



Lenovo ThinkAgile HX1320, HX1321, HX2320, HX2321, HX3320, HX3321 1U Appliances and Certified Nodes (Intel Xeon SP Gen 2)

Product Guide

The Lenovo ThinkAgile HX 1U 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 1U systems are available either as an Appliance (HXnnn0) or Certified Node (HXnnn1):

- HX1320 and HX1321 for entry systems
- HX2320 and HX2321 for remote office and branch office
- HX3320 and HX3321 for VDI, server virtualization, and private cloud
- HX3320 for HANA and HX3321 for HANA are 1U offerings designed for SAP HANA-based solutions

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. ThinkAgile HX3320 and HX3321 with 2.5-inch drive bays

Did you know?

The ThinkAgile HX 1U Appliances & Certified Nodes are built on the Lenovo ThinkSystem SR630 server that features enterprise-class reliability, management, and security.

The HX1320, HX2320 and HX3320 and HX3320 for HANA Appliances offer ThinkAgile Advantage Single Point of Support for quick 24/7 problem reporting and resolution.

Key features

Combining performance and flexibility, the HX 1U 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 (HX1320, HX2320 and HX3320 and HX3320 for HANA) 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 (including all-NVMe) 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 (HX1321, HX2321 and HX3321 and HX3321 for HANA) 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 1U 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 ThinkAgile HX 1U Appliances & Certified Nodes systems are based on the SR630 and have the following hardware features:

Scalability and performance

The HX 1U systems offer numerous features to boost performance, improve scalability and reduce costs:

- Support one or two second-generation Intel Xeon Scalable processors:
 - Up to 28 cores and 56 threads per processor
 - Core speeds of up to 3.6 GHz
 - TDP ratings of up to 205 W
- Helps maximize system performance for data intensive applications with up to 2933 MHz memory speeds and up to 3 TB of memory capacity with 3DS RDIMMs.
- Offers flexible and scalable internal storage in a 1U rack form factor with up to 12x 2.5-inch drives for performance-optimized configurations or up to 4x 3.5-inch drives for capacity-optimized configurations
- Provides flexibility to use SAS, SATA, or NVMe drives in the same drive bays with a unique AnyBay design.
- Provides I/O scalability with the LOM slot, PCIe 3.0 slot for an internal storage controller, and up to three PCI Express (PCIe) 3.0 I/O expansion slots in a 1U rack form factor.

Availability and serviceability

The HX 1U systems provide many features to simplify serviceability and increase system uptime:

- Offers protection in the event of a non-correctable memory failure with Single Device Data Correction (SDDC, also known as Chipkill, requires x4-based DIMMs), Adaptive Double Device Data Correction (ADDDC, also known as Redundant Bit Steering (RBS), requires x4-based DIMMs and Intel Xeon Gold or Platinum processors), memory mirroring, and memory rank sparing.
- Provides easy access to upgrades and serviceable parts (such as processors, memory DIMMs, and adapter cards) with tool-less cover removal.
- Offers data protection and greater system uptime with hot-swap drives supporting basic or advanced RAID redundancy.
- Provides availability for business-critical applications with redundant hot-swap power supplies and redundant hot-swap fans.
- Simplifies servicing, speeds up problem resolution, and helps improve system availability with light path diagnostics.
- Allows preventive actions in advance of possible failure, thereby increasing server uptime and application availability with Proactive Platform Alerts (including PFA and SMART alerts) for processors, voltage regulators, memory, internal storage (SAS/SATA HDDs and SSDs, NVMe SSDs, M.2 storage, flash storage adapters), fans, power supplies, and server ambient and sub-component temperatures.
- Continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failure to minimize downtime with Built-in XClarity Controller (XCC).
- Provides quick access to system status, firmware, network, health, and alerts information via Virtual Operator Panel 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.
- Speeds up troubleshooting tasks to reduce service time with diagnostics built into the XClarity Provisioning Manager.

Manageability and security

Powerful systems management features simplify local and remote management of the HX 1U systems and deliver enterprise-class data protection:

- Provides advanced service processor control, monitoring, and alerting functions with XClarity Controller, a next generation service processor.
- Improves Unified Extensible Firmware Interface (UEFI) system setup, configuration, updates, simplified error handling, and operating system deployment with the embedded XClarity Provisioning Manager.
- Offers XClarity Essentials software tools that can help you set up, use, and maintain the server.
- Increases uptime, reduces costs, and improves productivity through advanced server management capabilities with Lenovo XClarity Administrator that provides comprehensive hardware management.
- Provides on-the-go monitoring and management of devices in XClarity Administrator from anywhere with the Lenovo XClarity mobile app, which can help improve efficiency and reduce downtime risks.
- Centralizes infrastructure resource management with Lenovo XClarity Integrators for VMware vCenter and Microsoft System Center, extending XClarity Administrator features to virtualization management software tools and enabling users to deploy and manage infrastructure end-to-end.
- Offers advanced cryptographic functionality (such as digital signatures and remote attestation) with an integrated Trusted Platform Module (TPM)
- Provides faster, stronger encryption with industry-standard AES NI support.
- Helps prevent certain classes of malicious buffer overflow attacks with Intel Execute Disable Bit functionality, when combined with a supporting operating system.
- Enhances security through hardware-based resistance to malicious software attacks with Intel Trusted Execution Technology, allowing an application to run in its own isolated space, protected from all other software running on a system.

Energy efficiency

The HX 1U systems offer the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to the green environment:

- Delivers impressive compute power per watt, featuring 80 PLUS Titanium and Platinum redundant power supplies.
- Enables customers to lower energy costs with design to meet ASHRAE A4 standards in select configurations.
- Reduces power drawn with Intel Intelligent Power Capability that powers individual processor elements on and off as needed.
- Helps reduce power consumption with variable speed fans.
- Helps achieve lower heat output and reduced cooling needs with Lenovo XClarity Energy Manager that provides advanced data center power notification, analysis, and policy-based management.

Components and connectors

The ThinkAgile HX 1U Appliances & Certified Nodes are based on the ThinkSystem SR630 server.

The following figure shows the front view of the HX1320, HX1321, HX2320 and HX2321 systems with 4x 3.5-inch drive bays.

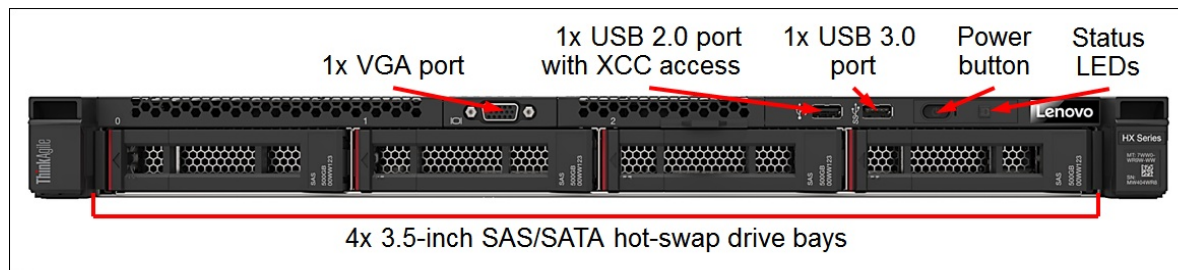


Figure 2. Front view of HX1320, HX1321, HX2320 and HX2321 systems

The following figure shows the front view of the HX3320 and HX3321 systems with 10x 2.5-inch drive bays.

