You must install each drive in its original location in the drive drawer.

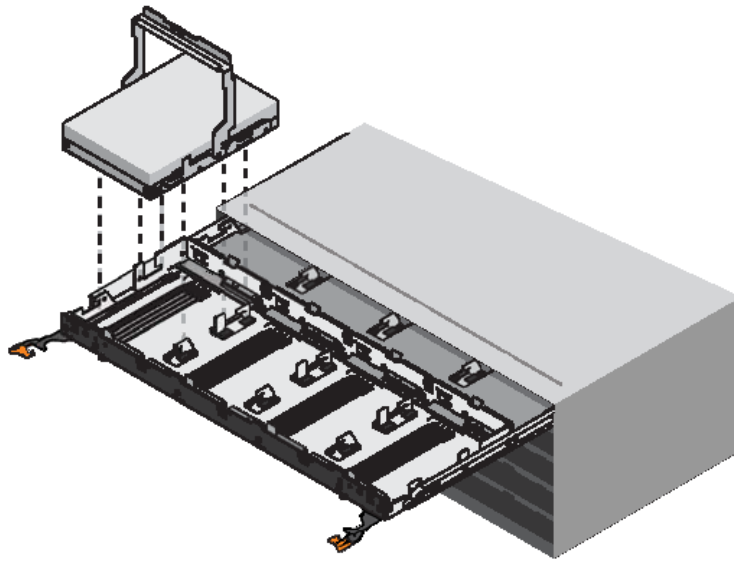


- d. Raise the handle on the drive to vertical.
- e. Align the two raised buttons on each side of the drive with the notches on the drawer. The figure shows the right side view of a drive, showing the location of the raised buttons.



1	Raised button on the right side of the drive.
---	---

- f. Lower the drive straight down, and then rotate the drive handle down until the drive snaps into place.



g. Repeat these substeps to reinstall all of the drives.

Step 6. Slide the drawer back into the drive shelf by pushing it from the center and closing both levers.

Attention: Risk of equipment malfunction – Make sure to completely close the drive drawer by pushing both levers. You must completely close the drive drawer to allow proper airflow and prevent overheating.

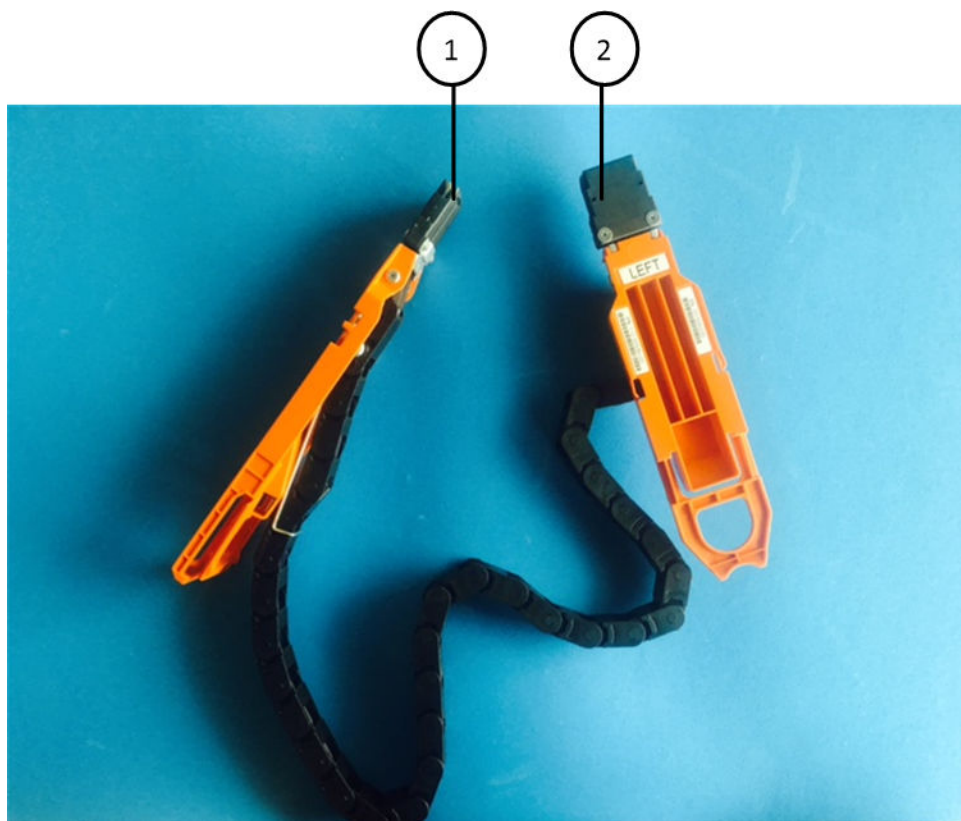
Step 7. Attach the bezel to the front of the drive shelf.

