Lenovo ThinkAgile HX3720 Appliance (Xeon SP Gen 1)
Product Guide (withdrawn product)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 the first generation of the Intel Xeon Processor Scalable family.

The ThinkAgile HX3720 appliances are dense nodes in the 2U 4-node (2U4N) rack-mount enclosures, and each node supports two processors, up to 768 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.

Several common uses for the ThinkAgile HX Series appliances for compute-heavy workloads include virtual desktop infrastructure (VDI), server virtualization, private/hybrid clouds, enterprise applications, light databases, and remote office and branch office workloads.

The ThinkAgile HX3720 appliances in the HX Series Enclosure are shown in the following figure.

Figure 1. ThinkAgile HX3720 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 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.

Components and connectors

The following figure shows the front view of the ThinkAgile HX Series enclosure with up to four HX3720 appliance nodes.

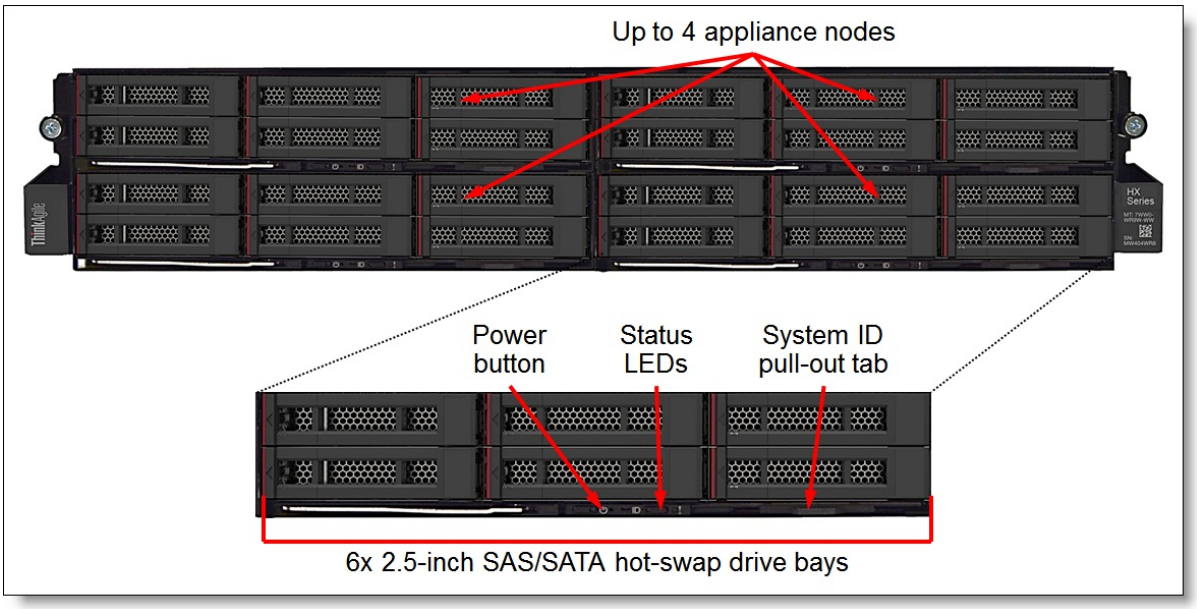

Figure 2. HX Series enclosure with up to four HX3720 appliances front view

The front of the HX Series enclosure contains up to four HX3720 appliances, and each appliance includes the following components:

- 6x SFF SAS/SATA hot-swap drive bays
- A Power button
- Status LEDs
- A System ID pull-out tab

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

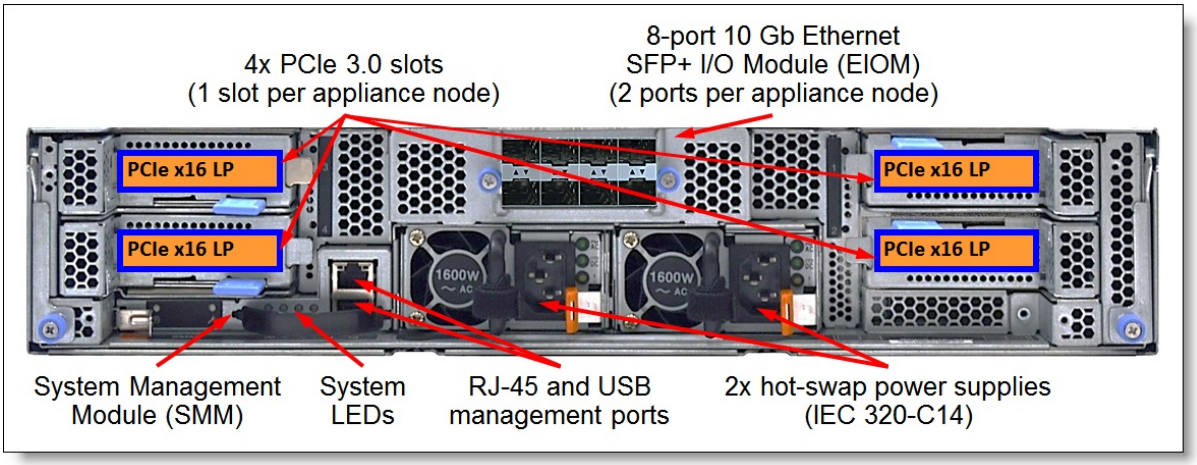

Figure 3. HX Series enclosure rear view

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

- Four PCIe expansion slots (One slot per appliance)
- Eight 10 GbE SFP+ network ports
- A System Management Module
  - One 1 GbE management port
  - One USB port
  - Status LEDs
- Two hot-swap power supplies

System specifications

The following table lists the system specifications of the ThinkAgile HX3720 appliance.

