

Lenovo ThinkAgile HX3321 Certified Node (Xeon SP Gen 2) Product Guide

Lenovo ThinkAgile HX Certified Nodes are designed for deploying industry-leading hyperconvergence software from Nutanix on Lenovo enterprise platforms that feature the second generation of the Intel Xeon Processor Scalable Family (Xeon SP Gen 2).

The ThinkAgile HX Certified Nodes deliver fully validated and integrated Lenovo hardware and firmware, certified and preloaded with Nutanix software. Nutanix brings the benefits of web-scale technologies to enterprise applications through enterprise storage, data protection, infrastructure resilience, management and analytics, and security.

The ThinkAgile HX3321 is a 1U rack-mount certified node for compute-heavy workloads that supports two processors, up to 3 TB of TruDDR4 memory with up to 2933 MHz memory speeds, 10x or 12x 2.5-inch hot-swap drive bays with an extensive choice of NVMe PCIe, SAS, or SATA SSDs and SAS or SATA HDDs, and flexible network connectivity options with 1/10 GbE RJ-45, 10 GbE SFP+, 10/25 GbE SFP28, and 25/40 GbE QSFP+ ports.

Several common uses for the ThinkAgile HX Certified Nodes 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 HX3321 Certified Node is shown in the following figure.



Figure 1. Lenovo ThinkAgile HX3321 Certified Node

Did you know?

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

The ThinkAgile HX Certified Nodes deliver fully validated and integrated hardware and firmware that is certified with Nutanix software.

Key features

The ThinkAgile HX Certified Nodes are designed for the industry's most feature-rich hyperconverged infrastructure from Nutanix. Nutanix brings the benefits of web-scale technologies to enterprise applications through enterprise storage, data protection, infrastructure resilience, management and analytics, and security.

The ThinkAgile HX Certified Nodes offer the following key features:

- Built on proven and reliable Lenovo ThinkSystem servers featuring Intel Xeon Processor Scalable Family that provide compute power for a variety of workloads and applications.
- Deliver fully validated and integrated hardware and firmware that is certified with Nutanix software.
- Preloaded with Nutanix software and ready for out-of-box deployment (software licenses are not included).
- Provide flexibility in using the existing Nutanix term-based software licenses and active support contracts or purchasing new software licenses and support contracts from Nutanix.
- Offer optional Lenovo Professional Services to get customers up and running quickly.

The Nutanix software running on the HX Certified Nodes 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 HX3321 Certified Node.

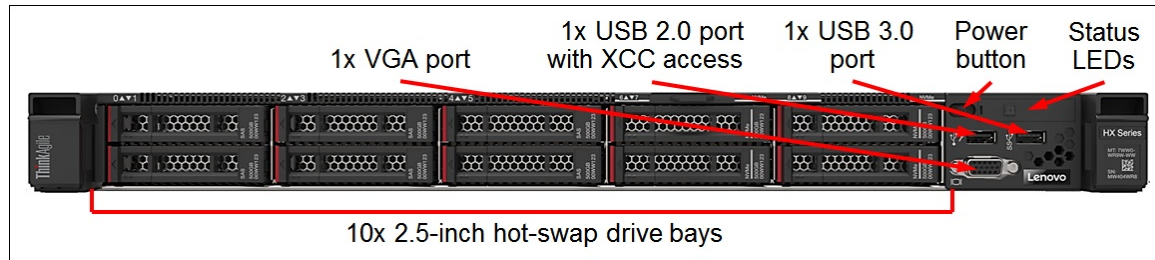


Figure 2. HX3321 front view

The front of the HX3321 Certified Node includes the following components:

- 6x SAS/SATA and 4x AnyBay 2.5-inch hot-swap drive bays
- One VGA port
- One USB 2.0 port with XClarity Controller access
- One USB 3.0 port
- A Power button
- Status LEDs

The following figure shows the rear view of the HX3321 Certified Node with 10 drive bays.

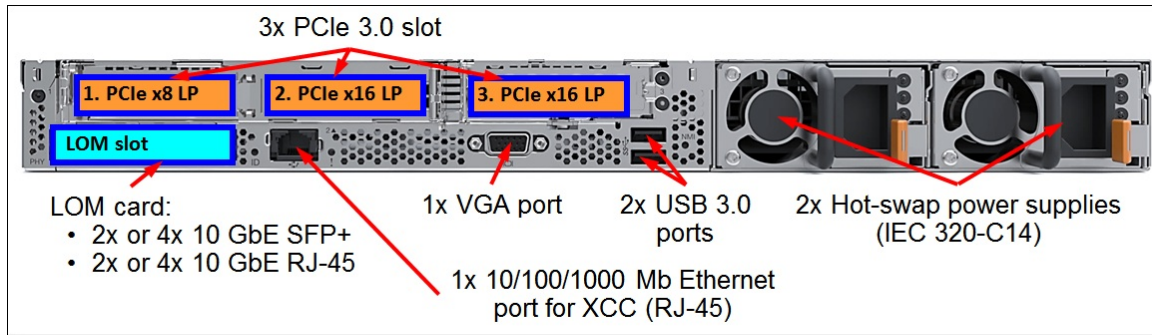


Figure 3. HX3321 10-drive bay rear view

The following figure shows the rear view of the HX3321 Certified Node with 12 drive bays.

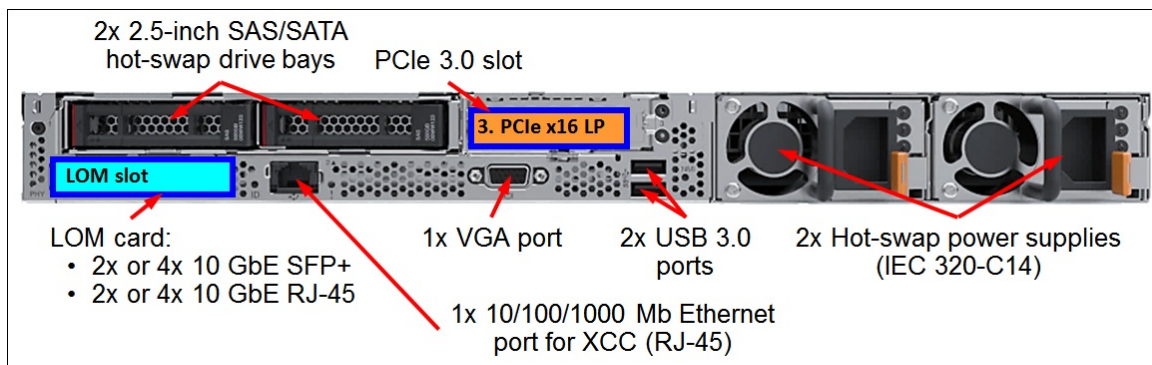


Figure 4. HX3321 12-drive bay rear view

The rear of the HX3321 Certified Node includes the following components:

- Three (models with 10 drive bays) or one (models with 12 drive bays) PCIe expansion slots
- Two SFF SAS/SATA hot-swap rear drive bays (models with 12 drive bays)
- One LOM card slot
- One 1 GbE port for XClarity Controller
- One VGA port
- Two USB 3.0 ports
- Two hot-swap power supplies

System specifications

The following table lists the system specifications of the ThinkAgile HX3321 Certified Node.

