



## Lenovo ThinkAgile HX7821 Certified Node (Xeon SP Gen 1) Product Guide (withdrawn product)

Lenovo ThinkAgile HX Certified Nodes are designed for deploying industry-leading hyperconvergence software from Nutanix on Lenovo enterprise platforms that feature the first generation of the Intel Xeon Processor Scalable Family (Xeon SP Gen 1).

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 HX7821 is a 4U rack-mount certified node that supports four processors, up to 6 TB of 2666 MHz TruDDR4 memory, 16x SAS/SATA and 8x AnyBay SFF hot-swap drive bays with an extensive choice of SAS/SATA SSDs and SAS 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 HX7821 Certified Node that is optimized for high-performance workloads include databases, e-mail and collaboration, and workload-balancing clusters.

The ThinkAgile HX7821 Certified Node is shown in the following figure.

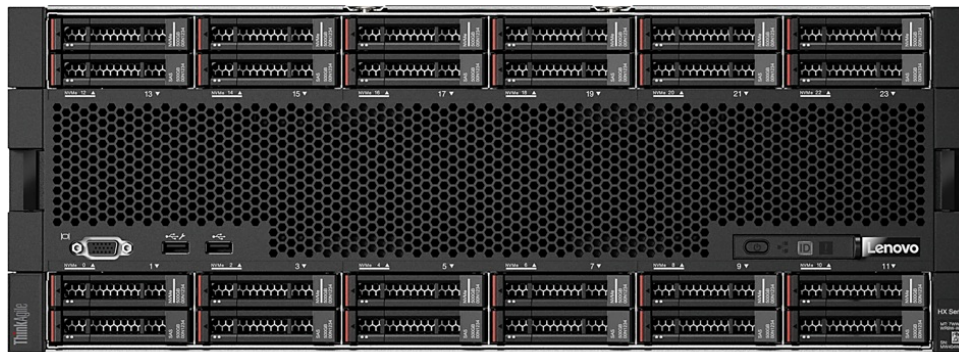


Figure 1. Lenovo ThinkAgile HX7821 Certified Node

### 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 HX7821 Certified Node.

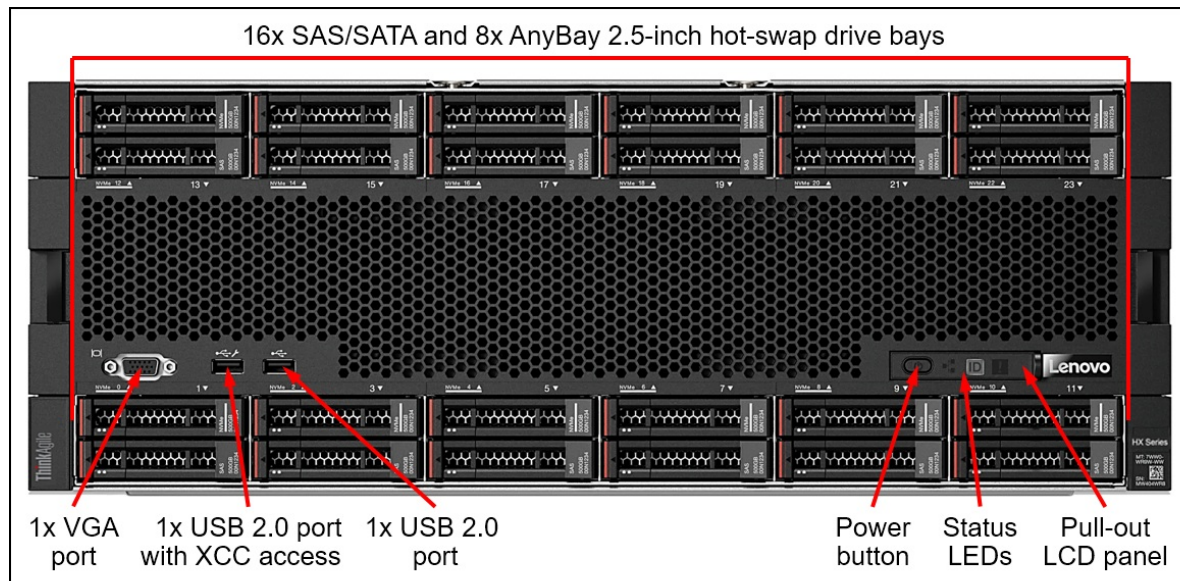


Figure 2. HX7821 Certified Node front view

The front of the HX7821 Certified Node includes the following components:

