EMC Data Domain DD2200 and DD2500 Systems

Hardware Overview

300-119-009 REV. 05

May, 2014

This document describes the hardware components of DD2200 and DD2500 systems.

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Related Documentation

Note

Hard copies of a document may be out of date. Always check for the current version of a document on the EMC Support website at https://support.emc.com.

There are various types of documents available that are related to the use of Data Domain products:

- End user documents, for example, user guides, hardware installation guides, administrator guides, software guides, part replacement guides, release notes and others.
- Integration documents about how to integrate Data Domain systems with third party backup applications.
- Compatibility matrices that show which components are compatible with each other.

Viewing EMC Data Domain Documents

Procedure

1. Connect to the EMC Support website at https://support.emc.com.
2. If you are a registered user, log in and skip to the next step. Otherwise:
   a. Click **Register Here**.
   b. Follow the online registration steps, filling in all required fields.
   c. After your registration is processed, you will receive an email confirmation.
3. Click the **Support by Product** option.
4. Enter a product name in **Find a Product**, for example, DD990. Click the search icon at the right of this field.
5. On the next screen, click **Documentation**.
6. At the right, all documents are displayed that fit the criteria. A menu at the left is automatically populated with various categories of these documents, for example, *Manual and Guides*.
7. Store a search by clicking **Add to my favorites**.
8. When you revisit the **Support by Product** page, your most recent searches are displayed at the bottom of the screen.

   Your suggestions help us continue to improve the accuracy, organization, and overall quality of the user publications. Please send your opinions of any document to DPAD.Doc.Feedback@emc.com.

System Features

The table summarizes the DD2200 and DD2500 system features.

Feature	DD2500	DD2200
Rack Height	2U, supported in four-post racks only	
NVRAM Module	One 2-GB NVRAM-BBU combination module for data integrity during a power outage. Not hot-swappable.	System memory-BBU module-hard disk drive combination for data integrity during a power outage.
BBU Module	BBU module is combined with the NVRAM module.	One BBU module for data integrity during a power outage. Not hot-swappable.
Power	1 +1 redundant, hot-swappable power units	
Fans	Seven fan assemblies. Not hot-swappable.	
Drives (SAS only)	7 or 12 3-TB HDD hot-swappable drives.	7 or 12 2-TB HDD hot-swappable drives.
I/O Module Slots	Four replaceable I/O module (FC, Ethernet, and SAS) slots. Not hot-swappable.	Two replaceable I/O module (FC and Ethernet) slots. Not hot-swappable.
Memory	• 4 x 8 GB DIMM installed supports 1 x 30-TB SAS shelf adding up to 30 TB of external raw capacity • 8 x 8 GB DIMM installed supports up to 4 x 30-TB SAS shelves or 3 x 45-TB SAS shelves adding up to 135 TB of external raw capacity	• Base configuration contains 2 x 4 GB DIMM • Extended configuration contains 4 x 4 GB DIMM (required for a 12 disk drive system)
Processors	One 8-core processor	One 6-core processor
Rack Mounting	Rack mount kit included with each system. Adjustable between 18 - 36 in. (45.7 - 76.2 cm).	

Storage Capacity

The table lists the capacities of the DD2200 and DD2500 systems. EMC 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 data sets to otherwise identical systems, one system may, over time, have room for more or less actual backup data than another.

Note

EMC Data Domain system commands compute and display amounts of disk space or data as decimal multiples of certain powers of two (2^{10}, 2^{20}, 2^{30}, and so forth). For example, 7 GiB of disk space = 7 x 2^{30} bytes = 7 x 1,073,741,824 bytes. EMC Data Domain refers to this process as Base 2 calculation.