Table 1. HX3321 system specifications

Attribute	Specification
Form factor	1U Rack-mount.
Processor	Two Intel Xeon Silver, Gold, or Platinum Gen 2 processors.
Chipset	Intel C624.
Memory	24 DIMM slots (up to 12 DIMMs per processor; six memory channels per processor with two DIMMs per channel) with support for the following DIMM types and capacities: <ul style="list-style-type: none"> • TruDDR4 RDIMMs: <ul style="list-style-type: none"> ◦ 16 GB, 32 GB, and 64 GB Performance+ 2933 MHz. ◦ 16 GB, 32 GB, and 64 GB 2933 MHz. ◦ 16 GB and 32 GB 2666 MHz. • TruDDR4 3DS RDIMMs: <ul style="list-style-type: none"> ◦ 128 GB Performance+ 2933 MHz. ◦ 128 GB 2933 MHz.
Memory capacity	Up to 3 TB.
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 or 8x SAS/SATA and 4x AnyBay 2.5-inch hot-swap.
Internal storage	<ul style="list-style-type: none"> • Hybrid: <ul style="list-style-type: none"> ◦ 2 cache SSDs (SAS or SATA SSDs) and from 4 to 10 capacity HDDs (SAS or SATA HDDs) in increments of 2 drives. ◦ 4 cache SSDs and 8 capacity HDDs. • All Flash: <ul style="list-style-type: none"> ◦ From 2 to 12 capacity SSDs (SAS or SATA SSDs) in increments of 2 drives. ◦ 2 cache SSDs (NVMe PCIe SSDs) and from 4 to 10 capacity SSDs in increments of 2 drives. ◦ 4 cache SSDs and 8 capacity SSDs.
Drive capacities	<ul style="list-style-type: none"> • SSDs: <ul style="list-style-type: none"> ◦ NVMe PCIe 3.0 x4 SSDs up to 3.2 TB ◦ 12 Gbps SAS SSDs up to 7.68 TB ◦ 6 Gbps SATA SSDs up to 3.84 TB • HDDs: <ul style="list-style-type: none"> ◦ 12 Gbps SAS HDDs up to 2.4 TB ◦ 6 Gbps NL SATA HDDs up to 2 TB <p>Note: All NVMe PCIe SSDs in the appliance must be of the same model and capacity. All SAS or SATA 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.</p>
Storage capacity	<ul style="list-style-type: none"> • Hybrid: Up to 24 TB (10x 2.4 TB HDDs). • All Flash: Up to 92 TB (12x 7.68 TB SSDs).
Storage controller	1x 430-16i HBA (12 Gbps SAS/6 Gbps SATA; non-RAID). Onboard NVMe (non-RAID).
Network interfaces	<ul style="list-style-type: none"> • 2x or 4x 1/10 GbE RJ-45 or 10 GbE SFP+ base network ports. • 2x, 4x, or 6x optional 1/10 GbE RJ-45, 10 GbE SFP+, or 25 GbE SFP28, or 2x or 4x 40 GbE QSFP+ optional expansion ports. • 1x RJ-45 10/100/1000 Mb Ethernet port for systems management.

Attribute	Specification
Boot drive	2x M.2 non-hot-swap SSDs up to 480 GB (RAID-1).
I/O expansion slots	Models with 10 drive bays: 4x PCIe 3.0 slots <ul style="list-style-type: none"> Slot 1: PCIe 3.0 x8; low profile (for a network adapter). Slot 2: PCIe 3.0 x16; low profile (for a network adapter). Slot 3: PCIe 3.0 x16; low profile (for a network adapter). Slot 4: PCIe 3.0 x8 (for an internal storage controller). Models with 12 drive bays: 2x PCIe 3.0 slots <ul style="list-style-type: none"> Slot 3: PCIe 3.0 x16; low profile (for a network adapter). Slot 4: PCIe 3.0 x8 (for an internal storage controller).
Ports	<ul style="list-style-type: none"> Front: 1x USB 2.0 port with XClarity Controller access, 1x USB 3.0 port, 1x VGA port. Rear: 2x USB 3.0 ports, 1x VGA port.
Cooling	Seven hot-swap system fans with N+1 redundancy.
Power supply	Two redundant hot-swap 750 W or 1100 W (100 - 240 V) High Efficiency Platinum, or 750 W (200 - 240 V) Titanium power supplies.
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, light path diagnostics, XClarity Provisioning Manager, XClarity Administrator and XClarity Pro. XClarity Energy Manager (optional).
Security features	Power-on password, administrator's password, secure firmware updates, Trusted Platform Module (TPM) 1.2 or 2.0 (configurable UEFI setting). Optional security bezel.
Software	Nutanix Acropolis Pro and Ultimate editions (licenses purchased separately from Nutanix).
Hypervisors	<ul style="list-style-type: none"> Nutanix Acropolis Hypervisor (Bundled with AOS). VMware ESXi 6.5 Update 2. VMware ESXi 6.5 Update 3. VMware ESXi 6.7 Update 1. VMware ESXi 6.7 Update 3. Microsoft Windows Server 2016 Datacenter (Hyper-V).
Warranty and support	One- (PRC only), three-, four-, or five-year customer-replaceable unit and onsite limited warranty with selectable service levels: 9x5 coverage with next business day (NBD) parts delivered (base warranty), 9x5 coverage with NBD onsite response (Foundation Service), 24x7 coverage with 4-hour onsite response or 24-hour committed repair (select areas) (Essential Service), or 24x7 coverage with 2-hour onsite response or 6-hour committed repair (select areas) (Advanced Service). Also available are 1-year and 2-year post-warranty extensions, YourDrive YourData, and Enterprise Software Support.
Dimensions	Height: 43 mm (1.7 in.), width: 434 mm (17.1 in.), depth: 715 mm (28.1 in.).
Weight	Maximum configuration: 18.8 kg (41.4 lb).

Factory-integrated models

Factory-integrated models of the ThinkAgile HX Certified Nodes 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/>

The following table lists the base CTO models of the ThinkAgile HX3321 Certified Node.

Table 2. Base CTO models

Description	Machine Type/Model
Models with 3-year warranty (Worldwide)	
Lenovo ThinkAgile HX3321 Certified Node 3YR	7Y89CTO3WW
Models with 1-year warranty (PRC only)	
Lenovo ThinkAgile HX3321 Certified Node 1YR	7Z04CTO3WW

The following table lists the base chassis for the HX3321 Certified Node.

