Dell EMC Data Domain DD6300, DD6800, and DD9300 Systems

Version 6.1

Hardware Overview and Installation Guide

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CONTENTS

FIGURES

TABLES

Revision history

Table 1 Document revision history

Revision	Date	Document part #	Software version	Description
08	May 2018	302-003-008	6.1	Added references to documentation for systems shipped in a rack from the factory.
07	January 2018	302-003-008	6.1	Added rack dimensions, corrected power specifications, and editorial revisions.
06	June 2017	302-003-008	6.1	Editorial revisions.
05	April 2017	302-003-008	6.0	Editorial revisions.
04	January 2017	302-003-008	6.0	Added heat dissipation (BTU/hr) to the system specifications.
03	December 2016	302-003-008	6.0	Editorial revisions.
02	October 2016	302-003-008	6.0	Editorial revisions.
01	October 2016	302-003-008	6.0	Initial publication.

CHAPTER 1

Planning and Site Preparation

Tools and supplies needed

These tools and supplies may be helpful for the installation and setup tasks for Data Domain systems.

- Null modem cable (DB-9 female to female), plus spare
- USB-to-DB-9 serial (male connector) converter cable if the laptop does not have a serial port, plus spare
- Power adapter, C13 to NEMA 5–15 (if based in North America), or a power cord for your laptop power adapter with a C13 plug, so that you can power your laptop from a rack PDU
- Antistatic wrist strap and conductive foam pad
- Screwdrivers:
  - Phillips #2 with a 12 in. or longer blade
  - Phillips #2 (standard-length blade)
  - Phillips #1
  - Flat head 3/16 in.
  - Flat head 1/4 in.
  - Torx T10
- Flashlight
- Needle nose pliers
- Diagonal wire cutters (for cutting tie wraps)
- 2 GB or greater USB flash memory drive
- Tie wraps (4 in. and 8 in.)
- (recommended) Roll of 5/8 inch Velcro cable tie material (3M Scotchmate SJ-3401 or similar)

Safety information

⚠ CAUTION

- **If the system is used in a manner that is not specified by the manufacturer, the protection that is provided by the equipment may be impaired.**
- **The RJ45 sockets on the motherboard, PCI cards, or I/O modules are for Ethernet connection only and must not be connected to a telecommunications network.**

Review this list of important safety recommendations.

- All plug-in modules and blank plates are part of the fire enclosure and must be removed only when a replacement can be added immediately. The system must not be run without all parts in place.
- DD6300, DD6800, and DD9300 systems must be operated only from a power supply input voltage range of 100–240 VAC and 50–60 Hz. The ES30 and FS15

shelves use 100–240 VAC and 50–60 Hz. DS60 shelves use 200–240 VAC and 50–60 Hz.

- Each component is intended to operate with all working power supplies installed.
- Provide a suitable power source with electrical overload protection.
- A safe electrical earth connection must be provided to each power cord. Check the grounding of the power sources before applying power.
- The plug on each power supply cord is used as the main device to disconnect power from the system. Ensure that the socket outlets are located near the equipment and are easily accessible.
- Permanently unplug the unit if you think it is damaged in any way and before moving the system. DD6300, DD6800, and DD9300 systems include two power supplies. To remove system power completely, disconnect both power supplies.
- The power connections must always be disconnected before removal or replacement of a power supply module from the system.
- A faulty power supply module must be replaced within 24 hours.
- Do not lift system components by yourself. DD6300, DD6800, and DD9300 systems weigh up to 80 lbs (36.29 kg) and an ES30 expansion shelf weighs up to 68 lbs (30.8 kg). A DS60 shelf weighs up to 225 lbs (102 KG)

  ⚠ CAUTION

  Data Domain systems are heavy. Use at least two people or a mechanical lift to move any system.

- Do not lift an expansion shelf by the front handles on any modules. The handles are not designed to support the weight of the populated shelf.
- To comply with applicable safety, emission, and thermal requirements, covers must not be removed and all bays must be fitted with plug-in modules.
- Once removed from the shipping box, it is ok to lift the system or the chassis

Figure 1 Warning about lifting the system

- To prevent the rack from becoming top-heavy, load the rack with storage shelves beginning at the bottom and the system in the designated location.
- Data Domain recommends that you wear a suitable antistatic wrist or ankle strap for ESD protection. Observe all conventional ESD precautions when handling plug-in modules and components.

Field-installed systems vs. factory-racked systems

Data Domain systems are available from the factory as components to install in an existing rack on site, or pre-installed in a rack. The following sections provide additional information about each type of installation.

Field-installed systems

This installation guide is primarily intended for systems shipped as components to be installed in an existing rack on site. Follow all the instructions in this document to rack, cable, and configure the system.

Factory-racked systems

Factory-racked systems are pre-installed in the rack, with the cables already connected. Follow the instructions in the chapter *Configure System For Use* to configure the factory-racked system.

The following documents, available from the Online Support website at https://support.emc.com, provide additional information about the factory rack:

- *Dell EMC 40U-P Cabinet Site Preparation Guide*
- *Dell EMC 40U-P Cabinet Unpacking and Setup Guide*
- *Data Domain Rack Service Guide*

CHAPTER 2

Data Domain DD6300, DD6800, and DD9300 Hardware Overview

Front panel

The front panel contains 12 slots for a mix of 4 TB hard disk drives (HDDs) and 800 GB solid state drives (SSDs). The exact layout of the drives, and the types of drives used varies depending on the specific system model.

Note

Configurations that do not fill all 12 drive slots use filler panels in the empty slots to maintain proper air flow inside the chassis.

DD6300 front panel

DD6300 All-in-One (AIO) systems have one of the following front panel drive configurations to host the DD OS boot drives, and provide storage for customer data:

Note

Upgrading a base configuration to an expanded configuration provides less capacity than a factory-built expanded configuration.

Table 2 DD6300 AIO capacity

Configuration	Installed drives	Usable internal capacity
DD6300 base configuration	Seven 4 TB HDDs	14 TB
DD6300 expanded configuration (factory)	Twelve 4 TB HDDs	34 TB
DD6300 expanded configuration (upgrade)	Seven 4 TB HDDs + Five 4 TB HDDs	22 TB

Table 3 DD6300 AIO configuration

Slot 0: HDD 1	Slot 1: HDD 2	Slot 2: HDD 3	Slot 3: HDD 4
Slot 4: HDD 5	Slot 5: HDD 6	Slot 6: HDD 7	Slot 7: Filler
Slot 8: Filler	Slot 9: Filler	Slot 10: Filler	Slot 11: Filler

Table 4 DD6300 AIO expanded configuration

Slot 0: HDD 1	Slot 1: HDD 2	Slot 2: HDD 3	Slot 3: HDD 4
Slot 4: HDD 5	Slot 5: HDD 6	Slot 6: HDD 7	Slot 7: HDD 8
Slot 8: HDD 9	Slot 9: HDD 10	Slot 10: HDD 11	Slot 11: HDD 12

DD6800 front panel

DD6800 Dataless Head (DLH) systems have one of the following front panel drive configurations to host the DD OS boot drives and provide metadata caching on SSD:

Table 5 DD6800 DLH SSD requirements

Configuration	Number of SSDs
DD6800	2
DD6800 expanded	4

Note

SSDs are not RAID-protected.

Table 6 DD6800 DLH configuration drive layout

Slot 0: HDD 1	Slot 1: HDD 2	Slot 2: HDD 3	Slot 3: HDD 4
Slot 4: SSD 1	Slot 5: SSD 2	Slot 6: Filler	Slot 7: Filler
Slot 8: Filler	Slot 9: Filler	Slot 10: Filler	Slot 11: Filler

Table 7 DD6800 DLH expanded configuration drive layout

Slot 0: HDD 1	Slot 1: HDD 2	Slot 2: HDD 3	Slot 3: HDD 4
Slot 4: SSD 1	Slot 5: SSD 2	Slot 6: SSD 3	Slot 7: SSD 4
Slot 8: Filler	Slot 9: Filler	Slot 10: Filler	Slot 11: Filler

DD9300 front panel

DD9300 Dataless Head (DLH) systems have one of the following front panel drive configurations to host the DD OS boot drives and provide metadata caching on SSD:

Table 8 DD9300 DLH SSD requirements

Configuration	Number of SSDs
DD9300	5
DD9300 expanded	8

Note

SSDs are not RAID-protected.

Table 9 DD9300 DLH configuration drive layout

Slot 0: HDD 1	Slot 1: HDD 2	Slot 2: HDD 3	Slot 3: HDD 4
Slot 4: SSD 1	Slot 5: SSD 2	Slot 6: SSD 3	Slot 7: SSD 4
Slot 8: SSD 5	Slot 9: Filler	Slot 10: Filler	Slot 11: Filler

Table 10 DD9300 DLH expanded configuration drive layout

Slot 0: HDD 1	Slot 1: HDD 2	Slot 2: HDD 3	Slot 3: HDD 4

Table 10 DD9300 DLH expanded configuration drive layout (continued)

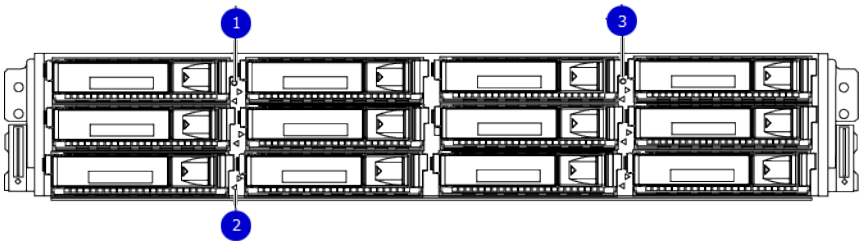
Slot 4: SSD 1	Slot 5: SSD 2	Slot 6: SSD 3	Slot 7: SSD 4
Slot 8: SSD 5	Slot 9: SSD 6	Slot 10: SSD 7	Slot 11: SSD 8

Front LED indicators

The front of the DD6300, DD6800, and DD9300 systems contain 12 disk drive status LEDs that are normally blue, and blink when there is activity on the disk. The LEDs are shaped like triangles, and the apex of the triangle points left or right, indicating that disk's status. If the disk drive has a failure, the disk's status LED turns from blue to amber, indicating that a drive must be replaced.

The front also contains two system status LEDs. A blue system power LED is present that is on whenever the system has power. An amber system fault LED is also present that is normally off and lit amber whenever the chassis or any other FRU in the system requires service.

Figure 2 Front LED indicators



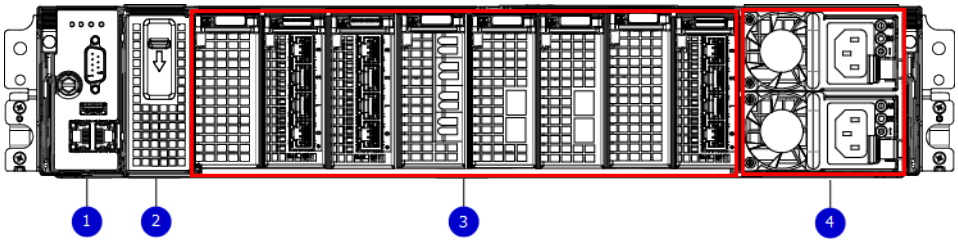
1. System service LED
2. Drive activity/service LED
3. System power LED

Table 11 Front LEDs

Name	Color	Purpose
System power LED	Blue	Indication that the system has power.
System service LED	Amber	Normally off; is lit amber whenever the SP or any other FRU (except disk drives) in the system requires service.
Drive activity/Service LED	Blue /Amber	• Lit blue when the drive is powered. • Blinks blue during drive activity. • Lit solid amber when a disk needs service.

Back panel

The back panel of the DD6300/DD6800/DD9300 chassis contains the following components:



1. Management panel
2. Two 2.5" SSD slots labeled 0 and 1 (populated on DD6300 only)
3. I/O module slots
4. Power supply modules (PSU 0 is the lower module, and PSU 1 is the upper module)

DD6300 rear SSDs

The D6300 system uses one or two 800 GB SSDs mounted at the rear of the chassis for metadata caching:

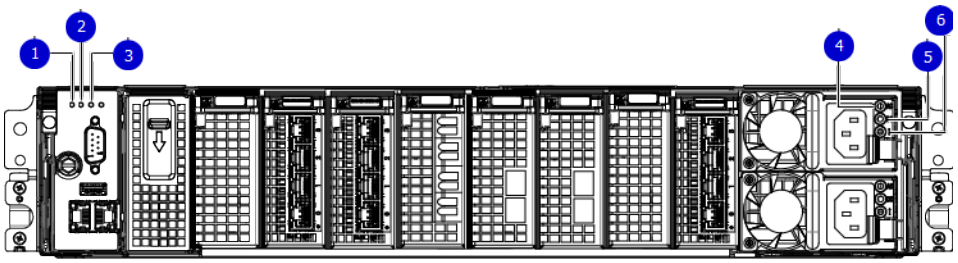
Configuration	Number of SSDs	SSD location
DD6300	1	SSD slot 0
DD6300 expanded	2	SSD slots 0 and 1

Note

SSDs are not RAID-protected.

Rear LED indicators

Figure 3 Rear LED indicators



1. Do not remove LED
2. SP service LED
3. System power LED
4. AC power good LED
5. DC power good LED

Figure 3 Rear LED indicators (continued)

6. Power supply fault LED

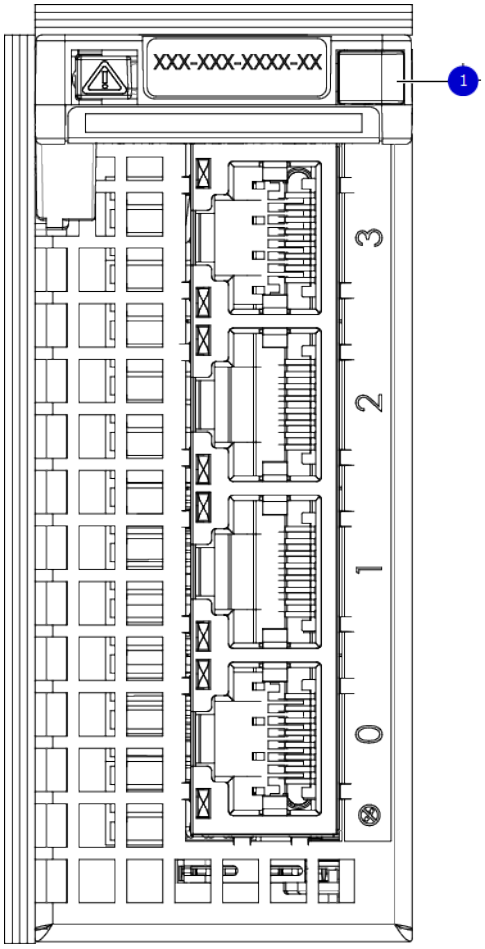
Name of LED	Location	Color	Definition
"Do not remove" LED	Upper left-most part of rear chassis	White	This LED is lit during system BIOS and BMC firmware updates and indicates that the SP should not be removed from the chassis, nor should system power be removed.

