Smarter technology for all

Servicing the ThinkSystem DE Series storage arrays

ES71931G

May 2025

Lenovo

What's new

DE Series storage arrays – May 2025 updates

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What's new in the May 2025 updates

New DE Series models: DE4200 and DE4800

The DE4200 and DE4800 are scheduled for release in May 2025. The DE4200 and DE4800 are 2U or 4U, 12-, 24- or 60-drive storage enclosures with support for hybrid or all-flash drive configurations.

For more information, refer to the Product overview: DE4200 and DE4800 section in this course.

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Product overview: DE2000, DE4000, and DE6000

Product description, enclosure front view, and rear view

ThinkSystem DE Series storage arrays product overview

Lenovo ThinkSystem DE Series storage arrays are SAN storage systems that are designed for medium to large businesses. ThinkSystem DE Series storage arrays deliver hybrid and all flash storage with enterprise-class storage management capabilities and various host interface card (HIC) options.

The DE Series storage arrays support the 2U enclosure with 12 3.5-inch or 2.5-inch drives (2U12), the 2U enclosure with 24 2.5-inch drives (2U24), and the 4U enclosure with 60 3.5-inch or 2.5-inch drives (4U60). Each enclosure supports two controllers for redundancy.

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ThinkSystem DE Series storage arrays – features

Dynamic Disk Pools (DDP)
With the DDP feature, DE Series systems provide faster rebuild times than traditional RAID.
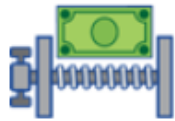
SSD read cache (model dependent)
The SSD read cache increases the performance of read-centric workloads.

Snapshot and Volume Copy
Provides more precise recovery point objectives and faster storage recovery

Thin Provisioning
A storage allocation scheme that automatically allocates storage as the user's applications need it. Enabling this feature may reduce storage system performance.

Mirroring (synchronous or asynchronous, model dependent)
Enterprise-class disaster recovery of data with FC and IP replication

Encrypted Drive Support
Extended security enhancements for compliance and regulations

Note:
- The mirroring and snapshot features require the additional Lenovo Features on Demand (FoD) keys to enable the full functions.
- Async Mirroring on DE4200/DE4800 supports Fibre Channel protocol only.

NVMe-oF feature

DE Series storage arrays now support the following NVME over Fabrics (NVMe-oF) features:
- NVMe-RoCE (RDMA over Converged Ethernet)
    - Uses the the new dual-port 100 Gb NVMe-RoCE host interface card (HIC)
    - Allows NVMe protocol emulation to SAS drives
    - Uses new NVMe-oF submodel ID (SMID) migrations for new DE6000H/F controller IDs
    - Only valid for DE6000H/F 64 GB controllers (one per controller)
- NVMe-FC
    - Uses the existing FC HIC with NVMe-FC protocol
    - Utilizes the same NVMe-oF SMIDs used with the NVMe-RoCE HIC
    - Only valid for DE6000H/F 64 GB controllers (one per controller)

For more information about NVMe-oF, refer to the NVMe organization website:

https://nvmexpress.org/wp-content/uploads/NVMe_Over_Fabrics.pdf

Note: The NVMe-oF features on DE Series storage arrays require the 11.60.2 or later version of firmware to be installed.

ThinkSystem DE Series product list

Marketing name	Machine Type	Form factor	Available controller HIC options
DE2000H	7Y70	2U12	• Two-port 10Base-T • Two-port SAS
	7Y71	2U24	
DE4000H	7Y74	2U12	• Four-port SAS • Four-port 16 Gb FC / 10 Gb iSCSI • Four-port 32 Gb FC • Four-port 10/25 Gb iSCSI
	7Y75	2U24	
	7Y77	4U60	
DE4000F	7Y76	2U24	
DE6000H	7Y78	2U24	• Four-port SAS • Four-port 32 Gb FC (support for NVMe-oF mode) • Four-port 10 /25 Gb iSCSI • Two-port 100 Gb NVMe-RoCE
	7Y80	4U60	
DE6000F	7Y79	2U24	

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ThinkSystem DE Series expansion enclosure product list

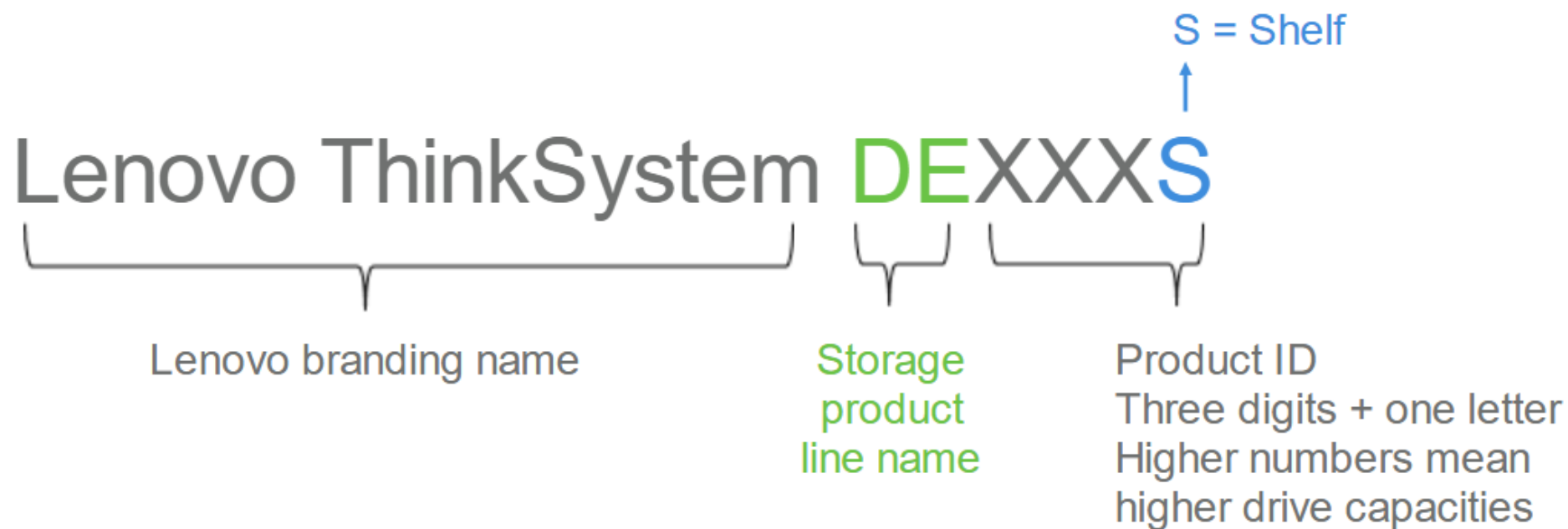| Marketing name	Machine Type	Form factor	Description
DE120S	7Y63	2U12	Supports 2.5-inch or 3.5-inch drives
DE240S	7Y68	2U24	Supports 2.5-inch drives
DE600S	7Y69	4U60	Supports 2.5-inch or 3.5-inch drives

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DE Series storage arrays naming rules

F = All flash drives
H = Hybrid drives
↑

Lenovo ThinkSystem DEXXXXY

Lenovo branding name

Storage product line name

Product ID
Four digits + one letter

Example:
- Lenovo ThinkSystem DE4000H
  - Supports HDD and SSD hybrid drives configuration
  - Controller cache: 8 GB per controller
- Lenovo ThinkSystem DE6000F
  - Supports all SSD flash drives configuration
  - Controller cache: 64 GB per controller

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DE Series expansion enclosure naming rules

S = Shelf

↑

Lenovo ThinkSystem DEXXXS

Lenovo branding name

Storage product line name

Product ID
Three digits + one letter
Higher numbers mean higher drive capacities

Example:
- Lenovo ThinkSystem DE120S
  - o 2U12 expansion enclosure
- Lenovo ThinkSystem DE600S
  - o 4U60 expansion enclosure

DE Series front views

Click the buttons to see front views of the DE Series enclosures.