Table 3. Base chassis

Description	Feature code
ThinkAgile HX332x Base	B0T2

The HX3321 Certified Nodes ship with the following items:

- *Electronic Publications Flyer*
- Tool-less Slide Rail Kit with or without 1U CMA (depending on the rack installation option selected)
- With or without two rack power cables or line cords (depending on the power cable option selection)

Processors

The ThinkAgile HX3321 Certified Node ships with two processors. The following table lists the processor options that are available for selection.

Table 4. Processor selection options

Description	Feature code	Quantity
Intel Xeon Silver processors		
Intel Xeon Silver 4208 8C 85W 2.1GHz Processor	B4HT	2
Intel Xeon Silver 4210 10C 85W 2.2GHz Processor	B4HS	2
Intel Xeon Silver 4210R 10C 100W 2.4GHz Processor	B7N5	2
Intel Xeon Silver 4214 12C 85W 2.2GHz Processor	B4HR	2
Intel Xeon Silver 4214R 12C 100W 2.4GHz Processor	B7N6	2
Intel Xeon Silver 4215 8C 85W 2.5GHz Processor	B4HQ	2
Intel Xeon Silver 4215R 8C 130W 3.2GHz Processor	BAZU	2
Intel Xeon Silver 4216 16C 100W 2.1GHz Processor	B4HP	2
Intel Xeon Gold processors		
Intel Xeon Gold 5215 10C 85W 2.5GHz Processor	B4HN	2
Intel Xeon Gold 5215L 10C 85W 2.5GHz Processor	B4P9	2
Intel Xeon Gold 5217 8C 115W 3.0GHz Processor	B4HM	2
Intel Xeon Gold 5218 16C 125W 2.3GHz Processor	B4HL	2
Intel Xeon Gold 5218R 20C 125W 2.1GHz Processor	BAZS	2
Intel Xeon Gold 5220 18C 125W 2.2GHz Processor	B4HK	2

Description	Feature code	Quantity
Intel Xeon Gold 5220R 24C 150W 2.2GHz Processor	B7N9	2
Intel Xeon Gold 5220S 18C 125W 2.7GHz Processor	B6CW	2
Intel Xeon Gold 6222V 20C 115W 1.8GHz Processor	B6CV	2
Intel Xeon Gold 6226 12C 125W 2.7GHz Processor	B6CL	2
Intel Xeon Gold 6226R 16C 150W 2.9GHz Processor	BAZW	2
Intel Xeon Gold 6230 20C 125W 2.1GHz Processor	B4HJ	2
Intel Xeon Gold 6230N 20C 125W 2.3GHz Processor	B5RY	2
Intel Xeon Gold 6230R 26C 150W 2.1GHz Processor	BAZX	2
Intel Xeon Gold 6234 8C 130W 3.3GHz Processor	B6CK	2
Intel Xeon Gold 6238 22C 140W 2.1GHz Processor	B6CJ	2
Intel Xeon Gold 6238L 22C 140W 2.1GHz Processor	B6CR	2
Intel Xeon Gold 6238R 28C 165W 2.2GHz Processor	BAZL	2
Intel Xeon Gold 6240 18C 150W 2.6GHz Processor	B4HH	2
Intel Xeon Gold 6240L 18C 150W 2.6GHz Processor	B6CS	2
Intel Xeon Gold 6240R 24C 165W 2.4GHz Processor	BAZM	2
Intel Xeon Gold 6242 16C 150W 2.8GHz Processor	B4HG	2
Intel Xeon Gold 6242R 20C 205W 3.1GHz Processor	BAZN	2
Intel Xeon Gold 6244 8C 150W 3.6GHz Processor	B4HF	2
Intel Xeon Gold 6246 12C 165W 3.3GHz Processor	B6PD	2
Intel Xeon Gold 6246R 16C 205W 3.4GHz Processor	BAZP	2
Intel Xeon Gold 6248 20C 150W 2.5GHz Processor	B4HE	2
Intel Xeon Gold 6248R 24C 205W 3.0GHz Processor	BAZQ	2
Intel Xeon Gold 6252 24C 150W 2.1GHz Processor	B4HC	2
Intel Xeon Gold 6252N 24C 150W 2.3GHz Processor	B6CT	2
Intel Xeon Gold 6254 18C 200W 3.1GHz Processor	B4HD	2
Intel Xeon Gold 6258R 28C 205W 2.7GHz Processor	BAZR	2
Intel Xeon Gold 6262V 24C 135W 1.9GHz Processor	B6CU	2
Intel Xeon Platinum processors		
Intel Xeon Platinum 8253 16C 125W 2.2GHz Processor	B5RZ	2
Intel Xeon Platinum 8260 24C 165W 2.4GHz Processor	B4HB	2
Intel Xeon Platinum 8260L 24C 165W 2.4GHz Processor	B4P7	2
Intel Xeon Platinum 8268 24C 205W 2.9GHz Processor	B4HA	2
Intel Xeon Platinum 8270 26C 205W 2.7GHz Processor	B4H9	2
Intel Xeon Platinum 8276 28C 165W 2.2GHz Processor	B4H8	2
Intel Xeon Platinum 8276L 28C 165W 2.2GHz Processor	B4P6	2
Intel Xeon Platinum 8280 28C 205W 2.7GHz Processor	B4H7	2
Intel Xeon Platinum 8280L 28C 205W 2.7GHz Processor	B4P5	2

Configuration notes:

- The HX3321 Certified Node allows configurations with 12x SFF drive bays only if the processors of up to 125 W TDP (except Silver 4210 and 4210R) are selected.
- If the configurations with Gold 6242R, 6246R, 6248R, 6254, and 6258R processors, a maximum of 4 SSDs is supported for all flash storage (hybrid storage is not supported).

The following table lists the specifications of the processors for the certified nodes.

Processor specifications table abbreviations:

- UPI: Ultra Path Interconnect
- TDP: Thermal Design Power
- HT: Hyper-Threading
- TB: Turbo Boost 2.0
- VT-x: Virtualization Technology
- VT-d: Virtualization Technology for Directed I/O
- RAS: Reliability, Availability, and Serviceability
 - Std: Standard RAS
 - Adv: Advanced RAS

