NexentaStor 5.x
Reference Architecture

May 2019

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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

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1 Supermicro X11 Reference Architectures

1.1 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.

1.1.1 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.

1.2   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.

1.2.1 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.

1.2.2 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.

1.2.3 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.

1.2.4 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.

1.3   Supermicro All-Disk Configurations

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

1.3.1 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.

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1.3.2 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.

1.3.3 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-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.

1.4   Supermicro and HGST Storage Platform Configurations

1.4.1 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.

1.4.2 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.

2 Supermicro X10 Reference Architectures

2.1 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.

2.1.1 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.

2.2   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.

2.2.1 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.

2.2.2 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.

2.2.3 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.

2.2.4 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.

2.3   Supermicro All-Disk Configurations

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

2.3.1 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-SAS3-9300-16e~~ AOC-SAS3-9305-16e	3x ~~AOC-SAS3-9300-16e~~ AOC-SAS3-9305-16e	4x ~~AOC-SAS3-9300-16e~~ 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.

2.3.2 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-SAS3-9300-16e~~ 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 #	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.

2.3.3 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-SAS3-9300-16e~~ AOC-SAS3-9305-16e	3x ~~AOC-SAS3-9300-16e~~ AOC-SAS3-9305-16e	4x ~~AOC-SAS3-9300-16e~~ 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.

2.4   Supermicro and HGST Storage Platform Configurations

2.4.1 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.

2.4.2 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-SAS3-9300-16e~~ 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 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 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.

3.1.1 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.

3.1.2   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.

4 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, Twitter, Facebook, LinkedIn and YouTube.

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