NexentaStor 5.0
Reference Architecture

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Global Leader in Software-Defined Storage.

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Dell Reference Architectures

1.1 Dell All-Flash Configurations

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

1.1.1 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.

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1.1.2 Dell R730 and SanDisk InfiniFlash 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.

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.

1.2 Dell Hybrid Configurations

NexentaStor Hybrid configurations deliver great sync write performance and are best suited for mixed read/write workloads with small random IO that are typical of private cloud (VMware, OpenStack and Hyper-V) storage backend, generic file services and high performance backup and archive use cases.

1.2.1 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.

1.2.2 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 takes into account the 2 ports on the server Network Daughter Card.
Note 4: Contact Dell for detailed wiring diagrams for these configurations.

1.2.3 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 takes into account the 2 ports on the server Network Daughter Card.
Note 4: Contact Dell for detailed wiring diagrams for these configurations.

1.3 Dell R730 All-Disk Configurations

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

1.3.1 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	n/a				

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.