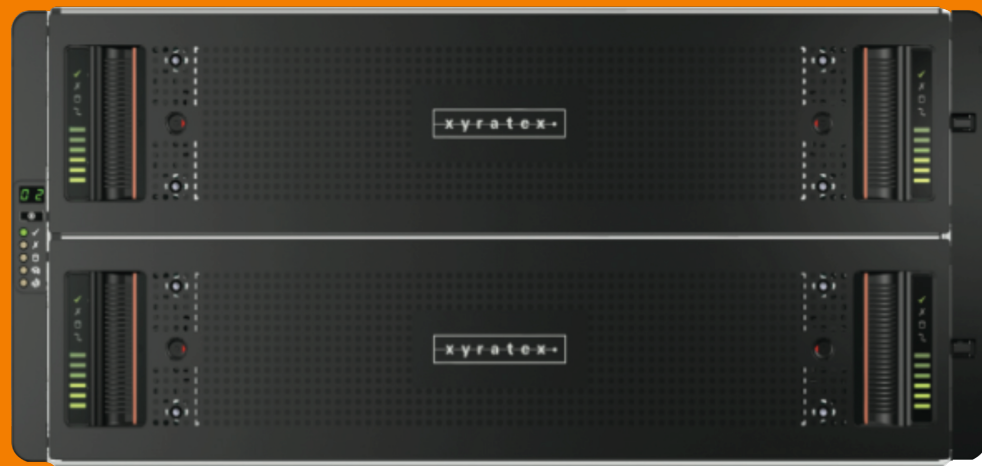


# NexentaStor 5.x Reference Architecture



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# Preface

## Intended Audience

This document is intended for Nexenta partners and Nexenta customer-facing organizations. The latest version of this document is available through the Nexenta Partner Portal.

## Comments

For comments and inquiries, send email to [pm@nexenta.com](mailto:pm@nexenta.com). Refer to specific pages, sections, and paragraphs whenever possible.

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# 1 Cisco Reference Architectures

## 1.1 Cisco All-Flash Configurations

NexentaStor All-Flash configurations deliver high IOPS and sub millisecond latency for small random IO workloads that are typical of databases and high performance private cloud (VMware, OpenStack and Hyper-V) environments.

### 1.1.1 Cisco C240 and HGST 2U24 All-Flash

The following reference architectures are based on the following [HGST 2U24 Flash Storage](#) Platforms:

HGST Model Number	Configuration
1ES0107	12x 3.84TB 1 DWPD SAS SSDs
1ES0110	24x 3.84TB 1 DWPD SAS SSDs
1ES0108	12x 7.68TB 1 DWPD SAS SSDs
1ES0111	24x 7.68TB 1 DWPD SAS SSDs

Cisco and HGST RA	NCH-AF-24	NCH-AF-48	NCH-AF-72	NCH-AF-96
Raw Capacity	Up to 184TB	Up to 368TB	Up to 552TB	Up to 737TB
Device Slots	24	48	72	96
Form Factor (HA)	6U	8U	10U	12U
Memory (HA)	512GB			
10GbE Ports	4			
Software	NexentaStor 5.x			

Cisco and HGST RA	NCH-AF-24	NCH-AF-48	NCH-AF-72	NCH-AF-96
Controller	1x or 2x <a href="#">C240 M4SX</a>			
CPU	E5-2643 v4 3.4GHz, 6 cores, 2 socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 480GB internal SSD			
SAS HBA (external)	1x Cisco 9300-8e 12Gb SAS	2x Cisco 9300-8e 12Gb SAS	3x Cisco 9300-8e 12Gb SAS	4x Cisco 9300-8e 12Gb SAS
NIC	Intel X520 10GbE Dual Port SFP+ Intel X540 10GbE Dual Port Base T			
FC HBA	Emulex LPe 12002, LPe 16002-MC QLogic QLE 2562, QLE 2672			
Storage Enclosure	1x <a href="#">HGST 2U24</a>	2x <a href="#">HGST 2U24</a>	3x <a href="#">HGST 2U24</a>	4x <a href="#">HGST 2U24</a>
Data Device #	Up to 24	Up to 48	Up to 72	Up to 96
Flash Device	3.84TB SAS SSD (1 DWPD) 7.68TB SAS SSD (1 DWPD)			
L2ARC	n/a			
ZIL/SLOG	n/a			