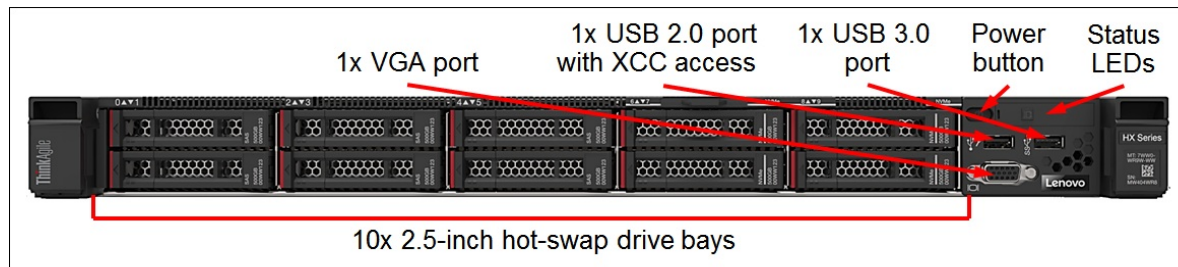


Figure 3. Front view of HX3320 and HX3321 systems

The following figure shows the rear view of the HX1320 and HX1321 with 2x PCIe Gen 3 slots

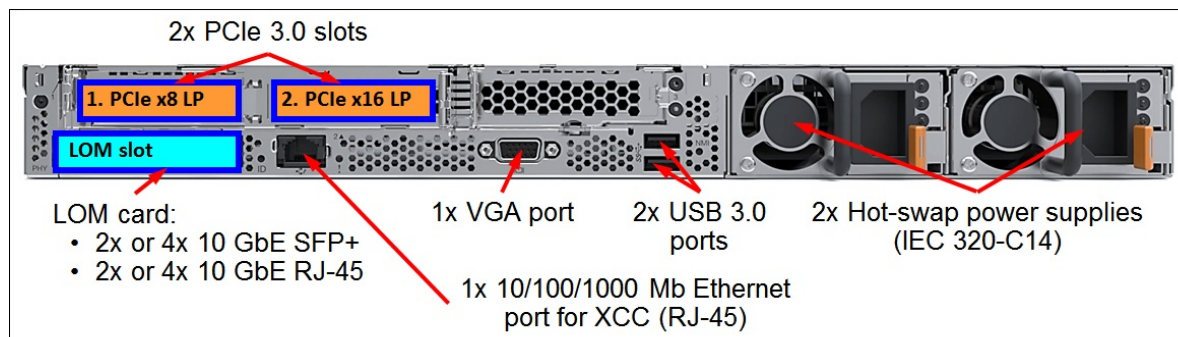


Figure 4. HX1320 and HX1321 rear view

The following figure shows the rear view of the HX2320, HX2321, HX3320 and HX3321 systems with 3x PCIe Gen 3 slots.

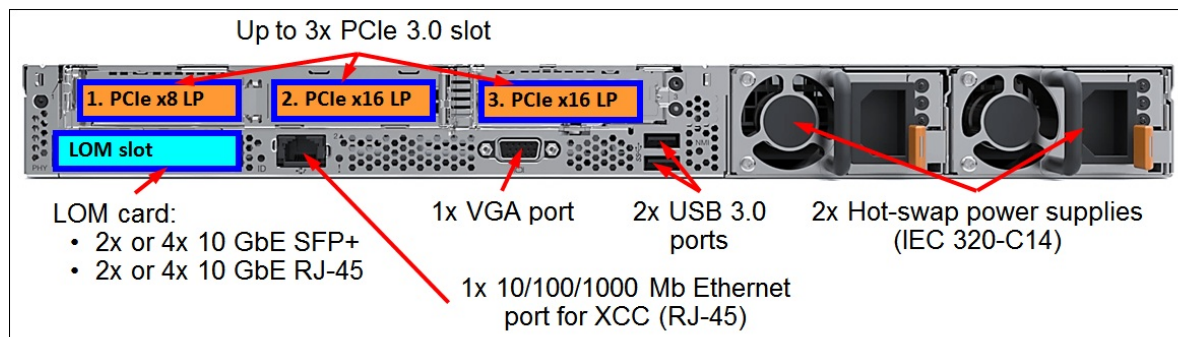


Figure 5. HX2320, HX2321, HX3320 and HX3321 rear view

The following figure shows the rear view of the HX3320 and HX3321 systems with 2 drives at the rear of the systems, a total of 12 drive bays

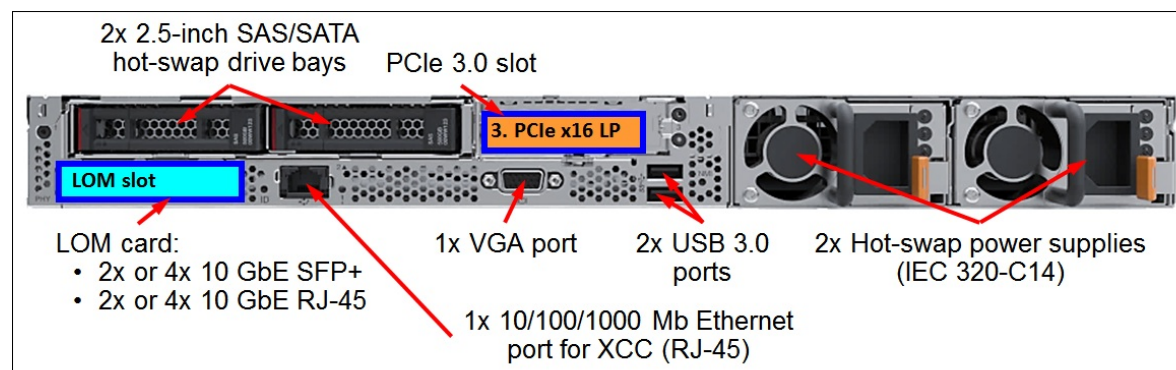


Figure 6. HX3320 and HX3321 12-drive bay rear view

Standard specifications

The ThinkAgile HX 1U Appliances & Certified Nodes are based on the ThinkSystem SR630 server.

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

Table 1. Comparison of features

	HX1320 HX1321	HX2320 HX2321	HX3320 HX3321	HX3320 for HANA HX3321 for HANA
HX offering type	Appliance Certified Node	Appliance Certified Node	Appliance Certified Node	Appliance Certified Node
Target workloads	Entry systems	ROBO	VDI, server virtualization, private cloud	SAP HANA-based solutions
Base MTM	7X83CTO1WW 7Y89CTO1WW	7X83CTO5WW 7Y89CTO5WW	7X83CTO3WW 7Y89CTO3WW	7X83CTO8WW 7Y89CTO8WW
Form Factor	1U	1U	1U	1U
Base platform	SR630	SR630	SR630	SR630
CPU	1x Intel Xeon SP Gen 2	2x Intel Xeon SP Gen 2	2x Intel Xeon SP Gen 2	2x Intel Xeon SP Gen 2
Memory	24x DDR4 2933 MHz (768GB maximum)	24x DDR4 2933 MHz (1.5TB maximum)	24x DDR4 2933 MHz (3TB maximum)	24x DDR4 2933 MHz (3TB maximum)
Drive Bays	Front: 4x 3.5" SAS/SATA Rear: None	Front: 4x 3.5" SAS/SATA Rear: None	Front: 6x 2.5" SAS/SATA + 4x 2.5" AnyBay Rear: 2x 2.5" SAS/SATA (optional)	Front: 6x 2.5" SAS/SATA + 4x 2.5" AnyBay Rear: 2x 2.5" SAS/SATA (optional)
Drive Configuration	All Flash Hybrid	All Flash Hybrid	All Flash Hybrid	All Flash
HBA	430-8i HBA	430-8i HBA	430-16i HBA	430-16i HBA
Boot drives	2x M.2 SATA	2x M.2 SATA	2x M.2 SATA	2x M.2 SATA
Rear slots	2	3	3 (1 if rear drives configured)	3 (1 if rear drives configured)