SP service LED	To the right of "Do not remove" LED	Amber	• Solid amber - SP or a FRU inside the SP requires service
			• Blinking amber - blink rate reflects one of the following is booting
			  ▪ BIOS - 1/4 Hz
			  ▪ POST - 1 Hz
			  ▪ OS - 4 Hz

Drive Power/Activity LED [a]	Left LED on the SSD	Blue	Lit blue when the drive is powered. Blinks during drive activity.
Drive Fault LED [a]	Right LED on the SSD	Amber	Lit solid amber when a drive needs service.
System power LED	Right-most LED on the management panel	Blue	SP has good, stable power
PSU FRU LED - AC Good	Top LED on power supply	Green	AC input is as expected
PSU FRU LED - DC Good	Middle LED on power supply	Green	DC output is as expected
PSU FRU LED - Attention	Bottom LED on power supply	Amber	PSU has encountered a fault condition

a. The SSD is only present on DD6300 systems.

Figure 4 I/O module Power/Service LED location

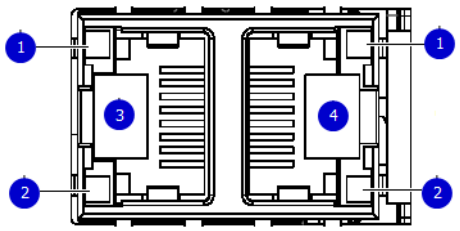


1. I/O module power/service LED

Name of LED	Location	Color	Definition
I/O module FRU LED - Figure 4 on page 21	Ejector handle of I/O modules	Green/Amber	• Green - I/O module has power and is functioning normally • Amber - I/O module has encountered a fault condition and requires service
I/O port status LED (SAS, Fibre Channel, and optical networking I/O modules only)	One LED per I/O module port	Blue	Lit when port is enabled. May flash if SW "marks" the port. [a]

a. For RJ45 networking ports, the standard green link and amber activity LEDs are used.

Figure 5 Onboard network port LEDs



1. Network port link LED
2. Network port activity LED
3. Dedicated IPMI port BMC0A
4. Management interface EthMa

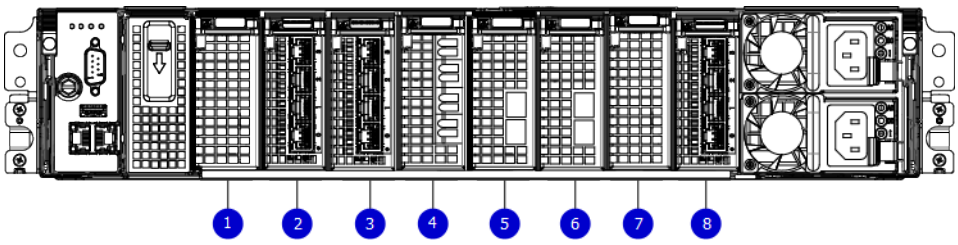
Name of LED	Location	Color	Definition
Onboard network port LED - Link LED Figure 5 on page 22	Top LED on network port	Green	• Lit when there is a link at 1000BaseT and 100BaseT speeds • Off when the link speed is 10BaseT or there is no link
Onboard network port LED - Activity LED	Bottom LED on network port	Amber	Blinks when there is traffic on the port

I/O modules

I/O module slot numbering

The eight I/O module slots are enumerated as Slot 0 (on the left when viewed from the rear) through Slot 7. Ports on an I/O module are enumerated as 0 through 3, with 0 being on the bottom.

Figure 6 I/O module slot numbering



1. Slot 0
2. Slot 1
3. Slot 2
4. Slot 3
5. Slot 4
6. Slot 5
7. Slot 6

8. Slot 7

Since DD6300, DD6800, and DD9300 is a data backup appliance, it is only supported in fixed configurations. The fixed configurations define the exact slots into which the I/O modules may be inserted. The processors directly drive the eight I/O module slots, meaning all slots are full performance.

The non-optional SAS, NVRAM, and 10GBaseT I/O modules are allocated to fixed slots. The optional Host Interface I/O modules are used for front end networking and Fibre Channel connections. The quantity and type of these I/O modules is customizable, and there are many valid configurations.

DD6300 slot map

Slot 0, Slot 1, Slot 2 (except when it is marked "Reserved") are populated with the required I/O modules and are not optional. I/O module slots 3-7 contain optional Host Interface I/O modules and can contain specific I/O modules or no I/O modules at all.

Table 12 DD6300 I/O slot module mapping

Tier	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7
AIO Expanded	NVRAM 8g Model 3	Quad Port 10 GBase-T	Reserved	(Optional) Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	(Optional) Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	(Optional) Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	(Optional) Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	(Optional) Quad Port 6 Gbps SAS [a]
AIO	NVRAM 8g Model 3	Quad Port 10 GBase-T	Reserved	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	Quad Port 6 Gbps SAS[a]

a. Optional in DD6300 configurations, but required with one or more external storage shelves.

DD6800 and DD9300 slot map

I/O module slots 3–6 contain optional Host Interface I/O modules and can contain specific I/O modules or no I/O modules at all. Slot 0, Slot 1, Slot 2, and Slot 7 are populated with the required I/O modules and are not optional.

Table 13 DD6800 and DD9300 I/O module slot mapping

Tier	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7
DLH	NVRAM 8g Model 3	Quad Port 10 GBase-T	Quad Port 6 Gbps SAS	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	Quad Port 6 Gbps SAS
DLH Extended Retention/DD Cloud Tier								

Table 13 DD6800 and DD9300 I/O module slot mapping (continued)

Tier	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7
				Fibre Channel		Fibre Channel		
DLH High Availability	NVRAM 8g Model 3	Quad Port 10 GBase-T for HA interconnect	Quad Port 6 Gbps SAS	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	Quad Port 10GbE SR, Quad Port 10 GBase-T, or Dual Port 16 Gbps Fibre Channel	Quad Port 6 Gbps SAS

I/O module population rules

DD6300, DD6800, and DD9300 systems have eight slots for I/O modules. Slots 0, 1, 2, and 7 are reserved. Slots 3, 4, 5, and 6 support host interface I/O modules. The maximum supported number of any type of host interface I/O module is four.

Note

A maximum of three Quad Port 10 GBase-T I/O modules are supported in slots 3-6 because of the mandatory Quad Port 10 GBase-T I/O module in slot 1.

The following table assigns rules for populating the I/O modules.

Table 14 I/O module slot population rules

Step	I/O module name	Slots	Notes
Step 1: Populate mandatory I/O modules	NVRAM 8g Model 3	0	Mandatory for all configurations
	Quad Port 10 GBase-T	1	Mandatory for all configurations
	Quad Port 6 Gbps SAS	2	Mandatory for DD6800 and DD9300 DLH. This slot is reserved for DD6300 configuration.
	Quad Port 6 Gbps SAS	7	Mandatory for all configurations except DD6300. Reserved in DD6300 for base configuration.
Step 2: Populate all Quad Port 10GbE SR I/O modules	Quad Port 10GbE SR	3, 4, 5, 6	Populate starting from the lowest available slot number.
Step 3: Populate all Quad Port 10 GBase-T I/O modules	Quad Port 10 GBase-T	3, 4, 5, 6	Populate starting from the lowest available slot number.

Table 14 I/O module slot population rules (continued)

Step	I/O module name	Slots	Notes
			With Quad Port 10 GBase-T in slot 1, max number of Quad Port 10 GBase-T I/O modules are limited to 4.
Step 4: Populate all Dual Port 16 Gbps Fibre Channel I/O modules	Dual Port 16 Gbps Fibre Channel	6, 5, 4, 3	Populate starting from the highest available slot number.

Storage capacity

Data Domain system internal indexes and other product components use variable amounts of storage, depending on the type of data and the sizes of files. If you send different datasets to otherwise identical systems, one system may, over time, have room for more or less actual backup data than another.

Note

For information about Data Domain expansion shelves, see the separate document, *Data Domain Expansion Shelf Hardware Guide*.

DD6300 storage capacity

The following table provides storage capacity information for the DD6300 system.

Table 15 DD6300 storage capacity

Memory	Internal disks	Internal storage (raw)	External storage (raw)	Usable data storage space (TB/TiB/GB/GiB)[a]			
48 GB (Base)	• Front: 7 x 4 TB or 12 x 4 TB HDD • Rear: 1 x 800 GB SSD	• 7 drives: 28 TB • 12 drives: 48 TB	60 TB	• 7 internal drives: 14 TB • 7+ 5 internal drives: 22 TB • 12 internal drives: 34 TB • External: 48 TB	• 7 internal drives: 12.74 TiB • 7+ 5 internal drives: 20.02 TiB • 12 internal drives: 30.94 TiB • External: 43.68 TiB	• 7 internal drives: 14,000 GB • 7+ 5 internal drives: 22,000 GB • 12 internal drives: 34,000 GB • External: 48,000 GB	• 7 internal drives: 13,039 GiB • 7+ 5 internal drives: 20,489 GiB • 12 internal drives: 31,665 GiB • External: 44,704 GiB
96 GB (Expanded)	• Front: 12 x 4 TB HDDs • Rear: 2 x 800 GB SSD	48 TB	180 TB	• Internal: 34 TB • External: 144 TB	• Internal: 30.94 TiB • External: 131 TiB	• Internal: 34,000 GB • External: 144,000 GB	• Internal: 31,665 GiB • External: 134,110 GiB

a. The capacity differs depending on the size of the external storage shelves used. This data based on ES30 shelves.

DD6800 storage capacity

The following table provides storage capacity information for the DD6800 system.

Table 16 DD6800 storage capacity

Memory	Internal disks (system disks only)	External storage (raw)	Usable data storage space (TB/TiB/GB/GiB)[a]			
192 GB (Base)	• 4 x 4 TB HDD • 2 x 800 GB SSD	180 TB[b]	144 TB	131 TiB	144,000 GB	134,110 GiB
192 GB (Expanded)	• 4 x 4 TB HDD • 4 x 800 GB SSD	• Active Tier: 360 TB[b] • Archive Tier: 360 TB[c] • Cloud Tier: 720 TB in the cloud[d] • Cloud Tier metadata: 120 TB local storage	• Active Tier: 288 TB • Archive Tier: 288 TB • Cloud Tier: 576 TB • Cloud Tier metadata: 96 TB	• Active Tier: 261.9 TiB • Archive Tier: 261.9 TiB • Cloud Tier: 523.8 TiB • Cloud Tier metadata: 87.3 TiB	• Active Tier: 288,000 GB • Archive Tier: 288,000 GB • Cloud Tier: 576,000 GB • Cloud Tier metadata: 96,000 GB	• Active Tier: 268,221 GiB • Archive Tier: 268,221 GiB • Cloud Tier: 536,442 GiB • Cloud Tier metadata: 89,407 GiB

a. The capacity differs depending on the size of the external storage shelves used. This data based on ES30 shelves.
b. HA is supported.
c. HA is not supported with Extended Retention.
d. HA is supported in combination with Cloud Tier.

DD9300 storage capacity

The following table provides storage capacity information for the DD9300 system.

Table 17 DD9300 storage capacity

Memory	Internal disks (system disks only)	External storage (raw)	Usable data storage space (TB/TiB/GB/GiB)[a]			
192 GB (Base)	• 4 x 4 TB HDD • 5 x 800 GB SSD	480 TB[b]	384 TB	349.2 TiB	384,000 GB	357,628 GiB
384 GB (Expanded)	• 4 x 4 TB HDD • 8 x 800 GB SSD	• Active Tier: 900 TB[b]	• Active Tier: 720 TB	• Active Tier: 654.8 TiB • Archive Tier: 654.8 TiB	• Active Tier: 720,000 GB • Archive Tier: 720,000 GB	• Active Tier: 670,552 GiB • Archive Tier: 670,552 GiB

Table 17 DD9300 storage capacity (continued)

Memory	Internal disks (system disks only)	External storage (raw)	Usable data storage space (TB/TiB/GB/GiB)[a]			
		• Archive Tier: 900 TB[c] • Cloud Tier: 1800 TB in the cloud[d] • Cloud Tier metadata: 240 TB local storage	• Archive Tier: 720 TB • Cloud Tier: 1,440 TB • Cloud Tier metadata: 192 TB	• Cloud Tier: 1,309.6 TiB • Cloud Tier metadata: 174.6 TiB	• Cloud Tier: 144,000 GB • Cloud Tier metadata: 192,000 GB	• Cloud Tier: 1,341,104 GiB • Cloud Tier metadata: 178,814 GiB

a. The capacity differs depending on the size of the external storage shelves used. This data based on ES30 shelves.
b. HA is supported.
c. HA is not supported with Extended Retention.
d. HA is supported in combination with Cloud Tier.

DD6300 system features

Table 18 DD6300 system features

Feature	DD6300 AIO (Base configuration)	DD6300 AIO (Expanded configuration)
Rack height	2U	2U
Processor	E5-2620 V3	E5-2620 V3
Kernel	3.2.x	3.2.x
Memory configuration (Non-extended retention)	48GB	96GB
DIMMs	6x8 GB	12x8 GB
Supported capacity (Non-extended retention)	76 TB (28 TB internal + 48 TB external)	180 TB (36 TB internal + 144 TB external)
Stream count	270 writes, 75 reads	270 writes, 75 reads
HDDs in 3.5" bays	7/ 7+5	12
SSDs in 3.5" bays	0	0
SSDs in 2.5" bays	1	2
NVRAM	NVRAM 8g Model 3	NVRAM 8g Model 3
High availability configuration support	No	No
HA Private Interconnect	N/A	N/A

Table 18 DD6300 system features (continued)

Feature		DD6300 AIO (Base configuration)	DD6300 AIO (Expanded configuration)
External SSD shelf		N/A	N/A
SAS I/O modules (Quad Port 6 Gbps SAS		• 0 for internal storage only • 1 with external storage	• 0 for internal storage only • 1 with external storage
SAS string depth (max)	ES30	1	4
	DS60	0	1

DD6300 system specifications

Table 19 DD6300 system specifications

Model	Average power consumption 25 C	Heat dissipation (operating maximum)	Weight [a]	Width	Depth	Height
DD6300	530W	1.69 x 10^6 J/hr (1604 Btu/hr) maximum	80 lbs (36.29 kg)	17.50 in (44.45 cm)	30.5 in (77.5 cm)	3.40 in (8.64 cm)

a. The weight does not include mounting rails. Allow 2.3-4.5 kg (5-10 lb) for a rail set.