- 16x SAS/SATA and 8x AnyBay SFF hot-swap drive bays
- One VGA port
- One USB 2.0 port with XClarity Controller access
- One USB 2.0 port
- A Power button
- Status LEDs
- A Pull-out LCD panel

The following figure shows the rear view of the HX7821 Certified Node.

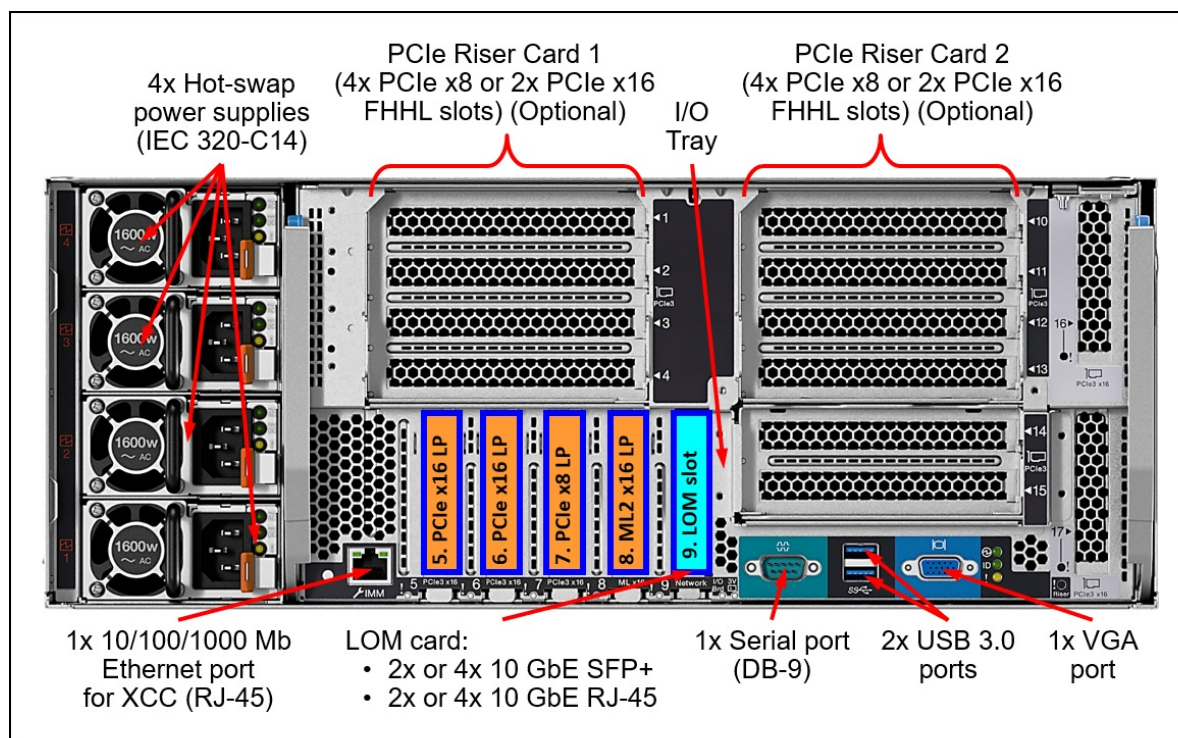


Figure 3. HX7821 Certified Node rear view

The rear of the HX7821 Certified Node includes the following components:

- PCIe x8 Riser Card 1 (optional): Up to four PCIe slots
- I/O Tray:
  - Three PCIe slots
  - One ML2 slot
  - One LOM card slot
- PCIe x8 Riser Card 2 (optional): Up to four PCIe slots
- One 1 GbE port for XClarity Controller
- One DB-9 serial port
- Two USB 3.0 ports
- One VGA port
- Four hot-swap power supplies

## System specifications

The following table lists the system specifications of the ThinkAgile HX7821 Certified Node.