	HX1320 HX1321	HX2320 HX2321	HX3320 HX3321	HX3320 for HANA HX3321 for HANA
LOM networking	1x 10Gb LOM adapter	1x 10Gb LOM adapter	1x 10Gb LOM adapter	1x 10Gb LOM adapter
PCIe networking	Up to 2x adapters 10Gb, 25Gb, 40Gb	Up to 3x adapters 10Gb, 25Gb, 40Gb	Up to 3x adapters 10Gb, 25Gb, 40Gb	Up to 3x adapters 10Gb, 25Gb, 40Gb
GPUs	No support	No support	No support	No support
Hypervisor	Nutanix AHV VMware ESXi Microsoft Windows Hyper-V	Nutanix AHV VMware ESXi Microsoft Windows Hyper-V	Nutanix AHV VMware ESXi Microsoft Windows Hyper-V	Nutanix AHV VMware ESXi

The following table lists the standard specifications.

Table 2. Standard specifications

Components	Specification
Machine types	7Z85 - Appliance - 3 year warranty 7D52 - Certified Node - 3 year warranty
Form factor	1U rack
Processor	Up to two 2nd Gen Intel Xeon Scalable processors: <ul style="list-style-type: none"> • HX1320 and HX1321: 1 processor maximum • HX2320, HX2321, HX3320, and HX3321: 2 processors
Chipset	Intel C624
Memory	12 DIMMs per processor. Each processor has six memory channels with two DIMMs per channel. Support for RDIMMs and 3DS RDIMMs up to 2933 MHz. DIMM support is as follows: <ul style="list-style-type: none"> • HX1320 and HX1321: 12 DIMMs (1 processor) • HX2320, HX2321, HX3320, and HX3321: 24 DIMMs (2 processors)
Persistent memory	Not supported
Memory maximum	<ul style="list-style-type: none"> • HX1320 and HX1321: 384 GB • HX2320 and HX2321: 1.5 TB • HX3320 and HX3321: 3.0 TB (requires L-suffix processor)
Memory protection	Error correction code (ECC), Single Device Data Correction (SDDC; for x4-based memory DIMMs), Adaptive Double Device Data Correction (ADDDC; for x4-based memory DIMMs, requires Intel Xeon Gold or Platinum processors), patrol scrubbing, and demand scrubbing.

Components	Specification
Drive bays	<ul style="list-style-type: none"> • HX1320 and HX1321: <ul style="list-style-type: none"> ◦ Front drive bays: 4x 3.5-inch SAS/SATA ◦ Rear drive bays: None • HX2320 and HX2321: <ul style="list-style-type: none"> ◦ Front drive bays: 4x 3.5-inch SAS/SATA ◦ Rear drive bays: None • HX3320 and HX3321: <ul style="list-style-type: none"> ◦ Front drive bays: 6x 2.5-inch SAS/SATA + 4x 2.5-inch AnyBay ◦ Rear drive bays: 2x 2.5-inch SAS/SATA (optional) • HX3320 and HX3321 for HANA: <ul style="list-style-type: none"> ◦ Front drive bays: 6x 2.5-inch SAS/SATA + 4x 2.5-inch AnyBay ◦ Rear drive bays: 2x 2.5-inch SAS/SATA (optional) • Internal M.2 module supporting two M.2 drives, for OS boot support
Internal storage	<ul style="list-style-type: none"> • HX1320 and HX1321: <ul style="list-style-type: none"> ◦ Hybrid: 2 cache drives (SSDs) and 2 capacity drives (HDDs) ◦ All Flash: 2 or 4 SSDs • HX2320 and HX2321: <ul style="list-style-type: none"> ◦ Hybrid: 2 cache drives (SSDs) and 2 capacity drives (HDDs). ◦ All Flash: 2 or 4 SSDs • HX3320 and HX3321: <ul style="list-style-type: none"> ◦ Hybrid: <ul style="list-style-type: none"> ■ 2 cache SSDs (SAS or SATA SSDs) and 4-10 capacity HDDs (SAS or SATA HDDs) in increments of 2 drives ■ 4 cache SSDs and 8 capacity HDDs ◦ All Flash: <ul style="list-style-type: none"> ■ 2-12 capacity SSDs (SAS or SATA SSDs) in increments of 2 drives. ■ 2 cache SSDs (NVMe PCIe SSDs) and 4-10 capacity SSDs in increments of 2 drives. ■ 4 cache SSDs and 8 capacity SSDs • HX3320 and HX3321 for HANA: <ul style="list-style-type: none"> ◦ No cache drives (NVMe PCIe SSDs) and 8-12 capacity drives (SAS or SATA SSDs) in increments of 2 drives ◦ 2 cache drives and 4-10 capacity drives in increments of 2 drives ◦ 4 cache drives and 8 capacity drives <p>All cache drives in a system must be of the same model and capacity (same feature code). All capacity drives must also be of the same model and capacity.</p>
Storage controller	<ul style="list-style-type: none"> • Onboard NVMe ports (RAID not supported) • 12 Gb SAS/SATA non-RAID: <ul style="list-style-type: none"> ◦ 430-8i HBA ◦ 430-16i HBA
Network interfaces	<ul style="list-style-type: none"> • 2x or 4x 10 GbE LOM base network ports, either RJ-45 or SFP+ • 10GBASE-T, 10 GbE SFP+, 25 GbE SFP28, or 40 GbE QSFP28 network adapters. • 1x RJ-45 10/100/1000 Mb Ethernet port for systems management.

Components	Specification
PCI expansion slots	<p>Up to 3x rear-accessible PCIe 3.0 slots, plus 1x internal PCIe 3.0 slot for a storage controller, plus a slot dedicated to LOM network adapter adapter. Slot availability is based on riser selection and rear drive bay selection.</p> <ul style="list-style-type: none"> Slot 1: PCIe 3.0 x8; low profile (not available if rear drives configured) Slot 2: PCIe 3.0 x16; low profile (not available if rear drives configured) Slot 3: PCIe 3.0 x16; low profile (not available with HX1320 or HX1321) Slot 4: PCIe 3.0 x8 (internal)
GPU support	No support
Ports	<ul style="list-style-type: none"> Front: 1x USB 2.0 port with XClarity Controller access, 1x USB 3.0 port, 1x VGA port. Rear: 2x USB 3.0 ports, 1x VGA port.
Cooling	Five hot-swap system fans with N+1 redundancy.
Power supply	Two redundant hot-swap 550 W, 750 W, or 1100 W (100 - 240 V) High Efficiency Platinum, or 750 W (200 - 240 V) High Efficiency Titanium AC power supplies. HVDC support (China only).
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	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 2.0 (TPM 2.0). Optional security bezel.
Software	<ul style="list-style-type: none"> 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).
Hypervisor	Nutanix AHV, VMware ESXi, Microsoft Windows Server Hyper-V
Hardware warranty	<ul style="list-style-type: none"> 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	Height: 43 mm (1.7 in.), width: 434 mm (17.1 in.), depth: 715 mm (28.1 in.).
Weight	Maximum configuration: 18.8 kg (41.4 lb).

