Lenovo ThinkAgile HX2720-E Appliance
Product Guide (withdrawn product)

Lenovo ThinkAgile HX Series 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 that feature Intel Xeon Processor Scalable Family.

The ThinkAgile HX Series Express appliances are tailored specifically for various types of workloads for small and medium sized businesses. The HX Series Express appliances include leading edge Nutanix Xpress software to deliver a simplified, cost effective solution that helps lower total-cost-of-ownership and enables smaller organizations to focus less time on infrastructure management.

The ThinkAgile HX2720-E Express appliances are dense nodes in the 2U 4-node (2U4N) rack-mount enclosures, and each node supports one or two processors, up to 384 GB of 2666 MHz TruDDR4 memory, 6x SAS/SATA SFF hot-swap drive bays with an extensive choice of SAS/SATA SSDs and HDDs, and flexible network connectivity options with 1/10 GbE RJ-45, 10 GbE SFP+, and 10/25 GbE SFP28 ports.

The ThinkAgile HX2720-E appliances are shown in the following figure.

Figure 1. Lenovo ThinkAgile HX2720-E Appliances in the HX Series enclosure

Did you know?

The ThinkAgile HX Series appliances are built on industry-leading Lenovo ThinkSystem servers that feature enterprise-class reliability, management, and security.

The ThinkAgile HX Series appliances offer ThinkAgile Advantage Single Point of Support for quick 24/7 problem reporting and resolution.

Key features

The ThinkAgile HX Series appliances offer the following key features:

- Factory-integrated, pre-configured ready-to-go appliances built on proven and reliable Lenovo ThinkSystem servers that provide compute power for a variety of workloads and applications and powered by industry's most feature-rich hyperconverged infrastructure software from Nutanix.
- Provide quick and convenient path to implement a hyperconverged solution powered by Nutanix with "one stop shop" and a single point of contact provided by Lenovo for purchasing, deploying, and supporting the solution.
- Meet various workload demands with cost-efficient hybrid or performance-optimized all-flash storage configurations.
- Deliver fully validated and integrated hardware and firmware that is certified with Nutanix software.
- Include Lenovo ThinkAgile Advantage Single Point of Support for quick 24/7 problem reporting and resolution.
- Offer Lenovo deployment services to get customers up and running quickly.

The Nutanix software running on the HX Series appliances deliver the following key features:

- A natively integrated solution for data protection and continuous availability at VM granularity that gives administrators an affordable range of options to meet the recovery point objectives (RPO) and recovery time objectives (RTO) for different applications.
- A fault resistant platform, with no single point of failure and no bottlenecks with shared-nothing architecture, where all data, metadata and services are distributed to all nodes within the cluster, that is built to detect, isolate and recover from failures anywhere in the system.
- An intuitive user-centric management experience to simplify every aspect of the IT infrastructure lifecycle and provide a single pane of glass to monitor and control Nutanix clusters, with simplified workflows and rich automation for common administrative tasks.
- Powerful security features, such as two-factor authentication, with a security development lifecycle that is integrated into product development to help customers meet the most stringent security requirements.

Components and connectors

The following figure shows the front view of the ThinkAgile HX Series enclosure with up to four HX2720-E appliance nodes.
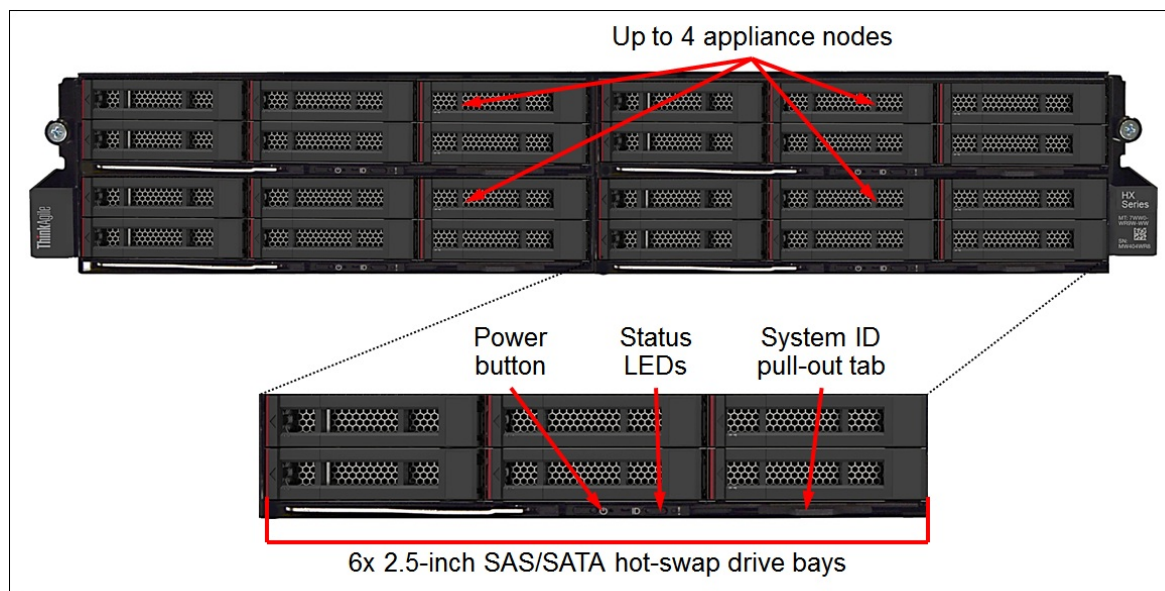

Figure 2. HX Series enclosure with up to four HX2720-E appliances front view

The front of the HX Series Enclosure contains up to four HX2720-E appliances, and each appliance includes the following components:

- 6x SAS/SATA SFF hot-swap drive bays
- A Power button
- Status LEDs that display the status of the system
- A System ID pull-out tab that contains system identification information

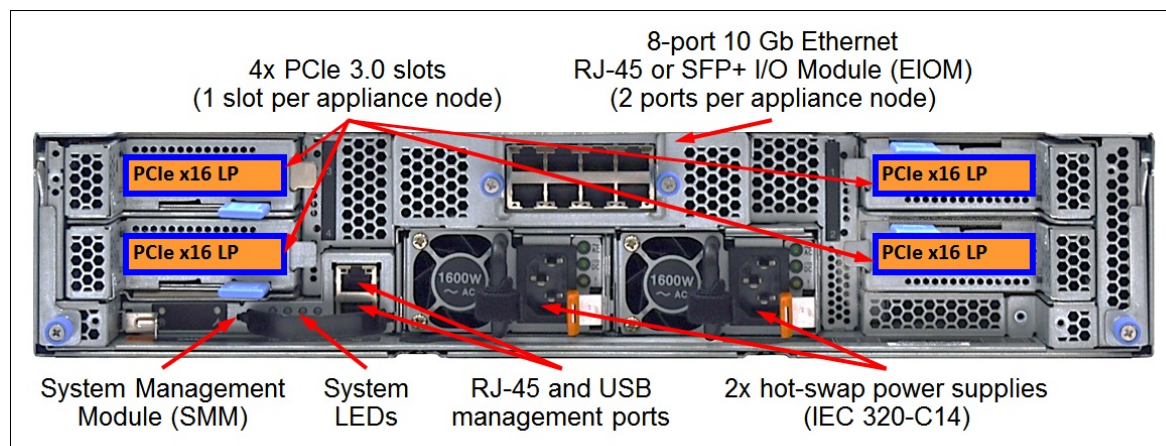The following figure shows the rear view of the HX Series enclosure.

