Lenovo ThinkAgile HX5530, HX5531, HX7530 and HX7531 2U Appliances & Certified Nodes (Intel Xeon SP Gen 3)

Product Guide

The Lenovo ThinkAgile HX 2U Appliances & Certified Nodes are 2-socket 1U systems that feature the 3rd Generation Intel Xeon Scalable processors and are designed for deploying industry-leading hyperconvergence software from Nutanix on Lenovo enterprise platforms. Nutanix brings the benefits of web-scale technologies to enterprise applications through enterprise storage, data protection, infrastructure resilience, management and analytics, and security.

The 2U systems are available either as an Appliance (HXnnn0) or Certified Node (HXnnn1):

- HX5530 and HX5531 for storage-heavy workloads
- HX7530 and HX7531 for high performance workloads

HX Appliances deliver fully validated and integrated Lenovo hardware and firmware, certified and preloaded with licensed Nutanix software. They also include ThinkAgile Advantage support with one single point of contact for support of the hardware and software.

HX Certified Nodes deliver fully validated Lenovo hardware and firmware, certified and can be preloaded with Nutanix software. Certified Nodes do not include licenses to Nutanix software and enhanced software support.

Figure 1. Lenovo ThinkAgile HX 2U Appliances & Certified Nodes with 2.5-inch drive bays

Did you know?

The ThinkAgile HX 2U Appliances & Certified Nodes are built on the Lenovo ThinkSystem SR650 V2 server that features enterprise-class reliability, management, and security.

The HX5530 and HX7530 Appliances offer ThinkAgile Advantage Single Point of Support for quick 24/7 problem reporting and resolution.

Key features

Combining performance and flexibility, the HX 2U systems are a great choice for enterprises of all sizes. The systems offer a broad selection of processors, memory and drives, and offers high performance features that industries such as finance, healthcare and telco need. Outstanding reliability, availability, and serviceability (RAS) and high-efficiency design can improve your business environment and can help save operational costs.

Appliance features

The HX Series Appliances (HX5530 and HX7530) offer the following key features:

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

Certified Node features

The HX Certified Nodes (HX5531 and HX7531) offer the following key features:

- Built on proven and reliable Lenovo ThinkSystem servers 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 (Note: 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 2U systems delivers 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.

Hardware features

The HX systems are based on the SR650 V2 and have the following hardware features:

Scalability and performance

The HX 2U systems offer numerous features to boost performance, improve scalability and reduce costs:

- Supports one or two third-generation Intel Xeon Processor Scalable processors
  - Up to 40 cores and 80 threads
  - Core speeds of up to 3.6 GHz
  - TDP ratings of up to 270W
- Support for up to 32 TruDDR4 memory DIMMs operating at up to 3200 MHz means you have the fastest available memory subsystem.
- Supports configurations of 2 DIMMs per channel to operate at the 3200 MHz rated speed of the memory DIMMs.
- Using 128GB 3DS RDIMMs, the server supports up to 4TB of system memory.
- Supports single-width GPUs or double-wide GPUs, for substantial processing power in a 2U system.
- Configurations with 2.5-inch drives support up to 24x hot-swap drives, all front accessible
- Configurations with 3.5-inch drives support up to 12x 3.5-inch hot-swap front-accessible drives plus 4x 2.5-inch hot-swap rear-accessible drives
- The HX7530 and HX7531 support 8x NVMe drives without oversubscription of PCIe lanes (1:1 connectivity). The use of NVMe drives maximizes drive I/O performance, in terms of throughput and latency.
- Supports up to two externally accessible 7mm hot-swap drives with RAID functionality for operating system boot functions.
- Supports M.2 drives for convenient operating system boot functions. Available M.2 adapters support either one M.2 drive or two M.2 drives in a RAID 1 configuration for performance and reliability.
- The server has a dedicated industry-standard OCP 3.0 small form factor (SFF) slot, with a PCIe 4.0 x16 interface, supporting a variety of Ethernet network adapters. A simple-swap mechanism with a thumbscrew and pull-tab enables tool-less installation and removal of the adapter. The adapter supports shared BMC network sideband connectivity to enable out-of-band systems management.
- The server offers PCI Express 4.0 I/O expansion capabilities that doubles the theoretical maximum bandwidth of PCIe 3.0 (16GT/s in each direction for PCIe 4.0, compared to 8 GT/s with PCIe 3.0). A PCIe 4.0 x16 slot provides 64 GB/s bandwidth, enough to support a 200GbE network connection.
- The server offers up to eight PCIe 4.0 slots, all with rear access, plus a slot dedicated to the OCP adapter.

Availability and serviceability

The HX 2U systems provide many features to simplify serviceability and increase system uptime:

- The server offers Single Device Data Correction (SDDC, also known as Chipkill), Adaptive Double-Device Data Correction (ADDDC, also known as Redundant Bit Steering or RBS), and memory mirroring for redundancy in the event of a non-correctable memory failure.
- Available M.2 RAID Boot Adapters support RAID-1 which can enable two SATA or two NVMe M.2 drives to be configured as a redundant pair.
- The server has up to two hot-swap redundant power supplies and up to six hot-swap redundant fans to provide availability for business-critical applications.
- The light path diagnostics feature uses LEDs to lead the technician to failed (or failing) components, which simplifies servicing, speeds up problem resolution, and helps improve system availability.
- Solid-state drives (SSDs) offer more reliability and performance than traditional mechanical HDDs for greater uptime.
- Proactive Platform Alerts (including PFA and SMART alerts): Processors, voltage regulators, memory, internal storage (SAS/SATA HDDs and SSDs, NVMe SSDs, M.2 storage, flash storage adapters), fans, power supplies, server ambient and subcomponent temperatures. Alerts can be surfaced through the XClarity Controller to managers such as Lenovo XClarity Administrator, VMware vCenter, and Microsoft System Center. These proactive alerts let you take appropriate actions in advance of possible failure, thereby increasing server uptime and application availability.
- The built-in XClarity Controller continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failures to minimize downtime.
- Built-in diagnostics in UEFI, using Lenovo XClarity Provisioning Manager, speed up troubleshooting tasks to reduce service time.
- Lenovo XClarity Provisioning Manager supports diagnostics and can save service data to a USB key drive or remote CIFS share folder for troubleshooting and reduce service time.
- Auto restart in the event of a momentary loss of AC power (based on power policy setting in the XClarity Controller service processor)
- Offers a diagnostics port on the front of the server to allow you to attach an external diagnostics handset for enhanced systems management capabilities.
- Support for the XClarity Administrator Mobile app running on a supported smartphone or tablet and connected to the server through the service-enabled USB port, enables additional local systems management functions.
- Three-year or one-year customer-replaceable unit and onsite limited warranty (varies by geography), 9 x 5 next business day. Optional service upgrades are available.

Manageability and security

Systems management features simplify local and remote management of the HX 2U systems:

- The server includes an XClarity Controller (XCC) to monitor server availability. Optional upgrade to XCC Advanced to provide remote control (keyboard video mouse) functions. Optional upgrade to XCC Enterprise enables the additional support for the mounting of remote media files (ISO and IMG image files), boot capture, and power capping.
- Lenovo XClarity Administrator offers comprehensive hardware management tools that help to increase uptime, reduce costs and improve productivity through advanced server management capabilities.
- UEFI-based Lenovo XClarity Provisioning Manager, accessible from F1 during boot, provides system inventory information, graphical UEFI Setup, platform update function, operating system installation function, and diagnostic functions.
- Support for Lenovo XClarity Energy Manager, which captures real-time power and temperature data

from the server and provides automated controls to lower energy costs.

- An integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.
- Support for industry standard management protocols, IPMI 2.0, SNMP 3.0, Redfish REST API, serial console via IPMI
- An integrated hardware Trusted Platform Module (TPM) supporting TPM 2.0 enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Administrator and power-on passwords help protect from unauthorized access to the server.
- Supports Secure Boot to ensure only a digitally signed operating system can be used. Supported with HDDs and SSDs, as well as 7mm and M.2 drives.
- Industry-standard Advanced Encryption Standard (AES) NI support for faster, stronger encryption.
- Intel Execute Disable Bit functionality can prevent certain classes of malicious buffer overflow attacks when combined with a supported operating system.
- Intel Trusted Execution Technology provides enhanced security through hardware-based resistance to malicious software attacks, allowing an application to run in its own isolated space, protected from all other software running on a system.
- Additional physical security features are an available chassis intrusion switch and available lockable front bezel.