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. Base CTO models

Base model	Description
7X83CTO1WW	ThinkAgile HX1320 Appliance
7Y89CTO1WW	ThinkAgile HX1321 Certified Node
7X83CTO5WW	ThinkAgile HX2320 Appliance
7Y89CTO5WW	ThinkAgile HX2321 Certified Node
7X83CTO3WW	ThinkAgile HX3320 Appliance
7Y89CTO3WW	ThinkAgile HX3321 Certified Node
7X83CTO8WW	ThinkAgile HX3320 Appliance for SAP HANA
7Y89CTO8WW	ThinkAgile HX3321 Certified Node for SAP HANA

Comparison with the ThinkSystem SR630

The ThinkAgile HX 1U Appliances & Certified Nodes are based on the ThinkSystem SR630 server, however there are key differences:

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

For details about the ThinkSystem SR630, see the SR630 product guide:

<https://lenovopress.com/lp1049-thinksystem-sr630-server>

To verify what specific hardware components are supported with the HX 1U systems, see the DCSC configurator:

<https://dcsc.lenovo.com>

Processors

The HX 1U systems support the following processors.

For details about these options, see the SR630 product guide:

<https://lenovopress.com/lp1049-thinksystem-sr630-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 rules regarding Hybrid configurations (configurations with HDDs as capacity drives and SSDs as cache drives):

- For the HX1320 and HX1321, hybrid storage configurations are not supported with processors with 26 cores or more
- For the HX2320 and HX2321, hybrid storage configurations are not supported with processors with 16 cores or more

Table 4. Processors

Part number	Feature	Description	Maximum supported							
			HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
Intel Xeon Silver processors										
4XG7A37936	B4HT	Intel Xeon Silver 4208 8C 85W 2.1GHz Processor	1	1	2	2	2	2	No	No
4XG7A37933	B4HS	Intel Xeon Silver 4210 10C 85W 2.2GHz Processor	1	1	2	2	2	2	2	2
4XG7A37988	B7N5	Intel Xeon Silver 4210R 10C 100W 2.4GHz Processor	1	1	2	2	2	2	2	2
4XG7A37930	B4HR	Intel Xeon Silver 4214 12C 85W 2.2GHz Processor	1	1	2	2	2	2	2	2
4XG7A37987	B7N6	Intel Xeon Silver 4214R 12C 100W 2.4GHz Processor	1	1	2	2	2	2	2	2
4XG7A37927	B4HQ	Intel Xeon Silver 4215 8C 85W 2.5GHz Processor	1	1	2	2	2	2	2	2
4XG7A63298	BAZU	Intel Xeon Silver 4215R 8C 130W 3.2GHz Processor	1	1	2	2	2	2	2	2
4XG7A37924	B4HP	Intel Xeon Silver 4216 16C 100W 2.1GHz Processor	1	1	2	2	2	2	2	2
Intel Xeon Gold processors										
4XG7A37917	B4HN	Intel Xeon Gold 5215 10C 85W 2.5GHz Processor	1	1	2	2	2	2	2	2
4XG7A37911	B4P9	Intel Xeon Gold 5215L 10C 85W 2.5GHz Processor	1	1	2	2	2	2	2	2
4XG7A37920	B4HM	Intel Xeon Gold 5217 8C 115W 3.0GHz Processor	1	1	2	2	2	2	2	2
4XG7A37896	B4HL	Intel Xeon Gold 5218 16C 125W 2.3GHz Processor	1	1	2	2	2	2	2	2
4XG7A63296	BAZS	Intel Xeon Gold 5218R 20C 125W 2.1GHz Processor	1	1	2	2	2	2	2	2

Part number	Feature	Description	Maximum supported							
			HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
4XG7A37893	B4HK	Intel Xeon Gold 5220 18C 125W 2.2GHz Processor	1	1	2	2	2	2	2	2
4XG7A37984	B7N9	Intel Xeon Gold 5220R 24C 150W 2.2GHz Processor	1	1	2	2	2	2	2	2
4XG7A38018	B6CW	Intel Xeon Gold 5220S 18C 125W 2.7GHz Processor	No	No	2	2	2	2	2	2
CTO only	BAZV	Intel Xeon Gold 6208U 16C 150W 2.9GHz Processor	1	1	No	No	No	No	No	No
4XG7A38022	B6CV	Intel Xeon Gold 6222V 20C 115W 1.8GHz Processor	1	1	2	2	2	2	2	2
4XG7A38020	B6CL	Intel Xeon Gold 6226 12C 125W 2.7GHz Processor	1	1	2	2	2	2	2	2
4XG7A63292	BAZW	Intel Xeon Gold 6226R 16C 150W 2.9GHz Processor	1	1	2	2	2	2	2	2
4XG7A37890	B4HJ	Intel Xeon Gold 6230 20C 125W 2.1GHz Processor	1	1	2	2	2	2	2	2
4XG7A15720	B5RY	Intel Xeon Gold 6230N 20C 125W 2.3GHz Processor	1	1	2	2	2	2	2	2
4XG7A63290	BAZX	Intel Xeon Gold 6230R 26C 150W 2.1GHz Processor	1	1	2	2	2	2	2	2
4XG7A38000	B6CK	Intel Xeon Gold 6234 8C 130W 3.3GHz Processor	1	1	2	2	2	2	2	2
4XG7A38024	B6CJ	Intel Xeon Gold 6238 22C 140W 2.1GHz Processor	1	1	2	2	2	2	2	2
4XG7A38002	B6CR	Intel Xeon Gold 6238L 22C 140W 2.1GHz Processor	1	1	2	2	2	2	2	2
4XG7A63288	BAZL	Intel Xeon Gold 6238R 28C 165W 2.2GHz Processor	1	1	2	2	2	2	2	2
4XG7A37884	B4HH	Intel Xeon Gold 6240 18C 150W 2.6GHz Processor	1	1	2	2	2	2	2	2
4XG7A38014	B6CS	Intel Xeon Gold 6240L 18C 150W 2.6GHz Processor	1	1	2	2	2	2	2	2
4XG7A63286	BAZM	Intel Xeon Gold 6240R 24C 165W 2.4GHz Processor	1	1	2	2	2	2	2	2
4XG7A37887	B4HG	Intel Xeon Gold 6242 16C 150W 2.8GHz Processor	1	1	2	2	2	2	2	2
4XG7A63284	BAZN	Intel Xeon Gold 6242R 20C 205W 3.1GHz Processor	No	No	No	No	2	2	2	2
4XG7A15875	B4HF	Intel Xeon Gold 6244 8C 150W 3.6GHz Processor	1	1	2	2	2	2	2	2
4XG7A37965	B6PD	Intel Xeon Gold 6246 12C 165W 3.3GHz Processor	1	1	2	2	2	2	2	2
4XG7A63282	BAZP	Intel Xeon Gold 6246R 16C 205W 3.4GHz Processor	No	No	No	No	2	2	2	2

