

# NexentaStor 5.x Reference Architecture



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# Preface

## Intended Audience

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

## Comments

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

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# 1 Dell 14G Reference Architectures

## 1.1 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.

### 1.1.1 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 <sup>3</sup>		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:** R740xd and R740 should run legacy BIOS, with firmware version 1.3.7 or later.

**Note 2:** Required for external JBOD connectivity only.

## 1.2 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.

### 1.2.1 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 <sup>2</sup>
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 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:** R740xd should run legacy BIOS, with firmware version 1.3.7 or later.

**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.

## 1.2.2 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+		
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:** R740 should run legacy BIOS, with firmware version 1.3.7 or later.

**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.

### 1.2.3 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
Network Daughter Card	H730P+ (for boot devices only) 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+			

<b>NIC (optional)</b>	Intel X520 10GbE SFP+ Intel X550 10GbE Base-T Intel X710 10GbE SFP+ Intel XXV710 25GbE SFP28 Intel XL710 40GbE QSFP+			
<b>FC HBA (optional)</b>	QLogic QLE 2692 16Gb FC			
<b>Storage Enclosure</b>	1x ME484 (84-bay)	2x ME484 (84-bay)	3x ME484 (84-bay)	4x ME484 (84-bay)
<b>Data HDD</b>	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			
<b>Data Drive #</b>	Up to 81	Up to 165	Up to 246	Up to 330
<b>L2ARC</b>	1x 960GB RI SSD per pool		1x 960GB RI SSD per pool (2 pools recommended)	
<b>ZIL/SLOG</b>	2x 480GB MU SSD per pool		2x 480GB MU SSD per pool (2 pools recommended)	

**Note 1:** R740 should run legacy BIOS, with firmware version 1.3.7 or later.

**Note 2:** Contact Dell for detailed wiring diagrams for these configurations



## 1.3 Dell and HGST Storage Platform Configurations

### 1.3.1 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 <a href="#">R740</a>			
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
Network Daughter Card	H730P+ (for boot devices only) 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 <a href="#">HGST 2U24</a>	2x <a href="#">HGST 2U24</a>	3x <a href="#">HGST 2U24</a>	4x <a href="#">HGST 2U24</a>
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:** R740 should run legacy BIOS, with firmware version 1.3.7 or later.

## 1.3.2 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:** R740 should run legacy BIOS, with firmware version 1.3.7 or later.

**Note 2:** 10GbE port count takes into account the 2 ports on the server Network Daughter Card.

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

## 2 Dell 13G Reference Architectures

### 2.1 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.

#### 2.1.1 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 <sup>4</sup>		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.

## 2.2 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.

### 2.2.1 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 <sup>3</sup>	
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.

## 2.2.2 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 <b>R730</b> 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 <b>MD1420</b> (24-bay) PN: 210-AEWI	4x <b>MD1400</b> (12-bay) PN: 210-AFDZ	8x <b>MD1400</b> (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 takes into account the 2 ports on the server Network Daughter Card.

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

## 2.2.3 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 <b>R730</b> 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
NIC	H730 (for internal SysPool drives only) 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 <b>MD3060e</b> (60-bay) PN: 210-ACIS	4x <b>MD3060e</b> (60-bay) PN: 210-ACIS	2x <b>MD1280</b> (84-bay) PN: 210-AIDE	4x <b>MD1280</b> (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 takes into account the 2 ports on the server Network Daughter Card.

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

## 2.3 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.

### 2.3.1 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 takes into account the 2 ports on the server Network Daughter Card.

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

## 2.4 Dell and HGST Storage Platform Configurations

### 2.4.1 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 <a href="#">R730</a> 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
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 <a href="#">HGST 2U24</a>	2x <a href="#">HGST 2U24</a>	3x <a href="#">HGST 2U24</a>	4x <a href="#">HGST 2U24</a>
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.



## 2.4.2 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 <b>R730</b> 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
NIC	H730 (for internal SysPool drives only) 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 <b>HGST 4U60G2</b>	2x <b>HGST 4U60G2</b>	3x <b>HGST 4U60G2</b>	4x <b>HGST 4U60G2</b>
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 takes into account the 2 ports on the server Network Daughter Card.

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

## 3 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](http://www.nexenta.com), [Twitter](#), [Facebook](#), [LinkedIn](#) and [YouTube](#).

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