

# Lenovo ThinkAgile HX645 V3 Integrated System and Certified Node (AMD 9004)

## Product Guide

The Lenovo ThinkAgile HX645 V3 Integrated Systems and Certified Nodes are 2-socket 1U systems that feature the AMD EPYC 9004 "Genoa" family of 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. With up to 96 cores per processor and support for the new PCIe 5.0 standard for I/O, the HX645 V3 offer the ultimate in two-socket performance in a 1U form factor.

The 1U systems are available either as an Integrated System (HX645 V3 IS) or Certified Node (HX645 V3 CN):

- The ThinkAgile HX645 V3 Integrated System delivers fully validated and certified Lenovo hardware and firmware preloaded with licensed Nutanix software. It also includes ThinkAgile Premier support with one single point of contact for support of the hardware and software.
- The ThinkAgile HX645 V3 Certified Node delivers fully validated and certified Lenovo hardware and firmware and can be preloaded with Nutanix software. Certified Nodes do not include licenses to Nutanix software and enhanced software support.

Common uses for these HX Series system include compute-heavy workloads such as virtual desktop infrastructure (VDI), server virtualization, private/hybrid clouds, enterprise applications, light databases, and remote office and branch office workloads.



Figure 1. ThinkAgile HX645 V3 Integrated Systems and Certified Nodes

## **Did you know?**

The ThinkAgile HX645 V3 Integrated Systems and Certified Nodes are built on the Lenovo ThinkSystem SR645 v3 server that features enterprise-class reliability, management, and security.

The HX645 V3 Integrated Systems offer ThinkAgile Premier Single Point of Support for quick 24/7 problem reporting and resolution.

The systems have been designed to take advantage of the features of the AMD EPYC 9004 Series "Genoa" family of processors, such as the full performance of 96-core processors, support for 4800 MHz memory and PCIe Gen 5.0 support.

The systems are available as an Integrated System or a Certified Node delivering greater virtualized workload consolidation with higher core count, GPU support and easy-to-use lifecycle management console.

## Key features

Combining performance and flexibility, the ThinkAgile HX645 V3 Integrated Systems and Certified Nodes 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.

### HX645 V3 Integrated System

The HX645 Integrated System offers 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 performance-optimized all-flash storage configurations.
- Deliver fully validated and integrated hardware and firmware that is certified with Nutanix software.
- Include Lenovo ThinkAgile Premier Single Point of Support for quick 24/7 problem reporting and resolution.
- Offer Lenovo deployment services to get customers up and running quickly.

### HX645 V3 Certified Node

The HX645 V3 Certified Node offers 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 HX645 V3 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 HX645 V3 Integrated Systems and Certified Nodes systems are based on the ThinkSystem SR645 V3 and have the following hardware features:

### Scalability and performance

The appliance and certified node offer numerous features to boost performance, improve scalability and reduce costs:

- Supports one or two fourth-generation AMD EPYC 9004 processors
  - Up to 96 cores and 192 threads
  - Core speed of up to 3.6 GHz
  - TDP rating of up to 360 W
- Support for DDR5 memory DIMMs to maximize the performance of the memory subsystem:
  - Up to 24 DDR5 memory DIMMs, 12 DIMMs per processor
  - 12 memory channels per processor (1 DIMM per channel)
  - DIMM speeds up to 4800 MHz
  - Using 256GB 3DS RDIMMs, the server supports up to 6TB of system memory
- Support up to 12x 2.5-inch hot-swap drive bays, by using combinations of front-accessible (up to 10 bays) and rear-accessible (2 bays).
- Supports 4x NVMe drives without the need for additional NVMe adapters and without oversubscription of PCIe lanes (1:1 connectivity). The use of NVMe drives maximizes drive I/O performance, in terms of throughput, bandwidth, and latency
- Supports M.2 drives for convenient operating system boot functions or data storage. Available M.2 adapters support two M.2 drives with a RAID adapter installed in a slot.
- The systems have a dedicated industry standard OCP 3.0 small form factor (SFF) slot, with a PCIe 5.0 x16 interface, supporting a variety of Ethernet network adapters. Simple-swap mechanism with thumbscrews and pull-tab enables tool-less installation and removal of the adapter. Supports shared BMC network sideband connectivity to enable out-of-band systems management.
- The server offers PCI Express 5.0 (PCIe Gen 5) I/O expansion capabilities that doubles the theoretical maximum bandwidth of PCIe 4.0 (32GT/s in each direction for PCIe 5.0, compared to 16 GT/s with PCIe 4.0). A PCIe 5.0 x16 slot provides 128 GB/s bandwidth, enough to support a 400GbE network connection.
- Up to three PCIe 5.0 slots, all with rear access, plus an internal bay for a cabled RAID adapter or HBA, plus a slot dedicated to the OCP adapter.

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

- The HX645 V3 uses ECC memory and supports memory RAS features including Single Device Data Correction (SDDC, also known as Chipkill), Patrol/Demand Scrubbing, Bounded Fault, DRAM Address Command Parity with Replay, DRAM Uncorrected ECC Error Retry, On-die ECC, ECC Error Check and Scrub (ECS), and Post Package Repair.
- The systems have two hot-swap redundant power supplies and up to eight hot-swap redundant fans to provide availability for business-critical applications.
- The power-source-independent light path diagnostics 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 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 Nutanix Prism. 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 2 continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failures to minimize downtime.
- Offer a diagnostics port on the front of the server to allow you to attach an external diagnostics handset for enhanced systems management capabilities.

### Manageability and security

Systems management features simplify local and remote management:

- The server includes an XClarity Controller 2 (XCC2) to monitor server availability. Included upgrade to XCC Platinum to provide remote control (keyboard video mouse) functions, support for the mounting of remote media files, FIPS 140-3 security, enhanced NIST 800-193 support, boot capture, power capping, and other management and security features.
- Lenovo XClarity Administrator offers comprehensive hardware management tools that help to increase uptime, reduce costs and improve productivity through advanced server management capabilities.
- 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.
- Administrator and power-on passwords help protect from unauthorized access to the server.
- Support AMD Secure Root-of-Trust, Secure Run and Secure Move features to minimize potential attacks and protect data as the OS is booted, as applications are run and as applications are migrated from server to server.
- Industry-standard Advanced Encryption Standard (AES) NI support for faster, stronger encryption.
- Additional physical security features are a chassis intrusion switch (standard in all models) and a lockable front bezel (optional).

### Components and connectors

The ThinkAgile HX645 V3 Integrated Systems and Certified Nodes are based on the ThinkSystem SR645 V3 server.

The following figure shows the front of the systems.