Table 5. Processor specifications

CPU model	Cores / threads	Core speed (Base / TB Max)	Cache	Max DDR4 speed	Max memory capacity per socket	UPI speed	TDP	HT	TB	VT-x	VT-d	RAS
Intel Xeon Silver processors												
4208	8 / 16	2.1 / 3.2 GHz	11 MB	2400 MHz	1 TB	9.6 GT/s	85 W	Y	Y	Y	Y	Std
4210	10 / 20	2.2 / 3.2 GHz	13.75 MB	2400 MHz	1 TB	9.6 GT/s	85 W	Y	Y	Y	Y	Std
4210R	10 / 20	2.4 / 3.2 GHz	13.75 MB	2400 MHz	1 TB	9.6 GT/s	100 W	Y	Y	Y	Y	Std
4214	12 / 24	2.2 / 3.2 GHz	16.5 MB	2400 MHz	1 TB	9.6 GT/s	85 W	Y	Y	Y	Y	Std
4214R	12 / 24	2.4 / 3.5 GHz	16.5 MB	2400 MHz	1 TB	9.6 GT/s	100 W	Y	Y	Y	Y	Std
4215	8 / 16	2.5 / 3.5 GHz	11 MB	2400 MHz	1 TB	9.6 GT/s	85 W	Y	Y	Y	Y	Std
4215R	8 / 16	3.2 / 4.0 GHz	11 MB	2400 MHz	1 TB	9.6 GT/s	130 W	Y	Y	Y	Y	Std
4216	16 / 32	2.1 / 3.2 GHz	22 MB	2400 MHz	1 TB	9.6 GT/s	100 W	Y	Y	Y	Y	Std
Intel Xeon Gold processors												
5215	10 / 20	2.5 / 3.4 GHz	13.75 MB	2666 MHz	1 TB	10.4 GT/s	85 W	Y	Y	Y	Y	Adv
5215L	10 / 20	2.5 / 3.4 GHz	13.75 MB	2666 MHz	4.5 TB	10.4 GT/s	85 W	Y	Y	Y	Y	Adv
5217	8 / 16	3.0 / 3.7 GHz	11 MB	2666 MHz	1 TB	10.4 GT/s	115 W	Y	Y	Y	Y	Adv
5218	16 / 32	2.3 / 3.9 GHz	22 MB	2666 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	Adv
5218R	20 / 40	2.1 / 4.0 GHz	27.5 MB	2666 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	Adv
5220	18 / 36	2.2 / 3.9 GHz	24.75 MB	2666 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	Adv
5220R	24 / 48	2.2 / 4.0 GHz	35.75 MB	2666 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	Adv
5220S	18 / 36	2.7 / 3.9 GHz	24.75 MB	2667 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	Adv
6222V	20 / 40	1.8 / 3.6 GHz	27.5 MB	2400 MHz	1 TB	10.4 GT/s	115 W	Y	Y	Y	Y	Adv
6226	12 / 24	2.7 / 3.7 GHz	19.25 MB	2933 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	Adv
6226R	16 / 32	2.9 / 3.9 GHz	22 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	Adv
6230	20 / 40	2.1 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	Adv
6230N	20 / 40	2.3 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	Adv
6230R	26 / 52	2.1 / 4.0 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	Adv
6234	8 / 16	3.3 / 4.0 GHz	24.75 MB	2933 MHz	1 TB	10.4 GT/s	130 W	Y	Y	Y	Y	Adv
6238	22 / 44	2.1 / 3.7 GHz	30.25 MB	2933 MHz	1 TB	10.4 GT/s	140 W	Y	Y	Y	Y	Adv
6238L	22 / 44	2.1 / 3.7 GHz	30.25 MB	2933 MHz	4.5 TB	10.4 GT/s	140 W	Y	Y	Y	Y	Adv

CPU model	Cores / threads	Core speed (Base / TB Max)	Cache	Max DDR4 speed	Max memory capacity per socket	UPI speed	TDP	HT	TB	VT-x	VT-d	RAS
6238R	28 / 56	2.2 / 4.0 GHz	38.5 MB	2933 MHz	1 TB	10.4 GT/s	165 W	Y	Y	Y	Y	Adv
6240	18 / 36	2.6 / 3.9 GHz	24.75 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	Adv
6240L	18 / 36	2.6 / 3.9 GHz	24.75 MB	2933 MHz	4.5 TB	10.4 GT/s	150 W	Y	Y	Y	Y	Adv
6240R	24 / 48	2.4 / 4.0 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	165 W	Y	Y	Y	Y	Adv
6242	16 / 32	2.8 / 3.9 GHz	22 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	Adv
6242R	20 / 40	3.1 / 4.1 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	205 W	Y	Y	Y	Y	Adv
6244	8 / 16	3.6 / 4.4 GHz	24.75 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	Adv
6246	12 / 24	3.3 / 4.2 GHz	24.75 MB	2933 MHz	1 TB	10.4 GT/s	165 W	Y	Y	Y	Y	Adv
6246R	16 / 32	3.4 / 4.1 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	205 W	Y	Y	Y	Y	Adv
6248	20 / 40	2.5 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	Adv
6248R	24 / 48	3.0 / 4.0 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	205 W	Y	Y	Y	Y	Adv
6252	24 / 48	2.1 / 3.7 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	Adv
6252N	24 / 48	2.3 / 3.6 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	Adv
6254	18 / 36	3.1 / 4.0 GHz	24.75 MB	2933 MHz	1 TB	10.4 GT/s	200 W	Y	Y	Y	Y	Adv
6258R	28 / 56	2.7 / 4.0 GHz	38.5 MB	2933 MHz	1 TB	10.4 GT/s	205 W	Y	Y	Y	Y	Adv
6262V	24 / 48	1.9 / 3.6 GHz	33 MB	2400 MHz	1 TB	10.4 GT/s	135 W	Y	Y	Y	Y	Adv
Intel Xeon Platinum processors												
8253	16 / 32	2.2 / 3 GHz	22 MB	2933 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	Adv
8260	24 / 48	2.4 / 3.9 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	165 W	Y	Y	Y	Y	Adv
8260L	24 / 48	2.4 / 3.9 GHz	35.75 MB	2933 MHz	4.5 TB	10.4 GT/s	165 W	Y	Y	Y	Y	Adv
8268	24 / 48	2.9 / 3.9 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	205 W	Y	Y	Y	Y	Adv
8270	26 / 52	2.7 / 4 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	205 W	Y	Y	Y	Y	Adv
8276	28 / 56	2.2 / 4 GHz	38.5 MB	2933 MHz	1 TB	10.4 GT/s	165 W	Y	Y	Y	Y	Adv
8276L	28 / 56	2.2 / 4 GHz	38.5 MB	2933 MHz	4.5 TB	10.4 GT/s	165 W	Y	Y	Y	Y	Adv
8280	28 / 56	2.7 / 4 GHz	38.5 MB	2933 MHz	1 TB	10.4 GT/s	205 W	Y	Y	Y	Y	Adv
8280L	28 / 56	2.7 / 4 GHz	38.5 MB	2933 MHz	4.5 TB	10.4 GT/s	205 W	Y	Y	Y	Y	Adv

Memory

The ThinkAgile HX3321 Certified Nodes 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 HX3321 supports up to 24 DIMMs with two processors. Each processor has six memory channels (two integrated memory controllers with three memory channels per memory controller), and there are two DIMMs per channel.