Table 1. HX7821 Certified Node system specifications

Attribute	Specification
Form factor	4U Rack-mount.
Processor	Four Intel Xeon Gold or Platinum Gen 1 processors.
Chipset	Intel C624.
Memory	Up to 48 DIMMs. Support for 32 GB TruDDR4 2666 MHz RDIMMs, 64 GB TruDDR4 2666 MHz LRDIMMs, or 64 GB and 128 GB TruDDR4 2666 MHz 3DS RDIMMs.
Memory capacity	Up to 6 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), patrol scrubbing, and demand scrubbing.
Drive bays	16x SAS/SATA and 8x AnyBay SFF hot-swap.
Internal storage	Hybrid: <ul style="list-style-type: none"> <li>2 cache drives: From 4 to 10 capacity drives in increments of 2 drives.</li> <li>4 cache drives and 8 or from 12 to 20 capacity drives in increments of 2 drives.</li> <li>6 cache drives and from 12 to 18 capacity drives in increments of 2 drives.</li> <li>8 cache drives and 16 capacity drives.</li> </ul> All Flash: From 4 to 24 SSDs in increments of 2 drives.
Drive capacities	SSDs: <ul style="list-style-type: none"> <li>12 Gbps SAS SSDs up to 3.84 TB</li> <li>6 Gbps SATA SSDs up to 3.84 TB</li> </ul> HDDs: <ul style="list-style-type: none"> <li>12 Gbps SAS HDDs up to 2.4 TB</li> <li>6 Gbps NL SATA HDDs up to 2 TB</li> </ul> <b>Note:</b> All SSDs in the certified node must be of the same model and capacity. All HDDs in the certified node must be of the same type and capacity.
Maximum storage capacity	<ul style="list-style-type: none"> <li>Hybrid: Up to 48 TB (20x 2.4 TB HDDs).</li> <li>All Flash: Up to 92 TB (24x 3.84 TB SSDs).</li> </ul>
Storage controller	2x 430-16i HBAs (12 Gbps SAS/6 Gbps SATA).
Network interfaces	<ul style="list-style-type: none"> <li>2x or 4x base 1/10 GbE RJ-45 or 10 GbE SFP+ network ports.</li> <li>2x, 4x, 6x, or 8x optional 10 GbE SFP+ or 25 GbE SFP28 expansion network ports.</li> <li>1x RJ-45 10/100/1000 Mb Ethernet port for systems management.</li> </ul>
Boot drive	2x M.2 non-hot-swap SSDs up to 480 GB (RAID-1).

