

Lenovo Converged HX3500, HX5500, and HX7500 Nutanix Appliances

Product Guide (withdrawn product)

Lenovo Converged HX Series Nutanix Appliances are designed to help you simplify IT infrastructure, reduce costs, and accelerate time to value. These hyperconverged appliances from Lenovo combine industry-leading hyperconvergence software from Nutanix with Lenovo enterprise platforms.

Several common uses for the Lenovo Converged HX Series appliances that feature Intel Xeon processors include virtual desktop infrastructure (VDI), server virtualization, private/hybrid clouds, enterprise applications and remote/branch office. Starting with as few as three nodes to keep your acquisition costs down, the HX Series is capable of immense scalability as your needs grow.

The Lenovo Converged HX Series appliances are available in three models (shown in the following figure) that can be tailored to your needs:

- Lenovo Converged HX3500: Optimized for compute-heavy environments.
- Lenovo Converged HX5500: Optimized for storage-heavy workloads.
- Lenovo Converged HX7500: Optimized for high-performance workloads.



Figure 1. Lenovo Converged HX Series appliances: HX3500 (top), HX5500 (middle), HX7500 (bottom)

Did you know?

The Lenovo Converged HX Series appliances are built on industry-leading Lenovo System x servers that consistently achieve the highest reliability ratings and top customer satisfaction scores:

- #1 in customer satisfaction for 14 out of 16 quarters (TBR 2Q15 Survey, August 2015):
http://www.lenovo.com/images/products/system-x/pdfs/white-papers/tbr_x86servers_top_csat_2q15_wp.pdf
- #1 in reliability for 3 years running (ITIC 2015-2016 Reliability Survey, July 2015):
http://www.lenovo.com/images/products/system-x/pdfs/white-papers/itic_2015_reliability_wp.pdf

Nutanix named a leader in the Magic Quadrant for Integrated Systems report (Gartner, August 2015):
<http://go.nutanix.com/2015-gartner-magic-quadrant-integrated-systems.html>

Key features

The Lenovo Converged HX Series Nutanix Appliances deliver the industry's most feature-rich hyperconverged infrastructure to enterprise datacenters (shown in the following figure). Nutanix brings the benefits of web-scale technologies to enterprise applications through enterprise storage, data protection, infrastructure resilience, management and analytics, and security.

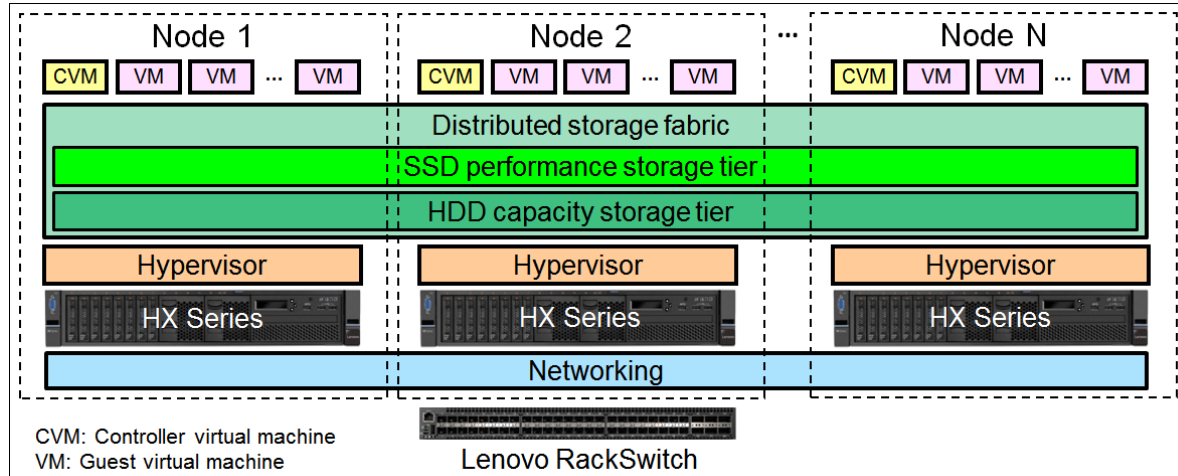


Figure 2. HX Series hyperconverged infrastructure

The Lenovo Converged HX Series appliances offer the following key features:

- Enterprise storage

The Lenovo Converged HX Series Nutanix Appliances deliver enterprise data storage as an on-demand service by employing highly distributed software architecture. The 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, deduplication and more.

- Inline and post-process compression at the sub-block level increase effective storage capacity by up to four times.
- Redirect-on-write snapshots and writeable clones at the granularity of a single VM increase efficiency.
- Distributed caching of VM data improves performance in multi-reader scenarios, such as VDI with linked clones.
- Inline deduplication in the read cache and post-process deduplication in the capacity tier improve performance and effective capacity.
- Powerful acceleration capabilities such as caching, automatic data tiering and data locality speed storage performance.

- Data protection

The 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.

- Unlimited local backups using VM-centric snapshots and integrated workflows delivering RPO in minutes.
- Natively integrated solution for disaster recovery enables simple VM-centric backup, recovery and replication with application-level consistency.
- Built-in Cloud Connect hybrid cloud technology enables seamless backup of data to public cloud services.

- Metro availability feature provides continuous availability of data across different sites during planned maintenance or disasters through synchronous replication.
- Support for Microsoft Volume Shadow Services (VSS), VMware vStorage API for Data Protection (VADP), and seamless integration with third-party backup providers.
- Infrastructure resilience

The platform for the Lenovo Converged HX Series Nutanix Appliances is fault resistant, with no single point of failure and no bottlenecks. The system uses a shared-nothing architecture, where all data, metadata and services are distributed to all nodes within the cluster, and is 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.

 - Intelligent data placement in different physical failure domains, or availability domains, (for example, separate racks or power sources) delivers greater fault tolerance.
 - Data and metadata replicated across multiple nodes provide user-defined resilience against hardware failures.
 - Multiple copies of data ensure 100% data availability in the event that a Nutanix controller VM is unavailable due to failure or maintenance.
 - Automatic integrity checks during reads and silent at-rest error detection for data consistency.
- Management and analytics

The platform for the Lenovo Converged HX Series Nutanix Appliances marries web-scale capabilities with an intuitive user-centric management experience to simplify every aspect of the IT infrastructure lifecycle. Nutanix Prism provides a single pane of glass to monitor and control one or more Nutanix clusters, with simplified workflows and rich automation for common administrative tasks.

 - Elegantly simple management framework with intuitive workflows delivers radical simplicity and powerful control to IT management.
 - Single pane of glass delivers centralized visibility and management of multiple Nutanix clusters across the world.
 - Rich automation and intuitive workflows simplify deployment, provisioning, orchestration and maintenance of Nutanix clusters.
 - End-to-end visibility of VMs, nodes and disks and the ability to visually diagnose potential issues gives administrators total infrastructure control.
 - Programmatic control of every aspect of cluster management, including deployment, upgrades, data protection, and performance management enables powerful automation.
 - Streamlined management for hypervisor and virtual machines on Nutanix.
- 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.

 - Security incorporated into every step of the software development process enables verifiably secure software releases.
 - Two-step authentication using a client certificate and username/password, along with cluster lockdown, provides protection against unauthorized access.

Components and connectors

The following figure shows the front view of the HX3500 appliance.

