Install and cable shelves for a new system installation - shelves with IOM12 modules

ONTAP Systems

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Table of Contents

Install and cable shelves for a new system installation - shelves with IOM12 modules 1
Requirements for installing and cabling disk shelves with IOM12 modules for a new system installation . . . 1
Considerations for installing and cabling disk shelves with IOM12 modules for a new system installation . . . 1
Install disk shelves with IOM12 modules for a new system installation 2
Cable disk shelves with IOM12 modules for a new system installation 6

Install and cable shelves for a new system installation - shelves with IOM12 modules

If your new system—HA pair or single-controller configuration—did not come installed in a cabinet, you can install and cable the disk shelves in a rack.

Requirements for installing and cabling disk shelves with IOM12 modules for a new system installation

You must meet certain requirements before installing and cabling the disk shelves.

- You must have the installation and setup instructions for your platform model.

  The installation and setup instructions address the complete procedure for your system installation, setup, and configuration. You only use this procedure (*Install and cable shelves for a new system installation*) in conjunction with the platform installation and setup instructions if you need detailed information about installing or cabling the disk shelves to your storage system.

  Installation and setup instructions can be found by navigating to your platform model documentation.

  AFF and FAS System Documentation

- Disk shelves and controllers must not be powered on at this time.
- If you are using mini-SAS HD SAS optical cables, you must have met the rules in Mini-SAS HD SAS optical cable rules.

Considerations for installing and cabling disk shelves with IOM12 modules for a new system installation

You should familiarize yourself with aspects and best practices about this procedure before installing and cabling the disk shelves.

General considerations

- Disk shelves with IOM12 modules are shipped with shelf IDs preset to 00.

  > If you have an HA pair with at least two stacks, the disk shelf containing the root aggregates for the second stack has the shelf ID preset to 10.

  You must set shelf IDs so they are unique within the HA pair or single-controller configuration. You can manually set shelf IDs or have shelf IDs automatically assigned for all disk shelves in the HA pair or single-controller configuration using a command in maintenance mode. Instructions for both methods are provided.

- Disk shelves containing the root aggregates can be identified by the labels on the disk shelf box and disk shelf chassis.

  The labels show the stack number; for example, "`Loop or Stack #: 1 `" and "`Loop or Stack #: 2 `". Disk shelves that do not contain the root aggregates only show the disk shelf serial number is on the labels.

- If at system setup and configuration, you do not configure the system to use automatic disk ownership assignment, you need to manually assign disk ownership.
- In-band Alternate Control Path (ACP) is automatically enabled.

  In-band ACP is not supported on single-path HA or single-path configurations.

Best practice considerations

- The best practice is to have the current version of the Disk Qualification Package (DQP) installed.

  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.

  NetApp Downloads: Disk Qualification Package

- The best practice is to download and run Config Advisor after a new system installation.

  Running Config Advisor after a new system installation allows you to verify SAS connections are cabled correctly and that shelf IDs are unique within the HA pair or single-controller configuration.

  If any SAS cabling or duplicate shelf ID errors are generated, follow the corrective actions provided.

  You need network access to download Config Advisor.

  NetApp Downloads: Config Advisor

SAS cable handling considerations

- Visually inspect the SAS port to verify the proper orientation of the connector before plugging it in.

  The SAS cable connectors are keyed. When oriented correctly into a SAS port, the connector clicks into place and if the disk shelf power is on at the time, 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).

  For controllers, the orientation of SAS ports can vary depending on the platform model; therefore, the correct orientation of the SAS cable connector varies.

- To prevent degraded performance, do not twist, fold, pinch, or step on the cables.

  Cables have a minimum bend radius. Cable manufacturer specifications define the minimum bend radius; however, a general guideline for minimum bend radius is 10 times the cable diameter.

- Using Velcro wraps instead of tie-wraps to bundle and secure system cables allows for easier cable adjustments.

Install disk shelves with IOM12 modules for a new system installation

You install the disk shelves in a rack using the rack mount kits that came with the disk

shelves.

1. Install the rack mount kit (for two-post or four-post rack installations) that came with your disk shelf using the installation flyer that came with the kit.