Table 1. HX3720 system specifications

Attribute	Specification
Form factor	HX3720: Half-wide, 1U node; up to four nodes per enclosure. HX Series enclosure: 2U Four-node (2U4N) rack-mount.
Processor	Two Intel Xeon Silver, Gold, or Platinum Gen 1 processors.
Chipset	Intel C624.
Memory	Up to 12 TruDDR4 2666 MHz DIMMs. Support for 16 GB and 32 GB RDIMMs or 64 GB LRDIMMs.
Memory capacity	Up to 768 GB with 12x 64 GB LRDIMMs.
Memory protection	Error correction code (ECC), Single Device Data Correction (SDDC; for x4-based memory DIMMs), Adaptive Double Device Data Correction (ADDDC; for x4-based memory DIMMs, requires Intel Xeon Gold or Platinum processors), patrol scrubbing, and demand scrubbing.
Drive bays	6x 2.5-inch SAS/SATA hot-swap.
Internal storage	• Hybrid: 2 cache SSDs and 4 capacity HDDs. • All Flash: From 2 to 6 SSDs in increments of 2 drives.
Drive capacities	SSDs: • 12 Gbps SAS SSDs up to 3.84 TB • 6 Gbps SATA SSDs up to 3.84 TB HDDs: • 12 Gbps SAS HDDs up to 2.4 TB • 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 type and capacity.
Storage capacity	• Hybrid: Up to 9.6 TB (HDDs). • All Flash: Up to 23.04 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.
Boot drive	2x M.2 non-hot-swap SSDs up to 480 GB (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).

Attribute	Specification
Ports	• 1x Gigabit Ethernet RJ-45 port for systems management (per enclosure). • 1x USB port (per enclosure).
Cooling	Five hot-swap system fans (per enclosure).
Power supply	Two redundant hot-swap 2000 W (200 - 240 V) Platinum power supplies (per enclosure).
Video	Matrox G200 with 16 MB memory integrated into the XClarity Controller. Maximum resolution is 1920x1200 at 60 Hz with 32 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 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: Starter, Pro, and Ultimate editions. Nutanix Prism, Nutanix Calm (optional), Nutanix Flow (optional).
Hypervisors	• Nutanix Acropolis Hypervisor (Bundled with AOS). • VMware ESXi 6.0 Update 3. • VMware ESXi 6.5 Update 1. • VMware ESXi 6.5 Update 2. • VMware ESXi 6.7 Update 1. • VMware ESXi 6.7 Update 3. • Microsoft Windows Server 2016 Datacenter (Hyper-V).
Warranty and support	Three-, four-, or five-year customer-replaceable unit and onsite limited hardware 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 areas). Also available are YourDrive YourData, Premier Support, and Enterprise Software Support.
Software maintenance	Three-, four-, 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 HX3720 appliances that use the first generation of the Intel Xeon Processor Scalable Family are withdrawn and no longer available for ordering. For currently available ThinkAgile HX3720 appliances that use the second generation of the Intel Xeon Processor Scalable Family, refer to the Lenovo ThinkAgile HX3720 Appliance (Xeon SP Gen 2) product guide: http://lenovopress.com/lp1123

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 HX3720 appliances.

Table 2. Base CTO models

Description	Machine Type/Model
ThinkAgile HX3720 Appliance	7X82CTO2WW
ThinkAgile HX Series Enclosure	7X81CTO1WW

The following table lists the base chassis for the HX3720 appliance.

Table 3. Base chassis

Description	Feature code
ThinkAgile HX372x Base	B0SY

The HX3720 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)

It is possible to perform a hardware upgrade after the initial deployment, such as adding more memory or network adapters, by purchasing the hardware upgrade option listed in the following table.

Table 4. Hardware upgrade option

Description	Part number	Quantity
Nutanix HW Upgrade	01KT971	1

Configuration note: You should request a quote for the Nutanix HW Upgrade part number from Lenovo and provide additional details on the existing installation and planned upgrade.