Attaching the cable chains

The final step in installing a drive drawer is attaching the left and right cable chains to the drive shelf. When attaching a cable chain, reverse the order you used when disconnecting the cable chain. You must insert the chain's horizontal connector into the horizontal bracket in the enclosure before inserting the chain's vertical connector into the vertical bracket in the enclosure.

Before you begin

- You have replaced the drive drawer and all of the drives.
- You have two replacement cable chains, marked as LEFT and RIGHT (on the horizontal connector next to the drive drawer).



Callout	Cable chain	Connector	Connects to
1	Left	Vertical	Midplane
2		Horizontal	Drive drawer



Callout	Cable chain	Connector	Connects to
1	Right	Horizontal	Drive drawer
2		Vertical	Midplane

Step 1. Follow these steps to attach the left cable chain:

- a. Locate the horizontal and vertical connectors on the left cable chain and the corresponding horizontal and vertical brackets inside the enclosure.
- b. Align both cable chain connectors with their corresponding brackets.
- c. Slide the cable chain's horizontal connector under the guide rail on the horizontal bracket, and push it in as far as it can go. The figure shows the guide rail on the left side for the second drive

drawer in the enclosure.



1	Guide rail
---	------------

CAUTION:

Risk of equipment malfunction — Make sure to slide the connector underneath the guide rail on the bracket. If the connector rests on the top of the guide rail, problems might occur when the system runs.

- d. Slide the vertical connector on the left cable chain into the vertical bracket.
- e. After you have reconnected both ends of the cable chain, carefully pull on the cable chain to verify that both connectors are latched.

Attention: Risk of equipment malfunction — If the connectors are not latched, the cable chain might come loose during drawer operation.

Step 2. Reinstall the left fan module.

Step 3. Follow these steps to reattach the right cable chain:

- a. Locate the horizontal and vertical connectors on the cable chain and their corresponding horizontal and vertical brackets inside the enclosure.
- b. Align both cable chain connectors with their corresponding brackets.
- c. Slide the cable chain's horizontal connector under the guide rail on the horizontal bracket and push it in as far as it will go.

CAUTION:

Risk of equipment malfunction — Make sure to slide the connector underneath the guide rail on the bracket. If the connector rests on the top of the guide rail, problems might occur when the system runs.

- d. Slide the vertical connector on the right cable chain into the vertical bracket.
- e. After you reconnect both ends of the cable chain, carefully pull on the cable chain to verify that both connectors are latched.

Attention: Risk of equipment malfunction — If the connectors are not latched, the cable chain might come loose during drawer operation.

Step 4. Reinstall the right fan module.

Step 5. Reapply power:

- a. Turn on both power switches on the drive shelf.
- b. Confirm that both fans come on and that the amber LED on the back of the fans is off.

Chapter 6. Hot-swapping or replacing an IOM12 module

Your system configuration determines whether you can perform a nondisruptive IOM12 module hot-swap or a disruptive IOM12 module replacement when an IOM12 module fails. When an IOM12 module fails, the system logs a warning message to the system console indicating which IOM12 module has failed. In addition, the attention (amber) LED on the operator display panel and the attention (amber) LED on the failed IOM12 module illuminate.

Before you begin

All other components in the system, including the other IOM12 module, must be functioning properly.

About this task

- For multipathed (multipath HA or multipath) and quad-pathed (quad-path HA or quad-path) configurations, you can hot-swap an IOM12 module (nondisruptively replace an IOM12 module in a system that is powered on and serving data—I/O is in progress).
- Best practice is to have the current versions of disk shelf (IOM) firmware and disk drive firmware on your system before adding new disk shelves, shelf FRU components, or SAS cables. Current versions of firmware can be found on the Lenovo Support Web site.