Attribute	Specification
I/O expansion slots	<p>Up to 15 I/O expansion slots:</p> <ul style="list-style-type: none"> <li>• Riser Card 1 (if present): <ul style="list-style-type: none"> <li>◦ PCIe x8 Riser Card: <ul style="list-style-type: none"> <li>■ Slot 1: PCIe 3.0 x8; full-height, half-length.</li> <li>■ Slot 2: PCIe 3.0 x8; full-height, half-length.</li> <li>■ Slot 3: PCIe 3.0 x8; full-height, half-length.</li> <li>■ Slot 4: PCIe 3.0 x8; full-height, half-length.</li> </ul> </li> <li>◦ PCIe x16 Riser Card: <ul style="list-style-type: none"> <li>■ Slot 3: PCIe 3.0 x16; full-height, half-length.</li> <li>■ Slot 4: PCIe 3.0 x16; full-height, half-length.</li> </ul> </li> </ul> </li> <li>• I/O tray: <ul style="list-style-type: none"> <li>◦ Slot 5: PCIe 3.0 x16; low profile.</li> <li>◦ Slot 6: PCIe 3.0 x16; low profile.</li> <li>◦ Slot 7: PCIe 3.0 x8; low profile.</li> <li>◦ Slot 8: ML2 x16; low profile (not used).</li> <li>◦ Slot 9: LOM Card slot (PCIe 3.0 x8 interface).</li> </ul> </li> <li>• Riser Card 2 (if present): <ul style="list-style-type: none"> <li>◦ PCIe x8 Riser Card: <ul style="list-style-type: none"> <li>■ Slot 10: PCIe 3.0 x8; full-height, half-length.</li> <li>■ Slot 11: PCIe 3.0 x8; full-height, half-length.</li> <li>■ Slot 12: PCIe 3.0 x8; full-height, half-length.</li> <li>■ Slot 13: PCIe 3.0 x8; full-height, half-length.</li> </ul> </li> <li>◦ PCIe x16 Riser Card: <ul style="list-style-type: none"> <li>■ Slot 12: PCIe 3.0 x16; full-height, half-length.</li> <li>■ Slot 13: PCIe 3.0 x16; full-height, half-length.</li> </ul> </li> </ul> </li> <li>• Compute tray: Internal PCIe 3.0 x8 (for an internal storage controller).</li> <li>• Storage tray: Internal PCIe 3.0 x8 (for an internal storage controller).</li> </ul>
Ports	<ul style="list-style-type: none"> <li>• Front: 1x USB 2.0 port with XClarity Controller access, 1x USB 3.0 port, 1x VGA port.</li> <li>• Rear: 2x USB 3.0 ports, 1x VGA port, 1x DB-9 serial port.</li> </ul>
Cooling	Six hot-swap fans with N+1 redundancy in the compute tray.
Power supply	Four redundant hot-swap 1600 W (200 - 240 V) High Efficiency power supplies (80 PLUS Platinum certified).
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 and 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).
Software	Nutanix Acropolis Pro and Ultimate editions (licenses purchased separately from Nutanix).
Hypervisors	<ul style="list-style-type: none"> <li>• Nutanix Acropolis Hypervisor (Bundled with AOS).</li> <li>• VMware ESXi 6.5 Update 1.</li> <li>• VMware ESXi 6.5 Update 2.</li> <li>• VMware ESXi 6.7 Update 1.</li> <li>• VMware ESXi 6.7 Update 3.</li> <li>• Microsoft Windows Server 2016 Datacenter (Hyper-V).</li> </ul>

Attribute	Specification
Warranty and support	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: 173 mm (6.8 in.), width: 447 mm (17.6 in.), depth: 800 mm (31.5 in.)
Weight	Maximum configuration: 58.7 kg (129.4 lb)

## Factory-integrated models

**Product availability:** The ThinkAgile HX7821 Certified Nodes that use the first generation of the Intel Xeon Processor Scalable Family are withdrawn and no longer available for ordering. For currently available ThinkAgile HX7821 Certified Nodes that use the second generation of the Intel Xeon Processor Scalable Family, refer to the Lenovo ThinkAgile HX7821 Certified Node (Xeon SP Gen 2) product guide: <http://lenovopress.com/lp1134>

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/>

**Note:** You are required to engage a Lenovo representative in the project that includes the ThinkAgile HX Certified Nodes.

The following table lists the base CTO model of the ThinkAgile HX7821 Certified Node.

Table 2. Base CTO model

Description	Machine Type/Model
ThinkAgile HX7821 Certified Node	7Y96CTO1WW

The following table lists the base chassis for the HX7821 Certified Node.

Table 3. Base chassis

Description	Feature code
ThinkAgile HX782x Base	B4EE

The HX7821 Certified Nodes ship with the following items:

- *Electronic Publications Flyer*
- Fixed Rail Kit
- Four customer-selected power cables

## Memory

The ThinkAgile HX7821 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 ThinkAgile HX7821 Certified Nodes support 24 or 48 DIMMs. Each processor has six memory channels, and there are two DIMMs per channel.

The following rules apply when selecting the memory configuration:

- The certified node supports RDIMMs, LRDIMMs, or 3DS RDIMMs.
- All DIMMs in the certified node must be of the same type (RDIMMs, LRDIMMs, or 3DS RDIMMs).
- All DIMMs in the certified node 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 maximum memory capacities are supported by the certified node:
  - RDIMMs: 768 GB.
  - LRDIMMs: 3 TB.
  - 3DS RDIMMs: 6 TB (requires processors that support 1.5 TB of memory per socket).