Part number	Feature	Description	Maximum supported							
			HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
4XG7A15893	B4HE	Intel Xeon Gold 6248 20C 150W 2.5GHz Processor	1	1	2	2	2	2	2	2
4XG7A63280	BAZQ	Intel Xeon Gold 6248R 24C 205W 3.0GHz Processor	No	No	No	No	2	2	2	2
4XG7A15890	B4HC	Intel Xeon Gold 6252 24C 150W 2.1GHz Processor	1	1	2	2	2	2	2	2
4XG7A15812	B6CT	Intel Xeon Gold 6252N 24C 150W 2.3GHz Processor	1	1	2	2	2	2	2	2
4XG7A15873	B4HD	Intel Xeon Gold 6254 18C 200W 3.1GHz Processor	No	No	No	No	2	2	No	No
4XG7A63278	BAZR	Intel Xeon Gold 6258R 28C 205W 2.7GHz Processor	No	No	No	No	2	2	2	2
4XG7A38009	B6CU	Intel Xeon Gold 6262V 24C 135W 1.9GHz Processor	1	1	2	2	2	2	2	2
Intel Xeon Platinum processors										
4XG7A37899	B5RZ	Intel Xeon Platinum 8253 16C 125W 2.2GHz Processor	1	1	2	2	2	2	2	2
4XG7A15888	B4HB	Intel Xeon Platinum 8260 24C 165W 2.4GHz Processor	1	1	2	2	2	2	2	2
4XG7A15886	B4P7	Intel Xeon Platinum 8260L 24C 165W 2.4GHz Processor	1	1	2	2	2	2	2	2
4XG7A15871	B4HA	Intel Xeon Platinum 8268 24C 205W 2.9GHz Processor	1	1	2	2	2	2	2	2
4XG7A15869	B4H9	Intel Xeon Platinum 8270 26C 205W 2.7GHz Processor	1	1	2	2	2	2	2	2
4XG7A15882	B4H8	Intel Xeon Platinum 8276 28C 165W 2.2GHz Processor	1	1	2	2	2	2	2	2
4XG7A15878	B4P6	Intel Xeon Platinum 8276L 28C 165W 2.2GHz Processor	1	1	2	2	2	2	2	2
4XG7A15867	B4H7	Intel Xeon Platinum 8280 28C 205W 2.7GHz Processor	1	1	2	2	2	2	2	2
4XG7A15863	B4P5	Intel Xeon Platinum 8280L 28C 205W 2.7GHz Processor	1	1	2	2	2	2	2	2

Memory

The HX 1U systems support up to 12 DIMMs per processor. The HX1320 and HX1321 support 1 processor and 12 DIMMs. The HX2320, HX2321, HX3320, and HX3321 all support 2 processors and 24 DIMMs. Each processor has six memory channels (two integrated memory controllers with three memory channels per memory controller), and there are two DIMMs per channel.

Memory maximums are as follows:

- HX1320 and HX1321: 384 GB
- HX2320 and HX2321: 1.5 TB
- HX3320 and HX3321: 3.0 TB
- HX3320 and HX3321 for HANA: 3.0 TB

Only specific memory capacities are supported and only with certain DIMM combinations. In most configurations, all DIMMs must be of the same type, speed, rank, and capacity (the same part number or feature code). The only exception is with 576 GB of memory capacity, in which a combination of 16 GB and 32 GB DIMMs is used, and all DIMMs in the appliance must be of the same type and speed.

For more information about memory support, see the SR630 product guide:

<https://lenovopress.com/lp1049-thinksystem-sr630-server#memory-options>

The following tables list the memory options that are available for selection for each HX system. It is possible to expand memory capacity after the initial deployment by adding more memory DIMMs to match one of the supported memory configurations.

- [Memory for HX1320 and HX1321](#)
- [Memory for HX2320 and HX2321](#)
- [Memory for HX3320 and HX3321](#)
- [Memory for HX3320 and HX3321 for SAP HANA](#)

Memory for HX1320 and HX1321

The following table lists the memory options that are available for the HX1320 and HX1321.

Table 5. Memory configuration selection options for HX1320 and HX1321

Part number	Feature code	Description	Quantity					
			64 GB	96 GB	128 GB*	192 GB	256 GB*	384 GB
ThinkSystem 2933 MHz Performance+ RDIMMs								
4X77A12184	B5N6	16GB TruDDR4 Performance+ 2933MHz (2Rx8 1.2V) RDIMM	4	6	8	12	-	-
4X77A12185	B5N7	32GB TruDDR4 Performance+ 2933MHz (2Rx4 1.2V) RDIMM	-	-	-	-	8	12
ThinkSystem 2933 MHz RDIMMs								
4ZC7A08707	B4LY	16GB TruDDR4 2933 MHz (1Rx4 1.2V) RDIMM	4	6	-	-	-	-
4ZC7A08706	B4H1	8GB TruDDR4 2933MHz (1Rx8 1.2V) RDIMM	-	12	-	-	-	-
4ZC7A08708	B4H2	16GB TruDDR4 2933MHz (2Rx8 1.2V) RDIMM	-	-	8	12	-	-
4ZC7A08709	B4H3	32GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	-	-	-	-	8	12
ThinkSystem 2666 MHz RDIMMs								
7X77A01303	AUNC	16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	4	6	8	12	-	-
7X77A01304	AUND	32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	-	-	-	-	8	12

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

Memory for HX2320 and HX2321

The following table lists the memory options that are available for the HX2320 and HX2321.

Table 6. Memory configuration selection options for HX2320 and HX2321

Part number	Feature code	Description	Quantity									
			96 GB	128 GB*	192 GB	256 GB*	384 GB	512 GB*	576 GB	768 GB	1 TB*	1.5 TB
ThinkSystem 2933 MHz Performance+ RDIMMs												
4X77A12184	B5N6	16GB TruDDR4 Performance+ 2933MHz (2Rx8 1.2V) RDIMM	-	8	12	-	-	-	-	-	-	-
4X77A12185	B5N7	32GB TruDDR4 Performance+ 2933MHz (2Rx4 1.2V) RDIMM	-	-	-	8	12	16	-	24	-	-
4X77A12186	B5N8	64GB TruDDR4 Performance+ 2933MHz (2Rx4 1.2V) RDIMM	-	-	-	-	-	8	-	12	16	24
ThinkSystem 2933 MHz Performance+ 3DS RDIMMs												
4X77A12187	B5N9	128GB TruDDR4 Perf.+ 2933MHz (4Rx4 1.2V) 3DS RDIMM	-	-	-	-	-	-	-	-	-	12
ThinkSystem 2933 MHz RDIMMs												
4ZC7A08706	B4H1	8GB TruDDR4 2933MHz (1Rx8 1.2V) RDIMM	12	-	-	-	-	-	-	-	-	-
4ZC7A08708	B4H2	16GB TruDDR4 2933MHz (2Rx8 1.2V) RDIMM	-	8	12	-	-	-	12 + 12	-	-	-
4ZC7A08709	B4H3	32GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	-	-	-	8	12	16	-	24	-	-
4ZC7A08710	B4H4	64GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	-	-	-	-	-	8	-	12	16	24
ThinkSystem 2933 MHz 3DS RDIMMs												
4ZC7A15113	B587	128GB TruDDR4 2933MHz (4Rx4 1.2V) 3DS RDIMM	-	-	-	-	-	-	-	-	-	12
ThinkSystem 2666 MHz RDIMMs												
7X77A01303	AUNC	16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	-	8	12	-	-	-	12 + 12	-	-	-
7X77A01304	AUND	32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	-	-	-	8	12	16	-	24	-	-

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

Memory for HX3320 and HX3321

The following table lists the memory options that are available for the HX3320 and HX3321.