| 2U12 | 2U24 | 4U60 |

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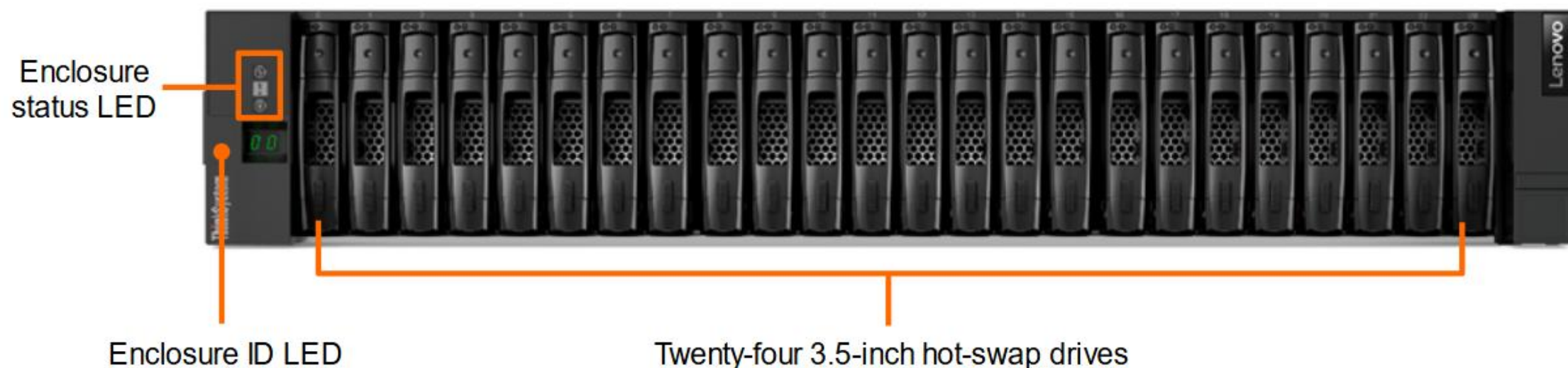# DE Series front views

The DE2000H (MT 7Y70), DE4000H (MT 7Y74), and DE120S (MT 7Y63) support the 2U12 enclosure.

Enclosure status LED

Enclosure ID LED

Twelve 3.5-inch hot-swap drives

2U12

2U24

4U60

DE Series front views

The DE2000H (MT 7Y71), DE4000H (MT 7Y75), DE4000F (MT 7Y76), DE6000H (MT 7Y78), DE6000F (MT 7Y79), and DE240S (MT 7Y68) support the 2U24 enclosure.
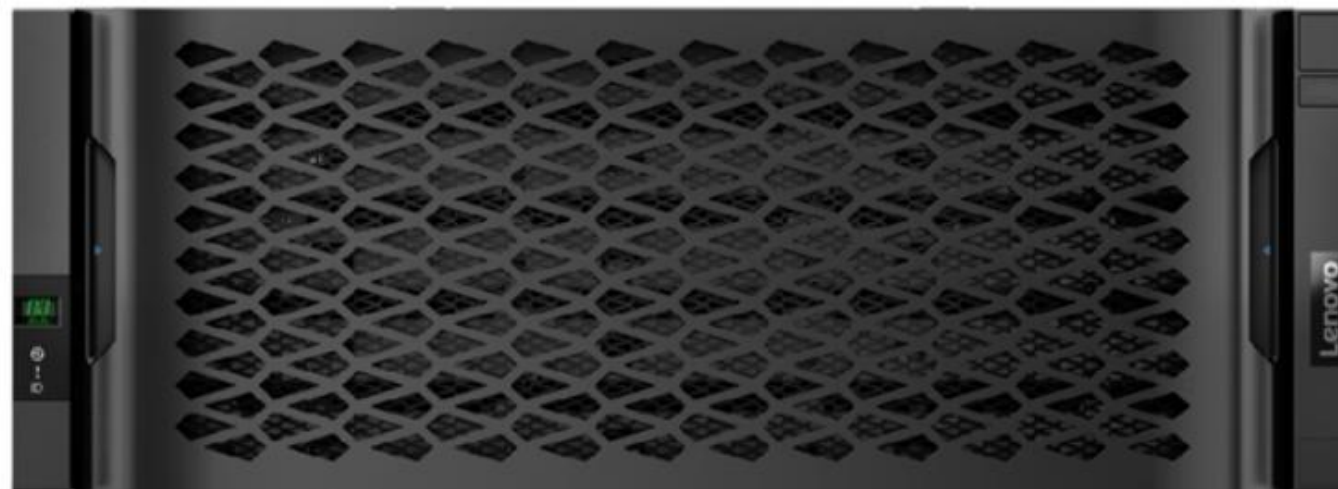
Enclosure status LED

Enclosure ID LED

Twenty-four 3.5-inch hot-swap drives

2U12

2U24

4U60

DE Series front views

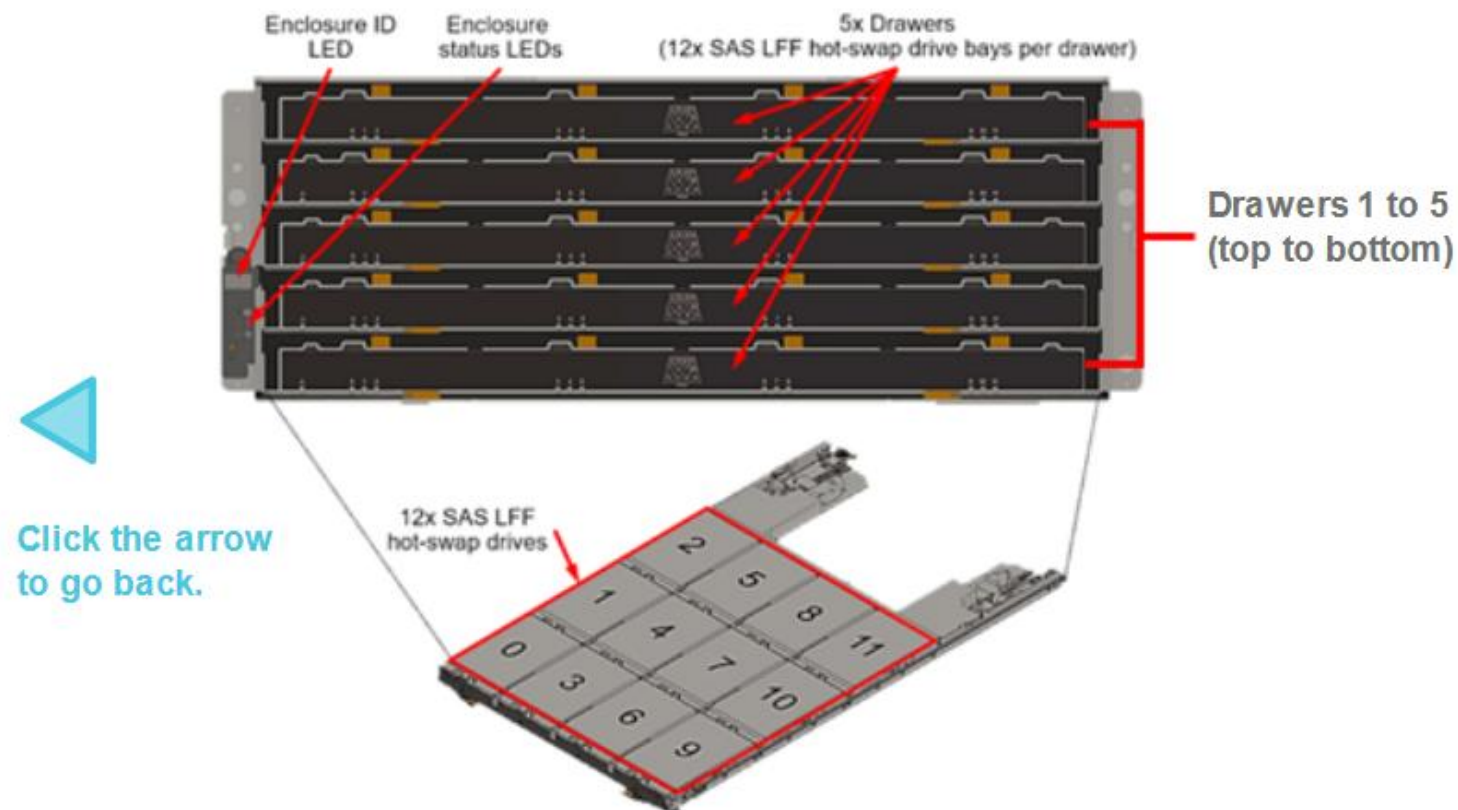The DE4000H (MT 7Y77), DE6000H (MT 7Y80), and DE600S (MT 7Y69) support the 4U60 form-factor enclosure.