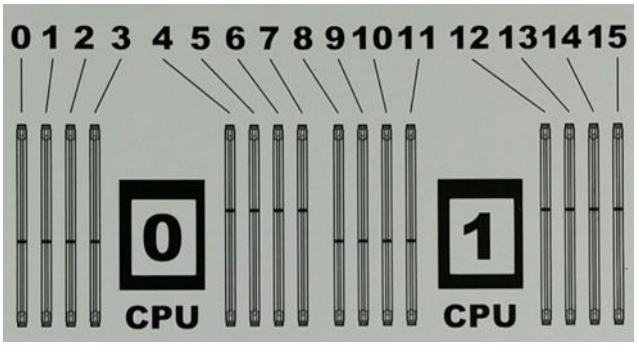
Table 20 System operating environment

Requirement	Description
Ambient temperature	10°C - 35°C; derate 1.1°C per 1,000 ft (304 m)
Relative humidity (extremes)	20–80% noncondensing
Elevation	0 - 7,500ft (0 - 2,268m)
Operating acoustic noise	L_{wad} sound power, 7.5 Bels

Internal system components

The following figure shows the layout of the CPUs and DIMMs inside the chassis. The front of the system is at the top of the figure.

Figure 7 CPU and memory locations



DIMMs overview

Dual in-line memory modules (DIMM) come in various sizes, which must be configured in a certain way. This topic can help you select the correct configuration when servicing DIMMs.

The storage processor contains two Intel processors each with an integrated memory controller that supports four channels of memory. The storage processor allows two DIMM slots per channel, so the storage processor supports a total of 16 DIMM slots.

DD6300 memory DIMM configuration

Table 21 DD6300 memory DIMM configuration

Tier	Total Memory	Memory DIMM Configuration
DD6300 AIO Expanded	96 GB	12 x 8 GB
DD6300 AIO	48 GB	6 x 8 GB

To ensure maximum memory performance, there are memory DIMM population rules for best memory loading and interleaving. Table 22 on page 30 and Table 23 on page 31 specify the DIMM location rules for various memory configurations:

Table 22 Memory locations - CPU 0

		Channel A		Channel B		Channel D		Channel C	
Tier	Total Memory	0	1	2	3	4	5	6	7
DD6300 AIO Expanded	96 GB	8 GB	N/A	8 GB	N/A	8 GB	8 GB	8 GB	8 GB
DD6300 AIO	48 GB	N/A	N/A	8 GB	N/A	N/A	8 GB	N/A	8 GB

Table 23 Memory locations - CPU 1

		Channel A		Channel B		Channel D		Channel C	
Tier	Total Memory	8	9	10	11	12	13	14	15
DD6300 AIO Expanded	96 GB	8 GB	8 GB	8 GB	8 GB	N/A	8 GB	N/A	8 GB
DD6300 AIO	48 GB	8 GB	N/A	8 GB	N/A	N/A	8 GB	N/A	N/A

DD6800 system features

Table 24 DD6800 system features

Feature		DD6800 DLH (Base configuration)	DD6800 DLH (Expanded configuration)
Rack height		2U	2U
Processor		E5-2630 V3	E5-2630 V3
Kernel		3.2.x	3.2.x
Memory configuration	Non-extended retention	192 GB	192 GB
	DD Cloud Tier	N/A	192 GB
	Extended retention	N/A	192 GB [a]
DIMMs		8x8 GB + 8x16 GB	8x8 GB + 8x16 GB
Supported capacity	Non-extended retention (Active tier)	144 TB	288 TB
	DD Cloud Tier	N/A	576 TB [b]
	Extended retention (Archive tier)	N/A	288 TB[a]
Stream count		405 writes, 112 reads	405 writes, 112 reads
HDDs in 3.5" bays		4	4
SSDs in 3.5" bays		2	4
SSDs in 2.5" bays		0	0
NVRAM		NVRAM 8g Model 3	NVRAM 8g Model 3
High availability configuration support		Yes	Yes
HA Private Interconnect		(2) 10GBase-T ports	(2) 10GBase-T ports
External SSD shelf		One SSD shelf for A-P high availability cluster containing two drives.	One SSD shelf for A-P high availability cluster containing four drives.
SAS I/O modules (Quad Port 6 Gbps SAS		2	2

Table 24 DD6800 system features (continued)

Feature		DD6800 DLH (Base configuration)	DD6800 DLH (Expanded configuration)
SAS string depth (max)	ES30	6	6 (7 for extended retention)
	DS60	3	3
	ES30 and DS60	5 shelves total	5 shelves total

a. Extended retention not available on HA configurations
b. DD Cloud Tier requires two ES30 shelves fully populated with 4 TB drives to store DD Cloud Tier metadata.

DD6800 system specifications

Table 25 DD6800 system specifications

Model	Average power consumption 25 C	Heat dissipation (operating maximum)	Weight [a]	Width	Depth	Height
DD6800	560W	1.69 x 10^6 J/hr (1604 Btu/hr) maximum	68 lbs (30.84 kg)	17.50 in (44.45 cm)	30.5 in (77.5 cm)	3.40 in (8.64 cm)

a. The weight does not include mounting rails. Allow 2.3-4.5 kg (5-10 lb) for a rail set.

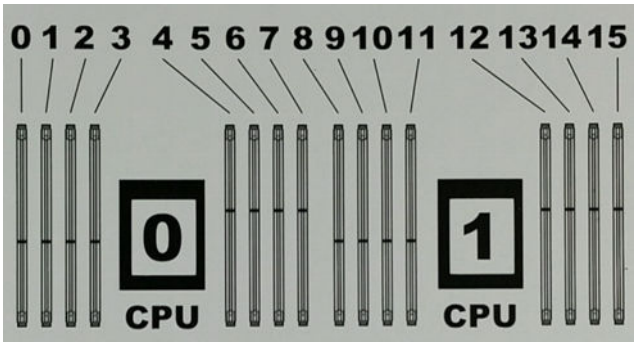
Table 26 System operating environment

Requirement	Description
Ambient temperature	10°C - 35°C; derate 1.1°C per 1,000 ft (304 m)
Relative humidity (extremes)	20–80% noncondensing
Elevation	0 - 7,500ft (0 - 2,268m)
Operating acoustic noise	L_{wad} sound power, 7.5 Bels

Internal system components

The following figure shows the layout of the CPUs and DIMMs inside the chassis. The front of the system is at the top of the figure.

Figure 8 CPU and memory locations



DIMMs overview

Dual in-line memory modules (DIMM) come in various sizes, which must be configured in a certain way. This topic can help you select the correct configuration when servicing DIMMs.

The storage processor contains two Intel processors each with an integrated memory controller that supports four channels of memory. The storage processor allows two DIMM slots per channel, so the storage processor supports a total of 16 DIMM slots.

DD6800 memory DIMM configuration

Table 27 DD6800 memory DIMM configuration

Tier	Total Memory	Memory DIMM Configuration
DD6800 DLH	192 GB	8 x 16 GB +8 x 8 GB
DD6800 DLH Extended Retention/DD Cloud Tier	192 GB	8 x 16 GB +8 x 8 GB

HA is supported with all available memory configurations.

To ensure maximum memory performance, there are memory DIMM population rules for best memory loading and interleaving. Table 28 on page 33 and Table 29 on page 34 specify the DIMM location rules for various memory configurations:

Table 28 Memory locations - CPU 0

		Channel A		Channel B		Channel D		Channel C	
Tier	Total Memory	0	1	2	3	4	5	6	7
DD6800 DLH	192 GB	16 GB	8 GB	16 GB	8 GB	8 GB	16 GB	8 GB	16 GB
DD6800 DLH Extended	192 GB	16 GB	8 GB	16 GB	8 GB	8 GB	16 GB	8 GB	16 GB

Table 28 Memory locations - CPU 0 (continued)

Retention/DD Cloud Tier									

Table 29 Memory locations - CPU 1

		Channel A		Channel B		Channel D		Channel C	
Tier	Total Memory	8	9	10	11	12	13	14	15
DD6800 DLH	192 GB	16 GB	8 GB	16 GB	8 GB	8 GB	16 GB	8 GB	16 GB
DD6800 DLH Extended Retention/DD Cloud Tier	192 GB	16 GB	8 GB	16 GB	8 GB	8 GB	16 GB	8 GB	16 GB

DD9300 system features

Table 30 DD9300 system features

Feature		**DD9300 DLH (Base configuration)**	**DD9300 DLH (Expanded configuration)**
Rack height		2U	2U
Processor		E5-2680 V3	E5-2680 V3
Kernel		3.2.x	3.2.x
Memory configuration	Non-extended retention	192 GB	384 GB
	DD Cloud Tier	N/A	384 GB
	Extended retention	N/A	384 GB [a]
DIMMs		4x32 GB + 4x16 GB	8x32 GB + 8x16 GB
Supported capacity	Non-extended retention (Active tier)	384TB	720 TB
	DD Cloud Tier	N/A	1440 TB [b]
	Extended retention (Archive tier)	N/A	720 TB [a]
Stream count		810 writes, 225 reads	810 writes, 225 reads
HDDs in 3.5" bays		4	4
SSDs in 3.5" bays		5	8
SSDs in 2.5" bays		0	0
NVRAM		NVRAM 8g Model 3	NVRAM 8g Model 3
High availability configuration support		Yes	Yes

Table 30 DD9300 system features (continued)

Feature		DD9300 DLH (Base configuration)	DD9300 DLH (Expanded configuration)
HA Private Interconnect		(2) 10GBase-T ports	(2) 10GBase-T ports
External SSD shelf		One SSD shelf for A-P high availability cluster containing five drives.	One SSD shelf for A-P high availability cluster containing eight drives.
SAS I/O modules (Quad Port 6 Gbps SAS		2	2
SAS string depth (max)	ES30	6	6 (7 for extended retention)
	DS60	3	3
	ES30 and DS60	5 shelves total	5 shelves total

a. Extended retention not available on HA configurations
b. DD Cloud Tier requires four ES30 shelves fully populated with 4 TB drives to store DD Cloud Tier metadata.

DD9300 system specifications

Table 31 DD9300 system specifications

Model	Average power consumption 25 C	Heat dissipation (operating maximum)	Weight [a]	Width	Depth	Height
DD9300	645W	1.69 x 10^6 J/hr (1604 Btu/hr) maximum	70 lbs (31.75 kg)	17.50 in (44.45 cm)	30.5 in (77.5 cm)	3.40 in (8.64 cm)

a. The weight does not include mounting rails. Allow 2.3-4.5 kg (5-10 lb) for a rail set.

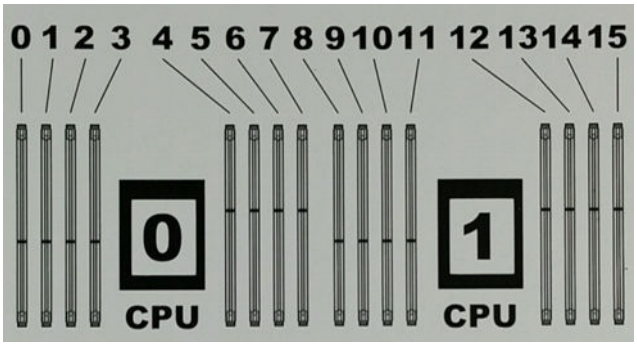
Table 32 System operating environment

Requirement	Description
Ambient temperature	10°C - 35°C; derate 1.1°C per 1,000 ft (304 m)
Relative humidity (extremes)	20–80% noncondensing
Elevation	0 - 7,500ft (0 - 2,268m)
Operating acoustic noise	L_{wad} sound power, 7.5 Bels

Internal system components

The following figure shows the layout of the CPUs and DIMMs inside the chassis. The front of the system is at the top of the figure.

Figure 9 CPU and memory locations



DIMMs overview

Dual in-line memory modules (DIMM) come in various sizes, which must be configured in a certain way. This topic can help you select the correct configuration when servicing DIMMs.

The storage processor contains two Intel processors each with an integrated memory controller that supports four channels of memory. The storage processor allows two DIMM slots per channel, so the storage processor supports a total of 16 DIMM slots.

DD9300 memory DIMM configuration

Table 33 DD9300 memory DIMM configuration

Tier	Total Memory	Memory DIMM Configuration
DD9300 DLH Expanded	384 GB	8 x 32 GB + 8 x 16 GB
DD9300 DLH	192 GB	4 x 32 GB + 4 x 16 GB
DD9300 DLH Extended Retention/DD Cloud Tier	384 GB	8 x 32 GB +8 x 16 GB

HA is supported with all available memory configurations.

To ensure maximum memory performance, there are memory DIMM population rules for best memory loading and interleaving. Table 34 on page 36 and Table 35 on page 37 specify the DIMM location rules for various memory configurations:

Table 34 Memory locations - CPU 0

		Channel A		Channel B		Channel D		Channel C	
Tier	Total Memory	0	1	2	3	4	5	6	7
DD9300 DLH Expanded	384 GB	32 GB	16 GB	32 GB	16 GB	16 GB	32 GB	16 GB	32 GB

Table 34 Memory locations - CPU 0 (continued)

DD9300 DLH	192 GB	16 GB	N/A	16 GB	N/A	N/A	32 GB	N/A	32 GB
DD9300 DLH Extended Retention/DD Cloud Tier	384 GB	32 GB	16 GB	32 GB	16 GB	16 GB	32 GB	16 GB	32 GB

Table 35 Memory locations - CPU 1

		Channel A		Channel B		Channel D		Channel C	
Tier	Total Memory	8	9	10	11	12	13	14	15
DD9300 DLH Expanded	384 GB	32 GB	16 GB	32 GB	16 GB	16 GB	32 GB	16 GB	32 GB
DD9300 DLH	192 GB	32 GB	N/A	32 GB	N/A	N/A	16 GB	N/A	16 GB
DD9300 DLH Extended Retention/DD Cloud Tier	384 GB	32 GB	16 GB	32 GB	16 GB	16 GB	32 GB	16 GB	32 GB

CHAPTER 3

Install the System in the Rack

Unpack the system

1. Remove the accessories and rail mount kit from the shipping packages.
2. Remove the controller and the bezels from the shipping packages.

⚠ CAUTION

Data Domain systems are heavy. Always use two people or a mechanical lift to move a system.

Figure 10 Warning about lifting the system

3. Remove expansion shelves and their bezels from the shipping packages.

Rails and cable management assembly

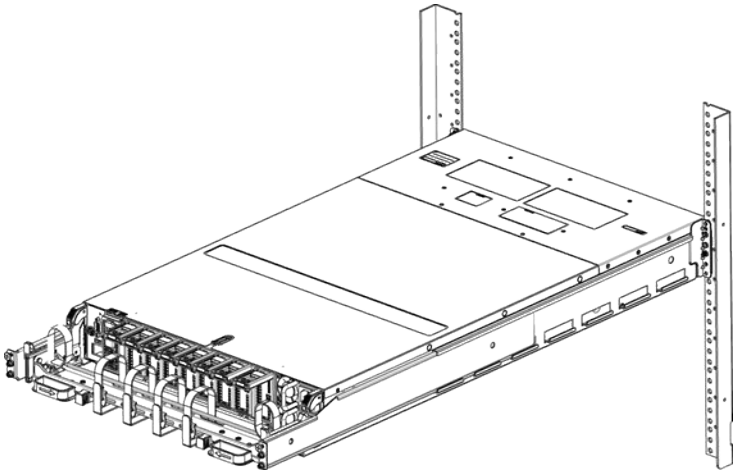
The rail kit is universal in that it supports all rack mounting hole types and sizes. Both the front and the rear ends of the rail kit contain threaded posts that come with a cap installed. The cap fits square and round hole unthreaded racks. Large flat headed M4 screws insert through the rail into the rail kit to secure the rail to the rack.