Energy efficiency

The HX 2U systems offer the following energy-efficiency features to save energy, reduce operational costs, and increase energy availability:

- Energy-efficient system board components help lower operational costs.
- High-efficiency power supplies with 80 PLUS Platinum and Titanium certifications
- Solid-state drives (SSDs) consume as much as 80% less power than traditional spinning 2.5-inch HDDs.
- The server uses hexagonal ventilation holes, which can be grouped more densely than round holes, providing more efficient airflow through the system and thus keeping your system cooler.
- Optional Lenovo XClarity Energy Manager provides advanced data center power notification, analysis, and policy-based management to help achieve lower heat output and reduced cooling needs.

Components and connectors

The ThinkAgile HX 2U Appliances & Certified Nodes are based on the ThinkSystem SR650 V2 server.

The following figure shows the front of the HX7530 and HX7531 with 2.5-inch drives.

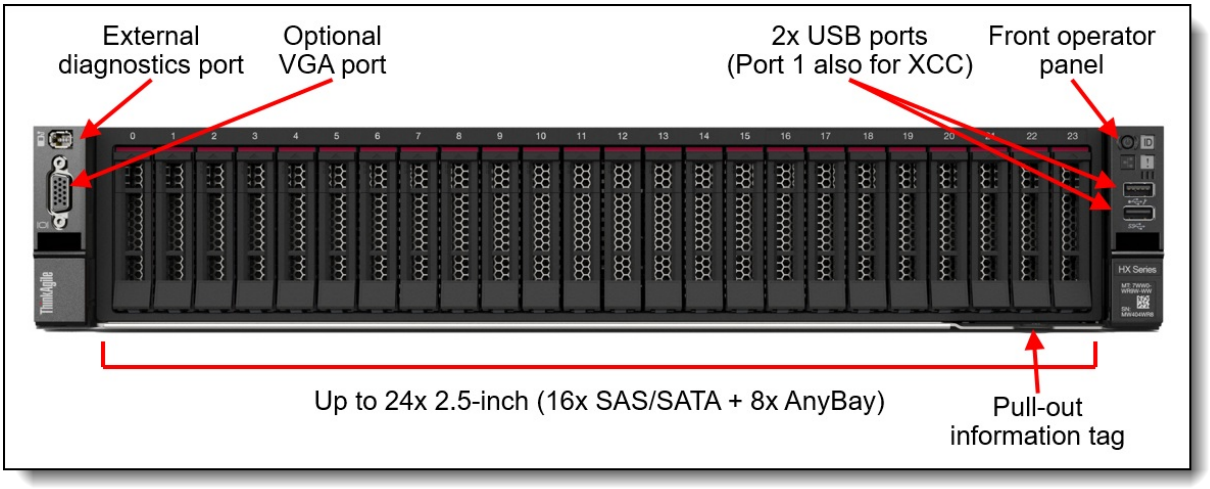

Figure 2. Front view with 2.5-inch drives

The following figure shows the front of the HX5530 and HX5531 with 3.5-inch drives.

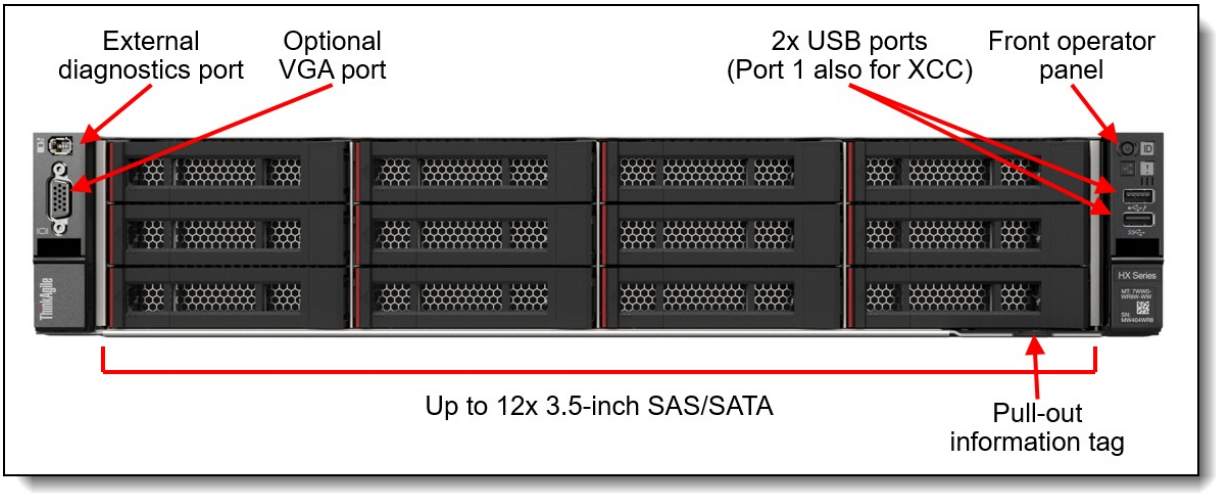

Figure 3. Front view with 3.5-inch drives

The following figure shows the components visible from the rear of the system. The figure shows one configuration, with eight PCIe slots, however there are additional rear configurations which include 3.5-inch drive bays, 2.5-inch drive bays, or 7mm drive bays.

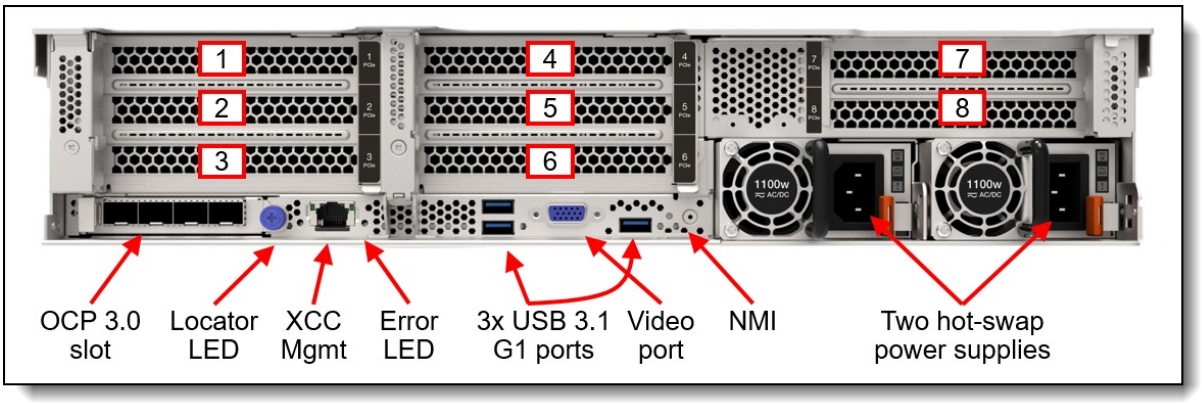

Figure 4. Rear view of the HX systems (configuration with eight PCIe slots)

The following figure shows the locations of key components inside the systems.