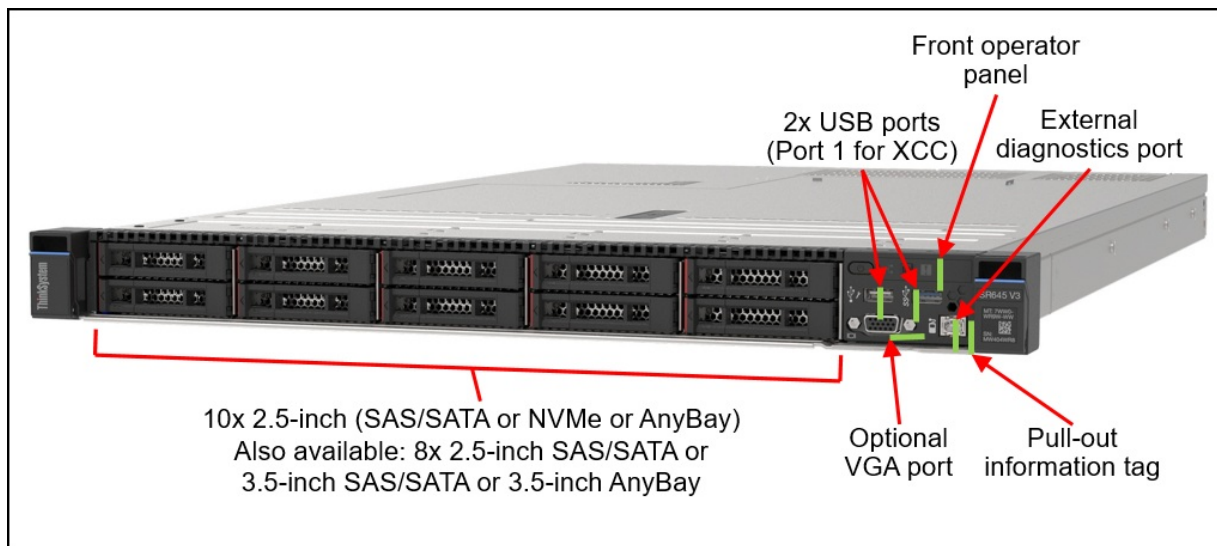


Figure 2. Front view of the Lenovo ThinkAgile 645 V3

The following figure shows the components visible from the rear of the server. As shown, there are three different configurations available, including one with rear-mounted drive bays: two 2.5-inch hot-swap SAS/SATA drive bays.

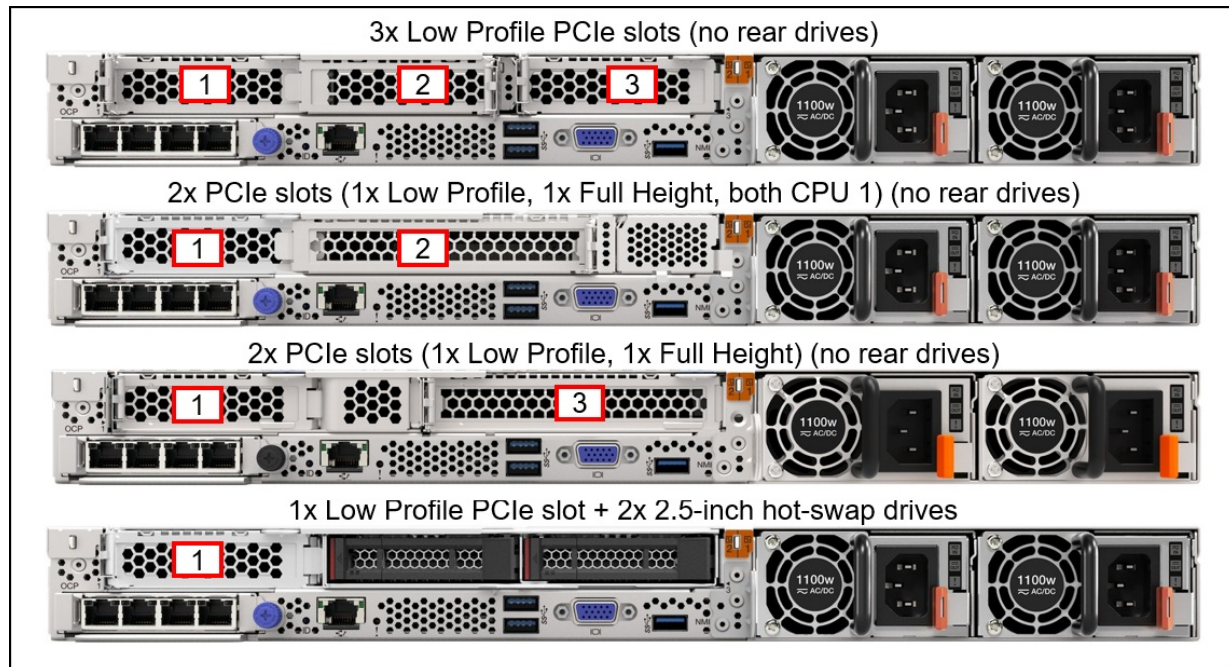


Figure 3. Rear view of the Lenovo ThinkAgile HX645 V3

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

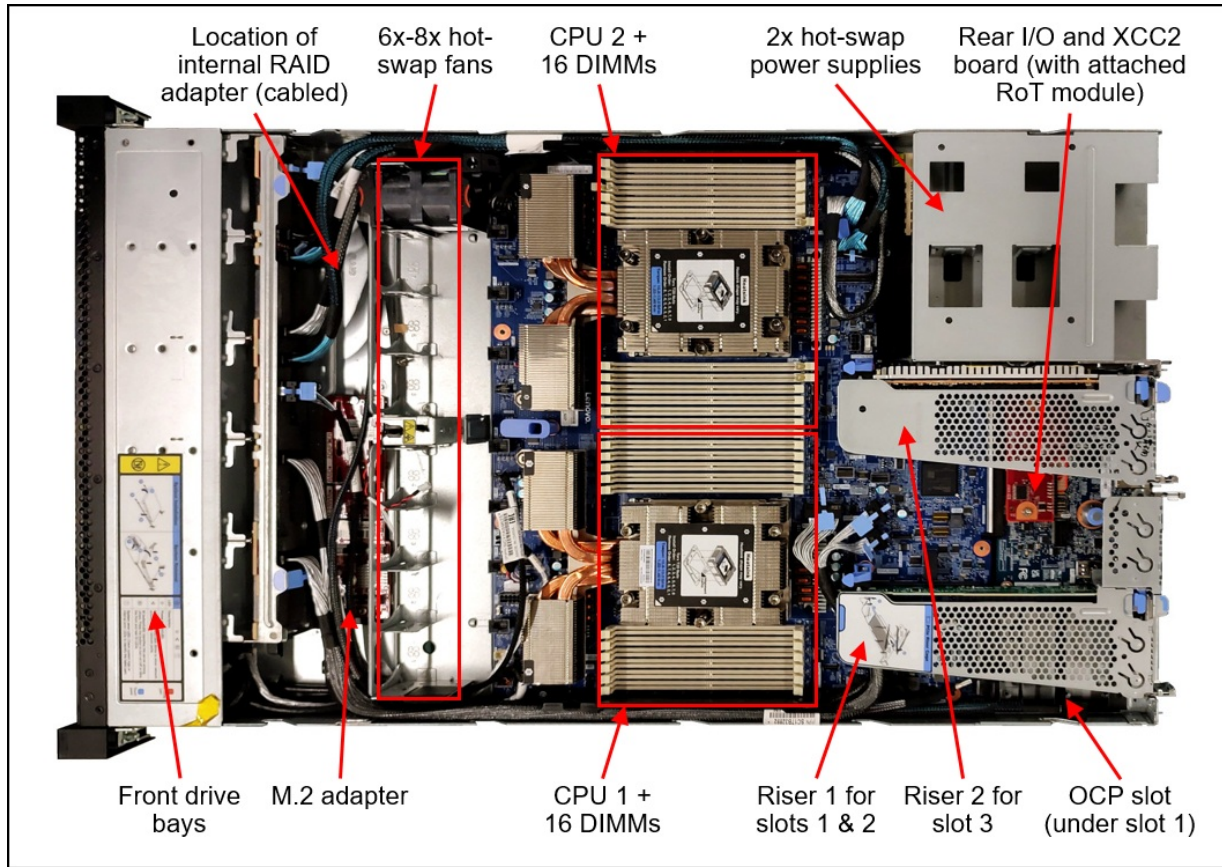


Figure 4. Internal view of the Lenovo ThinkAgile HX645 V3

## Standard specifications

The ThinkAgile HX645 V3 Integrated Systems and Certified Nodes are based on the ThinkSystem SR645 V3 server.