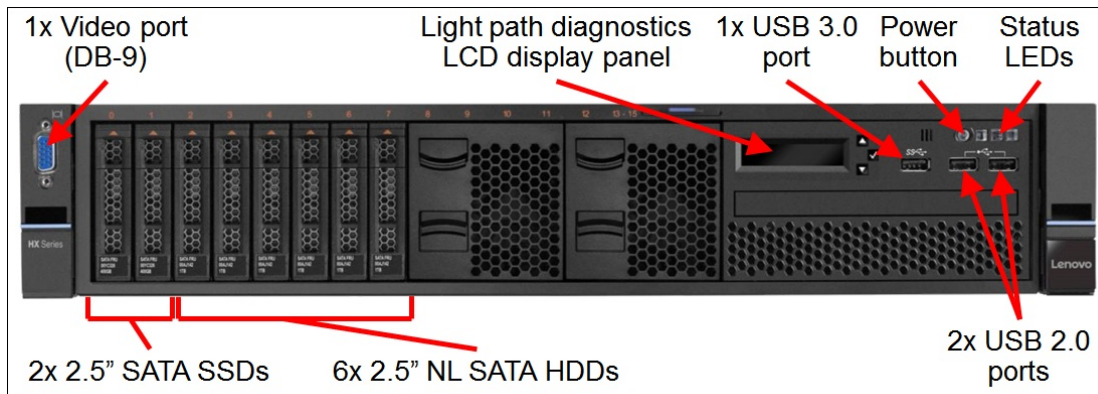


Figure 3. HX3500 front view

The following figure shows the front view of the HX5500 appliance.

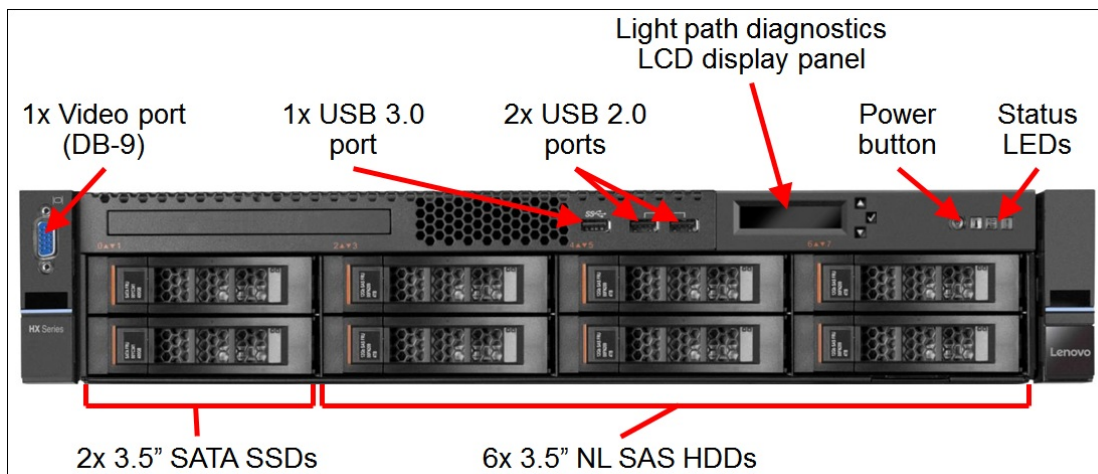


Figure 4. HX5500 front view

The following figure shows the front view of the HX7500 appliance.

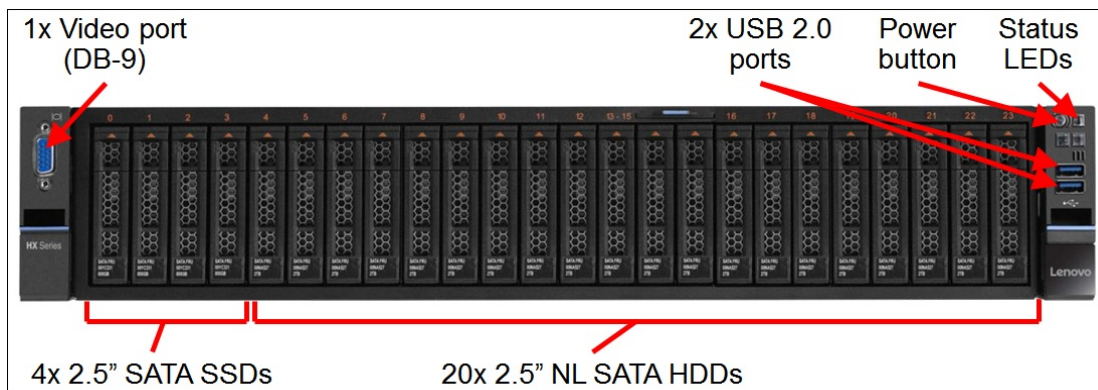


Figure 5. HX7500 front view

The following figure shows the rear view of the HX3500 and HX5500 appliances.

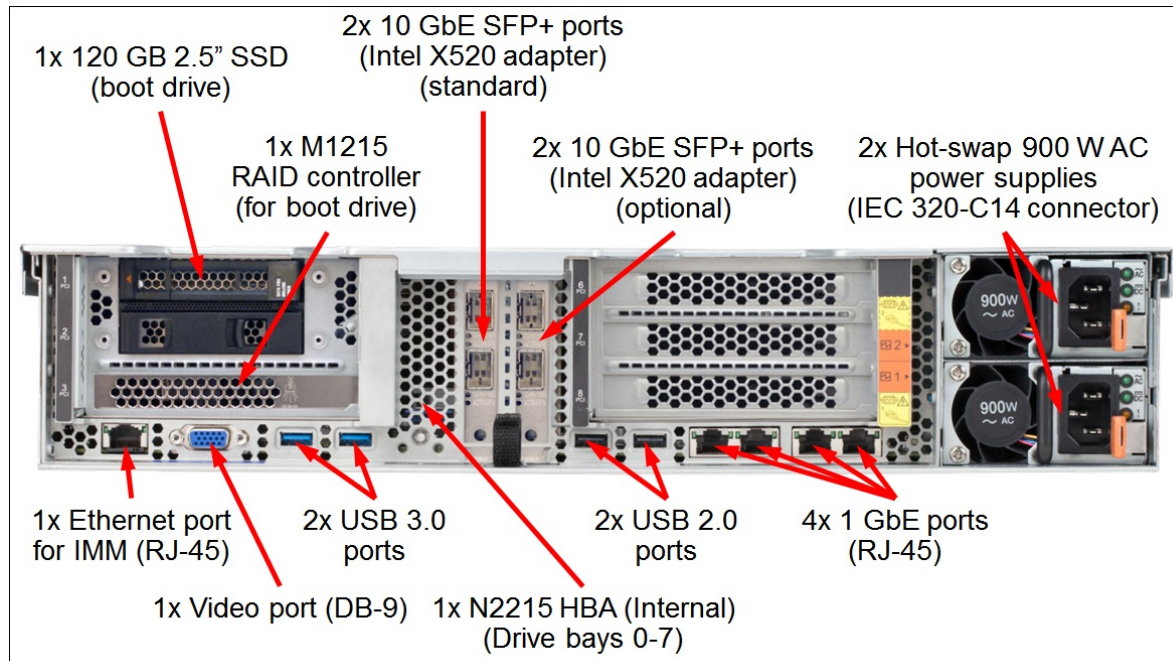


Figure 6. HX3500 and HX5500 rear view

The following figure shows the rear view of the HX7500 appliance.