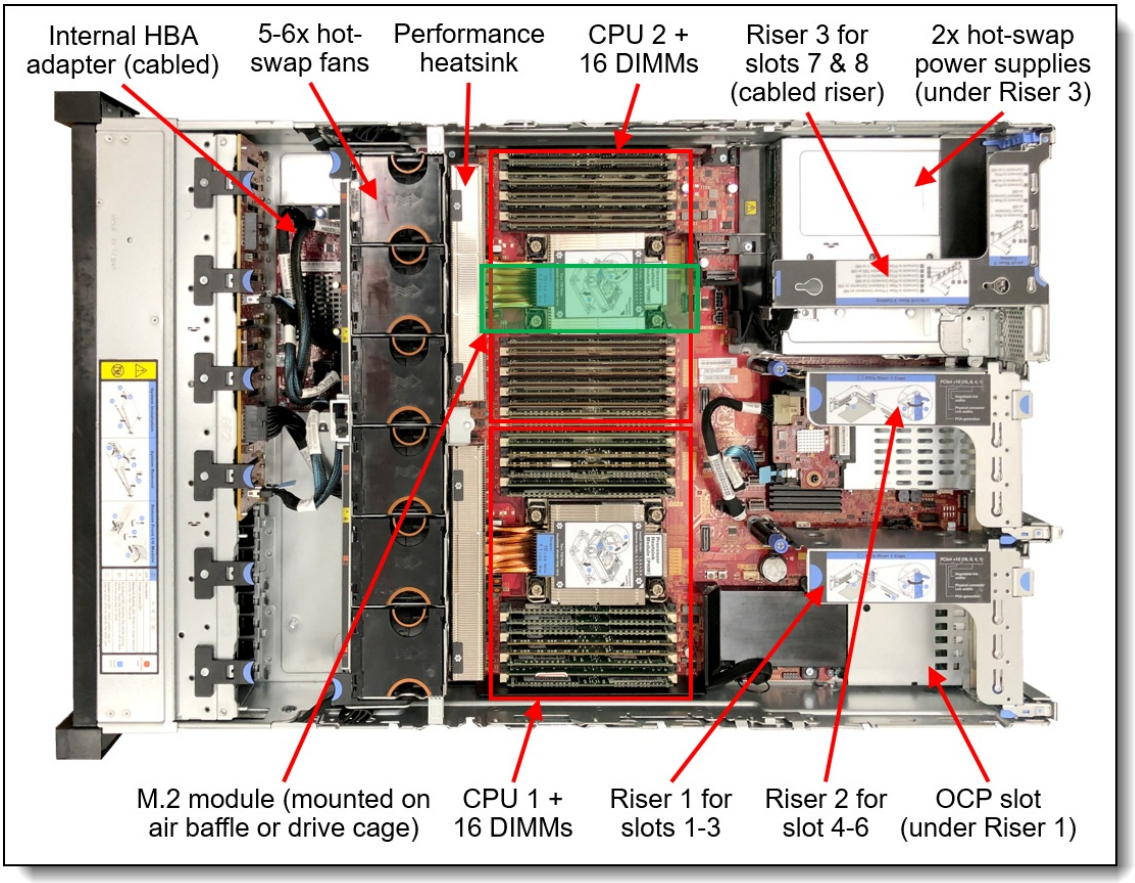

Figure 5. Internal view of the HX systems

Standard specifications

The ThinkAgile HX 2U Appliances & Certified Nodes are based on the ThinkSystem SR650 V2 server.

The following table provides an overview comparison between the HX systems.

Table 1. Comparison of features

	HX5530 Appliance HX5531 Certified Node	**HX7530 Appliance HX7531 Certified Node**
HX offering type	Appliance Certified Node	Appliance Certified Node
Target workloads	Storage heavy	High performance
Base MTM	A: 7Z82CTO1WW CN: 7Z84CTO1WW	A: 7Z82CTO2WW CN: 7Z84CTO2WW
Form Factor	2U	2U
Base platform	SR650 V2	SR650 V2
CPU	1-2x Intel Xeon SP Gen 3	2x Intel Xeon SP Gen 3
Memory	32x DDR4 3200 MHz (4TB maximum)	32x DDR4 3200 MHz (4TB maximum)
Drive Bays	Front: 12x 3.5" SAS/SATA Rear: 4x 2.5" SAS/SATA	Front: 16x 2.5" SAS/SATA + optional 8x 2.5" AnyBay Rear: None
Drive configurations	All Flash Hybrid	All Flash Hybrid
HBA	430-16i HBA	430-8i HBA 430-16i HBA
Boot drives	2x M.2 SATA 2x 7mm SATA	2x M.2 SATA 2x 7mm SATA
OCP networking	1x OCP 3.0 adapter 10Gb, 25Gb	1x OCP 3.0 adapter 10Gb, 25Gb
PCIe networking	Up to 7x PCIe adapters 10Gb, 25Gb	Up to 7x PCIe adapters 10Gb, 25Gb
GPUs	2x DW GPU 300W each 6x SW GPU 75W each 4x SW GPU 150W each	2x DW GPU 300W each 7x SW GPU 75W each 4x SW GPU 150W each
Hypervisor	Nutanix AHV, VMware ESXi	Nutanix AHV, VMware ESXi

The following table lists the standard specifications.

Table 2. Standard specifications

Components	**Specification**
Machine types	7Z82 - 2U Appliance - 3 year warranty 7Z84 - 2U Certified Node - 3 year warranty
Form factor	2U rack
Processor	One or two third-generation Intel Xeon Scalable processor (formerly codenamed "Ice Lake"). Supports processors up to 40 cores, core speeds of up to 3.6 GHz, and TDP ratings of up to 270W.
Chipset	Intel C621A "Lewisburg" chipset, part of the platform codenamed "Whitley"

Components	Specification
Memory	32 DIMM slots with two processors (16 DIMM slots per processor). Each processor has 8 memory channels, with 2 DIMMs per channel (DPC). Lenovo TruDDR4 RDIMMs and 3DS RDIMMs are supported. DIMMs operate at up to 3200 MHz at 2 DPC.
Persistent memory	Not supported.
Memory maximum	With RDIMMs: Up to 4TB by using 32x 128GB 3DS RDIMMs
Memory protection	ECC, SDDC (for x4-based memory DIMMs), ADDDC (for x4-based memory DIMMs, requires Platinum or Gold processors), and memory mirroring.

Disk drive bays	• HX5530 and HX5531:
	  ◦ Front drive bays: 12x 3.5-inch SAS/SATA
	  ◦ Rear drive bays: 4x 2.5-inch SAS/SATA
	• HX7530 and HX7531:
	  ◦ Front drive bays (24 bays): 16x 2.5-inch SAS/SATA + 8x 2.5-inch AnyBay
	  ◦ Front drive bays (16 bays max): 16x 2.5-inch SAS/SATA
	  ◦ Rear drive bays: None
	• 7mm hot-swap drives at the rear of the server for OS boot support
	• Internal M.2 module supporting up to two M.2 drives, for OS boot support

Storage controller	• Onboard NVMe ports (RAID not supported)
	• 12 Gb SAS/SATA non-RAID:
	  ◦ 430-8i HBA
	  ◦ 430-16i HBA

Network interfaces	Dedicated OCP 3.0 SFF slot with PCIe 4.0 x16 host interface. Supports 10GbE and 25GbE network connectivity. One port can optionally be shared with the XClarity Controller (XCC) management processor for Wake-on-LAN and NC-SI support.
PCIe slots	Up to 8x PCIe 4.0 slots, all full height slots and with rear access, plus a slot dedicated to the OCP adapter. Slot availability is based on riser selection and rear drive bay selection. Slots 4-8 require two processors. Slots are configured using three riser cards. Riser 1 (slots 1-3) and Riser 2 (slots 4-6) are installed in slots in the system board, Riser 3 (slots 7-8) is cabled to ports on the system board. For 2.5-inch front drive configurations, the server supports the installation of an HBA in a dedicated area that does not consume any of the PCIe slots.
GPU support	Supports up to 7x single-wide GPUs or up to 2x double-wide GPUs
Ports	Front: 1x USB 3.1 G1 (5 Gb/s) port, 1x USB 2.0 port (also for XCC local management), External diagnostics port, optional VGA port. Rear: 3x USB 3.1 G1 (5 Gb/s) ports, 1x VGA video port, 1x RJ-45 1GbE systems management port for XCC remote management. Optional DB-9 COM serial port (installs in slot 3). Internal: 1x USB 3.1 G1 connector for operating system or license key purposes
Cooling	6x (with two processors installed) or 5x (with one processor installed) dual-rotor hot swap 60 mm fans, configuration dependent. Fans are N+1 redundant, tolerating a single-rotor failure. One fan integrated in each power supply.