Table 1 DD2200 and DD2500 storage capacity

System/ Installed Memory	Internal Disks	Raw Storage (Base 10)	Data Storage Space (Base 2 Calculation)	Data Storage Space (Base 10 Calculation)	External Storage
DD2200 2 x 4 GB DIMM	Seven 3.5 in. 2 TB SAS HDDs		7 drives: 7012 GiB	7 drives: 7531 GB	NA
DD2200 4 x 4 GB DIMM	Seven or twelve 3.5 in. 2 TB SAS HDDs		7 drives: 7012 GiB 7+5 drives: 12356 GiB 12 drives: 16100 GiB	7 drives: 7531 GB 7+5 drives: 13270 GB 12 drives: 17291 GB	NA
DD2500 4 x 8 GB DIMM	Seven or twelve 3.5 in. 3 TB SAS HDDs	21 TB or 36 TB	7 drives: 10671 GiB 7+5 drives: 18763 GiB 12 drives: 24334 GiB	7 drives: 11458 GB 7+5 drives: 20147 GB 12 drives: 26129 GB	1 x 30-TB SAS shelf; up to 30 TB of raw capacity.
DD2500 8 x 8 GB DIMM	Seven or twelve 3.5 in. 3 TB SAS HDDs	21 TB or 36 TB	7 drives: 10671 GiB 7+5 drives: 18763 GiB 12 drives: 24334 GiB	7 drives: 11458 GB 7+5 drives: 20147 GB 12 drives: 26129 GB	Up to a maximum of 4 x 30-TB SAS shelves or 3 x 45-TB SAS shelves; up to 135 TB of raw capacity.

Note

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

Front Panel

Figure 1 Front panel components

Disk Drives

A system contains up to 12 hot-swappable 3.5" HDD SAS disk drives located in the front of the chassis. Left to right, drives are numbered 0-3 in the top row, 4-7 in the middle row, and 8-11 in the bottom row.

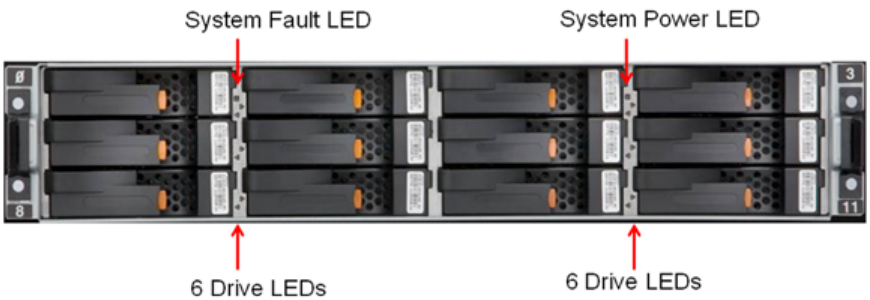
- The base configuration contains 7 disk drives in locations 0 through 6. Drive bays 7-11 contain bay blanks.
- The expanded configuration contains 12 disk drives.

Front LED Indicators

The front of the system contains 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 either left or right toward the disk whose status it represents. If the disk drive has a failure, the disk's status LED turns from blue to amber.

There are two square-shaped system LEDs. A blue system power LED is on whenever the system has power. An amber system fault LED is normally off and is lit amber whenever the chassis or any other FRU in the system requires service.

Figure 2 Disk and system LEDs



Part	State
System fault	Normally unlit. Amber indicates fault.
System power	Steady blue indicates normal power.
Disk drive status	Steady blue or blinking blue indicates normal operation. Amber indicates fault or failure.

When the bezel is affixed, the blue system power LED can be seen through the bezel.

Figure 3 Bezel showing lighted system power LED

Back Panel

The figures show hardware features on the back of a system.

Figure 4 Features on rear of DD2500 chassis

(1)	I/O module in slot 0
(2)	NVRAM-BBU combination module in slot 4
(3)	Power supply number 0

Figure 5 Features on rear of DD2200 chassis

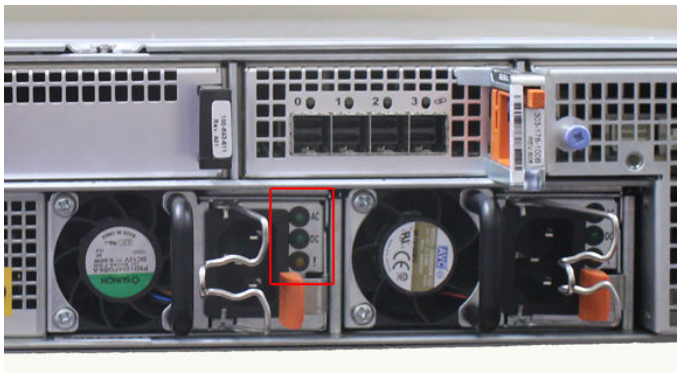
(1)	I/O module in slot 0
(2)	Blank filler
(3)	Power supply number 0
(4)	BBU module