The following rules apply when selecting the memory configuration:

- The certified node supports RDIMMs or 3DS RDIMMs with rated speeds of 2666 MHz or 2933 MHz.
 - The following memory capacities are supported by the certified node: 128 GB, 192 GB, 256 GB, 384 GB, 512 GB, 576 GB, 768 GB, 1 TB, 1.5 TB, and 3 TB.
 - In the configurations with other than 576 GB of memory capacity, all DIMMs in the certified node must be of the same type, speed, rank, and capacity (the same part number or feature code).
 - In the configuration with 576 GB of memory capacity, a combination of 16 GB and 32 GB DIMMs is used, and all DIMMs in the certified node must be of the same type and speed.
 - All DIMMs in the certified node operate at the same speed, which is determined as the lowest value of:
 - DIMM rated speed (2666 MHz or 2933 MHz).
 - Memory speed supported by the specific processor (2400 MHz, 2666 MHz, or 2933 MHz).
 - Memory speed for the selected quantity of DIMMs per channel:
 - One DIMM per channel (1 DPC): 2933 MHz.
 - Two DIMMs per channel (2 DPC)
 - Performance+ DIMMs: 2933 MHz.
 - Other supported DIMMs: 2666 MHz.
- Note:** Maximum memory speed can be achieved when Max performance mode is enabled in UEFI.
- Certified node configurations with more than 1 TB of memory capacity per socket require processors that support up to 4.5 TB (L-suffix) per socket.

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

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

Table 6. Memory configuration selection options

Description	Part number	Feature code	Quantity									
			128 GB*	192 GB	256 GB*	384 GB	512 GB*	576 GB	768 GB	1 TB*	1.5 TB	3 TB
ThinkSystem 2933 MHz Performance+ RDIMMs												
16GB TruDDR4 Performance+ 2933MHz (2Rx8 1.2V) RDIMM	None**	B5N6	8	12	-	-	-	-	-	-	-	-
32GB TruDDR4 Performance+ 2933MHz (2Rx4 1.2V) RDIMM	None**	B5N7	-	-	8	12	16	-	24	-	-	-
64GB TruDDR4 Performance+ 2933MHz (2Rx4 1.2V) RDIMM	None**	B5N8	-	-	-	-	8	-	12	16	24	-
ThinkSystem 2933 MHz Performance+ 3DS RDIMMs												
128GB TruDDR4 Perf.+ 2933MHz (4Rx4 1.2V) 3DS RDIMM	None**	B5N9	-	-	-	-	-	-	-	-	12	24
ThinkSystem 2933 MHz RDIMMs												
16GB TruDDR4 2933MHz (2Rx8 1.2V) RDIMM	4ZC7A08708	B4H2	8	12	-	-	-	12	-	-	-	-
32GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	4ZC7A08709	B4H3	-	-	8	12	16	12	24	-	-	-
64GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	4ZC7A08710	B4H4	-	-	-	-	8	-	12	16	24	-
ThinkSystem 2933 MHz 3DS RDIMMs												
128GB TruDDR4 2933MHz (4Rx4 1.2V) 3DS RDIMM	4ZC7A15113	B587	-	-	-	-	-	-	-	-	12	24
ThinkSystem 2666 MHz RDIMMs												
16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	7X77A01303	AUNC	8	12	-	-	-	12	-	-	-	-
32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	7X77A01304	AUND	-	-	8	12	16	12	24	-	-	-

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

** Factory-installed only; no field upgrade.

Internal storage

The ThinkAgile HX3321 Certified Node provides 6x or 8x SAS/SATA and 4x AnyBay 2.5-inch 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 HX3321 Certified Node.

Table 7. Internal storage options

Description	Feature code	Quantity (min / max)
Backplanes		
ThinkSystem SR630/SR570 2.5" AnyBay 10-Bay Backplane	AUW9	1 / 1
ThinkSystem SR630 Rear HDD Kit	AUWJ	0 / 1
M.2 enablement kit		
ThinkSystem M.2 with Mirroring Enablement Kit	AUMV	1 / 1

Configuration notes:

- One 10-bay drive backplane and one M.2 with Mirroring Enablement Kit are derived by the configurator.
- If more than 10 drives are selected (SSDs for all flash configurations or a combination of HDDs and SSDs for hybrid configurations), the certified node provides 10 front and 2 rear drive bays (the Rear HDD Kit is derived by the configurator). If 10 or fewer drives are selected, the certified node provides 10 front drive bays only (the rear drive bays are not present).
- More than 10 drives can be selected for the HX3321 Certified Node only with the processors of up to 125 W TDP (except Silver 4210 and 4210R).
- 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 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 HX3321 Certified Node.

Table 9. Controllers for internal storage

Description	Feature code	Quantity
ThinkSystem 430-16i SAS/SATA 12Gb HBA (non-RAID)	AUNM	1

Configuration notes:

- A low profile SAS HBA for internal storage is derived by the configurator, and it occupies the PCIe slot 4.
- The onboard NVMe interface provides PCIe 3.0 x4 JBOD (non-RAID) connectivity to the U.2 NVMe PCIe cache SSDs in the AnyBay drive bays.

Drives for internal storage

The following tables list the drive selection options.

Table 10. Drive selection options: Hybrid configurations

Description	Part number	Feature code	Quantity (min / max)
SSD selection (Cache tier): SAS 12Gb SSDs - PM1645 Mainstream			
ThinkSystem 2.5" PM1645 800GB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13653	B4A0	2 / 4
ThinkSystem 2.5" PM1645 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13654	B4A1	2 / 4
SSD selection (Cache tier): SAS 12Gb SSDs - PM1643 Capacity			
ThinkSystem 2.5" PM1643 3.84TB Capacity SAS 12Gb Hot Swap SSD	4XB7A13645	B4A7	2 / 4
SSD selection (Cache tier): SAS 12Gb SSDs - PM1643a Entry			
ThinkSystem 2.5" PM1643a 7.68TB Entry SAS 12Gb Hot Swap SSD	4XB7A17055	B91D	2 / 4
SSD selection (Cache tier): SATA 6Gb SSDs - 5200 Mainstream			
ThinkSystem 2.5" 5200 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10240	B48B	2 / 4
SSD selection (Cache tier): SATA 6Gb SSDs - S4610 Mainstream			
ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13634	B49M	2 / 4
ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13635	B49N	2 / 4
ThinkSystem 2.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13636	B49P	2 / 4
SSD selection (Cache tier): SATA 6Gb SSDs - PM883 Entry			
ThinkSystem 2.5" PM883 1.92TB Entry SATA 6Gb Hot Swap SSD	4XB7A10198	B34L	2 / 4
ThinkSystem 2.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A10199	B34M	2 / 4
SSD selection (Cache tier): SATA 6Gb SSDs - S4510 Entry			
ThinkSystem 2.5" Intel S4510 1.92TB Entry SATA 6Gb Hot Swap SSD	4XB7A13622	B49B	2 / 4
ThinkSystem 2.5" Intel S4510 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A13623	B49C	2 / 4
HDD selection (Capacity tier): SAS 12Gb HDDs			
ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD	7XB7A00069	B0YS	4 / 10
HDD selection (Capacity tier): SATA 6Gb HDDs			
ThinkSystem 2.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD	7XB7A00036	AUUE	4 / 10
ThinkSystem 2.5" 2TB 7.2K SATA 6Gb Hot Swap 512e HDD	7XB7A00037	AUUJ	4 / 10