The following memory protection technologies are supported:

- ECC
- SDDC (for x4-based memory DIMMs)
- ADDDC (for x4-based memory DIMMs)
- 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 memory selection options that are available for selection.

Table 4. Memory selection options

Description	Part number	Feature code	Quantity							
			384 GB	768 GB	1.125 TB	1.5 TB	2.25 TB	3 TB	4.5 TB	6 TB
ThinkSystem 2666 MHz RDIMMs										
16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	7X77A01303	AUNC	24	-	12	-	-	-	-	-
32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	7X77A01304	AUND	-	24	12	48	-	-	-	-
ThinkSystem 2666 MHz LRDIMMs										
64GB TruDDR4 2666 MHz (4Rx4 1.2V) LRDIMM	7X77A01305	AUNE	-	-	-	24	-	48	-	-
ThinkSystem 2666 MHz 3DS RDIMMs										
64GB TruDDR4 2666MHz (4Rx4, 1.2V) 3DS RDIMM	4ZC7A08716	AUW5	-	-	-	-	12	48	24	-
128GB TruDDR4 2666 MHz (8Rx4 1.2V) 3DS RDIMM	7X77A01307	AUNF	-	-	-	-	12	24	24	48



## Internal storage

The ThinkAgile HX7821 Certified Node provides 16x SAS/SATA and 8x AnyBay 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 HX7821 Certified Node.

Table 5. Internal storage options

Description	Feature code	Quantity
Backplanes		
ThinkSystem 2.5" SAS/SATA 2x2 Bay Backplane Kit	AUN6	2
ThinkSystem 2.5" SAS/SATA/NVMe 2x2 Bay Backplane Kit	AUN5	4
M.2 enablement kit		
ThinkSystem M.2 with Mirroring Enablement Kit	AUMV	1

### Configuration notes:

- Two SAS/SATA backplanes, four AnyBay (SAS/SATA/NVMe) backplanes, 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 drives for software preload.

Table 6. Drives 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 HX7821 Certified Node.

Table 7. Controllers for internal storage

Description	Feature code	Quantity
ThinkSystem 430-16i SAS/SATA 12Gb HBA (non-RAID)	AUNM	2

**Configuration note:** Two low profile SAS HBAs for internal storage are derived by the configurator, and they occupy the dedicated PCIe x8 slots on the compute and storage trays.

## Drives for internal storage

The following tables list the drive selection options.

Table 8. Drive selection options: Hybrid configurations

Description	Part number	Feature code	Quantity (min / max)
SSD selection (Cache tier): SAS 12Gb SSDs - PM1633a Capacity			
ThinkSystem 2.5" PM1633a 3.84TB Capacity SAS 12Gb Hot Swap SSD	7N47A00121	AUMK	2 / 8
SSD selection (Cache tier): SAS 12Gb SSDs - PM1635a Mainstream			
ThinkSystem 2.5" PM1635a 800GB Mainstream SAS 12Gb Hot Swap SSD	7N47A00118	AUMD	2 / 8
ThinkSystem 2.5" PM1635a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	7N47A00119	AVRG	2 / 8
SSD selection (Cache tier): SAS 12Gb SSDs - PM1645 Mainstream			
ThinkSystem 2.5" PM1645 800GB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13653	B4A0	2 / 8
ThinkSystem 2.5" PM1645 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13654	B4A1	2 / 8
SSD selection (Cache tier): SATA 6Gb SSDs - S4600 Mainstream			
ThinkSystem 2.5" Intel S4600 480GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05722	B0ZQ	2 / 8
ThinkSystem 2.5" Intel S4600 960GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05721	B0ZR	2 / 8
ThinkSystem 2.5" Intel S4600 1.92TB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05720	B0ZS	2 / 8
SSD selection (Cache tier): SATA 6Gb SSDs - S4610 Mainstream			
ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13634	B49M	2 / 8
ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13635	B49N	2 / 8
ThinkSystem 2.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13636	B49P	2 / 8
SSD selection (Cache tier): SATA 6Gb SSDs - PM883 Entry			
ThinkSystem 2.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A10199	B34M	2 / 8
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 / 8
HDD selection (Capacity tier): SAS 12Gb HDDs			
ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD	7XB7A00069	B0YS	4 / 20
HDD selection (Capacity tier): SATA 6Gb HDDs			
ThinkSystem 2.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD	7XB7A00036	AUUE	4 / 20
ThinkSystem 2.5" 2TB 7.2K SATA 6Gb Hot Swap 512e HDD	7XB7A00037	AUUJ	4 / 20

