

ThinkAgile HX Series features, specifications, and configurations

Product features, technical specifications, and software component introduction

Lenovo

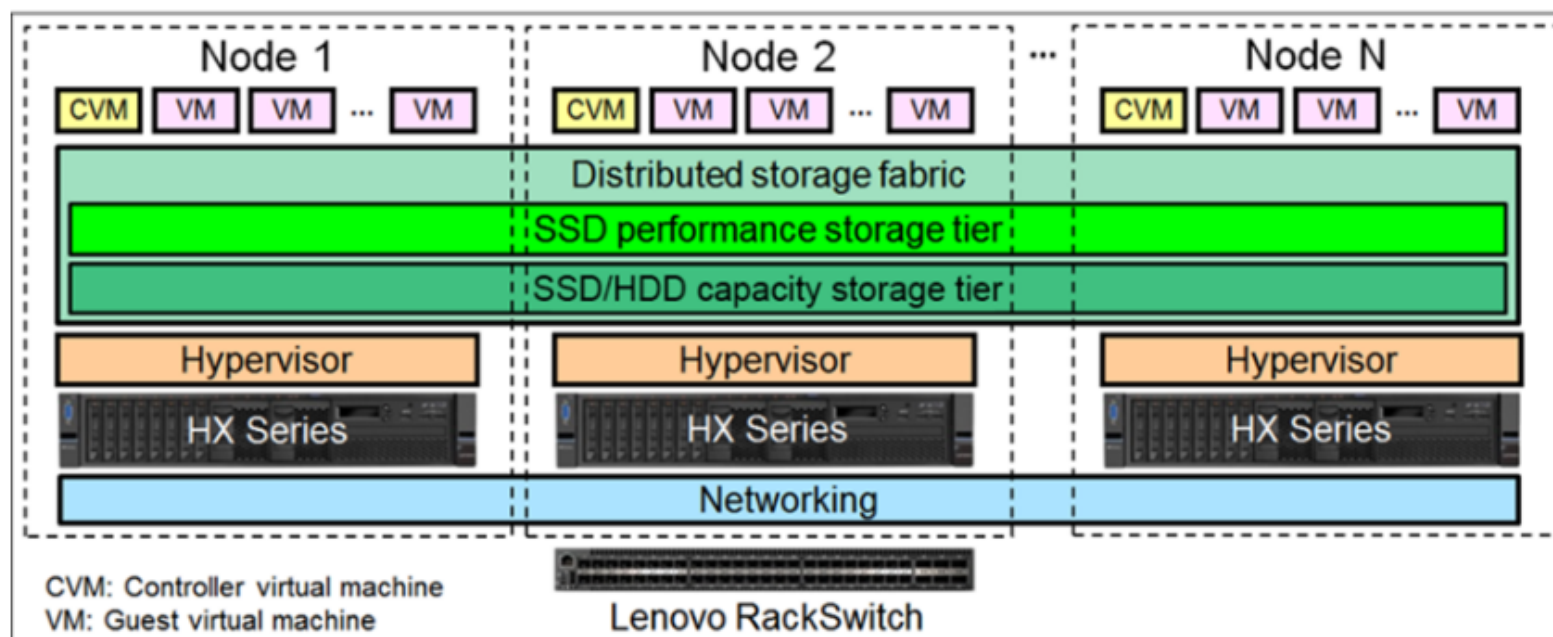
Lenovo ThinkAgile HX Series features

ThinkAgile HX Series consolidates servers, storage, and virtualization into one virtual structure, which is easily managed in scale-out clusters through a single interface. ThinkAgile HX Series offers the following key features:

- **Enterprise storage** – ThinkAgile HX Series delivers enterprise data storage as an on-demand service by employing highly distributed software architecture. Nutanix software eliminates the need for traditional SAN and NAS solutions, and delivers a rich set of software-defined services that are entirely VM-centric, including snapshots, high availability, disaster recovery, and deduplication.
- **Data protection** – Nutanix software offers a natively integrated solution for data protection and continuous availability at VM granularity. It gives administrators an affordable range of options to meet the recovery point objectives (RPO) and recovery time objectives (RTO) for different applications.
- **Infrastructure resilience** – The ThinkAgile HX Series platform is fault-resistant and has no single point of failure or bottlenecks. The system uses a shared-nothing architecture, which means all data, metadata, and services are distributed to all nodes within the cluster. It is also built to detect, isolate, and recover from failures anywhere in the system. Lenovo hyperconverged appliances deliver always-on operation and can survive system hardware, software, and hypervisor issues and maintain 100% availability to applications and data.
- **Management and analytics** – The ThinkAgile HX Series platform combines Web-scale capabilities with an intuitive user-centric management experience to simplify every aspect of the IT infrastructure lifecycle. Nutanix Prism provides a single tool to monitor and control one or more Nutanix clusters with simplified workflows and rich automation for common administrative tasks.
- **Security** – Nutanix software combines powerful features, such as two-factor authentication and data-at-rest encryption, with a security development lifecycle that is integrated into product development to help customers meet the most stringent security requirements.

ThinkAgile HX Series hyperconverged infrastructure

ThinkAgile HX Series provides a hyperconverged infrastructure. Hyperconverged means incorporating multiple components such as computation and storage into a single entity through software. A hyperconverged infrastructure pools computation and storage to deliver high performance for virtual workloads and provides flexibility to combine local storage using a distributed file system to eliminate shared storage such as SAN or NAS. These factors make the solution cost effective without compromising performance.



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table 1	table 2	← Click the tabs for more information.	
Marketing name	HX1310	HX1320 / HT1321	HX1520-R / HT1521-R
Platform	x3550 M5	SR630	SR650
Processor	One 2620v4, one 2630v4, one 2650v4, one 2680v4	One Intel first- or second-generation Xeon Scalable Silver or Gold processor	Two Intel first-generation Xeon Scalable Silver or Gold processors
Memory	64 GB, 128 GB, 256 GB (DDR4 2400 MHz)	<ul style="list-style-type: none">• With a first-generation Xeon Scalable processor: 64 GB, 96 GB, 192 GB, 384 GB (TruDDR4, up to 2666 MHz)• With a second-generation Xeon Scalable processor: 64 GB, 96 GB, 192 GB, 256 GB, 384 GB (TruDDR4, up to 2933 MHz)	192 GB, 384 GB, 768 GB (TruDDR4 2666 MHz)
Drives	Eight 2.5 inch	Four 3.5 inch	Twelve or fourteen 3.5 inch
SSD performance	Two 400 GB SED SSDs, two 480 GB SSDs, two 800 GB	<ul style="list-style-type: none">• Hybrid configuration: two 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 2.4 TB SSD	<ul style="list-style-type: none">• Hybrid configuration: two 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, 2.4 TB SSD

Note: For the latest ThinkSystem hardware specifications and features, refer to [Lenovo Press](#) Web site.

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SSD performance tier storage options	Two 400 GB SED SSDs, two 480 GB SSDs, two 800 GB SSDs/SED SSDs, two 1.2 TB SSDs, two 1.6 TB SSDs/SED SSDs	<ul style="list-style-type: none"> Hybrid configuration: two 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs All flash configuration: two or four 480 GB, 800 GB, 960 GB, 1.6 TB, or 1.92 TB, or 3.84 TB SSDs 	<ul style="list-style-type: none"> Hybrid configuration: two 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs All flash configuration: six or fourteen 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs
HDD/SSD capacity tier storage options	Six 1 TB HDD, six 2 TB HDDs/SED HDDs	<ul style="list-style-type: none"> Hybrid configuration: Up to 20 TB (Two 10 TB HDDs). All Flash configuration: Up to 15.36 TB (Four 3.84 TB SSDs). 	<ul style="list-style-type: none"> Hybrid configuration: Up to 80 TB (Ten 8 TB or Eight 10 TB HDDs). All Flash configuration: Up to 53.76 TB (14x 3.84 TB SSDs).
GPU	N/A	N/A	N/A
Network	Zero or one 10 GbE	<ul style="list-style-type: none"> Two to six 10 GbE Two to four 10 G-BaseT Zero to two 25 GbE 	<ul style="list-style-type: none"> Two to eight 10 GbE Two to four 10 G BaseT Zero to two 25 GbE
Default Nutanix software edition	Nutanix Pro Edition	<ul style="list-style-type: none"> Nutanix Starter Edition HT1321 separate software license 	<ul style="list-style-type: none"> Nutanix Pro Edition HT1521 separate software license

Note: For the latest ThinkSystem hardware specifications and features, refer to [Lenovo Press](#) Web site.

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table 1	table 2	← Click the tabs for more information.
Marketing name	HX1020	HX1021
Platform	SE350	SE350
Processor	Intel Xeon D-2100 Series	Intel Xeon D-2100 Series
Memory	Lenovo TruDDR4 supported, 64 GB to 256 GB capacity	Lenovo TruDDR4 supported, 64 GB to 256 GB capacity
Drives	Four or eight M.2 NVMe drives	Four or eight M.2 NVMe drives
SSD/HDD options(Hybrid Config)	N/A	N/A
SSD/NVMe options(All-Flash config)	NVMe options: Four or eight 650 GB	NVMe options: Four or eight 650 GB

Note: For the latest ThinkSystem hardware specifications and features, refer to [Lenovo Press](#) Web site.