   If you are installing multiple disk shelves, you should install them from the bottom to the top of the rack for the best stability.

   Do not flange-mount the disk shelf into a telco-type rack; the disk shelf's weight can cause it to collapse in the rack under its own weight.

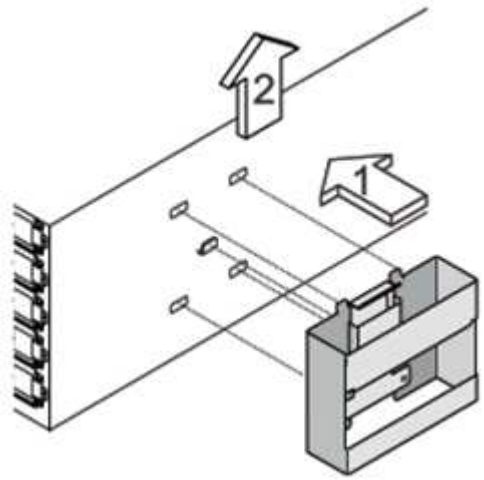
2. Install and secure the disk shelf onto the support brackets and rack using the installation flyer that came with the kit.

   To make a disk shelf lighter and easier to maneuver, remove the power supplies and I/O modules (IOMs).

   For DS460C disk shelves, you can also use the four detachable handles that shipped with your disk shelf. Handles (two on each side of the chassis) are installed by pushing up until they click into place. As you slide the disk shelf onto the rails, detach handles using the thumb latch.

   It is recommended that you use a mechanical hoist or lift if you are moving a fully loaded DS460C disk shelf.

   A fully loaded DS460C disk shelf can weigh approximately 247 lbs (112 kg).



3. If you are installing a DS460C disk shelf, install the components into the racked disk shelf; otherwise, go to the next step.

   If you purchased a partially populated disk shelf which does not have a drive in every drive slot, you must ensure that:

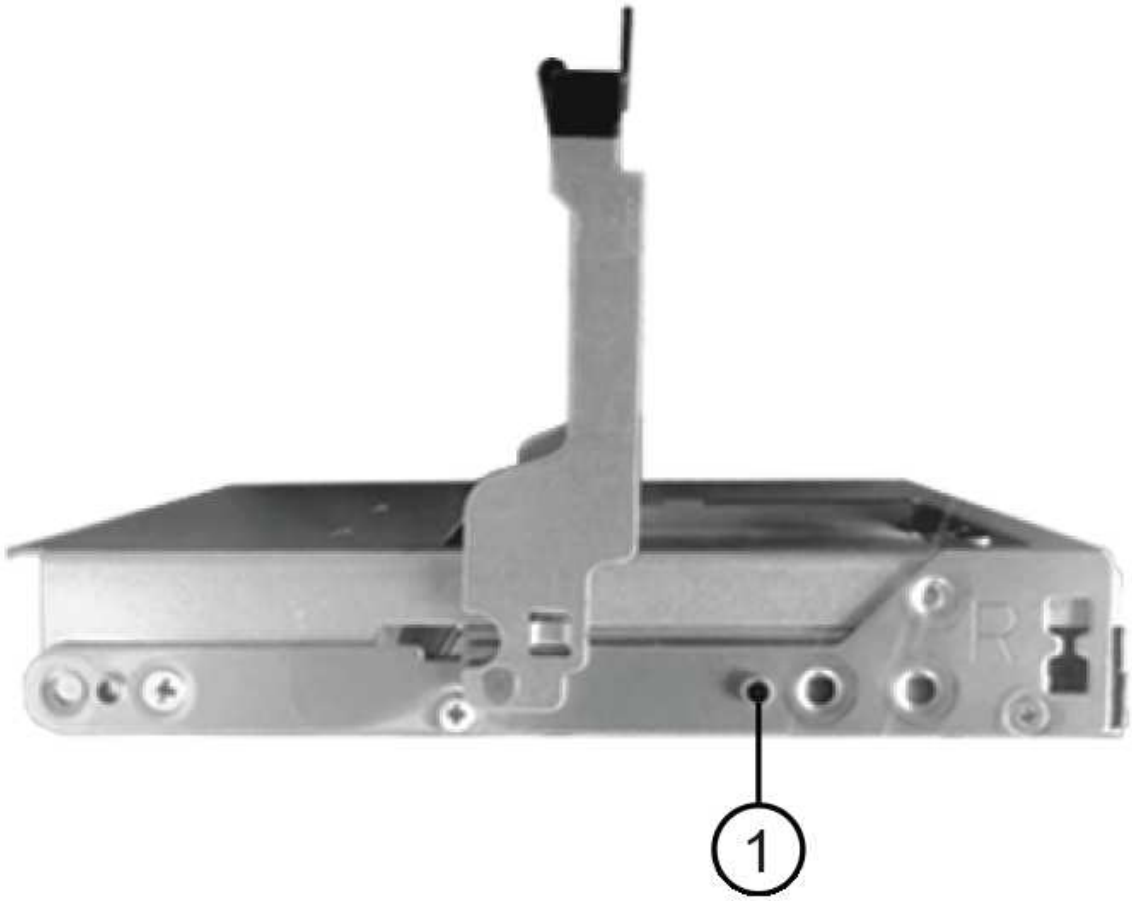
   - The first four slots (0, 3, 6, and 9) are occupied in each drawer.