Table 9. 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	6 / 24
SAS 12Gb SSDs - PM1635a Mainstream			
ThinkSystem 2.5" PM1635a 800GB Mainstream SAS 12Gb Hot Swap SSD	7N47A00118	AUMD	6 / 24
ThinkSystem 2.5" PM1635a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	7N47A00119	AVRG	6 / 24
SAS 12Gb SSDs - PM1645 Mainstream			
ThinkSystem 2.5" PM1645 800GB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13653	B4A0	6 / 24
ThinkSystem 2.5" PM1645 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13654	B4A1	6 / 24
SATA 6Gb SSDs - S4600 Mainstream			
ThinkSystem 2.5" Intel S4600 480GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05722	B0ZQ	6 / 24
ThinkSystem 2.5" Intel S4600 960GB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05721	B0ZR	6 / 24
ThinkSystem 2.5" Intel S4600 1.92TB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05720	B0ZS	6 / 24
SATA 6Gb SSDs - S4610 Mainstream			
ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13634	B49M	6 / 24
ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13635	B49N	6 / 24
ThinkSystem 2.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13636	B49P	6 / 24
SATA 6Gb SSDs - 5100 Mainstream			
ThinkSystem 2.5" 5100 1.92TB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05762	B10Z	6 / 24
SATA 6Gb SSDs - 5200 Mainstream			
ThinkSystem 2.5" 5200 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10238	B489	6 / 24
ThinkSystem 2.5" 5200 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10239	B48A	6 / 24
SATA 6Gb SSDs - PM883 Entry			
ThinkSystem 2.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A10199	B34M	6 / 24
SATA 6Gb SSDs - S4510 Entry			
ThinkSystem 2.5" Intel S4510 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A13623	B49C	6 / 24

#### Configuration notes:

- For hybrid configurations, the HX7821 Certified Node supports from 4 to 20 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 or from 12 to 20 capacity drives in increments of 2 drives.
  - 6 cache drives: From 12 to 18 capacity drives in increments of 2 drives.
  - 8 cache drives: 16 capacity drives.
- For All Flash configurations, the HX7821 Certified Node supports from 4 to 24 SSDs in increments of 2 drives.
- All SSDs in the certified node must be of the same model and capacity. All HDDs in the certified node must be of the same type and capacity.

## I/O expansion

The HX7821 Certified Node supports one LOM card slot and up to 14 I/O expansion slots: Three PCIe slots and one ML2 slot in the I/O tray, one PCIe slot in the Compute tray, one PCIe slot in the Storage tray, and up to eight PCIe slots with up to two riser cards.

The slot form factors are as follows:

- Riser Card 1 (if present):
  - PCIe x8 Riser Card:
    - Slot 1: PCIe 3.0 x8; full-height, half-length.
    - Slot 2: PCIe 3.0 x8; full-height, half-length.
    - Slot 3: PCIe 3.0 x8; full-height, half-length.
    - Slot 4: PCIe 3.0 x8; full-height, half-length.
  - PCIe x16 Riser Card:
    - Slot 3: PCIe 3.0 x16; full-height, half-length.
    - Slot 4: PCIe 3.0 x16; full-height, half-length.
- I/O tray:
  - Slot 5: PCIe 3.0 x16; low profile.
  - Slot 6: PCIe 3.0 x16; low profile.
  - Slot 7: PCIe 3.0 x8; low profile.
  - Slot 8: ML2 x16; low profile (not used).
  - Slot 9: LOM Card slot (PCIe 3.0 x8 interface).
- Riser Card 2 (if present):
  - PCIe x8 Riser Card:
    - Slot 10: PCIe 3.0 x8; full-height, half-length.
    - Slot 11: PCIe 3.0 x8; full-height, half-length.
    - Slot 12: PCIe 3.0 x8; full-height, half-length.
    - Slot 13: PCIe 3.0 x8; full-height, half-length.
  - PCIe x16 Riser Card:
    - Slot 12: PCIe 3.0 x16; full-height, half-length.
    - Slot 13: PCIe 3.0 x16; full-height, half-length.
- Compute tray: Internal PCIe 3.0 x8 (for an internal storage controller).
- Storage tray: Internal PCIe 3.0 x8 (for an internal storage controller).