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Drives	Four or eight M.2 NVMe drives	Four or eight M.2 NVMe drives
SSD/HDD options(Hybrid Config)	N/A	N/A
SSD/NVMe options(All-Flash config)	NVMe options: Four or eight 650 GB	NVMe options: Four or eight 650 GB
GPU	One NVIDIA T4 (optional)	One NVIDIA T4 (optional)
Network	<ul style="list-style-type: none">Two SFP+ and two 1 GbEFour 10 Gbase-T	<ul style="list-style-type: none">Two SFP+ and two 1 GbEFour 10 Gbase-T
Default Nutanix software edition	<ul style="list-style-type: none">Nutanix Acropolis Hypervisor preloadedVmware ESXi 6.7 update 3	<ul style="list-style-type: none">Nutanix Acropolis Hypervisor preloadedVmware ESXi 6.7 update 3

Note: For the latest ThinkSystem hardware specifications and features, refer to [Lenovo Press](#) Web site.

HX 2000 Series specifications

table 1

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Marketing name	HX2310-E	HX2710-E	HX2720-E	HX2320-E
Platform	x3550 M5	sd350/n400	SD530	SR630
Processor	Two E5-2609 v4, two E5-2620 v4, two E5-2630 v4		One or two Intel first-generation Xeon Scalable Silver or Gold processors	One or two Intel first-generation Xeon Scalable Silver or Gold processors
Memory	64 GB, 128 GB, 256 GB, 512 GB (DDR4 2400 MHz)		192 GB, 384 GB, 768 GB (TruDDR4 2666 MHz)	Up to 512 GB with 16x32 GB 2666 MHz RDIMMs
Drives	Seven 2.5-inch	Six 2.5-inch	Six 2.5-inch	Eight 2.5-inch drives
SSD performance tier storage options	One 480-GB SSD, one 800-GB SSD, one 1200-GB SSD, one 1600-GB SSD		<ul style="list-style-type: none"> Hybrid configuration: one or two 480 GB, 800 GB, 960 GB, 1.6 TB, or 1.92 TB SSDs All flash configuration: four to six 480 GB, 800 GB, 960 GB, 1.6 TB, or 1.92 TB SSDs 	One to two 1.92-TB SSDs, one to two 3.84-TB SSDs
HDD/SSD capacity tier storage options	Six 1-TB HDDs, six 2-TB HDDs	Five 1-TB HDDs, five 2-TB HDDs	<ul style="list-style-type: none"> Hybrid: Up to 10 TB (HDDs) All Flash: Up to 11.52 TB (SSDs) 	Six to seven 1-TB HDDs, six to seven 2-TB HDDs, six to eight 960-GB SSDs, six to seven 1.92-TB SSDs, six to seven 3.84-TB SSDs
GPU	N/A	N/A	N/A	N/A
Network	Zero or one 2 x 10 GbE		<ul style="list-style-type: none"> Two to four 10 GbE Two 10 G-BaseT Zero to two 25 GbE 	<ul style="list-style-type: none"> Two to six 10 GbE Two to four 10G-BaseT Zero to two 25 GbE
Default Nutanix software edition	Nutanix Express Edition			

HX 2000 Series specifications

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Marketing name	HX2320 appliance	HX2321 certified node	HX2321 certified node
Platform / form factor	SR630 / 1U		
Machine type	7X83	7Y89	7Z04
Model	CTO5WW	CTO5WW	CTO5WW
Warranty	Three years	Three years	One year
Processor	Two Intel first- or second-generation Xeon Scalable Silver or Gold processors		
Memory	<ul style="list-style-type: none"> With first-generation Xeon Scalable processors: Up to 24 TruDDR4 2666 MHz DIMMs. Up to 1.5 TB with 24x64 GB LRDIMMs With second-generation Xeon Scalable processors: Up to 24 TruDDR4 2933 MHz DIMMs. Up to 1.5 TB with 24x64 GB LRDIMMs 		
Drives	Four 3.5-inch drives, either two SSDs + two HDDs or four SSDs		
Network	<ul style="list-style-type: none"> Onboard LOM slot for up to 4x 1/10 Gb Ethernet ports Optional Mezzanine LOM (ML2) slot for dual-port 10 GbE cards with SFP+ or RJ-45 connectors or single- or dual-port 25 GbE cards with SFP28 connectors 1x RJ-45 10/100/1000 Mb Ethernet systems management port 		
Boot drive	Two 128 GB M.2 non-hot-swap SSDs (RAID-1)		
Power supply	Two redundant hot-swap power supplies		
System management	<ul style="list-style-type: none"> Nutanix Prism for storage/hyperconverged cluster management VMware vCenter for hypervisor management 		

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Memory	<ul style="list-style-type: none"> • With first-generation Xeon Scalable processors: Up to 24 TruDDR4 2666 MHz DIMMs. Up to 1.5 TB with 24x64 GB LRDIMMs • With second-generation Xeon Scalable processors: Up to 24 TruDDR4 2933 MHz DIMMs. Up to 1.5 TB with 24x64 GB LRDIMMs 	
Drives	Four 3.5-inch drives, either two SSDs + two HDDs or four SSDs	
Network	<ul style="list-style-type: none"> • Onboard LOM slot for up to 4x 1/10 Gb Ethernet ports • Optional Mezzanine LOM (ML2) slot for dual-port 10 GbE cards with SFP+ or RJ-45 connectors or single- or dual-port 25 GbE cards with SFP28 connectors • 1x RJ-45 10/100/1000 Mb Ethernet systems management port 	
Boot drive	Two 128 GB M.2 non-hot-swap SSDs (RAID-1)	
Power supply	Two redundant hot-swap power supplies	
System management	<ul style="list-style-type: none"> • Nutanix Prism for storage/hyperconverged cluster management • XClarity and/or XClarity Integrator for hardware resource management 	
Software	<ul style="list-style-type: none"> • NutanixAcropolis: Starter, Pro, and Ultimate editions • Nutanix Prism • Nutanix Calm (optional) • Nutanix Flow (optional) 	NutanixAcropolis Pro and Ultimate editions (licenses purchased separately from Nutanix)
Hypervisors	<ul style="list-style-type: none"> • NutanixAcropolis Hypervisor (Bundled with AOS; default factory preload) • VMware ESXi 6.0 Update 3 (Optional factory preload) • VMware ESXi 6.5 Update 1 (Optional factory preload) • VMware ESXi 6.5 Update 2 (Field upgrade only) • VMware ESXi 6.7 Update 1 (Field upgrade only) 	

HX 3000 Series specifications

table 1	table 2	table 3	table 4	← Click the tabs for more information.
Marketing name	HX3310		HX3510-G	HX3710
Platform	x3550 M5		x3650 M5	sd350/n400
Processor	Two E5-2630 v4, two E5-2650 v4, two E5-2680 v4, two E5-2697 v4, two E5-2699 v4			Two E5-2620 v4, two E5-2630 v4, two E5-2650 v4, two E5-2680 v4, two E5-2698 v4
Memory	128 GB, 256 GB, 384 GB, 512 GB, 768 GB (DDR4 2400)			128 GB, 256 GB, 512 GB (DDR4 2400)
Drives	Eight 2.5-inch			Six 2.5-inch
SSD performance tier storage options	Two 400 GB SED SSDs, two 480 GB SSDs, two 800 GB SSDs/SED SSDs, two 1200 GB SSDs, two 1600 GB SSDs/SED SSDs			
HDD/SSD capacity tier storage options	Six 1 TB HDDs, six 2 TB HDDs/SED HDDs			Four 1 TB HDDs, four 2 TB HDDs, six 2 TB SED HDDs
GPU	N/A			
Network	One or two 10 GbE			One or two 10 GbE
Default Nutanix software edition	Nutanix Pro Edition			

Note: For the latest ThinkSystem hardware specifications and features, refer to the [Lenovo Press](#) Web site.