Figure 3. HX Series enclosure rear view

The rear of the HX Series Enclosure includes the following components:

- Four PCIe expansion slots (One slot per node)
- Eight 10 GbE RJ-45 or SFP+ network ports
- A System Management Module
    - One 1 GbE management port
    - One USB port
    - Status LEDs that display the status of the system
- Two hot-swap power supplies

System specifications

The following table lists the system specifications of the ThinkAgile HX2720-E appliance.

Table 1. HX2720-E appliance specifications

Attribute	Specification
Form factor	HX2720-E: Half-wide, 1U node; up to four nodes per HX Series enclosure. HX Series enclosure: 2U Four-node (2U4N) rack-mount.
Processor	One or two Intel Xeon Silver processors.
Chipset	Intel C624.
Memory	Up to 12 DIMMs. Support for 8 GB, 16 GB, and 32 GB TruDDR4 2666 MHz RDIMMs.
Memory capacity	Up to 384 GB with 12x 32 GB RDIMMs.
Memory protection	Error correction code (ECC), Single Device Data Correction (SDDC; for x4-based memory DIMMs), patrol scrubbing, and demand scrubbing.
Drive bays	6x 2.5-inch SAS/SATA hot-swap.
Internal storage	- Hybrid: 1 cache SSD and from 4 to 5 capacity HDDs. 2 cache SSDs and 4 capacity HDDs. - All Flash: From 4 to 6 SSDs in increments of 1 drive.

Attribute	Specification

Drive capacities	• SSDs:
	   ◦ 12 Gbps SAS SSDs up to 1.6 TB.
	   ◦ 6 Gbps SATA SSDs up to 1.92 TB.
	• HDDs: 6 Gbps NL SATA HDDs up to 2 TB.
	
	Note: All SSDs in the appliance must be of the same model and capacity. All HDDs in the appliance must be of the same model and capacity.

Storage capacity	• Hybrid: Up to 10 TB (HDDs). • All Flash: Up to 11.52 TB (SSDs).
Storage controller	1x 430-8i Dense HBA (12 Gbps SAS/6 Gbps SATA).
Network interfaces	• 2x base 1/10 GbE RJ-45 or 10 GbE SFP+ network ports. • 2x optional 1/10 GbE RJ-45, 10 GbE SFP+ or 25 GbE SFP28 expansion ports. • 1x Ethernet RJ-45 port for systems management (in the HX Series enclosure).
Boot drive	2x 128 GB M.2 non-hot-swap SSDs (RAID-1).

I/O expansion slots	• One PCIe 3.0 x8 on the system board (for an internal storage controller).
	• One PCIe 3.0 x16 slot per node in the HX Enclosure with the PCIe x16 I/O shuttle:
	   ◦ Slot 1 (Node 1): PCIe 3.0 x16 low-profile (for a network adapter).
	   ◦ Slot 2 (Node 2): PCIe 3.0 x16 low-profile (for a network adapter).
	   ◦ Slot 3 (Node 3): PCIe 3.0 x16 low-profile (for a network adapter).
	   ◦ Slot 4 (Node 4): PCIe 3.0 x16 low-profile (for a network adapter).

Cooling	Five hot-swap system fans in the enclosure.
Power supply	Two redundant hot-swap 2000 W (200 - 240 V) Platinum power supplies in the enclosure.
Video	Matrox G200 with 16 MB memory integrated into the XClarity Controller. Maximum resolution is 1920x1200 at 60 Hz with 16 bits per pixel
Hot-swap parts	SSDs, HDDs, power supplies, and fans.
Systems management	XClarity Controller (XCC) Enterprise (Pilot 4 chip), proactive platform alerts, XClarity Provisioning Manager, XClarity Administrator and XClarity Pro, XClarity Integrator for Nutanix (optional). XClarity Energy Manager (optional).
Security features	Power-on password, administrator's password, Trusted Platform Module (TPM) 1.2 or 2.0 (configurable UEFI setting).
Software	Nutanix Acropolis: Xpress edition.
Hypervisors	• Nutanix Acropolis Hypervisor (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).
Hardware warranty	Three-year or five-year customer-replaceable unit and onsite limited warranty with ThinkAgile Advantage Support and selectable service levels: 9x5 next business day (NBD) parts delivered, 9x5 NBD onsite response, 24x7 coverage with 2-hour or 4-hour onsite response, or 6-hour or 24-hour committed repair (select countries). Also available are 1-year or 2-year post-warranty extensions, Your Drive Your Data, and Premier Support.
Software maintenance	Three-year or five-year software support and subscription (matches the duration of the selected warranty period).
Dimensions	• Enclosure: Height: 87 mm (3.4 in.), width: 448 mm (17.6 in.), depth: 834 mm (32.8 in.). • Node: Height: 41 mm (1.6 in.), width: 222 mm (8.7 in.), depth: 562 mm (21.1 in.).
Weight	• Enclosure (maximum configuration, with four nodes): 55.0 kg (121.3 lb). • Node (maximum configuration): 7.5 kg (16.5 lb).

Factory-integrated models

Product availability: The ThinkAgile HX2720-E appliances are withdrawn and no longer available for ordering.

Factory-integrated models of the ThinkAgile HX Series appliances are configured by using the Lenovo Data Center Solution Configurator (DCSC):
http://dcsc.lenovo.com

During the configuration process, you are selecting one of the base Configure-to-Order (CTO) models first, and then you are adding components (processors, memory, drives, and network adapters) 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 ThinkAgile HX Series appliances.

The following table lists the base CTO models of the ThinkAgile HX2720-E appliance and enclosure.

Table 2. Base CTO models

Description	Machine Type/Model
ThinkAgile HX2720-E Appliance	7X82CTO1WW
ThinkAgile HX Series Enclosure	7X81CTO1WW

The following table lists the base chassis for the HX2720-E appliance.

Table 3. Base chassis

Description	Feature code
ThinkAgile HX2720-E Appliance	B0SX

The HX2720-E appliances ship with the following items:

- *Electronic Publications Flyer*
- D2 Tool-less Slide Rail Kit with CMA (enclosure only)
- Two customer-selected power cables (enclosure only)

Processors

The ThinkAgile HX2720-E appliance ships with one or two processors. The following table lists the processor options that are available for selection.

Table 4. Processor selection options

Description	Feature code	Quantity (min / max)
Intel Xeon Silver processors		
Intel Xeon Silver 4108 8C 85W 1.8GHz Processor	AXQZ	1 / 2
Intel Xeon Silver 4114 10C 85W 2.2GHz Processor	AXQT	1 / 2
Intel Xeon Silver 4116 12C 85W 2.1GHz Processor	AXNZ	1 / 2

The following table lists the specifications of the processors for the appliance.

Table 5. CPU specifications (HT = Hyper-Threading, TB = Turbo Boost, VT = Virtualization Technology)

CPU model	Core frequency (Base / TB Max)	Number of cores / threads	Cache	Max DDR4 frequency	Max memory per socket	UPI speed	TDP	HT	TB	VT-x	VT-d
Intel Xeon Silver processors											
4108	1.8 / 3 GHz	8 / 16	11 MB	2400 MHz	768 GB	9.6 GT/s	85W	Yes	Yes	Yes	Yes
4114	2.2 / 3 GHz	10 / 20	13.75 MB	2400 MHz	768 GB	9.6 GT/s	85W	Yes	Yes	Yes	Yes
4116	2.1 / 3 GHz	12 / 24	16.5 MB	2400 MHz	768 GB	9.6 GT/s	85W	Yes	Yes	Yes	Yes

Memory

The ThinkAgile HX2720-E appliance supports Lenovo TruDDR4 memory. TruDDR4 memory uses the highest-quality components sourced from Tier 1 DRAM suppliers and only memory that meets strict requirements is selected. It is compatibility tested and tuned to maximize performance and reliability.