Memory

The ThinkAgile HX3720 appliances support 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 HX3720 supports up to 12 DIMMs. The following rules apply when selecting the memory configuration:

- The appliance supports RDIMMs or LRDIMMs.
- All DIMMs in the appliance must be of the same type (RDIMMs or LRDIMMs).
- All DIMMs in the appliance operate at the same speed up to 2666 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)
- ADDDC (for x4-based memory DIMMs; Gold and Platinum processors only)
- Patrol scrubbing
- Demand scrubbing

Single Device Data Correction (SDDC) works only in the independent channel mode (the default operational mode) and supports only x4-based memory DIMMs.

Adaptive Double Device Data Correction (ADDDC) works with x4-based memory DIMMs and requires two DIMM ranks per channel, Intel Xeon Gold or Platinum processors, and the Closed Page memory access mode.

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

Table 5. Memory selection options

Description	Part number	Feature code	Quantity			
			192 GB	384 GB	512 GB*	768 GB
ThinkSystem 2666 MHz RDIMMs						
16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	7X77A01303	AUNC	12	-	-	-
32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	7X77A01304	AUND	-	12	-	-
ThinkSystem 2666 MHz LRDIMMs						
64GB TruDDR4 2666 MHz (4Rx4 1.2V) LRDIMM	7X77A01305	AUNE	-	6	8	12

* System performance might be impacted due to unbalanced memory configuration.

Internal storage

The ThinkAgile HX3720 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 HX3720 appliance.

Table 6. 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 7. Drive options for software preload

Description	Feature code	Quantity
ThinkSystem M.2 128GB SATA 6Gbps Non-Hot-Swap SSD	AUUV	2
ThinkSystem M.2 5100 240GB SATA 6Gbps Non-Hot Swap SSD	B5S4	2
ThinkSystem M.2 5300 240GB SATA 6Gbps Non-Hot Swap SSD	B8HS	2
ThinkSystem M.2 5100 480GB SATA 6Gbps Non-Hot Swap SSD	B11V	2
ThinkSystem M.2 5300 480GB SATA 6Gbps Non-Hot Swap SSD	B919	2

Configuration note: Two M.2 SATA SSDs are required for selection, and they must be of the same model and capacity.

The following table lists the storage controllers for internal storage of the HX3720 appliance.

Table 8. Controllers for internal storage

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

Configuration note: The 430-8i HBA is derived by the configurator, and it occupies the internal PCIe slot.

Drives for internal storage

The following tables list the drive selection options.

Table 9. Drive selection options: Hybrid configurations

Description	Part number	Feature code	Quantity
SSD selection (Cache tier): SAS 12Gb SSDs - PM1633a Capacity			
ThinkSystem 2.5" PM1633a 3.84TB Capacity SAS 12Gb Hot Swap SSD	7N47A00121	AUMK	2
SSD selection (Cache tier): SAS 12Gb SSDs - PM1635a Mainstream			
ThinkSystem 2.5" PM1635a 800GB Mainstream SAS 12Gb Hot Swap SSD	7N47A00118	AUMD	2
ThinkSystem 2.5" PM1635a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	7N47A00119	AVRG	2
SSD selection (Cache tier): SAS 12Gb SSDs - PM1645 Mainstream			
ThinkSystem 2.5" PM1645 800GB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13653	B4A0	2
ThinkSystem 2.5" PM1645 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13654	B4A1	2
SSD selection (Cache tier): SATA 6Gb SSDs - S4600 Mainstream			
ThinkSystem 2.5" Intel S4600 480GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05722	B0ZQ	2
ThinkSystem 2.5" Intel S4600 960GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05721	B0ZR	2
ThinkSystem 2.5" Intel S4600 1.92TB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05720	B0ZS	2
SSD selection (Cache tier): SATA 6Gb SSDs - S4610 Mainstream			
ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13634	B49M	2
ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13635	B49N	2
ThinkSystem 2.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13636	B49P	2
SSD selection (Cache tier): SATA 6Gb SSDs - PM883 Entry			
ThinkSystem 2.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A10199	B34M	2
SSD selection (Cache tier): SATA 6Gb SSDs - S4510 Entry			
ThinkSystem 2.5" Intel S4510 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A13623	B49C	2
HDD selection (Capacity tier): SAS 12Gb HDDs			
ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD	7XB7A00069	B0YS	4
HDD selection (Capacity tier): SATA 6Gb HDDs			
ThinkSystem 2.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD	7XB7A00036	AUUE	4
ThinkSystem 2.5" 2TB 7.2K SATA 6Gb Hot Swap 512e HDD	7XB7A00037	AUUJ	4