     This ensures proper airflow in the disk shelf.

   - In a shelf with 30 drives, the remaining ten drives are distributed evenly throughout the shelf in slots 1 and 10 of each drawer. The following illustration shows how the drives are numbered from 0 to 11 in each drive drawer within the shelf. Slots 0, 3, 6, 9, and, in a shelf containing 30 drives, slots 1 and 10 in

each drawer must contain drives.

a. Reinstall any power supplies and IOMs you removed prior to installing your disk shelf into the rack.
b. Open the top drawer of the shelf.
c. Raise the cam handle on the drive to vertical.
d. 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

e. Lower the drive straight down, and then rotate the cam handle down until the drive snaps into place under the orange release latch.

f. Repeat the previous substeps for each drive in the drawer.

   You must be sure that slots 0, 3, 6, and 9 in each drawer contain drives.

g. Carefully push the drive drawer back into the enclosure.

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.

h. Close the drive drawer by pushing both levers towards the center.

i. Repeat these steps for each drawer in the disk shelf.

4. If you are adding multiple disk shelves, repeat this procedure for each disk shelf you are installing.

Do not power on the disk shelves at this time.

Cable disk shelves with IOM12 modules for a new system installation

You cable disk shelf SAS connections—shelf-to-shelf (as applicable) and controller-to-shelf—to establish storage connectivity for the system.

Before you begin

You must have met the requirements in Requirements for installing and cabling disk shelves with IOM12 modules for a new system installation and installed the disk shelves in the rack.

About this task

After you cable the disk shelves, you power them on, set the shelf IDs, and complete system setup and configuration.

Steps

1. Cable the shelf-to-shelf connections within each stack if the stack has more than one disk shelf; otherwise, go to the next step:

   For a detailed explanation and examples of shelf-to-shelf “standard” cabling and shelf-to-shelf “double-wide” cabling, see shelf-to-shelf connection rules.

If…	Then…
You are cabling a multipath HA, multipath, single-path HA, or single-path configuration	Cable the shelf-to-shelf connections as “standard” connectivity (using IOM ports 3 and 1): a. Beginning with the logical first shelf in the stack, connect IOM A port 3 to the next shelf’s IOM A port 1 until each IOM A in the stack is connected. b. Repeat substep a for IOM B. c. Repeat substeps a and b for each stack.
You are cabling a quad-path HA or quad-path configuration	Cable the shelf-to-shelf connections as “double-wide” connectivity: You cable the standard connectivity using IOM ports 3 and 1 and then the double-wide connectivity using IOM ports 4 and 2. a. Beginning with the logical first shelf in the stack, connect IOM A port 3 to the next shelf’s IOM A port 1 until each IOM A in the stack is connected. b. Beginning with the logical first shelf in the stack, connect IOM A port 4 to the next shelf’s IOM A port 2 until each IOM A in the stack is connected. c. Repeat substeps a and b for IOM B. d. Repeat substeps a through c for each stack.