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

Table 1. Comparison of features

	<b>HX645 V3 Integrated System</b>	<b>HX645 V3 Certified Node</b>
HX offering type	Integrated System	Certified Node
Target workloads	VDI, server virtualization, private cloud, general compute, ROBO/Edge	VDI, server virtualization, private cloud, general compute, ROBO/Edge
Base MTM	7D9MCTO1WW	7D9MCTO2WW
Form Factor	1U	1U
Base platform	SR645 V3	SR645V3
Supported cluster sizes	3+ nodes	3+ nodes
CPU	2x AMD EPYC™ 9004 Series Processors	2x AMD EPYC™ 9004 Series Processors
Memory	24x DDR5 4800 MHz (6TB maximum)	24x DDR5 4800 MHz (6TB maximum)
Drive Bays	Front drive bays: 6x2.5" SATA/SAS + 4x 2.5" AnyBay Rear drive bays: 2x2.5" SATA/SAS (optional)	Front drive bays: 6x2.5" SATA/SAS + 4x 2.5" AnyBay Rear drive bays: 2x2.5" SATA/SAS (optional)
Drive Configuration	All Flash	All Flash
HBA	440-16i HBA	440-16i HBA
Boot drives	2x M.2	2x M.2
OCF networking	1x OCP 3.0 adapter 10Gb, 25Gb	1x OCP 3.0 adapter 10Gb, 25Gb
PCIe networking	2x PCIe adapters 10Gb, 25Gb	2x PCIe adapters 10Gb, 25Gb
GPUs	Up to 2x single-wide GPUs	Up to 2x single-wide GPUs
Hypervisor	Nutanix AHV, VMware ESXi	Nutanix AHV, VMware ESXi

The following table lists the standard specifications.

Table 2. Standard specifications

<b>Components</b>	<b>Specification</b>
Machine types	7D9M - 3 year warranty
Form factor	1U rack.
Processor	Two AMD EPYC 9004 Series processors (formerly codenamed "Genoa"). Supports processors up to 96 cores, core speeds of up to 3.6 GHz, and TDP ratings of up to 360W. Supports PCIe 5.0 for high performance I/O.
Chipset	Not applicable (platform controller hub functions are integrated into the processor)



Components	Specification
Memory	24 DIMM slots with two processors (12 DIMM slots per processor). Each processor has 12 memory channels, with 1 DIMM per channel (DPC). Lenovo TruDDR5 RDIMMs, 3DS RDIMMs, and 9x4 RDIMMs are supported, up to 4800 MHz
Memory maximum	Up to 6TB with 24x 256GB 3DS RDIMMs
Memory protection	ECC, SDDC, Patrol/Demand Scrubbing, Bounded Fault, DRAM Address Command Parity with Replay, DRAM Uncorrected ECC Error Retry, On-die ECC, ECC Error Check and Scrub (ECS), Post Package Repair
Disk drive bays	<ul style="list-style-type: none"> <li>● HX645 V3 - Integrated System and Certified Node: <ul style="list-style-type: none"> <li>○ Front drive bays: 6x2.5" SATA/SAS + 4x 2.5" AnyBay</li> <li>○ Rear drive bays: 2x2.5" SATA/SAS (optional)</li> </ul> </li> <li>● Internal M.2 module supporting up to two M.2 drives (no RAID support), for OS boot support</li> </ul>
Storage controller	16i SAS HBA
Network interfaces	Dedicated OCP 3.0 SFF slot with PCIe 5.0 x16 host interface, at the rear of the server (rear-accessible). Supports a variety of 2-port and 4-port adapters with 10GbE and 25GbE network connectivity. One port can optionally be shared with the XClarity Controller 2 (XCC2) management processor for Wake-on-LAN and NC-SI support. Additional PCIe network adapters supported in PCIe slots.
PCI Expansion slots	<p>Up to 3x PCIe 5.0 slots, all with rear access, plus a slot dedicated to the OCP adapter. Slot availability is based on riser selection and rear drive bay selection. Slot 3 requires two processors.</p> <p>Four choices for rear-access slots:</p> <ul style="list-style-type: none"> <li>● 3x PCIe x16 low-profile slots</li> <li>● 1x PCIe x16 full-height half-length slot + 1x PCIe x16 low-profile slot</li> <li>● 1x PCIe x16 low-profile slot (also supports 2x rear 2.5-inch drive bays)</li> </ul> <p>For 2.5-inch front drive configurations, the server supports the installation of a CFF RAID adapter or HBA in a dedicated area that does not consume any of the PCIe slots.</p> <p>The server alternatively supports slots at the front of the server:</p> <ul style="list-style-type: none"> <li>● OCP slot</li> <li>● 1x PCIe x16 full-height half-length slot + 1x PCIe x16 low-profile slot</li> </ul> <p><b>Note:</b> Not all slots are available in a 1-processor configuration.</p>
GPUs	Supports up to 2 single width GPU
Ports	<p>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.</p> <p>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 2nd XCC remote management port (installs in OCP slot). Optional DB-9 COM serial port (installs in slot 3).</p> <p>Internal: 1x USB 3.1 G1 (5 Gb/s) connector for operating system or license key purposes.</p>
Cooling	Up to 8x N+1 redundant hot swap 40 mm fans, configuration dependent. 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. 750 W, 1100 W and 1800 W AC options, supporting 220 V AC. 750 W and 1100 W options also support 110V input supply. In China only, all power supply options support 240 V DC. Also available is a 1100W power supply with a -48V DC input.
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 2.5-inch front drive bays can optionally support an Integrated Diagnostics Panel. XClarity Controller 2 (XCC2) embedded management based on the ASPEED AST2600 baseboard management controller (BMC). Dedicated rear Ethernet port for XCC2 remote access for management. Optional 2nd redundant XCC2 remote port supported, installs in the OCP slot. XClarity Administrator for centralized infrastructure management, XClarity Integrator plugins, and XClarity Energy Manager centralized server power management. XCC Platinum enables remote control functions and other features.
Security features	Chassis intrusion switch, Power-on password, administrator's password, Root of Trust module supporting TPM 2.0 and Platform Firmware Resiliency (PFR). Optional lockable front security bezel.
Software	<ul style="list-style-type: none"> <li>● HX645 V3 Integrated System: Nutanix Acropolis: Starter, Pro, and Ultimate editions. Nutanix Prism, Nutanix Calm (optional), Nutanix Flow (optional).</li> <li>● HX645 V3 Certified Node: Nutanix Acropolis Starter, Pro and Ultimate editions (licenses purchased separately from Lenovo, Nutanix or a Nutanix reseller).</li> </ul>
Hypervisors supported	Nutanix AHV or VMware ESXi. See the <a href="#">Software</a> section for details.
Hardware warranty	<ul style="list-style-type: none"> <li>● HX645 V3 Integrated System: Three-, four-, or five-year customer-replaceable unit and onsite limited hardware warranty with ThinkAgile Premier 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.</li> <li>● HX645 V3 Certified Node: One, 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.</li> </ul>
Software maintenance	Three-, four-, or five-year software support and subscription (matches the duration of the selected warranty period).
Dimensions	Width: 440 mm (17.3 in.), height: 43 mm (1.7 in.), depth: 773 mm (30.4 in.). See <a href="#">Physical and electrical specifications</a> for details.
Weight	Maximum: 20.2 kg (44.6 lb)