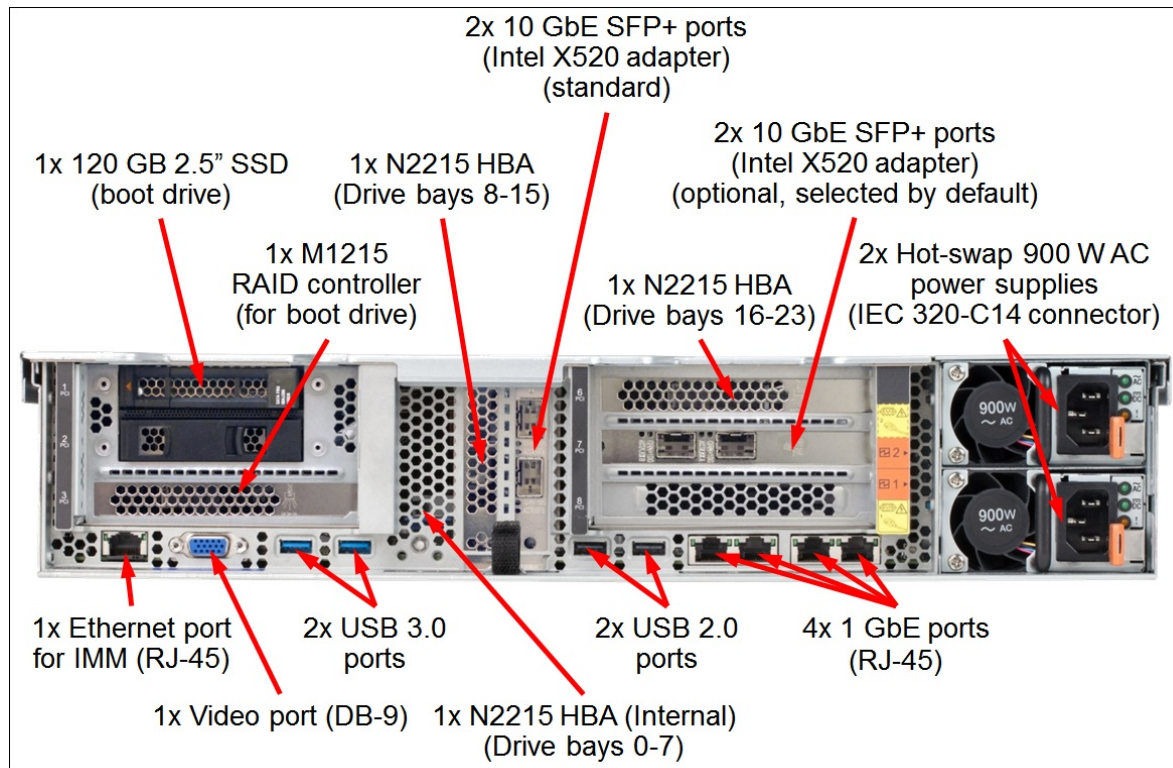


Figure 7. HX7500 rear view

System specifications

The following table lists the system specifications of the Converged HX Series appliances.

Table 1. System specifications

Components	Specification
Form factor	2U Rack-mount.
Processor	Two Intel Xeon E5-2600 v3 processors with 18 cores (2.3 GHz core speeds); or 14 or 10 cores (2.6 GHz core speeds); or 12 cores (2.5 GHz core speeds); or 8 cores (up to 2.4 GHz core speeds); or 6 cores (2.4 GHz or 3.4 GHz core speeds). Two QPI links up to 9.6 GT/s each. Up to 2133 MHz memory speed. Up to 45 MB L3 cache.
Chipset	Intel C612.
Memory	24 DIMM sockets. Support for 16 GB and 32 GB RDIMMs. Memory speed up to 2133 MHz.
Memory maximums	Up to 768 GB with 24x 32 GB RDIMMs.
Memory protection	ECC and Chipkill.
Drive bays	<ul style="list-style-type: none"> ● HX3500: 8x 2.5" (front) ● HX5500: 8x 3.5" (front) ● HX7500: 24x 2.5" (front)
Maximum internal storage	<ul style="list-style-type: none"> ● HX3500: 12 TB (HDD) + 1600 GB (SSD) ● HX5500: 24 TB (HDD) + 1600 GB (SSD) ● HX7500: 40 TB (HDD) + 3200 GB (SSD)
Storage controller	<ul style="list-style-type: none"> ● HX3500: 1x N2215 (12 Gb SAS) ● HX5500: 1x N2215 (12 Gb SAS) ● HX7500: 3x N2215 (12 Gb SAS)
Network interfaces	One or two dual-port Intel X520 10 GbE adapters (Intel 82599 10 GbE controller) with SFP+ connectors. Four integrated RJ-45 Gigabit Ethernet 1000BASE-T ports (BCM5719).
Boot drive	1x 2.5" (rear) hot-swap SAS/SATA drive bay with the 120GB SSD connected to the M1215 controller.
PCI Expansion slots	Seven slots. The slots are as follows: <ul style="list-style-type: none"> ● Slot 0: PCIe 3.0 x8 (for the N2215 storage controller) ● Slot 3: PCIe 3.0 x8 (for the M1215 storage controller) ● Slot 4: PCIe 3.0 x8; low profile (for the Intel X520 adapter or 2nd N2215 controller) ● Slot 5: PCIe 3.0 x16; low profile (for the Intel X520 network adapter) ● Slot 6: PCIe 3.0 x8; full-height, full-length (for the 3rd N2215 storage controller) ● Slot 7: PCIe 3.0 x8; full-height, full-length (for the Intel X520 network adapter) ● Slot 8: PCIe 3.0 x8; full-height, half-length (not used by the appliances)
Ports	<ul style="list-style-type: none"> ● Front: 1x USB 3.0 (HX3500 and HX5500), 2x USB 2.0, and 1x DB-15 video. ● Rear: 2x USB 3.0, 2x USB 2.0, 1x DB-15 video, 1x RJ-45 systems management, and 4x RJ-45 GbE network ports.
Cooling	Calibrated Vectored Cooling with six redundant hot-swap fans; two fan zones with N+1 fan redundancy; each fan has two motors.
Power supply	Two redundant hot-swap 900 W (100-240V) High Efficiency Platinum AC power supplies.
Video	Matrox G200eR2 with 16 MB memory integrated into the IMM2.1. Maximum resolution is 1600x1200 at 75 Hz with 16 M colors.
Hot-swap parts	SSDs and HDDs, power supplies, and fans.
Systems management	UEFI, Integrated Management Module II (IMM2.1) (based on Renesas SH7758) with Advanced Upgrade, Predictive Failure Analysis, light path diagnostics, Lenovo XClarity, Nutanix Prism.

Components	Specification
Security features	Power-on password, administrator's password, Trusted Platform Module (TPM) 2.0-ready.
Software	Nutanix Acropolis: Starter, Pro, and Ultimate editions.
Hypervisors	Nutanix Acropolis Hypervisor (preloaded). Optional support for VMware ESXi 5.5 Update 2, VMware ESXi 5.5 Update 3, and VMware ESXi 6.0 Update 1 (field-installable options only).
Hardware warranty	Three-year or five-year customer-replaceable unit and onsite limited warranty with selectable service levels: 9x5 next business day (NBD), 9x5x4, 24x7x4, and 24x7x2.
Software maintenance	Three-year or five-year software support and subscription (matches the duration of the selected warranty period).
Dimensions	Height: 87 mm (3.4 in), width: 446 mm (17.5 in), depth: 800 mm (31.5 in)
Weight	Maximum configuration: 34 kg (75 lb)

Models

The Converged HX Series appliances are factory-integrated offerings only; they are configured by using the System x and Cluster Solutions Configurator (x-config):

<http://lesc.lenovo.com/products/hardware/configurator/worldwide/bhui/asit/>

During the configuration process, you are selecting one of the base models first, and then you are adding components to the selected model according to the output from the Nutanix Sizer tool:

<http://services.nutanix.com/>

Note: You are required to engage a Lenovo representative in the project that includes the Converged HX Series appliances.