Table 10. Drive selection options: All Flash configurations

Description	Part number	Feature code	Quantity (min / max)
SAS 12Gb SSDs - PM1633a Capacity			
ThinkSystem 2.5" PM1633a 3.84TB Capacity SAS 12Gb Hot Swap SSD	7N47A00121	AUMK	2 / 6
SAS 12Gb SSDs - PM1635a Mainstream			
ThinkSystem 2.5" PM1635a 800GB Mainstream SAS 12Gb Hot Swap SSD	7N47A00118	AUMD	2 / 6
ThinkSystem 2.5" PM1635a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	7N47A00119	AVRG	2 / 6
SAS 12Gb SSDs - PM1645 Mainstream			
ThinkSystem 2.5" PM1645 800GB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13653	B4A0	2 / 6
ThinkSystem 2.5" PM1645 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13654	B4A1	2 / 6
SATA 6Gb SSDs - S4600 Mainstream			
ThinkSystem 2.5" Intel S4600 480GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05722	B0ZQ	2 / 6
ThinkSystem 2.5" Intel S4600 960GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05721	B0ZR	2 / 6
ThinkSystem 2.5" Intel S4600 1.92TB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05720	B0ZS	2 / 6
SATA 6Gb SSDs - S4610 Mainstream			
ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13634	B49M	2 / 6
ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13635	B49N	2 / 6
ThinkSystem 2.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13636	B49P	2 / 6
SATA 6Gb SSDs - 5100 Mainstream			
ThinkSystem 2.5" 5100 1.92TB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05762	B10Z	2 / 6
SATA 6Gb SSDs - 5200 Mainstream			
ThinkSystem 2.5" 5200 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10238	B489	2 / 6
ThinkSystem 2.5" 5200 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10239	B48A	2 / 6
SATA 6Gb SSDs - PM883 Entry			
ThinkSystem 2.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A10199	B34M	2 / 6
SATA 6Gb SSDs - S4510 Entry			
ThinkSystem 2.5" Intel S4510 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A13623	B49C	2 / 6

Configuration notes:

- For hybrid configurations, the HX3720 appliance supports 2 cache drives (SSDs) and 4 capacity drives (HDDs).
- For All Flash configurations, the HX3720 appliance supports from 2 to 6 SSDs in increments of 2 drives.
- All SSDs in the appliance must be of the same model and capacity. All HDDs in the appliance must be of the same type and capacity.

It is possible to expand storage capacity after the initial deployment by adding more drives to match one of the supported storage configurations and acquiring additional storage capacity license options (see Software for details).

The following table lists withdrawn storage capacity license options that are no longer available for ordering. For currently available storage capacity license options, refer to Software.

Table 11. Additional storage capacity licenses

Description	Part number	Feature code	Quantity
Nutanix APOS HW Upgrade for previously sold HX node: 480GB SSD	01PG360	S0QT	1 per SSD
Nutanix APOS HW Upgrade for previously sold HX node: 800GB SSD	01PG874	S0QU	1 per SSD
Nutanix APOS HW Upgrade for previously sold HX node: 960GB SSD	01PG875	S0QV	1 per SSD
Nutanix APOS HW Upgrade for previously sold HX node: 1600GB SSD	01PG357	S0QQ	1 per SSD
Nutanix APOS HW Upgrade for previously sold HX node: 1920GB SSD	01PG358	S0QR	1 per SSD
Nutanix APOS HW Upgrade for previously sold HX node: 3840GB SSD	01PG359	S0QS	1 per SSD

Configuration note: You should request a quote for the Nutanix HW Upgrade part number from Lenovo and provide additional details on the existing installation and planned upgrade.

Network connectivity

The ThinkAgile HX3720 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

It is possible to increase the number of network ports after the initial deployment by adding more network adapters to match one of the supported network adapter configurations and acquiring additional network adapter license options listed in the following table.

Table 13. Additional network adapter licenses

Description	Part number	Feature code	Quantity
Nutanix APOS HW Upgrade for previously sold HX node: 2P NIC	01PG356	S0QP	1 per NIC

Configuration note: You should request a quote for the Nutanix HW Upgrade part number from Lenovo and provide additional details on the existing installation and planned upgrade.

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

Table 14. 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
25m Cat6 Green Cable	90Y3727	A1MW

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

Table 15. 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

Description	Part number	Feature code
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 16. 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 17. 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 18. 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
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	6201

Description	Part number	Feature code
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
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 19. Rail kit

Description	Feature code	Quantity
ThinkSystem D2 Slide Rail	AUYC	1

The following table summarizes the rail kit features and specifications.

Table 20. 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 appliances support the following software components:

- Hypervisor
- Nutanix Acropolis
- Nutanix Prism
- Nutanix Calm (optional)
- Nutanix Flow (optional)

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 HX3720 (Xeon SP Gen 1) appliance supports the following hypervisors that are installed on the 2x M.2 SSDs configured in a RAID-1 drive group:

- Nutanix Acropolis Hypervisor (AHV) (Bundled with AOS)
- VMware ESXi 6.0 Update 3
- VMware ESXi 6.5 Update 1
- VMware ESXi 6.5 Update 2
- VMware ESXi 6.7 Update 1
- VMware ESXi 6.7 Update 3
- Microsoft Windows Server 2016 Datacenter (Hyper-V)

The following table lists the hypervisors available for selection.

Table 21. Hypervisors

Description	Feature code	Quantity
Nutanix SW Stack on Nutanix AHV (default selection)	B15S	1
Nutanix SW Stack on VMware ESXi 6.0	B15T	1
Nutanix SW Stack on VMware ESXi 6.5	B15R	1
Nutanix SW Stack on VMware ESXi 6.7	B63T	1
Nutanix SW Stack on Hyper-V 2016	B63U	1

Configuration note: In ESXi-based environments, HX Series appliances require VMware vCenter Server.