The HX2720-E supports up to 6 DIMMs with one processor and up to 12 DIMMs with two processors. The following rules apply when selecting the memory configuration:

- The appliance supports up to 384 GB with RDIMMs.
- All DIMMs in the appliance must be of the same capacity.
- All DIMMs in the appliance operate at the same speed up to 2400 MHz, which is determined by the maximum memory speed supported by the specific processor.
  Note: Maximum memory speed can be achieved when Max performance mode is enabled in UEFI.

The following memory protection technologies are supported:

- ECC
- SDDC (for x4-based memory DIMMs)
- Patrol scrubbing
- Demand scrubbing

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

Table 6. Memory selection options

Capacity	Description	Part number	Feature code	Quantity
64 GB	ThinkSystem 16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	7X77A01303	AUNC	4^
96 GB	ThinkSystem 16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	7X77A01303	AUNC	6^
96 GB	ThinkSystem 8GB TruDDR4 2666 MHz (1Rx8 1.2V) RDIMM	7X77A01301	AUU1	12^^
192 GB	ThinkSystem 16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	7X77A01303	AUNC	12^^
384 GB	ThinkSystem 32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	7X77A01304	AUND	12^^

^ Available for selection only in the configurations with one processor.
^^ Available for selection only in the configurations with two processors.

Internal storage

The ThinkAgile HX2720-E appliance provides 6x SAS/SATA SFF hot-swap drive bays for configurable storage capacity, and it contains two internal M.2 SATA non-hot-swap SSDs configured in a RAID-1 drive group for software preload.

The following table lists the internal storage options for the HX2720-E appliance.

Table 7. Internal storage options

Description	Feature code	Quantity
Backplanes		
ThinkSystem SD530 3x2 SAS/SATA Backplane	AUYG	1
M.2 enablement kit		
ThinkSystem M.2 with Mirroring Enablement Kit	AUMV	1

Configuration notes:

- One SAS/SATA backplane and one M.2 with Mirroring Enablement Kit are derived by the configurator.
- The M.2 with Mirroring Enablement Kit is connected to the Intel PCH via the PCIe link, and the kit supports two M.2 SATA SSDs configured in a RAID-1 drive group for software preload.

The following table lists M.2 drive selection options for software preload.

Table 8. Drive options for software preload

Description	Feature code	Quantity
ThinkSystem M.2 CV3 128GB SATA 6Gbps Non-Hot-Swap SSD	AUUV	2

The following table lists the storage controllers for internal storage of the HX2720-E appliance.

Table 9. Controllers for internal storage

Description	Feature code	Quantity
ThinkSystem 430-8i SAS/SATA 12Gb Dense HBA	B0SS	1

Configuration note: A low profile SAS HBA for internal storage are derived by the configurator, and it occupies the internal PCIe slot.

Drives for internal storage

The following tables list the drive selection options for the HX2720-E appliance.

Table 10. Drive selection options: Hybrid configurations

Description	Part number	Feature code	Quantity (min / max)
SSD selection (Cache tier): SAS 12Gb SSDs - PM1635a			
ThinkSystem 2.5" PM1635a 800GB Mainstream SAS 12Gb Hot Swap SSD	7N47A00118	AUMD	1 / 2
ThinkSystem 2.5" PM1635a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	7N47A00119	AVRG	1 / 2
SSD selection (Cache tier): SAS 12Gb SSDs - PM1645			
ThinkSystem 2.5" PM1645 800GB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13653	B4A0	1 / 2
ThinkSystem 2.5" PM1645 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13654	B4A1	1 / 2
SSD selection (Cache tier): SATA 6Gb SSDs - S4600			
ThinkSystem 2.5" Intel S4600 480GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05722	B0ZQ	1 / 2
ThinkSystem 2.5" Intel S4600 960GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05721	B0ZR	1 / 2
ThinkSystem 2.5" Intel S4600 1.92TB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05720	B0ZS	1 / 2
SSD selection (Cache tier): SATA 6Gb SSDs - S4610			
ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13634	B49M	1 / 2
ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13635	B49N	1 / 2
ThinkSystem 2.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13636	B49P	1 / 2
HDD selection (Capacity tier): SATA 6Gb HDDs			
ThinkSystem 2.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD	7XB7A00036	AUUE	4 / 5
ThinkSystem 2.5" 2TB 7.2K SATA 6Gb Hot Swap 512e HDD	7XB7A00037	AUUJ	4 / 5

Table 11. Drive selection options: All Flash configurations

Description	Part number	Feature code	Quantity (min / max)
SAS 12Gb SSDs - PM1635a			
ThinkSystem 2.5" PM1635a 800GB Mainstream SAS 12Gb Hot Swap SSD	7N47A00118	AUMD	4 / 6
ThinkSystem 2.5" PM1635a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	7N47A00119	AVRG	4 / 6
SAS 12Gb SSDs - PM1645			
ThinkSystem 2.5" PM1645 800GB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13653	B4A0	4 / 6
ThinkSystem 2.5" PM1645 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13654	B4A1	4 / 6
SATA 6Gb SSDs - S4600			
ThinkSystem 2.5" Intel S4600 480GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05722	B0ZQ	4 / 6
ThinkSystem 2.5" Intel S4600 960GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05721	B0ZR	4 / 6
ThinkSystem 2.5" Intel S4600 1.92TB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05720	B0ZS	4 / 6
SATA 6Gb SSDs - S4610			
ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13634	B49M	4 / 6
ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13635	B49N	4 / 6
ThinkSystem 2.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13636	B49P	4 / 6
SATA 6Gb SSDs - 5100			
ThinkSystem 2.5" 5100 1.92TB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05762	B10Z	4 / 6

Description	Part number	Feature code	Quantity (min / max)

Configuration notes:

- For hybrid configurations, the HX2720-E appliance supports from 4 to 5 capacity drives (HDDs) depending on the quantity of the cache drives (SSDs):
    - 1 cache drive: From 4 to 5 capacity drives.
    - 2 cache drives: 4 capacity drives.

- For All Flash configurations, the HX2720-E appliance supports from 4 to 6 SSDs in increments of 1 drive.

- All SSDs in the appliance must be of the same model and capacity. All HDDs in the appliance must be of the same model and capacity.

Network connectivity

The ThinkAgile HX2720-E appliances provide base two-port 1/10 GbE RJ-45 or 10 GbE SFP+ network connectivity with the onboard Intel X722 NIC in the appliance and an Ethernet I/O Module (EIOM) installed in the HX Series enclosure. Two additional 1/10 GbE RJ-45, 10 GbE SFP+, or 25 GbE SFP28 expansion ports can be selected, if required.