Table 11. Drive selection options: All Flash configurations

Description	Part number	Feature code	Quantity (min / max)
Cache tier: NVMe PCIe 3.0 x4 SSDs			
ThinkSystem U.2 Intel P4800X 750GB Performance NVMe PCIe 3.0 x4 HS SSD	7N47A00083	B2ZJ	0 / 4
ThinkSystem U.2 CM5-V 1.6TB Mainstream NVMe PCIe 3.0 x4 HS SSD	4XB7A08517	B21X	0 / 4
ThinkSystem U.2 Intel P4610 3.2TB Mainstream NVMe PCIe 3.0 x4 HS SSD	4XB7A13937	B58A	0 / 4
Capacity tier: SAS 12Gb SSDs - PM1645 Mainstream			
ThinkSystem 2.5" PM1645 800GB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13653	B4A0	2 / 12
ThinkSystem 2.5" PM1645 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13654	B4A1	2 / 12
Capacity tier: SAS 12Gb SSDs - PM1643 Capacity			
ThinkSystem 2.5" PM1643 3.84TB Capacity SAS 12Gb Hot Swap SSD	4XB7A13645	B4A7	2 / 12
Capacity tier: SAS 12Gb SSDs - PM1643a Entry			
ThinkSystem 2.5" PM1643a 7.68TB Entry SAS 12Gb Hot Swap SSD	4XB7A17055	B91D	2 / 12
Capacity tier: SATA 6Gb SSDs - S4610 Mainstream			
ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13634	B49M	2 / 12
ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13635	B49N	2 / 12
ThinkSystem 2.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13636	B49P	2 / 12
Capacity tier: SATA 6Gb SSDs - 5200 Mainstream			
ThinkSystem 2.5" 5200 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10238	B489	2 / 12
ThinkSystem 2.5" 5200 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10239	B48A	2 / 12
ThinkSystem 2.5" 5200 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10240	B48B	2 / 12
Capacity tier: SATA 6Gb SSDs - PM883 Entry			
ThinkSystem 2.5" PM883 1.92TB Entry SATA 6Gb Hot Swap SSD	4XB7A10198	B34L	2 / 12
ThinkSystem 2.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A10199	B34M	2 / 12
Capacity tier: SATA 6Gb SSDs - S4510 Entry			
ThinkSystem 2.5" Intel S4510 1.92TB Entry SATA 6Gb Hot Swap SSD	4XB7A13622	B49B	2 / 12
ThinkSystem 2.5" Intel S4510 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A13623	B49C	2 / 12

Configuration notes:

- For hybrid configurations, the HX3321 Certified Node supports from 4 to 10 capacity drives (HDDs) depending on the quantity of the cache drives (SSDs):
 - 2 cache drives: From 4 to 10 capacity drives in increments of 2 drives.
 - 4 cache drives: 8 capacity drives.
- For All Flash configurations, the HX3321 Certified Node supports from 2 to 12 capacity drives (SAS or SATA SSDs) depending on the quantity of the cache drives (NVMe PCIe SSDs):
 - No cache drives: From 2 to 12 capacity drives in increments of 2 drives.
 - 2 cache drives: From 4 to 10 capacity drives in increments of 2 drives.
 - 4 cache drives: 8 capacity drives.
- All cache drives in the certified node must be of the same model and capacity. All capacity drives in the certified node must be of the same model and capacity.
- More than 10 drives can be selected for the HX3321 Certified Node only with the processors of up to 125 W TDP (except Silver 4210 and 4210R).

Network connectivity

The HX3321 Certified Nodes provide base two- or four-port 1/10 GbE RJ-45 or 10 GbE SFP+ network connectivity with the onboard Intel X722 NIC and a LOM card installed in the certified node. Two, four, or six additional 1/10 GbE RJ-45, 10 GbE SFP+, or 25 GbE SFP28, or two or four additional 40 GbE QSFP+ 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 10Gb 2-port Base-T LOM (RJ-45)	7ZT7A00548	AUKL	0 / 1
ThinkSystem 10Gb 4-port Base-T LOM (RJ-45)	7ZT7A00549	AUKM	0 / 1
1/10 GbE RJ-45 expansion ports			
Intel X550-T2 Dual Port 10GBase-T Adapter (RJ-45)	00MM860	ATPX	0 / 3*
10 GbE SFP+ base ports			
ThinkSystem 10Gb 2-port SFP+ LOM	7ZT7A00546	AUKJ	0 / 1
ThinkSystem 10Gb 4-port SFP+ LOM	7ZT7A00547	AUKK	0 / 1
10 GbE SFP+ expansion ports			
Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter	7ZT7A00537	AUKX	0 / 3*
10/25 GbE SFP28 expansion ports			
Mellanox ConnectX-4 Lx 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	01GR250	AUAJ	0 / 3*
25/40 GbE QSFP+ expansion ports			
Mellanox ConnectX-5 Ex 25/40GbE 2-port Low-Latency Adapter	4XC7A08229	B31C	0 / 2*†^

* The maximum number of expansion adapters supported in the HX3321 12-drive bay certified node is one.

† The adapter is supported only in the PCIe x16 slots.

^ For 25 GbE connectivity, the ConnectX-5 adapter requires the optional Mellanox QSA 100G to 25G Cable Adapters (4G17A10853) (one per port); the supported cables include 25 GbE passive DAC and active optical cables (25 GbE transceivers not supported) (see [Transceivers and cables for 25 GbE SFP28 ports](#) for details).

Configuration notes:

- One of the 1/10 GbE RJ-45 or 10 GbE SFP+ LOM cards 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+, SFP28, and QSFP+ 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](#)
- [Transceivers and cables for 40 GbE QSFP+ 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
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	00FE331	B0RJ
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 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

The following table lists transceivers and cables for the 40 GbE QSFP+ ports.

Table 16. Transceivers and cables for 40 GbE QSFP+ ports

Description	Part number	Feature code
Optical transceivers for 40 GbE QSFP+ ports		
Lenovo 40GBASE-SR4 QSFP+ Transceiver	49Y7884	A1DR
Optical cables for 40 GbE QSFP+ SR4 transceivers		
Lenovo 10m QSFP+ MPO-MPO OM3 MMF Cable	00VX003	AT2U
Lenovo 30m QSFP+ MPO-MPO OM3 MMF Cable	00VX005	AT2V
Passive DAC cables for 40 GbE QSFP+ ports		
Lenovo 1m Passive QSFP+ DAC Cable	49Y7890	A1DP
Lenovo 3m Passive QSFP+ DAC Cable	49Y7891	A1DQ
Lenovo 5m Passive QSFP+ DAC Cable	00D5810	A2X8
Lenovo 7m Passive QSFP+ DAC Cable	00D5813	A2X9
Active optical cables for 40 GbE QSFP+ ports		
Lenovo 1m QSFP+ to QSFP+ Active Optical Cable	7Z57A04256	AX42
Lenovo 3m QSFP+ to QSFP+ Active Optical Cable	00YL652	ATZ3
Lenovo 5m QSFP+ to QSFP+ Active Optical Cable	00YL655	ATZ4
Lenovo 7m QSFP+ to QSFP+ Active Optical Cable	00YL658	ATZ5
Lenovo 15m QSFP+ to QSFP+ Active Optical Cable	00YL661	ATZ6
Lenovo 20m QSFP+ to QSFP+ Active Optical Cable	00YL664	ATZ7
25 GbE SFP28 cable adapter for 40 GbE QSFP+ ports		
Mellanox 100G QSFP28 to 25G SFP28 Cable Adapter	4G17A10853	B306

Power supplies and cables

The ThinkAgile HX3321 Certified Nodes ship with two power supplies. The following table lists the power supply options that are available for selection.