Nutanix Acropolis

The ThinkAgile HX3720 appliances can be configured with one of the Nutanix software editions that are listed in the following table. The Nutanix software is factory-preloaded and the appropriate license for the selected software edition can be downloaded from the Nutanix website to match the serial number of the appliance.

Configuration note: The ThinkAgile HX3720 (Xeon SP Gen 1) appliances can be deployed as a cluster of 3 or more nodes (AOS 5.1.3 or later).

Table 22. Nutanix software options

Description	Feature code	Quantity (per node)
Nutanix Starter Edition	B0VU	1
Nutanix Pro Edition	B0VV	1
Nutanix Ultimate Edition	B0VW	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 key features of the Nutanix software editions.

Table 23. Nutanix software editions feature comparison

	Nutanix software edition		
Feature	**Starter**	**Pro**	**Ultimate**
Enterprise storage			
Cluster size	12 nodes max	Unlimited	Unlimited
Heterogeneous clusters	Yes	Yes	Yes
Online cluster grow/shrink	Yes	Yes	Yes
Storage containers	Yes	Yes	Yes
VM-centric snapshots and clones	Yes	Yes	Yes
Data tiering	Yes	Yes	Yes
Inline compression	Yes	Yes	Yes
Inline performance (cache) deduplication	Yes	Yes	Yes
Post-process compression	No	Yes	Yes
Post-process capacity deduplication	No	Yes	Yes
Erasure Coding (EC-X)	No	Yes	Yes
Nutanix Volumes	No	Yes	Yes
VM Flash Mode (Pin to SSD)	No	No	Yes
Nutanix Files	Optional*	Optional*	Optional*
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			
Asynchronous replication and disaster recovery (DR)	Yes	Yes	Yes
Application-consistent snapshots	Yes	Yes	Yes
Local snapshots	Yes	Yes	Yes
Cloud Connect (Backup to public clouds)	No	Yes	Yes
Self-service restore	No	Yes	Yes
Multiple site DR (many to many)	No	Optional*	Yes
Metro availability	No	Optional*	Yes
Synchronous replication and disaster recovery	No	Optional*	Yes
Security			
Client authentication	Yes	Yes	Yes
Cluster lockdown	No	Yes	Yes

Feature	Nutanix software edition		
	Starter	**Pro**	**Ultimate**
Data-at-rest encryption	No	Optional*^	Yes^
Management and analytics			
Prism Starter (Single- and multi-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
Rest APIs	Yes	Yes	Yes
Virtualization			
Built-in Acropolis Hypervisor (AHV)	Yes	Yes	Yes
VMware vSphere (ESXi)	Yes	Yes	Yes
Microsoft Hyper-V	Yes	Yes	Yes
VM management	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
Self-service portal	Yes	Yes	Yes

* Requires a separate license.
^ Software-based encryption that uses standard drives.

It is possible to upgrade a software edition after the initial deployment by purchasing one of the software upgrade options listed in the following table.

Table 24. Nutanix software upgrade options

Description	Part number	Feature code	Quantity (per node)
Nutanix Starter to Pro Upgrade	01GU985	AW7H	1
Nutanix Starter to Ultimate Upgrade	01GU986	AW7J	1
Nutanix Pro to Ultimate Upgrade	01GU987	AW7K	1

Configuration note: Customers should request a quote for the selected Nutanix SW Upgrade part number from Lenovo and provide additional details on the existing installation and planned upgrade.

In addition to the software licenses for the specific Nutanix software edition, the ThinkAgile HX Series appliances require the Nutanix capacity licenses that are based on the total number of the processor cores and total flash storage (SSD) capacity in the appliance.

During the initial purchase, the Nutanix capacity licenses are derived by the configurator that automatically adds the required quantity of the capacity license options that are listed in the following table based on the selected processors and SSDs.

Table 25. Nutanix capacity license options

Description	Feature code	Quantity
Node Cores	B6C1	1 per processor core
Node Tebibytes	B6C2	1 per TiB of SSD capacity

Also, it is possible to expand storage capacity after the initial deployment by adding more drives to match one of the supported storage configurations and acquiring additional SSD capacity license options listed in the following table, as needed.

Table 26. Optional capacity expansion license options

Description	Part number	Feature code	Quantity (per TiB of SSD capacity)
Nutanix APOS HW Upgrade for previously sold HX node: Additional TiB	7S0P0002WW	S1NM	1

Configuration notes:

- The total flash storage capacity in Tebibytes (TiB) can be calculated by multiplying the total flash storage capacity in Terabytes (TB) by 0.909495.
- When expanding storage capacity after the initial deployment, customers should request a quote for the selected HW Upgrade part numbers from Lenovo and provide additional details on the existing installation.