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

Table 12. Network adapter selection options

Description	Part number	Feature code	Quantity (min / max)
1/10 GbE RJ-45 base ports			
ThinkSystem D2 10Gb 8 port EIOM Base-T RJ-45	7M17A04001	AUYA	0 / 1*
1/10 GbE RJ-45 expansion ports			
Intel X550-T2 Dual Port 10GBase-T Adapter (RJ-45)	00MM860	ATPX	0 / 1
10 GbE SFP+ base ports			
ThinkSystem D2 10Gb 8 port EIOM SFP+	7M17A04000	AUY9	0 / 1*
10 GbE SFP+ expansion ports			
Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter	7ZT7A00537	AUKX	0 / 1
10/25 GbE SFP28 expansion ports			
Mellanox ConnectX-4 Lx 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	01GR250	AUAJ	0 / 1

* Per HX Series enclosure.

Configuration notes:

- One of the 1/10 GbE RJ-45 or 10 GbE SFP+ EIOMs is required for selection, and it provides base network connectivity. Optional expansion ports can be selected, if needed.

- Supported transceivers or DAC cables should be purchased for the SFP+ and SFP28 ports, and UTP Category 6 cables should be purchased for the 10 GbE RJ-45 ports. The maximum number of transceivers or cables that are supported per adapter equals the quantity of the adapter ports, and all adapter ports must have the same type of the transceiver or cable selected.
  The following transceiver and cables can be purchased:

    - UTP cables for 1/10 GbE RJ-45 ports
    - Transceivers and cables for 10 GbE SFP+ ports
    - Transceivers and cables for 25 GbE SFP28 ports

The following table lists cables for the 1/10 GbE RJ-45 ports.

Table 13. Cables for 1/10 GbE RJ-45 ports

Description	Part number	Feature code
UTP Category 6 cables (Green) for 1/10 GbE RJ-45 ports		
0.75m Cat6 Green Cable	00WE123	AVFW
1.0m Cat6 Green Cable	00WE127	AVFX
1.25m Cat6 Green Cable	00WE131	AVFY
1.5m Cat6 Green Cable	00WE135	AVFZ
3m Cat6 Green Cable	00WE139	AVG0
10m Cat6 Green Cable	90Y3718	A1MT

Description	Part number	Feature code
25m Cat6 Green Cable	90Y3727	A1MW

The following table lists transceivers and cables for the 10 GbE SFP+ ports.

Table 14. Transceivers and cables for 10 GbE SFP+ ports

Description	Part number	Feature code
10 GbE SFP+ SR transceivers for 10 GbE SFP+ ports		
Lenovo 10GBASE-SR SFP+ Transceiver	46C3447	5053
Lenovo 10GBASE-LR SFP+ Transceiver (for X710-DA2)	00FE331	B0RJ
Lenovo 10Gb SFP+ LR Transceiver (10GBASE-LR) (for SFP+ EIOM)	90Y9412	A1PM
Optical cables for 10 GbE SFP+ SR transceivers		
Lenovo 0.5m LC-LC OM3 MMF Cable	00MN499	ASR5
Lenovo 1m LC-LC OM3 MMF Cable	00MN502	ASR6
Lenovo 3m LC-LC OM3 MMF Cable	00MN505	ASR7
Lenovo 5m LC-LC OM3 MMF Cable	00MN508	ASR8
Lenovo 10m LC-LC OM3 MMF Cable	00MN511	ASR9
Lenovo 15m LC-LC OM3 MMF Cable	00MN514	ASRA
Lenovo 25m LC-LC OM3 MMF Cable	00MN517	ASRB
Passive SFP+ DAC cables for 10 GbE SFP+ ports		
Lenovo 0.5m Passive SFP+ DAC Cable	00D6288	A3RG
Lenovo 1m Passive SFP+ DAC Cable	90Y9427	A1PH
Lenovo 1.5m Passive SFP+ DAC Cable	00AY764	A51N
Lenovo 2m Passive SFP+ DAC Cable	00AY765	A51P
Lenovo 3m Passive SFP+ DAC Cable	90Y9430	A1PJ
Lenovo 5m Passive SFP+ DAC Cable	90Y9433	A1PK
Lenovo 7m Passive SFP+ DAC Cable	00D6151	A3RH
Active SFP+ DAC cables for 10 GbE SFP+ ports		
Lenovo 1m Active DAC SFP+ Cable	00VX111	AT2R
Lenovo 3m Active DAC SFP+ Cable	00VX114	AT2S
Lenovo 5m Active DAC SFP+ Cable	00VX117	AT2T
SFP+ active optical cables for 10 GbE SFP+ ports		
Lenovo 1m SFP+ to SFP+ Active Optical Cable	00YL634	ATYX
Lenovo 3m SFP+ to SFP+ Active Optical Cable	00YL637	ATYY
Lenovo 5m SFP+ to SFP+ Active Optical Cable	00YL640	ATYZ
Lenovo 7m SFP+ to SFP+ Active Optical Cable	00YL643	ATZ0
Lenovo 15m SFP+ to SFP+ Active Optical Cable	00YL646	ATZ1
Lenovo 20m SFP+ to SFP+ Active Optical Cable	00YL649	ATZ2

The following table lists transceivers and cables for the 25 GbE SFP28 ports.

Table 15. Transceivers and cables for 25 GbE SFP28 ports

Description	Part number	Feature code
25 GbE SFP28 SR transceivers for 25 GbE SFP28 ports		
Lenovo 25GBase-SR SFP28 Transceiver	7G17A03537	AV1B
Optical cables for 25 GbE SFP28 SR transceivers		
Lenovo 0.5m LC-LC OM3 MMF Cable	00MN499	ASR5
Lenovo 1m LC-LC OM3 MMF Cable	00MN502	ASR6
Lenovo 3m LC-LC OM3 MMF Cable	00MN505	ASR7
Lenovo 5m LC-LC OM3 MMF Cable	00MN508	ASR8
Lenovo 10m LC-LC OM3 MMF Cable	00MN511	ASR9
Lenovo 15m LC-LC OM3 MMF Cable	00MN514	ASRA
Lenovo 25m LC-LC OM3 MMF Cable	00MN517	ASRB
Passive copper cables for 25 GbE SFP28 ports		
Lenovo 1m Passive 25G SFP28 DAC Cable	7Z57A03557	AV1W
Lenovo 3m Passive 25G SFP28 DAC Cable	7Z57A03558	AV1X
Lenovo 5m Passive 25G SFP28 DAC Cable	7Z57A03559	AV1Y
Active optical cables for 25 GbE SFP28 ports		
Lenovo 3m 25G SFP28 Active Optical Cable	7Z57A03541	AV1F
Lenovo 5m 25G SFP28 Active Optical Cable	7Z57A03542	AV1G
Lenovo 10m 25G SFP28 Active Optical Cable	7Z57A03543	AV1H
Lenovo 15m 25G SFP28 Active Optical Cable	7Z57A03544	AV1J
Lenovo 20m 25G SFP28 Active Optical Cable	7Z57A03545	AV1K

Power supplies and cables

The HX Series enclosures ship with two 2000 W (230V) Platinum hot-swap power supplies listed in the following table.

Table 16. Power supplies

Description	Feature code	Quantity
ThinkSystem D2 2000W Platinum PSU	AUZ2	2

The ThinkAgile HX Series enclosures ship with two customer-configured power cords. The following table lists the rack power cables and line cords that are available for selection.