The following table lists the base models of the Converged HX Series appliances.

Table 2. Base models of the Lenovo Converged HX Series appliances

Description	Machine Type-Model
HX3500 Nutanix Appliance	5462-AC1
HX5500 Nutanix Appliance	5462-AC1
HX7500 Nutanix Appliance	5462-AC1

The following table lists the default configurations of each appliance.

Table 3. Default configurations

Model	Intel Xeon processor	Memory	Storage controllers	Drives	NIC	Power supply
HX3500	2x E5-2680 v3	512 GB (16x 32 GB RDIMMs)	1x N2215 (front drives) 1x M1215 (rear drive)	6x 1 TB 2.5" HDDs (front) 2x 400 GB 2.5" SSDs (front) 1x 120 GB 2.5" SSD (rear)	2x 10 GbE	2x 900 W HS
HX5500	2x E5-2630 v3	256 GB (16x 16 GB RDIMMs)	1x N2215 (front drives) 1x M1215 (rear drive)	6x 4 TB 3.5" HDDs (front) 2x 400 GB 3.5" SSDs (front) 1x 120 GB 2.5" SSD (rear)	2x 10 GbE	2x 900 W HS
HX7500	2x E5-2697 v3	512 GB (16x 32 GB RDIMMs)	3x N2215 (front drives) 1x M1215 (rear drive)	20x 1 TB 2.5" HDDs (front) 4x 400 GB 2.5" SSDs (front) 1x 120 GB 2.5" SSD (rear)	4x 10 GbE	2x 900 W HS

The Lenovo Converged HX Series appliances ship with the following items:

- Enterprise Slides Kit
- Enterprise 2U Cable Management Arm (CMA)
- Two 2.8 m IEC 320-C13 to C14 rack power cables
- Documentation package

Processors

The Lenovo Converged HX Series appliances ship two processors. The following table lists the processor options that are available for selection.

Table 4. Processor options

Description	Quantity
HX3500	
Intel Xeon Processor E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	2
Intel Xeon Processor E5-2660 v3 10C 2.6GHz 25MB 2133MHz 105W	2
Intel Xeon Processor E5-2680 v3 12C 2.5GHz 30MB 2133MHz 120W	2
Intel Xeon Processor E5-2697 v3 14C 2.6GHz 35MB 2133MHz 145W	2
Intel Xeon Processor E5-2699 v3 18C 2.3GHz 45MB 2133MHz 145W	2
HX5500	
Intel Xeon Processor E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	2
Intel Xeon Processor E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	2
Intel Xeon Processor E5-2660 v3 10C 2.6GHz 25MB 2133MHz 105W	2
Intel Xeon Processor E5-2680 v3 12C 2.5GHz 30MB 2133MHz 120W	2
Intel Xeon Processor E5-2697 v3 14C 2.6GHz 35MB 2133MHz 145W	2
HX7500	
Intel Xeon Processor E5-2643 v3 6C 3.4GHz 20MB 2133MHz 135W	2
Intel Xeon Processor E5-2680 v3 12C 2.5GHz 30MB 2133MHz 120W	2
Intel Xeon Processor E5-2697 v3 14C 2.6GHz 35MB 2133MHz 145W	2
Intel Xeon Processor E5-2699 v3 18C 2.3GHz 45MB 2133MHz 145W	2

Memory

The Lenovo Converged HX Series appliances support Lenovo TruDDR4 memory. TruDDR memory is selected, tested and tuned to maximize performance and reliability, and it enables extended memory performance features to support memory speeds that exceed industry standards.

The appliances support up to 24 DIMMs (12 DIMMs per processor). Each processor has four memory channels, and there are three DIMMs per channel.

The following memory protection technologies are supported:

- ECC
- Chipkill

The following table lists the memory options that are available for selection.

Table 5. Memory options

Selection option	Description	Quantity
128 GB	16GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	8
256 GB	16GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	16
384 GB	16GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	24
512 GB	32GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	16
768 GB	32GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	24

The following table lists supported memory configurations and maximum operating speeds.

Note: Cells highlighted with a gray background indicate when the number of DIMMs per channel allows the DIMMs to operate faster than Intel processor specifications define, while still maintaining world-class reliability.

Table 6. Maximum memory speeds

Memory capacity	DIMMs per channel	Maximum memory speed	
		1866 MHz memory controller (E5-2620 v3, E5-2630 v3)	2133 MHz memory controller (E5-2643 v3, E5-2660 v3, E5-2680 v3, E5-2697 v3, E5-2699 v3)
128 GB	1	1866 MHz	2133 MHz
256 GB	2	1866 MHz	2133 MHz
384 GB	3	1866 MHz	1866 MHz
512 GB	2	1866 MHz	2133 MHz
768 GB	3	1866 MHz	1866 MHz

Internal storage

The Lenovo Converged HX Series appliances support the internal drive bay configurations that are listed in the following table.

Table 7. Internal drive bay configurations

Model	Hot-swap front drive bays (main storage)		Hot-swap rear drive bay (booting)		
	Quantity, form factor, drive types		Storage controller	Quantity, form factor, drive types	Storage controller
HX3500	8x 2.5-inch (6x SATA HDDs + 2x SATA SSDs)		1x N2215	1x 2.5-inch (1x SATA SSD)*	1x M1215
HX5500	8x 3.5-inch (6x NL SAS HDDs + 2x SATA SSDs)		1x N2215	1x 2.5-inch (1x SATA SSD)*	1x M1215
HX7500	24x 2.5-inch (20x SATA HDDs + 4x SATA SSDs)		3x N2215**	1x 2.5-inch (1x SATA SSD)*	1x M1215

* The rear SSD boot drive is 120GB SATA 2.5" MLC G3HS Enterprise Value SSD, feature code A577.

** Each N2215 controls eight drives.

The following table summarizes features of storage controllers used in the Converged HX Series appliances.

Table 8. Storage controller features and specifications summary

Feature	M1215	N2215
Form factor	PCIe low profile	PCIe low profile
Controller chip	LSI SAS3008	LSI SAS3008
Host interface	PCIe 3.0 x8	PCIe 3.0 x8
Port interface	12 Gbps SAS	12 Gbps SAS
Number of ports	8	8
Number of ports used	1	8
Port connectors	2x Mini-SAS HD x4 (SFF-8643)	2x Mini-SAS HD x4 (SFF-8643)
Drive interface	SATA	SAS, SATA
Drive type	SSD	HDD, SSD
Drive form factor	SFF	SFF, LFF
RAID level	0 (1 drive)	None
Cache	None	None

For more information, see the list of Product Guides in the RAID adapters category:
<https://lenovopress.com/servers/options/raid>

The following table lists the hard drive options that are available for selection.

Table 9. Hard drive options

Selection option	Description	Quantity
HX3500		
6 TB	1TB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	6
12 TB	2TB 7.2K 6Gbps NL SATA 2.5" G3HS 512e HDD	6
HX5500		
12 TB	2TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	6
24 TB	4TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	6
36 TB	6TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	6
HX7500		
20 TB	1TB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	20
40 TB	2TB 7.2K 6Gbps NL SATA 2.5" G3HS 512e HDD	20

The following table lists the solid-state drive options that are available for selection.

