NexentaStor 5.x Hardware Certification List (HCL)

Nexenta Certification Team

April 2023

www.nexenta.com

Table of Contents

Table of Contents 2

Preface 4
Intended Audience 4
Comments 4
Copyright, Trademarks, and Compliance 4
Document History 5

1 Overview 8
1.1 Introduction 8
1.2 NexentaStor Solutions 8
1.2.1 Reference Architectures (RA) 8
1.2.2 Certified Solutions (CS) 8
1.3 Common Pre-Requisites 9

2 Current Recommended Configurations 10
2.1 Lenovo Reference Architectures 10
2.1.1 Lenovo ThinkSystem SR650V2 All-Flash 10
2.1.2 Lenovo ThinkSystem SR650V2 Hybrid 11
2.2 Dell 15G Reference Architectures 12
2.2.1 Dell 15G All-Flash Configurations 12
2.2.2 Dell 15G Hybrid Configurations 13
2.3 HPE Gen10 Plus Reference Architectures 16
2.3.1 HPE DL380 Gen 10 Plus All Flash 16
2.3.2 HPE DL380 Gen 10 plus Hybrid – D3610 17
2.3.3 HPE DL380 Gen 10 plus Hybrid – D3710 18

3 Legacy Configurations 19
3.1 Cisco Reference Architectures 19
3.1.1 Cisco All-Flash Configurations 19
3.1.2 Cisco Hybrid / All-Disk Configurations 20
3.2 Dell 14G Reference Architectures 23
3.2.1 Dell 14G All-Flash Configurations 23
3.2.2 Dell 14G Hybrid Configurations 24
3.2.3 Dell and HGST Storage Platform Configurations 28
3.3 Dell 13G Reference Architectures 30
3.3.1 Dell 13G All-Flash Configurations 30
3.3.2 Dell 13G Hybrid Configurations 31
3.3.3 Dell 13G All-Disk Configurations 35
3.3.4 Dell and HGST Storage Platform Configurations 36
3.4 HPE Gen10 Reference Architectures 38
3.4.1 HPE Gen10 All-Flash Configurations 38
3.4.2 HPE Gen10 Hybrid Configurations 39
3.5 Lenovo Reference Architectures 43
3.5.1 Lenovo ThinkSystem SR650 All-Flash – D1224 43
3.5.2 Lenovo Hybrid Configurations 44
3.5.3 Lenovo ThinkSystem SR650 Single Node Appliances 48
3.5.4 Lenovo and HGST Storage Platform Configurations 51

3.6 StorMax Reference Architectures....53
3.6.1 StorMax All-Flash and Hybrid Configurations....53
3.7 Supermicro X11 Reference Architectures....54
3.7.1 Supermicro X11 All-Flash Configurations....54
3.7.2 Supermicro X11 Hybrid Configurations....55
3.7.3 Supermicro All-Disk Configurations....59
3.7.4 Supermicro and HGST Storage Platform Configurations....62
3.8 Supermicro X10 Reference Architectures....64
3.8.1 Supermicro All-Flash Configurations....64
3.8.2 Supermicro Hybrid Configurations....65
3.8.3 Supermicro All-Disk Configurations....69
3.8.4 Supermicro and HGST Storage Platform Configurations....72
3.9 Supermicro Unified Storage Appliances....74
3.9.1 Supermicro (2U) All-Flash Appliances....74
3.9.2 Supermicro (4U) Hybrid and All-Disk Appliances....75
3.10 Virtual NAS Configurations....76
3.10.1 NexentaStor as a VMware vSphere 6.x Virtual NAS....76
3.11 MetroHA Configurations....77
3.12 Legacy Certified Solutions....79
3.12.1 Certified Solutions with NexentaStor 5.x....79
3.12.2 Certified Solution Building Blocks....79

4 Current Certified Solutions....81
4.1 Certified Solutions with NexentaStor 5.x....81
4.2 Certified Solution Building Blocks....81

5 Key Management for Data At Rest Encryption....83

6 About Nexenta....84

Appendix A: Supported SSDs....85

Appendix B: Legacy Configurations....86
B.1 Cisco Legacy Configurations....86
B.1.1 Cisco C240 and SanDisk InfiniFlash All-Flash....86
B.2 Dell Legacy Configurations....87
B.2.1 Dell R730 and SanDisk InfiniFlash All-Flash....87
B.3 Lenovo Legacy Configurations....88
B.3.1 Lenovo X3650-M5 and SanDisk InfiniFlash All-Flash....88
B.3.2 Lenovo X3650-M5 and D1224 –All-Flash....89
B.3.3 Lenovo X3650-M5 and D1224 – Hybrid....90
B.3.4 Lenovo X3650-M5 and D1212 – Hybrid....91
B.3.5 Lenovo X3650-M5 and D3284 – Hybrid....92
B.3.6 Lenovo X3650-M5 and D1212 – All-Disk....93
B.3.7 Lenovo X3650-M5 D3284 – All-Disk....94
B.3.8 Lenovo X3650-M5 and HGST 2U24 All-Flash....95
B.3.9 Lenovo X3650-M5 & HGST 4U60G2 Hybrid / All-Disk....96
B.4 Supermicro Legacy Configurations....97
B.4.1 Supermicro X10 and SanDisk InfiniFlash IF150 All-Flash....97

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. Refer to specific pages, sections, and paragraphs whenever possible.

Copyright, Trademarks, and Compliance

Copyright © 2023 Nexenta Systems ™, ALL RIGHTS RESERVED

Notice: No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or stored in a database or retrieval system for any purpose without the express written permission of Nexenta Systems (hereinafter referred to as “Nexenta”).

Nexenta reserves the right to make changes to this document at any time without notice and assumes no responsibility for its use. Nexenta products and services only can be ordered under the terms and conditions of Nexenta Systems’ applicable agreements. All of the features described in this document may not be currently available. Refer to the latest product announcement or contact your local Nexenta Systems sales office for information on feature and product availability. This document includes the latest information available at the time of publication.

Nexenta, NexentaStor, NexentaFusion, NexentaEdge and NexentaCloud are registered trademarks of Nexenta Systems in the United States and other countries. All other trademarks, service marks, and company names in this document are properties of their respective owners.

Document History

Date	Description
4/27/2023	**Additions:** New section for "Lenovo ThinkSystem SR650V2 Server" in Current Recommended Configurations chapter.
12/23/2022	**Additions:** New section "Current Recommended Configurations" for Dell PowerEdge R750 Server and HPE DL380 Gen10 Plus Server. **Modifications:** Moved all the old configurations to a new section "Legacy Configurations". Updated the section "Current Certified Solutions". Deleted below sections from Appendix: • SSDs Supported for New Deployments • SSDs Supported for Legacy Deployments
12/09/2019	**Additions:** • Updated the HPE configs to specify the 366-FLR and the 621SFP29 – PCIe version of the 622
8/15/2019	**Additions:** • Noted that Dell R740 servers cannot utilize Dell Firmware v2.x • Noted new Lenovo BIOS firmware version
6/21/2019	**Additions:** Section 11.1: • Added HDS 8000 Compute Rack Unit (CRU 0211)
5/03/2019	**Additions:** Section 2.3, Common Pre-Requisites: added details on Broadcom / LSI HBA FW that are supported with NexentaStor 5, including instructions on how to change settings for FW 16.x to work. Section 3, Dell 14G RAs: • Added Hybrid / All-Disk RAs based on Dell ME484 storage enclosures • Removed references to Dell 14G with MD3060e and MD1280 enclosures Section 5, HPE Gen10 RAs: • Added support for 15.3TB SSD in HPE All-Flash RAs • Added 10/25GbE 621SFP28 NIC and 622FLR LOM to HPE RAs • Added note on supported HPE FW 1.36 and known issue with FW 1.46. Section 6.2.3, Lenovo D3284 RAs – Added support for 14TB HDD configurations. Section 11, Certified Solutions: • Added Ericsson SRU0201 enclosure • Added Seagate Exos E 2U24, Exos E 5U84 and Nytro E 2U24 enclosures **Modifications:** Section 1.3, Common Pre-reqs: • Called out ability to deploy on NVMe boot devices with UEFI Loader ISO • Added details on supported LSI HBA FW

	Section 3, Dell 14G RAs: • Streamlined definitions of Dell Hybrid and All-Disk RAs • Reduced the number of required SAS HBAs per servers Section 6, Lenovo RAs: • Added note on supported Emulex FC HBA FW for Lenovo RAs Appendix A, -Supported SSDs: • Restructured the SSD tables • Added a number of new Seagate, Toshiba and WD SAS SSD options.
11/27/2018	**Additions:** New Section 5 with HPE DL380 Gen10 based Reference Architectures, for NexentaStor 5.2.0 or higher New Section 6 with Lenovo ThinkSystem SR650 based Reference Architectures • Replacement of X3650-M5 configurations • Addition of single-node SR650 based entry-level configurations Section 11.1: added Ericsson SSU 0112 (20 bay) to certified solutions Section 11.2: added support for HGST Ultrastar Data60 enclosure **Modifications:** Moved all Lenovo X3650-M5 sections to Appendix C – Legacy configurations Updated all HGST sections to call out support for HGST Ultrastar Data60 Platform
6/25/2018	**Additions:** Section 3: added support for MD1280 enclosures in Dell 14G Reference Architectures Appendix A: completed additions of HGST SS200 SSD references for L2ARC **Modifications:** Section 3: • updated CPU config for the mid-tier reference architectures • updated minimum BIOS version Section 7: • updated CPU config for the mid-tier reference architectures • updated minimum BIOS version Section 12: updated requirements for MetroHA configurations
4/2/2018	**Additions:** New section 1.3 for Common Pre-Requisites New section 3 for Dell 14G Reference Architectures based on R740/R740xd servers New section 7 for Supermicro X11 Reference Architectures based on 6029U-E1CR4T servers Section 10.1: Added Ericsson CSU0201 Section 10.2: Added Cisco S3260-M4 with ESXi DirectPath IO based deployment Appendix A: • Added Ultrastar SS300 SSDs for SLOG and mention of SS200 SSD as "pending" for L2ARC • Added Seagate Nytro XF1440 U.2 and XM1440 M.2 NVMe devices **Modifications:** Section 8: the Broadcom 9300-16e SAS HBA is no longer supported in Supermicro servers. The Broadcom 9305-16e SAS HBA should be used instead.

1 Overview

1.1 Introduction

NexentaStor is Nexenta's flagship Software Defined Storage (SDS) platform, allowing thousands of customers all around the world to transform their storage infrastructure, increase flexibility and agility, simplify management, and dramatically reduce costs without compromising on availability, reliability, or functionality.

NexentaStor delivers unified file and block storage services, runs on industry standard hardware, scales from tens of terabytes to petabyte configurations, and includes all data management functionalities.

This document is intended for Nexenta Partners and Nexenta customer-facing organizations looking to deploy NexentaStor 5.x. The latest version of the Nexenta Hardware Certification List (HCL) for NexentaStor 5.x is posted on Partner Portal. A separate HCL document is available for NexentaStor 4.0.

1.2 NexentaStor Solutions

1.2.1 Reference Architectures (RA)

A NexentaStor Reference Architecture comprises specific servers and storage enclosure configurations from a specific server vendor. There is flexibility in choosing your SSDs and HDDs accordingly to match capacity and performance requirements. The main components of a reference architecture are:

- Controllers: x86 servers with specific CPU, memory, NICs, and HBAs
- Storage enclosures: JBOD with specific HDDs and SSDs
- NexentaStor software

The detailed list of components for each partner-specific RA configurations (All-Flash, Hybrid, or All-Disk) start in Section 2.0. In most cases, hardware technology partners offer consolidated SKUs for RA configurations to simplify ordering and support of NexentaStor solutions.

As a result, reference architectures provide the fastest path to market for Nexenta Partners.

1.2.2 Certified Solutions (CS)

A NexentaStor Certified Solution (CS) comprises servers and storage enclosure configurations typically customized by a channel partner or reseller. Certified solutions generally use different server configurations from those supported in reference architectures, and pair them with storage enclosures from different hardware providers. All Certified Solutions must pass Nexenta Certification Testing before they can be added on the HCL and formally supported.

A specific certification may be a lengthy process depending on the nature of the certification and will require extra efforts from both Partners' and Nexenta's engineering resources. Additional fees are required for certification. As a result, it is generally recommended that partners closely review the available set of standard reference architectures when evaluating the need for a particular customized certified solution.

Note: Certified solutions are specific to NexentaStor major releases. For example, a Certified Solution for NexentaStor 4.0 does not automatically carry forward to NexentaStor 5.x and will need to get re-certified.

1.3 Common Pre-Requisites

The following requirements apply generically to all NexentaStor hardware configurations:

1. All Broadcom / LSI SAS HBAs used in NexentaStor 5 clusters should:
    - Be configured in IT (Initiator Target) mode, providing transparent pass-through of all commands to the backend devices. SAS HBAs in IR (Integrated Raid) mode are not supported.
    - For Dell R750 configurations, the firmware versions for HBA355e adapter is 15.5.3 and for HBA355ifnt (embedded) is 17.15.08.
    - For Dell 12Gb SAS controller; for 14G platforms and below, HBAs should be running either firmware 13 in order to work with default settings. The firmware 14.x and 15.x are not supported.
      FW 16.x and above are supported with the following ROM Option setting for error handling set to 'Abort Task'. To set error handling to 'Abort Task' using lsiutil:
        - Select menu option 9. The page type is 9, the page # is 17.
        - Hit enter for default value (NVRAM) and then look at offset 000C.
        - Type yes to change it and then 000C for the offset and then set it to 00001000 (Abort Task) from its default of 00000000 (Target Reset).
        - After setting it, use option 99 to reset the controller.
2. The default boot loader is Loader which can be used to boot Legacy BIOS or UEFI.
3. For hybrid configurations, each pool should be configured with a minimum of 2x SLOG SSDs and 1x L2ARC SSD. The number of SLOG and L2ARC devices in the various tables below is derived from assumptions on the typical number of pools per system of a particular size.
4. For all-flash configurations, all SSDs should be used as data devices. There is no need for separate SLOG or L2ARC devices.

2 Current Recommended Configurations

2.1 Lenovo Reference Architectures

2.1.1 Lenovo ThinkSystem SR650V2 All-Flash

Lenovo All-Flash RA	NL-AF-24	NL-AF-48	NL-AF-72	NL-AF-96
Raw Capacity	Up to 368TB	Up to 737TB	Up to 1,105TB	Up to 1,474TB
Device Slots	24	48	72	96
Form Factor (total system)	6U	8U	10U	12U
Memory (total system)	384GB to 768GB			
Software	NexentaStor 5.5-FP1 or higher			

Lenovo All-Flash RA	NL-AF-24	NL-AF-48	NL-AF-72	NL-AF-96
Controller	2x Lenovo ThinkSystem SR650V2			
Chassis	ThinkSystem SR650 3.5" Chassis With 3.5" SATA/SAS 8-Bay Backplane			
RAID Config	No RAID			
PCIe Riser	ThinkSystem 2U x8/x8/x8 PCIE FH Riser 1 ThinkSystem (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit			
CPU	Intel Xeon Gold 6338 2.00GHz Processor			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2x ThinkSystem 3.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD			
SAS HBA	1x ThinkSystem 440-8i SAS/SATA 12Gb HBA 1x ThinkSystem 440-16e SAS/SATA 12Gb HBA		1x ThinkSystem 440-8i SAS/SATA 12Gb HBA 2x ThinkSystem 440-16e SAS/SATA 12Gb HBA	
LOM & PCIe NICs	ThinkSystem 10Gb 2-port Base-T LOM ThinkSystem 10Gb 4-port Base-T LOM Intel X550-T2 Dual Port 10GBase-T Adapter Mellanox ConnectX-6 Lx 25GbE SFP+/QSF+ Broadcom BCM5719 PCIe 1Gb 4-Port Ethernet Adapter			
FC HBA (optional)	Emulex 16Gb Gen6 FC Dual-port HBA Emulex LPe32002-M2-L 32Gb 2 port FC HBA			
Storage Enclosure	1x Lenovo Storage D1224	2x Lenovo Storage D1224	3x Lenovo Storage D1224	4x Lenovo Storage D1224
Total Drive #	Up to 24	Up to 48	Up to 72	Up to 96
Flash Device	High Performance SAS SSDs – 1.6TB 10 DWPD Capacity Optimized SAS SSDs – 3.84TB 3 DWPD Capacity Optimized SAS SSDs – 7.68TB 1 DWPD Capacity Optimized SAS SSDs – 15.36TB 1 DWPD			
L2ARC	N/A			
ZIL/SLOG	N/A			

Note: The minimum BIOS version for Lenovo SR650V2 is 1.6.5.

2.1.2 Lenovo ThinkSystem SR650V2 Hybrid

Lenovo Hybrid RA	**NL-H-2x24**	**NL-H-4x24**	**NL-H-6x24**	**NL-H-8x24**
Raw Capacity	Up to 108TB	Up to 223TB	Up to 331TB	Up to 446TB
Device Slots	48	96	144	192
Form Factor (total)	8U	12U	16U	20U
Memory (total)	192GB to 384GB			
Read Cache	400GB		800GB	
Software	NexentaStor 5.5-FP1 or higher			

Lenovo Hybrid RA	**NL-H-2x24**	**NL-H-4x24**	**NL-H-6x24**	**NL-H-8x24**
Controller	2x Lenovo ThinkSystem SR650V2			
Chassis	ThinkSystem SR650 3.5" Chassis With 3.5” SATA/SAS 8-Bay Backplane			
RAID Config	No RAID			
PCIe Riser	ThinkSystem 2U x8/x8/x8 PCIE FH Riser 1 ThinkSystem (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit			
CPU	Intel Xeon Gold 6338 2.00GHz Processor			
DRAM	96GB (12x 8GB) 192GB (12x 16GB)			
Boot Drive	2x ThinkSystem 3.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD			
SAS HBA	1x ThinkSystem 440-8i SAS/SATA 12Gb HBA 1x ThinkSystem 440-16e SAS/SATA 12Gb HBA		1x ThinkSystem 440-8i SAS/SATA 12Gb HBA 2x ThinkSystem 440-16e SAS/SATA 12Gb HBA	
LOM & PCIe NICS	ThinkSystem 10Gb 2-port Base-T LOM ThinkSystem 10Gb 4-port Base-T LOM Intel X550-T2 Dual Port 10GBase-T Adapter Mellanox ConnectX-6 Lx 25GbE SFP+/QSF+ Broadcom BCM5719 PCIe 1Gb 4-Port Ethernet Adapter			
FC HBA (optional)	Emulex 16Gb Gen6 FC Dual-port HBA Emulex LPe32002-M2-L 32Gb 2 port FC HBA			
Storage Enclosure	2x Lenovo Storage D1224	4x Lenovo Storage D1224	6x Lenovo Storage D1224	8x Lenovo Storage D1224
Data HDD	Lenovo Storage 1.2TB 10K 2.5" SAS HDD Lenovo Storage 1.8TB 10K 2.5" SAS HDD Lenovo Storage 2.4TB 10K 2.5" SAS HDD Lenovo Storage 1TB 7.2K 2.5" NL-SAS HDD Lenovo Storage 2TB 7.2K 2.5" NL-SAS HDD			
Data Drive #	Up to 45	Up to 93	Up to 138	Up to 186
L2ARC (optional)	1x 400GB SAS SSD (3 DWPD) per pool		1x 400GB SAS SSD (3 DWPD) per pool (2 pools recommended)	
ZIL/SLOG	2x 400GB SAS SSD (10 DWPD) per pool		2x 400GB SAS SSD (10 DWPD) per pool (2 pools recommended)	

Note: The minimum BIOS version for Lenovo SR650V2 is 1.6.5.

2.2 Dell 15G Reference Architectures

The Dell PowerEdge R750 offers compelling performance, highspeed memory and capacity, I/O bandwidth and storage to address the data requirements.

2.2.1 Dell 15G All-Flash Configurations

2.2.1.1 Dell R750 All-Flash

Dell All-Flash RA	**ND-AF-24-15G (Non-HA)**	**ND-AF-48-15G (Non-HA)**	**ND-AF-72-15G (Non-HA)**	**ND-AF-96-15G (HA)**
Raw Capacity	Up to 184TB	Up to 368TB	Up to 552TB	Up to 737TB
Device Slots	24	48	72	Up to 96
Form Factor	6U	8U	10U	Up to 12U
Memory (total)	384GB 768GB			
Software	NexentaStor 5.5 or higher			

Dell All-Flash RA	**ND-AF-24-15G (Non-HA)**	**ND-AF-48-15G (Non-HA)**	**ND-AF-72-15G (Non-HA)**	**ND-AF-96-15G (HA)**
Controller	1x or 2x R750			
Chassis	8x 2.5" slots for 2 CPUs			
RAID Config	C1, No RAID, Mixed Drive Types Allowed			
PCIe Riser	Riser Config 5			
CPU	Intel 6326, 2.90GHz 16-core, 2-socket			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2x 1TB SAS 7.2k 2.5" mirrored			
SAS HBA	1x Dell SAS 12Gb HBA	2x Dell SAS 12Gb HBA	3x Dell SAS 12Gb HBA	4x Dell SAS 12Gb HBA
	H350i (for boot devices only) H350e (for data drives)			
Network Daughter Card	Intel X710 Quad Port 10GbE SFP+ Intel X10T2L Base-T Intel i350 Base-T			
NIC (optional)	Intel XL710 40GbE QSFP+ Intel X10T2L Base-T Intel I350 Base-T Mellanox ConnectX-6 Lx 25GbE SFP+/QSF+ Mellanox ConnectX-6 Dx 40GbE SFP+/QSFP+			
FC HBA (optional)	QLogic QLE 2692 16Gb FC			
Storage Enclosure	1x MD1420 2U24	2x MD1420 2U24	3x MD1420 2U24	4x MD1420 2U24
Total Drive #	Up to 24	Up to 48	Up to 72	Up to 96

Flash Device	1.6TB SAS SSD (1 DWPD/3 DWPD) 3.84TB SAS SSD (1 DWPD/3 DWPD) 7.68TB SAS SSD (1 DWPD)
L2ARC	N/A
ZIL/SLOG	N/A

Note: The minimum BIOS version for Dell R750 is 1.6.5.

2.2.2 Dell 15G Hybrid Configurations

2.2.2.1 Dell R750 Hybrid – MD14xx

Dell R750 Hybrid HA RA	**ND-H-2x24-15G**	**ND-H-4x12-15G**	**ND-H-8x12-15G**
Raw Capacity	Up to 90TB	Up to 540TB	Up to 1080TB
Device Slots	48	48	96
Form Factor (Max)	8U	12U	20U
Memory (total)	192GB	384GB	
Read Cache	Up to 400GB		Up to 800GB
Software	NexentaStor 5.5 or higher		

Dell R750 Hybrid RA	**ND-H-2x24-15G**	**ND-H-4x12-15G**	**ND-H-8x12-15G**
Controller	1 or 2x R750		
Chassis	8x 2.5” slots for 2 CPUs		
RAID Config	C1, No RAID, Mixed Drive Types Allowed		
PCIe Riser	Riser Config 5		
CPU	Intel 6326, 2.90GHz 16-core, 2-socket		
DRAM	192GB (12x 16GB) 384GB (12x 32GB)		
Boot Drive	2x 1TB SAS 7.2k 2.5” mirrored		
SAS HBA	1x Dell SAS 12Gb HBA	2x Dell SAS 12Gb HBA	4x Dell SAS 12Gb HBA
	H350i (for boot devices only) H350e (for data drives)		
Network Daughter Card	Intel X710 Quad Port 10GbE SFP+ Intel X10T2L Base-T Intel i350 Base-T		
NIC (optional)	Intel XL710 40GbE QSFP+ Intel X10T2L Base-T Intel I350 Base-T Mellanox ConnectX-6 Lx 25GbE SFP+/QSF+ Mellanox ConnectX-6 Dx 40GbE SFP+/QSFP+		
FC HBA (optional)	QLogic QLE 2692 16Gb FC		

Storage Enclosure	2x MD1420 (24-bay)	4x MD1400 (12-bay)	8x MD1400 (12-bay)
Data HDD	2.5” 10K SAS HDD 1.2TB 2.5” 10k SAS HDD 2.4TB	3.5” 7.2k SAS HDD – 2TB 3.5” 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 8TB 3.5” 7.2k SAS HDD – 12TB	3.5” 7.2k SAS HDD – 2TB 3.5” 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 8TB 3.5” 7.2k SAS HDD – 12TB
Data Drive #	Up to 45	Up to 45	Up to 90
L2ARC	1x Dell 960GB MU 12Gb 2.5” SSD		2x Dell 960GB MU 12Gb 2.5” SSD
ZIL/SLOG	2x Dell 960GB WI SSD		4x Dell 960GB WI SSD

Note: The minimum BIOS version for Dell R750 is 1.6.5.