## Models

Factory-integrated models of the integrated systems and certified nodes are configured by using the Lenovo Data Center Solution Configurator (DCSC), <http://dsc.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/>

To ensure that the controlled GPUs and accelerators are only sold in the supported markets, the following configure-to-order base machine-type models (CTO MTMs) are selectable in DCSC:

- **Standard Open models** are available in all markets worldwide. Controlled GPUs cannot be configured using these models. These are CTO1WW models.
- **GPU Controlled models** are used to order any of the controlled GPUs and accelerators. Controlled models are not available in affected markets. If you start from a controlled model, your configuration must include a controlled GPUs.

### Note:

- For all models listed in the GPU **Controlled models** column, one of the controlled GPUs *must* be selected in the DCSC configurator. DCSC will display an error if you configuration does not include one of the controlled GPUs.
- You are required to engage a Lenovo representative in the project that includes the ThinkAgile HX Series Integrated Systems. ThinkAgile HX Certified Nodes do not have this requirement.

The following table lists the base CTO models.

Table 3. CTO models

Server model	Standard Open models	GPU Controlled models
	These CTO models are available in all markets. Configurations based on these MTMs cannot include controlled GPUs.	These CTO models are not available in affected markets. Configurations based on these MTMs must include controlled GPUs.
ThinkAgile HX645 V3 Integrated System	7D9MCTO1WW	7D9MCTOAWW
ThinkAgile HX645 V3 Certified Node	7D9MCTO2WW	7D9MCTOBWW
ThinkAgile HX645 V3 LOD Integrated System - China Only	7D9MCTO3WW	None

## Processors

The HX645 V3 support the following processors.

For details about these options, see the SR645 V3 product guide:

<https://lenovopress.lenovo.com/lp1607-thinksystem-sr645-v3-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.

Table 4. Processors

Part number	Feature	Description	Maximum supported	
			HX645 V3 IS	HX645 V3 CN
None	BREE	ThinkSystem AMD EPYC 9124 16C 200W 3.0GHz Processor	2	2
None	BREH	ThinkSystem AMD EPYC 9224 24C 200W 2.5GHz Processor	2	2
None	BRED	ThinkSystem AMD EPYC 9254 24C 200W 2.9GHz Processor	2	2
None	BREC	ThinkSystem AMD EPYC 9334 32C 210W 2.7GHz Processor	2	2
None	BR30	ThinkSystem AMD EPYC 9354 32C 280W 3.25GHz Processor	2	2
None	BREB	ThinkSystem AMD EPYC 9454 48C 290W 2.75GHz Processor	2	2
None	BREA	ThinkSystem AMD EPYC 9534 64C 280W 2.45GHz Processor	2	2
None	BR2Z	ThinkSystem AMD EPYC 9634 84C 290W 2.25GHz Processor	2	2

## Memory

The HX645 V3 support the following memory options.

For details about these options, see the SR645 V3 product guide:

<https://lenovopress.lenovo.com/lp1607-thinksystem-sr645-v3-server#memory-options>

Table 5. Memory

Part number	Feature	Description	Maximum supported	
			HX645 V3 IS	HX645 V3 CN
4X77A81437	BQ3C	ThinkSystem 16GB TruDDR5 4800MHz (1Rx8) RDIMM-A	24	24
4X77A81438	BQ39	ThinkSystem 32GB TruDDR5 4800MHz (1Rx4) RDIMM-A	24	24
4X77A81439	BQ3E	ThinkSystem 32GB TruDDR5 4800MHz (1Rx4) Value RDIMM-A	24	24
4X77A81440	BQ37	ThinkSystem 32GB TruDDR5 4800MHz (2Rx8) RDIMM-A	24	24
4X77A81441	BQ3D	ThinkSystem 64GB TruDDR5 4800MHz (2Rx4) RDIMM-A	24	24
4X77A81442	BQ36	ThinkSystem 64GB TruDDR5 4800MHz (2Rx4) Value RDIMM-A	24	24
4X77A81443	BQ3A	ThinkSystem 128GB TruDDR5 4800MHz (4Rx4) 3DS RDIMM-A	24	24
4X77A81444	BQ3B	ThinkSystem 256GB TruDDR5 4800MHz (8Rx4) 3DS RDIMM-A	24	24

## Internal storage

The HX645 V3 support up to 12x 2.5-inch drive bays.

The two drive bay zones are as follows:

- Front: Up to 10x 2.5-inch hot-swap bays
  - 6x SAS/SATA + 4x AnyBay hot-swap drive bays (only with configurations with 2 processors)
- Rear: 2x 2.5-inch SAS/SATA hot-swap bays

All drives are hot-swap and are accessible from the front or from the rear. AnyBay drive bays support SAS, SATA or NVMe drives.

SATA and SAS SSDs are supported for cache, however NVMe drives are not supported for cache.

The systems also support two M.2 drives, installed in an M.2 adapter, as an OS boot drive alternative.

## 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 SR645 V3 product guide: <https://lenovopress.lenovo.com/lp1607-thinksystem-sr645-v3-server#internal-storage>

Table 6. Drive backplanes

Feature	Description	Maximum supported	
		HX645 V3 IS	HX645 V3 CN
<b>Front 2.5-inch drive backplanes</b>			
B8MX	ThinkSystem 1U 6 SATA/SAS + 4x2.5" AnyBay Backplane	1	1
<b>Rear - 2.5-inch drive backplanes</b>			
B8MY	ThinkSystem 1U 2x2.5" SAS/SATA Rear Backplane	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 boot drives.

For details about these options, including configuration rules, see the SR645 V3 product guide: <https://lenovopress.com/lp1607-thinksystem-sr645-v3-server#internal-storage>

Table 7. Boot drive enablement

Part number	Feature	Description	Maximum supported	
			HX645 V3 IS	HX645 V3 CN
<b>M.2 enablement</b>				
4Y37A79663	BM8X	ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit	1	1

## Controllers for internal storage

The HX645 V3 support the following internal storage controllers.

For details about these options, including configuration rules, see the SR645 V3 product guide:  
<https://lenovopress.com/lp1607-thinksystem-sr645-v3-server#internal-storage>

Table 8. Controllers for internal storage

Part number	Feature	Description	Maximum supported	
			HX645 V3 IS	HX645 V3 CN
<b>SAS/SATA HBA - PCIe 4.0 adapter</b>				
4Y37A09725	B8P1	ThinkSystem 440-16i SAS/SATA PCIe Gen4 12Gb Internal HBA	1	1

## Internal drive options

The following table lists the supported drive options for the HX645 V3.