Table 10. Solid-state drive options

Selection option	Description	Quantity
HX3500		
800 GB	S3710 400GB Enterprise Performance SATA G3HS 2.5" SSD	2
1600 GB	S3710 800GB Enterprise Performance SATA G3HS 2.5" SSD	2

Selection option	Description	Quantity
HX5500		
800 GB	S3710 400GB Enterprise Performance SATA HS 3.5" SSD	2
1600 GB	S3710 800GB Enterprise Performance SATA HS 3.5" SSD	2
HX7500		
1600 GB	S3710 400GB Enterprise Performance SATA G3HS 2.5" SSD	4
3200 GB	S3710 800GB Enterprise Performance SATA G3HS 2.5" SSD	4

Network connectivity

The Converged HX Series appliances provide two- or four-port 10 GbE network connectivity. 10 GbE ports are bonded with the 1 GbE ports on the system board.

The onboard 1 GbE network interface controller (NIC) that is based on the Broadcom BCM5719 chip provides four 10/100/1000 Mb Ethernet ports with RJ-45 connectors.

The following table lists the 10 GbE network adapter options that are available for selection.

Table 11. Network adapter options

Description	Quantity (min / max)
Intel X520 Dual Port 10GbE SFP+ Adapter	1 / 2

The Intel X520 Dual Port 10GbE SFP+ Adapter has the following specifications:

- Intel 82599 dual-port 10 Gb Ethernet controller (supports 10 Gbps speeds)
- Two SFP+ ports for SFP+ transceivers or DAC cables
- Standard PCIe low-profile card form factor
- PCIe 2.0 x8 host interface

The Intel X520 10GbE SFP+ Adapter requires SFP+ transceivers or direct-attach copper (DAC) cables that must be ordered separately (two SFP+ transceivers or DAC cables per adapter). The following table lists supported SFP+ transceiver and cable options.

Table 12. SFP+ transceivers and cable options

Description	Part number	Feature code	Quantity per adapter
SFP+ transceivers - 10 GbE			
Lenovo 10GBASE-SR SFP+ Transceiver	46C3447	5053	2
QLogic 10Gb SFP+ SR Optical Transceiver	49Y4218	0064	2
Optical cables for 10 GbE SFP+ SR transceivers			
Lenovo 0.5m LC-LC OM3 MMF Cable	00MN499	ASR5	2
Lenovo 1m LC-LC OM3 MMF Cable	00MN502	ASR6	2
Lenovo 3m LC-LC OM3 MMF Cable	00MN505	ASR7	2
Lenovo 5m LC-LC OM3 MMF Cable	00MN508	ASR8	2
Lenovo 10m LC-LC OM3 MMF Cable	00MN511	ASR9	2
Lenovo 15m LC-LC OM3 MMF Cable	00MN514	ASRA	2
Lenovo 25m LC-LC OM3 MMF Cable	00MN517	ASRB	2

Description	Part number	Feature code	Quantity per adapter
Lenovo 30m LC-LC OM3 MMF Cable	00MN520	ASRC	2
SFP+ passive direct-attach cables - 10 GbE			
Lenovo 0.5m Passive SFP+ DAC Cable	00D6288	A3RG	2
Lenovo 1m Passive SFP+ DAC Cable	90Y9427	A1PH	2
Lenovo 1.5m Passive SFP+ DAC Cable	00AY764	A51N	2
Lenovo 2m Passive SFP+ DAC Cable	00AY765	A51P	2
Lenovo 3m Passive SFP+ DAC Cable	90Y9430	A1PJ	2
Lenovo 5m Passive SFP+ DAC Cable	90Y9433	A1PK	2
Lenovo 7m Passive SFP+ DAC Cable	00D6151	A3RH	2

Hypervisors

The Lenovo Converged HX Series appliances support the following hypervisors:

- Nutanix Acropolis Hypervisor (AHV)
- VMware ESXi 5.5 Update 2
- VMware ESXi 5.5 Update 3
- VMware ESXi 6.0 Update 1

Notes:

- The Lenovo Converged HX Series appliances come standard with the Acropolis Hypervisor preloaded.
- VMware ESXi hypervisors are supported as a field-installable option.

Software

The Lenovo Converged HX Series appliances can be configured with one of the Nutanix Software editions that are listed in the following table. The Starter edition is factory-preloaded and the appropriate license can be downloaded from the Nutanix website to match the serial number of the appliance.

Table 13. Nutanix software options

Description	Quantity
Nutanix Starter Edition	1
Nutanix Pro Edition (default selection)	1
Nutanix Ultimate Edition	1

The Starter edition offers the core set of Nutanix software functionality. This edition is ideal for small-scale deployments with a limited set of workloads.

The Pro edition offers rich data services, along with resilience and management features. This edition is ideal for enterprises running multiple applications on a Nutanix cluster or with large-scale single workload deployments.

The Ultimate edition offers the full suite of Nutanix software capabilities to tackle complex infrastructure challenges. This edition is ideal for multi-site deployments.

The following table compares features of the Nutanix software editions.

Table 14. Nutanix software editions feature comparison

Feature	Nutanix software edition		
	Starter	Pro	Ultimate
Enterprise storage			
Cluster size	12 nodes max	Unlimited	Unlimited
Heterogeneous clusters	Yes	Yes	Yes
VM-centric snapshots and clones	Yes	Yes	Yes
Volume groups	Yes	Yes	Yes
Data tiering	Yes	Yes	Yes
Inline compression	Yes	Yes	Yes
Inline performance deduplication	Yes	Yes	Yes
MapReduce compression	No	Yes	Yes
MapReduce deduplication	No	Yes	Yes
Erasur Coding (EC-X)	No	Yes	Yes
VM Flash Mode (Pin to SSD)	No	No	Yes
Infrastructure resilience			
Data path redundancy	Yes	Yes	Yes
Redundancy factor	2 (Fixed)	2 or 3 (Tunable)	2 or 3 (Tunable)
Availability domains	No	Yes	Yes
Data protection			
1-1 Replication and disaster recovery (DR)	Yes	Yes	Yes
Bi-directional replication and DR	Yes	Yes	Yes
Online cluster grow/shrink	Yes	Yes	Yes
VSS integration	No	Yes	Yes
Time Stream (Converged local backups)	No	Yes	Yes
Cloud Connect (Backup to public clouds)	No	Yes	Yes
Multiple site DR (1-to many, many-to 1)	No	No	Yes
Metro availability	No	No	Yes
Security			
Client authentication	Yes	Yes	Yes
Cluster lockdown	No	Yes	Yes
Management and analytics			
Prism Element (Single-cluster management)	Yes	Yes	Yes
Pulse (Automated service agent)	Yes	Yes	Yes
Cluster health	Yes	Yes	Yes
One-click upgrades (Nutanix OS and Hypervisor)	Yes	Yes	Yes
Prism Central (Multi-cluster management)	No	Yes	Yes
Rest APIs	No	Yes	Yes
Virtualization			
vSphere support	Yes	Yes	Yes
Built-in Acropolis Hypervisor	Yes	Yes	Yes

Feature	Nutanix software edition		
	Starter	Pro	Ultimate
VM operations	Yes	Yes	Yes
Intelligent VM placement	Yes	Yes	Yes
Virtual network configuration	Yes	Yes	Yes
Host profiles	Yes	Yes	Yes
VM high availability	Yes	Yes	Yes

Systems management

The Lenovo Converged HX Series appliances support the following systems management tools:

- Integrated Management Module
- Light path diagnostics
- XClarity Administrator
- Nutanix Prism

Integrated Management Module

The Converged HX Series appliances contain Integrated Management Module II (IMM2.1), which provides advanced service-processor control, monitoring, and an alerting function. If an environmental condition exceeds a threshold or if a system component fails, the IMM2 lights LEDs to help you diagnose the problem, records the error in the event log, and alerts you to the problem. The Integrated Management Module Advanced Upgrade comes standard with the appliances, and it provides a virtual presence for remote management capabilities of the appliances.