Table 17. Power cables

Description	Part number	Feature code
Rack power cables		
1.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	00Y3043	A4VP
1.0m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08367	B0N5
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	6201
1.5m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08368	B0N6
2.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08365	B0N4
2.0m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08369	6570
2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08366	6311
2.8m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08370	6400
2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable	39Y7938	6204
4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7932	6263
4.3m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08371	6583
Line cords		
Argentina 2.8m, 10A/250V, C13 to IRAM 2073 Line Cord	39Y7930	6222
Argentina 4.3m, 10A/250V, C13 to IRAM 2073 Line Cord	81Y2384	6492
Australia/New Zealand 2.8m, 10A/250V, C13 to AS/NZS 3112 Line Cord	39Y7924	6211
Australia/New Zealand 4.3m, 10A/250V, C13 to AS/NZS 3112 Line Cord	81Y2383	6574
Brazil 2.8m, 10A/250V, C13 to NBR 14136 Line Cord	69Y1988	6532
Brazil 4.3m, 10A/250V, C13 to NBR14136 Line Cord	81Y2387	6404
China 2.8m, 10A/250V, C13 to GB 2099.1 Line Cord	39Y7928	6210
China 4.3m, 10A/250V, C13 to GB 2099.1 Line Cord	81Y2378	6580
Denmark 2.8m, 10A/250V, C13 to DK2-5a Line Cord	39Y7918	6213
Denmark 4.3m, 10A/250V, C13 to DK2-5a Line Cord	81Y2382	6575
Europe 2.8m, 10A/250V, C13 to CEE7-VII Line Cord	39Y7917	6212
Europe 4.3m, 10A/250V, C13 to CEE7-VII Line Cord	81Y2376	6572
India 2.8m, 10A/250V, C13 to IS 6538 Line Cord	39Y7927	6269
India 4.3m, 10A/250V, C13 to IS 6538 Line Cord	81Y2386	6567
Israel 2.8m, 10A/250V, C13 to SI 32 Line Cord	39Y7920	6218
Israel 4.3m, 10A/250V, C13 to SI 32 Line Cord	81Y2381	6579
Italy 2.8m, 10A/250V, C13 to CEI 23-16 Line Cord	39Y7921	6217
Italy 4.3m, 10A/250V, C13 to CEI 23-16 Line Cord	81Y2380	6493
Japan 2.8m, 12A/250V, C13 to JIS C-8303 Line Cord	4L67A08357	6533
Japan 4.3m, 12A/250V, C13 to JIS C-8303 Line Cord	4L67A08362	6495
Korea 2.8m, 12A/250V, C13 to KS C8305 Line Cord	39Y7925	6219
Korea 4.3m, 12A/250V, C13 to KS C8305 Line Cord	81Y2385	6494
South Africa 2.8m, 10A/250V, C13 to SABS 164 Line Cord	39Y7922	6214
South Africa 4.3m, 10A/250V, C13 to SABS 164 Line Cord	81Y2379	6576
Switzerland 2.8m, 10A/250V, C13 to SEV 1011-S24507 Line Cord	39Y7919	6216

Description	Part number	Feature code
Switzerland 4.3m, 10A/250V, C13 to SEV 1011-S24507 Line Cord	81Y2390	6578
Taiwan 2.8m, 10A/250V, C13 to CNS 10917-3 Line Cord	81Y2375	6317
Taiwan 4.3m, 10A/250V, C13 to CNS 10917-3 Line Cord	81Y2389	6531
United Kingdom 2.8m, 10A/250V, C13 to BS 1363/A Line Cord	39Y7923	6215
United Kingdom 4.3m, 10A/250V, C13 to BS 1363/A Line Cord	81Y2377	6577
United States 2.8m, 10A/250V, C13 to NEMA 6-15P Line Cord	46M2592	A1RF
United States 4.3m, 10A/250V, C13 to NEMA 6-15P Line Cord	4L67A08361	6373

Rack installation

The HX Series enclosures ship with a rail kit listed in the following table.

Table 18. Rail kit

Description	Feature code	Quantity
ThinkSystem D2 Slide Rail	AUYC	1

The following table summarizes the rail kit features and specifications.

Table 19. Rail kit features and specifications summary

Feature	D2 Slide Rail
Rail length	853 mm (33.58 in.)
Rail type	Full-out slide (ball bearing)
Tool-less installation	Yes
In-rack server maintenance	Yes
1U PDU support	Yes
0U PDU support	No
Rack type	IBM and Lenovo 4-post, IEC standard-compliant
Mounting holes	Square or round
Mounting flange thickness	2 mm (0.08 in.) – 3.3 mm (0.13 in.)
Distance between front and rear mounting flanges^	609.6 mm (24 in.) – 812.8 mm (32 in.)

^ Measured when mounted on the rack, from the front surface of the front mounting flange to the rear most point of the rail.

Software

The ThinkAgile HX Series Express appliances support the following software components:

- Hypervisor
- Nutanix Acropolis
- Nutanix Prism
- vCenter Server (ESXi-based environments)

Note: For the information on appliance firmware levels, hypervisor versions, and software versions that have been tested for interoperability, refer to the Lenovo ThinkAgile HX Series Best Recipes: http://datacentersupport.lenovo.com/us/en/solutions/ht505413

Hypervisor

The ThinkAgile HX2720-E supports the following hypervisors that are factory-preinstalled on the 2x 128 GB M.2 SSDs configured in a RAID-1 drive group:

- Nutanix Acropolis Hypervisor (AHV) (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)

The following table lists the hypervisor available for selection.

Table 20. Hypervisors

Description	Feature code	Quantity
Nutanix SW Stack on Nutanix AHV (default selection)	B15S	1
Nutanix SW Stack on VMware ESXi 6.0 U3	B15T	1
Nutanix SW Stack on VMware ESXi 6.5 U1	B15R	1

Nutanix Acropolis

The ThinkAgile HX Series Express appliances ship with Nutanix Xpress Software edition, which offers a rich set of features for cluster of up to four nodes.

Configuration notes:

- The HX2720-E appliance can be deployed as a single-node cluster (AOS 5.5 or later), a dual-node cluster (AOS 5.6 or later), or as a cluster of 3 or 4 nodes (AOS 5.1.3 or later).

- Dual-node clusters require a witness VM located outside of the cluster.

- The following Nutanix software features are not supported on single- and dual-node clusters:
  - Cluster expansion
  - Deduplication
  - Synchronous replication
  - Metro availability

The following table lists features that are available in the Nutanix Xpress software edition.

Table 21. Nutanix Xpress software edition features

Feature	Nutanix Xpress software edition
Enterprise storage	
Cluster size	4 nodes max
Online cluster grow/shrink	Yes
Heterogeneous clusters	No
VM-centric snapshots and clones	Yes
Volume groups	No
Data tiering	Yes
Inline compression	Yes
Inline performance deduplication	Yes
MapReduce compression	Yes
MapReduce deduplication	Yes
Erasure Coding (EC-X)	No
Acropolis block services	No
Acropolis file services	No
VM Flash Mode (Pin to SSD)	Yes
Infrastructure resilience	
Data path redundancy	Yes
Redundancy factor	2 (Fixed)
Availability domains	No
Data protection	
Asynchronous replication and disaster recovery (DR)	Yes
VSS integration	Yes
Time Stream (Converged local backups)	Yes
Cloud Connect (Backup to public clouds)	Yes
Multiple site DR (many to many)	No
Metro availability	Yes
Synchronous replication and disaster recovery	Yes
Security	
Client authentication	Yes
Cluster lockdown	No
Data-at-rest encryption	No
Management and analytics	
Prism Starter (Single- and multi-cluster management)	2 sites max
Pulse (Automated service agent)	Yes
Cluster health	Yes
One-click upgrades (Nutanix OS and Hypervisor)	Yes
Rest APIs	No
Virtualization	
VMware vSphere support	Yes

Feature	Nutanix Xpress software edition
Built-in Acropolis Hypervisor	Yes
VM operations	Yes
Intelligent VM placement	Yes
Virtual network configuration	Yes
Host profiles	Yes
VM high availability	Yes

Nutanix Prism

Nutanix Prism gives administrators an easy way to manage virtual environments running on Acropolis, and it simplifies and streamlines common workflows for hypervisor and virtual machine lifecycle management.