▷

Click the arrow to see the front view without the cover.

| 2U12 | 2U24 | 4U60 |

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DE Series front views

Enclosure ID
LED

Enclosure
status LEDs

5x Drawers
(12x SAS LFF hot-swap drive bays per drawer)

Drawers 1 to 5
(top to bottom)

12x SAS LFF
hot-swap drives

**Click the arrow
to go back.**

The 4U60 enclosure contains five drive drawers. Each drawer supports 12 3.5-inch or 2.5-inch drives.

For proper cooling, a minimum of 20 drives are required, with four drives installed in the front row of each of the five drawers. There are no drive fillers.
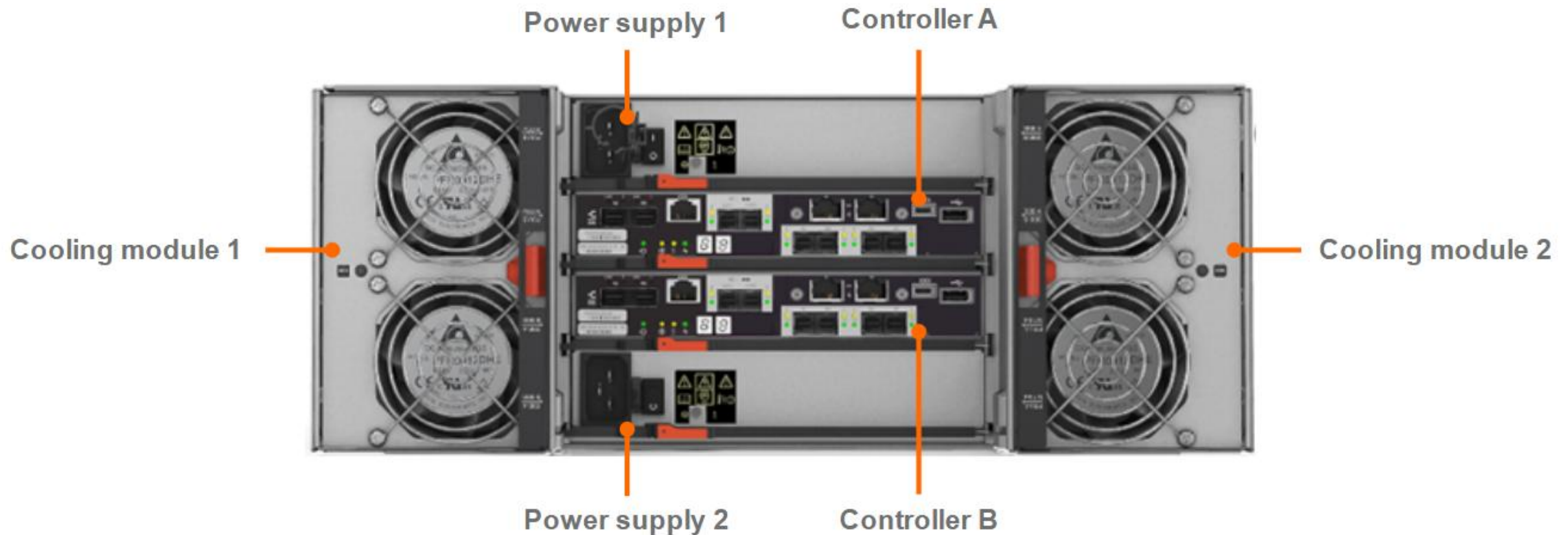
2U12

2U24

4U60

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DE Series 2U enclosure rear view

The DE2000H (MT 7Y70 and 7Y71), DE4000H (MT 7Y74 and 7Y75), DE6000H (MT 7Y78), DE4000F (MT 7Y76), and DE6000F (MT 7Y79) support the 2U enclosure. The enclosure supports two hot-swap redundant controllers and two hot-swap redundant power supplies.