[Lenovo Data Center Support](#)

- Disk shelf (IOM) firmware is automatically updated (nondisruptively) on a new IOM12 module with a non-current firmware version. IOM firmware checks occur every ten minutes. An IOM firmware update can take up to 30 minutes.
- If needed, you can turn on the disk shelf's location (blue) LEDs to aid in physically locating the affected disk shelf:
`storage shelf location-led modify -node node_name -shelf -name shelf_name -led-status on`

A disk shelf has three location (blue) LEDs: one on the operator display panel and one on each IOM12 module. Location LEDs remain illuminated for 30 minutes. You can turn them off by entering the same command, but using the *off* option.

- If needed, you can refer to the Monitoring disk shelf LEDs section for information about the meaning and location of disk shelf LEDs on the operator display panel and FRU components.

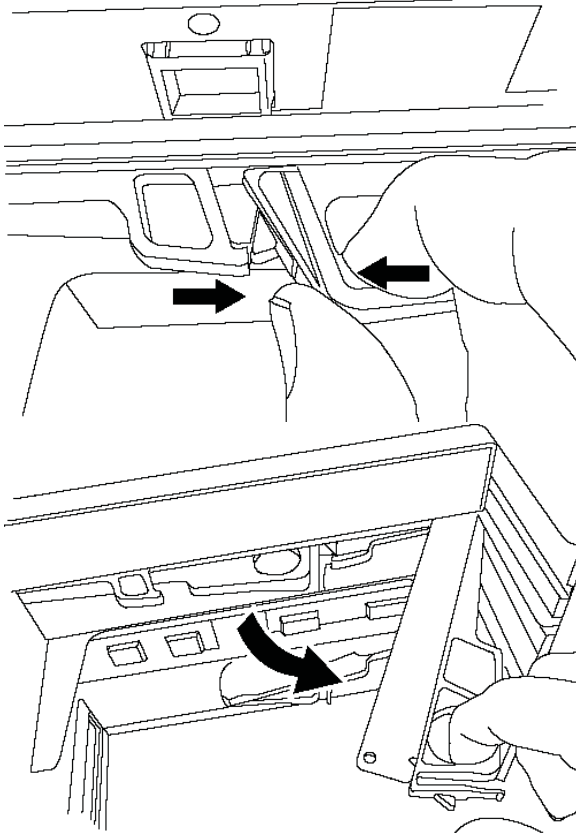
For DM600S, the video for this task is available at:

- Youtube: <https://www.youtube.com/playlist?list=PLYV5R7hVcs-BDPWjJVZFuHRfNWPEOhFWJ>
- Youku: https://list.youku.com/albumlist/show/id_51950116

- Step 1. Properly ground yourself.
- Step 2. Unpack the new IOM12 module, and set it on a level surface near the disk shelf. Save all packaging materials for use when returning the failed IOM12 module.
- Step 3. Physically identify the failed IOM12 module from the system console warning message and the illuminated attention (amber) LED on the failed IOM12 module.
- Step 4. Perform one of the following actions based on the type of configuration you have:

If you have a...	Then...
Multipath HA, multipath, quad-path HA, or quad-path configuration	Go to the next step.

- Step 5. Disconnect the cabling from the IOM12 module that you are removing. Make note of the IOM12 module ports each cable is connected to.
- Step 6. Press the orange latch on the IOM12 module cam handle until it releases, and then open the cam handle fully to release the IOM12 module from the mid plane.



- Step 7. Use the cam handle to slide the IOM12 module out of the disk shelf. If you have a DM240S or DM120S disk shelf, as you remove the power supply, a plastic flap swings into place to block the empty bay, helping to maintain air flow and cooling.
- Note:** When handling an IOM12 module, always use two hands to support its weight.
- Step 8. Wait at least 70 seconds after removing the IOM12 module before you install the new IOM12 module. Waiting at least 70 seconds enables the driver to register the shelf ID correctly.
- Step 9. Using two hands, with the cam handle of the new IOM12 module in the open position, support and align the edges of the new IOM12 module with the opening in the disk shelf, and then firmly push the new IOM12 module until it meets the mid plane.

Attention: Do not use excessive force when sliding the IOM12 module into the disk shelf; you might damage the connectors.

- Step 10. Close the cam handle so that the latch clicks into the locked position and the IOM12 module is fully seated.
- Step 11. Reconnect the cabling.

The SAS cable connectors are keyed; when oriented correctly into an IOM port, the connector clicks into place and the IOM port LNK LED illuminates green. You insert a SAS cable connector into an IOM port with the pull tab oriented down (on the underside of the connector).