The IMM provides remote appliance management through industry-standard interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3
- Common Information Model (CIM)
- Web browser

The remote presence feature provides the following functions:

- Remotely viewing video with graphics resolutions up to 1600x1200 at 75 Hz with up to 23 bits per pixel colors, regardless of the system state
- Remotely accessing the appliance using the keyboard and mouse from a remote client
- Mapping the CD or DVD drive, diskette drive, and USB flash drive on a remote client, and mapping ISO and diskette image files as virtual drives that are available for use by the appliance
- Uploading a diskette image to the IMM memory and mapping it to the appliance as a virtual drive

Light path diagnostics

All appliances include basic light path diagnostics, which include system LEDs on the front of the appliance and LEDs near the monitored components (for example, the DIMM error LED on the system board).

The Lenovo Converged HX3500 and HX5500 appliances also include a next-gen light path diagnostics LCD display panel. With LCD display, you have quick access to system status, firmware, network, and health information.

XClarity Administrator

Lenovo XClarity is a centralized systems management solution that helps administrators deliver infrastructure faster. This solution integrates easily with Lenovo System x M5 and X6 rack servers, Converged HX Series appliances, and Flex System, providing automated agent-less discovery, monitoring, firmware updates, configuration management, and bare metal deployment of operating systems and hypervisors across multiple systems.

Lenovo XClarity is an optional software component for the Lenovo Converged HX Series appliances which can be used to manage firmware upgrades outside of the Nutanix Prism software.

The following table lists the Lenovo XClarity software options.

Notes:

- When the required edition of Lenovo XClarity software is selected in the configurator, the appropriate software option will be derived automatically based on the duration of a selected warranty period.
- The default selection is Lenovo XClarity Pro.

Table 15. Lenovo XClarity software options

Description	Quantity
Lenovo XClarity Administrator, per Mngd Server w/3 Yr SW S&S	1
Lenovo XClarity Administrator, per Mngd Server w/5 Yr SW S&S	1
Lenovo XClarity Pro, per Mngd Server w/3 Yr SW S&S	1
Lenovo XClarity Pro, per Mngd Server w/5 Yr SW S&S	1

Lenovo XClarity Administrator offers the following features:

- Auto-discovery and monitoring of Converged HX Series appliances, System x servers, and Flex System chassis, nodes and I/O modules
- Firmware updates and compliance enforcement
- Pattern-based configuration management that allows to define configurations once and apply repeatedly without errors when deploying new servers or redeploying existing servers without disrupting the fabric
- External alerts and notifications via SNMP traps, syslog remote logging, and e-mail
- Secure connections to managed endpoints
- NIST 800-131A or FIPS 140-2 compliant cryptographic standards between the management solution and managed endpoints
- Integration into existing higher level management systems such as cloud automation and orchestration tools through REST APIs, providing extensive external visibility and control over hardware resources
- An intuitive, easy-to-use GUI
- Scripting support with Windows PowerShell, providing command-line visibility and control over hardware resources

Lenovo XClarity Pro includes Lenovo XClarity Administrator and two software plug-in modules:

- Lenovo XClarity Integrator for Microsoft System Center
- Lenovo XClarity Integrator for VMware vCenter

Lenovo XClarity Pro delivers all the features of Lenovo XClarity Administrator, while also allowing administrators to manage physical infrastructure from leading external virtualization management software tools from Microsoft and VMware.

Lenovo XClarity Pro offers the following additional features:

- Ability to discover, manage, and monitor Lenovo server hardware from VMware vCenter or Microsoft System Center
- Deployment of firmware updates and configuration patterns to System x M5 and X6 rack servers, Converged HX Series appliances, and Flex System from the virtualization management tool
- Non-disruptive server maintenance in clustered environments that reduces workload downtime by dynamically migrating workloads from affected hosts during rolling server updates or reboots
- Greater service level uptime and assurance in clustered environments during unplanned hardware events by dynamically triggering workload migration from impacted hosts when impending hardware failures are predicted

Nutanix Prism

Nutanix Prism 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 datacenter eliminating the need to have disparate management solutions. Nutanix Prism is a part of the Nutanix software preloaded on the appliances.

Nutanix Prism offers the following features:

- Single point of control
 - Accelerates enterprise-wide deployment
 - Manages capacity centrally
 - Adds nodes in minutes
 - Supports non-disruptive software upgrades with zero downtime
 - Integrates with REST APIs and PowerShell
- Monitoring and alerting
 - Tracks infrastructure utilization (storage, processor, memory)
 - Centrally monitors multiple clusters across multiple sites
 - Monitors per-VM performance and resource usage
 - Checks system health
 - Generates alerts and notifications
- Integrated data protection
 - Offers customizable RPO/RTO and retention policies
 - Supports configurable per-VM replication (1:1, 1:many and many:1)
 - Provides efficient VM recovery
 - Deploys affordable DR and backup to the cloud
- Diagnostics and troubleshooting
 - Provides time-based historical views of VM activity
 - Performs proactive alert analysis
 - Correlates alerts and events to quickly diagnose issues
 - Generates actionable alerts and reduces resolution times
 - Analyzes trending patterns for accurate capacity planning

Physical specifications

The Lenovo Converged HX Series appliances have the following dimensions and weight (approximate):

- Height: 87 mm (3.4 in.)
- Width: 446 mm (17.5 in.)
- Depth: 800 mm (31.5 in.)
- Weight (maximum): 34 kg (75 lb)

Operating environment

The Lenovo Converged HX Series appliances are supported in the following environment:

- Air temperature:
 - System on: 5 °C to 40 °C (41 °F to 104 °F); altitude: 0 to 950 m (3,117 ft); decrease the maximum system temperature by 1 °C for every 175-m increase in altitude above 950 m.
 - System off: 5 °C to 45 °C (41 °F to 113 °F)
 - Shipment: -40 °C to +60 °C (-40 °F to 140 °F) at up to 10,700 m (35,105 ft)
- Maximum altitude: 3,050 m (10,000 ft) at 5 °C to 28 °C (41 °F to 82 °F)
- Humidity:
 - System on: 8% to 85%, maximum dew point 24 °C, maximum rate of change 5 °C/hr
 - System off: 8% to 85%, maximum dew point 27 °C
- Design to ASHRAE Class A3, ambient of 36 °C to 40 °C (96.8 °F to 104 °F), with relaxed support:
 - Supports cloud-like workload with no performance degradation acceptable (Turbo-Off).
 - Under no circumstance can any combination of worst-case workload and configuration result in system shutdown or design exposure at 40 °C.
 - The worst-case workload (like Linpack, Turbo-On) might have performance degradation.
- Electrical:
 - 100 to 127 (nominal) V AC; 50 Hz or 60 Hz; 10.0 A
 - 200 to 240 (nominal) V AC; 50 Hz or 60 Hz; 5.0 A
 - Input kilovolt-amperes (kVA) (approximately): 1.194 kVA
- BTU output (maximum): 4073 Btu/hr (1194 watts)
- Noise level:
 - 6.6 bels (operating)
 - 6.4 bels (idle)

Regulatory compliance

The Lenovo Converged HX Series appliances conform to the following regulations:

- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 5, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 60950-1
- NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22, Class A; AS/NZS 60950.1
- China CCC GB4943.1, GB9254 Class A, GB17625.1
- Taiwan BSMI CNS13438, Class A; CNS14336-1
- Korea KN22, Class A; KN24
- Russia, Belorussia and Kazakhstan, TR CU 020/2011 (for EMC) and TR CU 004/2011 (for safety)
- IEC 60950-1 (CB Certificate and CB Test Report)
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
- TUV-GS (EN60950-1 /IEC60950-1,EK1-ITB2000)
- RoHS Directive

Hardware warranty

The Lenovo Converged HX Series appliances can be configured with a three-year or five-year hardware warranty and software support with 24x7 standard call center support and various levels of onsite coverage with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

The Lenovo local support centers perform problem determination and resolution for hardware-related issues and escalate to Nutanix, on behalf of the customer, for software-related problem determination. Nutanix will contact the customer and will own the software-related problem resolution until closure.