When installing rails, do not tighten the screws all the way until all the screws are in place. This assures that the screws are all screwed in the same distance, and prevents one from skewing the others.

The rail kit includes two bracket assemblies, one marked for the left side and one marked for the right side of the rack.

A cable management assembly (CMA), for organization of cables at the rear of the system, is already installed onto the system on a Data Domain rack. For field installed systems, the CMA is shipped with the system.

Figure 11 Cable management assembly (CMA)



Identify the rack location to install the system

Identify the designated location for the system controller or controllers in the rack.

- When using DD6300, DD6800, and DD9300 systems with ES30 shelves:
  - The designated location for a single node, or the primary node of an HA pair is U13-U14 in rack 1.
  - The designated location for the standby node of an HA pair is U15-16 in rack 1.
- When using DD6300, DD6800, and DD9300 systems with DS60 shelves:
  - The designated location for a single node, or the primary node of an HA pair is U22-U23 in rack 1.
  - The designated location for the standby node of an HA pair is U25-26 in rack 1.

Note

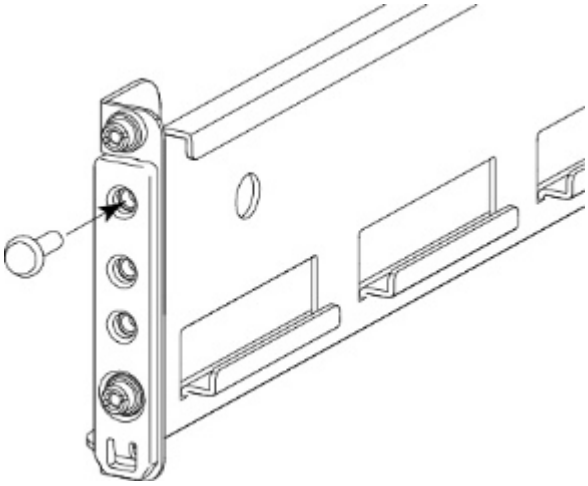
The designated slots in the rack are the recommended location for the DD6300, DD6800, and DD9300 systems to support the cabling described in this document. Other locations may require different cable lengths for some configurations.

Install the rails

This procedures describes how to install the mounting rails.

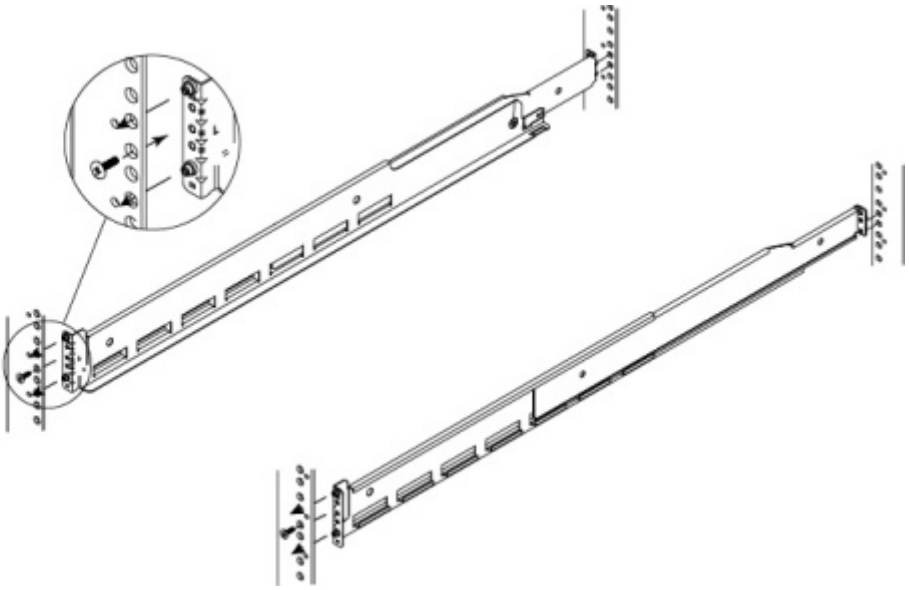
Procedure

1. If EIA rail mounting holes of 7.1 MM diameter round, or M5, 12-24, 10-32 threaded, are being used, install the filler using the pin as shown. If not, proceed to the next step.



Once the filler is installed to the rail, the installation can continue as follows.

2. At the front of the cabinet, insert the two adaptors on the front of the rail into the correct holes in the 2U space.

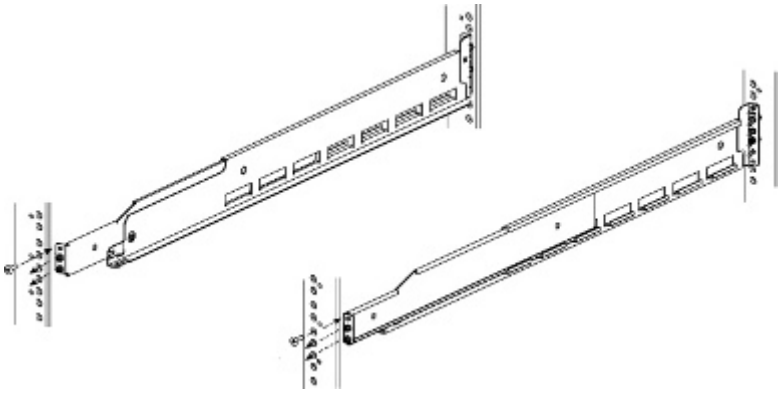


3. Insert one screw into the lower hole to hold the front of the rails in place. Do not fully tighten the screw at this time.

Note

An 18-inch screwdriver (minimum) is required to install the screw into the rear of the rails.

4. At the rear of the cabinet, align and insert the two adaptors on the rear of the rail with the mounting holes in the NEMA channel. Make sure the rail is level.



5. Use an 18-inch screwdriver (minimum) to secure the rear of the rail to the NEMA channel using one screw.
6. Tighten the front screw.
7. Repeat for the other rail.

Install the DD6300, DD6800, or DD9300 system into a rack

⚠ CAUTION

Data Domain systems are heavy. Always use two people or a mechanical lift to move a system.

Figure 12 Warning about lifting the system

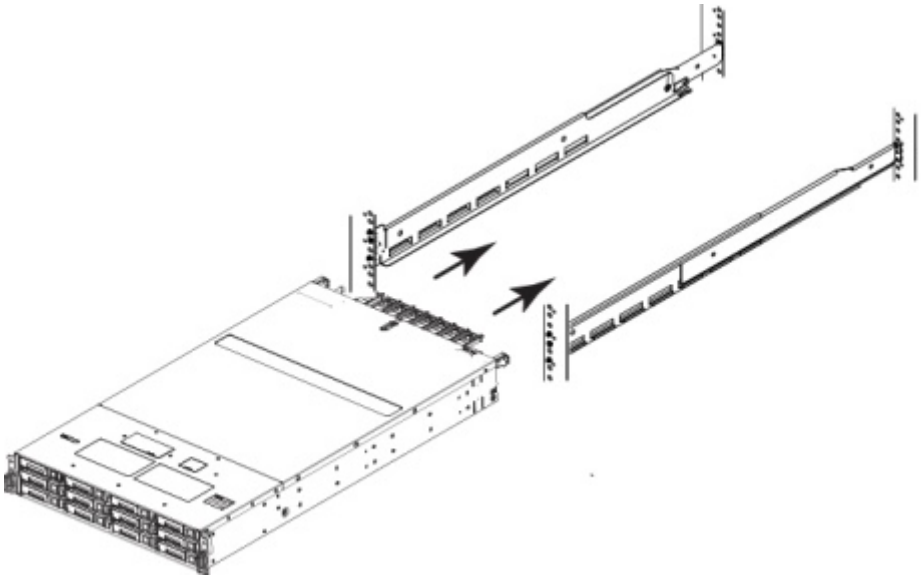
⚠ CAUTION

- **The system controller should be installed in the pre-defined location for the system controller in the rack to comply with Data Domain rack mounting guidelines.**
- **Do not apply AC power to the system controller until all expansion shelves and cables are installed.**
- **Ensure the PSNT label, which is in a slot just beneath the power supply on the rear of the chassis is not damaged or snagged during the installation of the system into the rack.**

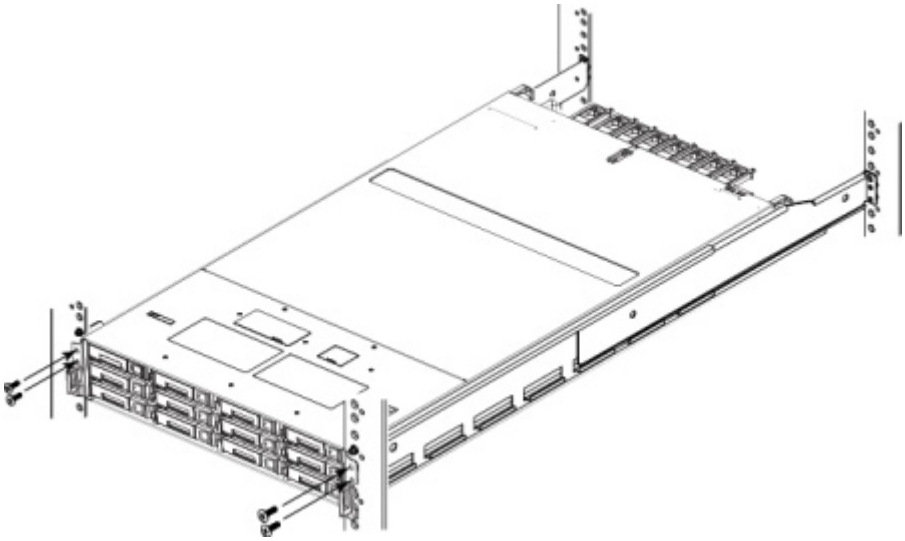
Procedure

1. From the front of the rack, lift the chassis to install the system in the rack in the correct location.

2. Slide the unit onto the rails and push it fully into the cabinet until the mounting holes on the unit are flush with the NEMA channel.

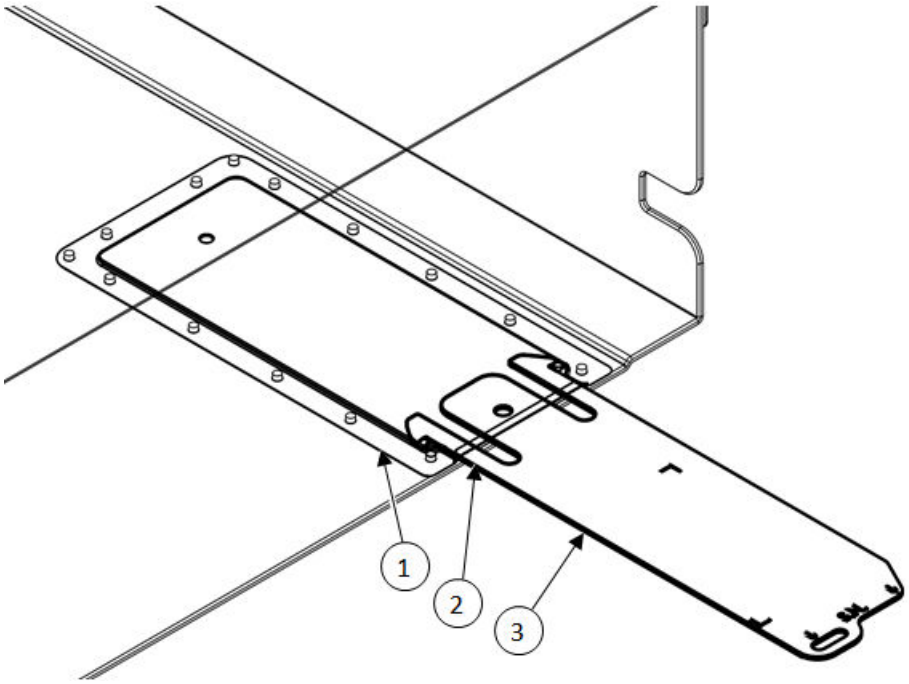


3. Secure the unit to the NEMA channel and rails using four screws, two on each side.



4. Check the PSNT label in the slot just beneath the power supply at the rear of the chassis.

Figure 13 Service tag (components removed for clarity)



1. Service tag bracket
2. Locking tab
3. Service tag

Installing the cable management assembly (CMA)

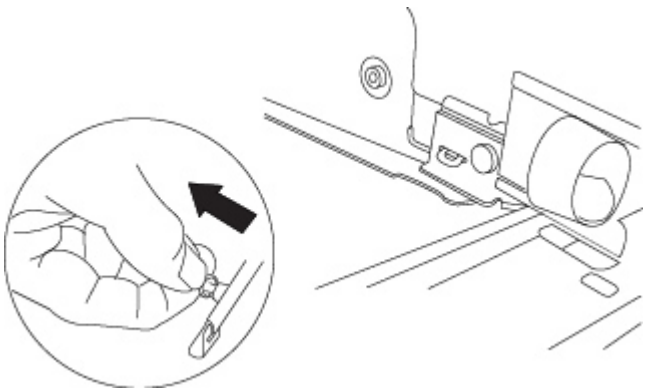
Installing a cable management assembly (CMA) can help keep the system neat and organized.

Procedure

1. Align and insert the CMA tabs in the tongues on the rails and align the plunger in the hole of the mounting rail on both sides.

2. Working one side at a time, pull out the plunger and slide the CMA tabs as required until the plunger pin snaps into the mounting hole of the rail.