Power Supply Units

A system has two power supply units, numbered 0 and 1 from left to right. Each power unit has LEDs (shown in the photo) that indicates the following states:

- AC LED (top): Glows green when AC input is good
- DC LED (middle): Glows green when DC output is good
- Symbol "!" (lower): Glows solid amber for fault or attention

Figure 6 Power supply unit LEDs

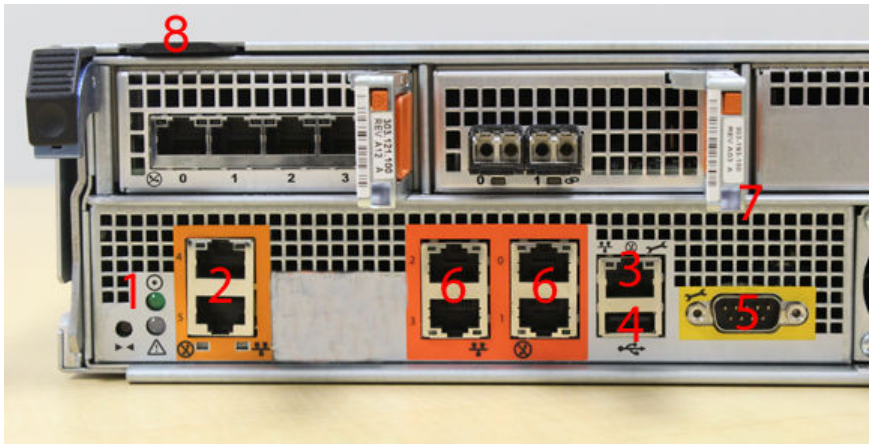


Onboard Interfaces, SN Pull-Out Tag and LEDs

The onboard interfaces are located on the far lower left side when facing the back of the system. The onboard interfaces enable you to check system status and connect to the system through a serial console or through Ethernet connections.

A USB port is provided for use during service of the system to allow booting from a USB flash device.

Figure 7 Onboard interfaces and SN tag for the DD2500 system



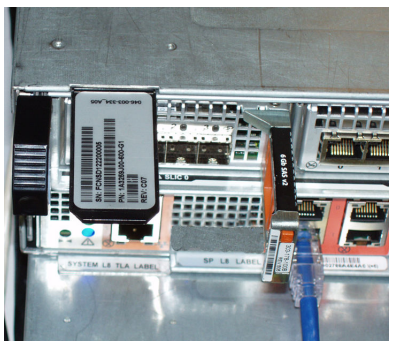
(1)	LEDs: top is SP power LED and the bottom is SP service LED
(2)	Dual-port 10G BaseT • Top port: physical #4, logical ethMe • Bottom port: physical #5, logical ethMf
(3)	Service network port
(4)	USB port
(5)	Serial port
(6)	Quad-port 1 Gigabit Ethernet

	• Top left port: physical #2, logical ethMc • Top right port: physical #0, logical ethMa • Lower left port: physical #3, logical ethMd • Lower right port: physical #1, logical ethMb
(7)	I/O module LED
(8)	Serial number pull-out tag

Figure 8 Onboard interfaces and SN tag for the DD2200 system

(1)	LEDs: top is SP power LED and the bottom is SP service LED
(2)	Quad-port Gigabit Ethernet • Top left port: physical #2, logical ethMc • Top right port: physical #0, logical ethMa • Lower left port: physical #3, logical ethMd • Lower right port: physical #1, logical ethMb
(3)	Service network port
(4)	USB port
(5)	Serial port
(6)	I/O module LED
(7)	Serial number pull-out tag

Figure 9 Serial number pull-out tag for both systems



Rear LED Status Summary

Part	State
SP service	Blue indicates normal operation. Amber indicates fault.
SP power	Steady green indicates normal power. Dark indicates no power.
I/O module	Steady green indicates normal operation. Amber indicates fault or failure.
Power supply AC	Glows green when AC input is good
Power supply DC	Glows green when DC output is good
Power supply symbol “!”	Glows solid amber for fault or attention

Slot Assignments

The table shows the I/O module slot assignments for a system. See the figures in Back Panel on page 6 for a view of the slot positions on the back panel and Figure 10 on page 10 for a top view.