2.2.2.2 Dell R750 Hybrid – ME484

Dell R750 Hybrid RA	**ND-1x84-15G**	**ND-2x84-15G**	**ND-H-3x84-15G**	**ND-H-4x84-15G**
Raw Capacity	Up to 972TB	Up to 1.98PB	Up to 2.95PB	Up to 3.96PB
Device Slots	84	168	252	336
Form Factor (total)	9U	14U	19U	24U
Memory (total)	384GB to 768GB			
Read Cache	Up to 800GB		Up to 1.6TB	
Software	NexentaStor 5.5 or higher			

Dell R740 Hybrid RA	**ND-1x84-15G**	**ND-2x84-15G**	**ND-H-3x84-15G**	**ND-H-4x84-15G**
Controller	2x R740			
Chassis	8x 2.5” slots for 2 CPUs			
RAID Config	C1, No RAID, Mixed Drive Types Allowed			
PCIe Riser	Riser Config 5			
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2x 1TB SAS 7.2k 2.5” mirrored			
SAS HBA	1x Dell SAS 12Gb HBA	2x Dell SAS 12Gb HBA	3x Dell SAS 12Gb HBA	4x Dell SAS 12Gb HBA
	H730P+ (for boot devices only)			
Network Daughter Card	Intel X710 Quad Port 10GbE SFP+ Intel X10T2L Base-T Intel i350 Base-T			
NIC (optional)	Intel XL710 40GbE QSFP+ Intel X10T2L Base-T Intel I350 Base-T Mellanox ConnectX-6 Lx 25GbE SFP+/QSF+ Mellanox ConnectX-6 Dx 40GbE SFP+/QSFP+			
FC HBA (optional)	QLogic QLE 2692 16Gb FC			

Storage Enclosure	1x ME484 (84-bay)	2x ME484 (84-bay)	3x ME484 (84-bay)	4x ME484 (84-bay)
Data HDD	3.5“ 7.2k SAS HDD – 4TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 16TB			
Data Drive #	Up to 81	Up to 165	Up to 246	Up to 330
L2ARC	1x 960GB MU SSD per pool		1x 960GB MU SSD per pool (2 pools recommended)	
ZIL/SLOG	2x 960GB WI SSD per pool		2x 960GB WI SSD per pool (2 pools recommended)	

Note 1: For all ME484 systems, the JBODs must be populated in multiples of 14.
Note 2: The minimum BIOS version for Dell R750 is 1.6.5.

2.3 HPE Gen10 Plus Reference Architectures

The HPE ProLiant DL380 Gen10 Plus server is adaptable for diverse workloads and environments, providing you with the right balance of expandability and scalability. Designed for supreme versatility and resilience.

2.3.1 HPE DL380 Gen 10 Plus All Flash

HPE All-Flash RA	H10-AF-1x25	H10-AF-2x25	H10-AF-3x25	H10-AF-4x25
Raw Capacity	Up to 192TB	Up to 384TB	Up to 768TB	Up to 1.53PB
Device Slots	25	50	75	100
Form Factor (total system)	6U	8U	10U	12U
Memory (total system)	384GB 768GB			
Software	NexentaStor 5.5 or higher			

HPE All-Flash RA	H10-AF-1x25	H10-AF-2x25	H10-AF-3x25	H10-AF-4x25
Controller	2x HPE ProLiant DL380 Gen10+			
Chassis	8SFF CTO (8x 2.5" slots)			
CPU	Intel 6326, 2.90GHz 16-core, 2-socket			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
PCIe Riser	1x HP DL380G10+ Standard Riser 1x HP DL Gen10+ x8/x16/x8 Riser kit			
RAID Config	No RAID			
Boot Drive	2x 1.92TB SAS SSD 2.5" mirrored			
SAS HBA	1x E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS			
	1x E208e-p SR Gen10 12G SAS		2x E208e-p SR Gen10 12G SAS	
LOM	HPE Ethernet 1Gb 4-port onboard controller			
NIC	Intel X710 DA2 Intel E810 Mellanox Connect X5 10/25GB Mellanox Connect X6 10/25/40/50GB			
FC HBA (optional)	SN1100Q 16Gb Single Port FC HBA SN1100Q 16Gb Dual Port FC HBA			
Storage Enclosure	2x HPE D3610	2x HPE D3710	3x HPE D3710	4x HPE D3710
Total Drive #	Up to 24	Up to 50	Up to 75	Up to 100
Flash Device	Write Intensive SAS SSDs –1.6TB Read Intensive SAS SSDs – 1.92TB, 3.84TB, 7.68TB			
L2ARC	N/A			
ZIL/SLOG	N/A			

2.3.2 HPE DL380 Gen 10 plus Hybrid – D3610

HPE Hybrid RA	H10-H-2x12	H10-H-4x12	H10-H-6x12	H10-H-8x12
Raw Capacity	Up to 210TB	Up to 450TB	Up to 690TB	Up to 930TB
Device Slots	24	48	72	96
Form Factor (total)	8U	12U	16U	20U
Memory (total)	384GB			
Read Cache	800GB per pool			
Software	NexentaStor 5.5 or higher			

HPE Hybrid RA	H10-H-2x12	H10-H-4x12	H10-H-6x12	H10-H-8x12
Controller	2x HPE ProLiant DL380 Gen10+			
Chassis	8SFF CTO (8x 2.5” slots)			
CPU	Intel 6326, 2.90GHz 16-core, 2-socket			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
PCIe Riser	1x HP DL380G10 Standard Riser 1x HP DL Gen10 x8/x16/x8 Riser kit			
RAID Config	No RAID			
Boot Drive	2x 2TB SAS 7.2k 2.5” mirrored			
SAS HBA	1x E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS			
	1x E208e-p SR Gen10 12G SAS		2x E208e-p SR Gen10 12G SAS	
LOM	HPE Ethernet 1Gb 4-port onboard controller			
NIC	Intel X710 DA2 Intel E810 Mellanox Connect X5 10/25GB Mellanox Connect X6 10/25/40/50GB			
FC HBA (optional)	SN1100Q 16Gb Single Port FC HBA SN1100Q 16Gb Dual Port FC HBA			
Storage Enclosure	2x HPE D3610	4x HPE D3610	6x HPE D3610	8x HPE D3610
Data HDD	3.5” 7.2K NL-SAS HDD - 4TB 3.5” 7.2K NL-SAS HDD - 6TB 3.5” 7.2K NL-SAS HDD - 8TB 3.5” 7.2K NL-SAS HDD - 10TB 3.5” 7.2K NL-SAS HDD - 14TB			
Data Drive #	Up to 21	Up to 45	Up to 69	Up to 93
L2ARC (optional)	1x 1.9TB SAS MU SSD per pool			
ZIL/SLOG	2x 1.9 SAS WI SSD per pool			

Note 1: Supported BIOS levels for HPE DL380Gen10+ is v1.58 as of NexentaStor 5.5.

Note 2: The configurations assume that up to 2 storage enclosures can be dual path daisy chained off a single E208e-p adapter.

Note 3: The minimum firmware version for E208e is 4.11.0.

2.3.3 HPE DL380 Gen 10 plus Hybrid – D3710

HPE Hybrid RA	H10-H-2x25	H10-H-4x25	H10-H-6x25	H10-H-8x25
Raw Capacity	Up to 94TB	Up to 194TB	Up to 294TB	Up to 394TB
Device Slots	50	100	150	200
Form Factor (total)	8U	12U	16U	20U
Memory (total)	384GB			
Read Cache	800GB per pool			
Software	NexentaStor 5.5 or higher			

HPE Hybrid RA	H10-H-2x25	H10-H-4x25	H10-H-6x25	H10-H-8x25
Controller	2x HPE ProLiant DL380 Gen10+			
Chassis	8SFF CTO (8x 2.5” slots)			
CPU	Intel 6242, 2.90GHz 16-core, 2-socket			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
PCIe Riser	1x HP DL380G10 Standard Riser 1x HP DL Gen10 x8/x16/x8 Riser kit			
RAID Config	No RAID			
Boot Drive	2x 2TB SAS 7.2k 2.5” mirrored			
SAS HBA	1x E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS			
	1x E208e-p SR Gen10 12G SAS		2x E208e-p SR Gen10 12G SAS	
LOM	HPE Ethernet 1Gb 4-port onboard controller			
NIC	Intel X710 DA2 Intel E810 Mellanox Connect X5 10/25GB Mellanox Connect X6 10/25/40/50GB			
FC HBA (optional)	SN1100Q 16Gb Single Port FC HBA SN1100Q 16Gb Dual Port FC HBA			
Storage Enclosure	2x HPE D3710	4x HPE D3710	6x HPE D3710	8x HPE D3710
Data HDD	2.5” 7.2K NL-SAS HDD – 1TB 2.5” 10K NL-SAS HDD – 1.2TB 2.5” 10K NL-SAS HDD – 1.8TB 2.5” 10K NL-SAS HDD – 2.4TB			
Data Drive #	Up to 21	Up to 45	Up to 69	Up to 93
L2ARC (optional)	1x 1.9TB SAS MU SSD per pool			
ZIL/SLOG	2x 1.9 SAS WI SSD per pool			

Note 1: Supported BIOS levels for HPE DL380Gen10+ is v1.58 as of NexentaStor 5.5

Note 2: The configurations assume that up to 2 storage enclosures can be dual path daisy chained off a single E208e-p adapter.

Note 3: The minimum firmware version for E208e is 4.11.0.

3 Legacy Configurations

3.1 Cisco Reference Architectures

3.1.1 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.

3.1.1.1 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 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 2U24	2x HGST 2U24	3x HGST 2U24	4x HGST 2U24
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.

3.1.2 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.

3.1.2.1 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 C240 M4SX
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 here 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.

3.1.2.2 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.

3.1.2.3 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.

3.2 Dell 14G Reference Architectures

3.2.1 Dell 14G 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.

3.2.1.1 Dell R740 and R740xd All-Flash

Dell All-Flash RA	NDxd-AF-22-14G (Non-HA)	NDxd-AF-46-14G (Non-HA)	ND-AF-96-14G (HA)
Raw Capacity	Up to 85TB	Up to 176TB	Up to 368TB
Device Slots	22	46	Up to 96
Form Factor	2U	4U	Up to 12U
Memory (total)	192GB		384GB 768GB
Software	NexentaStor 5.x		

Dell All-Flash RA	NDxd-AF-22-14G (Non-HA)	NDxd-AF-46-14G (Non-HA)	ND-AF-96-14G (HA)
Controller	1x R740xd	1x R740xd	2x R740
Chassis	24x 2.5” slots for 2 CPUs		8x 2.5” slots for 2 CPUs
RAID Config	C1, No RAID, Mixed Drive Types Allowed		
PCIe Riser	Riser Config 5		
CPU	Intel 6128, 3.4GHz, 6-core, 2-socket		
DRAM	192GB (12x 16GB)		192GB (12x 16GB) 384GB (12x 32GB)
Boot Drive	2x 1TB SAS 7.2k 2.5” mirrored		
SAS HBA	H730P+ for boot and internal data drives (data drives must be in pass through mode only) Optional: Dell SAS 12Gb HBA[3]		H730P+ for boot 1x to 4x Dell SAS 12Gb HBA
Network Daughter Card	Intel i350 DP + Intel X520 DP 10GbE SFP+ Intel i350 DP + Intel X550 DP 10GbE Base-T Intel i350 DP + Intel X710 DP 10GbE Intel X710 Quad Port 10GbE SFP+		
NIC (optional)	Intel X520 10GbE SFP+ Intel X550 10GbE Base-T Intel X710 10GbE SFP+ Intel XXV710 25GbE SFP28 Intel XL710 40GbE QSFP+		
FC HBA (optional)	QLogic QLE 2692 16Gb FC		

Dell All-Flash RA	NDxd-AF-22-14G (Non-HA)	NDxd-AF-46-14G (Non-HA)	ND-AF-96-14G (HA)
Storage Enclosure	N/A	1x MD1420 (24-bay)	1x to 4x MD1420 (24-bay)
Total Drive #	Up to 22	Up to 46	Up to 96

Flash Device	1.6TB SSD SAS WI 12Gb 2.5” 1.6TB SSD SAS MU 12Gb 2.5” 1.92TB SSD SAS MU 12Gb 2.5” 3.84TB SSD SAS MU 12Gb 2.5”
L2ARC	N/A
ZIL/SLOG	N/A

Note 1: For NexentaStor version 4.x, R740xd and R740 should run legacy BIOS with firmware either v1.3.7 or v1.6.11. Note that versions 2.x are not currently supported.

Note 2: Required for external JBOD connectivity only.

Note 3: For NexentaStor version 5.x and above, the recommended BIOS version is 2.16.1.

3.2.2 Dell 14G Hybrid 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.

3.2.2.1 Dell R740xd Hybrid

Reference Architectures with Dell R740xd servers and NexentaStor 5.x provide single node (non-HA) configurations combining controller and storage in a single 2U chassis, with optional capacity expansion with additional 2U enclosures.

Dell R740xd Hybrid RA	NDxd-H-22-14G (with 2.5” Drives)	NDxd-H-118-14G (with 2.5” Drives)
Raw Capacity	Up to 48TB	Up to 278TB
Device Slots	22	Up to 118
Form Factor	2U	Up to 10U
Memory	192GB	
Read Cache	N/A	
Software	NexentaStor 5.x	

Dell R740xd Hybrid RA	NDxd-H-22-14G (with 2.5” Drives)	NDxd-H-118-14G (with 2.5” Drives)
Controller	1x R740xd	
Chassis	24x 2.5” for 2 CPUs	
RAID Config	C1, No RAID, Mixed Drive Types Allowed	
PCIe Riser	Riser Config 5	
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket	
DRAM	192GB (12x 16GB)	
Boot Drive	2x 1TB SAS 7.2k 2.5” mirrored	
SAS HBA	H730P+ for boot and internal data drives (data drives must be in pass through mode only)	H730P+ for boot and data drives (data drives must be in pass through mode only) 1x to 2x Dell SAS 12Gb HBA [2]
Network Daughter	Intel i350 DP + Intel X520 DP 10GbE SFP+ Intel i350 DP + Intel X550 DP 10GbE Base-T	

Card	Intel i350 DP + Intel X710 DP 10GbE Intel X710 Quad Port 10GbE SFP+
NIC (optional)	Intel X520 10GbE SFP+ Intel X550 10GbE Base-T Intel X710 10GbE SFP+ Intel XXV710 25GbE SFP28 Intel XL710 40GbE QSFP+ Mellanox CX5 Mellanox CX6
FC HBA (optional)	QLogic QLE 2692 16Gb FC

Dell R740xd Hybrid RA	**NDxd-H-22-14G (with 2.5” Drives)**	**NDxd-H-118-14G (with 2.5” Drives)**
Storage Enclosure	Internal Only	1x to 4x MD1420 (24 bay)
Data HDD	2.5” 7.2K SAS HDD ≤ 2TB 2.5” 10k SAS HDD ≤ 2.4TB 2.5” 15k SAS HDD ≤ 900GB	2.5” 7.2K SAS HDD ≤ 2TB 2.5” 10k SAS HDD ≤ 2.4TB 2.5” 15k SAS HDD ≤ 900GB
Data Drive #	Up to 20	Up to 116
L2ARC	N/A	N/A
ZIL/SLOG	2x Dell 400GB WI 12Gb 2.5”	2x Dell 400GB WI 12Gb 2.5”

Note 1: For NexentaStor version 4.x, R740xd and R740 should run legacy BIOS with firmware either v1.3.7 or v1.6.11. Note that versions 2.x are not currently supported.

Note 2: Required for external JBOD connectivity only. The configuration assumes that up to 2 storage enclosures can be dual path daisy chained off a single SAS HBA.

Note 3: Enclosure management is not available for R740xd internal devices.

Note 4: For NexentaStor version 5.x and above, the recommended BIOS version is 2.16.1.

3.2.2.2 Dell R740 Hybrid – MD14xx

Dell R740 Hybrid RA	ND-H-2x24-14G	ND-H-4x12-14G	ND-H-8x12-14G
Raw Capacity	Up to 90TB	Up to 360TB	Up to 1080TB
Device Slots	48	48	96
Form Factor (Max)	8U	12U	20U
Memory (total)	192GB	384GB	
Read Cache	Up to 400GB		Up to 800GB
Software	NexentaStor 5.x		

Dell R740 Hybrid RA	ND-H-2x24-14G	ND-H-4x12-14G	ND-H-8x12-14G
Controller	2x R740		
Chassis	8x 2.5” slots for 2 CPUs		
RAID Config	C1, No RAID, Mixed Drive Types Allowed		
PCIe Riser	Riser Config 5		
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket		
DRAM	96GB (12x 8GB)	192GB (12x 16GB)	
Boot Drive	2x 1TB SAS 7.2k 2.5” mirrored		
SAS HBA	1x Dell SAS 12Gb HBA	2x Dell SAS 12Gb HBA	4x Dell SAS 12Gb HBA
	H730P+ (for boot devices only)		
Network Daughter Card	Intel i350 DP + Intel X520 DP 10GbE SFP+ Intel i350 DP + Intel X550 DP 10GbE Base-T Intel i350 DP + Intel X710 DP 10GbE Intel X710 Quad Port 10GbE SFP+		
NIC (optional)	Intel X520 10GbE SFP+ Intel X550 10GbE Base-T Intel X710 10GbE SFP+ Intel XXV710 25GbE SFP28 Intel XL710 40GbE QSFP+ Mellanox CX5 Mellanox CX6		
FC HBA (optional)	QLogic QLE 2692 16Gb FC		
Storage Enclosure	2x MD1420 (24-bay)	4x MD1400 (12-bay)	8x MD1400 (12-bay)
Data HDD	2.5” 7.2K SAS HDD ≤ 2TB 2.5” 10k SAS HDD ≤ 2.4TB 2.5” 15k SAS HDD ≤ 900GB	3.5” 7.2k SAS HDD – 2TB 3.5” 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB 3.5“ 7.2k SAS HDD – 12TB
Data Drive #	Up to 45	Up to 45	Up to 90
L2ARC	1x Dell 400GB MU 12Gb 2.5” SSD		2x Dell 400GB MU 12Gb 2.5” SSD
ZIL/SLOG	2x Dell 400GB WI SSD		4x Dell 400GB WI SSD

Note 1: For NexentaStor version 4.x, R740xd and R740 should run legacy BIOS with firmware either v1.3.7 or v1.6.11. Note that versions 2.x are not currently supported.

Note 2: Contact Dell for detailed wiring diagrams for these configurations. The configuration assumes that up to 2 storage enclosures can be dual path daisy chained off a single SAS HBA.

Note 3: For NexentaStor version 5.x and above, the recommended BIOS version is 2.16.1.

3.2.2.3 Dell R740 Hybrid – ME484

Dell R740 Hybrid RA	ND-1x84-14G	ND-2x84-14G	ND-H-3x84-14G	ND-H-4x84-14G
Raw Capacity	Up to 972TB	Up to 1.98PB	Up to 2.95PB	Up to 3.96PB
Device Slots	84	168	252	336
Form Factor (total)	9U	14U	19U	24U
Memory (total)	384GB to 768GB			
Read Cache	Up to 800GB		Up to 1.6TB	
Software	NexentaStor 5.x			

Dell R740 Hybrid RA	ND-1x84-14G	ND-2x84-14G	ND-H-3x84-14G	ND-H-4x84-14G
Controller	2x R740			
Chassis	8x 2.5” slots for 2 CPUs			
RAID Config	C1, No RAID, Mixed Drive Types Allowed			
PCIe Riser	Riser Config 5			
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2x 1TB SAS 7.2k 2.5” mirrored			
SAS HBA	1x Dell SAS 12Gb HBA	2x Dell SAS 12Gb HBA	3x Dell SAS 12Gb HBA	4x Dell SAS 12Gb HBA
	H730P+ (for boot devices only)			
Network Daughter Card	Intel i350 DP + Intel X520 DP 10GbE SFP+ Intel i350 DP + Intel X550 DP 10GbE Base-T Intel i350 DP + Intel X710 DP 10GbE Intel X710 Quad Port 10GbE SFP+			
NIC (optional)	Intel X520 10GbE SFP+ Intel X550 10GbE Base-T Intel X710 10GbE SFP+ Intel XXV710 25GbE SFP28 Intel XL710 40GbE QSFP+			
FC HBA (optional)	QLogic QLE 2692 16Gb FC			
Storage Enclosure	1x ME484 (84-bay)	2x ME484 (84-bay)	3x ME484 (84-bay)	4x ME484 (84-bay)
Data HDD	3.5“ 7.2k SAS HDD – 4TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB 3.5“ 7.2k SAS HDD – 12TB			
Data Drive #	Up to 81	Up to 165	Up to 246	Up to 330
L2ARC	1x 960GB RI SSD per pool		1x 960GB RI SSD per pool (2 pools recommended)	
ZIL/SLOG	2x 480GB MU SSD per pool		2x 480GB MU SSD per pool (2 pools recommended)	

Note 1: For NexentaStor version 4.x, R740xd and R740 should run legacy BIOS with firmware either v1.3.7 or v1.6.11. Note that versions 2.x are not currently supported.
Note 2: Contact Dell for detailed wiring diagrams for these configurations.
Note 3: For NexentaStor version 5.x and above, the recommended BIOS version is 2.16.1.

3.2.3 Dell and HGST Storage Platform Configurations

3.2.3.1 Dell R740 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

Dell and HGST RA	**NDH-AF-24-14G**	**NDH-AF-48-14G**	**NDH-AF-72-14G**	**NDH-AF-96-14G**
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)	384GB 768GB			
Software	NexentaStor 5.x			

Dell and HGST RA	**NDH-AF-24-14G**	**NDH-AF-48-14G**	**NDH-AF-72-14G**	**NDH-AF-96-14G**
Controller	1x or 2x R740			
Chassis	8x 2.5” slots for 2 CPUs			
RAID Config	C1, No RAID, Mixed Drive Types Allowed			
PCIe Riser	Riser Config 5			
CPU	Intel 6128, 3.4GHz, 6-core, 2-socket			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2x 1TB SAS 7.2k 2.5” mirrored			
SAS HBA	1x Dell SAS 12Gb HBA	2x Dell SAS 12Gb HBA	3x Dell SAS 12Gb HBA	4x Dell SAS 12Gb HBA
	H730P+ (for boot devices only)			
Network Daughter Card	Intel i350 DP + Intel X520 DP 10GbE SFP+ Intel i350 DP + Intel X550 DP 10GbE Base-T Intel i350 DP + Intel X710 DP 10GbE Intel X710 Quad Port 10GbE SFP+			
NIC (optional)	Intel X520 10GbE SFP+ Intel X550 10GbE Base-T Intel X710 10GbE SFP+ Intel XXV710 25GbE SFP28 Intel XL710 40GbE QSFP+			
FC HBA (optional)	QLogic QLE 2692 16Gb FC			
Storage	1x HGST 2U24	2x HGST 2U24	3x HGST 2U24	4x HGST 2U24

Enclosure				
Total 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: For NexentaStor version 4.x, R740xd and R740 should run legacy BIOS with firmware either v1.3.7 or v1.6.11. Note that versions 2.x are not currently supported.