3TB memory configurations: Configurations of 3TB of total memory require that "L" processors be configured. Processors with an L suffix are required when more than 1TB of memory per processor is installed.

Table 7. Memory configuration selection options for HX3320 and HX3321

Part number	Feature code	Description	Quantity									
			128 GB*	192 GB	256 GB*	384 GB	512 GB*	576 GB	768 GB	1 TB*	1.5 TB	3 TB
ThinkSystem 2933 MHz Performance+ RDIMMs												
4X77A12184	B5N6	16GB TruDDR4 Performance+ 2933MHz (2Rx8 1.2V) RDIMM	8	12	-	-	-	-	-	-	-	-
4X77A12185	B5N7	32GB TruDDR4 Performance+ 2933MHz (2Rx4 1.2V) RDIMM	-	-	8	12	16	-	24	-	-	-
4X77A12186	B5N8	64GB TruDDR4 Performance+ 2933MHz (2Rx4 1.2V) RDIMM	-	-	-	-	8	-	12	16	24	-
ThinkSystem 2933 MHz Performance+ 3DS RDIMMs												
4X77A12187	B5N9	128GB TruDDR4 Perf.+ 2933MHz (4Rx4 1.2V) 3DS RDIMM	-	-	-	-	-	-	-	-	12	24
ThinkSystem 2933 MHz RDIMMs												
4ZC7A08708	B4H2	16GB TruDDR4 2933MHz (2Rx8 1.2V) RDIMM	8	12	-	-	-	12 + 12	-	-	-	-
4ZC7A08709	B4H3	32GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	-	-	8	12	16		24	-	-	-
4ZC7A08710	B4H4	64GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	-	-	-	-	8	-	12	16	24	-
ThinkSystem 2933 MHz 3DS RDIMMs												
4ZC7A15113	B587	128GB TruDDR4 2933MHz (4Rx4 1.2V) 3DS RDIMM	-	-	-	-	-	-	-	-	12	24
ThinkSystem 2666 MHz RDIMMs												
7X77A01303	AUNC	16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	8	12	-	-	-	12 + 12	-	-	-	-
7X77A01304	AUND	32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	-	-	8	12	16		24	-	-	-

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

Memory for HX3320 and HX3321 for SAP HANA

The following table lists the memory options that are available for the HX3320 and HX3321 for SAP HANA.

3TB memory configurations: Configurations of 3TB of total memory require that "L" processors be configured. Processors with an L suffix are required when more than 1TB of memory per processor is installed.

Table 8. Memory configuration selection options for HX3320 and HX3321 for SAP HANA

Part number	Feature code	Description	Quantity							
			192 GB	384 GB	576 GB	768 GB	1.125 TB	1.5 TB	3 TB	
ThinkSystem 2933 MHz Performance+ RDIMMs										
None*	B5N6	16GB TruDDR4 Performance+ 2933MHz (2Rx8 1.2V) RDIMM	12	24	-	-	-	-	-	-
4X77A12185	B5N7	32GB TruDDR4 Performance+ 2933MHz (2Rx4 1.2V) RDIMM	-	12	-	24	-	-	-	-
4X77A12186	B5N8	64GB TruDDR4 Performance+ 2933MHz (2Rx4 1.2V) RDIMM	-	-	-	12	-	24	-	-
ThinkSystem 2933 MHz Performance+ 3DS RDIMMs										
4X77A12187	B5N9	128GB TruDDR4 Perf.+ 2933MHz (4Rx4 1.2V) 3DS RDIMM	-	-	-	-	-	12	24	-
ThinkSystem 2933 MHz RDIMMs										
4ZC7A08708	B4H2	16GB TruDDR4 2933MHz (2Rx8 1.2V) RDIMM	12	24	12 + 12	-	-	-	-	-
4ZC7A08709	B4H3	32GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	-	12		24	12 + 12	-	-	-
4ZC7A08710	B4H4	64GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	-	-	-	12	12	24	-	-
ThinkSystem 2933 MHz 3DS RDIMMs										
4ZC7A15113	B587	128GB TruDDR4 2933MHz (4Rx4 1.2V) 3DS RDIMM	-	-	-	-	-	12	24	-
ThinkSystem 2666 MHz RDIMMs										
7X77A01303	AUNC	16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	12	24	12 + 12	-	-	-	-	-
7X77A01304	AUND	32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	-	12		24	-	-	-	-

Internal storage

Internal storage configurations of the HX 1U systems are as follows. All drives are hot-swap and are accessible from the front or rear of the system:

- HX1320 and HX1321:
 - Front drive bays: 4x 3.5-inch SAS/SATA
 - Rear drive bays: No support
- HX2320 and HX2321
 - Front drive bays: 4x 3.5-inch SAS/SATA
 - Rear drive bays: No support
- HX3320 and HX3321
 - Front drive bays: 6x 2.5-inch SAS/SATA and 4x 2.5-inch AnyBay
 - Rear drive bays: 2x 2.5-inch SAS/SATA
- HX3320 for HANA and HX3321 for HANA
 - Front drive bays: 6x 2.5-inch SAS/SATA and 4x 2.5-inch AnyBay
 - Rear drive bays: 2x 2.5-inch SAS/SATA

The server also supports M.2 drives for OS boot, installed in an M.2 adapter internal to the server. Two M.2 SATA SSDs are required for selection, and they must be of the same model and capacity.

Configuration rules

Configuration rules for HX1320 and HX1321:

- For Hybrid configurations, the HX1320 supports 2 cache drives (SSDs) and 2 capacity drives (HDDs).
- For All Flash configurations, the HX1320 supports 2 or 4 SSDs
- All SSDs must be of the same model and capacity. All HDDs must be of the same type and capacity.

Configuration rules for HX2320 and HX2321:

- For Hybrid configurations, the systems support 2 cache drives (SSDs) and 2 capacity drives (HDDs).
- For All Flash configurations, the systems support 2 or 4 SSDs.
- All SSDs must be of the same model and capacity. All HDDs must be of the same model and capacity.

Configuration rules for HX3320 and HX3321:

- For Hybrid configurations, the systems support 4-10 capacity drives (HDDs) depending on the quantity of the cache drives (SSDs):
 - 2 cache drives: 4-10 capacity drives in increments of 2 drives.
 - 4 cache drives: 8 capacity drives.
- For Hybrid configurations, SATA and SAS SSDs are supported for cache, however NVMe drives are not supported for cache.
- For All Flash configurations, the systems support 2-12 capacity drives (SAS or SATA SSDs) depending on the quantity of the cache drives (NVMe SSDs):
 - No cache drives: 2-12 capacity drives in increments of 2 drives.
 - 2 cache drives: 4-10 capacity drives in increments of 2 drives.
 - 4 cache drives: 8 capacity drives.
- All cache drives must be of the same model and capacity. All capacity drives must be of the same model and capacity.
- The use of 12 drives is not supported with the following processors:
 - Processors with TDP > 125W
 - Intel Xeon 4210 processor
 - Intel Xeon 4210R processor

Configuration rules for HX3320 for HANA and HX3321 for HANA:

- Hybrid configurations are not supported
- Internal storage is defined as follows:
 - Cache tier: NVMe SSD
 - Capacity tier: SAS or SATA SSD
- The systems support 4-12 capacity drives (SAS or SATA SSDs) depending on the quantity of the cache drives (NVMe PCIe SSDs):
 - No cache drives: 8-12 capacity drives in increments of 2 drives.
 - 2 cache drives: 4-10 capacity drives in increments of 2 drives.
 - 4 cache drives: 8 capacity drives.
- All cache drives must be of the same model and capacity. All capacity drives must be of the same model and capacity.
- The use of 12 drives is not supported with the following processors:
 - Processors with TDP > 125W
 - Intel Xeon 4210 processor
 - Intel Xeon 4210R processor

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 SR630 product guide:

<https://lenovopress.com/lp1049-thinksystem-sr630-server#internal-storage>

Table 9. Drive backplanes

Feature	Description	Maximum supported							
		HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
Front 3.5-inch drive backplanes									
AUW8	ThinkSystem 3.5" SATA/SAS 4-Bay Backplane	1	1	1	1	No	No	No	No
Front 2.5-inch drive backplanes									
AUW9	ThinkSystem 1U 2.5" 4 AnyBay 10-Bay Backplane	No	No	No	No	1	1	1	1
Rear 2.5-inch drive backplane									
AUWJ	ThinkSystem SR630 Rear HDD/SSD Kit	No	No	No	No	1	1	1	1

Boot drive enablement

For OS boot functions, the systems also support 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 SR630 product guide:

<https://lenovopress.com/lp1049-thinksystem-sr630-server#internal-storage>

Table 10. Boot drive enablement

Part number	Feature	Description	Maximum supported							
			HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
7Y37A01092	AUMU	ThinkSystem M.2 Enablement Kit	1	1	1	1	1	1	1	1
7Y37A01093	AUMV	ThinkSystem M.2 with Mirroring Enablement Kit	1	1	1	1	1	1	1	1

Controllers for internal storage

The HX 1U systems support the following internal storage controllers.

For details about these options, see the SR630 product guide:

<https://lenovopress.com/lp1049-thinksystem-sr630-server#controllers-for-internal-storage>

Table 11. Controllers for internal storage

Part number	Feature	Description	Maximum supported							
			HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
7Y37A01088	AUNL	ThinkSystem 430-8i SAS/SATA 12Gb HBA	1	1	1	1	No	No	No	No
4Y37A78601	BM51	ThinkSystem 440-8i SAS/SATA PCIe Gen4 12Gb HBA	1	1	1	1	No	No	No	No
7Y37A01089	AUNM	ThinkSystem 430-16i SAS/SATA 12Gb HBA	No	No	No	No	1	1	1	1
4Y37A78602	BM50	ThinkSystem 440-16i SAS/SATA PCIe Gen4 12Gb HBA	No	No	No	No	1	1	1	1

Internal drive options

The following table lists the supported drive options for the HX 1U systems.

Table 12. Internal drive options

Part number	Feature	Description	Maximum supported							
			HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
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	No	No	10	10	No	No
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	No	No	10	10	No	No
7XB7A00037	AUUJ	ThinkSystem 2.5" 2TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	No	10	10	No	No
2.5-inch hot-swap 12 Gb SAS SSDs										
4XB7A17062	B8HU	ThinkSystem 2.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	No	No	No	No	12	12	12	12
4XB7A17063	B8J4	ThinkSystem 2.5" PM1645a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	No	No	No	No	12	12	12	12
4XB7A17054	B91C	ThinkSystem 2.5" PM1643a 3.84TB Entry SAS 12Gb Hot Swap SSD	No	No	No	No	12	12	12	12

Part number	Feature	Description	Maximum supported							
			HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
4XB7A17055	B91D	ThinkSystem 2.5" PM1643a 7.68TB Entry SAS 12Gb Hot Swap SSD	No	No	No	No	12	12	12	12
4XB7A17056	BC4R	ThinkSystem 2.5" PM1643a 15.36TB Entry SAS 12Gb Hot Swap SSD	No	No	No	No	12	12	No	No
2.5-inch hot-swap 6 Gb SATA SSDs										
4XB7A17126	BA4T	ThinkSystem 2.5" S4620 960GB Mixed Use SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A17127	BA4U	ThinkSystem 2.5" S4620 1.92TB Mixed Use SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A17128	BK7L	ThinkSystem 2.5" S4620 3.84TB Mixed Use SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A13634	B49M	ThinkSystem 2.5" S4610 480GB Mixed Use SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A13635	B49N	ThinkSystem 2.5" S4610 960GB Mixed Use SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A13636	B49P	ThinkSystem 2.5" S4610 1.92TB Mixed Use SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A72440	BM89	ThinkSystem 2.5" PM893 1.92TB Read Intensive SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A72441	BM88	ThinkSystem 2.5" PM893 3.84TB Read Intensive SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A17103	BA7J	ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A17104	BK77	ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A13622	B49B	ThinkSystem 2.5" S4510 1.92TB Read Intensive SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A13623	B49C	ThinkSystem 2.5" S4510 3.84TB Read Intensive SATA 6Gb HS SSD	No	No	No	No	12	12	12	12
4XB7A10198	B34L	ThinkSystem 2.5" PM883 1.92TB Entry SATA 6Gb Hot Swap SSD	No	No	No	No	12	12	12	12
4XB7A10199	B34M	ThinkSystem 2.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	No	No	No	No	12	12	12	12
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	No	No	4	4	4	4
4XB7A17153	BCFR	ThinkSystem 2.5" U.2 P5600 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	No	No	4	4	4	4
4XB7A17154	BCFS	ThinkSystem 2.5" U.2 P5600 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	No	No	4	4	4	4
4XB7A17145	BCFT	ThinkSystem 2.5" U.2 P5500 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	No	No	No	4	4	4	4

Part number	Feature	Description	Maximum supported							
			HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
4XB7A17146	BCFW	ThinkSystem 2.5" U.2 P5500 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	No	No	No	4	4	4	4
4XB7A17147	BCFU	ThinkSystem 2.5" U.2 P5500 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	No	No	No	4	4	4	4
2.5-inch hot-swap PCIe 3.0 NVMe SSDs										
7N47A00083	B2ZJ	ThinkSystem 2.5" U.2 P4800X 750GB Write Intensive NVMe PCIe 3.0 x4 HS SSD	No	No	No	No	4	4	4	4
3.5-inch hot-swap 12 Gb SAS HDDs										
7XB7A00046	AUUG	ThinkSystem 3.5" 10TB 7.2K SAS 12Gb Hot Swap 512e HDD	2	2	2	2	No	No	No	No
7XB7A00067	B117	ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD	2	2	2	2	No	No	No	No
3.5-inch hot-swap 6 Gb SATA HDDs										
7XB7A00049	AUUF	ThinkSystem 3.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD	2	2	2	2	No	No	No	No
7XB7A00050	AUUD	ThinkSystem 3.5" 2TB 7.2K SATA 6Gb Hot Swap 512n HDD	2	2	2	2	No	No	No	No
7XB7A00051	AUU8	ThinkSystem 3.5" 4TB 7.2K SATA 6Gb Hot Swap 512n HDD	2	2	2	2	No	No	No	No
7XB7A00052	AUUA	ThinkSystem 3.5" 6TB 7.2K SATA 6Gb Hot Swap 512e HDD	2	2	2	2	No	No	No	No
7XB7A00053	AUU9	ThinkSystem 3.5" 8TB 7.2K SATA 6Gb Hot Swap 512e HDD	2	2	2	2	No	No	No	No
7XB7A00054	AUUB	ThinkSystem 3.5" 10TB 7.2K SATA 6Gb Hot Swap 512e HDD	2	2	2	2	No	No	No	No
7XB7A00068	B118	ThinkSystem 3.5" 12TB 7.2K SATA 6Gb Hot Swap 512e HDD	2	2	2	2	No	No	No	No
4XB7A13914	B7F0	ThinkSystem 3.5" 16TB 7.2K SATA 6Gb Hot Swap 512e HDD	2	2	2	2	No	No	No	No
3.5-inch hot-swap 12 Gb SAS SSDs										
4XB7A17066	B8HT	ThinkSystem 3.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	4	4	4	4	No	No	No	No
4XB7A17043	B8JN	ThinkSystem 3.5" PM1645a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4	4	4	4	No	No	No	No
4XB7A17058	B91E	ThinkSystem 3.5" PM1643a 3.84TB Entry SAS 12Gb Hot Swap SSD	4	4	4	4	No	No	No	No
4XB7A17059	BEVK	ThinkSystem 3.5" PM1643a 7.68TB Entry SAS 12Gb Hot Swap SSD	4	4	4	4	No	No	No	No
3.5-inch hot-swap 6 Gb SATA SSDs										
4XB7A17138	BA4X	ThinkSystem 3.5" S4620 960GB Mixed Use SATA 6Gb HS SSD	4	4	4	4	No	No	No	No