The following optional software licenses are available for the Nutanix software editions:

- Nutanix Files
- Nutanix Software Encryption
- Nutanix Advanced Replication

The optional software licenses can be added during the initial purchase by selecting one of the software options listed in the following table.

Table 27. Optional software selection options

Description	Feature code	Quantity
Nutanix Files	B4MX	1 per TiB of NAS capacity
Nutanix ENC - Data at Rest Encryption	B4V5	1 per node
Nutanix REP - Advanced Replication	B4V6	1 per node

Also, the optional software licenses for Nutanix Files can be added after the initial deployment by purchasing one of the software license options listed in the following table.

Table 28. Optional software license options for Nutanix Files

Description	Part number	Feature code	Quantity (per TiB of NAS capacity)
Nutanix Files License with 1Yr Maintenance and Support (per TiB)	7S0P000JWW	S1P3	1
Nutanix Files License with 2Yr Maintenance and Support (per TiB)	7S0P000KWW	S1P5	1
Nutanix Files License with 3Yr Maintenance and Support (per TiB)	7S0P000LWW	S1MQ	1
Nutanix Files License with 4Yr Maintenance and Support (per TiB)	7S0P000MWW	S1MX	1
Nutanix Files License with 5Yr Maintenance and Support (per TiB)	7S0P000NWW	S1N4	1

Configuration notes:

- The Nutanix Files license is available as an add-on for the Nutanix Starter, Pro, and Ultimate software editions.
- When adding Nutanix Files after the initial deployment, customers should request a quote for the selected Nutanix Files license part numbers from Lenovo and provide additional details on the existing installation.
- The total NAS storage capacity in Tebibytes (TiB) can be calculated by multiplying the total NAS storage capacity in Terabytes (TB) by 0.909495.
- The Nutanix ENC and Nutanix REP licenses are available as add-ons for the Nutanix Pro software edition.
- The Nutanix REP license includes the multiple site DR, metro availability, and synchronous replication and disaster recovery features.

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 is a part of the Nutanix software preloaded on the appliances, and it includes the following components:

- Prism Starter (included in Starter, Pro, and Ultimate Nutanix software editions): Provides ability to configure, manage, and monitor a Nutanix cluster and centralized management of multiple local and remote Nutanix clusters.
- Prism Pro (Selectable software license; optional): Enables efficiency evaluation, capacity planning, expansion recommendations, custom dashboards, and advanced search capabilities.

The Prism Pro software license can be added during the initial purchase by selecting one of the software options listed in the following table.

Table 29. Prism Pro selection options

Description	Feature code	Quantity (per node)
Prism Pro	B0W4	1
XClarity Pro and Prism Pro	B0W5	1

Also, Prism Starter can be upgraded to Prism Pro after the initial deployment by purchasing one of the software license options listed in the following table.

Table 30. Prism Pro software license options

Description	Part number	Feature code	Quantity (per node)
Nutanix Prism Pro with 1Yr Support	7S0P000UWW	AW87	1
Nutanix Prism Pro with 2Yr Support	7S0P000VWW	AW88	1
Nutanix Prism Pro with 3Yr Support	7S0P000WWW	AW89	1
Nutanix Prism Pro with 4Yr Support	7S0P000XWW	AW8A	1
Nutanix Prism Pro with 5Yr Support	7S0P000YWW	AW8B	1

Configuration note: When upgrading Prism Starter to Prism Pro after the initial deployment, customers should request a quote for the selected Prism Pro part numbers from Lenovo and provide additional details on the existing installation.

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
  - Manages firmware updates with the ThinkAgile HX Lifecycle Manager (UEFI, XCC, drives, network adapters, and SAS HBAs)
- 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

Nutanix Calm

Nutanix Calm enables advanced application-level orchestration by providing a powerful, common management framework that can be leveraged by IT teams to rapidly create and deliver applications. The Calm software offers the following key features:

- Fully automates the provisioning, scaling, and deletion of traditional multi-tiered applications and distributed services.
- Simplifies the set-up and management of custom enterprise applications by incorporating all elements of each application, including relevant VMs, configurations, and related binaries, into an easy-to-use-blueprint.
- Publishes blueprints through the Nutanix Marketplace, giving end users the ability to request IT services that can then be instantly provisioned.
- Maintains control with role-based governance that limits user operations based on permissions and logs all activities for end-to-end traceability.

The Calm software is licensed on a per-VM basis in 25 VM packs. The Calm software licenses can be added during the initial purchase by selecting the software option listed in the following table.

Table 31. Calm software selection options

Description	Feature code	Quantity (per 25 VMs)
Calm 25 License Pack	B4E4	1

Also, Calm licenses can be added after the initial deployment by purchasing one of the software license options listed in the following table.