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table 1	table 2	table 3	table 4	← Click the tabs for more information.
Marketing name	HX3310-F		HX3710-F	
Platform	x3550 M5		sd350/n400	
Processor	Two E5-2650 v4, two E5-2680 v4, two E5-2697 v4, two E5-2699 v4		Two E5-2650 v4, two E5-2680 v4, two E5-2698 v4	
Memory	128 GB, 256 GB, 384 GB, 512 GB, 768 GB (DDR4 2400)		128 GB, 256 GB, 512 GB (DDR 2400)	
Drives	Eight 2.5 inch		Six 2.5 inch	
SSD performance tier storage options	Eight 400 GB SED SSDs, eight 480 GB SSDs, eight 800 GB SSDs/SED SSDs, eight 1200 GB SSDs, eight 1600 GB SSDs/SED SSDs		Six 400 GB SED SSDs, six 480 GB SSDs, six 800-GB SSDs/SED SSDs, six 1200 GB SSDs, six 1600 GB SSDs/SED SSDs	
HDD/SSD capacity tier storage options	N/A		N/A	
GPU	N/A			
Network	One or two 10 GbE		One 2 x 10 GbE	
Default Nutanix software edition	Nutanix Pro Edition			

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table 1	table 2	table 3	table 4	← Click the tabs for more information.	Scroll down for more information.
Marketing name	HX3320 / HX3321		HX3520-G / HX3521-G		HX3720 / HX3721
Platform	SR630		SR650		SD530
Processor	Two Intel first or second generation Xeon Scalable Silver, Gold, or Platinum processors		Two Intel Xeon first or second generation Scalable Silver, Gold, or Platinum processors		Two Intel first or second generation Xeon Scalable Silver, Gold, or Platinum processors
Memory	<ul style="list-style-type: none"> • With first-generation Xeon Scalable processors: Up to 3 TB with 24x 128 GB 3DS 2666 MHz RDIMMs. • With second-generation Xeon Scalable processors: Up to 3 TB with 24x 128 GB 3DS 2933 MHz RDIMMs 		<ul style="list-style-type: none"> • With first-generation Xeon Scalable processors: Up to 1.5 TB with 12x 128 GB 3DS 2666 MHz RDIMMs. • With second-generation Xeon Scalable processors: Up to 1.5 TB with 12x 128 GB 3DS 2933 MHz RDIMMs 		<ul style="list-style-type: none"> • With first-generation Xeon Scalable processors: Up to 768 GB with 12x 64 GB TruDDR4 2666 MHz RDIMMs • With second-generation Xeon Scalable processors: Up to 12x 64 GB TruDDR4 2933 MHz RDIMMs
Drives	Ten or twelve 2.5-inch		Sixteen 2.5-inch		Six 2.5-inch
SSD performance tier storage options	<ul style="list-style-type: none"> • Hybrid configuration: two or four 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs • All flash configuration: two to twelve 480 GB, 800 GB, 960 GB, 		<ul style="list-style-type: none"> • Hybrid configuration: two or four 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs • All flash configuration: eight to sixteen 480 GB, 800 GB, 960 GB, 1.6 		<ul style="list-style-type: none"> • Hybrid configuration: two 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs • All flash configuration: two to six 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB,

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table 1	table 2	table 3	table 4	← Click the tabs for more information.	Scroll down for more information.
Drives	Ten or twelve 2.5-inch	Sixteen 2.5-inch	Six 2.5-inch		
SSD performance tier storage options	<ul style="list-style-type: none"> Hybrid configuration: two or four 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs All flash configuration: two to twelve 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs 	<ul style="list-style-type: none"> Hybrid configuration: two or four 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs All flash configuration: eight to sixteen 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs 	<ul style="list-style-type: none"> Hybrid configuration: two 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs All flash configuration: two to six 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs 		
HDD/SSD capacity tier storage options	<ul style="list-style-type: none"> Hybrid: Up to 24 TB (10x 2.4 TB HDDs) All Flash: Up to 46.08 TB (12x 3.84 TB SSDs) 	<ul style="list-style-type: none"> Hybrid: Up to 33.6 TB (14x 2.4 TB HDDs) All Flash: Up to 61.44 TB (16x 3.84 TB SSDs) 	<ul style="list-style-type: none"> Hybrid: Up to 9.6 TB (4x 2.4 TB HDDs) All Flash: Up to 23.04 TB (6x 3.84 TB SSDs) 		
GPU	N/A	<ul style="list-style-type: none"> One or two NVIDIA M10, M60, P40, and P100 GPUs One to five NVIDIA T4 GPUs 	N/A		
Network	<ul style="list-style-type: none"> Two to eight 10 GbE Two to four 10 G-BaseT Zero to four 25 GbE 	<ul style="list-style-type: none"> Two to six 10 GbE Two to four 10G-BaseT Zero to two 25 GbE 	<ul style="list-style-type: none"> Two to four 10 GbE Two 10 G-BaseT Zero to two 25 GbE 		
Default Nutanix software edition	<ul style="list-style-type: none"> Nutanix Pro Edition HX3321, HX3521-G, and HX3721 separate software license 				

Note: For the latest ThinkSystem hardware specifications and features, refer to the [Lenovo Press](#) Web site.

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table 1	table 2	table 3	table 4	← Click the tabs for more information.	Scroll down for more information.
Marketing name	HX3375 Appliance		HX3376 Certified Nodes		
Platform	SR645(1U)		SR645(1U)		
Processor	One or two AMD EPYC™ 7002 Generation Processors, up to 64 cores		One or two AMD EPYC™ 7002 Generation Processors, up to 64 cores		
Memory	32 DDR4 memory slots; maximum 4 TB using 64 GB or 128 GB RDIMMs		32 DDR4 memory slots; maximum 4 TB using 64 GB or 128 GB RDIMMs		
Drives	<ul style="list-style-type: none"> Up to twelve 2.5 inch drives Up to four NVMe drives (requires two CPUs) 		<ul style="list-style-type: none"> Up to twelve 2.5 inch drives Up to four NVMe drives (requires two CPUs) 		
SSD/HDD options(Hybrid Config)	<ul style="list-style-type: none"> SSD options: Two to four 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB, 7.68 TB HDD options: Four to ten 1 TB, 2TB, 2.4 TB 		<ul style="list-style-type: none"> SSD options: Two to four 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB, 7.68 TB HDD options: Four to ten 1 TB, 2 TB, 2.4 TB 		

Note: For the latest ThinkSystem hardware specifications and features, refer to the [Lenovo Press](#) Web site.

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table 1	table 2	table 3	table 4	← Click the tabs for more information.	Scroll down for more information.
SSD/HDD options(Hybrid Config)	<ul style="list-style-type: none"> SSD options: Two to four 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB, 7.68 TB HDD options: Four to ten 1 TB, 2TB, 2.4 TB 	<ul style="list-style-type: none"> SSD options: Two to four 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB, 7.68 TB HDD options: Four to ten 1 TB, 2 TB, 2.4 TB 			
SSD/NVMe options(All-Flash config)	<ul style="list-style-type: none"> SSD options: Six to twelve 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB, 7.68 TB, 15.36 TB NVMe options: Zero, two, or four 1.6 TB, 3.2 TB, 3.84 TB, 6.4 TB 	<ul style="list-style-type: none"> SSD options: Six to twelve 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB, 7.68 TB, 15.36 TB NVMe options: Zero, two, or four 1.6 TB, 3.2 TB, 3.84 TB, 6.4 TB 			
GPU	Up to two NVIDIA T4	Up to two NVIDIA T4			
Network	Two to four 10/25 GbE SFP28 ports	Two to four 10/25 GbE SFP28 ports			
Default Nutanix software edition	<ul style="list-style-type: none"> Nutanix Acropolis Hypervisor preloaded Vmware ESXi 6.7 update 3 	<ul style="list-style-type: none"> Nutanix Acropolis Hypervisor preloaded Vmware ESXi 6.7 update 3 			

Note: For the latest ThinkSystem hardware specifications and features, refer to the [Lenovo Press](#) Web site.

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table 1

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Marketing name	HX5510	HX5510-C
Platform	x3650 M5	x3650 M5
Processor	Two E5-2620 v4, two E5-2630 v4, two E5-2650 v4, two E5-2680 v4, two E5-2697 v4	One E5-2620 v4
Memory	128 GB, 256 GB, 384 GB, 512 GB, 768 GB (DDR4 2400 MHz)	64 GB (DDR4 2400 MHz)
Drives	Eight 2.5-inch drives	
SSD performance tier storage options	Two 400 GB SED SSDs, two 480 GB SSDs, two 800 GB SSDs/SED SSDs, two 1200 GB SSDs, two 1600 GB SSDs/SED SSDs	Two 400 GB SED SSDs, two 480 GB SSDs
HDD/SSD capacity tier storage options	Six 2 TB HDDs/SED HDDs, six 4 TB HDDs/SED HDDs, six 6 TB HDDs/SED HDDs, six 8 TB HDDs/SED HDDs	Six 4 TB HDDs/SED HDDs, six 6 TB HDDs/SED HDDs, six 8 TB SED/HDDs
GPU	N/A	
Network	One or two 10 GbE	One or two 10 GbE
Default Nutanix software edition	Nutanix Pro Edition	

Note: For the latest ThinkSystem hardware specifications and features, refer to the [Lenovo Press](#) Web site.