Table 9. Internal drive options

Part number	Feature	Description	Maximum supported	
			HX645 V3 IS	HX645 V3 CN
<b>2.5-inch hot-swap 24Gb SAS SSDs</b>				
4XB7A80320	BNWF	ThinkSystem 2.5" PM1653 3.84TB Read Intensive SAS 24Gb HS SSD	12	12
4XB7A80321	BP3E	ThinkSystem 2.5" PM1653 7.68TB Read Intensive SAS 24Gb HS SSD	12	12
4XB7A80340	BNW8	ThinkSystem 2.5" PM1655 800GB Mixed Use SAS 24Gb HS SSD	12	12
4XB7A80341	BNW9	ThinkSystem 2.5" PM1655 1.6TB Mixed Use SAS 24Gb HS SSD	12	12
<b>2.5-inch hot-swap 6 Gb SATA SSDs</b>				
4XB7A72441	BM88	ThinkSystem 2.5" PM893 3.84TB Read Intensive SATA 6Gb HS SSD	12	12
4XB7A87526	BWKL	ThinkSystem 2.5" PM893a 1.92TB Read Intensive SATA 6Gb HS SSD	12	12
4XB7A87527	BWKK	ThinkSystem 2.5" PM893a 3.84TB Read Intensive SATA 6Gb HS SSD	12	12
4XB7A17103	BA7J	ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	12	12
4XB7A17104	BK77	ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	12	12
4XB7A17126	BA4T	ThinkSystem 2.5" S4620 960GB Mixed Use SATA 6Gb HS SSD	12	12
4XB7A17127	BA4U	ThinkSystem 2.5" S4620 1.92TB Mixed Use SATA 6Gb HS SSD	12	12
4XB7A17128	BK7L	ThinkSystem 2.5" S4620 3.84TB Mixed Use SATA 6Gb HS SSD	12	12
<b>2.5-inch hot-swap PCIe 4.0 NVMe SSDs</b>				

Part number	Feature	Description	Maximum supported	
			HX645 V3 IS	HX645 V3 CN
4XB7A13941	BMGD	ThinkSystem 2.5" U.2 P5520 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A13942	BMGE	ThinkSystem 2.5" U.2 P5520 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A13943	BNEF	ThinkSystem 2.5" U.2 P5520 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A13631	BNEQ	ThinkSystem 2.5" U.2 P5520 15.36TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A17129	BNEG	ThinkSystem 2.5" U.2 P5620 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A17130	BNEH	ThinkSystem 2.5" U.2 P5620 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A17133	BNEZ	ThinkSystem 2.5" U.2 P5620 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A79647	BNF2	ThinkSystem 2.5" U.3 7450 PRO 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A79648	BNF5	ThinkSystem 2.5" U.3 7450 PRO 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A79649	BNF4	ThinkSystem 2.5" U.3 7450 PRO 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A83097	BQAV	ThinkSystem 2.5" U.3 7450 PRO 15.36TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A13967	BNEJ	ThinkSystem 2.5" U.3 7450 MAX 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A13970	BNEY	ThinkSystem 2.5" U.3 7450 MAX 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	4	4
4XB7A13971	BNEL	ThinkSystem 2.5" U.3 7450 MAX 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	4	4
<b>M.2- NVMe PCIe 4.0 x4 NHS SSD</b>				
4XB7A13999	BKSR	ThinkSystem M.2 7450 PRO 960GB Read Intensive NVMe PCIe 4.0 x4 NHS SSD	2	2
4XB7A90102	BXMH	ThinkSystem M.2 PM9A3 960GB Read Intensive NVMe PCIe 4.0 x4 NHS SSD	2	2

Note: NVMe serviceability has improvements planned for AOS 6.8. Before AOS 6.8 some features, like hot-swap, are not enabled. To replace a NVMe drive, please follow Nutanix's documentation for drive replacement without VMD on the portal – <https://my.nutanix.com/>.



## Network adapters

For details about these options, including configuration rules, see the SR645 V3 product guide:  
<https://lenovopress.com/lp1607-thinksystem-sr645-v3-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 adapters

Part number	Feature	Description	Maximum supported	
			HX645 V3 IS	HX645 V3 CN
<b>10 Gb Ethernet</b>				
4XC7A08240	B5T4	ThinkSystem Broadcom 57454 10GBASE-T 4-port OCP Ethernet Adapter	1	1
4XC7A08236	B5ST	ThinkSystem Broadcom 57416 10GBASE-T 2-port OCP Ethernet Adapter	1	1
<b>25 Gb Ethernet</b>				
4XC7A08237	BN2T	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-Port OCP Ethernet Adapter	1	1
4XC7A80567	BPPW	ThinkSystem Broadcom 57504 10/25GbE SFP28 4-Port OCP Ethernet Adapter	1	1
4XC7A62582	BE4T	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-Port OCP Ethernet Adapter	1	1

Table 11. PCIe adapters

Part number	Feature	Description	Maximum supported	
			HX645 V3 IS	HX645 V3 CN
<b>10GBASE-T Ethernet</b>				
4XC7A08245	B5SU	ThinkSystem Broadcom 57454 10GBASE-T 4-port PCIe Ethernet Adapter	2	2
7ZT7A00496	AUKP	ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	2	2
<b>25 Gb Ethernet</b>				
4XC7A08238	BK1H	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-port PCIe Ethernet Adapter	2	2
4XC7A80566	BNWM	ThinkSystem Broadcom 57504 10/25GbE SFP28 4-Port PCIe Ethernet Adapter	1	1
4XC7A62580	BE4U	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	2	2
<b>100 Gb Ethernet</b>				
4XC7A08248	B8PP	ThinkSystem Mellanox ConnectX-6 Dx 100GbE QSFP56 2-port PCIe Ethernet Adapter	1	1

## GPU adapters

The HX645 V3 support the following GPU options.

Configuration Note:

- Some GPUs are only available with VMware ESXi selected as the hypervisor
- Some GPUs are unavailable because of government restriction in certain markets.
- A2 support in AHV is planned for AOS 6.9

For details about these options, including configuration rules, see the SR645 V3 product guide:

<https://lenovopress.com/lp1607-thinksystem-sr645-v3-server#gpu-adapters>

Table 12. GPU adapters

Part number	Feature	Description	Maximum supported	
			HX645 V3 IS	HX645 V3 CN
4X67A81547	BQZT	ThinkSystem NVIDIA A2 16GB PCIe Gen4 Passive GPU w/o CEC	2	2

## 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

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

### Configuration notes:

- In ESXi-based environments, HX Series Integrated Appliances require VMware vCenter Server.
- The HX systems support firmware updates from Nutanix 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>

## Nutanix Portfolio 2.0 (PnP) Licensing Model

Nutanix is introducing an enterprise-ready unified cloud platform with our HCI solution as the foundation. The new, simplified product portfolio includes: Nutanix Cloud Platform (NCP), Nutanix Cloud Infrastructure (NCI) and Nutanix Cloud Manager (NCM), NCI-Data with 3 license tiers for each software edition. There are additional packages, Nutanix Unified Storage, Nutanix Database Service (NDB), and Nutanix Desktop Services (NDS), Virtual Desktop Infrastructure (VDI) & Nutanix Frame that are available.