Controller A

Controller B

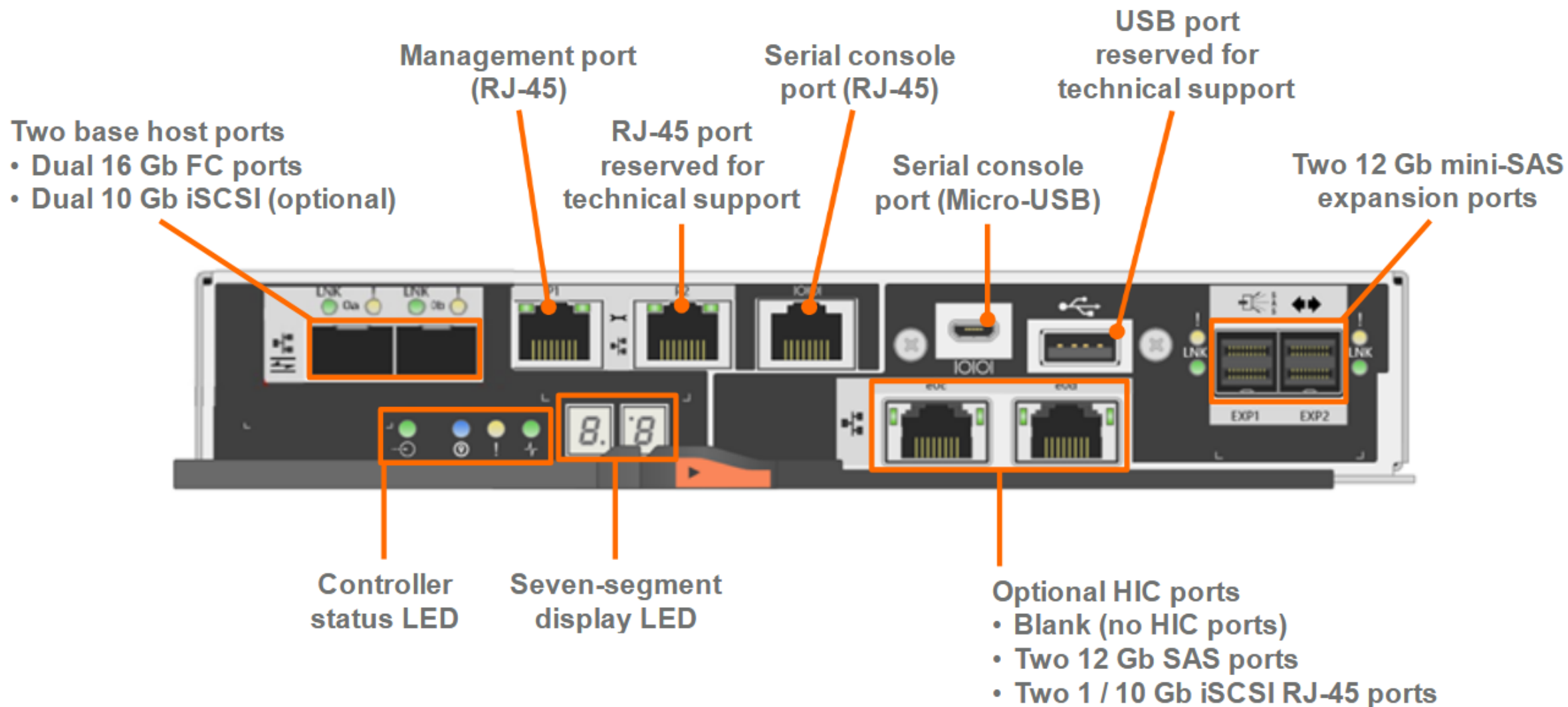**Power supply 1**

Power supply 2
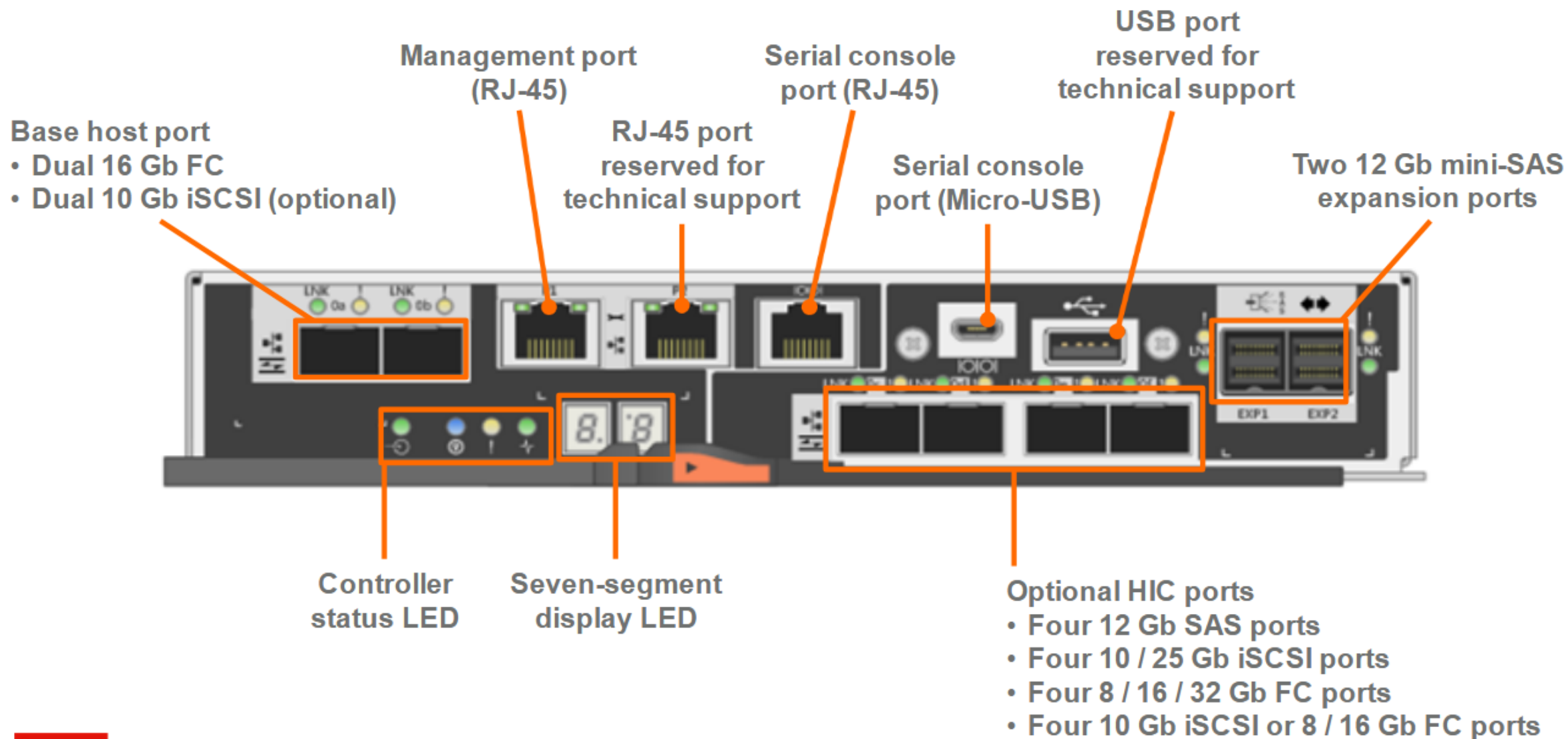
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DE Series 4U enclosure rear view

The DE4000H (MT 7Y77) and DE6000H (MT 7Y80) support the 4U enclosure. The 4U enclosure supports two hot-swap controllers, two hot-swap power supplies, and two hot-swap cooling modules.
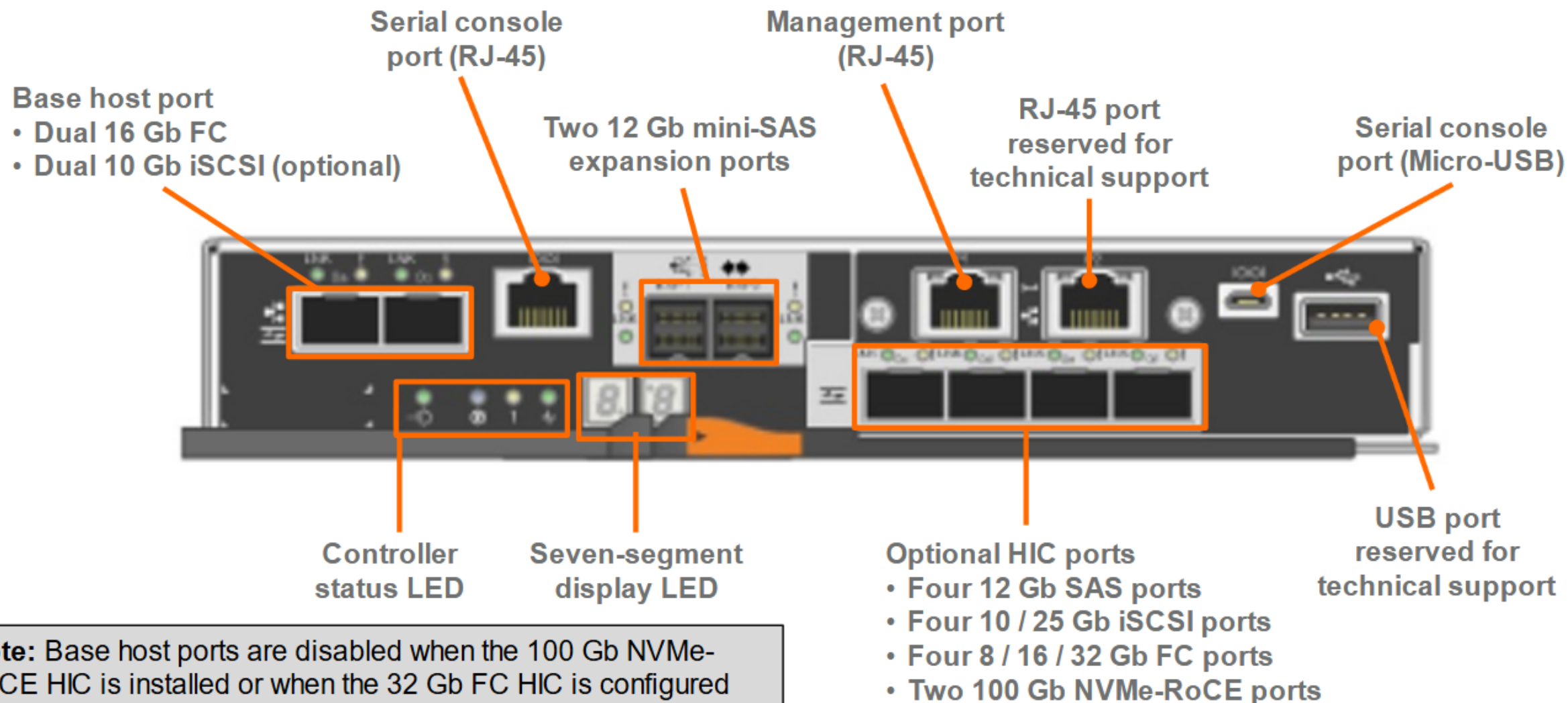

Power supply 1

Controller A

Cooling module 1

Cooling module 2

Power supply 2

Controller B

DE2000H controller rear view

Management port (RJ-45)

RJ-45 port reserved for technical support

Serial console port (RJ-45)

USB port reserved for technical support

Serial console port (Micro-USB)

Two 12 Gb mini-SAS expansion ports

Two base host ports
- Dual 16 Gb FC ports
- Dual 10 Gb iSCSI (optional)