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Marketing name	HX5520 / HX5521	HX5520-C / HX5521-C
Platform	SR650	
Processor	Two Intel first or second generation Xeon Scalable Silver, Gold, or Platinum processors	One Intel first generation Xeon Scalable Silver or Gold processor
Memory	<ul style="list-style-type: none"> With first generation Xeon Scalable processors: Up to 3 TB with 24x 128 GB 3DS 2666 MHz RDIMMs With second generation Xeon Scalable processors: Up to 3 TB with 24x 128 GB 3DS 2933 MHz DIMMs 	64 GB, 96 GB (TruDDR4 2666 MHz)
Drives	Twelve to fourteen 3.5-inch drives	
SSD performance tier storage options	<ul style="list-style-type: none"> Hybrid configuration: two to four 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB SSDs All flash configuration: six to fourteen 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs 	<ul style="list-style-type: none"> Hybrid configuration: two 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB SSDs All flash configuration: six to fourteen 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs
HDD/SSD capacity tier storage options	<ul style="list-style-type: none"> Hybrid: Up to 80 TB (Ten 8 TB or eight 10 TB HDDs) All Flash: Up to 53.76 TB (14x 3.84 TB SSDs) 	
GPU	N/A	

Note: For the latest ThinkSystem hardware specifications and features, refer to the [Lenovo Press](#) Web site.

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Memory	<ul style="list-style-type: none"> Up to 3 TB with 24x 128 GB 3DS 2666 MHz RDIMMs With second generation Xeon Scalable processors: Up to 3 TB with 24x 128 GB 3DS 2933 MHz DIMMs 	64 GB, 96 GB (TruDDR4 2666 MHz)
Drives	Twelve to fourteen 3.5-inch drives	
SSD performance tier storage options	<ul style="list-style-type: none"> Hybrid configuration: two to four 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB SSDs All flash configuration: six to fourteen 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs 	<ul style="list-style-type: none"> Hybrid configuration: two 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB SSDs All flash configuration: six to fourteen 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs
HDD/SSD capacity tier storage options	<ul style="list-style-type: none"> Hybrid: Up to 80 TB (Ten 8 TB or eight 10 TB HDDs) All Flash: Up to 53.76 TB (14x 3.84 TB SSDs) 	
GPU	N/A	
Network	<ul style="list-style-type: none"> Two to eight 10 GbE Two to four 10 G-BaseT Zero to four 25 GbE 	<ul style="list-style-type: none"> Two to six 10 GbE Two to four 10 G-BaseT Zero to two 25 GbE
Default Nutanix software edition	<ul style="list-style-type: none"> Nutanix Pro Edition HX5521 and HX5521-C separate software license 	

Note: For the latest ThinkSystem hardware specifications and features, refer to the [Lenovo Press](#) Web site.

HX 7000 Series specifications

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Marketing name	HX7510	HX7520 / HX7521	HX7820 / HX7821
Platform	x3650 M5	SR650	SR950
Processor	Two E5-2643 v4, two E5-2680 v4, two E5-2697 v4, two E5-2699 v4	Two Intel Xeon Scalable Gold or Platinum processors	Four Intel Xeon Scalable Gold or Platinum processors
Memory	128 GB, 256 GB, 384 GB, 512 GB, 768 GB (DDR4 2400 MHz)	<ul style="list-style-type: none"> With first generation Xeon Scalable processors: Up to 3 TB with 24x 128 GB 3DS 2666 MHz RDIMMs With second generation Xeon Scalable processors: Up to 3 TB with 24x 128 GB 3DS 2933 MHz DIMMs 	<ul style="list-style-type: none"> With first generation Xeon Scalable processors: Up to 6 TB with 48x 128 GB 3DS 2666 MHz RDIMMs With second generation Xeon Scalable processors: Up to 6 TB with 48x 128 GB 3DS 2933 MHz DIMMs
Drives	Twenty-four 2.5-inch	Twenty-four 2.5-inch	Twenty-four 2.5-inch
SSD performance tier storage options	Four 400 GB SED SSDs, four 480 GB SSDs, four 800 GB SSDs/SED SSDs, four 1200 GB SSDs, four 1600 GB SSDs/SED SSDs	<ul style="list-style-type: none"> Hybrid configuration: four to eight 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs All flash configuration: twelve to twenty-four 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs 	<ul style="list-style-type: none"> Hybrid configuration: two to eight 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs All flash configuration: six to twenty-four 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB or SSDs
HDD/SSD capacity tier storage options	Twenty 1 TB HDDs, twenty 2 TB HDDs, six 2 TB SED HDDs	<ul style="list-style-type: none"> Hybrid: Up to 48 TB (20x 2.4 TB HDDs) All Flash: Up to 92 TB (24x 3.84 TB SSDs) 	<ul style="list-style-type: none"> Hybrid: Up to 48 TB (20x 2.4 TB HDDs). All Flash: Up to 92 TB (24x 3.84 TB SSDs)

Note: For the latest ThinkSystem hardware specifications and features, refer to the [Lenovo Press](#) Web site.

HX 7000 Series specifications

Scroll down for more information.

Memory	GB (DDR4 2400 MHz)	<ul style="list-style-type: none"> With second generation Xeon Scalable processors: Up to 3 TB with 24x 128 GB 3DS 2933 MHz DIMMs 	<ul style="list-style-type: none"> With second generation Xeon Scalable processors: Up to 6 TB with 48x 128 GB 3DS 2933 MHz DIMMs
Drives	Twenty-four 2.5-inch	Twenty-four 2.5-inch	Twenty-four 2.5-inch
SSD performance tier storage options	Four 400 GB SED SSDs, four 480 GB SSDs, four 800 GB SSDs/SED SSDs, four 1200 GB SSDs, four 1600 GB SSDs/SED SSDs	<ul style="list-style-type: none"> Hybrid configuration: four to eight 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs All flash configuration: twelve to twenty-four 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs 	<ul style="list-style-type: none"> Hybrid configuration: two to eight 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, or 3.84 TB SSDs All flash configuration: six to twenty-four 480 GB, 800 GB, 960 GB, 1.6 TB, 1.92 TB, 3.84 TB or SSDs
HDD/SSD capacity tier storage options	Twenty 1 TB HDDs, twenty 2 TB HDDs, six 2 TB SED HDDs	<ul style="list-style-type: none"> Hybrid: Up to 48 TB (20x 2.4 TB HDDs) All Flash: Up to 92 TB (24x 3.84 TB SSDs) 	<ul style="list-style-type: none"> Hybrid: Up to 48 TB (20x 2.4 TB HDDs). All Flash: Up to 92 TB (24x 3.84 TB SSDs).
GPU	N/A	N/A	N/A
Network	One or two 10 GbE	<ul style="list-style-type: none"> Two to eight 10 GbE Two to four 10 G-BaseT Zero to four 25 GbE 	<ul style="list-style-type: none"> Two to eight 10 GbE Two to four 10 G-BaseT Zero to four 25 GbE
Default Nutanix software edition	Nutanix Pro Edition	<ul style="list-style-type: none"> Nutanix Pro Edition HX7521 separate software license 	<ul style="list-style-type: none"> Nutanix Pro Edition HX7821 separate software license

Note: For the latest ThinkSystem hardware specifications and features, refer to the [Lenovo Press](#) Web site.

ThinkAgile HX Series appliances machine type model

Intel Xeon Scalable processor-based appliances have individual machine types and model numbers that uniquely define particular appliance form factors and drive types, but not exact configurations. Machine type information for each appliance is shown in the following table.

Marketing name	HX1320	HX1520-R	HX2320	HX2320-E	HX2720-E	HX3320	
Form factor	1U	2U	1U	1U	2U4N	1U	
Machine type	7X83	7x84	7X83	7X83	7X82	7X83	
Model	CTO1WW	CTO1WW	CTO5WW	CTO2WW	CTO1WW	CTO3WW	CTO8WW*
Minimum number of nodes	1**	1***	3	3	3	3	

Marketing name	HX3520-G	HX3720	HX5520	HX5520-C	HX7520		HX7820
Form factor	2U	2U4N	2U	2U	2U		4U
Machine type	7X84	7X82	7X84	7X84	7X84		7Y95 7Z08*
Model	CTO3WW	CTO2WW	CTO4WW	CTO5WW	CTO6WW	CTO8WW*	CTO1WW
Minimum number of nodes	3	3	3	1****	3		4

Note:

* 7X83CTO8WW, 7X84CTO8WW, and 7Z08CTO1WW are for SAP HANA.

** Single-node HX1320 deployment requires the AOS 5.5 or later. Two-node HX1320 cluster requires the AOS 5.6 or later.

*** Single-node replication target only.

**** One or more HX5520-C must be deployed as a cluster with two or more VM-capable HX Series appliances shown in this table.

ThinkAgile HX Series certified nodes machine type model

Intel Xeon Scalable processor-based appliances have individual machine types and model numbers that uniquely define particular appliance form factors and drive types, but not exact configurations. Machine type information for each appliance is shown in the following table.