- Step 12. Perform one of the following actions based on the type of configuration you have:

If you have a...	Then...
Multipath HA, multipath, quad-path HA, or quad-path configuration	Go to the next step.

- Step 13. Verify that the IOM12 module port links have been established. For each module port that you cabled, the LNK (green) LED illuminates when one or more of the four SAS lanes have established a link (with either an adapter or another disk shelf).
- Step 14. If you are instructed to return the failed part, follow all packaging instructions and use any packaging materials that are provided.

Chapter 7. Hot-removing disk shelves with IOM12 modules

You can hot-remove a disk shelf with IOM12 modules—nondisruptively remove a disk shelf from a system that is powered on and serving data (I/O is in progress)—when you need to move or replace the disk shelf. You can hot-remove one or more disk shelves from anywhere within a stack of disk shelves or remove a stack of disk shelves.

Before you begin

- Your system must be a multipath HA, multipath, quad-path HA, or quad-path configuration.

For DM3000x, DM5000x, or DM7000x, the external storage must be cabled as multipath HA or multipath.

Note: For a DM3000x, DM5000x, or DM7000x single-controller system that has the external storage cabled with multipath connectivity, the system is a mixed-path configuration because the internal storage uses single-path connectivity.

- HA pair configurations cannot be in a takeover state.
- You must have removed all aggregates from the disk drives—the disk drives must be spares—in the disk shelves you are removing.

Attention: If you attempt this procedure with aggregates on the disk shelf you are removing, you could fail the system with a multidisk panic.

Note: Before you remove all aggregates, identify the SVMs of the aggregates and remove all port sets, ports, LUNs, and volumes allocated to the SVMs. Then, remove the SVMs.

You can use the `storage aggregate offline -aggregate aggregate_name` command.

- If you are removing one or more disk shelves from within a stack, you must have factored the distance to bypass the disk shelves you are removing; therefore, if the current cables are not long enough, you need to have longer cables available.

About this task

- Best practice is to remove disk drive ownership after you remove the aggregates from the disk drives in the disk shelves you are removing.

Removing ownership information from a spare disk drive allows the disk drive to be properly integrated into another node (as needed).

The procedure for removing ownership from a disk can be found in the *Disks and Aggregates Power Guide*.

Note: The procedure for removing ownership from disk drives requires you to disable disk ownership automatic assignment. You reenable disk ownership automatic assignment at the end of this procedure.

[ONTAP 9 Disks and Aggregates Power Guide](#)

- For a clustered ONTAP system that is greater than two-nodes, best practice is to have reassigned epsilon to an HA pair other than the one that is undergoing planned maintenance. Reassigning epsilon minimizes the risk of unforeseen errors impacting all nodes in a clustered ONTAP system. Information about the role of quorum and epsilon, and the procedure for reassigning epsilon to another node in a cluster can be found in the *System Administration Reference*.

[Find a System Administration Guide for your version of ONTAP 9](#)

- If you are hot-removing a disk shelf from a stack (but keeping the stack), you recable and verify one path at a time (path A then path B) to bypass the disk shelf you are removing so that you always maintain single-path connectivity from the controllers to the stack.

Attention: If you do not maintain single-path connectivity from the controllers to the stack when recabling the stack to bypass the disk shelf you are removing, you could fail the system with a multidisk panic.

Step 1. Verify that your system configuration is Multi-Path HA, Multi-Path, Quad-path HA, or Quad-path: First access the nodeshell by running `system node run node name`. When the nodeshell prompts, run `sysconfig`. You run this command from the nodeshell of either controller. It might take up to a minute for the system to complete discovery.

The configuration is listed in the System Storage Configuration field.

Note: For DM3000x, DM5000x, or DM7000x systems with external storage, the output is displayed as Mixed-Path HA for an HA pair, or Mixed-Path for a single-controller configuration because the internal storage is cabled differently than the external storage. For an HA pair, the internal storage is cabled as single-path HA and the external storage is cabled as multipath HA. For a single-controller configuration, the internal storage is cabled as single-path and the external storage is cabled as multipath.

Step 2. Verify that the disk drives in the disk shelves you are removing have no aggregates (are spares) and ownership is removed, by completing the following substeps:

- Enter the following command from the clustershell of either controller: `storage disk show -shelf shelf_number`
- Check the output to verify there are no aggregates on the disk drives in the disk shelves you are removing. Disk drives with no aggregates have a dash in the Container Name column.
- Check the output to verify that ownership is removed from the disk drives on the disk shelves you are removing. Disk drives with no ownership have unassigned in the Container Type column.