Part number	Feature	Description	Maximum supported							
			HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
4XB7A17139	BA4Y	ThinkSystem 3.5" S4620 1.92TB Mixed Use SATA 6Gb HS SSD	4	4	4	4	No	No	No	No
4XB7A17140	BK7P	ThinkSystem 3.5" S4620 3.84TB Mixed Use SATA 6Gb HS SSD	4	4	4	4	No	No	No	No
4XB7A13640	B49S	ThinkSystem 3.5" S4610 480GB Mixed Use SATA 6Gb HS SSD	4	4	4	4	No	No	No	No
4XB7A13641	B49T	ThinkSystem 3.5" S4610 960GB Mixed Use SATA 6Gb HS SSD	4	4	4	4	No	No	No	No
4XB7A13642	B49U	ThinkSystem 3.5" S4610 1.92TB Mixed Use SATA 6Gb HS SSD	4	4	4	4	No	No	No	No
4XB7A17121	BA7N	ThinkSystem 3.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	4	4	4	4	No	No	No	No
4XB7A17122	BK7F	ThinkSystem 3.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	4	4	4	4	No	No	No	No
4XB7A13628	B49G	ThinkSystem 3.5" S4510 1.92TB Read Intensive SATA 6Gb HS SSD	4	4	4	4	No	No	No	No
4XB7A13629	B49H	ThinkSystem 3.5" S4510 3.84TB Read Intensive SATA 6Gb HS SSD	4	4	4	4	No	No	No	No
4XB7A17179	B6JY	ThinkSystem 3.5" PM883 1.92TB Entry SATA 6Gb Hot Swap SSD	4	4	4	4	No	No	No	No
4XB7A17180	B6JZ	ThinkSystem 3.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	4	4	4	4	No	No	No	No
M.2 SATA drives										
7N47A00130	AUUV	ThinkSystem M.2 128GB SATA 6Gbps Non-Hot Swap SSD	2	2	2	2	2	2	2	2
7SD7A05703	B11V	ThinkSystem M.2 5100 480GB SATA 6Gbps Non-Hot Swap SSD	2	2	2	2	2	2	2	2
4XB7A17071	B8HS	ThinkSystem M.2 5300 240GB SATA 6Gbps Non-Hot Swap SSD	2	2	2	2	2	2	2	2
4XB7A17073	B919	ThinkSystem M.2 5300 480GB SATA 6Gbps Non-Hot Swap SSD	2	2	2	2	2	2	2	2

Network adapters

The HX 1U systems support the following networking options.

For details about the implementation of these networking options, see the SR630 product guide:

<https://lenovopress.com/lp1049-thinksystem-sr630-server#i-o-expansion>

<https://lenovopress.com/lp1049-thinksystem-sr630-server#network-adapters>

Table 13. LOM network adapters

Part number	Feature	Description	Maximum supported							
			HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
LOM cards - 10 Gb Ethernet										
7ZT7A00548	AUKL	ThinkSystem 10Gb 2-port Base-T LOM	1	1	1	1	1	1	1	1
7ZT7A00546	AUKJ	ThinkSystem 10Gb 2-port SFP+ LOM	1	1	1	1	1	1	1	1
7ZT7A00549	AUKM	ThinkSystem 10Gb 4-port Base-T LOM	1	1	1	1	1	1	1	1
7ZT7A00547	AUKK	ThinkSystem 10Gb 4-port SFP+ LOM	1	1	1	1	1	1	1	1

Table 14. PCIe network adapters

Part number	Feature	Description	Maximum supported							
			HX1320	HX1321	HX2320	HX2321	HX3320	HX3321	HX3320 HANA	HX3321 HANA
10 Gb Ethernet										
00MM860	ATPX	Intel X550-T2 Dual Port 10GBase-T Adapter	2	2	3	3	3	3	3	3
7ZT7A00537	AUKX	ThinkSystem Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter	2	2	3	3	3	3	3	3
25 Gb Ethernet										
4XC7A08316	BD49	ThinkSystem Broadcom 57454 10/25GbE SFP28 4-port PCIe Ethernet Adapter V2	1	1	1	1	1	1	1	1
01GR250	AUAJ	Mellanox ConnectX-4 Lx 10/25GbE SFP28 2-port PCIe Ethernet Adapter	2	2	3	3	3	3	3	3
40 Gb Ethernet										
4XC7A08229	B31C	ThinkSystem Mellanox ConnectX-5 Ex 25/40GbE 2-port Low-Latency Adapter	1	1	2	2	2	2	2	2

Software

The HX 1U 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 15. 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 systems support the Nutanix Software Starter, Pro and Ultimate editions.
- The HX systems can be deployed as a cluster of 1, 2 or 3+ nodes (AOS 5.17.1.3 or later).
- The HX systems 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 16. 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 17. Nutanix software editions feature comparison

Feature	Starter Edition	Pro Edition	Ultimate Edition
Enterprise Storage			
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
Erasur 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

Feature	Starter Edition	Pro Edition	Ultimate Edition
Advanced Orchestration with Runbook Automation	No	Adv Replication add-on license	Included
Security			
Client Authentication	Included	Included	Included
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 18. 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 19. 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 20. 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 21. 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 and ESXi hypervisors.
- When adding the Calm software licenses after the initial deployment, customers should request a quote for the selected Calm part numbers from Lenovo and provide additional details on the existing installation.

Nutanix Flow

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

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

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

Table 22. 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 23. 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 1U Appliances & Certified Nodes have a 3-year warranty:

- 7Z85 - 1U Appliance - 3 year warranty
- 7D52 - 1U 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)
 - Microsoft Hyper-V cluster and System Center Virtual Machine Manager (for Microsoft 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 24. 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
Annual Remote Health Check	
5MS7B00065	ThinkAgile HX 1X Annual Remote Health Check (up to 3 node cluster)
5MS7B00066	ThinkAgile HX 1X Annual Remote Health Check (additional node)
5MS7B00067	ThinkAgile HX 1X Annual Remote Health Check & Update (up to 3 node cluster)
5MS7B00068	ThinkAgile HX 1X Annual 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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