Nutanix Prism Starter is a part of the Nutanix Xpress Software edition preloaded on the appliances, and it provides ability to configure, manage, and monitor a Nutanix cluster and centralized management of multiple local and remote Nutanix clusters.

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

VMware vCenter Server

VMware vCenter Server provides centralized management of vSphere environments to simplify day-to-day operations and reduce the complexity of managing virtual infrastructure. vCenter Server is a required component for deploying HX Series appliances in ESXi-based environments.

VMware vCenter Server offers the following key features:

- Centralized management of virtualized hosts and virtual machines from a single console.
- Centralized inventory of virtual machines, hosts, datastores and networks.
- Alerts and notifications can trigger automated workflows to remedy and preempt problems.
- Host profiles standardize and simplify configuration and management of VMware ESXi hosts.
- Resource management for virtual machines allows to control allocation of processor, memory, disk and network resources.
- Continuously monitors utilization across resource pools and intelligently allocates available resources among virtual machines according to predefined rules
- Automatically restarts virtual machines that have failed without manual intervention with VMware vSphere HA.
- Maintains records of significant configuration changes and exports reports for event tracking.
- Patch management enforces compliance to patch standards through automated scanning and patching of online ESXi hosts and select Microsoft and Linux virtual machines.

Systems management

The ThinkAgile HX Series appliances support the following systems management tools:

- Lenovo XClarity Controller
- Lenovo XClarity Administrator and XClarity Pro
- Lenovo XClarity Integrator for Nutanix
- Lenovo XClarity Energy Manager

Lenovo XClarity Controller

The ThinkAgile HX appliances contain Lenovo XClarity Controller (XCC) Enterprise, which provides advanced service-processor control, monitoring, and alerting functions.

XClarity Controller Enterprise offers the following capabilities for the HX Series appliances:

- Gathering and viewing system information and inventory
- Monitoring system status and health
- Alerting and notifications
- Event logging
- Syslog alerting
- Configuring security
- Updating system firmware
- Real-time power usage monitoring
- Displaying graphics for real-time and historical power usage data and temperature
- Capping power usage
- Remotely controlling power (Power on, Power off, Restart)

The XClarity Controller provides remote server management through the following interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3
- Common Information Model (CIM)
- Data Center Manageability Interface (DCMI) Version 1.5
- Redfish REpresentational State Transfer (REST) API
- Web browser with HTML5 support
- Command-line interface
- Virtual Operator Panel with XClarity Mobile App via the front USB port with XClarity Controller access

Virtual Operator Panel provides quick access to system status, firmware, network, health, and alerts information. With proper authentication, it also allows to configure systems management and network settings and to control system power (Power on, Power off, Restart). The Virtual Operator Panel can be accessed from the XClarity Mobile App running on the Android or iOS mobile device that is connected to the front USB port with XClarity Controller access (See Components and connectors).

Lenovo XClarity Administrator and XClarity Pro

Lenovo XClarity Administrator is a centralized systems management solution that helps administrators deliver infrastructure faster. This solution integrates easily with Lenovo x86 servers, HX Series appliances, RackSwitch switches, and DS Series storage, providing automated agent-less discovery, monitoring, firmware updates, and configuration management across multiple systems.

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

Notes:

- Lenovo XClarity Administrator can be downloaded and used at no charge to discover and monitor HX Series appliances and manage firmware upgrades for them.

- Optional Lenovo XClarity Pro subscription license that can be selected in the configurator provides software support for XClarity Administrator for the duration of the selected warranty period. If Lenovo XClarity software support is required, the XClarity Pro option must be selected.

Lenovo XClarity Administrator is available from Lenovo at no charge, and it offers the following features:

- Auto-discovery and monitoring of HX Series appliances

- Firmware updates and compliance enforcement

- 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

For more information, refer to the Lenovo XClarity Administrator Product Guide: http://lenovopress.com/tips1200

In addition, Lenovo XClarity Administrator offers the Lenovo XClarity Integrator for Nutanix software plug-in module for the HX Series appliances at no charge.

Lenovo XClarity Integrator for Nutanix

Lenovo XClarity Integrator for Nutanix allow administrators to manage physical server infrastructure from Nutanix Prism in AHV hypervisor-based environments. Lenovo XClarity Integrator for Nutanix offers the following features:

- Ability to discover, manage, and monitor Lenovo server hardware from Nutanix Prism.
- Managing hardware and firmware events and logs, including proactive platform alerts.
- Integrated service and support with access to the warranty status, automated or manual diagnostics data collection, and a call home feature.

Note: Lenovo XClarity Integrator for Nutanix is supported with the AHV version 5.5.0.1 or later and Prism version 5.5.0.4 or later.

For more information, refer to the Lenovo XClarity Integrator for Nutanix web page:
http://support.lenovo.com/us/en/solutions/lnvo-lxci-nutanix

Lenovo XClarity Energy Manager

Lenovo XClarity Energy Manager provides a stand-alone, web-based agent-less power management console that provides real time data and enables you to observe, plan and manage power and cooling for Lenovo servers and appliances. Using built-in intelligence, it identifies server power consumption trends and ideal power settings and performs cooling analysis so that you can define and optimize power-saving policies.

Lenovo XClarity Energy Manager offers the following capabilities:

- Monitors room, row, rack, and device levels in the data center
- Reports vital system information, such as power, temperature and resource utilization
- Monitors inlet temperature to locate hot spots, reducing the risk of data or device damage
- Provides finely-grained controls to limit platform power in compliance with IT policy
- Generates alerts when a user-defined threshold is reached

Lenovo XClarity Energy Manager license is included in the XClarity Controller Enterprise upgrade.

For more information, refer to the Lenovo XClarity Energy Manager web page:
http://datacentersupport.lenovo.com/us/en/solutions/lnvo-lxem

Physical specifications

The ThinkAgile HX2720-E appliances have the following dimensions and weight (approximate):

- Enclosure
  - Height: 87 mm (3.4 in.)
  - Width: 448 mm (17.6 in.)
  - Depth: 834 mm (32.8 in.)
  - Weight (maximum, with four nodes): 55.0 kg (121.3 lb)
- Node
  - Height: 41 mm (1.6 in.)
  - Width: 222 mm (8.7 in.)
  - Depth: 562 mm (22.1 in.)
  - Weight (maximum): 7.5 kg (16.5 lb)

Operating environment

The HX Series appliances comply with ASHRAE class A2 specifications. The HX2720-E appliances also complies with ASHRAE class A3 and class A4 specifications. The appliance performance might be impacted when the operating temperature is outside the ASHRAE A2 specifications.