Components	Specification
Power supply	Up to two hot-swap redundant AC power supplies, 80 PLUS Platinum or 80 PLUS Titanium certification. 500 W, 750 W, 1100 W and 1800 W AC options, supporting 220 V AC. 500 W, 750 W and 1100 W options also support 110V input supply. In China only, all power supply options support 240 V DC.
Video	G200 graphics with 16 MB memory with 2D hardware accelerator, integrated into the XClarity Controller. Maximum resolution is 1920x1200 32bpp at 60Hz.
Hot-swap parts	Drives, power supplies, and fans.
Systems management	Operator panel with status LEDs. Optional External Diagnostics Handset with LCD display. Models with 8x or 16x 2.5-inch front drive bays can optionally support an Integrated Diagnostics Panel. XClarity Controller (XCC) embedded management, XClarity Administrator centralized infrastructure delivery, XClarity Integrator plugins, and XClarity Energy Manager centralized server power management. Optional XClarity Controller Advanced and Enterprise to enable remote control functions.
Security features	Chassis intrusion switch, Power-on password, administrator's password, Trusted Platform Module (TPM), supporting TPM 2.0. In China only, optional Nationz TPM 2.0. Optional lockable front security bezel.
Software	• Appliances: Nutanix Acropolis: Starter, Pro, and Ultimate editions. Nutanix Prism, Nutanix Calm (optional), Nutanix Flow (optional). • Certified Nodes: Nutanix Acropolis Starter, Pro and Ultimate editions (licenses purchased separately from Nutanix or a Nutanix reseller).
Hypervisors	Nutanix AHV or VMware ESXi.
Hardware warranty	• Appliances: Three-, four-, or five-year customer-replaceable unit and onsite limited hardware warranty with ThinkAgile Advantage Support and selectable service levels: 9x5 next business day (NBD) parts delivered, 9x5 NBD onsite response, 24x7 coverage with 2-hour or 4-hour onsite response, or 6-hour or 24-hour committed repair (select areas). Also available are YourDrive YourData, Premier Support, and Enterprise Software Support. • Certified Nodes: 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.
Software maintenance	Three-, four-, or five-year software support and subscription (matches the duration of the selected warranty period).
Dimensions	Width: 445 mm (17.5 in.), height: 87 mm (3.4 in.), depth: 764 mm (30.1 in.)
Weight	Maximum: 38.8 kg (85.5 lb)

Models

Factory-integrated models of the appliances and 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 Series appliances. ThinkAgile HX Certified Nodes do not have this requirement.

The following table lists the base CTO models.

Table 3. CTO base models

Machine Type/Model	Description
7Z82CTO1WW	ThinkAgile HX5530 Appliance
7Z84CTO1WW	ThinkAgile HX5531 Certified Node
7Z82CTO2WW	ThinkAgile HX7530 Appliance
7Z84CTO2WW	ThinkAgile HX7531 Certified Node

Comparison with the ThinkSystem SR650 V2

The ThinkAgile HX 2U Appliances & Certified Nodes are based on the ThinkSystem SR650 V2 server, however there are key differences:

- No persistent memory support
- No onboard SATA controller support
- No RAID adapter support
- No VROC RAID support
- No mid-chassis drive bay support
- No SED drive support
- No Fibre Channel support
- No InfiniBand support

For details about the ThinkSystem SR650 V2, see the SR650 V2 product guide:
https://lenovopress.com/lp1392-thinksystem-sr650-v2-server

To verify what specific hardware components are supported with the HX 2U systems, see the DCSC configurator:
https://dcsc.lenovo.com

Processors

The HX 2U systems support the following processors.

For details about these options, including configuration rules, see the SR650 V2 product guide: https://lenovopress.com/lp1392-thinksystem-sr650-v2-server#processors

Support for additional processors: The table below lists the processors supported across all configurations. Additional processors may also be supported. Please contact your Lenovo representative regarding the support of additional options through our Special Bid ordering process.

Configuration notes:

- HX5530 and HX5531 support 1 or 2 processors
- HX7530 and HX7531 require 2 processors

Table 4. Processor choices

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
4XG7A63443	BB2N	Intel Xeon Silver 4309Y 8C 105W 2.8GHz Processor	2	2	2	2
4XG7A63468	BB3C	Intel Xeon Silver 4310 12C 120W 2.1GHz Processor	2	2	2	2
4XG7A63459	BB34	Intel Xeon Silver 4310T 10C 105W 2.3GHz Processor	2	2	2	2
4XG7A63455	BB2Z	Intel Xeon ICX Silver 4314 16C 135W 2.4GHz Processor	2	2	2	2
4XG7A63465	BB39	Intel Xeon Silver 4316 20C 150W 2.3GHz Processor	2	2	2	2
4XG7A63477	BB3M	Intel Xeon Gold 5315Y 8C 140W 3.2GHz Processor	2	2	2	2
4XG7A63456	BB30	Intel Xeon Gold 5317 12C 150W 3.0GHz Processor	2	2	2	2
4XG7A63470	BB3E	Intel Xeon ICX Gold 5318N 24C 150W 2.1GHz Processor	2	2	2	2
4XG7A63442	BB2M	Intel Xeon Gold 5318S 24C 165W 2.1GHz Processor	2	2	2	2
4XG7A63460	BB35	Intel Xeon ICX Gold 5318Y 24C 165W 2.1GHz Processor	2	2	2	2
4XG7A63581	BB2R	Intel Xeon Gold 5320 26C 185W 2.2GHz Processor	2	2	2	2
4XG7A63454	BB2Y	Intel Xeon Gold 5320T 20C 150W 2.3GHz Processor	2	2	2	2
4XG7A63446	BB4E	Intel Xeon Gold 6326 16C 185W 2.9GHz Processor	2	2	2	2
4XG7A63473	BB3H	Intel Xeon Gold 6330 28C 205W 2.0GHz Processor	2	2	2	2
4XG7A63478	BB3N	Intel Xeon Gold 6330N 28C 165W 2.2GHz Processor	2	2	2	2
4XG7A63469	BB3D	Intel Xeon Gold 6334 8C 165W 3.6GHz Processor	2	2	2	2
4XG7A63480	BB3S	Intel Xeon Gold 6336Y 24C 185W 2.4GHz Processor	2	2	2	2
4XG7A63579	BB3P	Intel Xeon Gold 6338 32C 205W 2.0GHz Processor	2	2	2	2
4XG7A63457	BB31	Intel Xeon Gold 6338N 32C 185W 2.2GHz Processor	2	2	2	2
4XG7A63458	BB33	Intel Xeon Gold 6338T 24C 165W 2.1GHz Processor	2	2	2	2
4XG7A63578	BB3B	Intel Xeon Gold 6342 24C 230W 2.8GHz Processor	2	2	2	2
4XG7A63452	BB2W	Intel Xeon Gold 6346 16C 205W 3.1GHz Processor	2	2	2	2
4XG7A63575	BB2L	Intel Xeon Gold 6348 28C 235W 2.6GHz Processor	No	No	2	2
4XG7A63450	BB2U	Intel Xeon Gold 6354 18C 205W 3.0GHz Processor	2	2	2	2

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
4XG7A63580	BB3Q	Intel Xeon Platinum 8352S 32C 205W 2.2GHz Processor	2	2	2	2
4XG7A63448	BB2S	Intel Xeon Platinum 8352V 36C 195W 2.1GHz Processor	2	2	2	2
4XG7A63451	BB2V	Intel Xeon Platinum 8352Y 32C 205W 2.2GHz Processor	2	2	2	2
4XG7A63479	BB3R	Intel Xeon Platinum 8358 32C 250W 2.6GHz Processor	No	No	2	2
4XG7A63466	BB3A	Intel Xeon Platinum 8358P 32C 240W 2.6GHz Processor	No	No	2	2
4XG7A63444	BB2P	Intel Xeon Platinum 8360Y 36C 250W 2.4GHz Processor	No	No	2	2
4XG7A63462	BB37	Intel Xeon Platinum 8368 38C 270W 2.4GHz Processor	No	No	2	2
4XG7A63576	BB3G	Intel Xeon Platinum 8380 40C 270W 2.3GHz Processor	No	No	2	2

Memory

The HX 2U systems support the following memory options.