The Nutanix software is available for all base CTO models.

The editions have the following characteristics:

Table 14. Software Editions

License Tier	Nutanix Cloud Platform (NCP)	Nutanix Cloud Infrastructure (NCI)	Nutanix Cloud Manager (NCM)	NCI-Data
Ultimate	<ul style="list-style-type: none"> <li>• NCI Ultimate</li> <li>• NCM Ultimate</li> </ul>	<ul style="list-style-type: none"> <li>• Advanced DR: Sync, Near-Sync,</li> <li>• Runbook Security: Micro-segmentation, Encryption</li> <li>• Cloud Native: Kubernetes Services</li> </ul>	<ul style="list-style-type: none"> <li>• Application Automation</li> <li>• Security General</li> </ul>	<ul style="list-style-type: none"> <li>• No Mseg</li> <li>• No Karbon</li> </ul>
Pro	<ul style="list-style-type: none"> <li>• NCI Ultimate</li> <li>• NCM Pro</li> </ul>	<ul style="list-style-type: none"> <li>• Multisite Async DR</li> <li>• Overlay Networking</li> </ul>	<ul style="list-style-type: none"> <li>• Self Service Cost Governance</li> </ul>	<ul style="list-style-type: none"> <li>• No Flow Networking</li> </ul>
Starter	<ul style="list-style-type: none"> <li>• NCI Pro</li> <li>• NCM Pro</li> </ul>	<ul style="list-style-type: none"> <li>• AOS Storage + Compression + Dedup</li> </ul>	<ul style="list-style-type: none"> <li>• AI Operations</li> </ul>	<ul style="list-style-type: none"> <li>• No AHV Support</li> </ul>

### Nutanix Cloud Platform (NCP)

Nutanix Cloud Platform is the complete software edition package that includes both Nutanix Cloud Infrastructure (NCI) and Nutanix Cloud Manager (NCM). It is available in several editions to meet your infrastructure needs with the right set of capabilities.

### Nutanix Cloud Infrastructure (NCI)

Nutanix Cloud Infrastructure (NCI) is a complete software stack to unify your hybrid cloud infrastructure including compute, storage and network, hypervisors and containers, in public or enterprise clouds; all with built-in resilience, self-healing, disaster recovery capabilities, and security. It includes enterprise data services and consolidated storage, data protection and disaster recovery, native virtualization and container management, networking and security.

For details on software editions see <https://www.nutanix.com/products/cloud-platform/software-options#nci>

### Nutanix Cloud Manager (NCM)

Nutanix Cloud Manager (NCM) offers our customers simplicity and ease of use to build and grow their cloud deployments faster and realize rapid ROI, by providing intelligent operations, self service and orchestration, visibility and governance of spend, security and teams, all through a unified Multi-cloud management solution.

For details on software editions see <https://www.nutanix.com/products/cloud-platform/software-options#ncm>

### Nutanix Unified Storage

Nutanix Unified Storage provides software-defined, scale-out storage solutions for enterprise NAS and object workloads for unstructured data, block storage for structured data, and backup storage. Nutanix Unified Storage replaces traditional independent storage services and brings NAS, object, and block workloads into a consolidated unified storage platform with all its benefits, including a unified control plane.

Nutanix Data Lens delivers cloud-based data governance for unstructured data stored in the Nutanix Unified Storage platform, including data lifecycle management, data security, ransomware protection, and audit compliance.

Nutanix Unified Storage and Data Lens are purchased and licensed on a per TiB usable basis.

For details on software editions see <https://www.nutanix.com/products/cloud-platform/software-options#nus>

### **Nutanix Database Service**

Nutanix Database Service (NDB) is a Hybrid Multicloud DBaaS that enables small, nimble teams of DBAs to easily manage large fleets of databases using a single console and API, while enabling developers to self-service their database requests. NDB is purchased and licensed on a per core basis and is available either as a standalone or as an add-on to NCI. In the standalone version, NDB includes NCI Ultimate functionality in addition to database-specific capabilities and is licensed on a per-core basis.

For details on software editions see <https://www.nutanix.com/products/cloud-platform/software-options#database>

### **Nutanix Virtual Desktop Infrastructure (VDI) & Nutanix Frame**

The Nutanix VDI per user model offers hybrid cloud infrastructure capabilities appropriate for on-prem virtual desktop infrastructure (VDI) and Desktop as a Service (DaaS) use cases with pricing based on a Maximum Concurrent User basis (maximum number of provisioned end-user VMs). VDI per user is an alternative to the core-based NCI licensing option and is designed to provide simple, transparent licensing for all VDI users, regardless of the underlying hardware, hypervisor, or cloud.

- Agnostic: Works with any EUC management platform including Citrix Virtual Apps & Desktops and VMware Horizon
- Term license: 1-year through 5-year options
  - Term license must run on a dedicated software licensed VDI cluster with no core-based licensing. Mixing of non-VDI workloads is not supported.
- Unified Storage: Built-in and also available as a per TiB base add-on
- No additional license cost for DR site
- Portable across on-premises and public cloud, public cloud use requires Ultimate edition
- Available in Starter, Pro, and Ultimate editions
- Cloud Native and Database Service Add-ons not available with NCI VDI. Advanced Replication and Security Add-on features require NCI Ultimate edition

For details on software editions see <https://www.nutanix.com/products/cloud-platform/software-options#vdi>

### **License Options**

ThinkAgile HX can be configured with one of the latest Nutanix software editions that are listed in the following table.

Table 15. Nutanix license options

Feature code	Description	Quantity Required
BVKU	Nutanix Cloud Platform Starter Edition	1 per node
BVKW	Nutanix Cloud Platform Pro Edition	1 per node
BVKY	Nutanix Cloud Platform Ultimate Edition	1 per node
BSPJ	Nutanix Cloud Infrastructure Starter Edition	1 per node
BSPG	Nutanix Cloud Infrastructure Pro Edition	1 per node
BSPL	Nutanix Cloud Infrastructure Ultimate Edition	1 per node
BSQ0	Nutanix Cloud Manager Starter Edition	1 per node
BSPY	Nutanix Cloud Manager Pro Edition	1 per node
BSQ2	Nutanix Cloud Manager Ultimate Edition	1 per node
BSPQ	NCI-Data Starter Edition	1 per node
BSPN	NCI-Data Pro Edition	1 per node
BSPS	NCI-Data Ultimate Edition	1 per node
BSQH	Nutanix Database Service (NDB) Platform	1 per node
BSQ7	End User Computing (EUC) Starter	1 for every 200 concurrent users
BSQ5	End User Computing (EUC) Pro	1 for every 200 concurrent users
BSQ9	End User Computing (EUC) Ultimate	1 for every 200 concurrent users
BSQD	Nutanix Unified Storage (NUS) Starter	1 per Tib
BSQB	Nutanix Unified Storage (NUS) Pro	1 per Tib

## Warranty and Support

The ThinkAgile HX Series Integrates Systems can be configured with a three-, four, or five-year hardware warranty with 24x7 ThinkAgile Premier Single Point of Support (Lenovo Integrated Systems 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 Integrated Systems 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 systems have a 3-year warranty:

- 7D9M - 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 16. Deployment offerings

Part number	Description
<b>Onsite deployment services</b>	
5MS7B00043	ThinkAgile HX Onsite Deployment (up to 3 nodes)
5MS7B00044	ThinkAgile HX Onsite Deployment (additional node)
<b>Remote deployment services</b>	
5MS7B00045	ThinkAgile HX Remote Deployment (up to 3 nodes)
5MS7B00046	ThinkAgile HX Remote Deployment (additional node)
5MS7A27430	ThinkAgile HX SAP HANA Deployment - Custom
<b>Remote Health Check</b>	
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/>

## Seller training courses

The following sales training courses are offered for employees and partners (login required). Courses are listed in date order.