Table 17. Power supply selection options

Description	Feature code	Quantity
ThinkSystem 750W (230/115V) Platinum Hot-Swap Power Supply	AVWA	2
ThinkSystem 750W (230V) Titanium Hot-Swap Power Supply	AVW9	2
ThinkSystem 1100W (230V/115V) Platinum Hot-Swap Power Supply	AVWB	2

Configuration notes:

- For N+N power redundancy, the power supplies should provide sufficient power without oversubscription for the selected node configuration. To ensure that the right power supply is chosen, you should always validate your node configuration using the latest version of the Lenovo Capacity Planner:
<http://datacentersupport.lenovo.com/us/en/solutions/lncp>
- Both power supplies in the certified node must be identical.
- The power supplies support AC (Worldwide) and HVDC (China only) power sources.

The ThinkAgile HX3321 Certified Nodes ship with or without power cords depending on the selected option. 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
1.0m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08367	B0N5
1.2m, 16A/100-250V, 2 Short C13s to Short C20 Rack Power Cable	47C2491	A3SW
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
2.5m, 16A/100-250V, 2 Long C13s to Short C20 Rack Power Cable	47C2492	A3SX
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, 16A/100-250V, 2 Short C13s to Long C20 Rack Power Cable	47C2493	A3SY
4.1m, 16A/100-250V, 2 Long C13s to Long C20 Rack Power Cable	47C2494	A3SZ
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/125V, C13 to JIS C-8303 Line cord	46M2593	A1RE
Japan 2.8m, 12A/250V, C13 to JIS C-8303 Line Cord	4L67A08357	5472
Japan 4.3m, 12A/125V, C13 to JIS C-8303 Line Cord	39Y7926	6335
Japan 4.3m, 12A/250V, C13 to JIS C-8303 Line Cord	4L67A08362	6495

Description	Part number	Feature code
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/125V, C13 to CNS 10917-3 Line Cord	23R7158	6386
Taiwan 2.8m, 10A/250V, C13 to CNS 10917-3 Line Cord	81Y2375	6317
Taiwan 2.8m, 15A/125V, C13 to CNS 10917-3 Line Cord	81Y2374	6402
Taiwan 4.3m, 10A/125V, C13 to CNS 10917-3 Line Cord	4L67A08363	AX8B
Taiwan 4.3m, 10A/250V, C13 to CNS 10917-3 Line Cord	81Y2389	6531
Taiwan 4.3m, 15A/125V, C13 to CNS 10917-3 Line Cord	81Y2388	6530
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/125V, C13 to NEMA 5-15P Line Cord	90Y3016	6313
United States 2.8m, 10A/250V, C13 to NEMA 6-15P Line Cord	46M2592	A1RF
United States 2.8m, 13A/125V, C13 to NEMA 5-15P Line Cord	00WH545	6401
United States 4.3m, 10A/125V, C13 to NEMA 5-15P Line Cord	4L67A08359	6370
United States 4.3m, 10A/250V, C13 to NEMA 6-15P Line Cord	4L67A08361	6373
United States 4.3m, 13A/125V, C13 to NEMA 5-15P Line Cord	4L67A08360	AX8A

Configuration note: If the 1100 W AC power supplies in the certified node are connected to a low-voltage power source (100 - 125 V), the only supported power cables are those that are rated above 10 A; cables that are rated at 10 A are not supported.

Rack installation

The HX3321 Certified Nodes ship with a rail kit. The following table lists the rail kit options that are available for selection.

Table 19. Rack kit selection options

Description	Feature code	Quantity (min / max)
4-post rail kits		
ThinkSystem Tool-less Slide Rail	AXCA	0 / 1
ThinkSystem Tool-less Slide Rail Kit with 1U CMA	AXCB	0 / 1
Lockable front bezel		
ThinkSystem 1U Security Bezel	AUWR	0 / 1

Configuration note: One of the rail kits is required for selection.

The following table summarizes the rail kit features and specifications.

Table 20. Rail kit features and specifications summary

Feature	Tool-less Slide Rail	
	Without CMA	With 1U CMA
CMA	Not included	Included
Rail length	730 mm (28.74 in.)	807 mm (31.8 in.)
Rail type	Full-out slide (ball bearing)	
Tool-less installation	Yes	
In-rack maintenance	Yes	
1U PDU support	Yes	
0U PDU support	Limited*	
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.) – 863.6 mm (34 in.)	

* If a 0U PDU is used, the rack cabinet must be at least 1100 mm (43.31 in.) deep if no CMA is used, or at least 1200 mm (47.24 in.) deep if a CMA is used.

[^] 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 Certified Nodes support 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 6.5 Update 2
- VMware ESXi 6.5 Update 3
- 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 6.5	B15R	1
Nutanix SW Stack on VMware ESXi 6.7	B63T	1
Nutanix SW Stack on Hyper-V 2016	B63U	1

The ThinkAgile HX Certified Nodes are shipped with the Nutanix software preloaded. Nutanix software licenses and software support are not included. Customers can use the existing Nutanix term-based software licenses and active support contracts, or they can purchase term-based software licenses and support contracts from Nutanix.

Configuration notes:

- The HX Certified Nodes support the Nutanix Software Pro and Ultimate editions; the Starter edition is not supported.
- The HX3321 Certified Nodes (Xeon SP Gen 2) can be deployed as a cluster of 3 or more nodes (AOS 5.11 or later).
- The HX Certified Nodes support firmware updates from Nutanix Prism with the ThinkAgile HX Lifecycle Manager (UEFI, XCC, drives, network adapters, and SAS HBAs).

Systems management

The ThinkAgile HX Certified Nodes 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 Certified Nodes 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 Certified Nodes:

- 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](#)).

Light path diagnostics

The ThinkAgile HX3321 Certified Nodes include basic light path diagnostics, which provides the system LEDs on the front of the certified node (see [Components and connectors](#)) and the LEDs near the monitored components (for example, the DIMM error LEDs on the system board).