For details about these options, including configuration rules, see the SR650 V2 product guide: https://lenovopress.com/lp1392-thinksystem-sr650-v2-server#memory-options

Table 5. Memory options

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
RDIMMs						
4X77A08632	B963	ThinkSystem 16GB TruDDR4 3200 MHz (2Rx8 1.2V) RDIMM	32	32	32	32
4X77A08633	B964	ThinkSystem 32GB TruDDR4 3200 MHz (2Rx4 1.2V) RDIMM	32	32	32	32
4X77A08634	B965	ThinkSystem 32GB TruDDR4 3200 MHz (2Rx8 1.2V) RDIMM	32	32	32	32
4X77A08635	B966	ThinkSystem 64GB TruDDR4 3200 MHz (2Rx4 1.2V) RDIMM	32	32	32	32
3DS RDIMMs						
4X77A08636	BA62	ThinkSystem 128GB TruDDR4 3200 MHz (4Rx4 1.2V) 3DS RDIMM	32	32	32	32

Internal storage

Internal storage configurations of the HX 2U systems are as follows. All drives are hot-swap and are accessible from the front or rear of the system:

- HX5530 and HX5531:
  - Front drive bays: 12x 3.5-inch SAS/SATA
  - Rear drive bays: 4x 2.5-inch SAS/SATA
- HX7530 and HX7531:
  - Front drive bays (24 bays): 16x 2.5-inch SAS/SATA + 8x 2.5-inch AnyBay
  - Front drive bays (16 bays max): 16x 2.5-inch SAS/SATA
  - Rear drive bays: None

The systems also support the following boot drive alternatives:

- 7mm hot-swap SATA drives installed at the rear of the server
- M.2 drives in an M.2 adapter that is internal to the server

Note: Mid-chassis drives are not supported in HX 2U systems.

Configuration rules

Configuration rules are as follows:

- For hybrid configurations, the system supports from 4 to 12 capacity drives (HDDs) depending on the quantity of the cache drives (SSDs):
  - For HX5530/HX5531 systems only: 2 cache drives: From 4 to 12 capacity drives in increments of 2 drives
  - For all systems: 4 cache drives: From 8 to 10 capacity drives in increments of 2 drives
- Hybrid configurations with more than 80 TB of storage capacity require:
  - Processors with 12 or more cores
  - SSD cache capacity of 7.68 TB or more
- For Hybrid configurations, SATA and SAS SSDs are supported for cache, however NVMe drives are not supported for cache.
- For All Flash configurations, the system supports from 4 to 14 SSDs in increments of 2 drives
- All SSDs in the system must be of the same model and capacity. All HDDs in the system must be of the same type and capacity
- The 7mm or M.2 drives are used for software preload. Two SATA drives are required for selection, and they must be of the same part number.

Backplanes

The choice of backplanes supported varies by system, as listed in the following table.

For details about these options, including configuration rules, see the SR650 V2 product guide: https://lenovopress.com/lp1392-thinksystem-sr650-v2-server#internal-storage

Table 6. Drive backplanes

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
Front 3.5-inch drive backplanes						
None	B8LT	ThinkSystem 2U 12x3.5" SAS/SATA Backplane	1	1	No	No
Front 2.5-inch drive backplanes						
None	B8LU	ThinkSystem 2U 8x2.5" SAS/SATA Backplane	No	No	2	2
None	BH8B	ThinkSystem 2U/4U 8x2.5" AnyBay Backplane	No	No	1	1
Rear 2.5-inch drive backplanes						
None	B8LV	ThinkSystem 2U 4x2.5" SAS/SATA Backplane	1	1	No	No

Boot drive enablement

For OS boot functions, the systems also support either two 7mm hot-swap drive bays installed at the rear of the server, or two M.2 drives installed on an adapter internal to the server. The following table lists the supported controllers/enablement kits for M.2 boot drives.

For details about these options, including configuration rules, see the SR650 V2 product guide:
https://lenovopress.com/lp1392-thinksystem-sr650-v2-server#internal-storage

Table 7. Boot drive enablement

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
4Y37A09739	B5XH	ThinkSystem M.2 SATA 2-Bay RAID Enablement Kit	1	1	1	1
4XH7A61057	B8P2	ThinkSystem 2U 7mm Drive Kit w/ SATA RAID	1	1	1	1

Controllers for internal storage

The HX 2U systems support the following internal storage controllers.

For details about these options, see the SR650 V2 product guide:
https://lenovopress.com/lp1392-thinksystem-sr650-v2-server#controllers-for-internal-storage

Table 8. Controllers for internal storage

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
SAS/SATA HBA - PCIe 3.0						
7Y37A01088	AUNL	ThinkSystem 430-8i SAS/SATA 12Gb HBA	No	No	3	3
7Y37A01089	AUNM	ThinkSystem 430-16i SAS/SATA 12Gb HBA	1	1	1	1
SAS/SATA HBA - PCIe 4.0						
None	BM51	ThinkSystem 440-8i SAS/SATA PCIe Gen4 12Gb HBA	No	No	3	3
None	BM50	ThinkSystem 440-16i SAS/SATA PCIe Gen4 12Gb HBA	1	1	1	1

Internal drive options

The following table lists the supported drive options for the HX 2U systems.

Table 9. Internal drive options

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
2.5-inch hot-swap 12 Gb SAS HDDs						
7XB7A00069	B0YS	ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD	No	No	20	20
2.5-inch hot-swap 6 Gb SATA HDDs						
7XB7A00036	AUUE	ThinkSystem 2.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD	No	No	20	20
7XB7A00037	AUUJ	ThinkSystem 2.5" 2TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	20	20
2.5-inch hot-swap 12 Gb SAS SSDs						

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
4XB7A17062	B8HU	ThinkSystem 2.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	4	4	24	24
4XB7A17063	B8J4	ThinkSystem 2.5" PM1645a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4	4	24	24
4XB7A17054	B91C	ThinkSystem 2.5" PM1643a 3.84TB Entry SAS 12Gb Hot Swap SSD	4	4	24	24
4XB7A17055	B91D	ThinkSystem 2.5" PM1643a 7.68TB Entry SAS 12Gb Hot Swap SSD	4	4	24	24
2.5-inch hot-swap 6 Gb SATA SSDs						
4XB7A17126	BA4T	ThinkSystem 2.5" S4620 960GB Mixed Use SATA 6Gb HS SSD	4	4	24	24
4XB7A17127	BA4U	ThinkSystem 2.5" S4620 1.92TB Mixed Use SATA 6Gb HS SSD	4	4	24	24
4XB7A17128	BK7L	ThinkSystem 2.5" S4620 3.84TB Mixed Use SATA 6Gb HS SSD	4	4	24	24
4XB7A13635	B49N	ThinkSystem 2.5" S4610 960GB Mixed Use SATA 6Gb HS SSD	4	4	24	24
4XB7A13636	B49P	ThinkSystem 2.5" S4610 1.92TB Mixed Use SATA 6Gb HS SSD	4	4	24	24
4XB7A72440	BM89	ThinkSystem 2.5" PM893 1.92TB Read Intensive SATA 6Gb HS SSD	4	4	24	24
4XB7A72441	BM88	ThinkSystem 2.5" PM893 3.84TB Read Intensive SATA 6Gb HS SSD	4	4	24	24
4XB7A17103	BA7J	ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	4	4	24	24
4XB7A17104	BK77	ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	4	4	24	24
4XB7A13622	B49B	ThinkSystem 2.5" S4510 1.92TB Read Intensive SATA 6Gb HS SSD	4	4	24	24
4XB7A13623	B49C	ThinkSystem 2.5" S4510 3.84TB Read Intensive SATA 6Gb HS SSD	4	4	24	24
2.5-inch hot-swap PCIe 4.0 NVMe SSDs						
4XB7A17152	BCFV	ThinkSystem 2.5" U.2 P5600 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	8	8
4XB7A17153	BCFR	ThinkSystem 2.5" U.2 P5600 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	8	8
4XB7A17154	BCFS	ThinkSystem 2.5" U.2 P5600 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	8	8
4XB7A17145	BCFT	ThinkSystem 2.5" U.2 P5500 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	No	8	8
4XB7A17146	BCFW	ThinkSystem 2.5" U.2 P5500 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	No	8	8
4XB7A17147	BCFU	ThinkSystem 2.5" U.2 P5500 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	No	8	8
7mm 2.5-inch hot-swap 6 Gb SATA SSDs						