Controller status LED

Seven-segment display LED

Optional HIC ports
- Blank (no HIC ports)
- Two 12 Gb SAS ports
- Two 1 / 10 Gb iSCSI RJ-45 ports

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DE4000H/F controller rear view

Management port (RJ-45)

USB port reserved for technical support

Serial console port (RJ-45)

Base host port
- **Dual 16 Gb FC**
- **Dual 10 Gb iSCSI (optional)**

RJ-45 port reserved for technical support

Serial console port (Micro-USB)

Two 12 Gb mini-SAS expansion ports

Controller status LED

Seven-segment display LED

Optional HIC ports
- **Four 12 Gb SAS ports**
- **Four 10 / 25 Gb iSCSI ports**
- **Four 8 / 16 / 32 Gb FC ports**
- **Four 10 Gb iSCSI or 8 / 16 Gb FC ports**

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DE6000H/F controller rear view

Serial console port (RJ-45)

Management port (RJ-45)

Base host port
- Dual 16 Gb FC
- Dual 10 Gb iSCSI (optional)

Two 12 Gb mini-SAS expansion ports

RJ-45 port reserved for technical support

Serial console port (Micro-USB)

Controller status LED

Seven-segment display LED

Optional HIC ports
- Four 12 Gb SAS ports
- Four 10 / 25 Gb iSCSI ports
- Four 8 / 16 / 32 Gb FC ports
- Two 100 Gb NVMe-RoCE ports

USB port reserved for technical support

Note: Base host ports are disabled when the 100 Gb NVMe-RoCE HIC is installed or when the 32 Gb FC HIC is configured for NVMe-FC mode.

DE Series expansion shelves rear views

Click the buttons to see rear views of the DE Series expansion shelves.

| DE120S / DE240S | DE600S |

DE Series expansion shelves rear views

I/O Module A

Four 12 Gb SAS x4 expansion ports (Mini-SAS HD SFF-8644)

I/O Module status LEDs

Four 12 Gb SAS x4 expansion ports (Mini-SAS HD SFF-8644)

I/O Module status LEDs

I/O Module B

Two redundant hot-swap 913 W ac power supplies with cooling fans (IEC 320-C14 power connector)

DE120S / DE240S

DE600S

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DE Series expansion shelves rear views

Two redundant hot-swap
2325 W ac power supplies
(IEC 320-C20 power connector)

Four 12 Gb SAS x4 expansion ports
(Mini-SAS HD SFF-8644)

I/O Module
status LEDs

I/O Module A

I/O Module B

Four 12 Gb SAS x4 expansion ports
(Mini-SAS HD SFF-8644)

I/O Module
status LEDs

Two hot-swap cooling fan modules

DE120S / DE240S

DE600S

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DE Series inside views

Click the buttons to see inside views of the DE Series enclosures.

2U12	2U24	4U60

DE Series inside views

Controllers or I/O modules

Drives

Power and Cooling

2U12

2U24

4U60

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DE Series inside views

Controllers or I/O modules

Drives

Power and Cooling

2U12   2U24   4U60

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DE Series inside views

Drives

Power

Controllers or I/O modules

Cooling
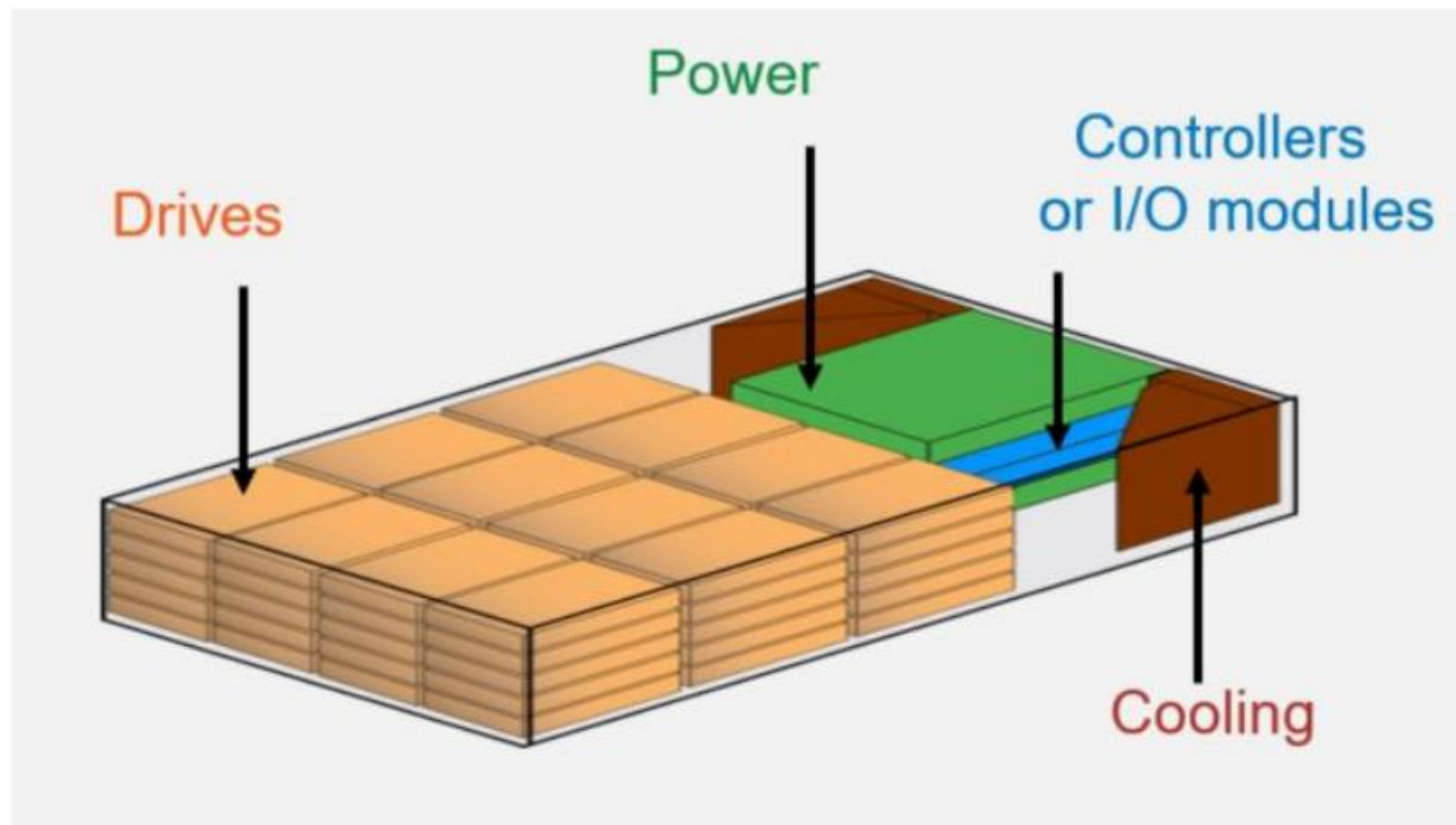
| 2U12 | 2U24 | 4U60 |

Drive roles in DE Series systems

- Dynamic Disk Pools
  - Randomly distributes data for each volume across the set of drives in the pool
- Volume group
  - Distributes data across the drives based on RAID level
- DSSD read cache
  - Extends the controller read cache
- Hot spare drive
  - Protects volume groups from drive failures