1. **Lenovo Data Center Product Portfolio**  
2024-04-22 | 20 minutes | Employees and Partners

This course introduces the Lenovo data center portfolio, and covers servers, storage, storage networking, and software-defined infrastructure products. After completing this course about Lenovo data center products, you will be able to identify product types within each data center family, describe Lenovo innovations that this product family or category uses, and recognize when a specific product should be selected.

Published: 2024-04-22  
Length: 20 minutes  
Employee link: [Grow@Lenovo](#)  
Partner link: [Lenovo Partner Learning](#)  
Course code: SXXW1110r7

2. **VTT Cloud and Edge Architecture: Principal Consultant Overview**  
2024-04-10 | 50 minutes | Employees Only

Join Ruth Miller, Lenovo Principal Consultant, SSG Services for a data-led discussions to examine in detail customer IT environments, highlighting pain points, performance issues, edge and hybrid cloud strategy and carbon reduction capability. Examples of workshop deliverables and outcomes will be discussed to illustrate the value of early engagement and discovery.

Published: 2024-04-10  
Length: 50 minutes  
Employee link: [Grow@Lenovo](#)  
Course code: DVCLD211

3. **VTT Data Management How to sell storage - April 2024**  
2024-04-10 | 60 minutes | Employees Only

In this course, you will know:

- Why do we sell storage?
- What are the basics you need to get an opportunity rolling?
- Why Lenovo for Storage?
- What is happening in the market today?
- How to determine traction?

Published: 2024-04-10  
Length: 60 minutes  
Employee link: [Grow@Lenovo](#)  
Course code: DVDAT209

#### 4. **Data management Overview**

2024-03-14 | 25 minutes | Employees and Partners

After completing this course you will be able to:

1. Know more about the data management trends and challenges
2. Understand the data management portfolio
3. Find out how data drives business value

Published: 2024-03-14

Length: 25 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: DSTOO201

#### 5. **Technical Overview: ThinkAgile HCI and Cloud Platforms**

2024-03-07 | 35 minutes | Employees and Partners

This course is designed to give Lenovo sales and partner representatives a technical overview of Lenovo's ThinkAgile hyperconverged infrastructure and cloud platforms. Turnkey cloud platforms along with their architectural makeup, and container and data protection solutions are also covered.

Learning Objectives:

- Describe Lenovo's ThinkAgile hyperconverged infrastructure and cloud platforms
- Explain do-it-yourself and turnkey cloud platforms along with their architectural makeup
- Describe container and data protection solutions

Published: 2024-03-07

Length: 35 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: DCLDT2001r3

#### 6. **Lenovo HX Business Conversations**

2024-03-06 | 20 minutes | Employees and Partners

This course covers business conversations for Lenovo HX Hyperconverged solutions.

Course objectives:

- Identify a potential Lenovo HX opportunity
- Conduct effective discovery to reveal the customer's data center needs
- Probe the customer
- Ensure the customer knows you understand their issue(s)

Published: 2024-03-06

Length: 20 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: DCGHXB001

7. **Whats new with ThinkAgile HX AI-Ready solutions and enabling edge to cloud**

2024-02-15 | 70 minutes | Employees Only

Join Scott Ellis, Nutanix Solution Architect, Ritu Jain, Lenovo Product Manager and Adam Mandelbloom, Lenovo Technical Product Manager for a discussion on why many customers are looking for VMware alternatives these days, ThinkAgile HX is a compelling choice, learn how easy it is to migrate from VMWare to Nutanix and some of the benefits it can provide. Another hot topic these days is Artificial intelligence, and many times this takes place at the edge. Learn how Lenovo and Nutanix solve these challenges with compelling edge to cloud solutions.

Published: 2024-02-15

Length: 70 minutes

Employee link: [Grow@Lenovo](#)

Course code: DVCLD209

8. **Family Introduction: Converged and Hyperconverged**

2024-01-25 | 15 minutes | Employees and Partners

This course is designed to give Lenovo sales a foundation on the characteristics of the Converged and Hyperconverged family. As an introduction to each family, this course also includes positioning, when to use a family and product, and keywords a client may use when discussing a converged or hyperconverged product.

Objectives:

- Family characteristics
- Priority positioning
- Product usage
- Key words and phrases

Published: 2024-01-25

Length: 15 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXSX1101r2

9. **FY24Q3 Hybrid Cloud Update**

2023-12-11 | 15 minutes | Employees and Partners

This update is designed to help you discuss the features and customer benefits of Lenovo ThinkAgile systems that use the 5th Gen Intel® Xeon® processors. Lenovo has also introduced a new service, Lenovo TruScale Hybrid Cloud for Edge, which provides agile and reliable infrastructure as a service where you need it, when you need it. New Professional Services for AI with NVIDIA provides customers with expert guidance for designing and implementing tailored AI solutions. Reasons to call your customer and talk about refreshing their infrastructure are also included as a guideline.

Published: 2023-12-11

Length: 15 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW2523a

10. **VEEAM Solutions Sales Training**

2023-09-27 | 20 minutes | Employees and Partners

In this course you will learn about Hyper-availability for the Always-On Enterprise.

By the end of this training, you should be able to:

Identify and explain the core products and solutions offered by Veeam.

Explain the key benefits and value propositions of integrating Veeam solutions with Lenovo products.

Published: 2023-09-27

Length: 20 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: DSTOO100

11. **A Seller's Guide to Nutanix OEM 2.0**

2023-08-24 | 90 minutes | Employees Only

In this Sales Team webinar, Mike Tilt, Ritu Jain and Brandon Saxton will cover the new Nutanix 2.0 pricing and packaging options to guide sellers on what the different types of offers, sales process and how to sell Nutanix 2.0. You will get an overview of OEM 2.0, Sales Process, PNP Pricing and Zone Information, and additional resources on Upgrade & Renewal SKUs and process.