Note: Lenovo warranty service coverage levels are region-specific. Not all warranty service levels are available in every region.

The following table explains warranty service definitions in more detail.

Table 16. Warranty service definitions

Term	Description
On-site service	A service technician will arrive at the client's location for equipment service.
24x7x2 hour	A service technician is scheduled to arrive at the client's location within two hours after remote problem determination is completed. Lenovo provides service around the clock, every day, including Lenovo holidays.
24x7x4 hour	A service technician is scheduled to arrive at the client's location within four hours after remote problem determination is completed. Lenovo provides service around the clock, every day, including Lenovo holidays.
9x5x4 hour	A service technician is scheduled to arrive at the client's location within four business hours after remote problem determination is completed. Lenovo provides service 8:00 am - 5:00 pm in the client's local time zone, Monday-Friday, excluding Lenovo holidays. For example, if a customer reports an incident at 3:00 pm on Friday, the technician will arrive by 10:00 am the following Monday.
9x5 next business day	A service technician is scheduled to arrive at the client's location on the business day after remote problem determination is completed. Lenovo provides service 8:00 am - 5:00 pm in the client's local time zone, Monday - Friday, excluding Lenovo holidays. Calls received after 4:00 pm local time require an extra business day for service dispatch. Next business day service is not guaranteed.
Committed Repair	Problems receive priority handling so that repairs are completed within the committed time of 6, 8, or 24 hours. Lenovo provides service 24 hours a day, every day, including Lenovo holidays.

In general, the following Lenovo warranty service levels are available for the Converged HX Series appliances:

- Three or five years of 9x5 or 24x7 service coverage
- Onsite response from next business day to 4 or 2 hours
- Committed repair service
 - Priority handling to meet defined time frames to restore the failing machine to good working condition
 - Committed repair service levels are measured within the following coverage hours:
 - 24x7x6: Service performed 24 hours per day, 7 days per week, within 6 hours
 - 24x7x8: Service performed 24 hours per day, 7 days per week, within 8 hours
 - 24x7x24: Service performed 24 hours per day, 7 days per week, within 24 hours

- Hard Disk Drive Retention (HDDR)

Lenovo's Hard Drive Retention service is a multi-drive hard drive retention offering that ensures your data is always under your control, regardless of the number of hard drives that are installed in your Lenovo appliance. In the unlikely event of a hard drive failure, you retain possession of your hard drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands.

Software maintenance

The Lenovo Converged HX Series appliances include a three-year or five-year software support and subscription (matches the duration of the selected hardware warranty period) that entitles you to submit service requests to troubleshoot Nutanix software issues and receive code updates, including fixes, patches, and new software releases.

The Lenovo local support centers perform problem determination and resolution for hardware-related issues and escalate to Nutanix, on behalf of the customer, for software-related problem determination. Nutanix will contact the customer and will own the software-related problem resolution until closure.

Software support that is provided by Nutanix includes 24x7 phone and web coverage with the following target response times (priorities are assigned by Nutanix based on the impact on productivity):

- Priority 1 (Emergency: Productivity halted): 2 hours
- Priority 2 (Critical: Significant impact on productivity): 4 hours
- Priority 3 (Normal: Minimal impact on productivity): 8 hours (by next business day)

Top-of-rack Ethernet switches

The following table lists the top-of-rack Ethernet switches that are offered by Lenovo that can be used in Lenovo Converged HX Series solutions.

Table 17. Top-of-rack Ethernet switches

Description	Part number	Feature code
1 Gb Ethernet top-of-rack switches (IPMI management ports connectivity)		
Lenovo RackSwitch G7028 (Rear to Front)	7159BAX	AT09
Lenovo RackSwitch G7052 (Rear to Front)	7159CAX	AT0A
Lenovo RackSwitch G8052 (Rear to Front)	7159G52	ASY2
10 Gb Ethernet top-of-rack switches (10 GbE physical host ports connectivity)		
Lenovo RackSwitch G8124E (Rear to Front)	7159BR6	AT0B
Lenovo RackSwitch G8272 (Rear to Front)	7159CRW	ASRD
Lenovo RackSwitch G8296 (Rear to Front)	7159GR6	ASVM
40 Gb Ethernet top-of-rack switches (40 GbE aggregation layer)		
Lenovo RackSwitch G8332 (Rear to Front)	7159BRX	ASY4

For more information, see the list of Product Guides in the Top-of-rack Switches category:

<http://lenovopress.com/servers/options/switches>

Rack cabinets

The following table lists the rack cabinets that are offered by Lenovo that can be used in Lenovo Converged HX Series solutions.

Table 18. Rack cabinets

Description	Part number	Feature code
11U Rack Office Enablement Kit	201886X	2731
25U S2 Standard Rack	93072RX	1042
25U Static S2 Standard Rack	93072PX	6690
42U S2 Standard Rack	93074RX	1043
42U 1100mm Enterprise V2 Dynamic Rack	93634PX	A1RC
42U 1100mm Enterprise V2 Dynamic Expansion Rack	93634EX	A1RD
42U 1200mm Deep Dynamic Rack	93604PX	7649
42U 1200mm Deep Static Rack	93614PX	7651
42U Enterprise Rack	93084PX	5621
42U Enterprise Expansion Rack	93084EX	5622

For more information, see the list of Product Guides in the Rack Cabinets category:
<http://lenovopress.com/servers/options/racks>

Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo that can be used in Lenovo Converged HX Series solutions.