Note 2: For NexentaStor version 5.x and above, the recommended BIOS version is 2.16.1.

3.2.3.2 Dell R740 and HGST Ultrastar Data60 Hybrid / All-Disk

Dell R740 HGST RA	**NDHG-1x60-14G**	**NDHG-2x60-14G**	**NDHG-3x60-14G**	**NDHG-4x60-14G**
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)	384GB			
Read Cache	800GB		Up to 1.6TB	
Software	NexentaStor 5.x			

Dell R740 HGST RA	**NDHG-1x60-14G**	**NDHG-2x60-14G**	**NDHG-3x60-14G**	**NDHG-4x60-14G**
Controller	2x R740			
Chassis	8x 2.5” slots for 2 CPUs			
RAID Config	C1, No RAID, Mixed Drive Types Allowed			
PCIe Riser	Riser Config 5			
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket		Intel 6128, 3.4GHz, 6-core, 2-socket	
DRAM	192GB (12x 16GB)			
Boot Drive	2x 1TB SAS 7.2k 2.5” mirrored			
SAS HBA	1x Dell SAS 12Gb HBA	2x Dell SAS 12Gb HBA	3x Dell SAS 12Gb HBA	4x Dell SAS 12Gb HBA
	H730P+ (for boot devices only)			
Network Daughter Card	Intel i350 DP + Intel X520 DP 10GbE SFP+ Intel i350 DP + Intel X550 DP 10GbE Base-T Intel i350 DP + Intel X710 DP 10GbE Intel X710 Quad Port 10GbE SFP+			
NIC (optional)	Intel X520 10GbE SFP+ Intel X550 10GbE Base-T Intel X710 10GbE SFP+ Intel XXV710 25GbE SFP28 Intel XL710 40GbE QSFP+			
FC HBA (optional)	QLogic QLE 2692 16Gb FC			
Storage Enclosure	1x HGST Data60	2x HGST Data60	3x HGST Data60	4x HGST Data60
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: For NexentaStor version 4.x, R740xd and R740 should run legacy BIOS with firmware either v1.3.7 or v1.6.11. Note that versions 2.x are not currently supported.
Note 2: 10GbE port count considers the 2 ports on the server Network Daughter Card.
Note 3: Use dual SAS path for configurations with up to 4 enclosures.
Note 4: For NexentaStor version 5.x and above, the recommended BIOS version is 2.16.1.

3.3 Dell 13G Reference Architectures

3.3.1 Dell 13G 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.

3.3.1.1 Dell R730 and R730xd All-Flash

Dell All-Flash RA	**NDxd-AF-24-13G (Non-HA)**	**NDxd-AF-48-13G (Non-HA)**	**ND-AF-96-13G (HA)**
Raw Capacity	Up to 92TB	Up to 184TB	Up to 368TB
Device Slots	24	48	Up to 96
Form Factor	2U	4U	Up to 12U
Memory (total)	256GB		512GB
Built-in Ethernet	2x 1GbE + 2x 10GbE		
10GbE Ports	2		4
Software	NexentaStor 5.x		

Dell All-Flash RA	**NDxd-AF-24-13G (Non-HA)**	**NDxd-AF-48-13G (Non-HA)**	**ND-AF-96-13G (HA)**
Controller	1x R730xd PN: 210-AHXR	1x R730xd PN: 210-AHXR	2x R730 PN: 210-AEZO
CPU	E5-2643 v4, 3.4GHz, 6-core, 2-socket		
DRAM	256GB		
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)		
SAS HBA	H730 (For SysPool and R730xd data drives, H730 data drives must be in pass through mode only) Dell SAS 12Gb HBA PN: 405-AAEB[4]		2x Dell SAS 12Gb HBA PN: 405-AAEB
NIC	1x Network Daughter Card: Intel i350 DP + Intel X520 DP 10GbE SFP+ or X540 DP 10GbE RJ45 Optional: Intel X520 10GbE SFP+ Intel X540 10GbE RJ45		

FC HBA (optional)	Emulex LPe 12002, LPe 16002B QLogic QLE 2562, QLE 2662		
Storage Enclosure	N/A	1x MD1420 (24-bay) PN: 210-AEWI	1x to 4x MD1420 (24-bay) PN: 210-AEWI
Total Drive #	Up to 24	Up to 48	Up to 96
Flash Device	1.92TB SSD MU 12Gb 2.5” 3.84TB SSD MU 12Gb 2.5”		
L2ARC	N/A		
ZIL/SLOG	N/A		

Note 1: For Dell deployments, please use Nexenta-specific platform SKUs in DellStar or Gii ordering system.
Note 2: BIOS for R730xd and R730 systems with the v4 CPU is 2.0.2 or later.
Note 3: All-SSD configurations are supported on the R730xd platform. There is no need for separate ZIL or L2ARC devices in all-SSD configurations.
Note 4: This is for external connectivity only. The low profile option (Dell SAS 12Gb HBA PN: 405-AAFB) can be used if the full height slots run out.

3.3.2 Dell 13G Hybrid 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.

3.3.2.1 Dell R730xd Hybrid

Reference Architectures with Dell R730xd servers and NexentaStor 5.x provide single node (non-HA) configurations combining controller and storage in a single 2U chassis, with optional capacity expansion to an additional 2U enclosure.

Dell R730xd Hybrid RA	NDxd-H-24-13G (with 2.5” Drives)	NDxd-H-12-13G (with 3.5” Drives)	NDxd-H-48-13G (with 2.5” Drives)	NDxd-H-24-13G (with 3.5” Drives)
Raw Capacity	Up to 44TB	Up to 40TB	Up to 92TB	Up to 88TB
Device Slots	24	12	48	24
Form Factor	2U		4U	
Memory	128GB (8x16GB)			
Read Cache	N/A			
10GbE Ports	2			
Software	NexentaStor 5.x			

Dell R730xd Hybrid RA	NDxd-H-24-13G (with 2.5” Drives)	NDxd-H-12-13G (with 3.5” Drives)	NDxd-H-48-13G (with 2.5” Drives)	NDxd-H-24-13G (with 3.5” Drives)
Controller	1x R730xd PN: 210-AHXR			
CPU	E5-2609 v3 1.9GHz, 6-core, 2-socket E5-2609 v4 1.7GHz, 8-core, 2-socket			
DRAM	128GB (8x16GB)			
Boot Drive	2TB (2x 1TB SAS 7.2k 2.5”)			
SAS HBA	H730 (For SysPool and data drives; data drives must be in pass through mode only)		H730 (For SysPool and R730xd data drives, H730 data drives must be in pass through mode only) Dell SAS 12Gb HBA PN: 405-AAEB [3]	

NIC	1x Network Daughter Card: Intel i350 DP + Intel X520 DP 10GbE SFP+ or X540 DP 10GbE RJ45 Optional: Intel X520 10GbE SFP+ Intel X540 10GbE RJ45			
FC HBA (optional)	Emulex LPe 12002, LPe 16002B QLogic QLE 2562, QLE 2662			
Storage Enclosure	Internal Only 24x 2.5” + 2x Flex Bay	Internal Only 12x 3.5” + 2x Flex Bay	1x MD1420 PN: 210- AEWI	1x MD1400 PN: 210-AFDZ
Data HDD	2.5” 7.2K SAS HDD ≤ 2TB 2.5” 10k SAS HDD ≤ 1.8TB 2.5” 15k SAS HDD ≤ 600GB	3.5” 7.2k SAS HDD - 2TB 3.5” 7.2k SAS HDD - 4TB	2.5” 7.2K SAS HDD ≤ 2TB 2.5” 10k SAS HDD ≤ 1.8TB 2.5” 15k SAS HDD ≤ 600GB	3.5” 7.2k SAS HDD - 2TB 3.5” 7.2k SAS HDD - 4TB
Data Drive #	22	10	46	22
L2ARC	N/A		N/A	
ZIL/SLOG	2x Dell 400GB WI 12Gb 2.5”		2x Dell 400GB WI 12Gb 2.5”	

Note 1: For Dell deployments, please use Nexenta-specific platform SKUs in DellStar or Gii ordering system.

Note 2: BIOS for R730xd system with v3 CPU is 1.1.4 or later. For systems with the v4 CPU, BIOS version is 2.0.2 or later.

Note 3: This is for external connectivity only. The low profile option (Dell SAS 12Gb HBA PN: 405-AAFB) can be used if there are no more full height slots available.

3.3.2.2 Dell R730 Hybrid – MD14xx

Dell R730 Hybrid RA	**ND-H-2x24-13G**	**ND-H-4x12-13G**	**ND-H-8x12-13G**
Raw Capacity	Up to 90TB	Up to 180TB	Up to 900TB
Device Slots	48	48	96
Form Factor (Max)	8U	12U	20U
Memory (total)	256GB		
Read Cache	Up to 800GB		Up to 1.6TB
10GbE ports	4		
Software	NexentaStor 5.x		

Dell R730 Hybrid RA	**ND-H-2x24-13G**	**ND-H-4x12-13G**	**ND-H-8x12-13G**
Controller	2x R730 PN: 210-AEZO		
CPU	E5-2609 v3 1.9GHz, 6-core, 2-socket E5-2609 v4 1.7GHz, 8-core, 2-socket		
DRAM	128GB (8x 16GB)		
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)		
SAS HBA	2x Dell SAS 12Gb HBA PN: 405-AAEB	4x Dell SAS 12Gb HBA PN: 405-AAEB	
	H730 (for internal SysPool drives only)		
NIC	1x Network Daughter Card: Intel i350 DP + Intel X520 DP 10GbE SFP+ or X540 DP		

	10GbE RJ45 Optional: Intel X520 10GbE SFP+ Intel X540 10GbE RJ45		
FC HBA (optional)	Emulex LPe 12002, LPe 16002B QLogic QLE 2562, QLE 2662		
Storage Enclosure	2x MD1420 (24-bay) PN: 210-AEWI	4x MD1400 (12-bay) PN: 210-AFDZ	8x MD1400 (12-bay) PN: 210-AFDZ
Data HDD	2.5” 7.2K SAS HDD ≤ 2TB 2.5” 10k SAS HDD ≤ 1.8TB 2.5” 15k SAS HDD ≤ 600GB	3.5” 7.2k SAS HDD – 2TB 3.5” 7.2k SAS HDD – 4TB	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB
Data Drive #	Up to 45	Up to 45	Up to 90
L2ARC	1x Dell 400GB MU 12Gb 2.5” SSD		2x Dell 400GB MU 12Gb 2.5” SSD
ZIL/SLOG	2x Dell 400GB WI SSD		4x Dell 400GB WI SSD

Note 1: For Dell deployments, use Nexenta-specific platform SKUs in DellStar or Gii ordering system.
Note 2: BIOS for R730 system with the v3 CPU should be 1.0.4 and above. BIOS for R730 with v4 CPU is 2.0.2 or later.
Note 3: 10GbE port count considers the 2 ports on the server Network Daughter Card.
Note 4: Contact Dell for detailed wiring diagrams for these configurations.

3.3.2.3 Dell R730 Hybrid – MD3060e and MD1280

Dell R730 Hybrid RA	**ND-H-120-13G**	**ND-H-240-13G**	**ND-H-168-13G**	**ND-H-336-13G**
Raw Capacity	Up to 1,140TB	Up to 2,340TB	Up to 1,620TB	Up to 3,240TB
Device Slots	120	240	168	336
Form Factor (total)	12U	20U	14U	24U
Memory (total)	512GB			
Read Cache	Up to 800GB			Up to 1.6TB
10GbE ports	4			
Software	NexentaStor 5.x			

Dell R730 Hybrid RA	**ND-H-120-13G**	**ND-H-240-13G**	**ND-H-168-13G**	**ND-H-336-13G**
Controller	2x **R730** PN: 210-AEZO			
CPU	E5-2643 v3 3.4GHz, 6-core, 2-socket E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)			
SAS HBA	2x LSI SAS 6Gb HBA PN: 406-BBDN	4x LSI SAS 6Gb HBA PN: 406-BBDN	2x LSI SAS 6Gb HBA PN: 406-BBDN	4x LSI SAS 6Gb HBA PN: 406-BBDN
	H730 (for internal SysPool drives only)			

NIC	1x Network Daughter Card: Intel i350 DP + Intel X520 DP 10GbE SFP+ or X540 DP 10GbE RJ45 Optional: Intel X520 10GbE SFP+ Intel X540 10GbE RJ45			
FC HBA (optional)	Emulex LPe 12002, LPe 16002B QLogic QLE 2562, QLE 2662			
Storage Enclosure	2x MD3060e (60-bay) PN: 210-ACIS	4x MD3060e (60-bay) PN: 210-ACIS	2x MD1280 (84-bay) PN: 210-AIDE	4x MD1280 (84-bay) PN: 210-AIDE
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB		3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB	
Data Drive #	Up to 114	Up to 234	Up to 162	Up to 324
L2ARC	2x Dell 400GB MU 12Gb 2.5” SSD			4x Dell 400GB MU 12Gb 2.5” SSD
ZIL/SLOG	4x Dell 400GB WI 12Gb 2.5” SSD			8x Dell 400GB WI 12Gb 2.5” SSD

Note 1: For Dell deployments, use Nexenta-specific platform SKUs in DellStar or Gii ordering system.

Note 2: BIOS for R730 system with the v3 CPU should be 1.0.4 and above. BIOS for R730 with v4 CPU is 2.0.2 or later.

Note 3: 10GbE port count considers the 2 ports on the server Network Daughter Card.

Note 4: Contact Dell for detailed wiring diagrams for these configurations.

3.3.3 Dell 13G All-Disk Configurations

NexentaStor All-Disk configurations are best suited for backup and archive type use cases, sequential workloads and read intensive workloads.

3.3.3.1 Dell R730 All-Disk – MD3060e and MD1280

Dell R730 All–Disk RA	**ND-120-13G**	**ND-240-13G**	**ND-168-13G**	**ND-336-13G**	**ND-672-13G**
Raw Capacity	Up to 1,200TB	Up to 2,400TB	Up to 1,680	Up to 3,360TB	Up to 6,720TB
Device Slots	120	240	168	336	672
Form Factor (Max)	12U	20U	14U	24U	44U
Memory (total)	512GB				
Read Cache	N/A				
10GbE ports	4				
Software	NexentaStor 5.x				

Dell R730 All–Disk RA	**ND-120-13G**	**ND-240-13G**	**ND-168-13G**	**ND-336-13G**	**ND-672-13G**
Controller	2x R730 PN: 210-AEZO				
CPU	E5-2643 v3 3.4GHz, 6-core, 2-socket E5-2643 v4 3.4GHz, 6-core, 2-socket				
DRAM	256GB (16x 16GB)				
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5")				
SAS HBA	2x LSI SAS 6Gb HBA PN: 406-BBDN	4x LSI SAS 6Gb HBA PN: 406-BBDN	2x LSI SAS 6Gb HBA PN: 406-BBDN	4x LSI SAS 6Gb HBA PN: 406-BBDN	4x LSI SAS 6Gb HBA PN: 406-BBDN
	H730 (for internal SysPool drives only)				
NIC	1x Network Daughter Card: Intel i350 DP + Intel X520 DP 10GbE SFP+ or X540 DP 10GbE RJ45 Optional: Intel X520 10GbE SFP+ Intel X540 10GbE RJ45				
FC HBA (optional)	Emulex LPe 12002, LPe 16002B QLogic QLE 2562, QLE 2662				
Storage Enclosure	2x MD3060e (60-bay) PN: 210-ACIS	4x MD3060e (60-bay) PN: 210-ACIS	2x MD1280 (84-bay) PN: 210-AIDE	4x MD1280 (84-bay) PN: 210-AIDE	8x MD1280 (84-bay) PN: 210-AIDE
Data HDD	3.5" 7.2k SAS HDD – 2TB 3.5" 7.2k SAS HDD – 4TB 3.5" 7.2k SAS HDD – 6TB 3.5" 7.2k SAS HDD – 8TB 3.5" 7.2k SAS HDD – 10TB		3.5" 7.2k SAS HDD – 2TB 3.5" 7.2k SAS HDD – 4TB 3.5" 7.2k SAS HDD – 6TB 3.5" 7.2k SAS HDD – 8TB 3.5" 7.2k SAS HDD – 10TB		
Data Drive #	120	240	168	336	672
L2ARC	N/A				
ZIL/SLOG	Recommended: 2x Dell 400GB WI 12Gb 2.5" SSD per pool				

Note 1: For Dell deployments, use Nexenta-specific platform SKUs in DellStar or Gii ordering system.

Note 2: BIOS for R730 system with the v3 CPU should be 1.0.4 and above. BIOS for R730 with v4 CPU is 2.0.2 or later.

Note 3: 10GbE port count considers the 2 ports on the server Network Daughter Card.
Note 4: Contact Dell for detailed wiring diagrams for these configurations.

3.3.4 Dell and HGST Storage Platform Configurations

3.3.4.1 Dell R730 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

Dell and HGST RA	NDH-AF-24	NDH-AF-48	NDH-AF-72	NDH-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	8			
Software	NexentaStor 5.x			

Dell and HGST RA	NDH-AF-24	NDH-AF-48	NDH-AF-72	NDH-AF-96
Controller	1x or 2x **R730** PN: 210-AEZO			
CPU	E5-2643 v4, 3.4GHz, 6-core, 2-socket			
DRAM	256GB per controller			
Boot Drive	2x 1TB SAS 7.2k 3.5” mirrored			
SAS HBA	1x Dell SAS 12Gb HBA	2x Dell SAS 12Gb HBA	3x Dell SAS 12Gb HBA	4x Dell SAS 12Gb HBA
	H730 (for internal SysPool drives only)			
NIC	1x Network Daughter Card: Intel i350 DP + Intel X520 DP SFP+ or X540 DP 10GbE RJ45 and 1x Intel X520 10GbE SFP+ or X540 10GbE RJ45			
FC HBA (optional)	Emulex LPe 12002, LPe 16002B QLogic QLE 2562, QLE 2662			
Storage Enclosure	1x HGST 2U24	2x HGST 2U24	3x HGST 2U24	4x HGST 2U24
Total 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 for R730 system with Intel v4 CPU is 2.0.2 or later.

3.3.4.2 Dell R730 and HGST 4U60G2 Hybrid / All-Disk

Dell R730 HGST RA	NDHG-1x60-13G	NDHG-2x60-13G	NDHG-3x60-13G	NDHG-4x60-13G
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			

Dell R730 HGST RA	NDHG-1x60-13G	NDHG-2x60-13G	NDHG-3x60-13G	NDHG-4x60-13G
Controller	2x R730 PN: 210-AEZO			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)			
SAS HBA	1x Dell SAS 12Gb HBA PN: 405-AAEB	2x Dell SAS 12Gb HBA PN: 405-AAEB	3x Dell SAS 12Gb HBA PN: 405-AAEB	4x Dell SAS 12Gb HBA PN: 405-AAEB
	H730 (for internal SysPool drives only)			
NIC	1x Network Daughter Card: Intel i350 DP + Intel X520 DP 10GbE SFP+ or X540 DP 10GbE RJ45 Optional: Intel X520 10GbE SFP+ Intel X540 10GbE RJ45			
FC HBA (optional)	Emulex LPe 12002, LPe 16002B QLogic QLE 2562, QLE 2662			
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: For Dell deployments, use Nexenta-specific platform SKUs in DellStar or Gii ordering system.
Note 2: BIOS for R730 with v4 CPU is 2.0.2 or later.
Note 3: 10GbE port count considers the 2 ports on the server Network Daughter Card.
Note 4: Use dual SAS path for configurations with up to 4 enclosures.

3.4 HPE Gen10 Reference Architectures

3.4.1 HPE Gen10 All-Flash Configurations

3.4.1.1 HPE DL380 Gen10 and D3710 All-Flash

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.

HPE All-Flash RA	**H10-AF-1x25**	**H10-AF-2x25**	**H10-AF-3x25**	**H10-AF-4x25**
Raw Capacity	Up to 382TB	Up to 765TB	Up to 1.14PB	Up to 1.53PB
Device Slots	25	50	75	100
Form Factor (total system)	6U	8U	10U	12U
Memory (total system)	384GB 768GB			
Software	NexentaStor 5.2.0 or higher			

HPE All-Flash RA	**H10-AF-1x25**	**H10-AF-2x25**	**H10-AF-3x25**	**H10-AF-4x25**
Controller	2x HPE ProLiant DL380 Gen10			
Chassis	8SFF CTO (8x 2.5" slots) with Legacy FIO Mode Setting			
CPU	Intel 6128, 3.4GHz, 6-core, 2-socket			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
PCIe Riser	1x HP DL380G10 Standard Riser 1x HP DL Gen10 x8/x16/x8 Riser kit			
RAID Config	No RAID			
Boot Drive	2x 1TB SAS 7.2k 2.5" mirrored			
SAS HBA	1x E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS			
	1x E208e-p SR Gen10 12G SAS		2x E208e-p SR Gen10 12G SAS	
LOM	HPE Ethernet 1Gb 4-port 366-FLR HPE Ethernet 10/25Gb 2-port 621SFP29			
NIC	HPE Ethernet 10Gb 2-port 562SFP+ HPE Ethernet 10Gb 2-port 562T HPE Ethernet 10/25Gb 2-port 661SFP28 HPE Ethernet 10/25Gb 2-port 621SFP28			
FC HBA (optional)	SN1100Q 16Gb Single Port FC HBA SN1100Q 16Gb Dual Port FC HBA			
Storage Enclosure	1x HPE D3710	2x HPE D3710	3x HPE D3710	4x HPE D3710
Total Drive #	Up to 25	Up to 50	Up to 75	Up to 100
Flash Device	Write Intensive SAS SSDs – 400GB, 800GB, 1.6TB, 3.2TB Mixed Use SAS SSDs – 400GB, 1.6TB, 3.2TB, 6.4TB Read Intensive SAS SSDs – 1.92TB, 3.84TB, 7.68TB, 15.3TB			
L2ARC	N/A			
ZIL/SLOG	N/A			

Note 1: Supported BIOS levels for HPE DL380Gen10 are v1.36 and v1.46 as of NexentaStor 5.2.1
Note 2: The configurations assume that up to 2 storage enclosures can be dual path daisy chained off a single E208e-p adapter.
Note 3: Use dual SAS path for configurations with up to 4 enclosures.

3.4.2 HPE Gen10 Hybrid 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.

3.4.2.1 HPE DL380 Gen 10 Hybrid – D3610

HPE Hybrid RA	H10-H-2x12	H10-H-4x12	H10-H-6x12	H10-H-8x12
Raw Capacity	Up to 210TB	Up to 450TB	Up to 690TB	Up to 930TB
Device Slots	24	48	72	96
Form Factor (total)	8U	12U	16U	20U
Memory (total)	384GB			
Read Cache	800GB per pool			
Software	NexentaStor 5.2.0 or higher			

HPE Hybrid RA	H10-H-2x12	H10-H-4x12	H10-H-6x12	H10-H-8x12
Controller	2x HPE ProLiant DL380 Gen10			
Chassis	8SFF CTO (8x 2.5” slots) with Legacy FIO Mode Setting			
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket			
DRAM	192GB (12x 16GB)			
PCIe Riser	1x HP DL380G10 Standard Riser 1x HP DL Gen10 x8/x16/x8 Riser kit			
RAID Config	No RAID			
Boot Drive	2x 1TB SAS 7.2k 2.5” mirrored			
SAS HBA	1x E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS			
	2x E208e-p SR Gen10 12G SAS		3x E208e-p SR Gen10 12G SAS	4x E208e-p SR Gen10 12G SAS
LOM	HPE Ethernet 1Gb 4-port 366-FLR HPE Ethernet 10/25Gb 2-port 621SFP29			
NIC	HPE Ethernet 10Gb 2-port 562SFP+ HPE Ethernet 10Gb 2-port 562T HPE Ethernet 10/25Gb 2-port 661SFP28 HPE Ethernet 10/25Gb 2-port 621SFP28			
FC HBA (optional)	SN1100Q 16Gb Single Port FC HBA SN1100Q 16Gb Dual Port FC HBA			

Storage Enclosure	2x HPE D3610	4x HPE D3610	6x HPE D3610	8x HPE D3610
Data HDD	3.5” 7.2K NL-SAS HDD - 2TB 3.5” 7.2K NL-SAS HDD - 4TB 3.5” 7.2K NL-SAS HDD - 6TB 3.5” 7.2K NL-SAS HDD - 8TB 3.5” 7.2K NL-SAS HDD - 10TB			
Data Drive #	Up to 21	Up to 45	Up to 69	Up to 93
L2ARC (optional)	1x 800GB SAS Mixed Use SSD per pool			
ZIL/SLOG	2x 800GB SAS Mixed Use SSD per pool			

Note 1: Supported BIOS levels for HPE DL380Gen10 are v1.36 and v1.46 as of NexentaStor 5.2.1

Note 2: The configurations assume that up to 2 storage enclosures can be dual path daisy chained off a single E208e-p adapter.