Marketing name	Enclosure		HX1321		HX1521-R		HX2321		HX3321		
Form factor	2U4N		1U		2U		1U		1U		
Machine type	7Z02	7Y87	7Z04	7Y89	7Z05	7Y90	7Y04	7Y89	7Z04	7Y89	
Model	CTO1WW	CTO1WW	CTO1WW	CTO1WW	CTO1WW	CTO1WW	CTO5WW	CTO5WW	CTO3WW	CTO3WW	CTO8WW ^
Warranty	1 Year	3 Year	1 Year	3 Year	1 Year	3 Year	1 Year	3 Year	1 Year	3 Year	
Minimum number of nodes	NA	NA	1*		1**		3		3		

HX3521-G		HX3721		HX5521		HX5521-C		HX7521			HX7821	
2U		2U4N		2U		2U		2U			4U	
7Z05	7Y90	7Z03	7Y88	7Z05	7Y90	7Z05	7Y90	7Z05	7Y90		7Z09 ^	7Y96
CTO3WW	CTO3WW	CTO2WW	CTO2WW	CTO4WW	CTO4WW	CTO5WW	CTO5WW	CTO6WW	CTO6WW	CTO8WW ^	CTO1WW	CTO1WW
1 Year	3 Year	1 Year	3 Year	1 Year	3 Year	1 Year	3 Year	1 Year	3 Year		1 year	3 year
3		3		3		1***		3			4	

Note:

* Single-node HX1320 deployment requires the AOS 5.5 or later. Two-node HX1320 cluster requires the AOS 5.6 or later.

** Single-node replication target only.

*** One or more HX5520-C must be deployed as a cluster with two or more VM-capable HX Series appliances shown in this table.

^ 7Y89CTO8WW, 7Y90CTO8WW, and 7Z09CTO1WW are for SAP HANA

Nutanix software components overview

The ThinkAgile HX series arrive from the factory preloaded with the Nutanix Acropolis Hypervisor (AHV) and the Nutanix base software (different software editions are available). Appliances with Intel E5-2600 v3 CPUs are supported by Nutanix base software version 4.5.2.2 or later; appliances with Intel E5-2600 v4 CPUs are supported by Nutanix base software version 4.6.2 or later; and appliances with Intel Xeon Scalable CPUs are supported by Nutanix base software version 4.6.3 or later.

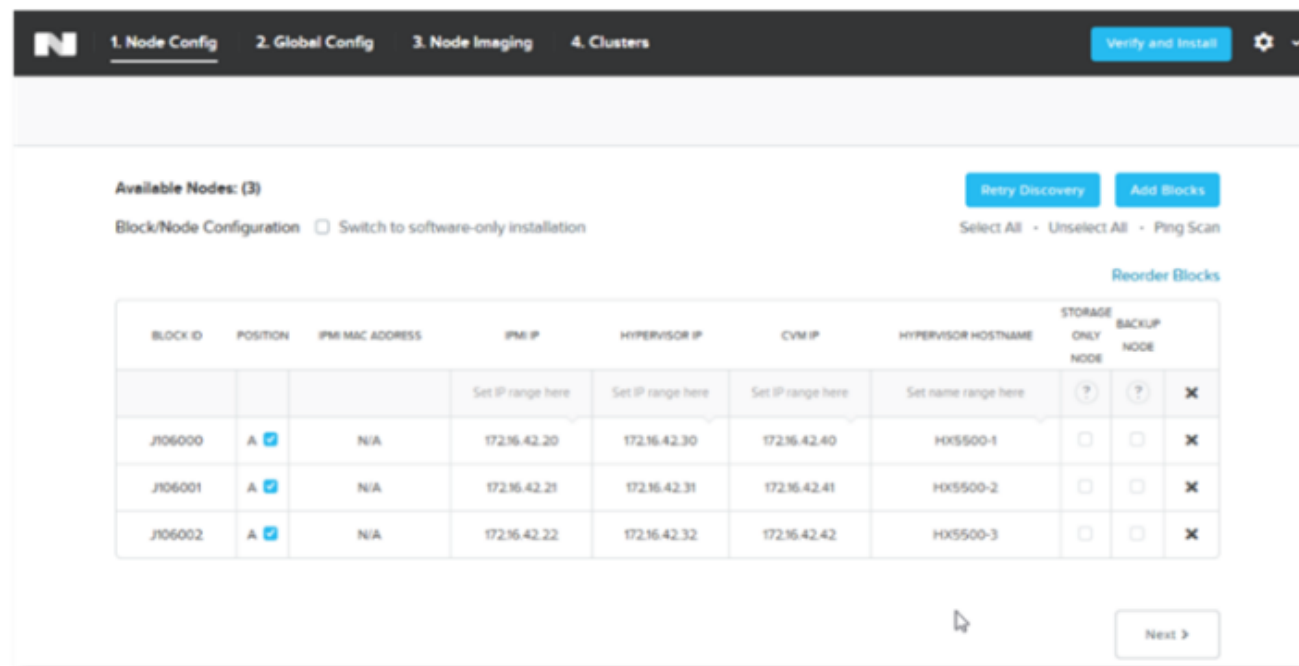
Nutanix base software includes:

- Controller VM – runtime that provides the key hyperconverged capability which manages storage within and across nodes.
- Foundation – Separate utility used to orchestrate the installation of Nutanix software on one or more nodes.
- Metis – Internal tool to help with automated hardware certification and testing.
- Phoenix – Bootable Linux used to install and configure nodes.
- Prism – End-user GUI for configuring and monitoring a cluster. Alerts are used to notify the user with hardware problems.
- LCM – Life-cycle Manager.

Nutanix Prism

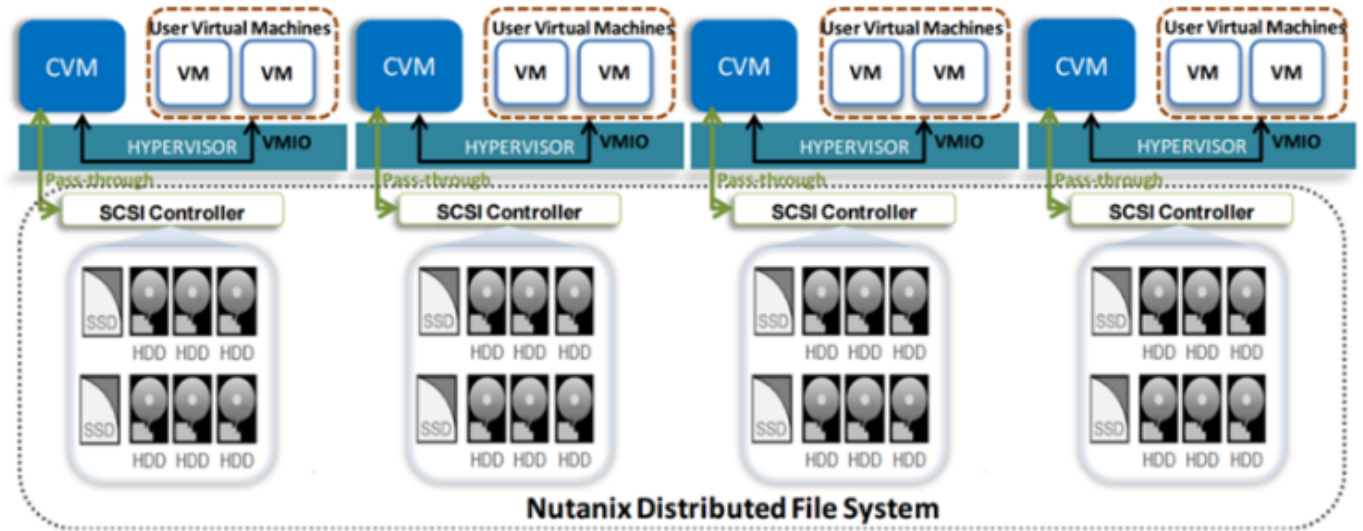
Nutanix Prism is a part of the Nutanix software preloaded on the appliances, which gives administrators a simple and elegant way to manage virtual environments. Powered by advanced data analytics and heuristics, Prism simplifies and streamlines common workflows within a data center. Nutanix Prism offers the following features:

- Single point of control
- Monitoring and alerting
- Integrated data protection
- Diagnostics and troubleshooting



Nutanix Controller VM

The Nutanix Controller VM (CVM) is the key to hyperconverged capability and each node in a cluster has its own instance. The CVM works as an interface between the storage and hypervisor to manage all I/O operations for the hypervisor and user VMs running on the nodes. CVM virtualizes all of the local storage attached to each node in a cluster and presents it as centralized storage array using Nutanix Distributed File System (NDFS). All I/O operations are handled locally to provide the highest performance.



Nutanix Foundation

The Nutanix Foundation is a separate utility that is used to manage the installation of hypervisors and Nutanix software on one or more nodes. The maximum number of nodes that can be deployed at one time is 20. The Nutanix Foundation is available as both a stand-alone VM and can be integrated into the CVM. Because CVM is pre-installed in the factory, the CVM integration of Nutanix Foundation simplifies the deployment and cluster creation of new servers delivered from the factory.



Nutanix software edition comparison

There are four Nutanix software editions that are support by the HX Series. HX2310-E, HX2710-E, HX2320-E, and HX2720-E can only use the Express license edition, and the other appliances support the Starter, Pro, and Ultimate editions. When nodes in the same cluster have different software editions installed, all nodes have access to the lower license features only.