   Figure 14 Installing the CMA on the rack

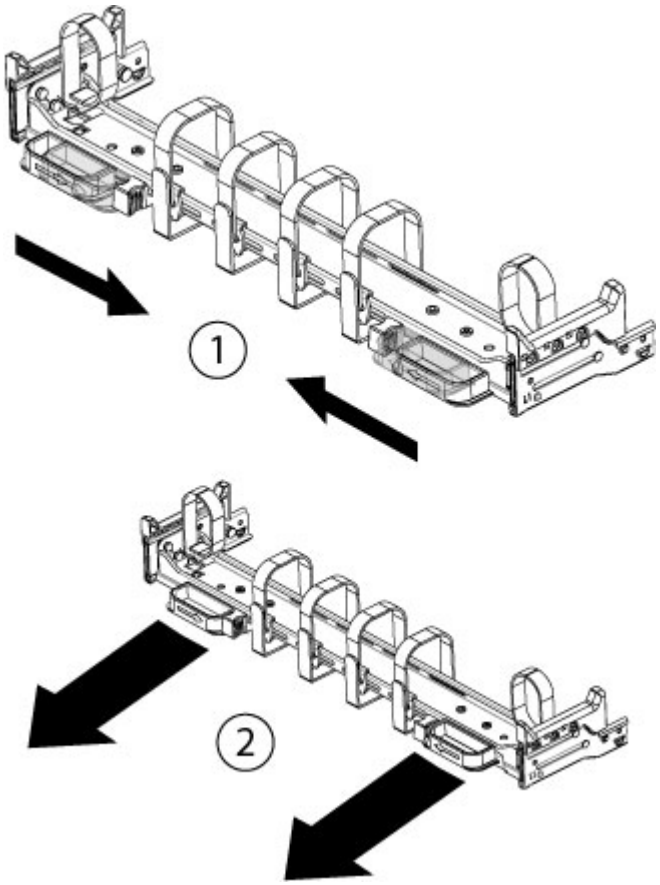


3. Open the velcro straps to route cables through the CMA. Secure the cables in place using the velcro straps.
4. To adjust the CMA position depth (in or out), pull inward on the orange latches (1) and pull out or push in on the arm simultaneously as needed (2).

Note

The I/O modules, the NVRAM module, the power supply units and the 2.5" disks can be accessed for removal and replacement with the CMA in place. Adjust the depth of the CMA arms to access these modules.

Figure 15 Adjusting the CMA depth



Installing the expansion shelves into the racks

⚠ CAUTION

- **Data Domain systems are heavy. Always use two people or a mechanical lift to move and install a Data Domain system. Use caution to install the expansion shelves.**
- **Ensure that each rack is securely anchored to prevent tipping.**

1. From the front of a rack, lift the shelf to the designated rack location.

2. Add shelves to the racks in order, one at a time, from the bottom of a rack to the top filling each string in that rack before going to the next.

   Note

   Strings in add-on racks may connect to the same string number in other racks.

   Shelves are added in the order V1.1, V1.2, V1.3, V1.4, V2.1, V2.2, and so on. Shelves are labeled VN.M. VN refers to string "N" and the "M" is the number of the shelf in the string. For example, V3.2 refers to the second shelf in the third string.
3. Secure each expansion shelf in the rack.
4. When installing an SSD shelf for Data Domain metadata on flash:
   - The SSD shelf counts towards the total number of shelves connected to the system.
   - Data Domain recommends installing the SSD shelf in the V1.1 positon, but if that is not possible, the shelf can be placed in a different location in the rack so long as cables of sufficient length are available.

     Note

     V1.1 is recommended for better performance because this will the 1st hop where data will be written. If the SSD shelf is connected to the last enclosure in a chain, then each read/write request has to go through many hops, which introduces latency issues when compared to when the SSD shelf is on the 1st shelf of a chain.

CHAPTER 4

Connect Cables and Power on

Connecting ES30 shelves

The cabling diagrams in this section show the maximum configurations for the DD6300, DD6800, and DD9300 systems. Not all systems will have all the disk shelves shown in the diagrams.

Add shelf-to-shelf cables between shelves in a loop and to the controller as shown in the diagrams.

1. Cable from the B Controller EXPANSION ◆ port of the lower shelf to the B controller HOST ● port of the next higher shelf.
2. Then cable from the A Controller HOST ● port of lower shelf to the A controller EXPANSION ◆ port of the next higher shelf
3. There are no specific placement or cabling requirements for SSD shelves, or the metadata shelves for DD Cloud Tier configurations. These shelves can be installed and cabled the same way as standard ES30 shelves. SSD shelves and DD Cloud Tier metadata do not need to be cabled in a separate set from the other ES30 shelves.

For HA pairs, the primary and standby nodes use different cables to connect to ES30 shelves. The primary node uses cables for ES30 host ports (●), and the standby node uses cables for ES30 expansion ports (◆).

ES30 cable information
When connecting ES30 shelves, different cables are required for the following connections:

- Connecting the primary node to the ES30 shelf loop
- Connecting the standby node to the ES30 shelf loop
- Connecting an ES30 shelf to an ES30 shelf within a loop

Table 36 Cables for primary node to ES30 shelf loop

HD-mini-SAS connector on controller, SFF-8088 connector keyed for host port on ES30		
Cable model code	**Part number**	**Cable length**
X-SAS-HDMS2	038-003-810	2 m (79 in)
X-SAS-HDMS3	038-003-811	3 m (118 in)
X-SAS-HDMS5	038-003-813	5 m (196 in)

Table 37 Cables for standby node to ES30 shelf loop

HD-mini-SAS connector on controller, SFF-8088 connector keyed for expansion port on ES30		
Cable model	**Part number**	**Cable length**
X-HA-ES30-SAS-2	038-004-108	2 m (79 in)
X-HA-ES30-SAS-5	038-004-111	5 m (196 in)

Table 38 ES30 to ES30 cable options

Mini-SAS cable, SFF-8088 connectors on both ends, one end keyed for host ports and the other keyed for expansion ports		
Cable model	**Part number**	**Cable length**
X-SAS-MSMS1	038-003-786	1 m (39 in.)
X-SAS-MSMS2	038-003-787	2 m (79 in.)
X-SAS-MSMS3	038-003-751	3 m (118 in.)
X-SAS-MSMS4	038-003-628	4 m (158 in.)
X-SAS-MSMS5	038-003-666	5 m (196 in.)

Select the appropriate configuration from the following list, and connect the disk shelves to the Data Domain controller.

- DD6300 on page 51
- DD6800 and DD9300 (single node, DD Cloud Tier, or ERSO) on page 52
- DD6800 and DD9300 (HA or HA with DD Cloud Tier) on page 54

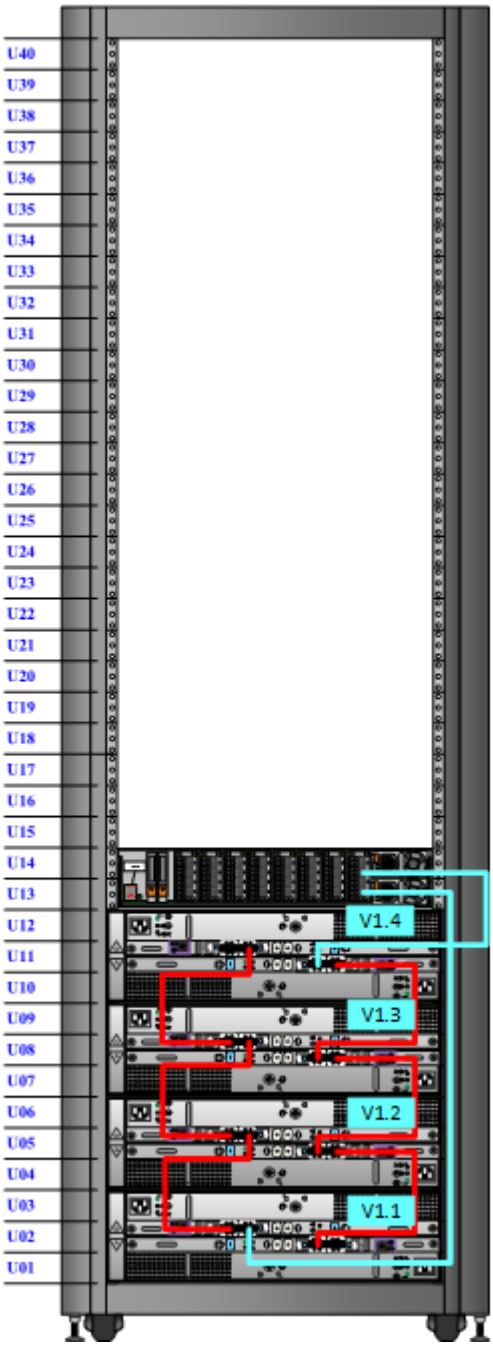
DD6300

The DD6300 system supports a maximum of four shelves, cabled in a single set.

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	B controller HOST ● port of shelf V1.1	2M
1	I/O 7 - Port 2	A controller HOST ● port of the highest number shelf in V1	2M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.

Figure 16 DD6300 with ES30 shelves



DD6800 and DD9300 (single node, DD Cloud Tier, or ERSO)

The DD6800 and DD9300 systems support a maximum of 28 shelves, divided into four sets of seven shelves.

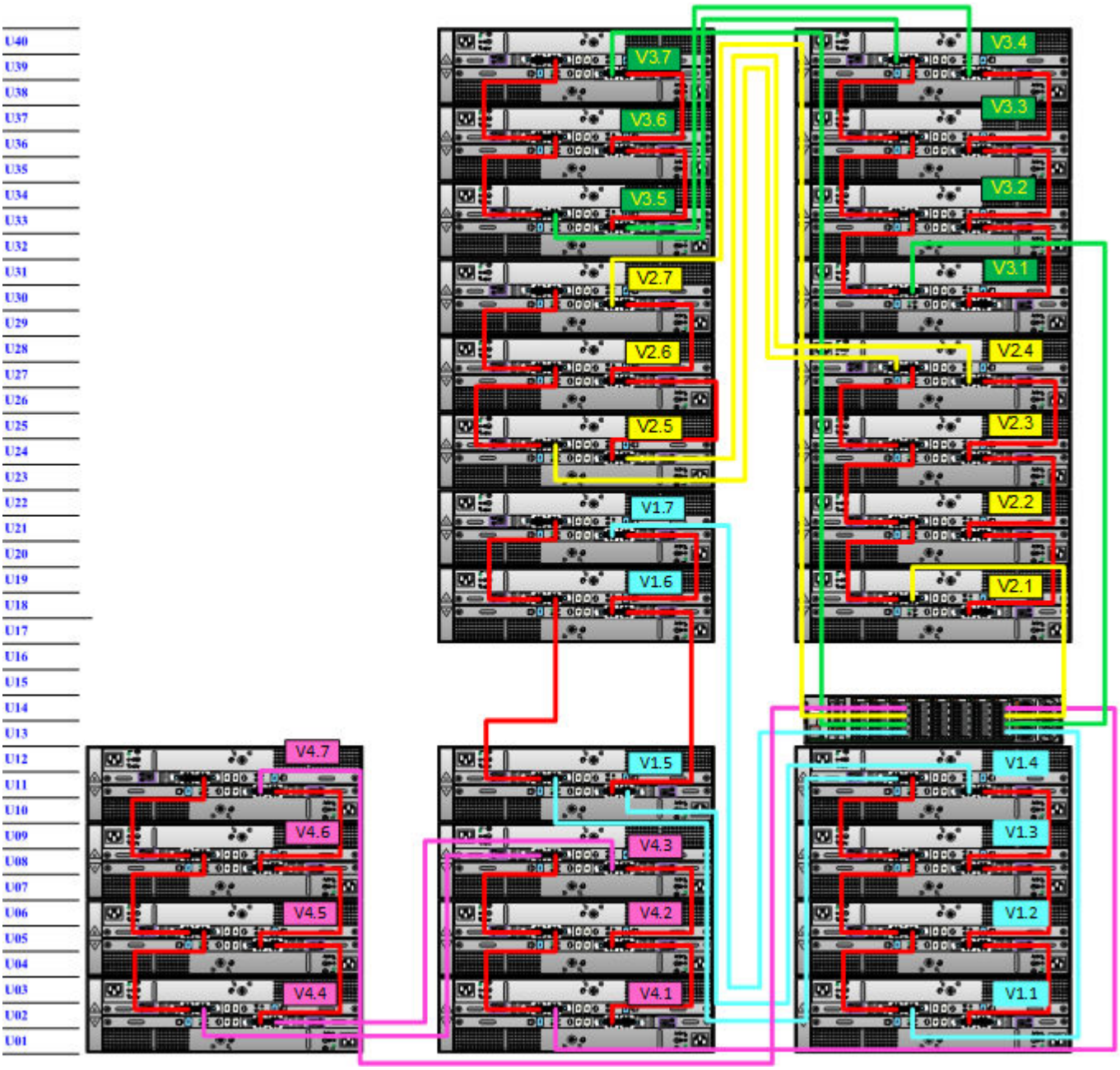
Note

For configurations of 16 SAS shelves or less, do not exceed four shelves per set.

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	B controller HOST ● port of shelf V1.1	2M
1	I/O 2 - Port 0	A controller HOST ● port of the highest number shelf in V1	2M
2	I/O 7 - Port 2	B controller HOST ● port of shelf V2.1	2M
2	I/O 2 - Port 2	A controller HOST ● port of the highest number shelf in V2	2M
3	I/O 7 - Port 1	B controller HOST ● port of shelf V3.1	2M
3	I/O 2 - Port 1	A controller HOST ● port of the highest number shelf in V3	2M
4	I/O 7 - Port 3	B controller HOST ● port of shelf V4.1	3M
4	I/O 2 - Port 3	A controller HOST ● port of the highest number shelf in V4	3M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.

Figure 17 DD6800 and DD9300 with ES30s, single node, DD Cloud Tier, or ER



DD6800 and DD9300 (HA or HA with DD Cloud Tier)

The DD6800 and DD9300 systems support a maximum of 28 shelves, divided into four sets of seven shelves.

Note

For configurations of 16 SAS shelves or less, do not exceed four shelves per set.