3.4.2.2 HPE DL380 Gen 10 Hybrid – D3710

HPE Hybrid RA	**H10-H-2x25**	**H10-H-4x25**	**H10-H-6x25**	**H10-H-8x25**
Raw Capacity	Up to 94TB	Up to 194TB	Up to 294TB	Up to 394TB
Device Slots	50	100	150	200
Form Factor (total)	8U	12U	16U	20U
Memory (total)	384GB			
Read Cache	800GB per pool			
Software	NexentaStor 5.2.0 or higher			

HPE Hybrid RA	**H10-H-2x25**	**H10-H-4x25**	**H10-H-6x25**	**H10-H-8x25**
Controller	2x HPE ProLiant DL380 Gen10			
Chassis	8SFF CTO (8x 2.5” slots) with Legacy FIO Mode Setting			
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket			
DRAM	192GB (12x 16GB)			
PCIe Riser	1x HP DL380G10 Standard Riser 1x HP DL Gen10 x8/x16/x8 Riser kit			
RAID Config	No RAID			
Boot Drive	2x 1TB SAS 7.2k 2.5” mirrored			
SAS HBA	1x E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS			
	2x E208e-p SR Gen10 12G SAS		3x E208e-p SR Gen10 12G SAS	4x E208e-p SR Gen10 12G SAS
LOM	HPE Ethernet 1Gb 4-port 366-FLR HPE Ethernet 10/25Gb 2-port 621SFP29			
NIC	HPE Ethernet 10Gb 2-port 562SFP+ HPE Ethernet 10Gb 2-port 562T HPE Ethernet 10/25Gb 2-port 661SFP28 HPE Ethernet 10/25Gb 2-port 621SFP28			
FC HBA (optional)	SN1100Q 16Gb Single Port FC HBA SN1100Q 16Gb Dual Port FC HBA			

Storage Enclosure	2x HPE D3710	4x HPE D3710	6x HPE D3710	8x HPE D3710
Data HDD	2.5” 7.2K SAS HDD ≤ 2TB 2.5” 10k SAS HDD ≤ 1.8TB 2.5” 15k SAS HDD ≤ 900GB			
Data Drive #	Up to 47	Up to 97	Up to 147	Up to 197
L2ARC (optional)	1x 800GB SAS Mixed Use SSD per pool			
ZIL/SLOG	2x 400GB SAS Write Intensive SSD per pool			

Note 1: Supported BIOS levels for HPE DL380Gen10 are v1.36 and v1.46 as of NexentaStor 5.2.1

Note 2: The configurations assume that up to 2 storage enclosures can be dual path daisy chained off a single E208e-p adapter.

3.4.2.3 HPE DL380 Gen 10 Hybrid – D6020

HPE Hybrid RA	**H10-H-1x70**	**H10-H-2x70**	**H10-H-3x70**	**H10-H-4x70**
Raw Capacity	Up to 804TB	Up to 1,644TB	Up to 2,448TB	Up to 3,288TB
Device Slots	70	140	210	280
Form Factor (total)	9U	14U	19U	24U
Memory (total)	384GB, or 768GB			
Read Cache	800GB per pool			
Software	NexentaStor 5.2.0 or higher			

HPE Hybrid RA	**H10-H-1x70**	**H10-H-2x70**	**H10-H-3x70**	**H10-H-4x70**
Controller	2x HPE ProLiant DL380 Gen10			
Chassis	8SFF CTO (8x 2.5” slots) with Legacy FIO Mode Setting			
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket, or Intel 6128, 3.4GHz, 6-core, 2-socket			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
PCIe Riser	1x HP DL380G10 Standard Riser 1x HP DL Gen10 x8/x16/x8 Riser kit			
RAID Config	No RAID			
Boot Drive	2x 1TB SAS 7.2k 2.5” mirrored			
SAS HBA	1x E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS			
	1x E208e-p SR Gen10 12G SAS	2x E208e-p SR Gen10 12G SAS	3x E208e-p SR Gen10 12G SAS	4x E208e-p SR Gen10 12G SAS
LOM	HPE Ethernet 1Gb 4-port 366-FLR HPE Ethernet 10/25Gb 2-port 621SFP29			
NIC	HPE Ethernet 10Gb 2-port 562SFP+ HPE Ethernet 10Gb 2-port 562T HPE Ethernet 10/25Gb 2-port 661SFP28 HPE Ethernet 10/25Gb 2-port 621SFP28			
FC HBA (optional)	SN1100Q 16Gb Single Port FC HBA SN1100Q 16Gb Dual Port FC HBA			

Storage Enclosure	1x HPE D6020	2x HPE D6020	3x HPE D6020	4x HPE D6020
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB 3.5“ 7.2k SAS HDD – 12TB			
Data Drive #	Up to 67	Up to 137	Up to 204	Up to 274
L2ARC (optional)	1x 800GB SAS Mixed Use SSD per pool		1x 800GB SAS Mixed Use SSD per pool (2 pools recommended)	
ZIL/SLOG	2x 400GB SAS Mixed Use SSD per pool		2x 400GB SAS Mixed Use SSD per pool (2 pools recommended)	

Note 1: Supported BIOS levels for HPE DL380Gen10 are v1.36 and v1.46 as of NexentaStor 5.2.1.

3.5 Lenovo Reference Architectures

3.5.1 Lenovo ThinkSystem SR650 All-Flash – D1224

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.

Lenovo All-Flash RA	NL-AF-24	NL-AF-48	NL-AF-72	NL-AF-96
Raw Capacity	Up to 368TB	Up to 737TB	Up to 1,105TB	Up to 1,474TB
Device Slots	24	48	72	96
Form Factor (total system)	6U	8U	10U	12U
Memory (total system)	384GB to 768GB			
Software	NexentaStor 5.1.2-FP1 or higher			

Lenovo All-Flash RA	NL-AF-24	NL-AF-48	NL-AF-72	NL-AF-96
Controller	2x Lenovo ThinkSystem SR650			
Chassis	ThinkSystem SR650 3.5" Chassis With 3.5" SATA/SAS 8-Bay Backplane			
RAID Config	No RAID			
PCIe Riser	ThinkSystem 2U x8/x8/x8 PCIE FH Riser 1 ThinkSystem (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit			
CPU	Intel Xeon Gold 6128 6C 115W 3.4GHz Processor			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2x ThinkSystem 3.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD			
SAS HBA	1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 1x ThinkSystem 430-16e SAS/SATA 12Gb HBA		1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 2x ThinkSystem 430-16e SAS/SATA 12Gb HBA	
LOM & PCIe NICs	ThinkSystem 10Gb 2-port Base-T LOM ThinkSystem 10Gb 4-port Base-T LOM Intel X550-T2 Dual Port 10GBase-T Adapter Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter			
FC HBA (optional)	Emulex 16Gb Gen6 FC Dual-port HBA Emulex LPe32002-M2-L 32Gb 2 port FC HBA			
Storage Enclosure	1x Lenovo Storage D1224	2x Lenovo Storage D1224	3x Lenovo Storage D1224	4x Lenovo Storage D1224
Total Drive #	Up to 24	Up to 48	Up to 72	Up to 96
Flash Device	High Performance SAS SSDs – 1.6TB 10 DWPD Capacity Optimized SAS SSDs – 3.84TB 3 DWPD Capacity Optimized SAS SSDs – 7.68TB 1 DWPD Capacity Optimized SAS SSDs – 15.36TB 1 DWPD			
L2ARC	N/A			
ZIL/SLOG	N/A			

Note 1: BIOS for the SR650 servers must be IVE122D-1.30 or newer. BMC firmware version must be CDI324Q-1.90 or newer.
Note 2: Use dual SAS path for configurations with up to 4 enclosures.
Note 3: Emulex Fibre Channel HBAs are supported with firmware 11.0.270.14 and firmware 11.2.89.0.

3.5.2 Lenovo Hybrid 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.

3.5.2.1 Lenovo ThinkSystem SR650 Hybrid – D1224

Lenovo Hybrid RA	NL-H-2x24	NL-H-4x24	NL-H-6x24	NL-H-8x24
Raw Capacity	Up to 108TB	Up to 223TB	Up to 331TB	Up to 446TB
Device Slots	48	96	144	192
Form Factor (total)	8U	12U	16U	20U
Memory (total)	192GB to 384GB			
Read Cache	400GB		800GB	
Software	NexentaStor 5.1.2-FP1 or higher			

Lenovo Hybrid RA	NL-H-2x24	NL-H-4x24	NL-H-6x24	NL-H-8x24
Controller	2x Lenovo ThinkSystem SR650			
Chassis	ThinkSystem SR650 3.5" Chassis With 3.5” SATA/SAS 8-Bay Backplane			
RAID Config	No RAID			
PCIe Riser	ThinkSystem 2U x8/x8/x8 PCIE FH Riser 1 ThinkSystem (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit			
CPU	Intel Xeon Silver 4114 10C 85W 2.2GHz Processor			
DRAM	96GB (12x 8GB) 192GB (12x 16GB)			
Boot Drive	2x ThinkSystem 3.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD			
SAS HBA	1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 1x ThinkSystem 430-16e SAS/SATA 12Gb HBA		1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 2x ThinkSystem 430-16e SAS/SATA 12Gb HBA	
LOM & PCIe NICS	ThinkSystem 10Gb 2-port Base-T LOM ThinkSystem 10Gb 4-port Base-T LOM Intel X550-T2 Dual Port 10GBase-T Adapter Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter			
FC HBA (optional)	Emulex 16Gb Gen6 FC Dual-port HBA Emulex LPe32002-M2-L 32Gb 2 port FC HBA			
Storage Enclosure	2x Lenovo Storage D1224	4x Lenovo Storage D1224	6x Lenovo Storage D1224	8x Lenovo Storage D1224
Data HDD	Lenovo Storage 1.2TB 10K 2.5" SAS HDD Lenovo Storage 1.8TB 10K 2.5" SAS HDD Lenovo Storage 2.4TB 10K 2.5" SAS HDD Lenovo Storage 1TB 7.2K 2.5" NL-SAS HDD			

	Lenovo Storage 2TB 7.2K 2.5" NL-SAS HDD			
Data Drive #	Up to 45	Up to 93	Up to 138	Up to 186
L2ARC (optional)	1x 400GB SAS SSD (3 DWPD) per pool		1x 400GB SAS SSD (3 DWPD) per pool (2 pools recommended)	
ZIL/SLOG	2x 400GB SAS SSD (10 DWPD) per pool		2x 400GB SAS SSD (10 DWPD) per pool (2 pools recommended)	

Note 1: BIOS for the SR650 servers must be IVE122D-1.30 or newer. BMC firmware version must be CDI324Q-1.90 or newer.

Note 2: Use dual SAS paths and SAS loops with no more than 2 enclosures per loop for configurations up to 8 enclosures.

Note 3: Emulex Fibre Channel HBAs are supported with firmware 11.0.270.14 and firmware 11.2.89.0.

3.5.2.2 Lenovo ThinkSystem SR650 Hybrid – D1212

Lenovo Hybrid RA	NL-H-2x12	NL-H-4x12	NL-H-6x12	NL-H-8x12
Raw Capacity	Up to 252TB	Up to 540TB	Up to 828TB	Up to 1,116TB
Device Slots	24	48	72	96
Form Factor (total)	8U	12U	16U	20U
Memory (total)	192GB to 384GB			
Read Cache	400GB		800GB	
Software	NexentaStor 5.1.2-FP1 or higher			

Lenovo Hybrid RA	NL-H-2x12	NL-H-4x12	NL-H-6x12	NL-H-8x12
Controller	2x Lenovo ThinkSystem SR650			
Chassis	ThinkSystem SR650 3.5" Chassis With 3.5” SATA/SAS 8-Bay Backplane			
RAID Config	No RAID			
PCIe Riser	ThinkSystem 2U x8/x8/x8 PCIE FH Riser 1 ThinkSystem (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit			
CPU	Intel Xeon Silver 4114 10C 85W 2.2GHz Processor			
DRAM	96GB (12x 8GB) 192GB (12x 16GB)			
Boot Drive	2x ThinkSystem 3.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD			
SAS HBA	1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 1x ThinkSystem 430-16e SAS/SATA 12Gb HBA		1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 2x ThinkSystem 430-16e SAS/SATA 12Gb HBA	
LOM & PCIe NICs	ThinkSystem 10Gb 2-port Base-T LOM ThinkSystem 10Gb 4-port Base-T LOM Intel X550-T2 Dual Port 10GBase-T Adapter Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter			
FC HBA (optional)	Emulex 16Gb Gen6 FC Dual-port HBA Emulex LPe32002-M2-L 32Gb 2 port FC HBA			
Storage Enclosure	2x Lenovo Storage D1212	4x Lenovo Storage D1212	6x Lenovo Storage D1212	8x Lenovo Storage D1212
Data HDD	Lenovo Storage 2TB 7.2K 3.5" NL-SAS HDD			

	Lenovo Storage 4TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 6TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 8TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 10TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 12TB 7.2K 3.5" NL-SAS HDD			
Data Drive #	Up to 21	Up to 45	Up to 69	Up to 93
L2ARC (optional)	1x 400GB SAS SSD (3 DWPD) per pool			
ZIL/SLOG	2x 400GB SAS SSD (10 DWPD) per pool			

Note 1: BIOS for the SR650 servers must be IVE122D-1.30 or newer. BMC firmware version must be CDI324Q-1.90 or newer.

Note 2: Use dual SAS paths and SAS loops with no more than 2 enclosures per loop for configurations up to 8 enclosures.

Note 3: Emulex Fibre Channel HBAs are supported with firmware 11.0.270.14 and firmware 11.2.89.0.

3.5.2.3 Lenovo ThinkSystem SR650 Hybrid – D3284

Lenovo Hybrid RA	NL-H-1x84	NL-H-2x84	NL-H-3x84	NL-H-4x84
Raw Capacity	Up to 1.13PB	Up to 2.31PB	Up to 3.44PB	Up to 4.62PB
Device Slots	84	168	252	336
Form Factor (total)	9U	14U	19U	24U
Memory (total)	384GB to 768GB			
Read Cache	400GB	800GB	800GB	1.6TB
Software	NexentaStor 5.1.2-FP1 or higher			

Lenovo Hybrid RA	NL-H-1x84	NL-H-2x84	NL-H-3x84	NL-H-4x84
Controller	2x Lenovo ThinkSystem SR650			
Chassis	ThinkSystem SR650 3.5" Chassis With 3.5" SATA/SAS 8-Bay Backplane			
RAID Config	No RAID			
PCIe Riser	ThinkSystem 2U x8/x8/x8 PCIE FH Riser 1 ThinkSystem (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit			
CPU	Intel Xeon Silver 4114 10C 85W 2.2GHz Processor			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2x ThinkSystem 3.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD			
SAS HBA	1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 1x ThinkSystem 430-16e SAS/SATA 12Gb HBA		1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 2x ThinkSystem 430-16e SAS/SATA 12Gb HBA	
LOM & PCIe NICs	ThinkSystem 10Gb 2-port Base-T LOM ThinkSystem 10Gb 4-port Base-T LOM Intel X550-T2 Dual Port 10GBase-T Adapter Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter			
FC HBA (optional)	Emulex 16Gb Gen6 FC Dual-port HBA Emulex LPe32002-M2-L 32Gb 2 port FC HBA			

Storage Enclosure	1x Lenovo Storage D3284 (84 Bay)	2x Lenovo Storage D3284 (84 Bay)	3x Lenovo Storage D3284 (84 Bay)	4x Lenovo Storage D3284 (84 Bay)
Data HDD	Lenovo Storage 4TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 6TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 8TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 10TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 12TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 14TB 7.2K 3.5" NL-SAS HDD			
Data Drive #	Up to 81	Up to 165	Up to 246	Up to 330
L2ARC (optional)	1x 400GB SAS SSD (3 DWPD) per pool		1x 400GB SAS SSD (3 DWPD) per pool (2 pools recommended)	
ZIL/SLOG	2x 400GB SAS SSD (10 DWPD) per pool		2x 400GB SAS SSD (10 DWPD) per pool (2 pools recommended)	

Note 1: BIOS for the SR650 servers must be IVE122D-1.30 or newer. BMC firmware version must be CDI324Q-1.90 or newer.

Note 2: Emulex Fibre Channel HBAs are supported with firmware 11.0.270.14 and firmware 11.2.89.0.

3.5.3 Lenovo ThinkSystem SR650 Single Node Appliances

NexentaStor Single Node configurations leverage disk capacity internal to the storage controller. **The single controller architecture determines that there is no high availability for storage services.** Full data protection services are available including data Mirror and RAID. NexentaStor Single-Node configurations are best suited for generic file services and backup and archive use cases.

3.5.3.1 Lenovo ThinkSystem SR650 Single Node (No HA) – All-Flash

Lenovo Single Node	**NL-SN-AF-24**
Raw Capacity	Up to 368TB
Device Slots	24 x 2.5”
Form Factor	2U
Memory	192GB
LOM 10 GbE ports	Up to 4
Software	NexentaStor 5.1.2-FP1 or higher

Controller	Lenovo ThinkSystem SR650
Chassis	ThinkSystem SR650 2.5" Chassis with 24 bays With 3x 2.5" SATA/SAS 8-Bay Backplane ThinkSystem SR590/SR650 Rear HDD Kit
RAID Config	No RAID
PCIe Riser	ThinkSystem SR550/SR590/SR650 (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit
CPU	2 x Intel Xeon Silver 4114 10C 85W 2.2GHz Processor
DRAM	192GB (12x 16GB)
Boot Drive	2x ThinkSystem 2.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD (Front Bays)
SAS HBA	2x ThinkSystem 430-16i SAS/SATA 12Gb HBA
LOM & PCIe NIC	ThinkSystem 10Gb 2-port Base-T LOM ThinkSystem 10Gb 4-port Base-T LOM Intel X550-T2 Dual Port 10GBase-T Adapter Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter
Data Device #	24
Data Devices	High Performance SAS SSDs – 1.6TB 10 DWPD Capacity Optimized SAS SSDs – 3.84TB 3 DWPD Capacity Optimized SAS SSDs – 7.68TB 1 DWPD Capacity Optimized SAS SSDs – 15.36TB 1 DWPD
L2ARC	N/A
ZIL/SLOG	N/A

Note 1:BIOS for the SR650 servers must be IVE122D-1.30 or newer. BMC firmware version must be CDI324Q-1.90 or newer.

3.5.3.2 Lenovo ThinkSystem SR650 Single Node (No HA) – Hybrid 2.5”

Lenovo Single Node	**NL-SN-H-24**
Raw Capacity	Up to 52TB
Device Slots	24 x 2.5”
Form Factor	2U
Memory	96GB
LOM 10 GbE ports	Up to 4
Software	NexentaStor 5.1.2-FP1 or higher

Controller	Lenovo ThinkSystem SR650
Chassis	ThinkSystem SR650 2.5" Chassis with 24 bays With 3x 2.5" SATA/SAS 8-Bay Backplane ThinkSystem SR590/SR650 Rear HDD Kit
RAID Config	No RAID
PCIe Riser	ThinkSystem SR550/SR590/SR650 (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit
CPU	2 x Intel Xeon Silver 4114 10C 85W 2.2GHz Processor
DRAM	96GB (12x 8GB)
Boot Drive	2x ThinkSystem 2.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD (Front Bays)
SAS HBA	2x ThinkSystem 430-16i SAS/SATA 12Gb HBA
LOM & PCIe NIC	ThinkSystem 10Gb 2-port Base-T LOM ThinkSystem 10Gb 4-port Base-T LOM Intel X550-T2 Dual Port 10GBase-T Adapter Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter
Data Device #	22
Data Devices	Lenovo Storage 1.2TB 10K 2.5" SAS HDD Lenovo Storage 1.8TB 10K 2.5" SAS HDD Lenovo Storage 2.4TB 10K 2.5" SAS HDD Lenovo Storage 1TB 7.2K 2.5" NL-SAS HDD Lenovo Storage 2TB 7.2K 2.5" NL-SAS HDD
L2ARC	N/A
ZIL/SLOG	2x 400GB SAS SSD 10 DWPD

Note 1: BIOS for the SR650 servers must be IVE122D-1.30 or newer. BMC firmware version must be CDI324Q-1.90 or newer.

3.5.3.3 Lenovo ThinkSystem SR650 Single Node (No HA) – Hybrid 3.5”

Lenovo Single Node	NL-SN-H-12
Raw Capacity	Up to 120TB
Device Slots	12 x 3.5”
Form Factor	2U
Memory	96GB
LOM 10 GbE ports	Up to 4
Software	NexentaStor 5.1.2-FP1 or higher

Controller	Lenovo ThinkSystem SR650
Chassis	ThinkSystem SR650 3.5" Chassis with 8 or 12 bays With 1x 3.5" SATA/SAS 12-Bay Backplane ThinkSystem SR590/SR650 Rear HDD Kit
RAID Config	No RAID
PCIe Riser	ThinkSystem SR550/SR590/SR650 (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit
CPU	2 x Intel Xeon Silver 4114 10C 85W 2.2GHz Processor
DRAM	96GB (12x 8GB)
Boot Drive	2x ThinkSystem 3.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD (Front Bays)
SAS HBA	1x ThinkSystem 430-16i SAS/SATA 12Gb HBA
LOM & PCIe NIC	ThinkSystem 10Gb 2-port Base-T LOM ThinkSystem 10Gb 4-port Base-T LOM Intel X550-T2 Dual Port 10GBase-T Adapter Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter
Data Device #	10
Data Drives	Lenovo Storage 2TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 4TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 6TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 8TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 10TB 7.2K 3.5" NL-SAS HDD Lenovo Storage 12TB 7.2K 3.5" NL-SAS HDD
L2ARC	N/A
ZIL/SLOG	2x 400GB SAS SSD 10 DWPD

Note 1: BIOS for the SR650 servers must be IVE122D-1.30 or newer. BMC firmware version must be CDI324Q-1.90 or newer.