Riser 1 supplies slots 1-4, and Riser 2 supplies slots 10-13. The slots that are available for use depend on the number of riser cards that are installed, as shown in the following table.

Table 10. Slots available for use

Riser Card 1	Riser Card 2	Slots available for use			
		Processor 1	Processor 2	Processor 3	Processor 4
None	None	LOM, 7, 8*	5, 6	-	-
None	PCIe x8	LOM, 7, 8*	5, 6	10, 11, 12, 13	-
None	PCIe x16	LOM, 7, 8*	5, 6	12, 13	-
PCIe x8	None	LOM, 7, 8*	5, 6	-	1, 2, 3, 4
PCIe x8	PCIe x8	LOM, 7, 8*	5, 6	10, 11, 12, 13	1, 2, 3, 4
PCIe x8	PCIe x16	LOM, 7, 8*	5, 6	12, 13	1, 2, 3, 4
PCIe x16	None	LOM, 7, 8*	5, 6	-	3, 4
PCIe x16	PCIe x8	LOM, 7, 8*	5, 6	10, 11, 12, 13	3, 4
PCIe x16	PCIe x16	LOM, 7, 8*	5, 6	12, 13	3, 4

\* Slot 8 is an ML2 slot (not available for PCIe adapter installation).

The following table lists available PCIe riser card options.

Table 11. PCIe riser cards

Description	Part number	Feature code	Quantity (min / max)
ThinkSystem SR950 (2) x16 PCIe Riser	7XC7A03961	AUN1	0 / 2
ThinkSystem SR950 (4) x8 PCIe Riser	7XC7A03962	AUN2	0 / 2

## Network connectivity

The ThinkAgile HX7821 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, six, or eight additional 10 GbE SFP+, or two additional 10/25 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 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
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 / 4
10/25 GbE SFP28 expansion ports			
Mellanox ConnectX-4 Lx 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	01GR250	AUAJ	0 / 4

## 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+ and SFP28 adapters, and UTP Category 6 cables should be purchased for the 10 GbE RJ-45 adapters. 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 transceivers and cables can be purchased:

- [UTP cables for 10 GbE RJ-45 adapters](#)
- [Transceivers and cables for 10 GbE SFP+ adapters](#)
- [Transceivers and cables for 25 GbE SFP28 adapters](#)

The following table lists cables for the 10 GbE RJ-45 adapters.

Table 13. Cables for 10 GbE RJ-45 adapters

Description	Part number	Feature code
UTP Category 6 cables (Green) for 10 GbE RJ-45 adapters		
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+ adapters.

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

Description	Part number	Feature code
10 GbE SFP+ SR transceivers for 10 GbE SFP+ adapters		
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
Lenovo 30m LC-LC OM3 MMF Cable	00MN520	ASRC
Passive SFP+ DAC cables for 10 GbE SFP+ adapters		
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+ adapters		
Lenovo 1m Active DAC SFP+ Cable	00VX111	AT2R
Lenovo 3m Active DAC SFP+ Cable	00VX114	AT2S
Lenovo 5m Active DAC SFP+ Cable	00VX117	AT2T