Table 32. Calm software license options

Description	Part number	Feature code	Quantity (per 25 VMs)
Nutanix Calm Standard, Per 25 VMs w/1Yr Support	7S0P000ZWW	B3D7	1
Nutanix Calm Standard, Per 25 VMs w/2Yr Support	7S0P0010WW	B3D8	1
Nutanix Calm Standard, Per 25 VMs w/3Yr Support	7S0P0011WW	B3D9	1
Nutanix Calm Standard, Per 25 VMs w/4Yr Support	7S0P0012WW	B3DA	1
Nutanix Calm Standard, Per 25 VMs w/5Yr Support	7S0P0013WW	B3DB	1

Configuration notes:

- Calm supports the AHV and ESXi hypervisors.
- When adding the Calm software licenses after the initial deployment, customers should request a quote for the selected Calm part numbers from Lenovo and provide additional details on the existing installation.

Nutanix Flow

Nutanix Flow delivers advanced networking and security services, providing visibility into the virtual network, application-centric protection from network threats, and automation of common networking operations. The Flow software offers the following key features:

- Real-time visualization of communications between VMs helps implement appropriate network policies in a Nutanix environment.
- Micro-segmentation provides granular control and governance of all traffic into and out of a virtual machine with network policies attached to individual VMs and applications, rather than specific network segments.
- API-based notifications enable third party network devices to automate network configuration changes, such as VLAN provisioning or policy updates, in response to VM lifecycle events, such as adding a new VM.
- Service insertion and chaining enables virtualized network functions from third-party software (such as virtual firewalls and load balancers) to be deployed with VM traffic in a Nutanix environment.

The Flow software is licensed on a per-node basis. The Flow software license can be added during the initial purchase by selecting the software option listed in the following table,

Table 33. Flow software selection options

Description	Feature code	Quantity (per node)
Flow Single Node License	B4E5	1

Also, Flow licenses can be added after the initial deployment by purchasing one of the software license options listed in the following table.

Table 34. Flow software license options

Description	Part number	Feature code	Quantity (per node)
Nutanix Flow, Per Node w/1Yr Support	7S0P0014WW	B3DC	1
Nutanix Flow, Per Node w/2Yr Support	7S0P0015WW	B3DD	1
Nutanix Flow, Per Node w/3Yr Support	7S0P0016WW	B3DE	1
Nutanix Flow, Per Node w/4Yr Support	7S0P0017WW	B3DF	1
Nutanix Flow, Per Node w/5Yr Support	7S0P0018WW	B3DG	1

Configuration notes:

- Flow supports the AHV hypervisors only.
- When adding the Flow software licenses after the initial deployment, customers should request a quote for the selected Flow part numbers from Lenovo and provide additional details on the existing installation.

The following tables list previously available Prism Pro, Calm, and Flow software licenses that are now withdrawn and no longer available for ordering. For currently available Prism Pro, Calm, and Flow software licenses, refer to the following software components:

- Nutanix Prism
- Nutanix Calm
- Nutanix Flow

Table 35. Withdrawn Prism Pro software license options

Description	Part number	Feature code
Nutanix Prism Pro with 1Yr Support	01GU988	AW87
Nutanix Prism Pro with 2Yr Support	01GU989	AW88
Nutanix Prism Pro with 3Yr Support	01GU990	AW89
Nutanix Prism Pro with 4Yr Support	01GU991	AW8A
Nutanix Prism Pro with 5Yr Support	01GU992	AW8B

Table 36. Withdrawn Calm software license options

Description	Part number	Feature code
Nutanix Calm Standard, Per 25 VMs w/1Yr Support	01PG292	B3D7
Nutanix Calm Standard, Per 25 VMs w/2Yr Support	01PG293	B3D8
Nutanix Calm Standard, Per 25 VMs w/3Yr Support	01PG294	B3D9
Nutanix Calm Standard, Per 25 VMs w/4Yr Support	01PG295	B3DA
Nutanix Calm Standard, Per 25 VMs w/5Yr Support	01PG296	B3DB

Table 37. Withdrawn Flow software license options

Description	Part number	Feature code
Nutanix Flow, Per Node w/1Yr Support	01PG297	B3DC
Nutanix Flow, Per Node w/2Yr Support	01PG298	B3DD
Nutanix Flow, Per Node w/3Yr Support	01PG299	B3DE
Nutanix Flow, Per Node w/4Yr Support	01PG300	B3DF
Nutanix Flow, Per Node w/5Yr Support	01PG301	B3DG

Systems management

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

- Lenovo XClarity Controller
- Light path diagnostics
- Lenovo XClarity Administrator and XClarity Pro
- 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

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, appliances, certified nodes, Top-of-Rack Ethernet switches, and storage systems, providing automated agent-less discovery, inventory, monitoring, and alerts across multiple systems. In addition, some managed endpoints support firmware updates and configuration management.

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.

The XClarity Pro license can be added during the initial purchase by selecting one of the software options listed in the following table.

Table 38. XClarity Pro selection options

Description	Feature code	Quantity (per node)
XClarity Pro	B0W3	1
XClarity Pro and Prism Pro	B0W5	1

Also, XClarity Pro licenses can be added after the initial deployment by purchasing one of the software license options listed in the following table.