Note: If you have failed disk drives in the shelf you are removing, they have broken in the Container Type column. (Failed disk drive do not have ownership.)

Example

The following output shows disk drives on the disk shelf being removed (disk shelf 3) are in a correct state for removing the disk shelf. Aggregates have been removed on all of the disk drives in disk shelf 3; therefore, a dash appears in the Container Name column for each disk drive. Ownership has been removed on two disk drives; therefore, unassigned appears in the Container Type column. And two disk drives are failed; therefore, broken appears in the Container Type column:

cluster::> storage disk show -shelf 3

Disk	Usable Size	Shelf	Bay	Disk Type	Container Type	Container Name	Owner
...							
1.3.4	-	3	4	SAS	unassigned	-	-
1.3.5	-	3	5	SAS	unassigned	-	-
1.3.6	-	3	6	SAS	broken	-	-
1.3.7	-	3	7	SAS	broken	-	-
...							

Step 3. Physically locate the disk shelves you are removing. If needed, you can turn on the disk shelf's location (blue) LEDs to aid in physically locating the affected disk shelf: `storage shelf location-led modify -node node_name -shelf -name shelf_name -led-status on`

Note: A disk shelf has three location (blue) LEDs: one on the operator display panel and one on each IOM12 module. Location LEDs remain illuminated for 30 minutes. You can turn them off by entering the same command, but using the *off* option.

- Step 4. If you are removing an entire stack of disk shelves, complete the following substeps; otherwise, go to the next step:
- a. Remove all SAS cables on Path A for the enclosure that you are removing. Then reattach the SAS cables back to the upstream enclosure and ensure that you have connectivity back to all enclosures on Path A. Remove the cables for path B on the enclosure you are removing. Then ensure that you have reconnected the cables of all additional enclosures back on path B to maintain your redundancy. This includes controller-to-shelf cables and shelf-to-shelf cables for all disk shelves in the stack you are removing.
 - b. Go to [Step 9 on page 41](#).
- Step 5. If you are removing one or more disk shelves from a stack (but keeping the stack), recable the path A (IOM A) stack connections to bypass the disk shelves you are removing by completing the applicable set of substeps: If you are removing more than one disk shelf in the stack, complete the applicable set of substeps one disk shelf at a time.

Note: Wait at least 10 seconds before connecting the port. The SAS cable connectors are keyed; when oriented correctly into a SAS port, the connector clicks into place and the disk shelf SAS port LNK LED illuminates green. For disk shelves, you insert a SAS cable connector with the pull tab oriented down (on the underside of the connector).

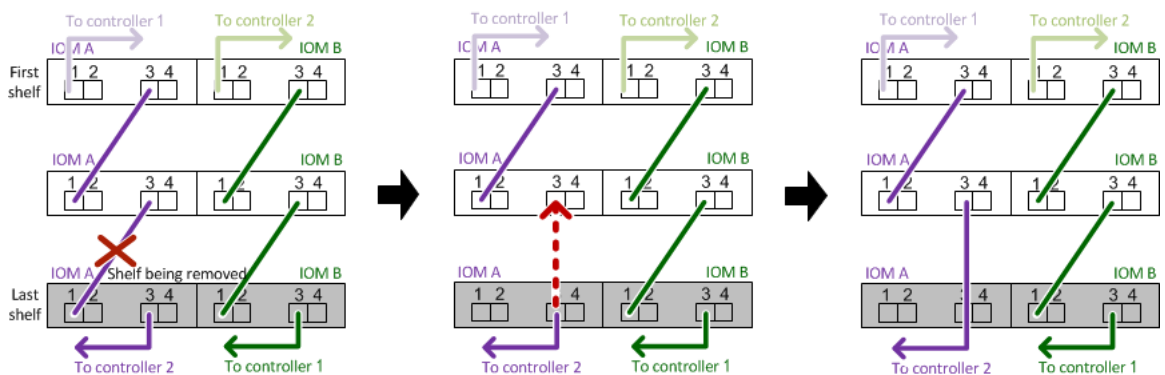
If you are removing...	Then...
<p>A disk shelf from either end (logical first or last disk shelf) of a stack</p>	<ol style="list-style-type: none"> 1. Remove any shelf-to-shelf cabling from IOM A ports on the disk shelf you are removing and put them aside. 2. Unplug any controller-to-stack cabling connected to IOM A ports on the disk shelf you are removing and plug them into the same IOM A ports on the next disk shelf in the stack. The “next” disk shelf can be above or below the disk shelf you are removing depending on which end of the stack you are removing the disk shelf from.
<p>A disk shelf from the middle of the stack</p> <p>A disk shelf in the middle of a stack is only connected to other disk shelves—not to any controllers.</p>	<ol style="list-style-type: none"> 1. Remove any shelf-to-shelf cabling from IOM A ports 1 and 2 or from ports 3 and 4 on the disk shelf you are removing and IOM A of the next disk shelf, and then put them aside. 2. Unplug the remaining shelf-to-shelf cabling connected to IOM A ports on the disk shelf you are removing and plug them into the same IOM A ports on the next disk shelf in the stack. <p>The “next” disk shelf can be above or below the disk shelf you are removing depending on which IOM A ports (1 and 2 or 3 and 4) you removed the cabling from.</p>