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
4XB7A17106	BK79	ThinkSystem 7mm S4520 240GB Read Intensive SATA 6Gb HS SSD	2	2	2	2
4XB7A17107	BK7A	ThinkSystem 7mm S4520 480GB Read Intensive SATA 6Gb HS SSD	2	2	2	2
4XB7A38181	B8JQ	ThinkSystem 7mm 5300 240GB Entry SATA 6Gb SSD	2	2	2	2
4XB7A38182	B8JT	ThinkSystem 7mm 5300 480GB Entry SATA 6Gb SSD	2	2	2	2
3.5-inch hot-swap 12 Gb SAS HDDs						
7XB7A00043	AUU6	ThinkSystem 3.5" 4TB 7.2K SAS 12Gb Hot Swap 512n HDD	12	12	No	No
7XB7A00044	AUU7	ThinkSystem 3.5" 6TB 7.2K SAS 12Gb Hot Swap 512e HDD	12	12	No	No
7XB7A00045	B0YR	ThinkSystem 3.5" 8TB 7.2K SAS 12Gb Hot Swap 512e HDD	12	12	No	No
7XB7A00046	AUUG	ThinkSystem 3.5" 10TB 7.2K SAS 12Gb Hot Swap 512e HDD	12	12	No	No
7XB7A00067	B117	ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD	12	12	No	No
4XB7A80353	BPKU	ThinkSystem 3.5" 20TB 7.2K SAS 12Gb Hot Swap 512e HDD	12	12	No	No
3.5-inch hot-swap 6 Gb SATA HDDs						
7XB7A00051	AUU8	ThinkSystem 3.5" 4TB 7.2K SATA 6Gb Hot Swap 512n HDD	12	12	No	No
7XB7A00052	AUUA	ThinkSystem 3.5" 6TB 7.2K SATA 6Gb Hot Swap 512e HDD	12	12	No	No
7XB7A00053	AUU9	ThinkSystem 3.5" 8TB 7.2K SATA 6Gb Hot Swap 512e HDD	12	12	No	No
7XB7A00054	AUUB	ThinkSystem 3.5" 10TB 7.2K SATA 6Gb Hot Swap 512e HDD	12	12	No	No
7XB7A00068	B118	ThinkSystem 3.5" 12TB 7.2K SATA 6Gb Hot Swap 512e HDD	12	12	No	No
4XB7A13914	B7F0	ThinkSystem 3.5" 16TB 7.2K SATA 6Gb Hot Swap 512e HDD	12	12	No	No
3.5-inch hot-swap 12 Gb SAS SSDs						
4XB7A17066	B8HT	ThinkSystem 3.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	12	12	No	No
4XB7A17043	B8JN	ThinkSystem 3.5" PM1645a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	12	12	No	No
4XB7A17058	B91E	ThinkSystem 3.5" PM1643a 3.84TB Entry SAS 12Gb Hot Swap SSD	12	12	No	No
4XB7A17059	BEVK	ThinkSystem 3.5" PM1643a 7.68TB Entry SAS 12Gb Hot Swap SSD	12	12	No	No
3.5-inch hot-swap 6 Gb SATA SSDs						
4XB7A17138	BA4X	ThinkSystem 3.5" S4620 960GB Mixed Use SATA 6Gb HS SSD	12	12	No	No

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
4XB7A17139	BA4Y	ThinkSystem 3.5" S4620 1.92TB Mixed Use SATA 6Gb HS SSD	12	12	No	No
4XB7A17140	BK7P	ThinkSystem 3.5" S4620 3.84TB Mixed Use SATA 6Gb HS SSD	12	12	No	No
4XB7A13641	B49T	ThinkSystem 3.5" S4610 960GB Mixed Use SATA 6Gb HS SSD	12	12	No	No
4XB7A13642	B49U	ThinkSystem 3.5" S4610 1.92TB Mixed Use SATA 6Gb HS SSD	12	12	No	No
4XB7A17121	BA7N	ThinkSystem 3.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	12	12	No	No
4XB7A17122	BK7F	ThinkSystem 3.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	12	12	No	No
4XB7A13628	B49G	ThinkSystem 3.5" S4510 1.92TB Read Intensive SATA 6Gb HS SSD	12	12	No	No
4XB7A13629	B49H	ThinkSystem 3.5" S4510 3.84TB Read Intensive SATA 6Gb HS SSD	12	12	No	No
M.2 SATA drives						
4XB7A17071	B8HS	ThinkSystem M.2 5300 240GB SATA 6Gbps Non-Hot Swap SSD	2	2	2	2
4XB7A17073	B919	ThinkSystem M.2 5300 480GB SATA 6Gbps Non-Hot Swap SSD	2	2	2	2

Network adapters

The HX 2U systems support the following networking options.

For details about these options, including configuration rules, see the SR650 V2 product guide:
https://lenovopress.com/lp1392-thinksystem-sr650-v2-server#i-o-expansion
https://lenovopress.com/lp1392-thinksystem-sr650-v2-server#network-adapters

Mixing vendors is not supported: HX configurations only support network adapters from one vendor. For example, if you select a Broadcom OCP adapter, you cannot select a Mellanox PCIe network adapter.

Table 10. OCP network adapters

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
10 Gb Ethernet						
4XC7A08240	B5T4	ThinkSystem Broadcom 57454 10GBASE-T 4-port OCP Ethernet Adapter	1	1	1	1
25 Gb Ethernet						
4XC7A08242	B5SV	ThinkSystem Broadcom 57454 10/25GbE SFP28 4-port OCP Ethernet Adapter	1	1	1	1
4XC7A62582	BE4T	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-Port OCP Ethernet Adapter	1	1	1	1
4XC7A08237	B5SZ	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-port OCP Ethernet Adapter	1	1	1	1

Table 11. PCIe network adapters

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
10GBASE-T Ethernet						
4XC7A08245	B5SU	ThinkSystem Broadcom 57454 10GBASE-T 4-port PCIe Ethernet Adapter	5	5	5	5
7ZT7A00496	AUKP	ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	5	5	5	5
25 Gb Ethernet						
4XC7A08316	BD49	ThinkSystem Broadcom 57454 10/25GbE SFP28 4-port PCIe Ethernet Adapter V2	5	5	5	5
4XC7A08249	B653	ThinkSystem Mellanox ConnectX-4 Lx 10/25GbE SFP28 2-port PCIe Ethernet Adapter	7	7	7	7
4XC7A62580	BE4U	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	7	7	7	7
4XC7A08238	B5T0	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-port PCIe Ethernet Adapter	5	5	5	5
100 Gb Ethernet						
4XC7A08248	B8PP	ThinkSystem Mellanox ConnectX-6 Dx 100GbE QSFP56 2-port PCIe Ethernet Adapter	5	5	5	5

Note: ThinkSystem Mellanox ConnectX-4 is the only adapter enabled for RDMA, minimum required quantity is two.

GPU adapters

The HX 2U systems support the following GPU options.

For details about these options, including configuration rules, see the SR650 V2 product guide: https://lenovopress.com/lp1392-thinksystem-sr650-v2-server#gpu-adapters

Note: The HX5530 and HX5531 only support GPUs under special bid conditions. An ambient temperature of 25°C or lower is required.