Table 39 Primary node cabling instructions

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	B controller HOST ● port of shelf V1.1	2M
1	I/O 2 - Port 0	A controller HOST ● port of the highest number shelf in V1	2M
2	I/O 7 - Port 2	B controller HOST ● port of shelf V2.1	2M
2	I/O 2 - Port 2	A controller HOST ● port of the highest number shelf in V2	2M
3	I/O 7 - Port 1	B controller HOST ● port of shelf V3.1	2M
3	I/O 2 - Port 1	A controller HOST ● port of the highest number shelf in V3	2M
4	I/O 7 - Port 3	B controller HOST ● port of shelf V4.1	3M
4	I/O 2 - Port 3	A controller HOST ● port of the highest number shelf in V4	3M

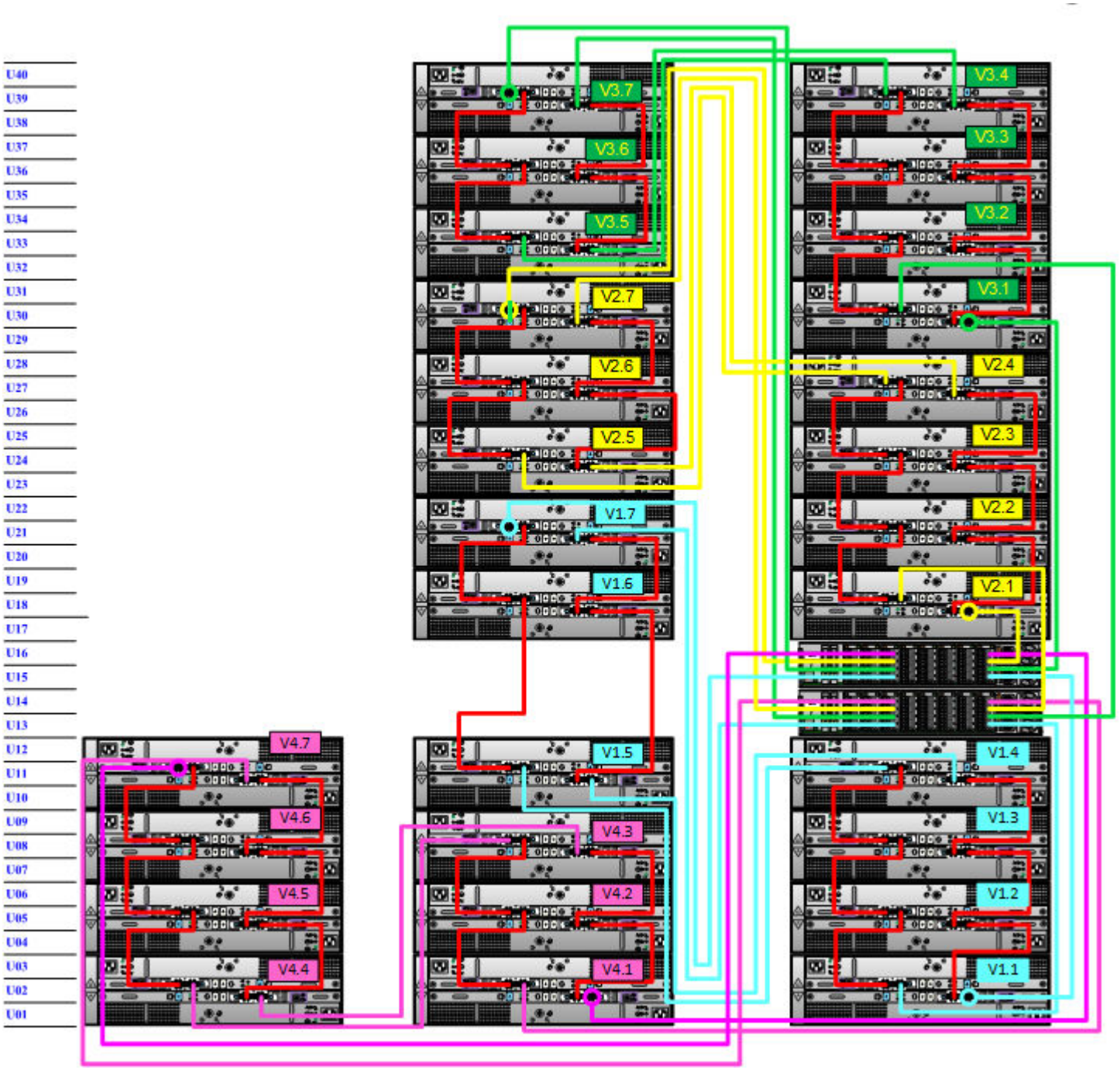
a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.

Table 40 Standby node cabling instructions

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	A controller EXPANSION ◆ port of shelf V1.1	2M
1	I/O 2 - Port 0	B controller EXPANSION ◆ port of the highest number shelf in V1	2M
2	I/O 7 - Port 2	A controller EXPANSION ◆ port of shelf V2.1	2M
2	I/O 2 - Port 2	B controller EXPANSION ◆ port of the highest number shelf in V2	2M
3	I/O 7 - Port 1	A controller EXPANSION ◆ port of shelf V3.1	2M
3	I/O 2 - Port 1	B controller EXPANSION ◆ port of the highest number shelf in V3	2M
4	I/O 7 - Port 3	A controller EXPANSION ◆ port of shelf V4.1	3M
4	I/O 2 - Port 3	B controller EXPANSION ◆ port of the highest number shelf in V4	3M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.

Figure 18 DD6800 and DD9300 with ES30s and HA or HA with DD Cloud Tier



Connecting DS60 shelves

The cabling diagrams in this section show the maximum configurations for the DD6300, DD6800, and DD9300 systems. Not all systems will have all the disk shelves shown in the diagrams.

Add shelf-to-shelf cables between shelves in a loop and to the controller as shown in the diagrams.

1. The recommended cabling for HA utilizes a maximum of three loops.
2. There are no specific placement or cabling requirements for SSD shelves. These shelves can be installed and cabled the same way as standard ES30 shelves.
3. The SSD shelf counts towards the total number of shelves connected to the system.
4. Data Domain recommends installing the SSD shelf in the V1.1 positon, but if that is not possible, the shelf can be placed in a different location in the rack so long as cables of sufficient length are available.

   Note

   V1.1 is recommended for better performance because this will the 1st hop where data will be written. If the SSD shelf is connected to the last enclosure in a chain, then each read/write request has to go through many hops, which introduces latency issues when compared to when the SSD shelf is on the 1st shelf of a chain.

5. Use the cable management assembly to support and organize all cables.

DS30 cable information

When connecting DS60 shelves, the same cable type connects a controller to a DS60 shelf, or a DS60 shelf to a DS60 shelf.

Table 41 DS60 cables

HD-mini-SAS connector on controller and enclosure		
Cable model code	**Part number**	**Cable length**
XC-DS60-SAS-3M	038-004-380-01	3 m (118 in)
XC-DS60-SAS-4M	038-000-212-00	4 m (158 in)
XC-DS60-SAS-5M	038-000-214-00	5 m (196 in)

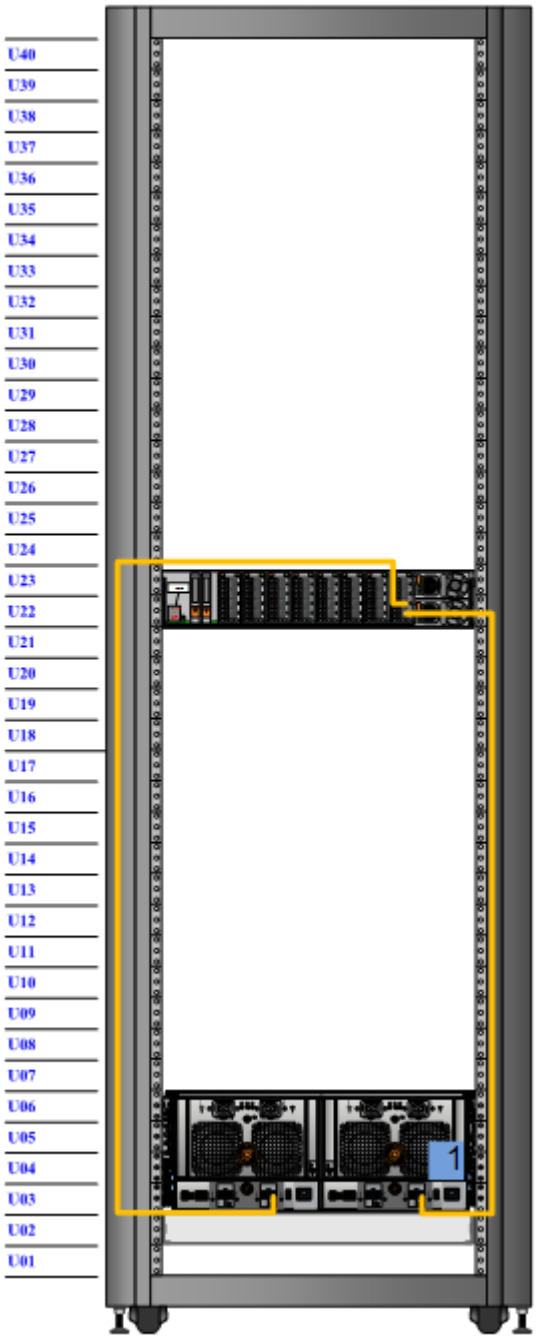
Select the appropriate configuration from the following list, and connect the disk shelves to the Data Domain controller.

- DD6300 on page 58
- DD6800 and DD9300 on page 59
- DD6800 and DD9300 with HA on page 61
- DD6800 with DD Cloud Tier on page 62
- DD6800 and with HA and DD Cloud Tier on page 64
- DD9300 with DD Cloud Tier or HA and DD Cloud Tier on page 65
- DD6800 and DD9300 with ERSO on page 67

DD6300

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	A controller port 0 of the DS60.	2M
1	I/O 7 - Port 1	B controller port 0 of the DS60.	2M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.

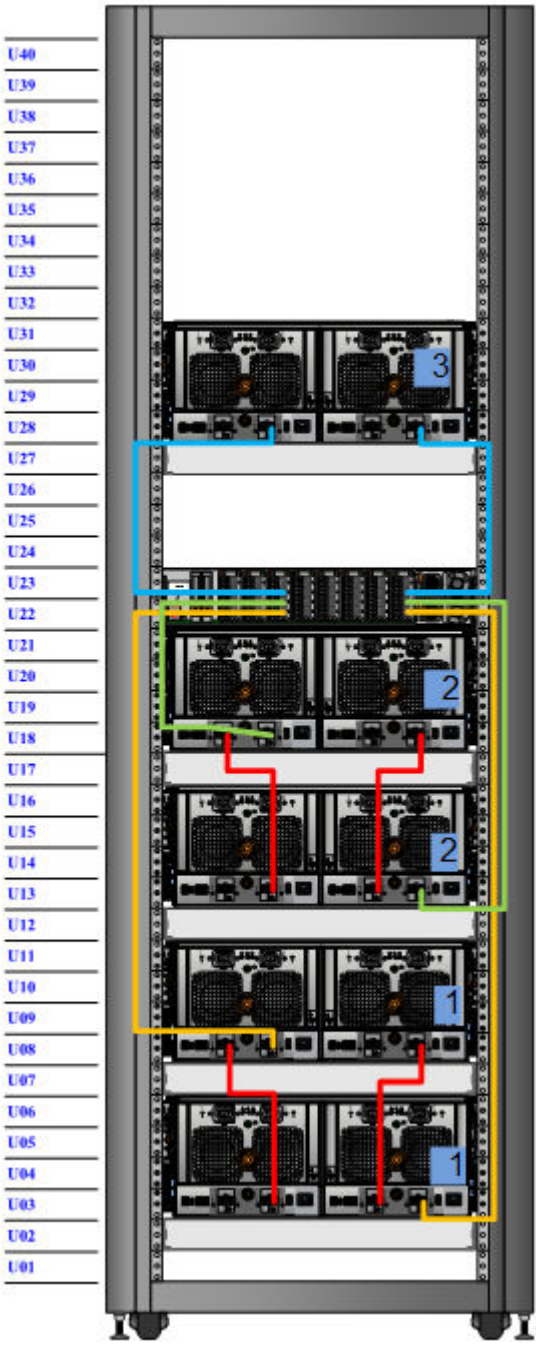


DD6800 and DD9300

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	A controller port 0 of shelf V1.1	2M
1	I/O 2 - Port 0	B controller port 0 of the highest number shelf in V1	2M
2	I/O 7 - Port 1	A controller port 0 of shelf V2.1	2M

String (Loop)	I/O - Port	Shelf Port	Length [a]
2	I/O 2 - Port 1	B controller port 0 of the highest number shelf in V2	2M
3	I/O 7 - Port 2	A controller port 0 of shelf V3.1	2M
3	I/O 2 - Port 2	B controller port 0 of the highest number shelf in V3	2M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.



DD6800 and DD9300 with HA

DD6800 and DD9300 with HA

Table 42 Primary node cabling instructions

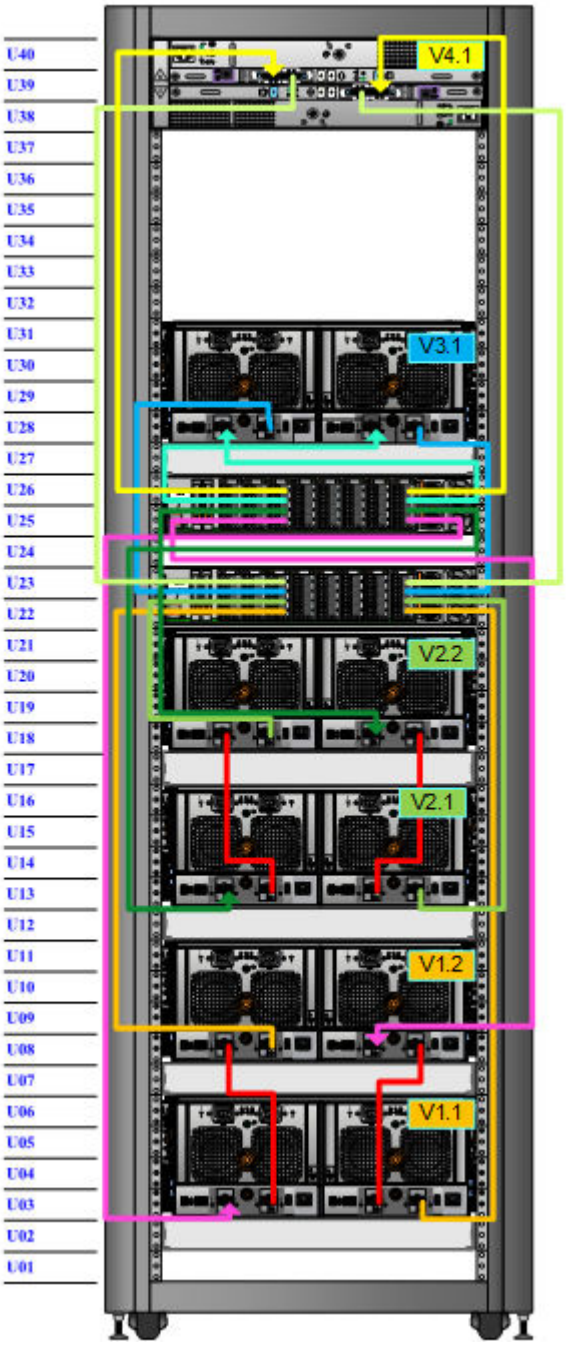
String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	A controller port 0 of shelf V1.1	2M
1	I/O 2 - Port 0	B controller port 0 of the highest number shelf in V1	2M
2	I/O 7 - Port 1	A controller port 0 of shelf V2.1	2M
2	I/O 2 - Port 1	B controller port 0 of the highest number shelf in V2	2M
3	I/O 7 - Port 2	A controller port 0 of shelf V3.1	2M
3	I/O 2 - Port 2	B controller port 0 of the highest number shelf in V3	2M
4	I/O 7 - Port 3	A controller HOST ● port of the SSD shelf	2M
4	I/O 2 - Port 3	B controller HOST ● port of the SSD shelf	2M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.