Example

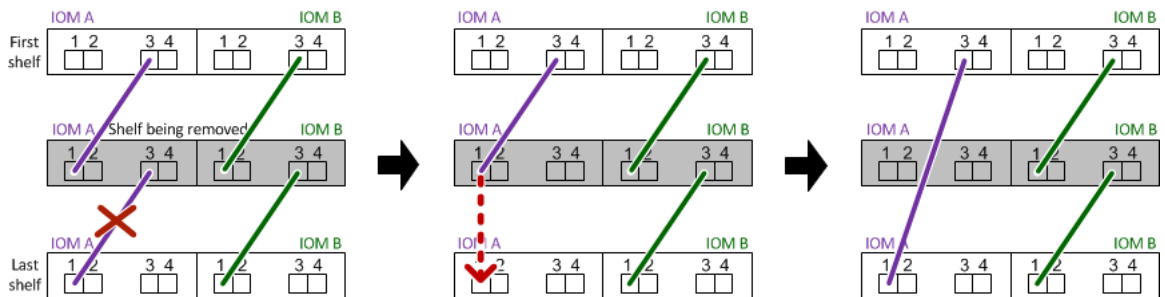
You can refer to the following cabling examples when removing a disk shelf from an end of a stack or the middle of a stack. Note the following about the cabling examples:

- The IOM12 modules are arranged side-by-side as in a DM240S or DM120S disk shelf; if you have a DM600S, the IOM12 modules are arranged one above the other.
- The stack in each example is cabled with standard shelf-to-shelf cabling, which is used in stacks cabled with multipath HA or multipath connectivity. You can infer the recabling if your stack is cabled with quad-path HA or quad-path connectivity, which uses double-wide shelf-to-shelf cabling.
- The cabling examples demonstrate recabling one of the paths: path A (IOM A). You repeat the recabling for path B (IOM B).
- The cabling example for removing a disk shelf from the end of a stack demonstrates removing the logical last disk shelf in a stack that is cabled with multipath HA connectivity. You can infer the recabling if you are removing the logical first disk shelf in a stack or if your stack has multipath connectivity.

Removing the logical last shelf in a stack: recabling path A (IOM A)



Removing a middle shelf in a stack: recabling path A (IOM A)



Step 6. Verify that you bypassed the disk shelves you are removing and reestablished the path A (IOM A) stack connections correctly: `storage disk show -port`

For HA pair configurations, you run this command from the cluster shell of either controller. It might take up to a minute for the system to complete discovery.

Example

The first two lines of output show disk drives with connectivity through both path A and path B. The last two lines of output show disk drives with connectivity through a single-path, path B.

cluster::> storage show disk -port

PRIMARY	PORT	SECONDARY	PORT	TYPE	SHELF	BAY
1.20.0	A	node1:6a.20.0	B	SAS	20	0
1.20.1	A	node1:6a.20.1	B	SAS	20	1
1.21.0	B	-	-	SAS	21	0

Step 7. The next step depends on the storage disk show -port command output:

If the output shows...	Then...
All disk drives in the stack are connected through path A and path B except for the ones in the disk shelves you disconnected, which are only connected through path B	Go to the next step. You successfully bypassed the disk shelves you are removing and reestablished path A on the remaining disk drives in the stack.
Anything other than the above	Repeat Step 5 and Step 6. You must correct the cabling.

Step 8. Complete the following substeps for the disk shelves (in the stack) you are removing:

- a. Repeat Step 5 through Step 7 for path B.