Table 12. GPU adapters

Part number	Feature	Description	Maximum supported			
			HX5530	HX5531	HX7530	HX7531
Double-wide GPUs						
4X67A76715	BLK1	ThinkSystem NVIDIA A100 80GB PCIe Gen4 Passive GPU	2*	2*	3	3
4X67A13135	BEL5	ThinkSystem NVIDIA A100 40GB PCIe Gen4 Passive GPU	2*	2*	2	2
4X67A72593	BEL4	ThinkSystem NVIDIA A40 48GB PCIe Gen4 Passive GPU	2*	2*	2	2
4X67A76581	BJHG	ThinkSystem NVIDIA A30 24GB PCIe Gen4 Passive GPU	2*	2*	3	3
4X67A76727	BNFE	ThinkSystem NVIDIA A16 64GB Gen4 PCIe Passive GPU	No	No	3	3
4X67A13125	BB2D	ThinkSystem NVIDIA Quadro RTX 6000 24GB PCIe Passive GPU	2*	2*	2	2
Single-wide GPUs						
4X67A71311	BFTZ	ThinkSystem NVIDIA A10 24GB PCIe Gen4 Passive GPU	4*	4*	4	4
4X67A14926	B4YB	ThinkSystem NVIDIA T4 16GB PCIe Passive GPU	6*	6*	7	7
4X67A81547	BP05	ThinkSystem NVIDIA A2 16GB PCIe Gen4 Passive GPU	No	No	7	7

* Only supported under special bid conditions including 25°C ambient temperature

Software

The systems support the hypervisors listed in the following table. Hypervisors are installed on the 2x M.2 SSDs configured in a RAID-1 drive group.

Table 13. Hypervisors

Feature code	Description	Quantity
B15S	Nutanix SW Stack on Nutanix AHV	1
BG4Z	Nutanix SW Stack on VMware ESXi 6.7	1
BFT6	Nutanix SW Stack on VMware ESXi 7.0	1

Configuration notes:

- In ESXi-based environments, HX Series Appliances require VMware vCenter Server.

- The HX Certified Nodes support the Nutanix Software Starter, Pro and Ultimate editions.
- The HX Certified Nodes can be deployed as a cluster of 3 or more nodes (AOS 5.17.1.3 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)

Nutanix licenses on certified nodes: The certified node ships with the Nutanix software preloaded, however 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.

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

The ThinkAgile Appliances support the following software components:

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

Nutanix Acropolis

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

Table 14. Nutanix software options (HX Appliances only)

Feature code	Description	Quantity (per node)
B0VU	Nutanix Starter Edition	1
B0VV	Nutanix Pro Edition	1
B0VW	Nutanix Ultimate Edition	1

The editions have the following characteristics:

- The Starter edition offers the core set of Nutanix software functionality. This edition is ideal for small-scale deployments with a limited set of workloads.
- The Pro edition offers rich data services, along with resilience and management features. This edition is ideal for enterprises running multiple applications on a Nutanix cluster or with large-scale single workload deployments.
- The Ultimate edition offers the full suite of Nutanix software capabilities to tackle complex infrastructure challenges. This edition is ideal for multi-site deployments.

The following table compares key features of the Nutanix software editions. For more information, see the following web page:
https://www.nutanix.com/products/software-options

Table 15. Nutanix software editions feature comparison

Feature	Starter Edition	Pro Edition	Ultimate Edition
Enterprise Storage			

Feature	Starter Edition	Pro Edition	Ultimate Edition
Cluster Size	12	No enforced limits on-prem. 16 nodes validated in AWS	No enforced limits on-prem. 16 nodes validated in AWS
Heterogeneous Clusters	Included	Included	Included
VM-centric Snapshots & Clones	Included	Included	Included
Data Tiering	Included	Included	Included
Online Cluster Grow/Shrink	Included	Included	Included
Data Path Redundancy	Included	Included	Included
Tunable Redundancy Factor	2	2 or 3	2 or 3
Availability Domains	Node	Node, Block, Rack	Node, Block, Rack
Basic Compression (LZ4) - Inline and post process	Included	Included	Included
Deep Compression (LZ4HC) - Greater efficiency for cold data	No	Included	Included
Cache Deduplication	Included	Included	Included
Capacity Tier Deduplication	No	Included	Included
Erasure Coding (EC-X)	No	Included	Included
VM Centric Storage QoS	No	Included	Included
VM Flash Mode	No	No	Included
Consolidated Storage Services			
Volume Groups - for in-cluster VMs	Included	Included	Included
Volume Groups - external access	No	Included	Included
Nutanix Files	1 TiB Free Capacity	1 TiB Free Capacity	1 TiB Free Capacity
Nutanix Objects	2 TiB Free Capacity	2 TiB Free Capacity	2 TiB Free Capacity
Data Protection and Disaster Recovery			
Async Replication (RPO = 1 hr or greater)	Included	Included	Included
Application Consistent Snapshots	Included	Included	Included
Self Service Restore	No	Included	Included
Multiple Site DR (many to one, one to many, many to many)	No	Adv Replication add-on license	Included
Metro Availability	No	Adv Replication add-on license	Included
Sync Replication (RPO = 0)	No	Adv Replication add-on license	Included
NearSync Replication (RPO = 1-15 min)	No	Adv Replication add-on license	Included
Advanced Orchestration with Runbook Automation	No	Adv Replication add-on license	Included
Security			
Client Authentication	Included	Included	Included

Feature	Starter Edition	Pro Edition	Ultimate Edition
Cluster Lockdown	No	Included	Included
Data-at-Rest Encryption (Software-based & SED)	No	Add-on license available	Included
Native KMS	No	Add-on license available	Included
Management & Analytics			
Prism Starter	Included	Included	Included
Insights	Included	Included	Included
LCM	Included	Included	Included
Foundation	Included	Included	Included
Foundation Central	Included	Included	Included
Supported Hypervisors			
Nutanix AHV	Included	Included	Included
VMware ESXi	Included	Included	Included
Microsoft Hyper-V	Included	Included	Included
Included Hypervisor and Container Runtime			
Nutanix AHV (All Hypervisor Features Included)	Included	Included	Included
Nutanix Karbon	Included	Included	Included

Configuration notes:

- When adding software licenses after the initial deployment, customers should request a quote for the selected license part numbers from Lenovo and provide additional details on the existing installation.
- The total file/object storage capacity in Tebibytes (TiB) can be calculated by multiplying the total file/object storage capacity in Terabytes (TB) by 0.909495.

Nutanix Prism

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

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

- Prism Starter (included in Starter, Pro, and Ultimate Nutanix software editions): Provides ability to configure, manage, and monitor a Nutanix cluster and centralized management of multiple local and remote Nutanix clusters.
- Prism Pro (selectable software license; optional): Enables efficiency evaluation, capacity planning, expansion recommendations, custom dashboards, and advanced search capabilities.
- Prism Ultimate (selectable software license; optional): Multiple Site DR, Sync Replication (RPO = 0), Data-at-Rest Encryption, VM Flash Mode, Metro Availability, Native KMS

The Prism Pro or Prism Ultimate software license can be added during the initial purchase by selecting one of the software options listed in the following table. These feature codes are only for HX appliances, not for certified nodes.

Table 16. Prism Pro selection options (HX Appliances only)

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

Also, Prism Starter can be upgraded to Prism Pro or Prism Ultimate after the initial deployment by purchasing one of the software license options listed in the following table. These part numbers are only for HX appliances, not for certified nodes.