The HX Series appliances are supported in the following environment:

- Air temperature:
  - Operating:
    - ASHRAE Class A4: 5 °C - 45 °C (41 °F - 113 °F); for altitudes above 900 m (2,953 ft), decrease the maximum ambient temperature by 1 °C for every 125-m (410-ft) increase in altitude
    - ASHRAE Class A3: 5 °C - 40 °C (41 °F - 104 °F); for altitudes above 900 m (2,953 ft), decrease the maximum ambient temperature by 1 °C for every 175-m (574-ft) increase in altitude
    - ASHRAE Class A2: 10 °C - 35 °C (50 °F - 95 °F); for altitudes above 900 m (2,953 ft), decrease the maximum ambient temperature by 1 °C for every 300-m (984-ft) increase in altitude
  - Non-operating: 5 °C - 45 °C (41 °F - 113 °F)
  - Storage: -40 °C - +60 °C (-40 °F - 140 °F)
- Maximum altitude: 3,050 m (10,000 ft)
- Humidity:
  - Operating:
    - ASHRAE Class A4: 8% - 90% (non-condensing); maximum dew point: 24 °C (75 °F)
    - ASHRAE Class A3: 8% - 85% (non-condensing); maximum dew point: 24 °C (75 °F)
    - ASHRAE Class A2: 8% - 80% (non-condensing); maximum dew point: 21 °C (70 °F)
  - Storage: 8% - 90% (non-condensing)
- Electrical:
  - 200 - 240 (nominal) V AC; 50 Hz / 60 Hz
  - 180 - 300 V DC (supported in China only)
- Acoustics (maximum configuration, operating): 6.8 bels
- Vibration:
  - Operating: 0.21 G rms at 5 Hz to 500 Hz for 15 minutes across 3 axes
  - Non-operating: 1.04 G rms at 2 Hz to 200 Hz for 15 minutes across 6 surfaces
- Shock:
  - Operating: 15 G for 3 milliseconds in each direction (positive and negative X, Y, and Z axes)
  - Non-operating:
    - 12 kg - 22 kg: 50 G for 152 in./sec velocity change across 6 surfaces
    - 23 kg - 31 kg: 35 G for 152 in./sec velocity change across 6 surfaces

The following table lists the maximum system power load, rated inlet current, and system heat output based on the power supply and source voltage.

Table 22. Rated system power, inlet current, and system heat output

Power supply	Source voltage	Maximum power load per system (two power supplies)	Rated current per inlet	System heat output
2000 W Platinum	200 - 240 V AC	2610 W	11 A	8905 BTU/hour
	180 - 300 V DC	2597 W	9.2 A	8861 BTU/hour

Regulatory compliance

The ThinkAgile HX Series appliances conform to the following regulations:

- United States FCC Part 15, Class A
- Canada ICES-003/NMB-03, Class A
- UL/CSA 60950-1
- Mexico NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22, Class A
- China CCC GB4943.1, GB9254 Class A, GB17625.1
- Taiwan BSMI CNS13438, Class A; CNS14336-1
- Korea KN22, Class A; KN24
- Russia/GOST ME01; IEC-60950-1; GOST R 51318.22, 51318.24, 51317.3.2, and 51317.3.3
- IEC 60950-1 (CB Certificate and CB Test Report)
- Europe CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
- Germany TUV-GS (EN60950-1 /IEC60950-1,EK1-ITB2000)
- Reduction of Hazardous Substances (ROHS)
- Energy Star 2.1

Hardware warranty

The ThinkAgile HX Series appliances can be configured with a three-year or five-year hardware warranty and software support with 24x7 call center support and various levels of 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.

Some regions might have different warranty terms and conditions than the standard warranty. This is due to local business practices or laws in the specific region. Local service teams can assist in explaining region-specific terms when needed. Examples of region-specific warranty terms are second or longer business day parts delivery or parts-only base warranty.

If warranty terms and conditions include onsite labor for repair or replacement of parts, Lenovo will dispatch a service technician to the customer site to perform the replacement. Onsite labor under base warranty is limited to labor for replacement of parts that have been determined to be field-replaceable units (FRUs). Parts that are determined to be customer-replaceable units (CRUs) do not include onsite labor under base warranty.

If warranty terms include parts-only base warranty, Lenovo is responsible for delivering only replacement parts that are under base warranty (including FRUs) that will be sent to a requested location for self-service. Parts-only service does not include a service technician being dispatched onsite. Parts must be changed at customer's own cost and labor and defective parts must be returned following the instructions supplied with the spares parts.

Lenovo warranty service coverage levels are region-specific. Not all warranty service levels are available in every region. For information about Lenovo warranty services that are available in your region, refer to the following resources:

- Service part numbers in Data Center Solution Configurator (DCSC):
  http://dcsc.lenovo.com/#/services

- Lenovo Services Availability Locator
  https://lenovolocator.com/

The following Lenovo warranty service levels are available for the ThinkAgile HX Series appliances:

- 3 or 5 years of warranty service coverage
  - Base warranty: 9x5 Next Business Day response with parts delivered
  - Foundation Service: 9x5 service coverage with next business day onsite response
  - Essential Service: 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select regions)
  - Advanced Service: 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select regions)
- Premier Support
  Premier Support service offers direct access to Lenovo's most advanced technicians for faster troubleshooting with single point of contact for end-to-end problem resolution and collaborative third-party software support.
- YourDrive YourData
  Lenovo's YourDrive YourData service (where applicable) is a multi-drive retention offering that ensures your data is always under your control, regardless of the number of drives that are installed in your Lenovo system. In the unlikely event of a drive failure, you retain possession of your drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. The YourDrive YourData service can be purchased in convenient bundles with Foundation, Essential, or Advanced Service upgrades and extensions.

For service definitions, region-specific details, and service limitations, please refer to the following documents:

- Lenovo Statement of Limited Warranty for Infrastructure Solutions Group (ISG) Servers and System Storage
  http://pcsupport.lenovo.com/us/en/solutions/ht503310
- Lenovo Data Center Services Agreement
  http://support.lenovo.com/us/en/solutions/ht116628

Software maintenance

The ThinkAgile 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): Within 30 minutes.
- Priority 2 (Critical: Significant impact on productivity): Within 2 hours.
- Priority 3 (Normal: Minimal impact on productivity): Within 4 hours.
- Priority 4 (Low: General requests for information): Within next two business days.

For more information, refer to the Lenovo Support Plan – ThinkAgile HX and Lenovo Converged HX Series:
http://datacentersupport.lenovo.com/us/en/solutions/ht505404

Deployment services

The following Lenovo Professional Services are available for the ThinkAgile HX Series solutions to get customers up and running quickly:

- Nutanix deployment services - Base
    - Conducting remote preparation and planning
    - Verifying firmware versions and performing firmware updates, if needed
    - Installing and configuring hypervisor and Nutanix controller VM
    - Creating Nutanix cluster
    - Configuring storage
    - Configuring administrative features

- Nutanix deployment services - Advanced
    - Configuring VMware vCenter Server and vSphere cluster (ESXi-based environments)
    - Configuring Nutanix container and Acropolis (AHV) cluster (AHV-based environments)
    - Transferring knowledge

- Nutanix deployment services - Advanced with XClarity
    - Nutanix deployment services - Advanced
    - Installing Lenovo XClarity
    - Installing system updates
    - Setting up XClarity Pro for upward integration

The following optional Lenovo basic installation services are available for the ThinkAgile HX Series appliances:

- Unpacking and inspecting the systems
- Mounting the systems in a rack cabinet
- Connecting the systems to electrical power and network
- Checking and updating firmware to the latest levels
- Verifying operations
- Disposal of the packaging materials (within the customer site)

For more information, refer to the Data Center Deployment Services web page:
http://www.lenovo.com/us/en/data-center/services/deployment

Ethernet LAN switches

The following table lists the Ethernet LAN switches that are offered by Lenovo that can be used with the ThinkAgile HX Series appliances.