Note: When you repeat Step 7 and if you have recabled the stack correctly you should see all disk drives connected through path A and path B.

- b. Repeat Step 1 to confirm that your system configuration is the same as before you removed one or more disk shelves from a stack.
- c. Go to the next step.

Step 9. If when you removed ownership from the disk drives (as part of the preparation for this procedure), you disabled disk ownership automatic assignment, reenable it by entering the following command; otherwise, go to the next step: `storage disk option modify -autoassign on`

For HA pair configurations, you run the command from the clustershell of both controllers.

Step 10. Power off the disk shelves you disconnected and unplug the power cords from the disk shelves.

Step 11. Remove the disk shelves from the rack or cabinet.

To make disk shelves lighter and easier to maneuver, remove the power supplies and IOM12 modules. Avoid removing the disk drives if possible, because excessive handling can lead to internal damage.

CAUTION:

It is recommended that you use a mechanical hoist or lift if you are moving a fully populated DS460C disk shelf, which can weigh 249 lb (113 kg).




Chapter 8. Monitoring disk shelf LEDs

You can monitor the health of your disk shelf by understanding the location and status conditions of the LEDs on your disk shelf components.

Operator display panel LEDs

The LEDs on the disk shelf front operator display panel indicate whether your disk shelf is functioning normally or there are problems with the hardware.

The following table describes the three LEDs on the operator display panel used in DM600S, DM240S, and DM120S disk shelves:

LED icon	LED name	State	Description
	Power	Solid green	One or more power supplies are supplying power to the disk shelf.
	Attention	Solid amber	An error occurred with the function of one of more FRUs: the disk shelf, disk drives, IOM12 modules, or power supplies. Check event messages to determine corrective action to take.
		Blinking amber	The shelf ID is in a pending state. Power cycle the disk shelf for the shelf ID to take affect.
	Location	Solid blue	The system administrator activated this LED function to aid in physically locating the disk shelf requiring service. Note: The location LED on the operator display panel and both IOM12 modules illuminate when this LED function is activated. Location LEDs automatically turn off after 30 minutes.

Depending on your disk shelf model, the operator display panel looks different; however, the three LEDs are arranged in the same way.

The following illustration is of a DM240S disk shelf operator display panel with the end cap on:



IOM12 module LEDs

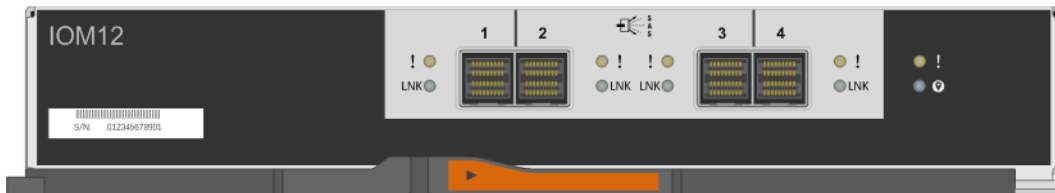
The LEDs on the IOM12 module indicate whether the module is functioning normally, whether it is ready for I/O traffic, and whether there are any problems with the hardware.

The following table describes IOM12 module LEDs associated with the function of the module and the function of each SAS port on the module.

The IOM12 module is used in DM600S, DM240S, and DM120S disk shelves.

LED icon	LED name	State	Description
!	Attention	Solid amber	IOM12 module function: An error occurred with the function of the IOM12 module. SAS port function: Less than all four SAS lanes established a link (with either an adapter or another disk shelf). Check event messages to determine corrective action to take.
LNK	Port link	Solid green	One or more of the four SAS lanes established a link (with either an adapter or another disk shelf).
📍	Location	Solid blue	The system administrator activated this LED function to aid in physically locating the disk shelf with the failed IOM12 module. Note: The location LED on the operator display panel and both IOM12 modules illuminate when this LED function is activated. Location LEDs automatically turn off after 30 minutes.

The following illustration is for a IOM12 module:



Power supply LEDs

The LEDs on the power supply indicate whether the power supply is functioning normally or there are hardware problems.

The following table describes the two LEDs on power supplies used in DM600S, DM240S, and DM120S disk shelves:

LED icon	LED name	State	Description
⚡	Power	Solid green	The power supply is functioning correctly.
		Off	The power supply failed, the AC switch is turned off, the AC power cord is not properly installed, or electricity is not being properly supplied to the power supply. Check event messages to determine corrective action to take.
!	Attention	Solid amber	An error occurred with the function of the power supply. Check event messages to determine corrective action to take.