Table 43 Standby node cabling instructions

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	B controller port 2 of shelf V1.1	2M
1	I/O 2 - Port 0	A controller port 2 of the highest number shelf in V1	2M
2	I/O 7 - Port 1	B controller port 2 of shelf V2.1	2M
2	I/O 2 - Port 1	A controller port 2 of the highest number shelf in V2	2M
3	I/O 7 - Port 2	B controller port 2 of shelf V3.1	2M
3	I/O 2 - Port 2	A controller port 2 of the highest number shelf in V3	2M
4	I/O 7 - Port 3	A controller EXPANSION ◆ port of the SSD shelf	2M
4	I/O 2 - Port 3	B controller EXPANSION ◆ port of the SSD shelf	2M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.

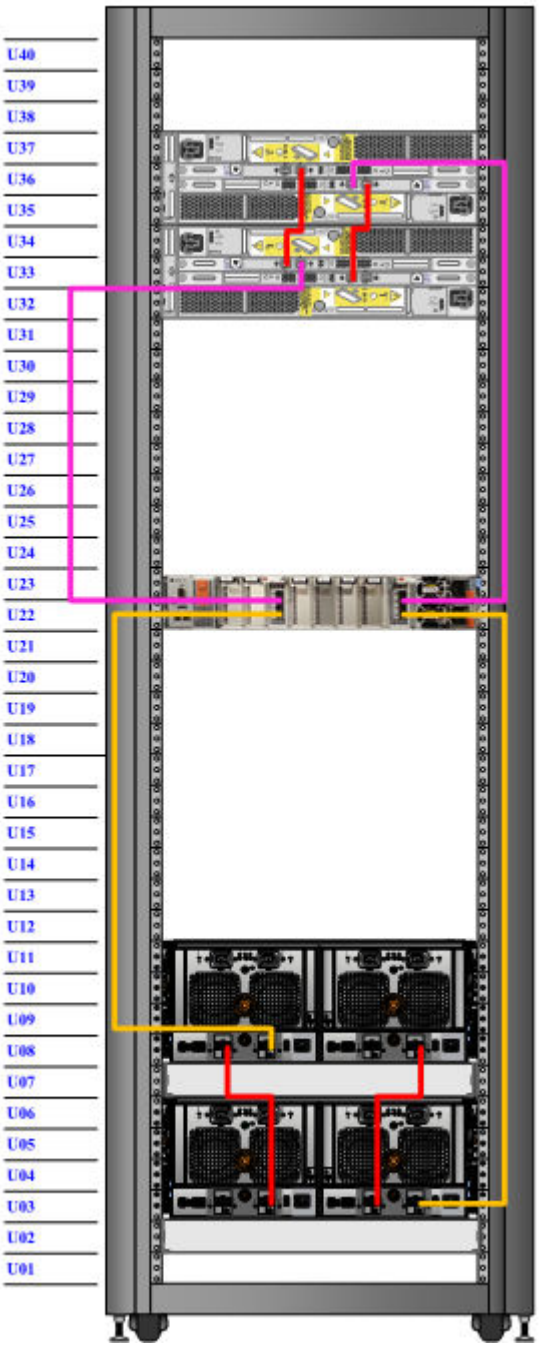


DD6800 with DD Cloud Tier

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	A controller port 0 of shelf V1.1	2M
1	I/O 2 - Port 0	B controller port 0 of the highest number shelf in V1	2M

String (Loop)	I/O - Port	Shelf Port	Length [a]
2	I/O 7 - Port 1	A controller HOST ● port of the second metadata shelf	2M
2	I/O 2 - Port 1	B controller HOST ● port of the first metadata shelf	2M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.



DD6800 and with HA and DD Cloud Tier

Table 44 Primary node cabling instructions

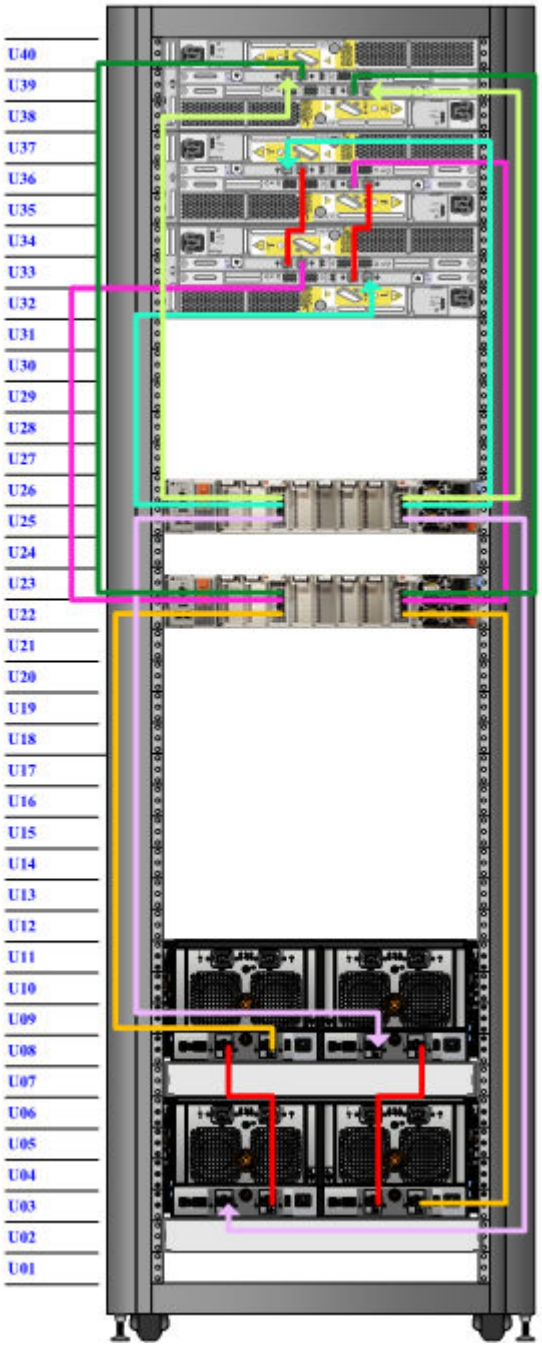
String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	A controller port 0 of shelf V1.1	2M
1	I/O 2 - Port 0	B controller port 0 of the highest number shelf in V1	2M
2	I/O 7 - Port 2	A controller HOST ● port of the second metadata shelf	2M
2	I/O 2 - Port 2	B controller HOST ● port of the first metadata shelf	2M
3	I/O 7 - Port 3	A controller HOST ● port of the SSD shelf	2M
3	I/O 2 - Port 3	B controller HOST ● port of the SSD shelf	2M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.

Table 45 Standby node cabling instructions

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	B controller port 2 of shelf V1.1	2M
1	I/O 2 - Port 0	A controller port 2 of the highest number shelf in V1	2M
2	I/O 7 - Port 2	B controller EXPANSION ◆ port of the second metadata shelf	2M
2	I/O 2 - Port 2	A controller EXPANSION ◆ port of the first metadata shelf	2M
3	I/O 7 - Port 3	A controller EXPANSION ◆ port of the SSD shelf	2M
3	I/O 2 - Port 3	B controller EXPANSION ◆ port of the SSD shelf	2M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.



DD9300 with DD Cloud Tier or HA and DD Cloud Tier

Table 46 Primary node cabling instructions

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	A controller port 0 of shelf V1.1	2M
1	I/O 2 - Port 0	B controller port 0 of the highest number shelf in V1	2M

Table 46 Primary node cabling instructions (continued)

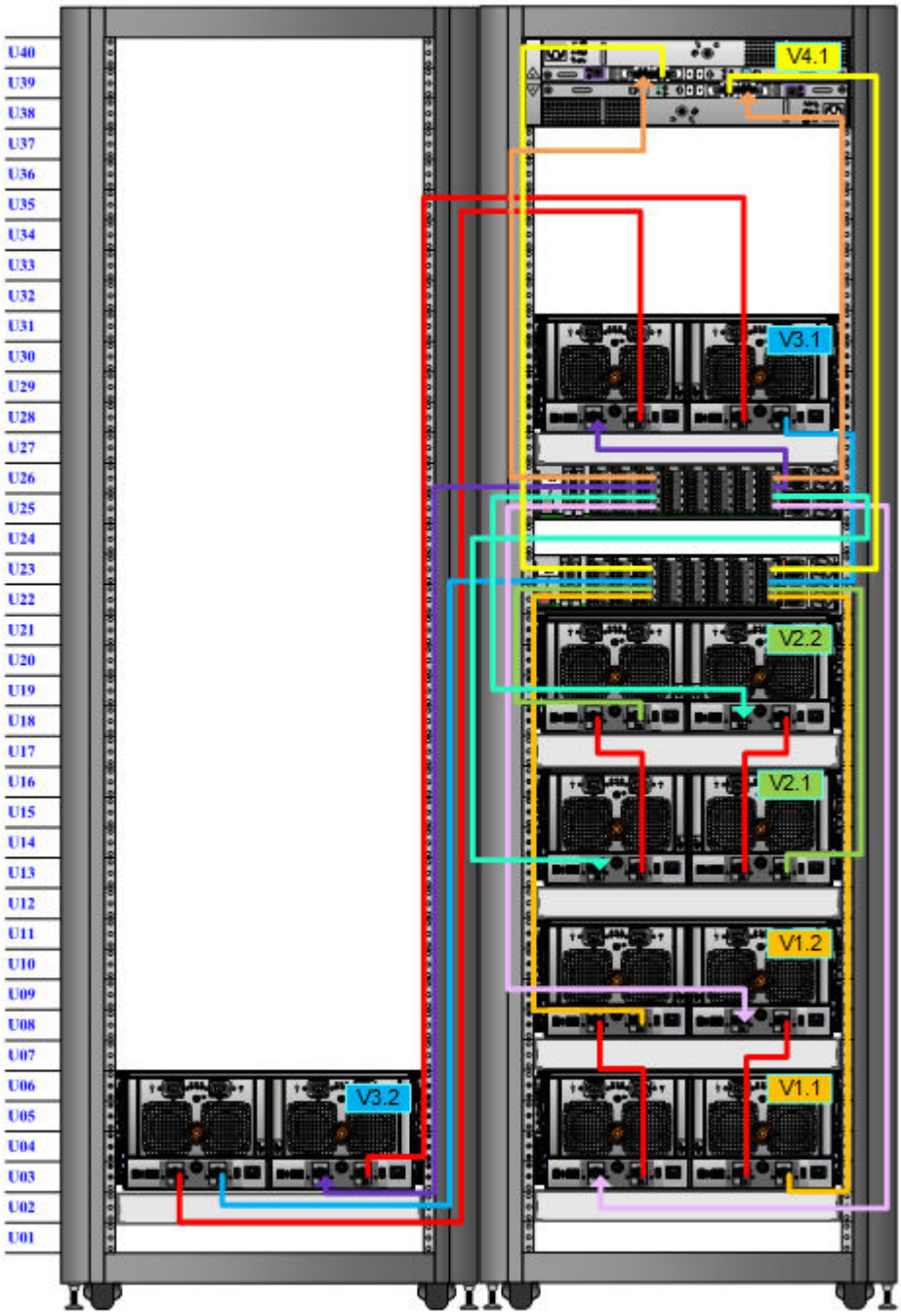
String (Loop)	I/O - Port	Shelf Port	Length [a]
2	I/O 7 - Port 1	A controller port 0 of shelf V2.1	2M
2	I/O 2 - Port 1	B controller port 0 of the highest number shelf in V2	2M
3	I/O 7 - Port 2	A controller port 0 of shelf V3.1	2M
3	I/O 2 - Port 2	B controller port 0 of the highest number shelf in V3	5M
4	I/O 7 - Port 3	A controller HOST ● port of the SSD shelf	2M
4	I/O 2 - Port 3	B controller HOST ● port of the SSD shelf	2M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.

Table 47 Standby node cabling instructions

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	B controller port 2 of shelf V1.1	2M
1	I/O 2 - Port 0	A controller port 2 of the highest number shelf in V1	2M
2	I/O 7 - Port 1	B controller port 2 of shelf V2.1	2M
2	I/O 2 - Port 1	A controller port 2 of the highest number shelf in V2	2M
3	I/O 7 - Port 2	B controller port 2 of shelf V3.1	2M
3	I/O 2 - Port 2	A controller port 2 of the highest number shelf in V3	5M
4	I/O 7 - Port 3	A controller EXPANSION ◆ port of the SSD shelf	2M
4	I/O 2 - Port 3	B controller EXPANSION ◆ port of the SSD shelf	2M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.

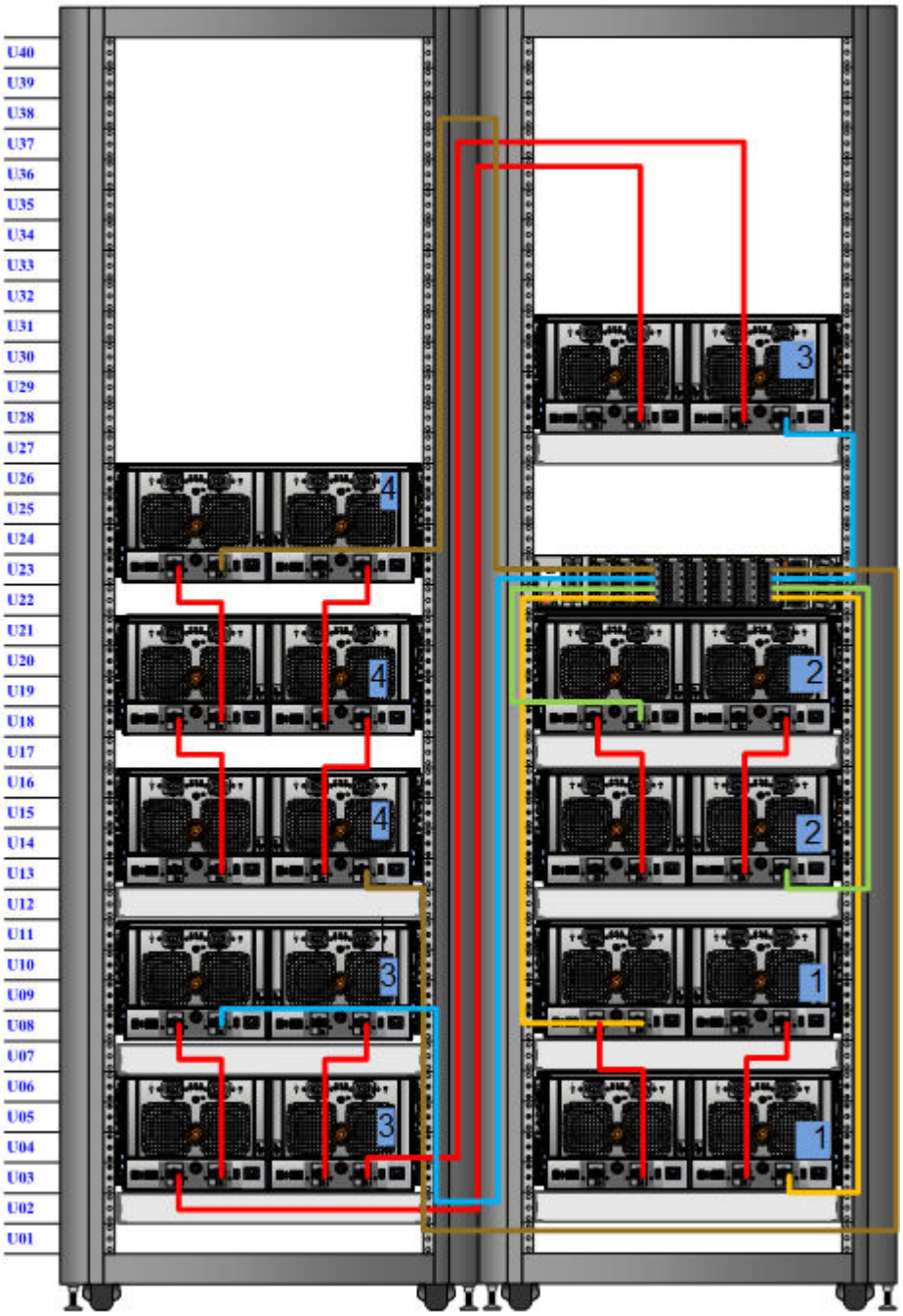


DD6800 and DD9300 with ERSO

String (Loop)	I/O - Port	Shelf Port	Length [a]
1	I/O 7 - Port 0	A controller port 0 of shelf V1.1	2M
1	I/O 2 - Port 0	B controller port 0 of the highest number shelf in V1	2M
2	I/O 7 - Port 1	A controller port 0 of shelf V2.1	2M

String (Loop)	I/O - Port	Shelf Port	Length [a]
2	I/O 2 - Port 1	B controller port 0 of the highest number shelf in V2	2M
3	I/O 7 - Port 2	A controller port 0 of shelf V3.1	2M
3	I/O 2 - Port 2	B controller port 0 of the highest number shelf in V3	5M
4	I/O 7 - Port 3	A controller port 0 of shelf V4.1	5M
4	I/O 2 - Port 3	B controller port 0 of the highest number shelf in V4	5M

a. Cable lengths shown are designed for Data Domain racks. Longer cables (up to 5M) can be used.