Table 2 DD2200 and DD2500 slot assignments

Slot Number	DD2200	DD2500
0	FC, Ethernet or empty	FC, Ethernet or empty
1	FC, Ethernet or empty	FC, Ethernet or empty
2	Not available	FC, Ethernet or empty
3	Not available	SAS or empty
4	Not available	NVRAM-BBU

When a system is upgraded, the newly inserted I/O module should go into the next available slot position. The following slot loading guidelines apply:

- For mixed populations, populate all Ethernet I/O modules first, then populate the FC I/O modules.
- For Ethernet I/O modules, populate the leftmost (slot 0) slot first, if empty, then slot 1 and so on.
- Slot 3 is reserved for SAS I/O modules (DD2500 system only).

FC I/O Module Option

An FC I/O module is a dual-port Fibre Channel module. The optional virtual tape library (VTL) feature requires at least one FC I/O module. Three FC I/O module slots for the DD2500 and two FC I/O module slots for the DD2200 are available to be used.

Ethernet I/O Module Options

Three Ethernet I/O module slots for the DD2500 and two Ethernet I/O module slots for the DD2200 are available to be used. The available Ethernet I/O modules are:

- Dual Port 10GBase-SR Optical with LC connectors
- Dual Port 10GBase-CX1 Direct Attach Copper with SPF+ module
- Quad Port 1000Base-T Copper with RJ-45 connectors
- Quad port 2 port 1000Base-T Copper (RJ45) /2 port 1000Base-SR Optical
- Quad port 10GBase-T Copper

Internal System Components

The photo shows the system with the storage processor (SP) module removed from the chassis. The top of the photo shows the rear of the system.

Figure 10 Top view of SP module (DD2500 system shown)

Cooling Fans

A storage processor module contains seven cooling fans. The fans provide cooling for the processor, DIMMs, and I/O modules. A system can run with one fan module faulted. From the front of the system, fans are numbered 1, 3, 4, 5, and 6 in the first row and 0 and 2 in the second row (right to left). The bottom of the photo shows the front of the system.

Figure 11 Top view of SP module with air duct removed (DD2200 system shown)

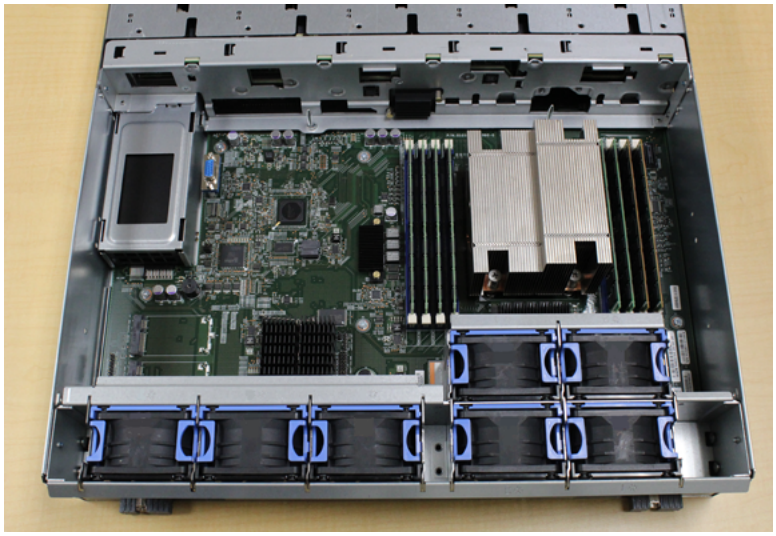
DIMM Modules

A DD2500 system contains either 4 x 8 GB or 8 x 8 GB memory DIMMs. The base system DIMMs are located in slots labeled CHAD0, CHBD0, CHCD0 and CHDD0. An expanded system contains a DIMM in each slot.

A DD2200 system contains either 2 x 4 GB or 4 x 4 GB memory DIMMs. The base system DIMMs are located in slots labeled CHAD0 and CHBD0. An expanded system contains a DIMM in slots labeled CHAD0, CHBD0, CHCD0 and CHDD0.

The bottom of the photo is the front of the system. The left group of 4 DIMM slots from left to right are labeled CHBD1, CHBD0, CHAD1, and CHAD0. The right group of 4 DIMM slots are labeled CHDD1, CHDD0, CHCD1, and CHCD0. A photo of the DD2200 DIMM locations is seen in Cooling Fans on page 10.

Figure 12 DIMM location (DD2500 system shown)



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Published May, 2014

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