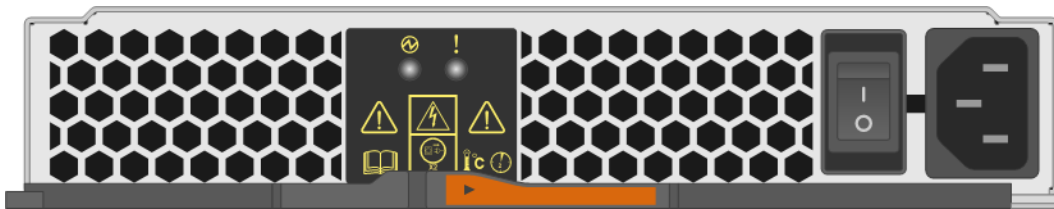
Depending on your disk shelf model, power supplies can be different, dictating the location of the two LEDs.

The following illustration is for a power supply used in a DM600S disk shelf.

The two LED icons act as the labels and LEDs, meaning the icons themselves illuminate—there are no adjacent LEDs.



The following illustration is for a power supply used in a DM240S or DM120S disk shelf:

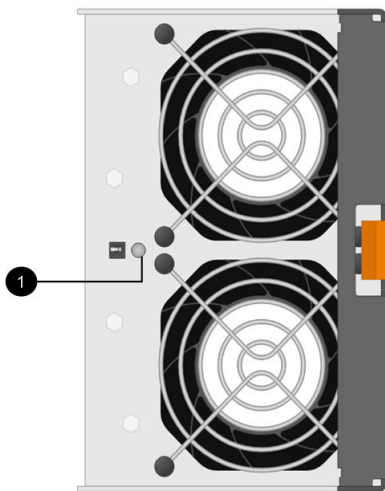


Fan LEDs on DM600S disk shelves

The LEDs on the DM600S fans indicate whether the fan is functioning normally or there are hardware problems.

The following table describes the LEDs on fans used in DM600S disk shelves:

Item	LED name	State	Description
1	Attention	Solid amber	An error occurred with the function of the fan. Check event messages to determine corrective action to take.



Disk drive LEDs

The LEDs on a disk drive indicates whether it is functioning normally or there are problems with the hardware.

Disk drive LEDs for DM240S and DM120S disk shelves

The following table describes the two LEDs on the disk drives used in DM240S and DM120S disk shelves:

Callout	LED name	State	Description
1	Activity	Solid green	The disk drive has power.
		Blinking green	The disk drive has power and I/O operations are in progress.
2	Attention	Solid amber	An error occurred with the function of the disk drive. Check event messages to determine corrective action to take.

Depending on your disk shelf model, disk drives are arranged vertically or horizontally in the disk shelf, dictating the location of the two LEDs.

The following illustration is for a disk drive used in a DM240S disk shelf.

DM240S disk shelves use 2.5-inch disk drives arranged vertically in the disk shelf.



The following illustration is for a disk drive used in a DM120S disk shelf.

DM120S disk shelves use 3.5-inch disk drives or 2.5-inch disk drives in carriers arranged horizontally in the disk shelf.



Disk drive LEDs for DM600S disk shelves

The following illustration and table describes the drive activity LEDs on the drive drawer and their operational states:



Location	LED	Status indicator	Description
1	Attention: Drawer attention for each drawer.	Solid amber	A component within the drive drawer requires operator attention.
		Off	No drive or other component in the drawer requires attention and no drive in the drawer has an active locate operation.
		Blinking amber	A locate drive operation is active for any drive within the drawer.
2-13	Activity: Drive activity for drives 0 through 11 in the drive drawer.	Green	The power is turned on and the drive is operating normally.
		Blinking green	The drive has power, and I/O operations are in progress.
		Off	The power is turned off.

When the drive drawer is open, an attention LED can be seen in front of each drive.



1	Attention LED light on
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Appendix A. Contacting Support

You can contact Support to obtain help for your issue.

You can receive hardware service through a Lenovo Authorized Service Provider. To locate a service provider authorized by Lenovo to provide warranty service, go to <https://datacentersupport.lenovo.com/serviceprovider> and use filter searching for different countries. For Lenovo support telephone numbers, see <https://datacentersupport.lenovo.com/supportphonenumberlist> for your region support details.

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