Table 23. Ethernet LAN switches

Description	Part number
1 Gb Ethernet switches (IPMI management)	
Lenovo ThinkSystem NE0152T RackSwitch (Rear to Front)	7Y810011WW
Lenovo ThinkSystem NE0152TO RackSwitch (Rear to Front, ONIE)	7Z320O11WW
Lenovo RackSwitch G7028 (Rear to Front)	7159BAX
Lenovo RackSwitch G7052 (Rear to Front)	7159CAX
10 Gb Ethernet switches (10 GbE host connectivity)	
Lenovo ThinkSystem NE1032 RackSwitch (Rear to Front)	7159A1X
Lenovo ThinkSystem NE1032T RackSwitch (Rear to Front)	7159B1X
Lenovo ThinkSystem NE1072T RackSwitch (Rear to Front)	7159C1X
Lenovo RackSwitch G8124E (Rear to Front)	7159BR6
Lenovo RackSwitch G8272 (Rear to Front)	7159CRW

Description	Part number
Lenovo RackSwitch G8296 (Rear to Front)	7159GR6
25 Gb Ethernet switches (25 GbE host connectivity)	
Lenovo ThinkSystem NE2572 RackSwitch (Rear to Front)	7159E1X
Lenovo ThinkSystem NE2572O RackSwitch (Rear to Front, ONIE)	7Z210O21WW
100 Gb Ethernet switches (40 GbE/100 GbE aggregation layer; 10 GbE/25 GbE breakout host connectivity)	
Lenovo ThinkSystem NE10032 RackSwitch (Rear to Front)	7159D1X
Lenovo ThinkSystem NE10032O RackSwitch (Rear to Front, ONIE)	7Z210O11WW

For more information, see the list of Product Guides in the Top-of-rack Switches category:
http://lenovopress.com/servers/options/switches#rt=product-guide

Rack cabinets

The following table lists the rack cabinets that are offered by Lenovo that can be used with the ThinkAgile HX Series appliances.

Table 24. Rack cabinets

Description	Part number
25U S2 Standard Rack (1000 mm deep; 2 sidewall compartments)	93072RX
25U Static S2 Standard Rack (1000 mm deep; 2 sidewall compartments)	93072PX
42U S2 Standard Rack (1000 mm deep; 6 sidewall compartments)	93074RX
42U 1100mm Enterprise V2 Dynamic Rack (6 sidewall compartments)	93634PX
42U 1100mm Enterprise V2 Dynamic Expansion Rack (6 sidewall compartments)	93634EX
42U 1200mm Deep Dynamic Rack (6 sidewall compartments)	93604PX
42U 1200mm Deep Static Rack (6 sidewall compartments)	93614PX
42U Enterprise Rack (1105 mm deep; 4 sidewall compartments)	93084PX
42U Enterprise Expansion Rack (1105 mm deep; 4 sidewall compartments)	93084EX

For more information, see the list of Product Guides in the Rack Cabinets category:
http://lenovopress.com/servers/options/racks#rt=product-guide

Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo that can be used with the ThinkAgile HX Series appliances.

Table 25. Power distribution units

Description	Part number
0U Basic PDUs	
0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord	00YJ776
0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord	00YJ777
0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 line cord	00YJ778
0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord	00YJ779

Description	Part number
Switched and Monitored PDUs	
0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P line cord	00YJ781
0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 line cord	00YJ780
0U 18 C13/6 C19 Switched / Monitored 32A/200-240V/346-415V/3Ph PDU w/ IEC60309 532P6 cord	00YJ782
0U 12 C13/12 C19 Switched and Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 line cord	00YJ783
1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord)	46M4002
1U 9 C19/3 C13 Switched and Monitored 60A 3Ph PDU with IEC 309 3P+Gnd cord	46M4003
1U 12 C13 Switched and Monitored DPI PDU (without line cord)	46M4004
1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord	46M4005
Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)	
Ultra Density Enterprise C19/C13 PDU Module (without line cord)	71762NX
Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord	71763NU
C13 Enterprise PDUs (12x IEC 320 C13 outlets)	
DPI C13 Enterprise PDU+ (without line cord)	39M2816
DPI Single Phase C13 Enterprise PDU (without line cord)	39Y8941
C19 Enterprise PDUs (6x IEC 320 C19 outlets)	
DPI Single Phase C19 Enterprise PDU (without line cord)	39Y8948
DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord	39Y8923
Front-end PDUs (3x IEC 320 C19 outlets)	
DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord	39Y8939
DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8934
DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8940
DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8935
Universal PDUs (7x IEC 320 C13 outlets)	
DPI Universal 7 C13 PDU (with 2 m IEC 320-C19 to C20 rack power cord)	00YE443
Line cords for PDUs that ship without a line cord	
DPI 30a Line Cord (NEMA L6-30P)	40K9614
DPI 32a Line Cord (IEC 309 P+N+G)	40K9612
DPI 32a Line Cord (IEC 309 3P+N+G)	40K9611
DPI 60a Cord (IEC 309 2P+G)	40K9615
DPI 63a Cord (IEC 309 P+N+G)	40K9613
DPI Australian/NZ 3112 Line Cord (32A)	40K9617
DPI Korean 8305 Line Cord (30A)	40K9618

For more information, see the list of Product Guides in the Power Distribution Units category:
http://lenovopress.com/servers/options/pdu#rt=product-guide

Uninterruptible power supply units

The following table list the uninterruptible power supply (UPS) units that are currently offered by Lenovo that can be used with the ThinkAgile HX Series appliances.

Table 26. Uninterruptible power supply units

Description	Part number
Worldwide models	
RT1.5kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A outlets)	55941KX
RT2.2kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 1x IEC 320 C19 16A outlets)	55942KX
RT3kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 1x IEC 320 C19 16A outlets)	55943KX
RT5kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets)	55945KX
RT6kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets)	55946KX
RT8kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets)	55948KX
RT11kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets)	55949KX
RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets)	55948PX
RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets)	55949PX
ASEAN, HTK, INDIA, and PRC models	
ThinkSystem RT3kVA 2U Standard UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)	55943KT
ThinkSystem RT3kVA 2U Long Backup UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)	55943LT
ThinkSystem RT6kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)	55946KT
ThinkSystem RT10kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)	5594XKT

For more information, see the list of Product Guides in the Uninterruptible Power Supply Units category: http://lenovopress.com/servers/options/ups#rt=product-guide

Lenovo Financial Services

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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.lenovo.com/us/en/landingpage/lenovo-financial-services

Related publications and links

For more information, see these resources:

- Lenovo ThinkAgile HX Series
  http://www3.lenovo.com/us/en/p/WMD00000326

- Lenovo Data Center Solution Configurator (DCSC):
  http://dcsc.lenovo.com

- Nutanix documentation
  http://portal.nutanix.com/#/page/docs

- Lenovo ThinkAgile HX Series Best Recipes
  http://datacentersupport.lenovo.com/us/en/solutions/ht505413

- Lenovo Data Center Support
  http://datacentersupport.lenovo.com

- Lenovo Converged HX Series TCO Calculator
  http://lenovo-hx.esgcalculator.com

- Lenovo Hyperconverged Decision Tool
  http://www.lenovo.com/hxdecisiontool

Related product families

Product families related to this document are the following:

- Hyperconverged Infrastructure
- Hyperconverged Infrastructure
- Nutanix Alliance
- ThinkAgile HX Series for Nutanix

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