3.5.4 Lenovo and HGST Storage Platform Configurations

3.5.4.1 Lenovo ThinkSystem SR650 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

Lenovo and HGST RA	NLHG-AF-24	NLHG-AF- 48	NLHG-AF-72	NLHG-AF-96
Raw Capacity	Up to 184TB	Up to 368TB	Up to 552TB	Up to 737TB
Device Slots	24	48	72	96
Form Factor (total)	6U	8U	10U	12U
Memory (total)	384GB to 768GB			
10GbE Ports	8			
Software	NexentaStor 5.1.2-FP1 or higher			

Lenovo and HGST RA	NLHG-AF-24	NLHG-AF-48	NLHG-AF-72	NLHG-AF-96
Controller	2x Lenovo ThinkSystem SR650			
Chassis	ThinkSystem SR650 3.5" Chassis With 3.5” SATA/SAS 8-Bay Backplane			
RAID Config	No RAID			
PCIe Riser	ThinkSystem 2U x8/x8/x8 PCIE FH Riser 1 ThinkSystem (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit			
CPU	Intel Xeon Gold 6128 6C 115W 3.4GHz Processor			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2xThinkSystem 3.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD			
SAS HBA	1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 1x ThinkSystem 430-16e SAS/SATA 12Gb HBA		1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 2x ThinkSystem 430-16e SAS/SATA 12Gb HBA	
LOM & PCIe NICs	ThinkSystem 10Gb 2-port Base-T LOM ThinkSystem 10Gb 4-port Base-T LOM Intel X550-T2 Dual Port 10GBase-T Adapter Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter			
FC HBA (optional)	Emulex 16Gb Gen6 FC Dual-port HBA Emulex LPe32002-M2-L 32Gb 2 port FC HBA			
Storage Enclosure	1x HGST 2U24	2x HGST 2U24	3x HGST 2U24	4x HGST 2U24
Total 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: Emulex Fibre Channel HBAs are supported with firmware 11.0.270.14 and firmware 11.2.89.0.
Note 2: BIOS for the SR650 servers must be IVE122D-1.30 or newer. BMC firmware version must be CDI324Q-1.90 or newer.

3.5.4.2 Lenovo ThinkSystem SR650 and HGST Ultrastar Data 60 Hybrid / All-Disk

Lenovo HGST RA	**NLHG -1x60**	**NLHG -2x60**	**NLHG -3x60**	**NLHG -4x60**
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 (total)	8U	12U	16U	20U
Memory (total)	384GB to 768GB			
Software	NexentaStor 5.1.2-FP1 or higher			

Lenovo HGST RA	**NLHG -1x60**	**NLHG -2x60**	**NLHG -3x60**	**NLHG -4x60**
Controller	2x Lenovo ThinkSystem SR650			
Chassis	ThinkSystem SR650 3.5" Chassis With 3.5" SATA/SAS 8-Bay Backplane			
RAID Config	No RAID			
PCIe Riser	ThinkSystem 2U x8/x8/x8 PCIE FH Riser 1 ThinkSystem (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit			
CPU	Intel Xeon Silver 4114 10C 85W 2.2GHz Processor			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2x ThinkSystem 3.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD			
SAS HBA	1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 1x ThinkSystem 430-16e SAS/SATA 12Gb HBA		1x ThinkSystem 430-8i SAS/SATA 12Gb HBA 2x ThinkSystem 430-16e SAS/SATA 12Gb HBA	
LOM & PCIe NICs	ThinkSystem 10Gb 2-port Base-T LOM ThinkSystem 10Gb 4-port Base-T LOM Intel X550-T2 Dual Port 10GBase-T Adapter Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter			
FC HBA (optional)	Emulex 16Gb Gen6 FC Dual-port HBA Emulex LPe32002-M2-L 32Gb 2 port FC HBA			
Storage Enclosure	1x HGST Data60	2x HGST Data60	3x HGST Data60	4x HGST Data60
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: Emulex Fibre Channel HBAs are supported with firmware 11.0.270.14 and firmware 11.2.89.0.
Note 2: BIOS for the SR650 servers must be IVE122D-1.30 or newer. BMC firmware version must be CDI324Q-1.90 or newer.

3.6 StorMax Reference Architectures

Reference Architectures with the StorMax NX224 controller provide configurations that combine 2 high-availability controllers and storage in a single 2U chassis.

3.6.1 StorMax All-Flash and Hybrid 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.

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.

StorMax RA	**NX225**	**NX250**
Max Raw Capacity	44TB	92TB
Device Slots	24	
Form Factor (total)	2U	
Memory (total)	512GB	
10GbE Ports	4x SFP+	
Software	NexentaStor 5.x	

StorMax RA	**NX225**	**NX250**
Controller	NX224	
CPU	E5-2650 v4 2.2GHz, 12-core, 2-socket	E5-2643 v4 3.4GHz, 6-core, 2-socket
DRAM	256GB (16x 16GB)	
Boot Drive	Intel DC S3510 240GB SATA 2.5 SSD	
SAS HBA	Built-in LSI 3008	
NIC	2x Intel 82599-ES 10GbE SFP+ OCP mezzanine cards	
FC HBA (optional)	Future	
Storage Enclosure	N/A	
Data HDD or SSD	22x 2TB HDD	24x 3.84TB SSD
L2ARC	N/A	
ZIL/SLOG	2x 400GB WI SAS SSD	N/A

Note 1: Tested motherboard BIOS version 1.00 for StorMax NX224.

3.7 Supermicro X11 Reference Architectures

3.7.1 Supermicro X11 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.

3.7.1.1 Supermicro X11 All-Flash – 24 Bay SC216

Supermicro X11 All-Flash RA	NS-AF-24-X11	NS-AF-48-X11	NS-AF-96-X11	NS-AF-144-X11	NS-AF-192-X11
Raw Capacity	Up to 92TB	Up to 184TB	Up to 368TB	Up to 552TB	Up to 737TB
Device Slots	24	48	96	144	192
Form Factor (total)	6U	8U	12U	16U	20U
Memory (total)	384GB		768GB		
Built-in Ethernet	4x 10GbE per node				
Software	NexentaStor 5.x				

Supermicro X11 All-Flash RA	NS-AF-24-X11	NS-AF-48-X11	NS-AF-96-X11	NS-AF-144-X11	NS-AF-192-X11
Controller	2x SMC 6029U-E1CR4T with 4x 10GBaseT, X11DPU				
CPU	Intel 6128, 3.4GHz, 6-core, 2-socket				
DRAM	192GB (12x16GB)		384GB (12x 32GB)		
Boot Drive	2x 1TB SAS 7.2k 3.5"				
SAS HBA	1x AOC-S3008L-L8E (for internal boot devices)				
	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	3x AOC-SAS3-9305-16e	4x AOC-SAS3-9305-16e
NIC (optional)	2 port 10GbE: AOC-STGN-i2S or AOC-STG-i2T 4 port 10GbE: AOC-STG-i4S 2 port 25GbE: AOC-S25G-i2S 2 port 40GbE: AOC-S40G-i2Q				
FC HBA (optional)	2 port 16Gbps: AOC-QLE2672				
Storage Enclosure	1x 216BE2C-R741JBOD (24-bay)	2x 216BE2C-R741JBOD (24-bay)	4x 216BE2C-R741JBOD (24-bay)	6x 216BE2C-R741JBOD (24-bay)	8x 216BE2C-R741JBOD (24-bay)
Flash Device	Up to 3.84TB SSD (See Appendix A for specific options)				
L2ARC	N/A				
ZIL/SLOG	N/A				

Note 1: Motherboard BIOS must be 2.0c or later.

Note 2: When deploying All-Flash configurations, ensure that the endurance of the SSDs used in the configuration is aligned with the expected write workload on the system. Best practice is to use SSDs rated from 3 DPWD to 10 DWPD.

3.7.2 Supermicro X11 Hybrid 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.

3.7.2.1 Supermicro X11 Hybrid – 24-bay SC216

Supermicro X11 24-bay RA	NSM-H-2x24-X11
Raw Capacity	Up to 110TB
Device Slots	48
Form Factor (total)	8U
Memory (total)	192GB
Read Cache	400GB
Built-in Ethernet	4x 10GbE per node
Software	NexentaStor 5.x

Supermicro X11 24-bay RA	NSM-H-2x24-X11
Controller	2x SMC 6029U-E1CR4T with 4x 10GBaseT, X11DPU
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket
DRAM	96GB (12x 8GB)
Boot Drive	2x 1TB SAS 7.2k 3.5”
SAS HBA	1x AOC-S3008L-L8E (for internal boot devices)
	2x AOC-SAS3-9300-8e
NIC (optional)	2 port 10GbE: AOC-STGN-i2S or AOC-STG-i2T 4 port 10GbE: AOC-STG-i4S 2 port 25GbE: AOC-S25G-i2S 2 port 40GbE: AOC-S40G-i2Q
FC HBA (optional)	2 port 16Gbps: AOC-QLE2672
Storage Enclosure	2x 216BE2C-R741JBOD (24-bay)
Data HDD	2.5” 10K SAS HDD – 1.2 TB 2.5” 10K SAS HDD – 1.8 TB 2.5” 7.2K SAS HDD – 2 TB 2.5” 10K SAS HDD – 2.4 TB
Data Drive #	46
L2ARC	N/A
ZIL/SLOG	2x 200GB SSD (25 DWPD)

Note 1: Motherboard BIOS must be 2.0c or later.

3.7.2.2 Supermicro X11 Hybrid – 44-bay SC847

Supermicro 44-bay RA	NSM-H-1x44-X11	NSM-H-2x44-X11	NSM-H-4x44-X11	NSM-H-6x44-X11
Raw Capacity	Up to 504TB	Up to 984TB	Up to 2,040TB	Up to 3,096TB
Device Slots	44	88	176	264
Form Factor (total)	8U	12U	20U	28U
Memory (total)	384GB 768GB			
Read Cache	N/A	800GB		
Built-in Ethernet	4x 10GbE per node			
Software	NexentaStor 5.x			

Supermicro 44 Bay RA	NSM-H-1x44-X11	NSM-H-2x44-X11	NSM-H-4x44-X11	NSM-H-6x44-X11
Controller	2x SMC 6029U-E1CR4T with 4x 10GBaseT, X11DPU			
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket		Intel 6128, 3.4GHz, 6-core, 2-socket	
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2x 1TB SAS 7.2k 3.5”			
SAS HBA	1x AOC-S3008L-L8E (for internal boot devices)			
	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	3x AOC-SAS3-9305-16e
NIC (optional)	2 port 10GbE: AOC-STGN-i2S or AOC-STG-i2T 4 port 10GbE: AOC-STG-i4S 2 port 25GbE: AOC-S25G-i2S 2 port 40GbE: AOC-S40G-i2Q			
FC HBA (optional)	2 port 16Gbps: AOC-QLE2672			
Storage Enclosure	1x 847E2C-R1K28JBOD (44-bay)	2x 847E2C-R1K28JBOD (44-bay)	4x 847E2C-R1K28JBOD (44-bay)	6x 847E2C-R1K28JBOD (44-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB 3.5“ 7.2k SAS HDD – 12TB			
Data Drive #	42	82	170	258
L2ARC	N/A	2x 400GB SSD (3 DWPD)		
ZIL/SLOG	2x 200GB SSD (25 DWPD)	4x 200GB SSD (25 DWPD)		

Note 1: Motherboard BIOS must be 2.0c or later.
Note 2: Latest certified version 66.16.11.00 (if looking using NEF CLI you'll see 100b)

3.7.2.3 Supermicro X11 Hybrid - 60 Bay SC946SE2C

Supermicro 60 Bay RA	NSM-H-1x60-X11	NSM-H-2x60-X11	NSM-H-3x60-X11	NSM-H-4x60-X11
Raw Capacity	Up to 696TB	Up to 1,368TB	Up to 2,088TB	Up to 2,808TB
Device Slots	60	120	180	240
Form Factor (total)	8U	12U	16U	20U
Memory (total)	384GB 768GB			
Read Cache	N/A	800GB		
Built-in Ethernet	4x 10GbE per node			
Software	NexentaStor 5.x			

Supermicro 60 Bay RA	NSM-H-1x60-X11	NSM-H-2x60-X11	NSM-H-3x60-X11	NSM-H-4x60-X11
Controller	2x SMC 6029U-E1CR4T with 4x 10GBaseT, X11DPU			
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket		Intel 6128, 3.4GHz, 6-core, 2-socket	
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2x 1TB SAS 7.2k 3.5”			
SAS HBA	1x AOC-S3008L-L8E (for internal boot devices)			
	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	
NIC (optional)	2 port 10GbE: AOC-STGN-i2S or AOC-STG-i2T 4 port 10GbE: AOC-STG-i4S 2 port 25GbE: AOC-S25G-i2S 2 port 40GbE: AOC-S40G-i2Q			
FC HBA (optional)	2 port 16Gbps: AOC-QLE2672			
Storage Enclosure	1x 946SE2C-R1K66JBOD (60-bay)	2x 946SE2C-R1K66JBOD (60-bay)	3x 946SE2C-R1K66JBOD (60-bay)	4x 946SE2C-R1K66JBOD (60-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB 3.5“ 7.2k SAS HDD – 12TB			
Data Drive #	58	114	174	234
L2ARC	N/A	2x 400GB SSD (3 DWPD)		
ZIL/SLOG	2x 200GB SSD (25 DWPD)	4x 200GB SSD (25 DWPD)		

Note 1: Motherboard BIOS must be 2.0c or later.

3.7.2.4 Supermicro X11 Hybrid – 90 Bay SC946

Supermicro 90 Bay RA	NSM-H-1x90-X11	NSM-H-2x90-X11	NSM-H-3x90-X11	NSM-H-4x90-X11
Raw Capacity	Up to 1,044TB	Up to 2,088TB	Up to 3,096TB	Up to 4,176TB
Device Slots	90	180	270	360
Form Factor (total)	8U	12U	16U	20U
Memory (total)	384GB 768GB			
Read Cache	400GB	800GB		1.6TB
Built-in Ethernet	4x 10GbE per node			
Software	NexentaStor 5.x			

Supermicro 90 Bay RA	NSM-H-1x90-X11	NSM-H-2x90-X11	NSM-H-3x90-X11	NSM-H-4x90-X11
Controller	2x SMC 6029U-E1CR4T with 4x 10GBaseT, X11DPU			
CPU	Intel 6128, 3.4GHz, 6-core, 2-socket			
DRAM	192GB (12x 16GB) 384GB (12x 32GB)			
Boot Drive	2x 1TB SAS 7.2k 3.5”			
SAS HBA	1x AOC-S3008L-L8E (for internal boot devices)			
	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	
NIC (optional)	2 port 10GbE: AOC-STGN-i2S or AOC-STG-i2T 4 port 10GbE: AOC-STG-i4S 2 port 25GbE: AOC-S25G-i2S 2 port 40GbE: AOC-S40G-i2Q			
FC HBA (optional)	2 port 16Gbps: AOC-QLE2672			
Storage Enclosure	1x 946ED-R2KJBOD (90-bay)	2x 946ED-R2KJBOD (90-bay)	3x 946ED-R2KJBOD (90-bay)	4x 946ED-R2KJBOD (90-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB 3.5“ 7.2k SAS HDD – 12TB			
Data Drive #	87	174	258	348
L2ARC	1x 400GB SSD (3 DWPD)	2x 400GB SSD (3 DWPD)		4x 400GB SSD (3 DWPD)
ZIL/SLOG	2x 200GB SSD (25 DWPD)	4x 200GB SSD (25 DWPD)		8x 200GB SSD (25 DWPD)

Note 1: Motherboard BIOS must be 2.0c or later.

3.7.3 Supermicro All-Disk Configurations

NexentaStor All-Disk configurations are best suited for backup and archive type use cases, sequential workloads and read intensive workloads.

3.7.3.1 Supermicro X11 All-Disk – 44 Bay SC847

Supermicro 44 Bay RA	**NSM-D-1x44-X11**	**NSM-D-2x44-X11**	**NSM-D-4x44-X11**	**NSM-D-6x44-X11**	**NSM-D-8x44-X11**
Raw Capacity	Up to 528TB	Up to 1,056TB	Up to 2,112TB	Up to 3,168TB	Up to 4,224TB
Device Slots	44	88	176	264	352
Form Factor (total)	8U	12U	20U	28U	36U
Memory (total)	384GB				
Read Cache	N/A				
Built-in Ethernet	4x 10GbE per node				
Software	NexentaStor 5.x				

Supermicro 44 Bay RA	**NSM-D-1x44-X11**	**NSM-D-2x44-X11**	**NSM-D-4x44-X11**	**NSM-D-6x44-X11**	**NSM-D-8x44-X11**
Controller	2x SMC 6029U-E1CR4T with 4x 10GBaseT, X11DPU				
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket		Intel 6128, 3.4GHz, 6-core, 2-socket		
DRAM	192GB (12x 16GB)				
Boot Drive	2x 1TB SAS 7.2k 3.5”				
SAS HBA	1x AOC-S3008L-L8E (for internal boot devices)				
	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	3x AOC-SAS3-9305-16e	4x AOC-SAS3-9305-16e
NIC (optional)	2 port 10GbE: AOC-STGN-i2S or AOC-STG-i2T 4 port 10GbE: AOC-STG-i4S 2 port 25GbE: AOC-S25G-i2S 2 port 40GbE: AOC-S40G-i2Q				
FC HBA (optional)	2 port 16Gbps: AOC-QLE2672				
Storage Enclosure	1x 847E2C-R1K28JBOD (44-bay)	2x 847E2C-R1K28JBOD (44-bay)	4x 847E2C-R1K28JBOD (44-bay)	6x 847E2C-R1K28JBOD (44-bay)	8x 847E2C-R1K28JBOD (44-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB 3.5“ 7.2k SAS HDD – 12TB				
Data Drive #	44	88	176	264	352
L2ARC	N/A				
ZIL/SLOG	Recommended: 2x 200GB SAS SSD (25 DWPD) per pool				

Note 1: Motherboard BIOS must be 2.0c or later.

Note 2: Latest certified version 66.16.11.00 (if looking using NEF CLI you'll see 100b).
Note 3: The SMC Raid Controller AOC-S3108L-H8IR can be used, but there is no chassis mgt support and thus cannot be used in cluster setups.

3.7.3.2 Supermicro X11 All-Disk – 60 Bay SC946SE2C

Supermicro 60 Bay RA	NSM-D-1x60-X11	NSM-D-2x60-X11	NSM-D-3x60-X11	NSM-D-4x60-X11
Raw Capacity	Up to 720TB	Up to 1,440TB	Up to 2,160TB	Up to 2,880TB
Device Slots	60	120	180	240
Form Factor (total)	8U	12U	16U	20U
Memory (total)	384GB			
Read Cache	N/A	800GB		
Built-in Ethernet	4x 10GbE per node			
Software	NexentaStor 5.x			

Supermicro 60 Bay RA	NSM-D-1x60-X11	NSM-D-2x60-X11	NSM-D-3x60-X11	NSM-D-4x60-X11
Controller	2x SMC 6029U-E1CR4T with 4x 10GBaseT, X11DPU			
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket		Intel 6128, 3.4GHz, 6-core, 2-socket	
DRAM	192GB (12x 16GB)			
Boot Drive	2x 1TB SAS 7.2k 3.5”			
SAS HBA	1x AOC-S3008L-L8E (for internal boot devices)			
	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	
NIC (optional)	2 port 10GbE: AOC-STGN-i2S or AOC-STG-i2T 4 port 10GbE: AOC-STG-i4S 2 port 25GbE: AOC-S25G-i2S 2 port 40GbE: AOC-S40G-i2Q			
FC HBA (optional)	2 port 16Gbps: AOC-QLE2672			
Storage Enclosure	1x 946SE2C-R1K66JBOD (60-bay)	2x 946SE2C-R1K66JBOD (60-bay)	3x 946SE2C-R1K66JBOD (60-bay)	4x 946SE2C-R1K66JBOD (60-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB 3.5“ 7.2k SAS HDD – 12TB			
Data Drive #	60	120	180	240
L2ARC	N/A			
ZIL/SLOG	Recommended: 2x 200GB SAS SSD (25 DWPD) per pool			

Note 1: Motherboard BIOS must be 2.0c or later.

3.7.3.3 Supermicro X11 All-Disk – 90 Bay SC946

Supermicro 90 Bay RA	NSM-D-1x90-X11	NSM-D-2x90-X11	NSM-D-4x90-X11	NSM-D-6x90-X11	NSM-D-8x90-X11
Raw Capacity	Up to 1,080TB	Up to 2,160TB	Up to 4,320TB	Up to 6,480TB	Up to 8,640TB
Device Slots	90	180	360	540	720
Form Factor (total)	8U	12U	20U	28U	36U
Memory (total)	384GB				
Read Cache	N/A				
Built-in Ethernet	4x 10GbE per node				
Software	NexentaStor 5.x				

Supermicro 90 Bay RA	NSM-D-1x90-X11	NSM-D-2x90-X11	NSM-D-4x90-X11	NSM-D-6x90-X11	NSM-D-8x90-X11
Controller	2x SMC 6029U-E1CR4T with 4x 10GBaseT, X11DPU				
CPU	Intel 6128, 3.4GHz, 6-core, 2-socket				
DRAM	192GB (12x 16GB)				
Boot Drive	2x 1TB SAS 7.2k 3.5”				
SAS HBA	1x AOC-S3008L-L8E (for internal boot devices)				
	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	3x AOC-SAS3-9305-16e	4x AOC-SAS3-9305-16e
NIC (optional)	2 port 10GbE: AOC-STGN-i2S or AOC-STG-i2T 4 port 10GbE: AOC-STG-i4S 2 port 25GbE: AOC-S25G-i2S 2 port 40GbE: AOC-S40G-i2Q				
FC HBA (optional)	2 port 16Gbps: AOC-QLE2672				
Storage Enclosure	1x 946ED-R2KJBOD (90-bay)	2x 946ED-R2KJBOD (90-bay)	4x 946ED-R2KJBOD (90-bay)	6x 946ED-R2KJBOD (90-bay)	8x 946ED-R2KJBOD (90-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB 3.5“ 7.2k SAS HDD – 12TB				
Data Drive #	90	180	360	540	720
L2ARC	N/A				
ZIL/SLOG	Recommended: 2x 200GB SAS SSD (25 DWPD) per pool				

Note 1: Motherboard BIOS must be 2.0c or later.

3.7.4 Supermicro and HGST Storage Platform Configurations

3.7.4.1 Supermicro X11 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

Supermicro and HGST RA	NSH-AF-24-X11	NSH-AF-48-X11	NSH-AF-72-X11	NSH-AF-96-X11
Raw Capacity	Up to 184TB	Up to 368TB	Up to 552TB	Up to 737TB
Device Slots	24	48	72	96
Form Factor (total)	6U	8U	10U	12U
Memory (total)	384GB 768GB			
Built-in Ethernet	4x 10GbE per node			
Software	NexentaStor 5.x			

Supermicro and HGST RA	NSH-AF-24-X11	NSH-AF-48-X11	NSH-AF-72-X11	NSH-AF-96-X11
Controller	2x SMC 6029U-E1CR4T with 4x 10GBaseT, X11DPU			
CPU	Intel 6128, 3.4GHz, 6-core, 2-socket			
DRAM	192GB (12x16GB) 384GB (12x 32GB)			
Boot Drive	2x 1TB SAS 7.2k 3.5”			
SAS HBA	1x AOC-S3008L-L8E (for internal boot devices)			
	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	3x AOC-SAS3-9300-8e	4x AOC-SAS3-9300-8e
NIC (optional)	2 port 10GbE: AOC-STGN-i2S or AOC-STG-i2T 4 port 10GbE: AOC-STG-i4S 2 port 25GbE: AOC-S25G-i2S 2 port 40GbE: AOC-S40G-i2Q			
FC HBA (optional)	2 port 16Gbps: AOC-QLE2672			
Storage Enclosure	1x HGST 2U24	2x HGST 2U24	3x HGST 2U24	4x HGST 2U24
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: Motherboard BIOS must be 2.0c or later.