The feature comparisons between the four editions are summarized in the following table. [Click the tabs for more information.](#)

Core data services	Infrastructure resilience	Data protection	Security	Management and analytics	Virtualization
	Express	Starter	Pro	Ultimate	
Cluster size	Four nodes	Twelve nodes	Unlimited	Unlimited	
Maximum number of clusters	Two	Unlimited	Unlimited	Unlimited	
Online clusters grow and shrink	•	•	•	•	
Data tiering	•	•	•	•	
Heterogeneous clusters		•	•	•	
VM flash mode (pinning)	•			•	
EC-X			•	•	
Inline compression	•	•	•	•	
Inline deduplication	•	•	•	•	
Post-process compression	•		•	•	
Post-process deduplication	•		•	•	

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The feature comparisons between the four editions are summarized in the following table. [Click the tabs for more information.](#)

Core data services	Infrastructure resilience	Data protection	Security	Management and analytics	Virtualization
	Express	Starter	Pro	Ultimate	
Data path redundancy	•	•	•	•	
Tunable redundancy factor	Two	Two	Two or three	Two or three	
Availability domains			•	•	

Nutanix software edition comparison

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Core data services	Infrastructure resilience	Data protection	Security	Management and analytics	Virtualization
	Express	Starter	Pro	Ultimate	
VM-centric snapshots and clones	•	•	•	•	
1-1 replication and disaster recovery	•	•	•	•	
Bi-directional replication and DR	•	•	•	•	
VSS integration	•		•	•	
Time stream snapshots	•		•	•	
Cloud Connect	•		•	•	
Multisite DR (1-to-many, many-to-1)				•	
Metro availability	•			•	

Nutanix software edition comparison

There are four Nutanix software editions that are support by the HX Series. HX2310-E, HX2710-E, HX2320-E, and HX2720-E can only use the Express license edition, and the other appliances support the Starter, Pro, and Ultimate editions. When nodes in the same cluster have different software editions installed, all nodes have access to the lower license features only. The feature comparisons between the four editions are summarized in the following table. [Click the tabs for more information.](#)

Core data services	Infrastructure resilience	Data protection	Security	Management and analytics	Virtualization
	Express	Starter	Pro	Ultimate	
Client authentication	•	•	•	•	
Cluster lockdown			•	•	
Data-at-rest encryption				•	

Nutanix software edition comparison

There are four Nutanix software editions that are support by the HX Series. HX2310-E, HX2710-E, HX2320-E, and HX2720-E can only use the Express license edition, and the other appliances support the Starter, Pro, and Ultimate editions. When nodes in the same cluster have different software editions installed, all nodes have access to the lower license features only. The feature comparisons between the four editions are summarized in the following table. [Click the tabs for more information.](#)

Core data services	Infrastructure resilience	Data protection	Security	Management and analytics	Virtualization
	Express	Starter	Pro	Ultimate	
Single site cluster management	•	•	•	•	
Multi-site cluster management	Two sites	Unlimited	Unlimited	Unlimited	
PulseHD remote monitoring	•	•	•	•	
Cluster health	•	•	•	•	
One click upgrades	•	•	•	•	
Rest APIs			•	•	

Nutanix software edition comparison

There are four Nutanix software editions that are support by the HX Series. HX2310-E, HX2710-E, HX2320-E, and HX2720-E can only use the Express license edition, and the other appliances support the Starter, Pro, and Ultimate editions. When nodes in the same cluster have different software editions installed, all nodes have access to the lower license features only. The feature comparisons between the four editions are summarized in the following table. [Click the tabs for more information.](#)

Core data services	Infrastructure resilience	Data protection	Security	Management and analytics	Virtualization
	Express	Starter	Pro	Ultimate	
vSphere and Hyper-V support	•	•	•	•	
Built-in Acropolis Hypervisor	•	•	•	•	
VM operations	•	•	•	•	
Host profiles	•	•	•	•	
Virtual network configuration	•	•	•	•	
VM placement	•	•	•	•	
VM high availability	•	•	•	•	

ThinkAgile HX Series appliance Hypervisor support matrix

The following table shows the scope of preload support for the hypervisors across the HX Series appliance:

Marketing name	Nutanix Acropolis Hypervisor (AHV)	VMware ESXi 6.0	VMware ESXi 6.5	VMware ESXi 6.7	Hyper-V
HX1320	•	•	•	•	•
HX1520	•				
HX2320	•	•	•	•	•
HX2320-E	•	•	•	•	•
HX2720-E	•	•	•	•	•
HX3320	•	•	•	•	•
HX3520-G	•	•	•	•	• (without GPU)
HX3720	•	•	•	•	•
HX5520	•	•	•	•	•
HX5520-C	•				
HX7520	•	•	•	•	•
HX7820	•		•	•	
HX7820 HANA	•				

ThinkAgile HX Series certified node hypervisor support matrix

The following table shows the scope of preload support for the hypervisors across the HX Series certified node:

Marketing name	Nutanix Acropolis Hypervisor (AHV)	VMware ESXi 6.0	VMware ESXi 6.5	VMware ESXi 6.7	Hyper-V
HX1321	•	•	•	•	•
HX1521	•				
HX2321	•	•	•	•	•
HX3321	•	•	•	•	•
HX3521	•	•	•	•	• (without GPU)
HX3721	•	•	•	•	•
HX5521	•	•	•	•	•
HX5521-C	•				
HX7521	•	•	•	•	•
HX7821	•		•	•	
HX7821 HANA	•				

Cluster sizes

AOS version 5.5 and later enables new cluster sizes and applications. The information in the following table is applicable to HX1320, HX2320-E and HX2720-E appliances:

Scroll down for more information.

Feature	One node cluster	Two nodes cluster	“Normal” 3+ node cluster
Expand cluster size post install?	No	No	Yes
Minimum CVM specification	6vCPU/20 GB RAM	6vCPU/20 GB RAM	Varies
RD considerations	RF2 within node only	RF2 spanned over 2 nodes RF4 for metadata on SSDs over 2 nodes	RF2 and/or RF3 (5+ nodes)
Compression/Dedupe support	No Dedupe support	No Dedupe support	Yes
AFS support/ABS support	No	No	Yes
Erasure coding	No	No	Yes (minimum of 4 nodes)
Capacity analysis support	No	No	Yes
	Approx 6 hours RPO only		

Cluster sizes

AOS version 5.5 and later enables new cluster sizes and applications. The information in the following table is applicable to HX1320, HX2320-E and HX2720-E appliances:

Scroll down for more information.

DR (async) RPO/Metro availability support	Async 6 hours RPO only. Metro availability not supported	Async 6 hours RPO only. Metro availability not supported	Less than 15 minutes RPO in AOS 5.5+. Metro OK
Single node failure effects	Offline	50% resource loss (plan for 40% max resource usage to avoid read-only state on remaining node)	Varies depending on cluster size (usually N+1 design ensures enough resources to cover node failure)
Drive failure effects	When SSD fails, cluster goes into Read-Only mode (in hybrid only)	One node and one SSD failure (on other node) leads to Read-Only mode	As per normal characteristics
Witness VM required?	No	Yes (must be outside of 2-node)	No
Hypervisor supported	AHV/ESXi	AHV/ESXi	AHV/ESXi/HyperV/Xen
Minimum AOS version required	5.5	5.5	Any currently supported version
Foundation support introduced	3.10	3.11	All

System management tools

Three tools are available to help manage the HX Series :

- IPMI
 - The Nutanix software uses local IPMI to query or set status on individual hardware components, such as FRU queries and sensors.
- Virtual media booting
 - One important feature is virtual media booting. This offers the ability to load an ISO image file into the server and have the server reboot and load an OS from that image. This facility is used by Foundation to significantly reduce the effort and time needed for field installation
- Lenovo XClarity Administrator (LXCA) and Lenovo XClarity Administrator Pro
 - LXCA is provided as a virtual appliance that can be quickly imported into a virtualized environment. Note that LXCA is not supported on the Acropolis Hypervisor (AHV).
 - For out-of-band management where the management subnet is different to the server subnet, then LXCA needs to be on a server that is connected into the 1 GbE management network. LXCA cannot run on an HX Series appliance that it is managing.
 - For in-band management where management and servers are on the same subnet, then there is a choice depending on the data center administrator's preference. LXCA can either be installed on a separate server or a server within a Nutanix cluster running ESXi. Lenovo recommends the first option for medium-to-large data centers and the second option for smaller deployments to eliminate the incremental cost of another server.
 - Lenovo XClarity Administrator Pro offers additional features such as Service and Support, configuration patterns, and operating system and hypervisor installation.

Network adapters

The non-Intel Xeon Scalable CPU HX series support the Intel X710 dual-port 10 GbE SFP+ and X550-T2 dual-port 10 Gbase-T network adapters, and the maximum quantity that can be selected is two (four network ports).

The Intel Xeon Scalable CPU HX models leverage the onboard x722 chipset embedded in the PCH, with the LOM PHYs supported on the system. These come in 2-port and 4-port configurations for 10 GbE, 10 Gbase-T and 1 GbE. 1 GbE PHY is not available on HX Intel Xeon Scalable CPU models. Systems that require 1 GbE connections can use the 10 Gbase-T PHY, which supports 1 GbE connections.