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 Certified Nodes 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 Certified Nodes 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 22. XClarity Pro selection options

Description	Feature code	Quantity (per node)
XClarity Pro	B0W3	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 23. 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 Certified Nodes
- 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/Invo-lxem>

Physical specifications

The ThinkAgile HX3321 Certified Nodes have the following dimensions and weight (approximate):

- Height: 43 mm (1.7 in.)
- Width: 434 mm (17.1 in.)
- Depth: 715 mm (28.1 in.)
- Weight (maximum): 18.8 kg (41.4 lb)

Operating environment

The ThinkAgile HX Certified Nodes comply with ASHRAE class A2 specifications. The node performance might be impacted when the operating temperature is outside the ASHRAE A2 specifications. Depending on the hardware configuration, some HX3321 Certified Nodes comply with ASHRAE class A3 and class A4 specifications. To comply with ASHRAE class A3 and class A4 specifications, the nodes must meet the following hardware configuration requirements at the same time:

- Processors with TDP more than or equal to 150 W not installed.
- NVMe drives not installed.

The ThinkAgile HX Certified Nodes 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:
 - 100 - 127 (nominal) V AC; 50 Hz / 60 Hz (except 750 W Titanium power supplies)
 - 200 - 240 (nominal) V AC; 50 Hz / 60 Hz
 - 180 - 300 V DC (supported in China only)
- Acoustics (maximum configuration, operating): 6.0 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 24. 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
750 W Platinum	100 - 127 V AC	984 W	8.4 A	3357 BTU/hour
	200 - 240 V AC	958 W	4.1 A	3269 BTU/hour
	180 - 300 V DC	958 W	3.5 A	3269 BTU/hour
750 W Titanium	200 - 240 V AC	949 W	4.1 A	3238 BTU/hour
	180 - 300 V DC	948 W	3.5 A	3235 BTU/hour
1100 W Platinum	100 - 127 V AC	1382 W	12 A	4715 BTU/hour
	200 - 240 V AC	1408 W	6 A	4804 BTU/hour
	180 - 300 V DC	1408 W	5.1 A	4804 BTU/hour

Regulatory compliance

The ThinkAgile HX3321 Certified Nodes conform to the following regulations:

- United States: FCC Part 15, Class A; UL 60950-1
- Canada: ICES-003/NMB-03, Class A; CAN/CSA-C22.2 60950-1
- Mexico: NOM-19
- Argentina: IEC60950-1
- European Union: CE Mark (EN55022 Class A, IEC/EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- Germany: TUV-GS (IEC/EN60950-1, EK1-ITB2000)
- Russia, Kazakhstan, Belarus: EAC (TR CU 004/2011, TR CU 020/2011)
- China: CCC GB4943.1, GB9254 Class A, GB17625.1
- India: BIS
- Japan: VCCI, Class A
- Taiwan: BSMI CNS13438, Class A; CNS14336-1
- Korea: KN22, Class A; KN24
- Australia/New Zealand: AS/NZS CISPR 22 Class A
- Reduction of Hazardous Substances (ROHS)
- Energy Star 3.0

Warranty and support

The ThinkAgile HX Certified Nodes can be configured with a one- (PRC only), three-, four-, or five-year hardware warranty and various levels of service coverage with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

The base warranty provides 9x5 Next Business Day response with parts delivered. Lenovo's additional 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:

- **Warranty service level upgrades (Preconfigured Support)** are available to meet the on-site response time targets that match the criticality of customer's systems:
 - 1 (PRC only), 3, 4, or 5 years of service coverage.
 - 1-year or 2-year post-warranty extensions.
 - **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 Data Center Group (DCG) 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>

Deployment services

The following optional Lenovo Professional Services are available for the ThinkAgile HX Certified Nodes to get customers up and running quickly:

- Basic Hardware Installation Services
 - Unpacking and inspecting the systems
 - Installing options and 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)
- 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

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 HX3321 Certified Nodes for network connectivity.

Table 25. 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)	7Z320011WW
Lenovo RackSwitch G7028 (Rear to Front)	7159BAX
Lenovo RackSwitch G7052 (Rear to Front)	7159CAX
Lenovo CE0128TB Switch (3-Year Warranty)	7Z340011WW
Lenovo CE0128TB Switch (Limited Lifetime Warranty)	7Z360011WW
Lenovo CE0128PB Switch (3-Year Warranty)	7Z340012WW
Lenovo CE0128PB Switch (Limited Lifetime Warranty)	7Z360012WW
Lenovo CE0152TB Switch (3-Year Warranty)	7Z350021WW
Lenovo CE0152TB Switch (Limited Lifetime Warranty)	7Z370021WW
Lenovo CE0152PB Switch (3-Year Warranty)	7Z350022WW
Lenovo CE0152PB Switch (Limited Lifetime Warranty)	7Z370022WW
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 NE1064TO RackSwitch (Rear to Front, ONIE)	7Z330011WW
Lenovo ThinkSystem NE1072T RackSwitch (Rear to Front)	7159C1X
Lenovo RackSwitch G8272 (Rear to Front)	7159CRW
25 Gb Ethernet switches (25 GbE host connectivity)	
Lenovo ThinkSystem NE2572 RackSwitch (Rear to Front)	7159E1X
Lenovo ThinkSystem NE2572O RackSwitch (Rear to Front, ONIE)	7Z210021WW
Lenovo ThinkSystem NE2580O RackSwitch (Rear to Front, ONIE)	7Z330021WW
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)	7Z210011WW

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 currently offered by Lenovo that can be used for mounting the ThinkAgile HX3321 Certified Nodes and other IT infrastructure building blocks.

Table 26. Rack cabinets

Description	Part number
12U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 1YR Warranty	7D2B0001WW
12U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 3YR Warranty	7D2N0001WW
18U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 1YR Warranty	7D2C0001WW
18U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 3YR Warranty	7D2P0001WW
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 currently offered by Lenovo that can be used for distributing electrical power to the ThinkAgile HX3321 Certified Nodes and other IT infrastructure building blocks mounted in a rack cabinet.

Table 27. 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
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

Description	Part number
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/125V Front-end PDU with NEMA L5-30P line cord	39Y8938
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
NEMA PDUs (6x NEMA 5-15R outlets)	
DPI 100-127V PDU with fixed NEMA L5-15P line cord	39Y8905
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 infrastructure category:
<http://lenovopress.com/servers/options/pdu#rt=product-guide>

Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are currently offered by Lenovo that can be used for providing electrical power protection to the ThinkAgile HX3321 Certified Nodes and other IT infrastructure building blocks.

Table 28. Uninterruptible power supply units

Description	Part number
Worldwide models	
RT1.5kVA 2U Rack or Tower UPS (100-125VAC) (8x NEMA5-15R 12A outlets)	55941AX
RT1.5kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A outlets)	55941KX
RT2.2kVA 2U Rack or Tower UPS (100-125VAC) (8x NEMA 5-20R 16A outlets)	55942AX
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 (100-125VAC) (6x NEMA5-20R 16A, 1x NEMA L5-30R 24A outlets)	55943AX
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>

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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.

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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:

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

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