3.7.4.2 Supermicro X11 & HGST 4U60G2 Hybrid / All-Disk

Supermicro HGST RA	NSH-1x60-X11	NSH-2x60-X11	NSH-3x60-X11	NSH-4x60-X11
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 (total)	8U	12U	16U	20U
Memory (total)	384GB			
Read Cache	800GB		Up to 1.6TB	
Built-in Ethernet	4x 10GbE per node			
Software	NexentaStor 5.x			

Supermicro HGST RA	NSH-1x60-X11	NSH-2x60-X11	NSH-3x60-X11	NSH-4x60-X11
Controller	2x SMC 6029U-E1CR4T with 4x 10GBaseT, X11DPU			
CPU	Intel 4114, 2.2GHz, 10-core, 2-socket		Intel 6128, 3.4GHz, 6-core, 2-socket	
DRAM	192GB (12x 16GB)			
Boot Drive	2x 1TB SAS 7.2k 3.5”			
SAS HBA	1x AOC-S3008L-L8E (for internal boot devices)			
	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	
NIC	2 port 10GbE: AOC-STGN-i2S or AOC-STG-i2T 4 port 10GbE: AOC-STG-i4S 2 port 25GbE: AOC-S25G-i2S 2 port 40GbE: AOC-S40G-i2Q			
FC HBA (optional)	2 port 16Gbps: AOC-QLE2672			
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: Motherboard BIOS must be 2.0c or later.
Note 2: Use dual SAS path for configurations with up to 4 enclosures.

3.8 Supermicro X10 Reference Architectures

3.8.1 Supermicro 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.

3.8.1.1 Supermicro X10 All-Flash – 24 Bay SC216

Supermicro X10 All-Flash RA	NS-AF-24	NS-AF-48	NS-AF-72	NS-AF-96
Raw Capacity	Up to 92TB	Up to 184TB	Up to 276TB	Up to 368TB
Device Slots	24	48	72	96
Form Factor (total)	6U	8U	10U	12U
Memory (total)	512GB			
10GbE Ports	8			
Software	NexentaStor 5.x			

Supermicro X10 All-Flash RA	NS-AF-24	NS-AF-48	NS-AF-72	NS-AF-96
Controller	2x SYS-6028U-NEX4			
CPU	E5-2643 v3 3.4GHz, 6-core, 2-socket E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5")			
SAS HBA	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	~~2x AOC-SAS3-9300-16e~~ 2x AOC-SAS3-9305-16e	
NIC	2x AOC-STGN-i2S or AOC-STG-i2T			
FC HBA (optional)	Emulex LPe 12000, LPe 12002, LPe 12004, LPe 16000B, LPe 16002B QLogic QLE 2560, 2562, 2672			
Storage Enclosure	1x 216BE2C-R741JBOD (24-bay)	2x 216BE2C-R741JBOD (24-bay)	3x 216BE2C-R741JBOD (24-bay)	4x 216BE2C-R741JBOD (24-bay)
Flash Device	Up to 3.84TB SSD (See Appendix A for specific options)			
L2ARC	N/A			
ZIL/SLOG	N/A			

Note 1: For Intel v3 CPUs, motherboard BIOS for the SMC X10 RA must be 1.01 or later. For Intel v4 CPUs, motherboard BIOS must be 2.0 or later.

Note 2: When deploying All-Flash configurations, ensure that the endurance of the SSDs used in the configuration is aligned with the expected write workload on the system. Best practice is to use SSDs rated from 3 DPWD to 10 DWPD.

Note 3: Supermicro has identified interoperability issues with the 4 port 9300-16e SAS HBA and no longer supports this HBA in this system. The 9305-16e HBA should be used instead.

Note 4: white on grey items are supported in existing deployments. They should not be used for new deployments.

3.8.2 Supermicro Hybrid 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.

3.8.2.1 Supermicro X10 Hybrid - 24 Bay SC216

Supermicro 24 Bay RA	NSM-H-2x24-X10
Raw Capacity	Up to 92TB
Device Slots	48
Form Factor (total)	8U
Memory (total)	192GB
Read Cache	400GB
10GbE Ports	4
Software	NexentaStor 5.x

Supermicro RA 24 Bay RA	NSM-H-2x24-X10
Controller	2x SYS-6028U-NEX3
CPU	E5-2609 v3 1.9GHz, 6-core, 2-socket E5-2620 v4 2.1GHz, 8-core, 2-socket
DRAM	96GB (12x 8GB)
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)
SAS HBA	1x AOC-SAS3-9300-8e
NIC	1x AOC-STGN-i2S or AOC-STG-i2T
FC HBA (optional)	Emulex LPe 12000, LPe 12002, LPe 12004, LPe 16000B, LPe 16002B QLogic QLE 2560, 2562, 2672
Storage Enclosure	2x 216BE2C-R741JBOD (24-bay)
Data HDD	2.5” 10K SAS HDD – 1.2 TB 2.5” 10K SAS HDD – 1.8 TB 2.5” 7.2K SAS HDD – 2 TB
Data Drive #	46
L2ARC	N/A
ZIL/SLOG	2x 200GB SSD (25 DWPD)

Note 1: For Intel v3 CPUs, motherboard BIOS for the SMC X10 RA must be 1.01 or later. For Intel v4 CPUs, motherboard BIOS must be 2.0 or later.

Note 2: white on grey items are supported in existing deployments. They should not be used for new deployments.

3.8.2.2 Supermicro X10 Hybrid - 44 Bay SC847

Supermicro 44 Bay RA	NSM-H-1x44-X10	NSM-H-2x44-X10	NSM-H-4x44-X10	NSM-H-6x44-X10
Raw Capacity	Up to 168TB	Up to 328TB	Up to 1,700TB	Up to 2,580TB
Device Slots	44	88	176	264
Form Factor (total)	8U	12U	20U	28U
Memory (total)	192GB		512GB	
Read Cache	N/A	800GB		
10GbE Ports	4	8		
Software	NexentaStor 5.x			

Supermicro 44 Bay RA	NSM-H-1x44-X10	NSM-H-2x44-X10	NSM-H-4x44-X10	NSM-H-6x44-X10
Controller	2x SYS-6028U-NEX3		2x SYS-6028U-NEX4	
CPU	E5-2609 v3 1.9GHz, 6-core, 2-socket E5-2620 v4 2.1GHz, 8-core, 2-socket		E5-2643 v3 3.4GHz, 6-core, 2-socket E5-2643 v4 3.4GHz, 6-core, 2-socket	
DRAM	96GB (12x 8GB)		256GB (16x 16GB)	
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)			
SAS HBA	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	~~2x AOC-SAS3-9300-16e~~ 2x AOC-SAS3-9305-16e	~~3x AOC-SAS3-9300-16e~~ 3x AOC-SAS3-9305-16e
NIC	1x AOC-STGN-i2S or AOC-STG-i2T	2x AOC-STGN-i2S or AOC-STG-i2T		
FC HBA (optional)	Emulex LPe 12000, LPe 12002, LPe 12004, LPe 16000B, LPe 16002B QLogic QLE 2560, 2562, 2672			
Storage Enclosure	1x 847E2C-R1K28JBOD (44-bay)	2x 847E2C-R1K28JBOD (44-bay)	4x 847E2C-R1K28JBOD (44-bay)	6x 847E2C-R1K28JBOD (44-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB		3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB	
Data Drive #	42	82	170	258
L2ARC	N/A	2x 400GB SSD (3 DWPD)		
ZIL/SLOG	2x 200GB SSD (25 DWPD)	4x 200GB SSD (25 DWPD)		

Note 1: For Intel v3 CPUs, motherboard BIOS for the SMC X10 RA must be 1.01 or later. For Intel v4 CPUs, motherboard BIOS must be 2.0 or later.

Note 2: Supermicro has identified interoperability issues with the 4 port 9300-16e SAS HBA and no longer supports this HBA in this system. The 9305-16e HBA should be used instead.

Note 3: white on grey items are supported in existing deployments. They should not be used for new deployments.

3.8.2.3 Supermicro X10 Hybrid - 60 Bay SC946SE2C

Supermicro 60 Bay RA	NSM-H-1x60-X10	NSM-H-2x60-X10	NSM-H-3x60-X10	NSM-H-4x60-X10
Raw Capacity	Up to 580TB	Up to 1,140TB	Up to 1,740TB	Up to 2,340TB
Device Slots	60	120	180	240
Form Factor (total)	8U	12U	16U	20U
Memory (total)	512GB			
Read Cache	N/A	800GB		
10GbE Ports	8			
Software	NexentaStor 5.x			

Supermicro 60 Bay RA	NSM-H-1x60-X10	NSM-H-2x60-X10	NSM-H-3x60-X10	NSM-H-4x60-X10
Controller	2x SYS-6028U-NEX4			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)			
SAS HBA	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	~~2x AOC-SAS3-9300-16e~~ 2x AOC-SAS3-9305-16e	
NIC	2x AOC-STGN-i2S or AOC-STG-i2T			
FC HBA (optional)	Emulex LPe 12000, LPe 12002, LPe 12004, LPe 16000B, LPe 16002B QLogic QLE 2560, 2562, 2672			
Storage Enclosure	1x 946SE2C-R1K66JBOD (60-bay)	2x 946SE2C-R1K66JBOD (60-bay)	3x 946SE2C-R1K66JBOD (60-bay)	4x 946SE2C-R1K66JBOD (60-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB			
Data Drive #	58	114	174	234
L2ARC	N/A	2x 400GB SSD (3 DWPD)		
ZIL/SLOG	2x 200GB SSD (25 DWPD)	4x 200GB SSD (25 DWPD)		

Note 1: For Intel v4 CPUs, motherboard BIOS must be 2.0 or later.

Note 2: Supermicro has identified interoperability issues with the 4 port 9300-16e SAS HBA and no longer supports this HBA in this system. The 9305-16e HBA should be used instead.

Note 3: white on grey items are supported in existing deployments. They should not be used for new deployments.

3.8.2.4 Supermicro X10 Hybrid – 90 Bay SC946

Supermicro 90 Bay RA	NSM-H-1x90-X10	NSM-H-2x90-X10	NSM-H-3x90-X10	NSM-H-4x90-X10
Raw Capacity	Up to 870TB	Up to 1,740TB	Up to 2,580TB	Up to 3,480TB
Device Slots	90	180	270	360
Form Factor (total)	8U	12U	16U	20U
Memory (total)	512GB			
Read Cache	400GB	800GB		1.6TB
10GbE Ports	8			
Software	NexentaStor 5.x			

Supermicro 90 Bay RA	NSM-H-1x90-X10	NSM-H-2x90-X10	NSM-H-3x90-X10	NSM-H-4x90-X10
Controller	2x SYS-6028U-NEX4			
CPU	E5-2643 v3 3.4GHz, 6-core, 2-socket E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)			
SAS HBA	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	~~2x AOC-SAS3-9300-16e~~ 2x AOC-SAS3-9305-16e	
NIC	2x AOC-STGN-i2S or AOC-STG-i2T			
FC HBA (optional)	Emulex LPe 12000, LPe 12002, LPe 12004, LPe 16000B, LPe 16002B QLogic QLE 2560, 2562, 2672			
Storage Enclosure	1x 946ED-R2KJBOD (90-bay)	2x 946ED-R2KJBOD (90-bay)	3x 946ED-R2KJBOD (90-bay)	4x 946ED-R2KJBOD (90-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB			
Data Drive #	87	174	258	348
L2ARC	1x 400GB SSD (3 DWPD)	2x 400GB SSD (3 DWPD)		4x 400GB SSD (3 DWPD)
ZIL/SLOG	2x 200GB SSD (25 DWPD)	4x 200GB SSD (25 DWPD)		8x 200GB SSD (25 DWPD)

Note 1: For Intel v3 CPUs, motherboard BIOS for the SMC X10 RA must be 1.01 or later. For Intel v4 CPUs, motherboard BIOS must be 2.0 or later.

Note 2: Supermicro has identified interoperability issues with the 4 port 9300-16e SAS HBA and no longer supports this HBA in this system. The 9305-16e HBA should be used instead.

Note 3: white on grey items are supported in existing deployments. They should not be used for new deployments.

3.8.3 Supermicro All-Disk Configurations

NexentaStor All-Disk configurations are best suited for backup and archive type use cases, sequential workloads and read intensive workloads.

3.8.3.1 Supermicro X10 All-Disk – 44 Bay SC847

Supermicro 44 Bay RA	**NSM-D-1x44-X10**	**NSM-D-2x44-X10**	**NSM-D-4x44-X10**	**NSM-D-6x44-X10**	**NSM-D-8x44-X10**
Raw Capacity	Up to 440TB	Up to 880TB	Up to 1,760TB	Up to 2,640TB	Up to 3,520TB
Device Slots	44	88	176	264	352
Form Factor (total)	8U	12U	20U	28U	36U
Memory (total)	512GB				
Read Cache	N/A				
10GbE Ports	8				
Software	NexentaStor 5.x				

Supermicro 44 Bay RA	**NSM-D-1x44-X10**	**NSM-D-2x44-X10**	**NSM-D-4x44-X10**	**NSM-D-6x44-X10**	**NSM-D-8x44-X10**
Controller	2x SYS-6028U-NEX4				
CPU	E5-2643 v3 3.4GHz, 6-core, 2-socket E5-2643 v4 3.4GHz, 6-core, 2-socket				
DRAM	256GB (16x 16GB)				
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)				
SAS HBA	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	3x AOC-SAS3-9305-16e	4x AOC-SAS3-9305-16e
NIC	2x AOC-STGN-i2S or AOC-STG-i2T				
FC HBA (optional)	Emulex LPe 12000, LPe 12002, LPe 12004, LPe 16000B, LPe 16002B QLogic QLE 2560, 2562, 2672				
Storage Enclosure	1x 847E2C-R1K28JBOD (44-bay)	2x 847E2C-R1K28JBOD (44-bay)	4x 847E2C-R1K28JBOD (44-bay)	6x 847E2C-R1K28JBOD (44-bay)	8x 847E2C-R1K28JBOD (44-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB				
Data Drive #	44	88	176	264	352
L2ARC	N/A				
ZIL/SLOG	Recommended: 2x 200GB SAS SSD (25 DWPD) per pool				

Note 1: For Intel v3 CPUs, motherboard BIOS for the SMC X10 RA must be 1.01 or later. For Intel v4 CPUs, motherboard BIOS must be 2.0 or later.

Note 2: Supermicro has identified interoperability issues with the 4 port 9300-16e SAS HBA and no longer supports this HBA in this system. The 9305-16e HBA should be used instead.

Note 3: white on grey items are supported in existing deployments. They should not be used for new deployments.

3.8.3.2 Supermicro X10 All-Disk – 60 Bay SC946SE2C

Supermicro 60 Bay RA	NSM-D-1x60-X10	NSM-D-2x60-X10	NSM-D-3x60-X10	NSM-D-4x60-X10
Raw Capacity	Up to 600TB	Up to 1,200TB	Up to 1,800TB	Up to 2,400TB
Device Slots	60	120	180	240
Form Factor (total)	8U	12U	16U	20U
Memory (total)	512GB			
Read Cache	N/A	800GB		
10GbE Ports	8			
Software	NexentaStor 5.x			

Supermicro 60 Bay RA	NSM-D-1x60-X10	NSM-D-2x60-X10	NSM-D-3x60-X10	NSM-D-4x60-X10
Controller	2x SYS-6028U-NEX4			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)			
SAS HBA	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	
NIC	2x AOC-STGN-i2S or AOC-STG-i2T			
FC HBA (optional)	Emulex LPe 12000, LPe 12002, LPe 12004, LPe 16000B, LPe 16002B QLogic QLE 2560, 2562, 2672			
Storage Enclosure	1x 946SE2C-R1K66JBOD (60-bay)	2x 946SE2C-R1K66JBOD (60-bay)	3x 946SE2C-R1K66JBOD (60-bay)	4x 946SE2C-R1K66JBOD (60-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB			
Data Drive #	60	120	180	240
L2ARC	N/A			
ZIL/SLOG	Recommended: 2x 200GB SAS SSD (25 DWPD) per pool			

Note 1: For Intel v4 CPUs, motherboard BIOS must be 2.0 or later.

Note 2: Supermicro has identified interoperability issues with the 4 port 9300-16e SAS HBA and no longer supports this HBA in this system. The 9305-16e HBA should be used instead.

3.8.3.3 Supermicro X10 All-Disk – 90 Bay SC946

Supermicro 90 Bay RA	NSM-D-1x90-X10	NSM-D-2x90-X10	NSM-D-4x90-X10	NSM-D-6x90-X10	NSM-D-8x90-X10
Raw Capacity	Up to 900TB	Up to 1,800TB	Up to 3,600TB	Up to 5,400TB	Up to 7,200TB
Device Slots	90	180	360	540	720
Form Factor (total)	8U	12U	20U	28U	36U
Memory (total)	512GB				
Read Cache	N/A				
10GbE Ports	8				
Software	NexentaStor 5.x				

Supermicro 90 Bay RA	NSM-D-1x90-X10	NSM-D-2x90-X10	NSM-D-4x90-X10	NSM-D-6x90-X10	NSM-D-8x90-X10
Controller	2x SYS-6028U-NEX4				
CPU	E5-2643 v3 3.4GHz, 6-core, 2-socket E5-2643 v4 3.4GHz, 6-core, 2-socket				
DRAM	256GB (16x 16GB)				
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)				
SAS HBA	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	3x AOC-SAS3-9305-16e	4x AOC-SAS3-9305-16e
NIC	2x AOC-STGN-i2S or AOC-STG-i2T				
FC HBA (optional)	Emulex LPe 12000, LPe 12002, LPe 12004, LPe 16000B, LPe 16002B QLogic QLE 2560, 2562, 2672				
Storage Enclosure	1x 946ED-R2KJBOD (90-bay)	2x 946ED-R2KJBOD (90-bay)	4x 946ED-R2KJBOD (90-bay)	6x 946ED-R2KJBOD (90-bay)	8x 946ED-R2KJBOD (90-bay)
Data HDD	3.5” 7.2k SAS HDD – 2TB 3.5“ 7.2k SAS HDD – 4TB 3.5” 7.2k SAS HDD – 6TB 3.5“ 7.2k SAS HDD – 8TB 3.5“ 7.2k SAS HDD – 10TB				
Data Drive #	90	180	360	540	720
L2ARC	N/A				
ZIL/SLOG	Recommended: 2x 200GB SAS SSD (25 DWPD) per pool				

Note 1: For Intel v3 CPUs, motherboard BIOS for the SMC X10 RA must be 1.01 or later. For Intel v4 CPUs, motherboard BIOS must be 2.0 or later.

Note 2: Supermicro has identified interoperability issues with the 4 port 9300-16e SAS HBA and no longer supports this HBA in this system. The 9305-16e HBA should be used instead.

Note 3: white on grey items are supported in existing deployments. They should not be used for new deployments.

3.8.4 Supermicro and HGST Storage Platform Configurations

3.8.4.1 Supermicro X10 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

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

Supermicro and HGST RA	**NSH-AF-24**	**NSH-AF-48**	**NSH-AF-72**	**NSH-AF-96**
Controller	1x or 2x SYS-6028U-NEX4			
CPU	E5-2643 v4, 3.4GHz, 6-core, 2-socket			
DRAM	256GB per controller			
Boot Drive	2x 1TB SAS 7.2k 3.5” mirrored			
SAS HBA	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	3x AOC-SAS3-9300-8e	4x AOC-SAS3-9300-8e
NIC	2x AOC-STGN-i2S or AOC-STG-i2T			
FC HBA (optional)	Emulex LPe 12002, LPe 12004, LPe 16002B QLogic QLE 2562, 2672			
Storage Enclosure	1x HGST 2U24	2x HGST 2U24	3x HGST 2U24	4x HGST 2U24
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: For Intel v4 CPUs, motherboard BIOS must be 2.0 or later.

3.8.4.2 Supermicro X10 & HGST 4U60G2 Hybrid / All-Disk

Supermicro HGST RA	**NSH-1x60-X10**	**NSH-2x60-X10**	**NSH-3x60-X10**	**NSH-4x60-X10**
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 (total)	8U	12U	16U	20U
Memory (total)	512GB			
Read Cache	800GB		Up to 1.6TB	
10GbE Ports	8			
Software	NexentaStor 5.x			

Supermicro HGST RA	**NSH-1x60-X10**	**NSH-2x60-X10**	**NSH-3x60-X10**	**NSH-4x60-X10**
Controller	2x SYS-6028U-NEX4			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2TB (2x 1TB SAS 7.2k 3.5”)			
SAS HBA	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	2x AOC-SAS3-9305-16e	
NIC	2x AOC-STGN-i2S or AOC-STG-i2T			
FC HBA (optional)	Emulex LPe 12000, LPe 12002, LPe 12004, LPe 16000B, LPe 16002B QLogic QLE 2560, 2562, 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: For Intel v4 CPUs, motherboard BIOS must be 2.0 or later.
Note 2: Use dual SAS path for configurations with up to 4 enclosures.
Note 3: Supermicro has identified interoperability issues with the 4 port 9300-16e SAS HBA and no longer supports this HBA in this system. The 9305-16e HBA should be used instead.

3.9 Supermicro Unified Storage Appliances

Supermicro Unified Storage Appliances powered by Nexenta ship from Supermicro pre-configured with NexentaStor 5 software, high-availability controllers and storage pool. They provide all the performance and functionality of NexentaStor 5 in simple to acquire, simple to deploy and simple to manage appliances based on 100% industry standard hardware.

These appliances are available in All-Flash 2U (2 nodes & 24x 2.5" bays) chassis and Hybrid / All-Disk 4U (2 nodes & 24x 3.5" bays) chassis. They can be extended with up to 2 additional SAS connected storage enclosures to meet larger capacity requirements. To further simplify ordering, they are offered in a limited set of pre-defined usable capacity configurations.

For more information, please visit www.supermicro.com.

3.9.1 Supermicro (2U) All-Flash Appliances

These systems deliver high-availability in a single 2U chassis, with 2 nodes and 12 or 24 SSDs in the initial chassis, scaling up to 72 SSDs for a chassis with 2 additional SAS connected enclosures.

Supermicro All-Flash SBB Appliance	**NX2010-AF-15 to NX2020-AF-61**	**NX2030-AF-30 to NX2040-AF-184**
Target Use Case	Low latency, high IOPS workloads Databases, Analytics, Virtual Machines	
Storage Software	NexentaStor 5.x	
Form Factor	Min of 2U, 24 Bay, 2 Nodes, All-in One Chassis	
	Max of 4U (with 1x 2U storage enclosure)	Max of 6U (with 2x 2U storage enclosures)
Storage Controllers	2 Node High-Availability Cluster	
On board 10GbE Ports	2 per Node / 4 per Appliance	
Optional 10GbE Ports	Up to 4 per Node / 8 per Appliance	
Optional 16Gbps Fibre Channel Ports	Up to 4 per Node / 8 per Appliance	
Storage Expansion	Up to one additional SC216 2U 24 Bay enclosure	Up to two additional SC216 2U 24 Bay enclosures
Device Slots	24 to 48	24 to 72
SSD Size	1.92TB (3 DWPD)	3.84TB (3 DWPD)
Data Protection	Dual-Parity	
Min-Max Raw Capacity (TB)	23 to 92 TB	46 to 276 TB
Min-Max Usable Capacity (TB)	15 to 61 TB	30 to 184 TB
Min-Max Usable Capacity (TiB)	14 to 55 TiB	27 to 167 TiB
Min-Max Effective Capacity (TiB)	41 to 166 TiB	82 to 502 TiB

Note 1: TB is $(1000)^4$ Bytes. TiB is $(1024)^4$ Bytes.
Note 2: Effective capacity reflects typical savings of 3:1 from inline data reduction for the workloads supported by this appliance. Actual capacity savings will vary based on customer datasets stored on the appliance.

3.9.2 Supermicro (4U) Hybrid and All-Disk Appliances

These systems deliver high-availability in a single 4U chassis, with 2 nodes and up to 24 devices in the initial 4U chassis, scaling up to large capacity systems in 12U with 2 additional SAS connected enclosures.