Controller A   **Controller Shelf**   **Drive Shelf**

HIC Onboard   Cache   SAS Expander

IOM A

HIC Onboard   Cache   SAS Expander

IOM B

Controller B

* IOM = I/O module

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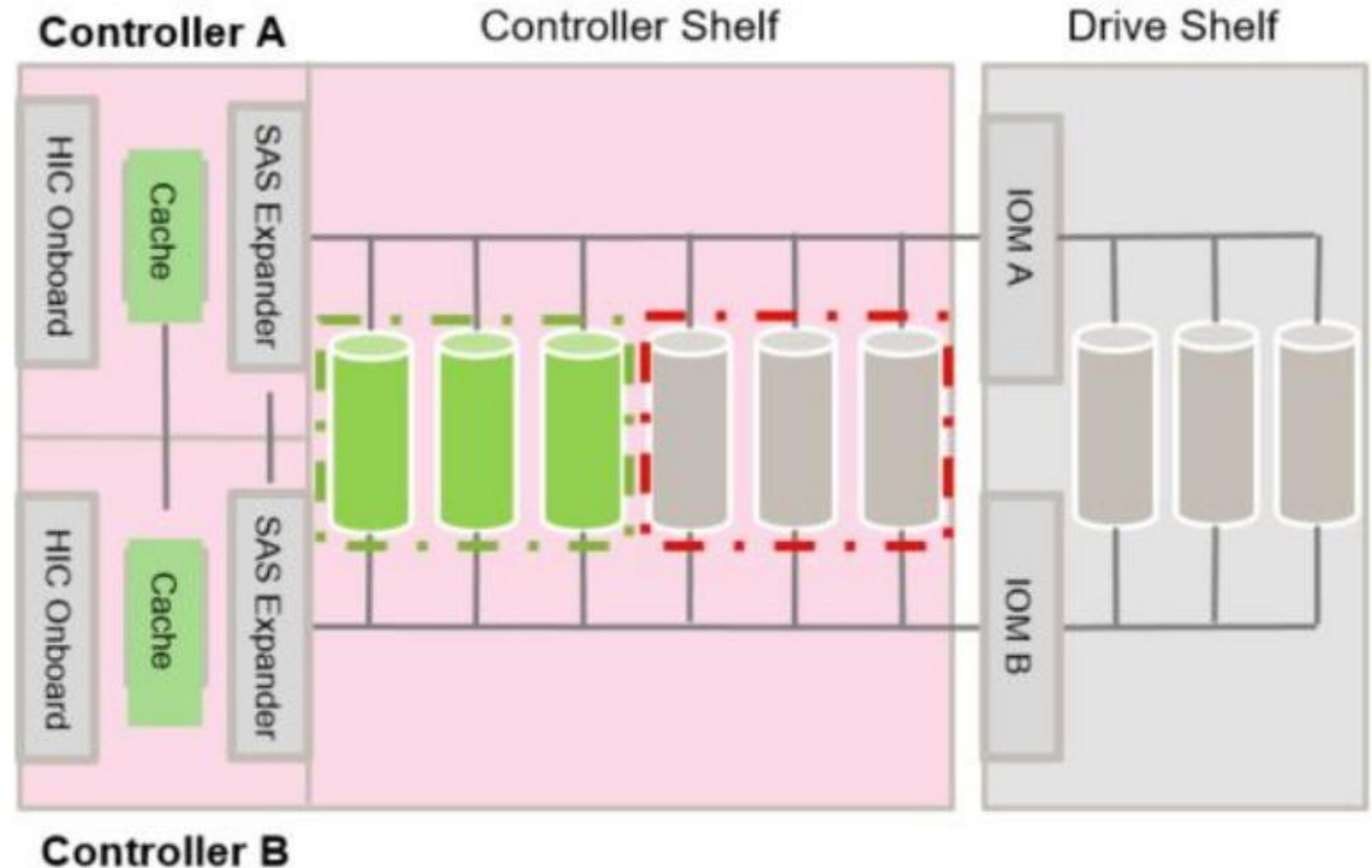
DE Series expansion support list

Enclosure	Supported expansion enclosures
DE2000H	DE120S, DE240S
DE4000H	DE120S, DE240S, DE600S
DE4000F	DE240S
DE6000H	DE240S, DE600S
DE6000F	DE240S

DE Series expansion topology

Click the buttons on the left to see the DE Series expansion topology for different models.

DE2000H

DE4000H
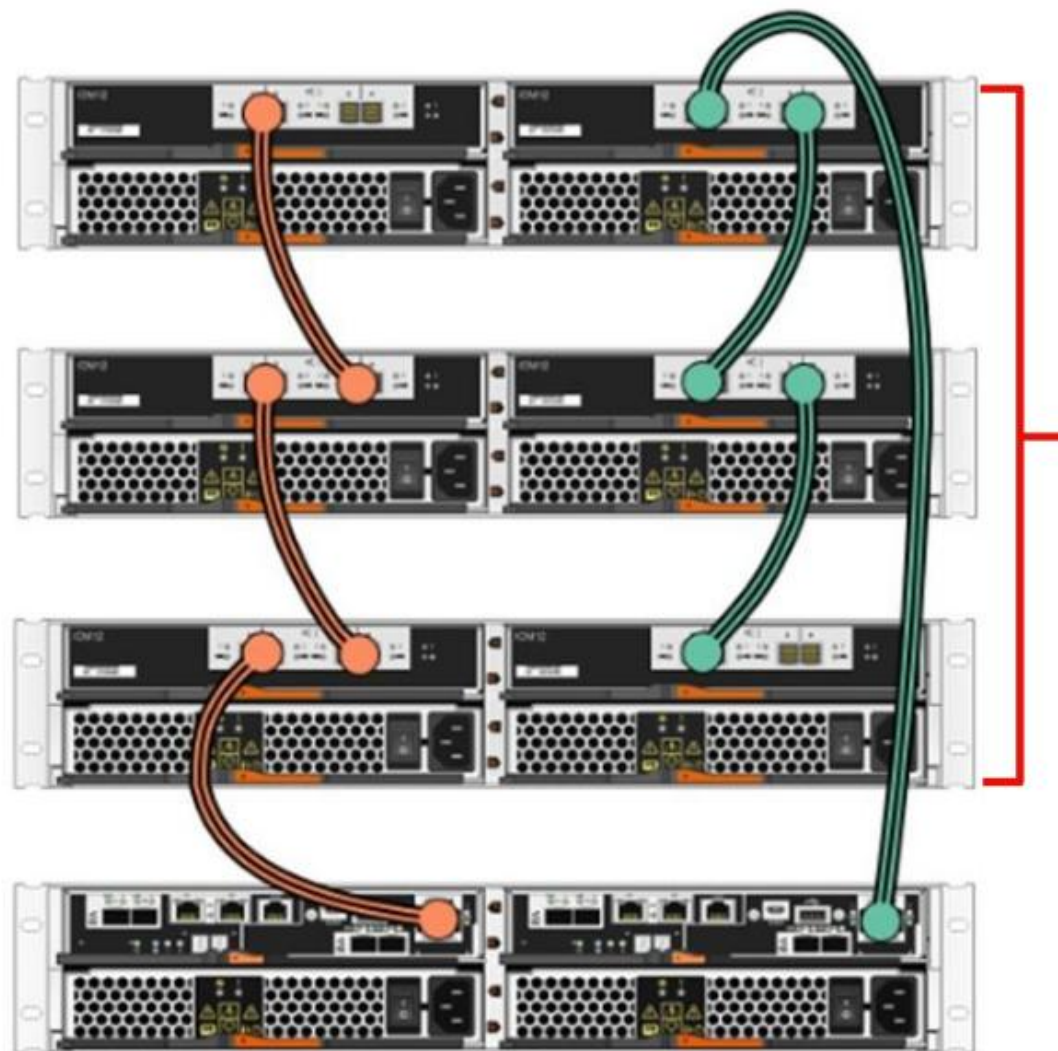
DE6000H
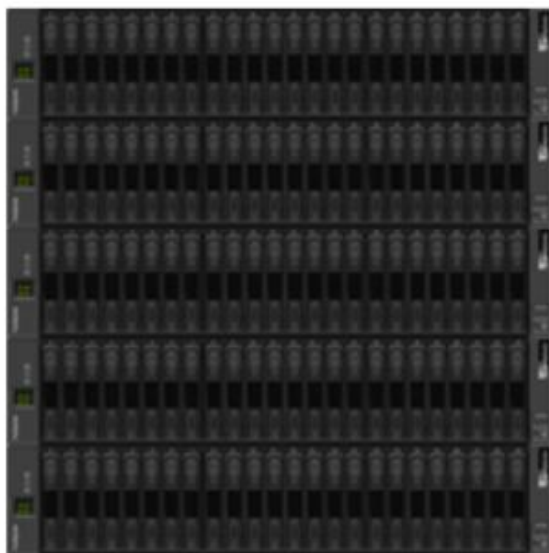
DE4000F