Network adapter topologies must be the same in the one appliance. For example, either two SFP+ network cards or two RJ-45 cards in the one appliance.



Intel X520 dual-port 10 GbE SFP+ adapter



Intel X550-T2 dual port 10 Gbase-T adapter

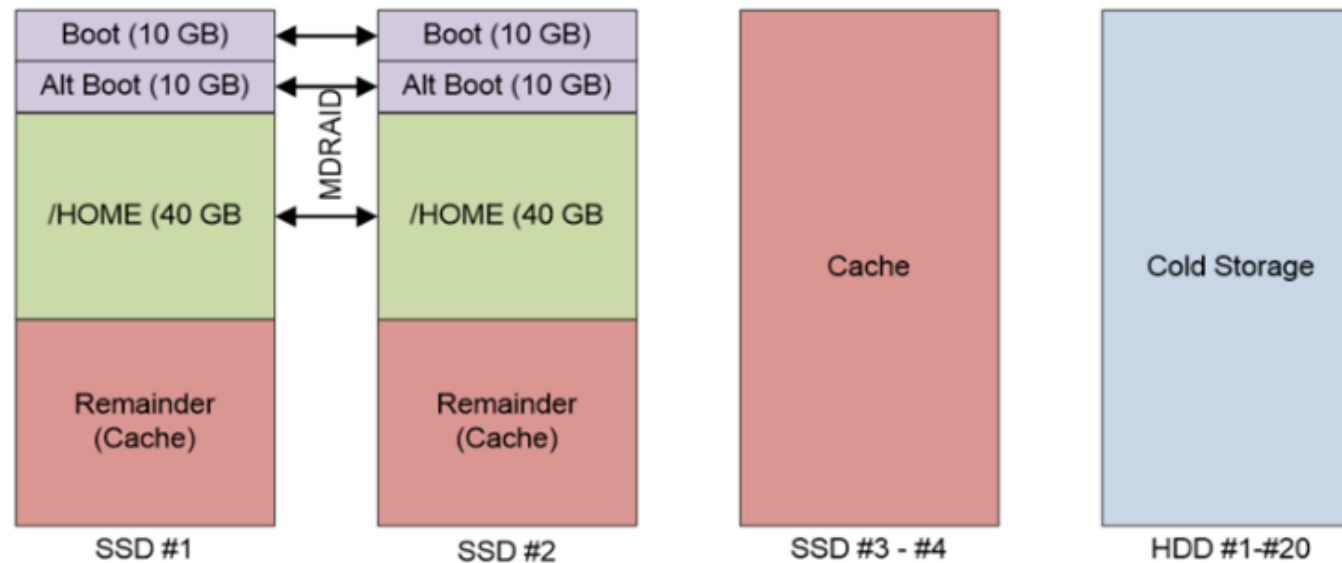
Disk layout – Overview

Nutanix requires a bootable SSD for the hypervisor of choice. It is recommended that the hypervisor is boot from a flash-based storage that is 64 GB or larger in storage size. Flash storage is needed for both capacity and performance. The flash storage must be PCI-H attached and therefore SD cards and USB keys are not suitable. For normal usage, the hypervisor is booted and then loads the Nutanix CVM from the SSD located in the front of the chassis.

There are two types of drives; the boot drive and data drives.

Disk layout – Data drives

The Nutanix CVM is Linux-based and is booted from the first two high-endurance SSDs. These two SSDs contain standard partitions for the CVM boot, alternative boot, and /HOME directory. The remaining space of the first two SSDs and the other two optional high-endurance SSDs are used for the cache storage. All of the HDDs contain a single partition that is used for cold storage data.

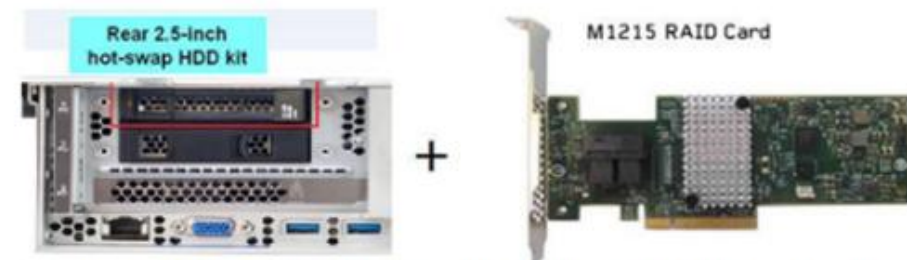


Disk layout – Boot drive

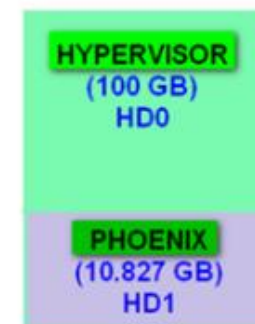
The hypervisor is boot from dedicated SSDs. The drive is partitioned appropriately for the hypervisor when the hypervisor is installed out of the factory. Boot drive options for different appliances are:

- Boot connected SSD using mSATA port (SATA DOM) – E5-2600 v4 series appliances
- SSD attached to disk controller PCI adapter – E5-2600 v3 series appliances
- The Lenovo ThinkAgile HX3500, HX5500, and HX7500 use a 120 GB 2.5-inch SATA SSD as the boot drive, which is installed in the rear 2.5-inch HDD kit attached to the ServerRAID M1215 SAS/SATA controller and configured as RAID 0.
- Onboard Marvell RAID controller and two 128 GB M.2 SSDs in RAID1 configuration used as the boot drives, offering redundancy for the boot drive – Intel Xeon Scalable CPU appliances (For more information on M.2 drives, refer to the *ES51780 Servicing the ThinkSystem storage controllers* course).

The boot SSD is configured with two virtual drives. The first 100 GB is used for the Hypervisor and the remaining 10.827 GB is used for the Phoenix installer. Note that if the SSD is in JBOD mode, then the drive must be set to Unconfigured Good.



Lenovo ThinkAgile HX Series Nutanix Appliances boot drive location and RAID adapter



Partition layout of the boot SSD



M.2 mirroring enablement kit

PCIe slot positions and adapter allocations

PCIe slot allocations for the HX Series are the same as the systems that each server is based on. The following table shows the respective adapter allocations as well as the processor that each PCIe slot is connected to.

Click each base platform model to see adapter allocations for them.

x3550 M5

x3650 M5

sd350 / n400

SD530

SR630

SR650

SR950

Lenovo



PCIe slot	Processor	HX1310 and HX2310-E	HX3310 and HX3310-F
1 (riser 1)	0	NIC #1 (optional)	NIC #1
2 (riser 2)	1	Not installed	NIC #2 (optional)
3 (riser 2)	0	Not installed	Blank
4 (system board)	0	HBA #1	HBA #1

PCIe slot positions and adapter allocations

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Click each base platform model to see adapter allocations for them.

x3550 M5

x3650 M5

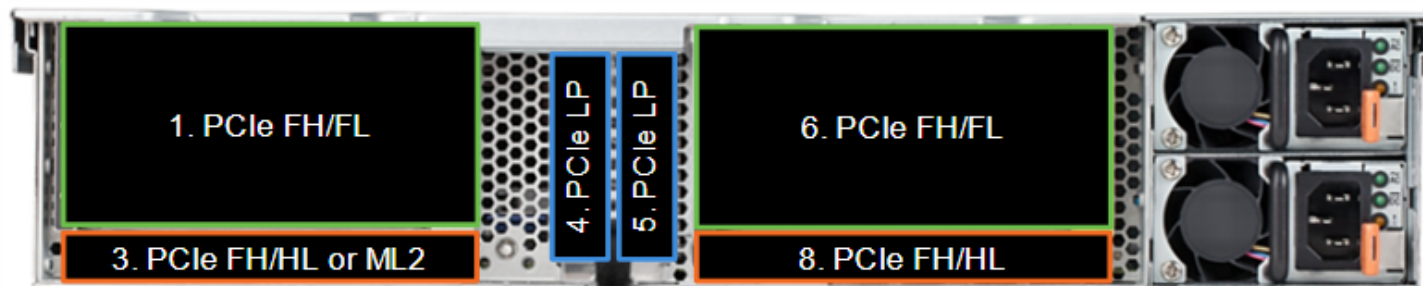
sd350 / n400

SD530

SR630

SR650

SR950

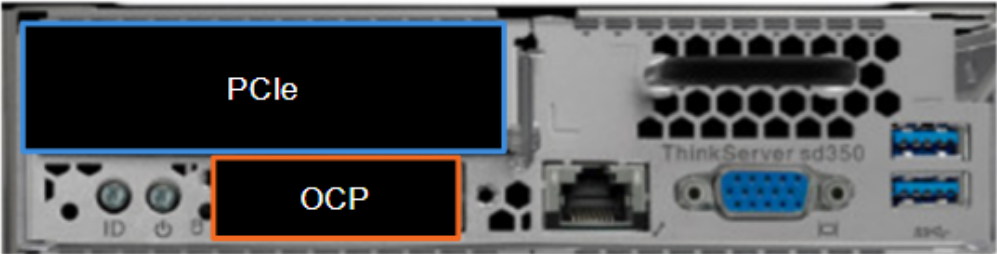


PCIe slot	Processor	HX3510-G	HX5510 and HX5510-C	HX7510
1 (riser 1)	0	GPU #1	Not installed	HBA #2
2 (riser 2)	0			
3 (riser 2)	0			Blank
4 (vertical on planar)	0	NIC #1	NIC #1	HBA #3
5 (vertical on planar)	1	NIC #2 (optional)	NIC #2 (optional)	NIC #1
6 (riser 2)	1	GPU #2	Not installed	NIC #2 (optional)
7 (riser 2)	1			
8 (riser 2)	1			Blank
9 (system board)	0	HBA #1	HBA #1	HBA #1

PCIe slot positions and adapter allocations

PCIe slot allocations for the HX Series are the same as the systems that each server is based on. The following table shows the respective adapter allocations as well as the processor that each PCIe slot is connected to. Click each base platform model to see adapter allocations for them.