Table 19. Power distribution units

Description	Part number	Feature code
0U Basic PDUs		
0U 24 C13 16A 3 Phase PDU with IEC 309 P+N+Gnd line cord	46M4122	5922
0U 24 C13 30A 3 Phase PDU with NEMA L21-30P line cord	46M4125	5923
0U 24 C13 30A PDU with NEMA L6-30P line cord	46M4128	5924
0U 24 C13 32A PDU with IEC 309 P+N+Gnd line cord	46M4131	5925
0U 12 C19/12 C13 32A 3 Phase PDU with IEC 309 3P+N+Gnd line cord	46M4143	5927
0U 12 C19/12 C13 60A 3 Phase PDU with CS8365L 3P+Gnd line cord	46M4140	5926
Switched and Monitored PDUs		
1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord)	46M4002	5896
1U 9 C19/3 C13 Switched and Monitored 60A 3Ph PDU with IEC 309 3P+Gnd cord	46M4003	5897
1U 12 C13 Switched and Monitored DPI PDU (without line cord)	46M4004	5894
1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord	46M4005	5895
0U 24 C13 Switched and Monitored 30A PDU with NEMA L6-30P line cord	46M4116	5929
0U 24 C13 Switched and Monitored 32A PDU with IEC 309 P+N+Gnd line cord	46M4119	5930
0U 12 C19/12 C13 Switched and Monitored 32A 3Ph PDU with IEC 309 3P+N+G cord	46M4137	5932
0U 12 C19/12 C13 Switched and Monitored 50A 3Ph PDU with CS8365L 3P+Gnd cord	46M4134	5931

Description	Part number	Feature code
Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)		
Ultra Density Enterprise C19/C13 PDU Module (without line cord)	71762NX	6050
Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord	71763NU	6051
C13 Enterprise PDUs (12x IEC 320 C13 outlets)		
DPI C13 Enterprise PDU+ (without line cord)	39M2816	6030
DPI Single Phase C13 Enterprise PDU (without line cord)	39Y8941	6010
C19 Enterprise PDUs (6x IEC 320 C19 outlets)		
DPI Single Phase C19 Enterprise PDU (without line cord)	39Y8948	6060
DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord	39Y8923	6061
Front-end PDUs (3x IEC 320 C19 outlets)		
DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord	39Y8938	6002
DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord	39Y8939	6003
DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8934	6005
DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8940	6004
DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8935	6006
Universal PDUs (7x IEC 320 C13 outlets)		
DPI Universal Rack PDU with US LV and HV line cords	39Y8951	5951
DPI Universal Rack PDU with CEE7-VII Europe line cord	39Y8952	5969
DPI Universal Rack PDU with Denmark line cord	39Y8953	5970
DPI Universal Rack PDU with Israel line cord	39Y8954	5956
DPI Universal Rack PDU with Italy line cord	39Y8955	5971
DPI Universal Rack PDU with South Africa line cord	39Y8956	5958
DPI Universal Rack PDU with UK line cord	39Y8957	5972
DPI Universal Rack PDU with AS/NZ line cord	39Y8958	5973
DPI Universal Rack PDU with China line cord	39Y8959	5974
DPI Universal Rack PDU (Argentina)	39Y8962	5952
DPI Universal Rack PDU (Brazil)	39Y8960	5953
DPI Universal Rack PDU (India)	39Y8961	5962
NEMA PDUs (6x NEMA 5-15R outlets)		
DPI 100-127V PDU with Fixed NEMA L5-15P line cord	39Y8905	5900
Line cords for PDUs that ship without a line cord		
DPI 32a Line Cord (IEC 309 3P+N+G)	40K9611	6504
DPI 32a Line Cord (IEC 309 P+N+G)	40K9612	6502
DPI 63a Cord (IEC 309 P+N+G)	40K9613	6503
DPI 30a Line Cord (NEMA L6-30P)	40K9614	6500
DPI 60a Cord (IEC 309 2P+G)	40K9615	6501
DPI Australian/NZ 3112 Line Cord	40K9617	6505

For more information, see the list of Product Guides in the Power Distribution Units category:
<http://lenovopress.com/servers/options/pdu>

Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are offered by Lenovo that can be used in Lenovo Converged HX Series solutions.

Table 20. Uninterruptible power supply units

Description	Part number	Feature code
RT1.5kVA 2U Rack or Tower UPS (100-125VAC)	55941AX	A53S
RT1.5kVA 2U Rack or Tower UPS (200-240VAC)	55941KX	A53T
RT2.2kVA 2U Rack or Tower UPS (100-125VAC)	55942AX	A53U
RT2.2kVA 2U Rack or Tower UPS (200-240VAC)	55942KX	A53V
RT3kVA 2U Rack or Tower UPS (100-125VAC)	55943AX	A53W
RT3kVA 2U Rack or Tower UPS (200-240VAC)	55943KX	A53X
RT5kVA 3U Rack or Tower UPS (200-240VAC)	55945KX	A540
RT6kVA 3U Rack or Tower UPS (200-240VAC)	55946KX	A541
RT8kVA 6U Rack or Tower UPS (200-240VAC)	55948KX	A543
RT11kVA 6U Rack or Tower UPS (200-240VAC)	55949KX	A544
RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)	55948PX	A546
RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)	55949PX	A547

For more information, see the list of Product Guides in the Uninterruptible Power Supply Units category: <http://lenovopress.com/servers/options/ups>

Lenovo Financial Services

Lenovo Financial Services reinforces Lenovo's commitment to deliver pioneering products and services that are recognized for their quality, excellence, and trustworthiness. Lenovo Financial Services offers financing solutions and services that complement your technology solution anywhere in the world.

We are dedicated to delivering a positive finance experience for customers like you who want to maximize your purchase power by obtaining the technology you need today, protect against technology obsolescence, and preserve your capital for other uses.

We work with businesses, non-profit organizations, governments and educational institutions to finance their entire technology solution. We focus on making it easy to do business with us. Our highly experienced team of finance professionals operates in a work culture that emphasizes the importance of providing outstanding customer service. Our systems, processes and flexible policies support our goal of providing customers with a positive experience.

We finance your entire solution. Unlike others, we allow you to bundle everything you need from hardware and software to service contracts, installation costs, training fees, and sales tax. If you decide weeks or months later to add to your solution, we can consolidate everything into a single invoice.

Our Premier Client services provide large accounts with special handling services to ensure these complex transactions are serviced properly. As a premier client, you have a dedicated finance specialist who manages your account through its life, from first invoice through asset return or purchase. This specialist develops an in-depth understanding of your invoice and payment requirements. For you, this dedication provides a high-quality, easy, and positive financing experience.

For your region specific offers please ask your Lenovo sales representative or your technology provider about the use of Lenovo Financial Services. For more information, see the following Lenovo website: <http://www.lenovofs.com>

Related publications and links

For more information, see these resources:

- Lenovo Converged HX Series appliances product page
<https://www3.lenovo.com/us/en/data-center/converged-systems/hx-series/Lenovo-Converged-HX-Series/p/WMD00000036>
- US Announcement Letter - January 19, 2016
<http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&htmlfid=897/ENUS116-007>
- System x and Cluster Solutions Configurator (x-config)
<http://lesc.lenovo.com/products/hardware/configurator/worldwide/bhui/asit/>
- Nutanix documentation
<http://portal.nutanix.com/#/page/docs>
- Support Portal - Lenovo Converged HX Series appliances
<http://support.lenovo.com/products/servers/lenovo-x86-servers/lenovo-converged-hx-series>

Related product families

Product families related to this document are the following:

- [Hyperconverged Infrastructure](#)
- [Hyperconverged Infrastructure](#)
- [Nutanix Alliance](#)
- [ThinkAgile HX Series for Nutanix](#)

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
8001 Development Drive
Morrisville, NC 27560
U.S.A.

Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

© Copyright Lenovo 2024. All rights reserved.

This document, LP0059, was created or updated on October 8, 2018.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
<https://lenovopress.lenovo.com/LP0059>
- Send your comments in an e-mail to:
comments@lenovopress.com

This document is available online at <https://lenovopress.lenovo.com/LP0059>.

Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at <https://www.lenovo.com/us/en/legal/copytrade/>.

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo®
Flex System
RackSwitch
System x®
ThinkAgile®
TruDDR4
XClarity®

The following terms are trademarks of other companies:

Intel® and Xeon® are trademarks of Intel Corporation or its subsidiaries.

Microsoft®, PowerShell, Windows PowerShell®, and Windows® are trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.