**Note 1:** BIOS version for Cisco C240 M4SX is C240M4.2.0.6a.0.051220151501 or later.

**Note 2:** Chassis management for the HGST 2U24 enclosure is supported in NexentaStor 5.1 and up.

## 1.2 Cisco Hybrid / All-Disk Configurations

NexentaStor Hybrid configurations deliver balanced performance and are great for general purpose private cloud (VMware, OpenStack and Hyper-V) storage backend, generic enterprise file services, and low TCO backup and archive use cases.

### 1.2.1 Cisco C240 Standalone Hybrid

Single node (non-HA) storage appliance based on a single Cisco C240 M4SX running NexentaStor 5.x in a 2U chassis.

Cisco Standalone RA	NC-H-24 (Non-HA)
Max Raw Capacity	Up to 44TB (22x 2TB)
Device Slots	24
Form Factor (total)	2U
Memory (total)	128GB
Read Cache	n/a
10GbE Ports	2
Software	NexentaStor 5.x

Cisco Standalone RA	NC-H-24 (Non-HA)
Controller	1x Cisco <a href="#">C240 M4SX</a>
CPU	E5-2680 v3 2.5GHz, 12 cores, 2 socket E5-2643 v4 3.4GHz, 6 cores, 2 socket
DRAM	128GB (8x 16GB)
Boot Drive	2x 480GB internal SSD
SAS HBA	n/a
Built-in Ethernet	Intel i350 dual-port on the motherboard
NIC	Intel X520 10GbE Dual Port SFP+ Intel X540 10GbE Dual Port Base T
FC HBA	Emulex LPe 12002, LPe 16002-MC QLogic QLE 2562, QLE 2672
Storage	24x 2.5" Data + internal Boot devices
Data HDD	See Cisco supported devices <a href="#">here</a> Note that PCIe devices are not supported.
Data Drive #	Up to 22
L2ARC	n/a
ZIL/SLOG	2x 200GB High Endurance SSD device

**Note 1:** No chassis management provided.

**Note 2:** BIOS version for Cisco C240 M4SX is C240M4.2.0.6a.0.051220151501 or later.

## 1.2.2 Cisco C240 and Seagate Hybrid / All-Disk

Cisco and Seagate RA	NCS-84	NCS-168	NCS-252	NCS-336
Max Raw Capacity	Up to 840TB	Up to 1,680TB	Up to 2,520TB	Up to 3,360TB
Device Slots	84	168	252	336
Form Factor (HA)	9U	14U	19U	24U
Memory (HA)	512GB			
Read Cache	Up to 400GB		Up to 800GB	
10GbE Ports	4			
Software	NexentaStor 5.x			

Cisco and Seagate RA	NCS-84	NCS-168	NCS-252	NCS-336
Controller	2x C240 M4SX			
CPU	E5-2680 v3 2.5GHz, 12 cores, 2 socket E5-2643 v4 3.4GHz, 6 cores, 2 socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 480GB internal SSD			
SAS HBA (external)	1x Cisco 9300-8e 12Gb SAS	2x Cisco 9300-8e 12Gb SAS	3x Cisco 9300-8e 12Gb SAS	4x Cisco 9300-8e 12Gb SAS
NIC	Intel X520 10GbE Dual Port SFP+ Intel X540 10GbE Dual Port Base T			
FC HBA	Emulex LPe 12002, LPe 16002-MC QLogic QLE 2562, QLE 2672			
Storage Enclosure	1x Seagate SP-2584	2x Seagate SP-2584	3x Seagate SP-2584	4x Seagate SP-2584
Data Drive #	Up to 84	Up to 168	Up to 252	Up to 336
Data HDD	Seagate 2TB NL SAS 7.2 PN: ST2000NM0135 Seagate 4TB NL SAS 7.2 PN: ST4000NM0125 Seagate 6TB NL SAS 7.2 PN: ST6000NM0095 Seagate 8TB NL SAS 7.2 PN: ST8000NM0075 Seagate 10TB NL SAS 7.2 PN: ST10000NM0086			
L2ARC (Optional)	Seagate 1200.2 400GB SSD 3DWPD per pool PN: ST400FM0303			
ZIL /SLOG (Optional)	Pair of Seagate 1200.2 200GB 25 DWPD SSD per pool PN: ST200FM0133			