Table 17. Prism Pro software license options (HX Appliances only)

Part number	Feature code	Description	Quantity (per node)
Prism Pro licenses			
7S0P000UWW	AW87	Nutanix Prism Pro with 1Yr Support	1
7S0P000VWW	AW88	Nutanix Prism Pro with 2Yr Support	1
7S0P000WWW	AW89	Nutanix Prism Pro with 3Yr Support	1
7S0P000XWW	AW8A	Nutanix Prism Pro with 4Yr Support	1
7S0P000YWW	AW8B	Nutanix Prism Pro with 5Yr Support	1
Prism Ultimate licenses			
7S0P002BWW	S6Q6	Nutanix Prism Ultimate per Node 1 Year	1
7S0P002CWW	S6Q7	Nutanix Prism Ultimate per Node 2 Year	1
7S0PCTO1WW	S6Q9	Nutanix Prism Ultimate per Node 4 Year	1
7S0PCTO1WW	S6Q8	Nutanix Prism Ultimate per Node 3 Year	1
7S0PCTO1WW	S6QA	Nutanix Prism Ultimate per Node 5 Year	1

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

Nutanix Prism offers the following features:

- Single point of control
  - Accelerates enterprise-wide deployment
  - Manages capacity centrally
  - Adds nodes in minutes
  - Supports non-disruptive software upgrades with zero downtime
  - Integrates with REST APIs and PowerShell
  - Manages firmware updates with the ThinkAgile HX Lifecycle Manager (UEFI, XCC, drives, network adapters, and SAS HBAs)

- Monitoring and alerting
  - Tracks infrastructure utilization (storage, processor, memory)
  - Centrally monitors multiple clusters across multiple sites
  - Monitors per-VM performance and resource usage
  - Checks system health
  - Generates alerts and notifications
- Integrated data protection
  - Offers customizable RPO/RTO and retention policies
  - Supports configurable per-VM replication (1:1, 1:many and many:1)
  - Provides efficient VM recovery
  - Deploys affordable DR and backup to the cloud
- Diagnostics and troubleshooting
  - Provides time-based historical views of VM activity
  - Performs proactive alert analysis
  - Correlates alerts and events to quickly diagnose issues
  - Generates actionable alerts and reduces resolution times
  - Analyzes trending patterns for accurate capacity planning

Nutanix Calm

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

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

The Calm software is licensed on a per-VM basis in 25 VM packs. The Calm software licenses can be added during the initial purchase by selecting the software option listed in the following table. Calm licenses are only for HX appliances, not for certified nodes.

Table 18. Calm software selection options (HX Appliances only)

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

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

Table 19. Calm software license options (HX Appliances only)

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

Configuration notes:

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

Nutanix Flow

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

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

The Flow software is licensed on a per-node basis. The Flow software license can be added during the initial purchase by selecting the software option listed in the following table, These part numbers are only for HX appliances, not for certified nodes.

Table 20. Flow software selection options (HX Appliances only)

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

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

Table 21. Flow software license options (HX Appliances only)

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

Configuration notes:

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

Warranty and Support

The ThinkAgile HX Series appliances can be configured with a three-, four, or five-year hardware warranty with 24x7 ThinkAgile Advantage Single Point of Support (Lenovo appliance hardware and Nutanix software) and various levels of coverage with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

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

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

The ThinkAgile HX Certified Nodes can be configured with 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.

For more information refer to the Lenovo Support Plan - ThinkAgile HX Certified Nodes
https://support.lenovo.com/us/en/solutions/HT510301

Hardware warranty

The ThinkAgile HX 2U Appliances & Certified Nodes have a 3-year warranty:

- 7Z82 - 2U Appliance - 3 year warranty
- 7Z84 - 2U Certified Node - 3 year warranty

The standard warranty terms are customer-replaceable unit (CRU) and onsite (for field-replaceable units FRUs only) with standard call center support during normal business hours and 9x5 Next Business Day Parts Delivered.

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

- **Premier Support**

  Premier Support provides a Lenovo-owned customer experience and delivers direct access to technicians skilled in hardware, software, and advanced troubleshooting, in addition to the following:

  - Direct technician-to-technician access through a dedicated phone line
  - 24x7x365 remote support
  - Single point of contact service
  - End to end case management
  - Third-party collaborative software support
  - Online case tools and live chat support
  - On-demand remote system analysis

- **Warranty Upgrade (Preconfigured Support)**

  Services are available to meet the on-site response time targets that match the criticality of your 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. YourDrive YourData is an optional extra (see below).
  - **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select markets). Bundled with YourDrive YourData.
  - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select markets). Bundled with YourDrive YourData.

- **Managed Services**

  Lenovo Managed Services provides continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of your 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 & OS device driver levels, and software as needed. We'll also maintain records of latest patches, critical updates, and firmware levels, to ensure you systems are providing business value through optimized performance.

- **Technical Account Management (TAM)**

  A Lenovo Technical Account Manager helps you optimize the operation of your data center based on a deep understanding of your business. You gain direct access to your Lenovo TAM, who serves as your single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. In addition, your TAM will help proactively make service recommendations and manage your service relationship with Lenovo to make certain your needs are met.

- **Enterprise Server Software Support**

  Enterprise Software Support is an additional support service providing 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 comparability and interoperability issues, isolate causes of problems, report defects to software vendors, and more.

- **YourDrive YourData**

  Lenovo's YourDrive YourData is a multi-drive retention offering that ensures your data is always under your control, regardless of the number of drives that are installed in your Lenovo server. In the unlikely event of a drive failure, you retain possession of your drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. The YourDrive YourData service can be purchased in convenient bundles and is optional with Foundation Service. It is bundled with Essential Service and Advanced Service.

- **Health Check**

  Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that your 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.

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 Service offerings are region-specific. Not all preconfigured support and upgrade options are available in every region. For information about Lenovo service upgrade offerings that are available in your region, refer to the following resources:

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

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

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

Deployment services

The following optional Lenovo Professional Services are available 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
    - VMware vCenter Server and vSphere cluster (for VMware installations)
  - Transferring knowledge

- Nutanix deployment services - Advanced with XClarity (per cluster)
  - Nutanix deployment services - Advanced
  - Installing Lenovo XClarity
  - Configuring Lenovo XClarity network settings and performing discovery and inventory
  - Installing system updates

The following table lists ThinkAgile Health Check & Deployment offerings are available for ThinkAgile HX customers. These offerings are performed by Lenovo Professional Services.

- **Onsite Deployment**: Install, configure, and validate solution on-site, and conduct knowledge transfer.
- **Remote Deployment**: Install, configure, and validate solution remotely, and conduct knowledge transfer.
- **Remote Health Check**: Report & remediation of hardware and cluster health issues, including firmware and software updates.

Note: For custom Hardware Installation and Deployment Services, please contact the Lenovo Professional Services team for sizing and pricing.

Table 22. Deployment offerings

Part number	Description
Onsite deployment services	
5MS7B00043	ThinkAgile HX Onsite Deployment (up to 3 nodes)
5MS7B00044	ThinkAgile HX Onsite Deployment (additional node)
Remote deployment services	
5MS7B00045	ThinkAgile HX Remote Deployment (up to 3 nodes)
5MS7B00046	ThinkAgile HX Remote Deployment (additional node)
5MS7A27430	ThinkAgile HX SAP HANA Deployment - Custom
Remote Health Check	
5MS7B00065	ThinkAgile HX 1X Remote Health Check (up to 3 node cluster)
5MS7B00066	ThinkAgile HX 1X Remote Health Check (additional node)
5MS7B00067	ThinkAgile HX 1X Remote Health Check & Update (up to 3 node cluster)
5MS7B00068	ThinkAgile HX 1X Remote Health Check & Update (additional node)

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

Lenovo Financial Services

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

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

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

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

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

For your region-specific offers, please ask your Lenovo sales representative or your technology provider about the use of Lenovo Financial Services. For more information, see the following Lenovo website:

https://www.lenovo.com/us/en/landingpage/lenovo-financial-services/

Related publications and links

For more information, see these resources:

- Lenovo ThinkAgile HX Series
  https://www.lenovo.com/us/en/data-center/software-defined-infrastructure/ThinkAgile-HX-Series/p/WMD00000326
- ThinkAgile HX Series Comparison reference
  https://lenovopress.com/lp1336-thinkagile-hx-series-comparison
- Interactive 3D Tour of ThinkAgile HX Series offerings:
  https://lenovopress.com/lp0454-lenovo-thinkagile-hx-series-interactive-3d-tour
- Lenovo Data Center Solution Configurator (DCSC):
  http://dcsc.lenovo.com
- Lenovo ThinkAgile product publications (user manuals):
  https://thinkagile.lenovofiles.com/help/index.jsp
- 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
- 2-Socket Rack Servers

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