DE6000F

DE Series expansion topology

DE2000H

DE4000H

DE6000H

DE4000F

DE6000F

Up to three expansion enclosures

(Up to 96 drives including controller enclosure)

DE2000H 2U

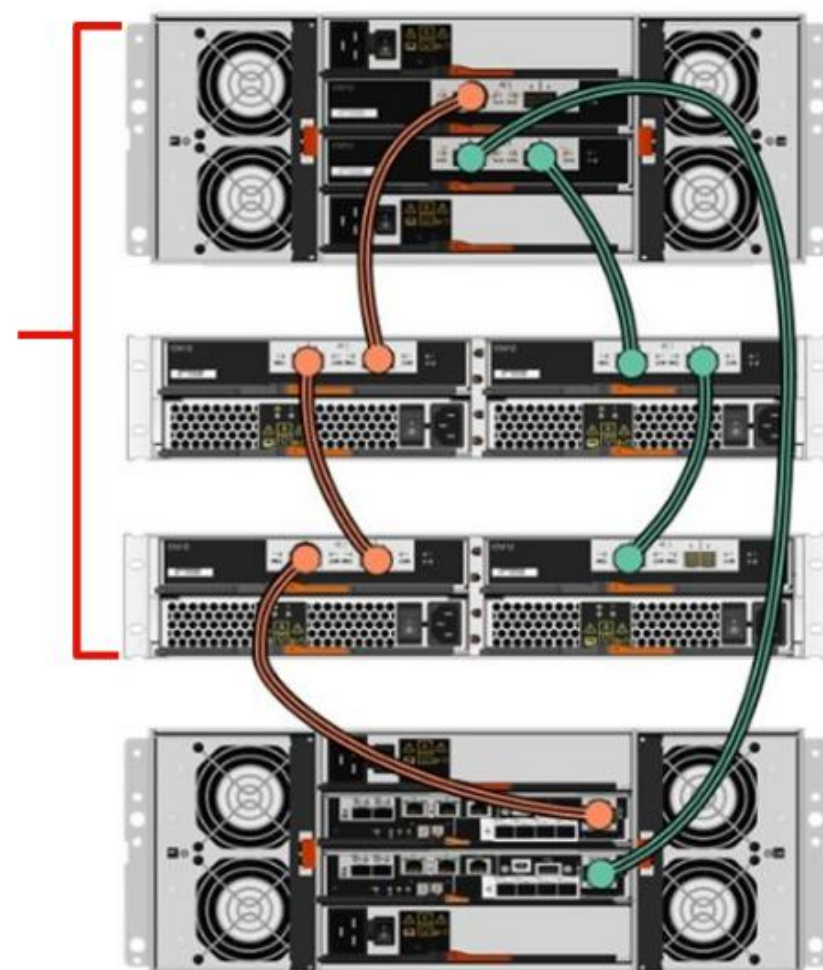# DE Series expansion topology
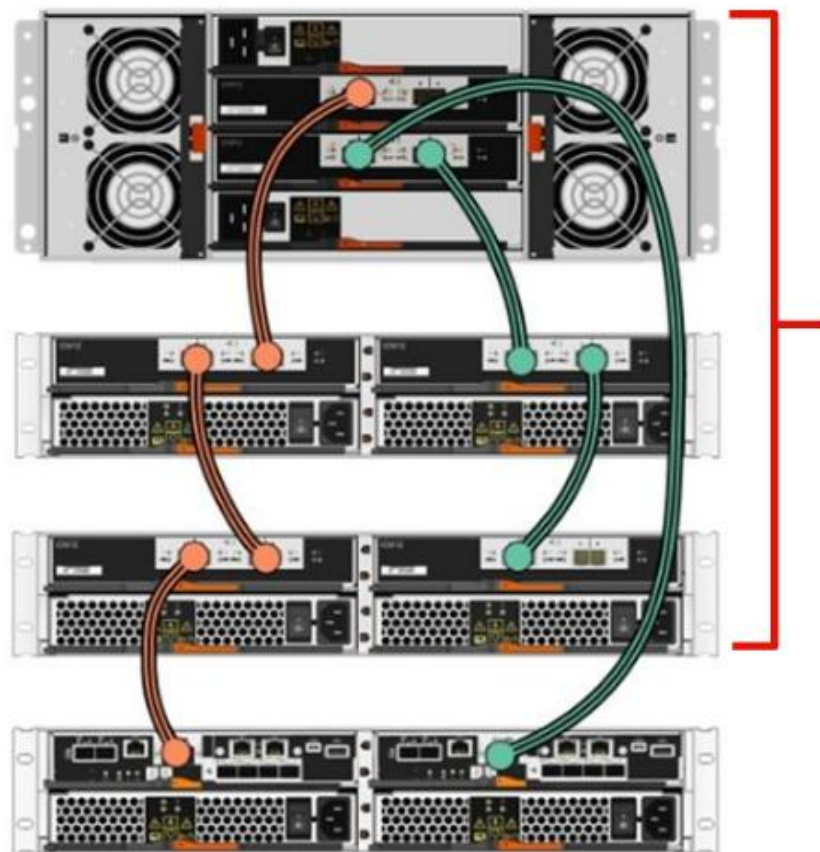
DE2000H

DE4000H

DE6000H

DE4000F

DE6000F

Up to seven
expansion
enclosures

(Up to 192
drives
including
controller
enclosure)

DE4000H 2U

DE4000H 4U

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DE Series expansion topology
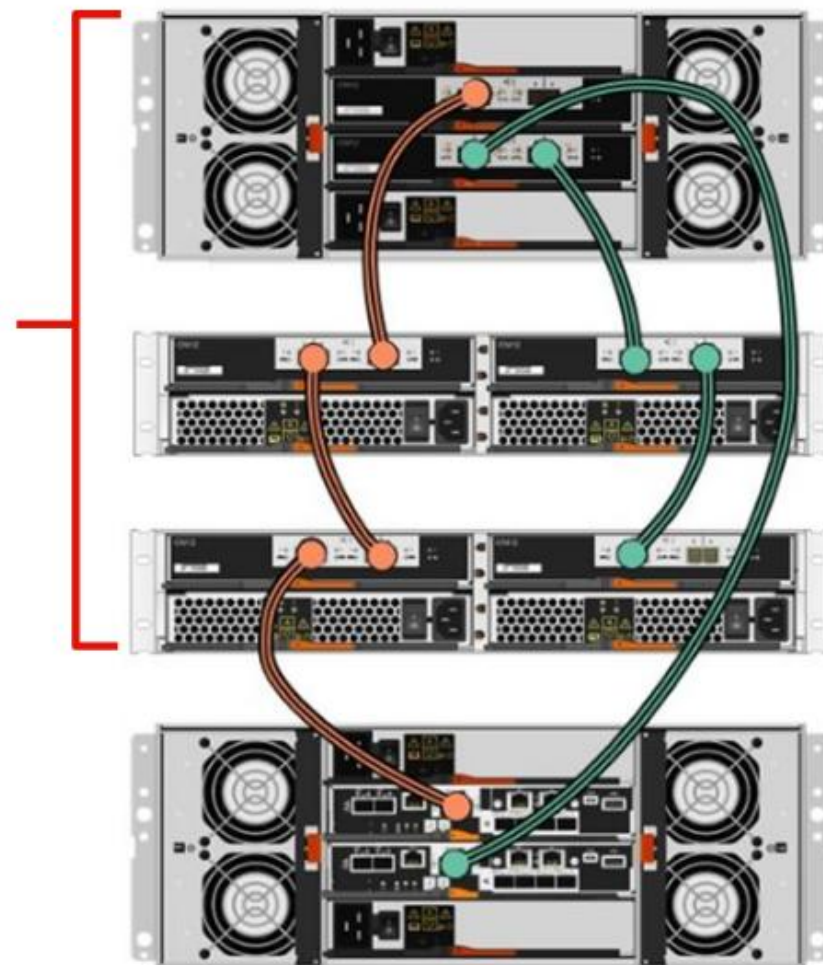