Table 39. Lenovo XClarity Pro license options

Description	Part number		Quantity (per node)
	NA, AP, Japan*	EMEA, LA**	
Lenovo XClarity Pro, per Managed Endpoint w/1 Yr SW S&S	00MT201	00MT207	1
Lenovo XClarity Pro, per Managed Endpoint w/3 Yr SW S&S	00MT202	00MT208	1
Lenovo XClarity Pro, per Managed Endpoint w/5 Yr SW S&S	00MT203	00MT209	1

* NA = North America; AP = Asia Pacific.
** EMEA = Europe, Middle East, Africa; LA = Latin America.

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

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 customers to observe, plan and manage power and cooling for Lenovo servers and appliances. Using built-in intelligence, XClarity Energy Manager identifies power consumption trends and ideal power settings, and it performs cooling analysis so that customers can define and optimize their 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 HX3720 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 appliance performance might be impacted when the operating temperature is outside the ASHRAE A2 specifications. Depending on the hardware configuration, some HX3720 appliances comply with ASHRAE class A3 and class A4 specifications. To comply with ASHRAE class A3 and class A4 specifications, the HX3720 appliances must meet the following hardware configuration requirement: Processors with TDP more than or equal to 125 W not installed.

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 40. 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 3.0

Warranty and support

The ThinkAgile HX Series appliances can be configured with a three-, four, or five-year hardware warranty with 24x7 ThinkAgile Advantage Single Point of Support (Lenovo appliance hardware and Nutanix software) 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.

Lenovo's support services provide a sophisticated, unified support structure for a customer's data center, with an experience consistently ranked number one in customer satisfaction worldwide.

The following Lenovo support services are available for selection:

- **Premier Support** provides a Lenovo-owned customer experience and delivers direct access to technicians skilled in hardware, software, and advanced troubleshooting, in addition to the following capabilities:
    - Direct technician-to-technician access through a dedicated phone line.
    - 24x7x365 remote support.
    - Single point of contact service.
    - End to end case management.
    - 3rd Party collaborative software support.
    - Online case tools and live chat support.
    - On-demand remote system analysis.
- **Warranty service level upgrades (Preconfigured Support)** are available to meet the on-site response time targets that match the criticality of customer's systems:
    - 3, 4, or 5 years of service coverage.
    - **Foundation Service:** 9x5 service coverage with next business day onsite response, with optional YourDrive YourData.
    - **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select regions), bundled with YourDrive YourData.
    - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select regions), bundled with YourDrive YourData.
- **Managed Services**
  Lenovo Managed Services provide continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of a customer's data center using state of the art tools, systems, and practices by a team of highly skilled and experienced Lenovo services professionals.

  Quarterly reviews check error logs, verify firmware and operating system device driver levels, and software as needed. Lenovo will also maintain records of latest patches, critical updates, and firmware levels, to ensure customer's systems are providing business value through optimized performance.
- **Technical Account Management (TAM)**
  A Lenovo Technical Account Manager helps customers optimize operations of their data centers based on a deep understanding of customer's business. Customers gain direct access to a Lenovo TAM, who serves as their single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. Also, a TAM helps proactively make service recommendations and manage service relationship with Lenovo to make certain that customer's needs are met.

- **Enterprise Software Support**
  Lenovo Enterprise Software Support is an additional support service that provides customers with software support on Microsoft, Red Hat, SUSE, and VMWare applications and systems. Around the clock availability for critical problems plus unlimited calls and incidents helps customers address challenges fast, without incremental costs. Support staff can answer troubleshooting and diagnostic questions, address product compatibility and interoperability issues, isolate causes of problems, report defects to software vendors, and more.

- **YourDrive YourData**
  Lenovo's YourDrive YourData service is a multi-drive retention offering that ensures that customer's data is always under their control, regardless of the number of drives that are installed in their Lenovo server. In the unlikely event of a drive failure, customers retain possession of their drive while Lenovo replaces the failed drive part. Customer's data stays safely on customer premises, in their hands. The YourDrive YourData service can be purchased in convenient bundles with Foundation, Essential, or Advanced services.

- **Health Check**
  Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that customer systems and business are always running at their best. Health Check supports Lenovo-branded server, storage, and networking devices, as well as select Lenovo-supported products from other vendors that are sold by Lenovo or a Lenovo-Authorized Reseller.

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 spare parts.

Lenovo support services are region-specific. Not all support services are available in every region. For information about Lenovo support services that are available in a specific 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/

For service definitions, region-specific details, and service limitations, 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-, four-, 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 (per node)
  - 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 (per cluster)
  - Configuring and integrating a virtualized environment:
    - Nutanix containers and Acropolis (AHV) cluster; or
    - VMware vCenter Server and vSphere cluster; or
    - Microsoft Hyper-V cluster and System Center Virtual Machine Manager
  - Transferring knowledge
- Nutanix deployment services - Advanced with XClarity (per cluster)
  - Nutanix deployment services - Advanced
  - Installing Lenovo XClarity
  - Configuring Lenovo XClarity network settings and performing discovery and inventory
  - Installing system updates

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

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

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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