**Note 1:** BIOS version for Cisco C240 M4SX is C240M4.2.0.6a.0.051220151501 or later.

**Note 2:** In order to support the highest levels of performance, resilience and redundancy for a NexentaStor deployment, SAS cabling from the head nodes to the JBOD should track the following rules of thumb:

- Unless otherwise specified, all JBODs should be direct connected to SAS HBAs, no intermediate SAS switches, no chaining of JBODs.
- Cabling for HA configurations should be connected to be redundant across HBAs, JBODs and JBOD controllers/expanders.
- Cabling for HA configurations should be consistent with the ports used on each node from the HBA to the ports on the JBOD controller/expander.

## 1.2.3 Cisco C240 and HGST 4U60G2 Hybrid / All-Disk

Cisco and HGST RA	NCH-60	NCH-120	NCH-180	NCH-240
Max Raw Capacity	Up to 696TB	Up to 1,416TB	Up to 2,136TB	Up to 2,856TB
Device Slots	60	120	180	240
Form Factor (HA)	8U	12U	16U	20U
Memory (HA)	512GB			
Read Cache	800GB		Up to 1.6TB	
10GbE Ports	4			
Software	NexentaStor 5.x			

Cisco and HGST RA	NCH-60	NCH-120	NCH-180	NCH-240
Controller	2x C240 M4SX			
CPU	E5-2643 v4 3.4GHz, 6 cores, 2 socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 480GB internal SSD			
SAS HBA (external)	1x Cisco 9300-8e 12Gb SAS	2x Cisco 9300-8e 12Gb SAS	3x Cisco 9300-8e 12Gb SAS	4x Cisco 9300-8e 12Gb SAS
NIC	Intel X520 10GbE Dual Port SFP+ Intel X540 10GbE Dual Port Base T			
FC HBA	Emulex LPe 12002, LPe 16002-MC QLogic QLE 2562, QLE 2672			
Storage Enclosure	1x HGST 4U60G2	2x HGST 4U60G2	3x HGST 4U60G2	4x HGST 4U60G2
Data Drive #	Up to 60	Up to 120	Up to 180	Up to 240
Data HDD	HGST Ultrastar 6TB air HDDs HGST Ultrastar 8TB helium HDDs HGST Ultrastar 10TB helium HDDs HGST Ultrastar 12TB helium HDDs			
L2ARC (Optional)	800GB SAS SSD (3 DWPD) per pool			
ZIL /SLOG	2x 400GB SAS SSD (10 DWPD) per pool			

**Note 1:** BIOS version for Cisco C240 M4SX is C240M4.2.0.6a.0.051220151501 or later.

**Note 2:** Use dual SAS path for configurations with up to 4 enclosures.

## 2 About Nexenta

Nexenta is the global leader in Open Source-driven Software-Defined Storage (OpenSDS). Founded in 2005 with 6,000+ customers and more than 1,500 petabytes of storage under management, our privately held company delivers **100% Software**-based storage solutions, providing organizations with **Total Freedom** to choose an easy-to-use, secure and ultra-low cost storage solution to fit their needs. Nexenta enables everyday apps; from the Internet of Things to Big Data; from OpenStack to Containers – and all types of Clouds – Private, Public, and Hybrid. Founded around an open source platform and industry-disrupting vision, Nexenta delivers its award- and patent-winning software-only unified storage management solutions 24x7 - around the globe - service and support. Nexenta has an **All Love** approach with its global partner network, including solution integration with top hardware partners to deliver validated and certified OpenSDS solutions to fit your business requirements.

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