DE2000H

DE4000H

DE6000H

DE4000F

DE6000F

DE6000H 2U

Up to seven expansion enclosures

(Up to 240 drives including controller enclosure)
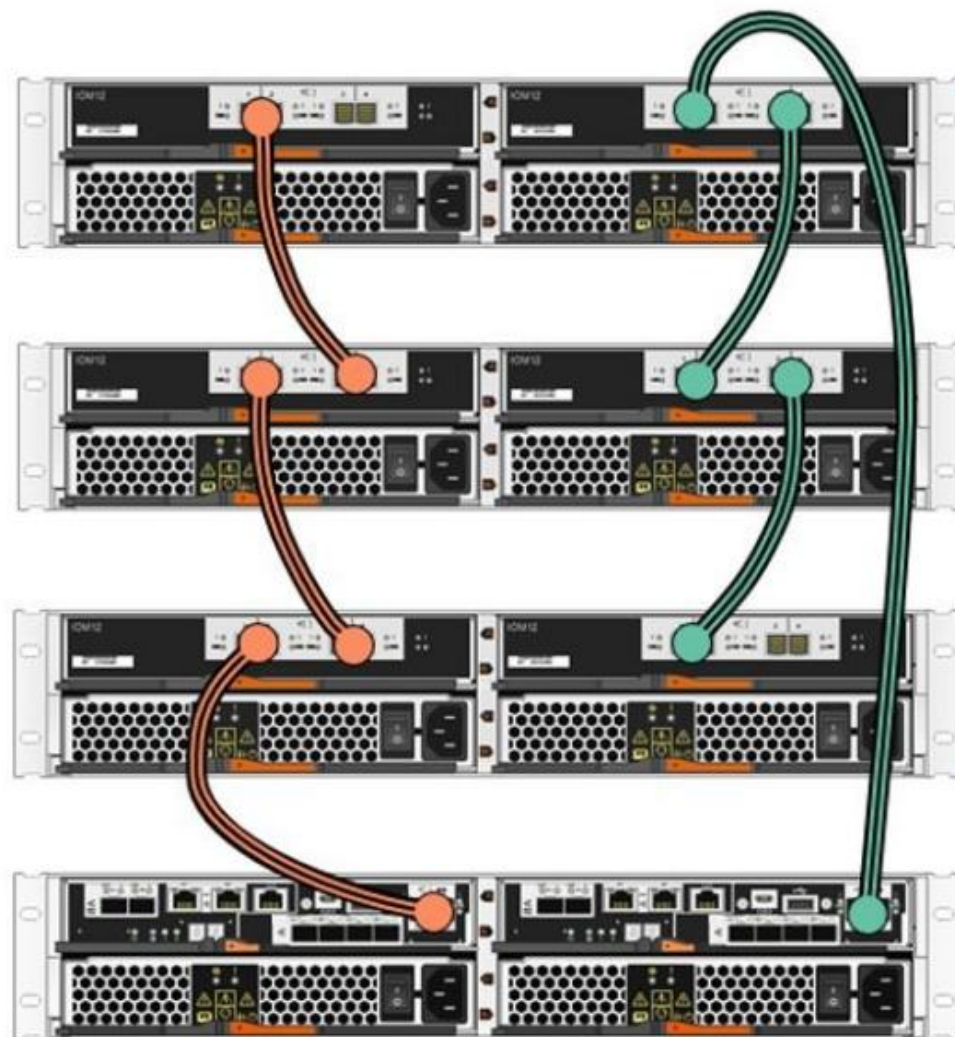
DE6000H 4U

DE Series expansion topology
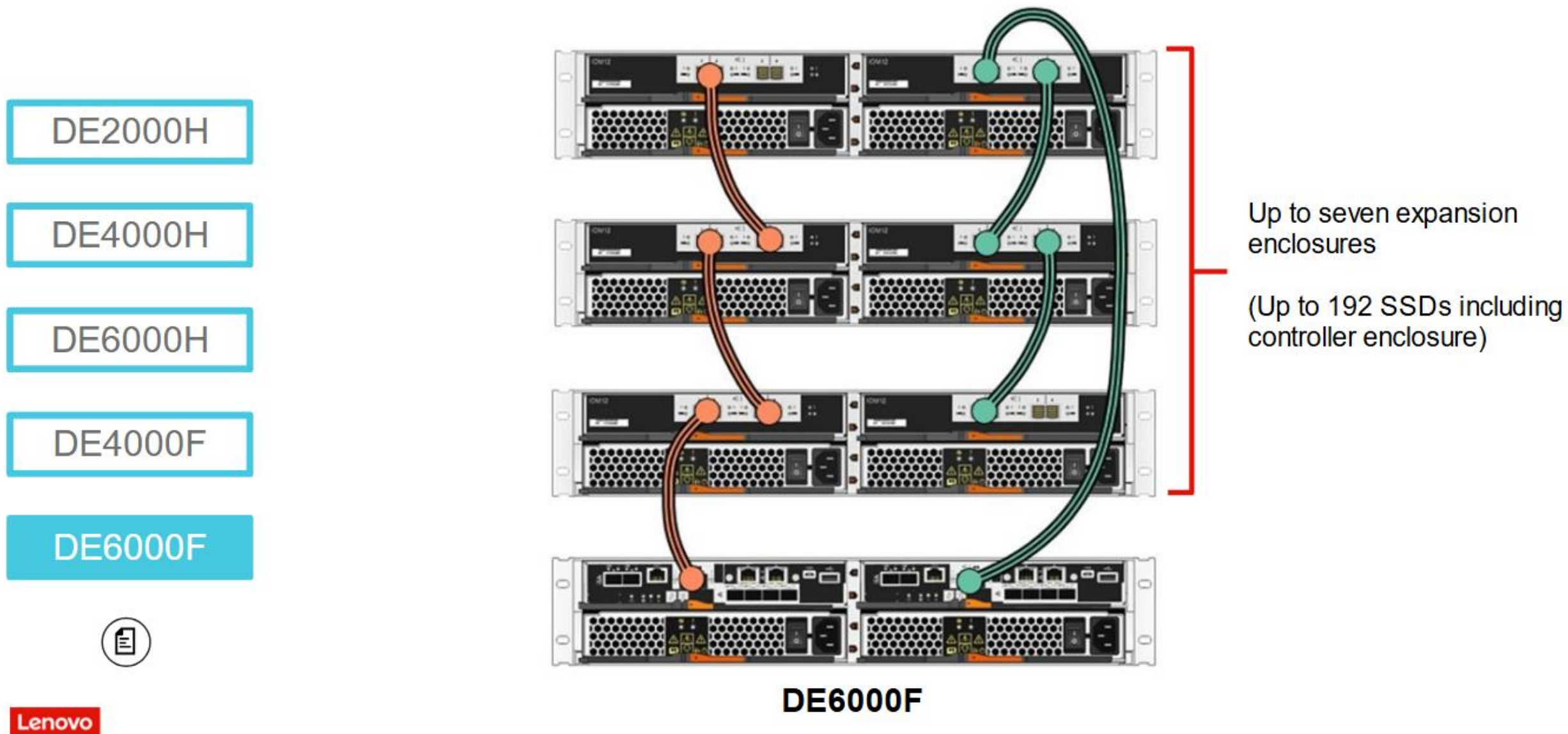
DE2000H

DE4000H

DE6000H

DE4000F

DE6000F

Up to seven expansion enclosures

(Up to 192 SSDs including controller enclosure)

DE4000F

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DE Series expansion topology

DE2000H

DE4000H

DE6000H

DE4000F

DE6000F

Up to seven expansion enclosures

(Up to 192 SSDs including controller enclosure)

DE6000F

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DE Series cabling

For more information about the DE Series cabling rules, refer to *ThinkSystem DE Series Hardware Installation and Maintenance Guide for 2U and 4U Enclosures – Chapter 2 System setup and configuration – Cabling your storage system* and *Ethernet cabling for a management station* sections.

The Hardware Installation and Maintenance Guide is available on:
https://thinksystem.lenovofiles.com/storage/help/index.jsp?topic=%2Fthinksystem_storage_de_himg_11.60.2%2FIC_pdf_file.html&cp=1_0_1_0