Supermicro Hybrid SBB Appliance	**NX4010-HM-20 to NX4010-HM-106**	**NX4020-HR-48 to NX4020-HR-272**	**NX4030-HA-128 to NX4030-HA-640**
Target Use Case	Good performance block and file services Virtual Machines, Home Directories		Low cost, high capacity disk storage Backup Target & Near Line Archive
Storage Software	NexentaStor 5.x		
Form Factor	Min of 4U (24 Bay, 2 Nodes, All-in One Chassis) Max of 12U (Appliance with 2x 4U storage enclosures)		
Storage Controllers	2 Node High-Availability Cluster		
On board 10GbE Ports	2 per Node / 4 per Appliance		
Optional 10GbE Ports	Up to 4 per Node / 8 per Appliance		
Optional 16Gbps Fibre Channel Ports	Up to 4 per Node / 8 per Appliance		
Storage Expansion	Up to two additional SC847E2C-R1K28JBOD 4U 44 Bay enclosures		
Device Slots	24 to 112		
Flash Cache	Yes	Yes	No
HDD Size	2TB	4TB	8TB
Data Protection	Mirror	Dual-Parity	Triple-Parity
Min-Max Raw Capacity (TB)	42 to 218 TB	84 to 420 TB	176 to 880 TB
Min-Max Usable Capacity (TB)	20 to 106 TB	48 to 272 TB	128 to 640 TB
Min-Max Usable Capacity (TiB)	18 to 96 TiB	44 to 247 TiB	116 to 582 TiB
Min-Max Effective Capacity (TiB)	27 to 145 TiB	65 to 371 TiB	140 to 698 TiB

Note 1: TB is $(1000)^4$ Bytes. TiB is $(1024)^4$ Bytes.

Note 2: Effective capacity reflects typical savings from inline data reduction for the workloads supported by this appliance (1.5:1 for the hybrid and 1.2:1 for archive). Actual capacity savings will vary based on customer datasets stored on the appliance.

3.10 Virtual NAS Configurations

3.10.1 NexentaStor as a VMware vSphere 6.x Virtual NAS

NexentaStor can be deployed as a Storage Virtual Appliance (SVA) on VMware ESXi 6.0 and above. This can be used to provide simple file services from small ESXi clusters (e.g. hyperconverged VSAN clusters in small / remote offices). It can also be leveraged to support Software-Defined Multi-Tenant file services use cases where each tenant gets a dedicated Virtual NAS appliance connected to tenant specific networks and AD servers.

In these scenarios, the NexentaStor SVA consumes vmdks from a backend VMware Datastore. Data protection is handled by the underlying storage (SAN, NAS or Hyperconverged storage from VSAN, Nutanix and others), and NexentaStor can be leveraged to provide NFS and SMB file services. High-availability is provided by VMware HA. This use case is depicted below:

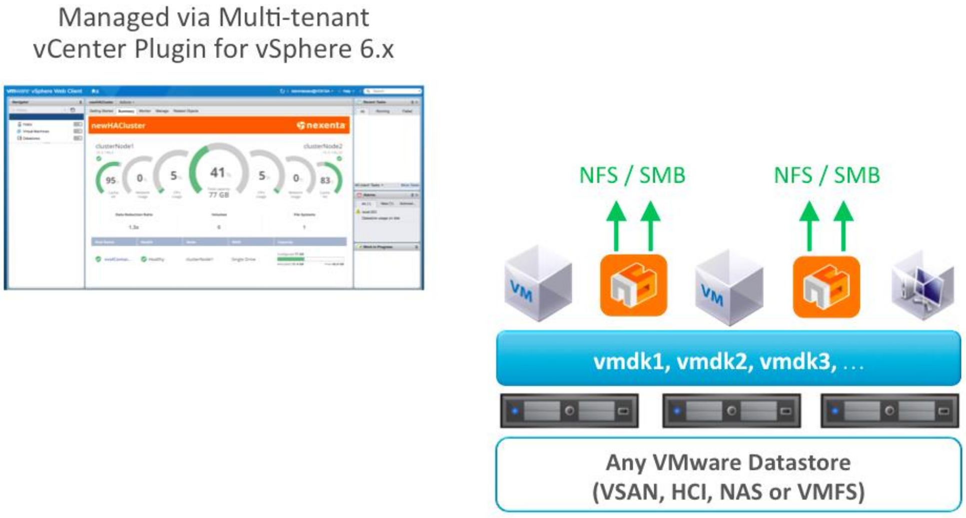

Figure 3-1 *– Two NexentaStor Virtual NAS deployed on VMware ESXi, managed via Multi-tenant vCenter Plugin*

Nexenta supports the following deployment model:

1. NexentaStor 5.x on VMware ESXi 6.0 or later
2. Solaris 11 x64 Virtual Machine with a minimum of 2 vCPUs and 16GB of DRAM
3. Single VM NexentaStor 5 instance consumes vmdks for rpool and data devices. Assuming that the underlying storage supporting the ESXi Datastore is responsible for data protection, the simplest configuration is for NexentaStor to simply stripe across a few data vmdks.
4. More advanced RAIDz data pool configurations can also be used to take advantage of NexentaStor’s own data integrity protection. A common option is to configure the pool with (4+1) vdevs across multiple vmdks.

Note that NexentaStor 5 includes open-vm-tools by default.

Note: The default e1000 and VMxnet3 drivers are supported and included in NexentaStor for network interface controllers. LSI Logic Parallel driver needs to be used to create VMDKs.

3.11 MetroHA Configurations

NexentaStor MetroHA delivers continuous availability, synchronous mirroring and zero RPO disaster recovery for business critical applications. The solution can be deployed between sites connected via a stretched Fibre Channel SAN on the same campus or in the same metro area, over distances up to 50 miles / 80 km.

Functionally, NexentaStor MetroHA stretches a NexentaStor HA cluster across 2 sites, with one NexentaStor head node in each site. SAS backend storage enclosures in both sites are connected using high performance ATTO Technology XstreamCORE FC 75xx Controllers to a shared stretched Fibre Channel Fabric. The NexentaStor software manages this Fibre Channel backend storage and synchronously mirrors data across both sites to ensure zero data loss in the event of a device, node or site failure.

Requirements

1. 2 sites connected via a stretched Fibre Channel fabric over distances not exceeding 50 miles / 80 km[1]
2. 2 NexentaStor nodes running NexentaStor 5.1 or later, one per site.
3. 2x or 4x ATTO XstreamCORE FC 75xx controllers (or FibreBridge 6500[2] with firmware version 1.18 or newer).
4. Fibre Channel switched fabric between the NexentaStor heads and ATTO controllers.
5. Stretched storage pools configured as 4-way mirrors.
6. NexentaStor 5 Smart Sparing allows hot spares to be configured as long as each storage enclosure contains at least one spare per pool.

The NexentaStor MetroHA solution with 4x ATTO XstreamCORE FC 75xx controllers can scale to large numbers of storage enclosures in each site, simply scaling up to 240 devices per site.

Note 1: Configurations beyond 10km stretches may require additional FC switch feature/capacity licenses to be purchased from switch vendors for additional buffer credits.

Note 2: The ATTO FibreBridge 6500 uses QSFP (SFF-8436) connectors. ATTO includes cables for connecting the FibreBridge 6500 to external mini-SAS (SFF-8088) ports. If you plan to use the ATTO FibreBridge with 12 Gb/s SAS enclosures, you must obtain separate SFF-8436-to-mini-SAS HD (SFF-8644) cables. Nexenta does not support fanout cables with the FibreBridge 6500.

High Level Topologies:

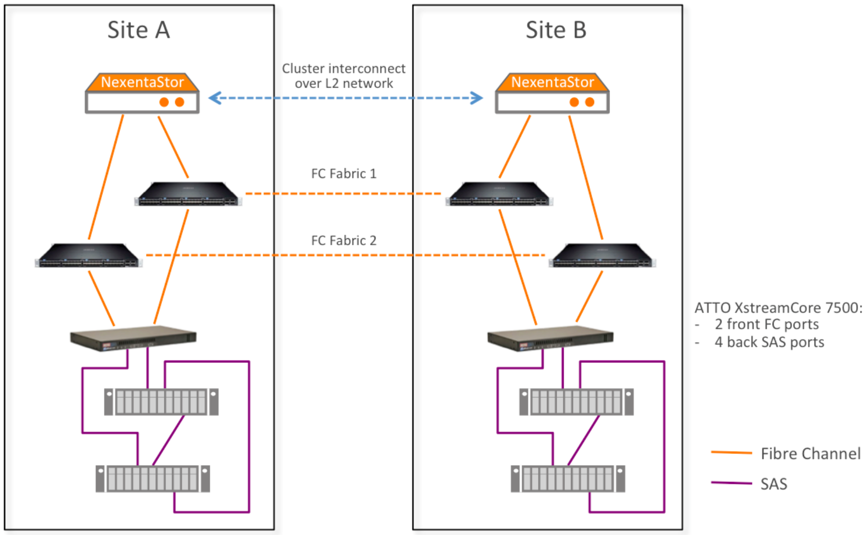

Figure 3-2 – *Typical NexentaStor MetroHA Deployment with 2x ATTO XstreamCORE FC 7500*

And

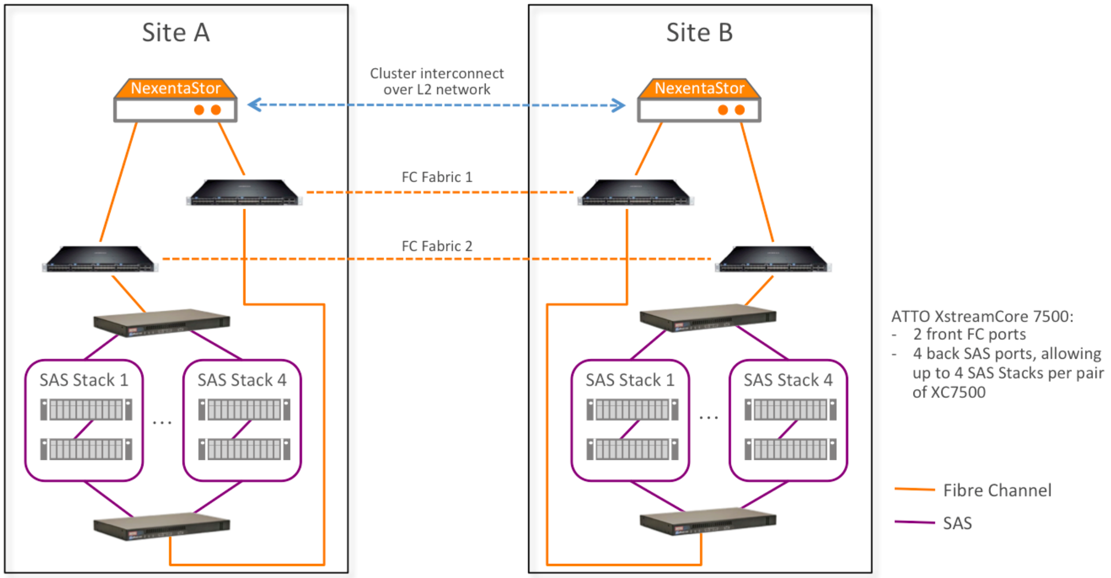
Site A
Site B
NexentaStor
NexentaStor
Cluster interconnect over L2 network
FC Fabric 1
FC Fabric 2
SAS Stack 1
SAS Stack 4
SAS Stack 1
SAS Stack 4
…
…
ATTO XstreamCore 7500:
- 2 front FC ports
- 4 back SAS ports, allowing up to 4 SAS Stacks per pair of XC7500
Fibre Channel
SAS

Figure 3-3 – *Typical NexentaStor MetroHA Deployment with 4x ATTO XstreamCORE FC 7500*

See NexentaStor 5 MetroHA User Guide and ATTO XstreamCORE FC 7500 documentation and best practices for more details.

3.12 Legacy Certified Solutions

3.12.1 Certified Solutions with NexentaStor 5.x

NexentaStor 5.x is certified on the following partner solutions:

Partner Name	Partner Solutions
Ericsson	HDS 8000 Compute Sled Unit: CSU 0101, CSU 0111, CSU 0201[1] HDS 8000 Storage Sled Unit (SSU 0101, SSU 0111 and SSU 0112) HDS 8000 Compute Rack Unit (CRU 0101) HDS 8000 Compute Rack Unit (CRU 0211) HDS 8000 Storage Rack Unit (SRU 0101) HDS 8000 Storage Rack Unit (SRU 0201)
Supermicro 24x3.5” Simply Double Server	Supermicro SSG-6028R-E1CR24L 2U, 24x 3.5” bays, Simply Double singe node with rear 2.5” boot devices Min of 128GB of DRAM Certified with NexentaStor 5.1 and BIOS version 2.0a

Note 1: Support for the Ericsson CSU0201 requires a special UEFI capable NexentaStor 5.x image.

3.12.2 Certified Solution Building Blocks

The following is a list of Certified Solutions building blocks that are certified with NexentaStor 5.x. Certified Solutions based on these building blocks are more likely to pass Nexenta Certification Testing.
Note that whether they are based on building blocks listed below or not, all partner specific Certified Solutions must pass Nexenta Certification Testing before they can be added on the HCL and formally supported.

Certified Solutions Building Blocks - Controllers					
Controller	**CPU**	**DRAM**	**SAS HBA**	**NIC**	**FC HBA**
Supermicro X9DRH-iTF X9DRi-LN4+ X9DR3-LN4+ X9DRW-3LN4F+ X9DRW-3TF+ X9DRD-7LN4F X10DRU-i+ X11DPU SMC SYS6048U-TR4+(2U) SMC SYS6018U-TR4+(1U) SMC SYS-6048R-NEX1 Cisco C240-M4SX Cisco S3260-M4[4] Dell R630 Dell R730 Dell R640 Dell R740 Dell R740xd SMC 6029-E1CR4T HPE DL380Gen10 HPE DL360Gen10	E5-2609v3 E5-2640v3 E5-2643v3 E5-2680v3 E5-2609v4 E5-2620v4 E5-2643v4 E5-2637v4 E5-2640v4 4114 5115 6128	Up to 256GB Up to 384GB	LSI 9200-8e LSI 9201-16e LSI 9205-8e LSI 9206-16e LSI 9207-8e LSI 9207-8i LSI-9211-8i LSI-9300-8i LSI-9300-8e AOC-SAS3-9300-8e LSI-9305-16e	10GbE: X520 DA/SFP+ X540 RJ45 AOC-STGN-i2S AOC-STG-i2T AOC-STG-i4T Intel X710-T4 Intel X710-DA2 QLE 3442 25GbE: Intel XXV710-DA1 Intel XXV710-DA2 AOC-S25G-i2S 40GbE: Intel XL710-QDA1 Intel XL710-QDA2	8Gb: LPe 12000 LPe 12002 LPe 12004 QLE 2560 QLE 2562 16Gb: LPe 16000B LPe 16002B QLE 2660 QLE 2662 QLE 2670 QLE 2672 ATTO FC-162E ATTO FC-162P 32Gb: ATTO FC-322E Emulex LPe 32002

Note 1: See respective partner AVL for supported drive list.

Note 2: SYS-6048R-NEX1 is the 36-bay server from Supermicro that is similar to 6048R-E1CR36L but with 2 SAS expanders.

Note 3: Intel XXV710 support starts with NexentaStor 5.1 and requires MTU 9000.

Note 4: Cisco S3260-M4 support requires ESXi and NexentaStor to be deployed as a DirectPath-IO VSA. Contact sales for installation instructions.

Note 5: 1U server configurations (e.g. Dell R640 or HPE DL360) are supported as long as all internal components match those documented for 2U server equivalents (Dell R740 and HPE DL380, respectively) in previous sections.

Certified Solutions Building Blocks - Storage Enclosures	Notes
Dell MD1400 (2U 12 bay)	
Dell MD1420 (2U 24 bay)	
Dell MD3060e (4U 60 bay)	
Dell MD1280 (5U 84 bay)	
Dell ME484 (5U 84 bay)	Chassis management supported with 5.2.1 and above
HGST 2U24 (2U 24 bay)	Models: 1ES0107, 1ES0110, 1ES0108, 1ES0111 Chassis management supported with 5.1.1 and above
HGST 4U60G1 (4U 60 bay)	Chassis management supported with 5.0.3 and above
HGST 4U60G2 (4U 60 bay)	Chassis management supported with 5.1.0 and above
HGST Ultrastar Data60 (4U 60 bay)	Chassis management supported with 5.2.0 and above Note – Replaces the 4U60G1 and G2
SanDisk InfiniFlash 100/150	
Seagate OneStor SP-2584 (5U 84 bay)	
Supermicro 216BE2C-R741JBOD (2U 24 bay)	
Supermicro 847E2C-R1K28JBOD (4U 44 bay)	
Supermicro 946SE2C-R1K66JBOD (4U 60 bay)	Chassis management supported with 5.1 and above
Supermicro SC946ED-R2KJBOD (4U 90 bay)	
Western Digital Ultrastar Data102 (4U 102bay)	Chassis management supported with 5.2.1 and above
Seagate Nytro E 2U24	Chassis management supported with 5.2.0 and above
Seagate Exos E 2U24	Chassis management supported with 5.2.0 and above
Seagate Exos E 5U84	Chassis management supported with 5.2.0 and above

Note 1: white on grey items are supported in existing deployments. They should not be used for new deployments.

4 Current Certified Solutions

4.1 Certified Solutions with NexentaStor 5.x

NexentaStor 5.x is certified on the following partner solutions:

Partner Name	Partner Solutions
Ericsson	HDS 8000 Compute Sled Unit: CSU 0101, CSU 0111, CSU 0201[1] HDS 8000 Storage Sled Unit (SSU 0101, SSU 0111 and SSU 0112) HDS 8000 Compute Rack Unit (CRU 0101) HDS 8000 Compute Rack Unit (CRU 0211) HDS 8000 Storage Rack Unit (SRU 0101) HDS 8000 Storage Rack Unit (SRU 0201)

Note 1: Support for the Ericsson CSU0201 requires a special UEFI capable NexentaStor 5.x image.

4.2 Certified Solution Building Blocks

The following is a list of Certified Solutions building blocks that are certified with NexentaStor 5.x. Certified Solutions based on these building blocks are more likely to pass Nexenta Certification Testing.
Note that whether they are based on building blocks listed below or not, all partner specific Certified Solutions must pass Nexenta Certification Testing before they can be added on the HCL and formally supported.

Certified Solutions Building Blocks - Controllers					
Controller	**CPU**	**DRAM**	**SAS HBA**	**NIC**	**FC HBA**
Lenovo SR650V2					
Dell R750	Intel 6326 Intel 4114	Up to 384GB	Dell PowerEdge 12Gbps	1GbE: Intel I350 Base-T 10GbE: Intel X10T2L Base-T 25GbE: Mellanox ConnectX-6 Lx 40GbE: Intel XL710 Mellanox ConnectX-6 Dx	16Gb: QLE 2692
HPE DL380 Gen 10 Plus	Intel 6326	Up to 384GB	E208i-a SR Gen10 12Gbps	10GbE: Intel X710 DA2 Intel E810 Mellanox Connect X5 Mellanox Connect X6 25GbE: Intel E810 Mellanox Connect X5 Mellanox Connect X6	16Gb: SN1100Q Single Port SN1100Q Dual Port

				40GbE: Mellanox Connect X6 50GbE: Intel E810 Mellanox Connect X6 100GbE: Intel E810	

Certified Solutions Building Blocks - Storage Enclosures	Notes
Dell MD1420 (2U 24-bay)	
Dell MD1400 (2U 12 bay)	
Dell ME484 (5U 84 bay)	Chassis management supported with 5.2.1 and above
HPE D3610	
HPE D3710	

5 Key Management for Data At Rest Encryption

NexentaStor 5.1 and above support data at rest encryption on hardware configurations built with "TCG Enterprise" Self-Encrypting Drives for SLOG, L2ARC and Data devices. As noted in previous sections of this document, such configurations can be All-Flash, Hybrid, and All-Disk from Dell, HPE, and others.

Data at rest encryption configurations require an external KMIP compliant key management infrastructure to generate, store and protect the Authentication Keys (AK) that are used to unlock SEDs at boot time.
At this time, NexentaStor has been certified to work with:

- SafeNet KeySecure from Gemalto, physical and virtual editions.

More information on configuring and managing a NexentaStor system for data at rest encryption is available in the ***NexentaStor 5.1 Data At Rest Encryption with SED Configuration Guide***.

6 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.

For more information, visit www.nexenta.com and https://www.ddn.com.

Nexenta, NexentaStor, NexentaFusion, NexentaEdge and NexentaCloud are trademarks or registered trademarks of Nexenta Systems Inc., in the United States and other countries. All other trademarks, service marks and company names mentioned in this document are properties of their respective owners.

Appendix A: Supported SSDs

Nexenta supports SSDs that are recommended by manufacturer's such as HPE and Dell.

Appendix B: Legacy Configurations

This section documents legacy configurations: configurations that continue to be supported even though they are no longer the preferred solutions for new deployments.

B.1 Cisco Legacy Configurations

B.1.1 Cisco C240 and SanDisk InfiniFlash All-Flash

Cisco and SanDisk RA	NCIF-AF-512	NCIF-AF-1024	NCIF-AF-1536	NCIF-AF-2048
Raw Capacity	Up to 512TB	Up to 1024TB	Up to 1536TB	Up to 2048TB
Device Slots	64	128	192	256
Form Factor (HA)	7U	10U	13U	16U
Memory (HA)	512GB			
10GbE Ports	4			
Software	NexentaStor 5.x			

Cisco and SanDisk RA	NCIF-AF-512	NCIF-AF-1024	NCIF-AF-1536	NCIF-AF-2048
Controller	1x or 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 InfiniFlash IF150	2x InfiniFlash IF150	3x InfiniFlash IF150	4x InfiniFlash IF150
Data Device #	Up to 64	Up to 128	Up to 192	Up to 256
Flash Device	4TB or 8TB Flash Module			
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: SanDisk InfiniFlash IF150 SAS controller firmware version is A01E or later. See supported general purpose BSSDs in Appendix A.

Note 3: SAS cabling between the NexentaStor node and the InfiniFlash IF150 enclosure should follow IF150 A.2 cabling topology where each NexentaStor node is connected to a single SAS controller on the IF150.

Note 4: There is no need for separate ZIL or L2ARC devices in all-SSD configurations. Nexenta requires a minimum of 128TB of raw flash for NexentaStor and SanDisk IF150 configurations deployed in production environments.

B.2 Dell Legacy Configurations

B.2.1 Dell R730 and SanDisk InfiniFlash All-Flash

Dell and InfiniFlash RA	NDIF-AF-512	NDIF-AF- 1024	NDIF-AF-1536	NDIF-AF-2048
Raw Capacity	Up to 512TB	Up to 1,024TB	Up to 1,536TB	Up to 2,048TB
Device Slots	64	128	192	256
Form Factor (HA)	7U	10U	13U	16U
Memory (HA)	512GB			
10GbE Ports	8			
Software	NexentaStor 5.x			

Dell and InfiniFlash RA	NDIF-AF-512	NDIF-AF-1024	NDIF-AF-1536	NDIF-AF-2048
Controller	1x or 2x **R730** PN: 210-AEZO			
CPU	E5-2643 v3, 3.4GHz, 6-core, 2-socket E5-2643 v4, 3.4GHz, 6-core, 2-socket			
DRAM	256GB per controller			
Boot Drive	2x 1TB SAS 7.2k 3.5" mirrored			
SAS HBA	1x Dell SAS 12Gb HBA	2x Dell SAS 12Gb HBA	3x Dell SAS 12Gb HBA	4x Dell SAS 12Gb HBA
	H730 (for internal SysPool drives only)			
NIC	1x Network Daughter Card: Intel i350 DP + Intel X520 DP SFP+ or X540 DP 10GbE RJ45 and 1x Intel X520 10GbE SFP+ or X540 10GbE RJ45			
FC HBA (optional)	Emulex LPe 12002, LPe 16002B QLogic QLE 2562, QLE 2662			
Storage Enclosure	1x InfiniFlash IF150	2x InfiniFlash IF150	3x InfiniFlash IF150	4x InfiniFlash IF150
Total Device #	Up to 64	Up to 128	Up to 192	Up to 256
Flash Device	4TB or 8TB Flash Module			
L2ARC	N/A			
ZIL /SLOG	N/A			

Note 1: BIOS R730 system with Intel v3 CPU should be 1.0.4 and above. BIOS for R730 system with Intel v4 CPU is 2.0.2 or later.