2. Identify the controller SAS port pairs that you can use to cable the controller-to-stack connections.
   a. Check the controller-to-stack cabling worksheets and cabling examples to see whether a completed worksheet exists for your configuration.

      Controller-to-stack cabling worksheets and cabling examples for common AFF A200, AFF A220, FAS2600 series and FAS2700 configurations

      Controller-to-stack cabling worksheets and cabling examples for common multipath HA configurations

      Controller-to-stack cabling worksheet and cabling example for a quad-path HA configuration with two quad-port SAS HBAs

   b. The next step depends on whether a completed worksheet exists for your configuration:

If…	Then…
There is a completed worksheet for your configuration	Go to the next step. You use the existing completed worksheet.

If…	Then…
There is no completed worksheet for your configuration	Fill out the appropriate controller-to-stack cabling worksheet template: Controller-to-stack cabling worksheet template for multipathed connectivity Controller-to-stack cabling worksheet template for quad-pathed connectivity

3. Cable the controller-to-stack connections using the completed worksheet.

   If needed, instructions for how to read a worksheet to cable controller-to-stack connections are available:

   How to read a worksheet to cable controller-to-stack connections for multipathed connectivity

   How to read a worksheet to cable controller-to-stack connections for quad-pathed connectivity

4. Connect the power supplies for each disk shelf:
   a. Connect the power cords first to the disk shelves, securing them in place with the power cord retainer, and then connect the power cords to different power sources for resiliency.
   b. Turn on the power supplies for each disk shelf and wait for the disk drives to spin up.
5. Set the shelf IDs and complete system setup:

   You must set shelf IDs so they are unique within the HA pair or single-controller configuration, including the internal disk shelf in applicable systems.

If…	Then…
You are manually setting shelf IDs	a. Access the shelf ID button behind the left end cap. b. Change the shelf ID to a unique ID (00 through 99). c. Power-cycle the disk shelf to make the shelf ID take effect. Wait at least 10 seconds before turning the power back on to complete the power cycle. The shelf ID blinks and the operator display panel amber LED blinks until you power cycle the disk shelf. d. Power on the controllers and complete system setup and configuration as instructed by the installation and setup instructions for your platform model.

If…	Then…
You are automatically assigning all shelf IDs in your HA pair or single-controller configuration Shelf IDs are assigned in sequential order from 00-99. For systems with an internal disk shelf, shelf ID assignment begins with the internal disk shelf.	a. Power on the controllers. b. As the controllers start booting, press `Ctrl-C` to abort the AUTOBOOT process when you see the message `Starting AUTOBOOT press Ctrl-C to abort`. If you miss the prompt and the controllers boot to ONTAP, halt both controllers, and then boot both controllers to the boot menu by entering `boot_ontap menu` at their LOADER prompt. c. Boot one controller to Maintenance mode:`boot_ontap menu` You only need to assign shelf IDs on one controller. d. From the boot menu, select option 5 for Maintenance mode. e. Automatically assign shelf IDs: `sasadmin expander_set_shelf_id -a` f. Exit Maintenance mode:`halt` g. Bring up the system by entering the following command at the LOADER prompt of both controllers:`boot_ontap` Shelf IDs appear in disk shelf digital display windows. Before you boot the system, best practice is to take this opportunity to verify cabling is correct, a root aggregate is present, and run system-level diagnostics to identify any faulty components. h. Complete system setup and configuration as instructed by the installation and setup instructions for your platform model.

6. If as part of system set up and configuration, you did not enable disk ownership automatic assignment, manually assign disk ownership; otherwise, go to the next step:
   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.

7. Download and run Config Advisor as instructed by the installation and setup instructions for your platform model to verify SAS connections are cabled correctly and there are no duplicate shelf IDs within the system.

   If any SAS cabling or duplicate shelf ID errors are generated, follow the corrective actions provided.

   NetApp Downloads: Config Advisor

   You can also run the `storage shelf show -fields shelf-id` command to see a list of shelf IDs already in use (and duplicates if present) in your system.

8. Verify that in-band ACP was automatically enabled. `storage shelf acp show`

   In the output, “in-band” is listed as “active” for each node.