Connecting the HA interconnect

The HA interconnect consists of a 10 GbE I/O module in slot 1 of each node in the HA pair. This connection between the two nodes provides the standby node with the information needed to fail over if the active node suffers a failure, and maintain the connections to hosts and clients after the failover is complete.

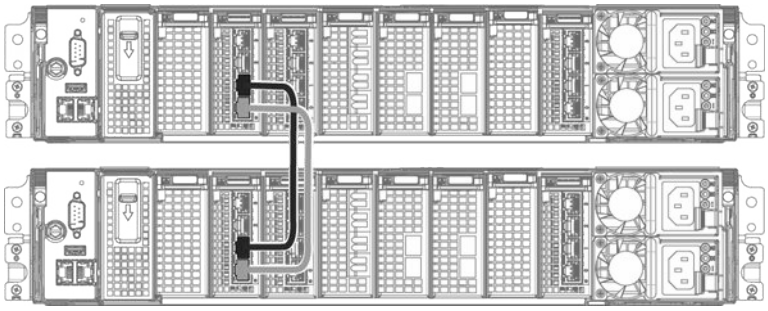
Note

- The interconnect IP address is automatically configured with the IPv6 prefix d:d:d:d:d:/80
- If there is an IP conflict, set the registry key `config.net.interconnect_ip6prefix`.

Procedure

1. Refer to the diagram for the port connections.

   Figure 19 HA interconnect

2. Cable port 0 of the interconnect I/O module in node 0, slot 1 to port 0 of the interconnect I/O module in node 1, slot 1.
3. Cable port 1 of the interconnect I/O module in node 0, slot 1 to port 1 of the interconnect I/O module in node 1, slot 1.

Installing the front bezel

Procedure

1. Align the bezel with the enclosure.
2. Gently push the bezel into place on the cabinet until it latches.
3. If the bezel has a key lock, lock the bezel the provided key.

Connect data cables

1. Enable data transfer Ethernet connectivity. Repeat for each connection.
   a. If using 1 Gb copper Ethernet, attach a Cat 5e or Cat 6 copper Ethernet cable to an RJ-45 Ethernet network port (start with ethMa and go up).
   b. If using 10 Gb copper Ethernet with an SFP+ connector, use a qualified SFP+ copper cable.
   c. If using 1/10 Gb fiber Ethernet, use MMF-850nm cables with LC duplex connectors.
   d. For 10GBaseT connections, use Cat6a S-STP Ethernet cables.
2. Enable data transfer Fibre Channel (FC) connectivity. Repeat for each connection.

a. Attach a Fibre Channel fiber optical cable (LC connector) to an I/O module port on the controller, and attach the other end (LC connector) to an FC switch or to an FC port on your server.

Power on all systems

Note

Power on all expansion shelves first before powering on the controller.

1. Connect power cables to each expansion shelf receptacle and attach the retention clips.
2. Provide power to power on each expansion shelf. The shelves power on when plugged in. Ensure that each shelf power cable is connected to a different power source.

   Note

   Wait approximately 3 minutes after all expansion shelves are powered on before powering on the controller.

3. Provide power to power on the controller. The system powers on when plugged in. The first boot may take several minutes to complete.

   Note

   DD6300, DD6800, and DD9300 systems should be powered from redundant AC sources. Redundant power sources allow one AC source to fail or be serviced without impacting system operation. PSU0 should be attached to one AC source. PSU1 should be attached to the other AC source.

   a. Connect power cables to each receptacle and attach the retention clips.

   b. Ensure that each power supply is connected to a different power source.

CHAPTER 5

Configure System for Use

Enable administrative communication

For HA pairs, administrative communication must be enabled on both nodes.

The administrative interfaces are located on the management module on the rear of the chassis. These interfaces are for management network traffic only. Do not use these interfaces for data traffic.

1. Connect an administrative console to the serial port on the back panel of the system.
2. **Note**

   You must have 115200 baud rate for the system to work correctly; 9600 baud rate does not work.

   Launch a terminal emulation program from your computer and configure the following communication settings:

   Table 48 Communications settings

Setting	Value
Baud rate	115200
Data bits	8
Stop bits	1
Parity	None
Flow control	None
Emulation	VT-100

3. Press `Enter` to activate the console.

   Note

   If you do not see the prompt on your terminal to log in, then complete Step 4.

4. Verify the front blue power LED (blue square) is on. If it is not, make sure the power cables are fully seated at both ends, and both AC sources are on.
5. **Note**

   The initial username is `sysadmin` and the initial password is the system serial number.

   Log in to the Data Domain console using the `sysadmin` username.

   ```
   localhost.localdomain login: sysadmin
   ```

6. Type the default password, which is the system serial number. The Product ID/SN tag is attached beneath the power supply at the rear of the system. See the rear panel of the system for the Product ID/SN tag.

   ```
   Password: system_serial_number
   ```

Note

If you type an incorrect password four consecutive times, the system locks out the specified username for 120 seconds. The login count and lockout period are configurable and might be different on your system. See the *Data Domain Operating System Administration Guide* and the *Data Domain Operating System Command Reference Guide* for setting these values.

For Data Domain HA systems, SSH keys created on the active node take 30 seconds to one minute to propagate to the standby node.

Accepting the End User License Agreement (EULA)

The first time you log in to a Data Domain system, the End User License Agreement (EULA) is displayed.

At the end of the EULA, you are prompted to accept it:

```
Press any key then hit enter to acknowledge the receipt of EULA
information
```

Note

The customer must accept the EULA. A Data Domain representative should not accept this agreement. If a customer is not present, press `Ctrl-C` to exit from the EULA acceptance screen and continue the installation.

The customer can later type the following to redisplay the EULA and accept it:

```
system show eula
```

Run the configuration wizard

The CLI configuration wizard starts automatically the first time the system starts. The wizard prompts you through a series of questions that provide just enough information for initial system configuration and basic network connectivity.

Note

You can begin the CLI configuration wizard manually by typing **`config setup`**.

Configuring the network

Procedure

1. Enter **`yes`** to configure the system for network connectivity.

   ```
   Network Configuration
   Configure Network at this time (yes|no) [no]:
   yes
   ```

2. Enter **`yes`** to configure DHCP (Dynamic Host Configuration Protocol) to obtain network parameters (such as, the host name, domain name, and IP addresses) dynamically from a DHCP server. Or enter **`no`** to configure the parameters manually.

   ```
   Use DHCP
   Use DHCP for hostname, domainname, default gateway
   and DNS servers? (At least one interface needs to
   be configured using DHCP)  (yes|no|?)
   ```

3. Enter a fully qualified domain name (FQDN) for the host name; for example, **str01.yourcompany.com**. Or accept the host name, if the system was able to discover it.

```
Enter the hostname for this system
(fully-qualified domain name)[]:
```

4. Enter the DNS (Domain Name System) domain name; for example, **yourcompany.com**. Or accept the domain name, if the system was able to discover it.

```
Domainname
Enter your DNS domainname []:
```

5. Enable and configure each Ethernet interface. Accept or decline DHCP for each interface. If the port does not use DHCP to discover network parameters automatically, enter the information manually.

```
Ethernet port eth0a
Enable Ethernet port eth0a (yes|no|?) [yes]:
no

Ethernet port eth0b
Enable Ethernet port eth0b (yes|no|?) [no]:
yes

Use DHCP on Ethernet port eth0b (yes|no|?) [no]:

Enter the IP address for eth0b [192.168.10.185]:

Enter the netmask for eth0b [255.255.255.0]:
```

6. Enter the IP address of the default routing gateway. Or accept the default gateway, if the system was able to discover it.

```
Default Gateway
Enter the default gateway IP address:
192.168.10.1
```

7. Enter the IPv6 address of the default routing gateway. Or accept the IPv6 address of the default gateway, if the system was able to discover it. If IPv6 is not in use, leave the field empty, and press **Enter** to continue.

```
IPV6 Default Gateway
Enter the ipv6 default gateway IP address:
```

8. Enter up to three DNS servers to use for resolving host names to IP addresses. Use a comma-separated or space-separated list. Enter a space for no DNS servers. Or accept the IP addresses of the DNS servers, if the system was able to discover them.

```
DNS Servers
Enter the DNS Server list (zero, one, two or three IP
addresses):
192.168.10.1
```

9. A summary of the network settings is displayed. You can accept the settings (**Save**), reject the settings and exit to the CLI (**Cancel**), or return to the beginning of the current section and change the settings (**Retry**). Entering **Retry** displays your previous responses for each prompt. Press **Return** to accept the displayed value or enter a new one.

```
Pending Network Settings
Hostname          ddbeta1.dallasrdc.com
Domain name       dallasrdc.com
Default Gateway   192.168.10.1
DNS Server List   192.168.10.1
Port       Enabled      Cable      DHCP      IP Address        Netmask or Prefix Length
-----      -------      -----      ----      --------------    ------------------------
eth0a      no           no         n/a       n/a               n/a
eth0b      no           no         n/a       n/a               n/a
```

```
eth0c      no           no         n/a       n/a               n/a
eth0d      no           no         n/a       n/a               n/a
ethMa      yes          yes        no        192.168.10.181    255.255.255.0
ethMb      no           no         n/a       n/a               n/a
ethMc      no           no         n/a       n/a               n/a
ethMd      no           no         n/a       n/a               n/a
ethMe      no           no         n/a       n/a               n/a
ethMf      no           no         n/a       n/a               n/a
-----      -------      -----      ----      --------------    ------------------------
Do you want to save these settings (Save|Cancel|Retry):
```

Configuring additional system parameters

Most installations would benefit from the configuration of a few additional system parameters, provided in this section for convenience.

Note

You can also use the Data Domain (DD) System Manager GUI interface to configure the system parameters. Open a web browser, and enter your Data Domain system's IP address in the browser's address text box. Log in when the DD System Manager login screen displays. Use the DD System Manager online help for more information.

Procedure

1. To set up the mail server, enter:

```
# config set mailserver mail.datadomain.com
The Mail (SMTP) server is: mail.datadomain.com
```

2. To set up the system location, enter:

```
# config set location "Dallas Regional Data Center Lab,
5000 Apple Drive Suite #130, Dallas, Tx"
The System Location is: Dallas Regional Data Center Lab,
5000 Apple Drive Suite #130, Dallas, Tx
```

3. To add one or more time servers, enter:

```
# ntp add timeserver 192.168.101.1
Remote Time Servers: 192.168.10.1
```

4. To enable the NTP daemon, enter:

```
# ntp enable
NTP enabled.
```

5. To change the system time zone, enter:

```
# config set timezone US/Central
The Timezone name is: US/Central
*** You made a change to the timezone setting.  To fully effect
this change
*** (in currently running processes), you need to reboot the
machine.
```

6. Reboot the system for the time zone change to take effect:

```
# system reboot

The 'system reboot' command reboots the system. File access is
interrupted during the reboot.
Are you sure? (yes|no|?) [no]: yes

ok, proceeding.
The system is going down for reboot.
```

7. After the system completes the reboot, login again as `sysadmin` using the serial number as a password. Press `Ctrl-C` to get through the EULA, sysadmin password prompt, and config setup wizard.

8. Generate an autosupport sent to yourself to use as ACG input:

```
# autosupport send your.email@emc.com
OK: Message sent.
```

Configure HA

Before you begin

- The HA interconnect between both nodes is connected.

  Note

  Connecting the HA interconnect on page 69 describes how to cable the HA interconnect.

- The data connections on both nodes are connected.

Configure the two nodes as an HA pair.

Note

Configuring an HA pair sets the system password on the standby node to match the system password on the active node, however, that synchronization is not set until the HA configuration is complete. If the HA configuration fails, or if there is a need to access either node before the HA configuration is complete, use the serial number of each node as the password.

Procedure

1. Identify which node will serve as the primary node.
2. On the primary node, create the HA pairing.

   Run the following command:
   `ha create peer {<ipaddr> | <hostname>} [ha-name <ha-system-name]`

   Note

   - Specify the hostname or the IP address of the standby node.
   - Specifying an HA system name:
     - Assigns node 0 the local hostname *<HA-system-name>*-p0.
     - Assigns node 1 the local hostname *<HA-system-name>*-p1.
   - The `ha create` command will fail if one node is configured to use DHCP and the other node is configured to use static IP addresses. Both nodes must use the same method to configure IP addresses.

   ```
   ha create peer mysystem-p1.emc.com ha-name mysystem.emc.com
   ```

   Both nodes reboot, and are configured as an HA pair when they come back up.
3. On the primary node, configure one or more floating IP addresses for data access.

   Run the following command:
   `net config <interface-name> <IP address> netmask <netmask> type floating`

Note

The net config command with the float option is the only way to configure a floating IP address. There is no method available in Data Domain System Manager to configure a floating IP address.

```
net config eth1a 2.2.2.1 netmask 255.255.255.0 type floating
```