Note 2: SanDisk InfiniFlash IF150 SAS controller firmware version is A01E or later. See supported general purpose BSSDs in Appendix A.

Note 3: SAS cabling between the NexentaStor node and the InfiniFlash IF150 enclosure should follow IF150 A.2 cabling topology where each NexentaStor node is connected to a single SAS controller on the IF150.

Note 4: There is no need for separate ZIL or L2ARC devices in all-SSD configurations. Nexenta requires a minimum of 128TB of raw flash for NexentaStor and SanDisk IF150 configurations deployed in production environments.

B.3 Lenovo Legacy Configurations

B.3.1 Lenovo X3650-M5 and SanDisk InfiniFlash All-Flash

Lenovo and InfiniFlash RA	**NLIF-AF-512**	**NLIF-AF- 1024**	**NLIF-AF-1536**	**NLIF-AF-2048**
Raw Capacity	Up to 512TB	Up to 1,024TB	Up to 1,536TB	Up to 2,048TB
Device Slots	64	128	192	256
Form Factor (total)	7U	10U	13U	16U
Memory (total)	512GB			
10GbE Ports	8			
Software	NexentaStor 5.x			

Lenovo and InfiniFlash RA	**NLIF-AF-512**	**NLIF-AF-1024**	**NLIF-AF-1536**	**NLIF-AF-2048**
Controller	2x Lenovo X3650-M5			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 1TB, 3.5” 7.2K NL SAS			
SAS HBA	1x N2215 for internal boot devices 2x N2226 for external devices			
NIC	1GbE Broadcom, 2x 10GbE Intel X520 DP, or 10GbE Intel X540 DP			
FC HBA (optional)	8Gb Emulex LPe 12000 (Single) or Emulex LPe 12002 (Dual) 8Gb QLogic QLE-2560 (Single) or QLE-2562 (Dual) 16Gb QLogic QLE-2660 (Single) or QLogic QLE-2662 (Dual)			
Storage Enclosure	1x InfiniFlash IF150	2x InfiniFlash IF150	3x InfiniFlash IF150	4x InfiniFlash IF150
Total Device #	Up to 64	Up to 128	Up to 192	Up to 256
Flash Device	4TB or 8TB Flash Module			
L2ARC	N/A			
ZIL /SLOG	N/A			

Note 1: BIOS for the X3650-M5 servers must be TCE126M. BMC FW version must be TC0018M. X3650-M5 server must be configured with A5FR in Riser 1 and A5R5 in Riser 2.

Note 2: N2226 FW version must be 1.11.02 and NVDATA field in sas3flash-list output must be 0b:00:01:07

Note 3: SanDisk InfiniFlash IF150 SAS controller firmware version is A01E or later. See supported general purpose BSSDs in Appendix A.

Note 4: SAS cabling between the NexentaStor node and the InfiniFlash IF150 enclosure should follow IF150 A.2 cabling topology where each NexentaStor node is connected to a single SAS controller on the IF150.

Note 5: There is no need for separate ZIL or L2ARC devices in all-SSD configurations. Nexenta requires a minimum of 128TB of raw flash for NexentaStor and SanDisk IF150 configurations deployed in production environments.

B.3.2 Lenovo X3650-M5 and D1224 –All-Flash

Lenovo All-Flash RA	DX8200N-AF-24	DX8200N-AF-48	DX8200N-AF-72	DX8200N-AF-96
Raw Capacity	Up to 184TB	Up to 368TB	Up to 552TB	Up to 737TB
Device Slots	24	48	72	96
Form Factor (total system)	6U	8U	10U	12U
Memory (total system)	512GB			
10GbE ports	4			
Software	NexentaStor 5.x			

Lenovo All-Flash RA	DX8200N-AF-24	DX8200N-AF-48	DX8200N-AF-72	DX8200N-AF-96
Controller	2x Lenovo X3650-M5			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 1TB, 3.5" 7.2K NL SAS			
SAS HBA	1x N2215 for internal boot devices 2x N2226 for external devices			
NIC	1GbE Broadcom, 10GbE Intel X520 DP, or 10GbE Intel X540 DP			
FC HBA (optional)	8Gb Emulex LPe 12000 (Single) or Emulex LPe 12002 (Dual) 8Gb QLogic QLE-2560 (Single) or QLE-2562 (Dual) 16Gb QLogic QLE-2660 (Single) or QLogic QLE-2662 (Dual)			
Storage Enclosure	1x Lenovo Storage D1224	2x Lenovo Storage D1224	3x Lenovo Storage D1224	4x Lenovo Storage D1224
Total Drive #	Up to 24	Up to 48	Up to 72	Up to 96
Flash Device	High Performance SAS SSDs – 1.6TB 10 DWPD Capacity Optimized SAS SSDs – 3.84TB 3 DWPD Capacity Optimized SAS SSDs – 7.68TB 1 DWPD			
L2ARC	N/A			
ZIL/SLOG	N/A			

Note 1: BIOS for the X3650-M5 servers must be TCE140H-2.91. BMC FW version must be TC0018M. X3650-M5 server must be configured with A5FR in Riser 1 and A5R5 in Riser 2.

Note 2: N2226 FW version must be 1.11.02 and NVDATA field in sas3flash-list output must be 0b:00:01:07

Note 3: There is no need for separate ZIL or L2ARC devices in all-SSD configurations. Use dual SAS path for configurations with up to 4 enclosures.

B.3.3 Lenovo X3650-M5 and D1224 – Hybrid

Lenovo Hybrid RA	DX8200N-H-2x24	DX8200N-H-4x24	DX8200N-H-6x24	DX8200N-H-8x24
Raw Capacity	Up to 90TB	Up to 186TB	Up to 276TB	Up to 372TB
Device Slots	48	96	144	192
Form Factor (total)	8U	12U	16U	20U
Memory (total)	512GB			
Read Cache	400GB		800GB	
10GbE Ports	4			
Software	NexentaStor 5.x			

Lenovo Hybrid RA	DX8200N-H-2x24	DX8200N-H-4x24	DX8200N-H-6x24	DX8200N-H-8x24
Controller	2x Lenovo X3650-M5			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 1TB, 3.5” 7.2K NL SAS			
SAS HBA	1x N2215 for internal boot devices 2x N2226 for external devices			
NIC	1GbE Broadcom, 10GbE Intel X520 DP, or 10GbE Intel X540 DP			
FC HBA (optional)	8Gb Emulex LPe 12000 (Single) or Emulex LPe 12002 (Dual) 8Gb QLogic QLE-2560 (Single) or QLE-2562 (Dual) 16Gb QLogic QLE-2660 (Single) or QLogic QLE-2662 (Dual)			
Storage Enclosure	2x Lenovo Storage D1224	4x Lenovo Storage D1224	6x Lenovo Storage D1224	8x Lenovo Storage D1224
Data HDD	2.5” 15K SAS HDD - 300GB and 600GB 2.5” 10K SAS HDD - 600GB, 900GB, 1.2TB, and 1.8TB 2.5” 7.2K NL-SAS HDD - 1TB and 2TB			
Data Drive #	Up to 45	Up to 93	Up to 138	Up to 186
L2ARC	1x 400GB SAS SSD 3 DWPD	1x 400GB SAS SSD 3 DWPD	2x 400GB SAS SSD 3 DWPD	2x 400GB SAS SSD 3 DWPD
ZIL/SLOG	2x 400GB SAS SSD 10 DWPD	2x 400GB SAS SSD 10 DWPD	4x 400GB SAS SSD 10 DWPD	4x 400GB SAS SSD 10 DWPD

Note 1: BIOS for the X3650-M5 servers must be TCE140H-2.91. BMC FW version must be TC0018M. X3650-M5 server must be configured with A5FR in Riser 1 and A5R5 in Riser 2.

Note 2: N2226 FW version must be 1.11.02 and NVDATA field in sas3flash-list output must be 0b:00:01:07

Note 3: Use dual SAS path for configurations with up to 4 enclosures. Use SAS loops with no more than 2 enclosures per loop for configurations up to 8 enclosures.

B.3.4 Lenovo X3650-M5 and D1212 – Hybrid

Lenovo Hybrid RA	DX8200N-H-2x12	DX8200N-H-4x12	DX8200N-H-6x12	DX8200N-H-8x12
Raw Capacity	Up to 84TB	Up to 180TB	Up to 264TB	Up to 360TB
Device Slots	24	48	72	96
Form Factor (total)	8U	12U	16U	20U
Memory (total)	512GB			
Read Cache	400GB		800GB	
10GbE Ports	4			
Software	NexentaStor 5.x			

Lenovo Hybrid RA	DX8200N-H-2x12	DX8200N-H-4x12	DX8200N-H-6x12	DX8200N-H-8x12
Controller	2x Lenovo X3650-M5			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 1TB, 3.5” 7.2K NL SAS			
SAS HBA	1x N2215 for internal boot devices 2x N2226 for external devices			
NIC	1GbE Broadcom, 10GbE Intel X520 DP, or 10GbE Intel X540 DP			
FC HBA (optional)	8Gb Emulex LPe 12000 (Single) or Emulex LPe 12002 (Dual) 8Gb QLogic QLE-2560 (Single) or QLE-2562 (Dual) 16Gb QLogic QLE-2660 (Single) or QLogic QLE-2662 (Dual)			
Storage Enclosure	2x Lenovo Storage D1212	4x Lenovo Storage D1212	6x Lenovo Storage D1212	8x Lenovo Storage D1212
Data HDD	3.5” 7.2K NL-SAS HDD - 2TB 3.5” 7.2K NL-SAS HDD - 4TB			
Data Drive #	Up to 21	Up to 45	Up to 66	Up to 90
L2ARC	1x 400GB SAS SSD 3 DWPD	1x 400GB SAS SSD 3 DWPD	2x 400GB SAS SSD 3 DWPD	2x 400GB SAS SSD 3 DWPD
ZIL/SLOG	2x 400GB SAS SSD 10 DWPD	2x 400GB SAS SSD 10 DWPD	4x 400GB SAS SSD 10 DWPD	4x 400GB SAS SSD 10 DWPD

Note 1: BIOS for the X3650-M5 servers must be TCE140H-2.91. BMC FW version must be TC0018M. X3650-M5 server must be configured with A5FR in Riser 1 and A5R5 in Riser 2.

Note 2: N2226 FW version must be 1.11.02 and NVDATA field in sas3flash-list output must be 0b:00:01:07

Note 3: Use dual SAS path for configurations with up to 4 enclosures. Use SAS loops with no more than 2 enclosures per loop for configurations up to 8 enclosures.

B.3.5 Lenovo X3650-M5 and D3284 – Hybrid

Lenovo Hybrid RA	DX8200N-H-1x84	DX8200N-H-2x84	DX8200N-H-3x84	DX8200N-H-4x84
Raw Capacity	Up to 810TB	Up to 1.62PB	Up to 2.43PB	Up to 3.24PB
Device Slots	84	168	252	336
Form Factor (total)	9U	14U	19U	24U
Memory (total)	512GB			
Read Cache	400GB	800GB	1.2TB	1.6TB
10GbE Ports	4			
Software	NexentaStor 5.x			

Lenovo Hybrid RA	DX8200N-H-1x84	DX8200N-H-2x84	DX8200N-H-3x84	DX8200N-H-4x84
Controller	2x Lenovo X3650-M5			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 1TB, 3.5” 7.2K NL SAS			
SAS HBA	1x N2215 for internal boot devices 2x N2226 for external devices			
NIC	1GbE Broadcom, 10GbE Intel X520 DP, or 10GbE Intel X540 DP			
FC HBA (optional)	8Gb Emulex LPe 12000 (Single) or Emulex LPe 12002 (Dual) 8Gb QLogic QLE-2560 (Single) or QLE-2562 (Dual) 16Gb QLogic QLE-2660 (Single) or QLogic QLE-2662 (Dual)			
Storage Enclosure	1x Lenovo Storage D3284 (84 Bay)	2x Lenovo Storage D3284 (84 Bay)	3x Lenovo Storage D3284 (84 Bay)	4x Lenovo Storage D3284 (84 Bay)
Data HDD	3.5” 7.2K NL-SAS HDD - 4TB 3.5” 7.2K NL-SAS HDD - 6TB 3.5” 7.2K NL-SAS HDD – 8TB 3.5” 7.2K NL-SAS HDD – 10TB			
Data Drive #	Up to 81	Up to 162	Up to 243	Up to 324
L2ARC	1x 400GB SAS SSD 3 DWPD	2x 400GB SAS SSD 3 DWPD	3x 400GB SAS SSD 3 DWPD	4x 400GB SAS SSD 3 DWPD
ZIL/SLOG	2x 400GB SAS SSD 10 DWPD	4x 400GB SAS SSD 10 DWPD	6x 400GB SAS SSD 10DWPD	8x 400GB SAS SSD 10 DWPD

Note 1: BIOS for the X3650-M5 servers must be TCE140H-2.91. BMC FW version must be TC0018M. X3650-M5 server must be configured with A5FR in Riser 1 and A5R5 in Riser 2.

Note 2: N2226 FW version must be 1.11.02 and NVDATA field in sas3flash-list output must be 0b:00:01:07

Note 3: Use dual SAS path for configurations with up to 4 enclosures. Use SAS loops with no more than 2 enclosures per loop for configurations up to 8 enclosures.

B.3.6 Lenovo X3650-M5 and D1212 – All-Disk

Lenovo All–Disk RA	**DX8200N-2x12**	**DX8200N-4x12**	**DX8200N-6x12**	**DX8200N-8x12**
Raw Capacity	Up to 240TB	Up to 480TB	Up to 720TB	Up to 960TB
Device Slots	24	48	72	96
Form Factor (total)	8U	12U	16U	20U
Memory (total)	512GB			
Read Cache	400GB		800GB	
10GbE Ports	4			
Software	NexentaStor 5.x			

Lenovo All–Disk RA	**DX8200N-2x12**	**DX8200N-4x12**	**DX8200N-6x12**	**DX8200N-8x12**
Controller	2x Lenovo X3650-M5			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 1TB, 3.5” 7.2K NL SAS			
SAS HBA	1x N2215 for internal boot devices 2x N2226 for external devices			
NIC	1GbE Broadcom, 2x 10GbE Intel X520 DP, or 10GbE Intel X540 DP			
FC HBA (optional)	8Gb Emulex LPe 12000 (Single) or Emulex LPe 12002 (Dual) 8Gb QLogic QLE-2560 (Single) or QLE-2562 (Dual) 16Gb QLogic QLE-2660 (Single) or QLogic QLE-2662 (Dual)			
Storage Enclosure	2x Lenovo Storage D1212	4x Lenovo Storage D1212	6x Lenovo Storage D1212	8x Lenovo Storage D1212
Data HDD	3.5” 7.2K NL-SAS HDD - 2TB 3.5” 7.2K NL-SAS HDD - 4TB 3.5” 7.2K NL-SAS HDD - 6TB 3.5” 7.2K NL-SAS HDD - 8TB 3.5” 7.2K NL-SAS HDD - 10TB			
Data Drive #	Up to 24	Up to 48	Up to 72	Up to 96
L2ARC	N/A			
ZIL/SLOG	Recommended: 2x 400GB SAS SSD (10 DWPD) per pool			

Note 1: BIOS for the X3650-M5 servers must be TCE140H-2.91. BMC FW version must be TC0018M. X3650-M5 server must be configured with A5FR in Riser 1 and A5R5 in Riser 2.

Note 2: N2226 FW version must be 1.11.02 and NVDATA field in sas3flash-list output must be 0b:00:01:07

Note 3: Use dual SAS path for configurations with up to 4 enclosures. Use SAS loops with no more than 2 enclosures per loop for configurations up to 8 enclosures.

B.3.7 Lenovo X3650-M5 D3284 – All-Disk

Lenovo Hybrid RA	DX8200N-2x84	DX8200N-4x84	DX8200N-6x84	DX8200N-8x84
Raw Capacity	Up to 1.68PB	Up to 3.36PB	Up to 5.04PB	Up to 6.72PB
Device Slots	168	336	504	672
Form Factor (total)	14U	24U	34U	44U
Memory (total)	512GB			
Read Cache	N/A			
10GbE Ports	4			
Software	NexentaStor 5.x			

Lenovo Hybrid RA	DX8200N-2x84	DX8200N-4x84	DX8200N-6x84	DX8200N-8x84
Controller	2x Lenovo X3650-M5			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 1TB, 3.5” 7.2K NL SAS			
SAS HBA	1x N2215 for internal boot devices 2x N2226 for external devices			
NIC	1GbE Broadcom, 10GbE Intel X520 DP, or 10GbE Intel X540 DP			
FC HBA (optional)	8Gb Emulex LPe 12000 (Single) or Emulex LPe 12002 (Dual) 8Gb QLogic QLE-2560 (Single) or QLE-2562 (Dual) 16Gb QLogic QLE-2660 (Single) or QLogic QLE-2662 (Dual)			
Storage Enclosure	2x Lenovo Storage D3284 (84 Bay)	4x Lenovo Storage D3284 (84 Bay)	6x Lenovo Storage D3284 (84 Bay)	8x Lenovo Storage D3284 (84 Bay)
Data HDD	3.5” 7.2K NL-SAS HDD - 4TB 3.5” 7.2K NL-SAS HDD - 6TB 3.5” 7.2K NL-SAS HDD – 8TB 3.5” 7.2K NL-SAS HDD – 10TB			
Data Drive #	Up to 168	Up to 336	Up to 504	Up to 672
L2ARC	N/A			
ZIL/SLOG	Recommended: 2x 400GB SAS SSD (10 DWPD) per pool			

Note 1: BIOS for the X3650-M5 servers must be TCE140H-2.91. BMC FW version must be TC0018M. X3650-M5 server must be configured with A5FR in Riser 1 and A5R5 in Riser 2.

Note 2: N2226 FW version must be 1.11.02 and NVDATA field in sas3flash-list output must be 0b:00:01:07

Note 3: Use dual SAS path for configurations with up to 4 enclosures. Use SAS loops with no more than 2 enclosures per loop for configurations up to 8 enclosures.

B.3.8 Lenovo X3650-M5 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

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

Lenovo and HGST RA	NLH-AF-24	NLH-AF-48	NLH-AF-72	NLH-AF-96
Controller	2x Lenovo X3650-M5			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 1TB, 3.5" 7.2K NL SAS			
SAS HBA	1x N2215 for internal boot devices 2x N2226 for external devices			
NIC	1GbE Broadcom, 2x 10GbE Intel X520 DP, or 10GbE Intel X540 DP			
FC HBA (optional)	8Gb Emulex LPe 12000 (Single) or Emulex LPe 12002 (Dual) 8Gb QLogic QLE-2560 (Single) or QLE-2562 (Dual) 16Gb QLogic QLE-2660 (Single) or QLogic QLE-2662 (Dual)			
Storage Enclosure	1x HGST 2U24	2x HGST 2U24	3x HGST 2U24	4x HGST 2U24
Total 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 for the X3650-M5 servers must be TCE140H-2.91. BMC FW version must be TC0018M. X3650-M5 server must be configured with A5FR in Riser 1 and A5R5 in Riser 2.
Note 2: N2226 FW version must be 1.11.02 and NVDATA field in sas3flash-list output must be 0b:00:01:07
Note 3: There is no need for separate ZIL or L2ARC devices in all-SSD configurations.
Note 4: Chassis management for the HGST 2U24 enclosure is targeted for NexentaStor 5.1.1.

B.3.9 Lenovo X3650-M5 & HGST 4U60G2 Hybrid / All-Disk

Lenovo HGST RA	DX8200N-HG-1x60	DX8200N-HG-2x60	DX8200N-HG-3x60	DX8200N-HG-4x60
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 (total)	8U	12U	16U	20U
Memory (total)	512GB			
Read Cache	800GB		Up to 1.6TB	
10GbE Ports	4			
Software	NexentaStor 5.x			

Lenovo HGST RA	DX8200N-HG-1x60	DX8200N-HG-2x60	DX8200N-HG-3x60	DX8200N-HG-4x60
Controller	2x Lenovo X3650-M5			
CPU	E5-2643 v4 3.4GHz, 6-core, 2-socket			
DRAM	256GB (16x 16GB)			
Boot Drive	2x 1TB, 3.5” 7.2K NL SAS			
SAS HBA	1x N2215 for internal boot devices 2x N2226 for external devices			
NIC	1GbE Broadcom, 10GbE Intel X520 DP, or 10GbE Intel X540 DP			
FC HBA (optional)	8Gb Emulex LPe 12000 (Single) or Emulex LPe 12002 (Dual) 8Gb QLogic QLE-2560 (Single) or QLE-2562 (Dual) 16Gb QLogic QLE-2660 (Single) or QLogic QLE-2662 (Dual)			
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 for the X3650-M5 servers must be TCE140H-2.91. BMC FW version must be TC0018M. X3650-M5 server must be configured with A5FR in Riser 1 and A5R5 in Riser 2.

Note 2: N2226 FW version must be 1.11.02 and NVDATA field in sas3flash-list output must be 0b:00:01:07

Note 3: Use dual SAS path for configurations with up to 4 enclosures.

Note 4: Chassis management for the HGST 4U60G2 enclosure is supported in NexentaStor 5.1 and up.

B.4 Supermicro Legacy Configurations

B.4.1 Supermicro X10 and SanDisk InfiniFlash IF150 All-Flash

The following SanDisk InfiniFlash based reference architectures deliver full featured, all flash configurations that can pack up to 2PB of raw capacity in as little as 16U and 3,000W of power.

Supermicro and SanDisk RA	NSS-AF-512	NSS-AF-1024	NSS-AF-1536	NSS-AF-2048
Raw Capacity	Up to 512TB	Up to 1,024TB	Up to 1,536TB	Up to 2,048TB
Device Slots	64	128	192	256
Form Factor (total)	7U	10U	13U	16U
Memory (total)	512GB			
10 GbE Ports	8			
Software	NexentaStor 5.x			

Supermicro and SanDisk RA	NSS-AF-512	NSS-AF-1024	NSS-AF-1536	NSS-AF-2048
Controller	1x or 2x SYS-6028U-NEX4			
CPU	E5-2643 v3, 3.4GHz, 6-core, 2-socket E5-2643 v4, 3.4GHz, 6-core, 2-socket			
DRAM	256GB per controller			
Boot Drive	2x 1TB SAS 7.2k 3.5” mirrored			
SAS HBA	1x AOC-SAS3-9300-8e	2x AOC-SAS3-9300-8e	3x AOC-SAS3-9300-8e	4x AOC-SAS3-9300-8e
NIC	2x AOC-STGN-i2S or AOC-STG-i2T			
FC HBA (optional)	Emulex LPe 12002, LPe 12004, LPe 16002B QLogic QLE 2562, 2672			
Storage Enclosure	1x InfiniFlash IF150	2x InfiniFlash IF150	3x InfiniFlash IF150	4x InfiniFlash IF150
Data Device #	64	128	192	256
Flash Device	4TB or 8TB Flash Module			
L2ARC	N/A			
ZIL /SLOG	N/A			

Note 1: For Intel v3 CPUs, motherboard BIOS for the SMC X10 RA must be 1.01 or later. For Intel v4 CPUs, motherboard BIOS must be 2.0 or later.

Note 2: SanDisk InfiniFlash IF150 SAS controller firmware version is A01E or later. See supported general purpose BSSDs in Appendix A.

Note 3: SAS cabling between the NexentaStor node and the InfiniFlash IF150 enclosure should follow IF150 A.2 cabling topology where each NexentaStor node is connected to a single SAS controller on the IF150.

Note 4: There is no need for separate ZIL or L2ARC devices in all-SSD configurations. Nexenta requires a minimum of 128TB of raw flash for NexentaStor and SanDisk IF150 configurations deployed in production environments.