- x3550 M5
- x3650 M5
- sd350 / n400
- SD530
- SR630
- SR650
- SR950



PCIe slot	Processor	HX2310-E	HX3310 and HX3310-F
OCP mezzanine	0	Intel X520 (optional phase 1)	Intel X520 (phase 1)
PCIe riser	0	Intel X710 or X550 (optional phase 2)	Intel X710 or X550 (phase 2)
HBA mezzanine	1	HBA	HBA

PCIe slot positions and adapter allocations

PCIe slot allocations for the HX Series are the same as the systems that each server is based on. The following table shows the respective adapter allocations as well as the processor that each PCIe slot is connected to.

Click each base platform model to see adapter allocations for them.

x3550 M5

x3650 M5

sd350 / n400

SD530

SR630

SR650

SR950



PCIe slot	Processor	HX3720	HX2720-E
PCIe riser	1	25 GbE NIC or 10 GbE NIC	10 GbE NIC
Onboard	1	HBA	HBA

PCIe slot positions and adapter allocations

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x3550 M5

x3650 M5

sd350 / n400

SD530

SR630

SR650

SR950



PCIe slot	Processor	HX3320	HX2320-E	HX1320
PCIe slot 1 (riser 1 x16)	1	25 GbE NIC #2 or 10 GbE NIC #2 or rear HDD	25 GbE NIC #2 or 10 GbE NIC #2	25 GbE NIC #1 or 10 GbE NIC #1
PCIe slot 2 (riser 1 x8)	1	Blank or HDD	Blank	Blank
PCIe slot 3 (riser 2 x16)	2	25 GbE NIC #1 or 10 GbE NIC #1	Not installed	Not installed
Onboard	1	HBA	HBA	HBA

PCIe slot positions and adapter allocations

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Click each base platform model to see adapter allocations for them.

x3550 M5

x3650 M5

sd350 / n400

SD530

SR630

SR650

SR950



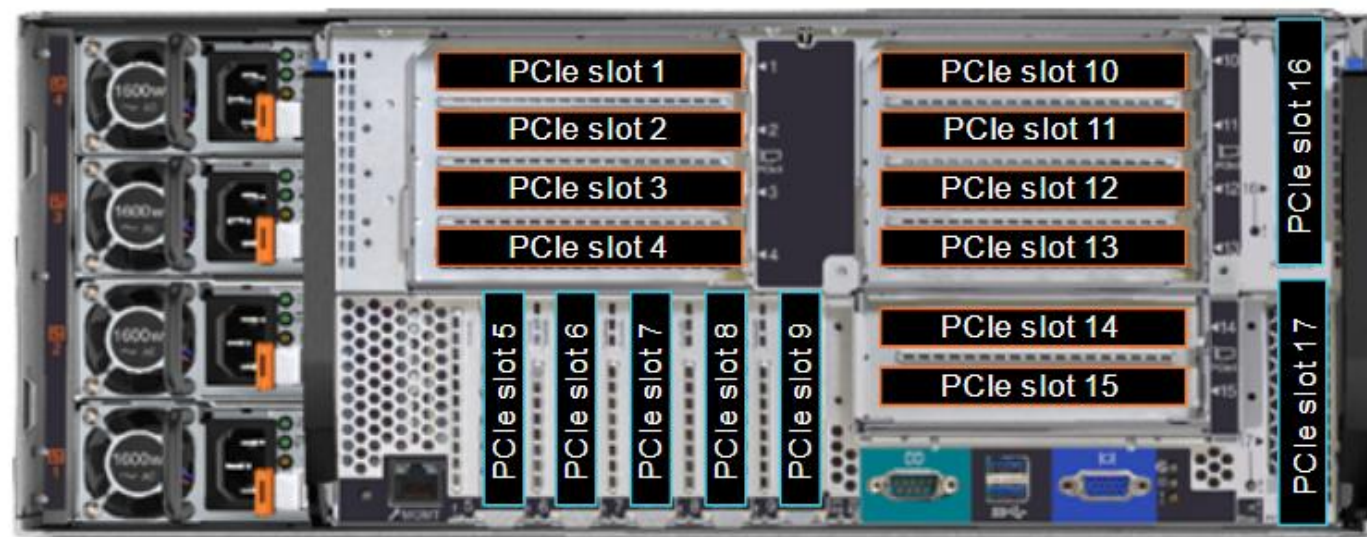
PCIe slot	Processor	HX5520-C	HX5520
PCIe slot 1 (riser 1 x16)	1	Blank or HDD	Blank or HDD
PCIe slot 2 (riser 1)	n/a	Not installed	Not installed
PCIe slot 3 (riser 1 x8)	1	Blank or HDD	Blank or HDD
PCIe slot 4 (planar x8)	1	25 GbE NIC #1 or 10 GbE NIC #1	25 GbE NIC #2 or 10 GbE NIC #2
PCIe slot 5 (riser 2 x16)	2	Not installed	Blank
PCIe slot 6 (riser 2 x16)	2	Not installed	25 GbE NIC #1 or 10 GbE NIC #1
Onboard	1	HBA	HBA

PCIe slot positions and adapter allocations

PCIe slot allocations for the HX Series are the same as the systems that each server is based on. The following table shows the respective adapter allocations as well as the processor that each PCIe slot is connected to.

Click each base platform model to see adapter allocations for them.

- x3550 M5
- x3650 M5
- sd350 / n400
- SD530
- SR630
- SR650
- SR950



PCIe slot	Processor	Note
PCIe slot 1 (riser 1 x16)	4	On riser card 1
PCIe slot 2 (riser 1 x16)	4	On riser card 1
PCIe slot 3 (riser 1 x16)	4	On riser card 1

PCIe slot 4 (riser 1 x16)	4	On riser card 1
PCIe slot 5 (IO tray board x16)	2	On I/O tray
PCIe slot 6 (IO tray board x16)	2	On I/O tray
PCIe slot 7 (IO tray board x8)	1	On I/O tray
PCIe slot 8 (IO tray board x16)	1	On I/O tray, dedicated to ML2 x16 network adapter
PCIe slot 9 (IO tray board x8)	1	On I/O tray, dedicated to LOM adapter
PCIe slot 10 (riser 2 x16)	3	On riser card 2
PCIe slot 11 (riser 2 x16)	3	On riser card 2
PCIe slot 12 (riser 2 x16)	3	On riser card 2
PCIe slot 13 (riser 2 x16)	3	On riser card 2
PCIe slot 14 (riser 2 x16)	Not connected	
PCIe slot 15 (riser 2 x16)	Not connected	
PCIe slot 16 (riser 3 x8)	Not connected	
PCIe slot 17 (riser 3 x8)	Not connected	

State transition diagram for a node

When a node is shipped to a user site, the node will contain Acropolis and AHV and is ready for further configuration. This is known as an Unconfigured Node. The diagram shows the state transition for an HX Series node and various end-user procedures to get the node from one state to another. An Unconfigured Node can be configured into a Configured Node, which may be part of a cluster, with Foundation. Three or more Unconfigured Nodes can also be imaged into Configured Nodes with a different hypervisor using the Foundation that is embedded in the CVM, which allows a user to convert Unconfigured Nodes with AHV into Configured Nodes with ESXi. Stand-alone imaging using the Foundation installation process can be used at any time to take one or more nodes and create unconfigured or configured nodes.

If a node experiences hardware failure or sensor alert, then it becomes a Broken Node that is taken out of the cluster. For most hardware problems, the node can be removed from the cluster, fixed, and join a cluster again as an Unclustered Node. (The node can then be returned to the cluster.)

One special case for a Broken Node is if the boot drive needs to be replaced. In this case, it is assumed that the data drives are still intact and the Foundation should not be used. After the boot drive is replaced, the hypervisor needs to be installed on the boot drive. The GUI version of Phoenix can be used to reinstall the CVM.