Description	Part number	Feature code
SFP+ active optical cables for 10 GbE SFP+ ports		
Lenovo 1m SFP+ to SFP+ Active Optical Cable	00YL634	ATYX
Lenovo 3m SFP+ to SFP+ Active Optical Cable	00YL637	ATYY
Lenovo 5m SFP+ to SFP+ Active Optical Cable	00YL640	ATYZ
Lenovo 7m SFP+ to SFP+ Active Optical Cable	00YL643	ATZ0
Lenovo 15m SFP+ to SFP+ Active Optical Cable	00YL646	ATZ1
Lenovo 20m SFP+ to SFP+ Active Optical Cable	00YL649	ATZ2

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

Table 15. Transceivers and cables for 25 GbE SFP28 adapters

Description	Part number	Feature code
25 GbE SFP28 SR transceivers for 25 GbE SFP28 adapters		
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
Lenovo 30m LC-LC OM3 MMF Cable	00MN520	ASRC
Passive copper cables for 25 GbE SFP28 network adapters		
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 network adapters		
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 ThinkAgile HX7821 Certified Nodes ship with four 1600 W (230V) High Efficiency hot-swap power supplies listed in the following table.

Table 16. Power supplies

Description	Feature code	Quantity
High Efficiency 1600W Power Supply for SR950 (200-240VAC only)	AUPJ	4

The ThinkAgile HX7821 Certified Nodes ship with four customer-configured power cords. The following table lists the rack power cables and line cords that can be ordered for the HX7821 Certified Nodes.

Table 17. Power cables

Description	Part number	Feature code
Rack power cables		
1.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	00Y3043	A4VP
1.0m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08367	B0N5
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	6201
1.5m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08368	B0N6
2.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08365	B0N4
2.0m, 13A/100-250V, 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/100-250V, 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/100-250V, 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



Description	Part number	Feature code
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 HX7821 Certified Nodes ship with the rail kit shown in the following table.

Table 18. Rail kit

Description	Feature code	Quantity
Rail Kit (screw-in, fixed)	A4AA	1

The following table summarizes the rail kit features and specifications.

Table 19. Rail kit features and specifications summary

Feature	Screw-in Fixed Rail
CMA	None
Rail type	Fixed
Rail length (supporting flange)	545.1 mm (21.46 in.)
Tool-less installation	No
In-rack maintenance	No*
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.)

Feature	Screw-in Fixed Rail
Distance between front and rear mounting flanges <sup>^</sup>	711.2 mm (28 in.) – 914.4 mm (36 in.)

\* While certain servicing tasks require the certified node to be removed from the rack cabinet, the majority of certified node components can be serviced from the front or rear of the certified node, which does not require the removal of the certified node from the rack cabinet.

\*\* If a 0U PDU is used, the rack cabinet must be at least 1100 mm (43.31 in.) deep.

<sup>^</sup> 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 HX7821 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 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 20. 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 HX7821 Certified Nodes can be deployed as a cluster of 3 or more nodes (AOS 5.8 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 HX7821 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). Also, the ThinkAgile HX7821 Certified Nodes offer an LCD display panel, which provides quick access to system status, firmware, network, and health information.

## 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 21. 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 22. 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-ixem>

## Physical specifications

The ThinkAgile HX7821 Certified Nodes have the following dimensions and weight (approximate):

- Height: 173 mm (6.8 in.)
- Width: 447 mm (17.6 in.)
- Depth: 800 mm (31.5 in.)
- Weight (maximum): 58.7 kg (129.4 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 HX7821 Certified Nodes comply with ASHRAE class A3 and class A4 specifications. To comply with ASHRAE class A3 and class A4 specifications, the HX7821 Certified Nodes must meet the hardware configuration requirement that processors with TDP more than or equal to 150 W are not installed.

The 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: 200 - 240 (nominal) V AC; 50 Hz / 60 Hz
- Acoustics (maximum configuration, operating): 6.1 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 23. Rated system power, inlet current, and system heat output

Power supply	Source voltage	Maximum power load per system (four power supplies)	Rated current per inlet	System heat output
1600 W Platinum	200 - 240 V AC	4176 W	8.7 A	14249 BTU/hour

## Regulatory compliance

The ThinkAgile HX Certified Nodes 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 Certified Nodes can be configured with a 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:
  - 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 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>



## 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>

## 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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