Course Objectives

- Defining Nutanix 2.0 Pricing and Packaging
- Describing OEM 2.0 Sales Process
- Identifying resources and support

Published: 2023-08-24

Length: 90 minutes

Employee link: [Grow@Lenovo](#)

Course code: DSXNS101

## 12. **Empowering Technical Sellers: Excelling In Transactional Workloads**

2023-08-18 | 60 minutes | Employees and Partners

This training abstract outlines a comprehensive program designed to equip technical sellers with the knowledge and expertise required to effectively promote and sell Lenovo and Nutanix solutions for transactional workloads. By focusing on the unique capabilities and advantages of Lenovo and Nutanix infrastructure in handling high-performance transactional applications, this training program empowers technical sellers to engage with customers, understand their specific workload requirements, and articulate the value proposition of Lenovo and Nutanix offerings in this domain. The training program encompasses the following key areas:

1. Transactional Workloads Overview:
2. Lenovo and Nutanix Solutions for Transactional Workloads:
3. Product Portfolio Deep Dive:
4. Addressing Customer Requirements:
5. Solution Positioning and Sales Techniques:
6. Competitor Analysis:

Through this training, technical sellers will acquire the expertise necessary to engage with customers, understand their transactional workload requirements, and effectively position Lenovo and Nutanix solutions as the ideal choice for high-performance, mission-critical applications. By understanding the intricacies of Lenovo and Nutanix offerings in the transactional workload space, technical sellers will be empowered to drive successful sales engagements, build strong customer relationships, and contribute to the growth and success of their organization.

Published: 2023-08-18

Length: 60 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: DHXD201

**13. Empowering Technical Sellers: Accelerating Lenovo and Nutanix Cloud Native-Container Application Solutions**

2023-08-18 | 60 minutes | Employees and Partners

This training abstract outlines a comprehensive program specifically designed to equip technical sellers with the knowledge and expertise needed to effectively promote and sell Lenovo and Nutanix cloud native/container application solutions. By focusing on the integration of Lenovo and Nutanix technologies with modern application development practices, this training enables tech sellers to engage with customers, understand their requirements, and articulate the unique value proposition of Lenovo and Nutanix offerings in the cloud native and containerization landscape.

The training encompasses the following key areas:

1. Cloud Native and Containerization Fundamentals:
2. Lenovo and Nutanix Solutions Overview:
3. Product Portfolio Deep Dive:
4. Addressing Customer Needs:
5. Solution Positioning and Sales Techniques:
6. Competitor Analysis:
7. Technical Demonstration and Proof-of-Concept:

Throughout the training, tech sellers will gain the expertise necessary to engage with customers, understand their unique requirements, and effectively position Lenovo and Nutanix solutions as the go-to choice for cloud native and containerized application needs. By learning the intricacies of Lenovo and Nutanix offerings, technical sellers will be equipped to drive successful sales engagements, strengthen customer relationships, and contribute to the overall growth and success of the organization.

Published: 2023-08-18

Length: 60 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: DHXC201

**14. ThinkAgile Accelerating Cloud Agility: HX Series Technical Presentation**

2023-07-28 | 40 minutes | Employees and Partners

Amalu Santhosh, Lenovo Technical Product Manager, reviews the ThinkAgile HX product portfolio. She will walk you through a technical deep dive into HX workloads and discuss technical details and performance of the latest ThinkAgile HX solutions.

Published: 2023-07-28

Length: 40 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: DHXT201

**15. Lenovo Data Center Product Portfolio**

2023-07-21 | 15 minutes | Employees and Partners

This course introduces the Lenovo data center portfolio, and covers servers, storage, storage networking, and software-defined infrastructure products. After completing this course about Lenovo data center products, you will be able to identify product types within each data center family, describe Lenovo innovations that this product family or category uses, and recognize when a specific product should be selected.

Published: 2023-07-21

Length: 15 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW1110r6

**16. Cloud and HCI or Somewhere in Between**  
2023-07-11 | 40 minutes | Employees and Partners

Provides a brief overview of Lenovo Portfolio for HCI and Cloud including ThinkAgile HX, VX, MX Certified Nodes and Appliances, Azure, and Engineered Cloud Solutions. Review Scenarios and complete questions "choose your own adventure" to identify and qualify an opportunity as HCI or Cloud and which portfolio solution would be the best option.

Course objectives:

- Where in the Sales Cycle we are
- What is Cloud
- What is Hyperconverged Infrastructure (HCI)
- Review Lenovo Offerings in Cloud and HCI
- Scenarios

Published: 2023-07-11

Length: 40 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: DCLDS104r2

**17. What's New with Nutanix 2.0? Portfolio and Licensing**  
2023-06-08 | 15 minutes | Employees and Partners

Nutanix has updated and simplified their licensing for our joint customers. This course is created to give sales and partners representatives an overview for the recent Nutanix licensing changes and their current options.

Course Objectives:

After completing this course, you should be able to:

- Describe the new Nutanix licensing rollout
- List the new pricing and packaging options

Published: 2023-06-08

Length: 15 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: DHXL001

**18. Partner Technical Webinar - HX vs VX vs MX Panelist Discussion**  
2023-04-11 | 60 minutes | Employees and Partners

In this 60-minute replay, Joe Murphy moderated a panelist discussion on ThinkAgile SHI. Baker Hull, VMware represented VX; Mike Tilt, Lenovo Technical Sales Manager presented HX; Phil Searles, Lenovo Solution Architect represented MX; and Brandon Saxton Lenovo NA Product Manager for ThinkAgile made up the panelist. The focus was less on the differences but how to elevate the conversation to get to the best solution. No slides were presented.

Published: 2023-04-11

Length: 60 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: 033123



**19. Partner Technical Webinar - ThinkAgile V3 Overview and SMB Express**

2023-02-13 | 60 minutes | Employees and Partners

In this 60-minute replay, Joe Murphy and Dave Brown, Lenovo Solution Architects reviewed the new ThinkAgile V3 solutions. In addition, Dave did a lengthy demo and explanation of the new SMB Express feature of DCSC.

Published: 2023-02-13

Length: 60 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: 021023

**20. Family Portfolio: ThinkAgile HX**

2022-12-13 | 20 minutes | Employees and Partners

This course is designed to give Lenovo sales an introduction to Lenovo ThinkAgile HX appliances. This course also includes why a customer should choose Lenovo for their hyperconverged products.

Course objectives:

- Learn to identify products and features within the ThinkAgile HX family
- Describe Lenovo innovations that the ThinkAgile HX family uses
- Recognize when a specific product or products should be selected

Published: 2022-12-13

Length: 20 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXS2109r3

**21. ThinkAgile HX Seller Presentation**

2022-11-01 | 25 minutes | Employees Only

Join Ritu Jain, Worldwide Product Manager for ThinkAgile, as she shares how ThinkAgile HX unique values, routes to market, how to position HX, and competitive landscape.

By the end of this training, you should be able to:

- Describe the ThinkAgile HX advantages
- Discover the routes to market & models available to sell
- Explain the HX solution positioning

Published: 2022-11-01

Length: 25 minutes

Employee link: [Grow@Lenovo](#)

Course code: DHXSP101

22. **ThinkAgile HX Customer Presentation**

2022-10-31 | 25 minutes | Employees Only

Join Ritu Jain, Worldwide ThinkAgile Product Manager for ThinkAgile, as she shares trends shaping cloud deployment models, customer Hybrid cloud strategy and how ThinkAgile HX is helping customers in their journey.

By the end of this training, you should be able to:

- Describe the ThinkAgile HX Solution
- Discover the trends in the cloud industry
- Explain how HX is helping customers with evolving trends

Published: 2022-10-31

Length: 25 minutes

Employee link: [Grow@Lenovo](#)

Course code: DHXCP101

23. **Data Infrastructure Management - DM Series Storage**

2022-10-28 | 25 minutes | Employees Only

This course provides a technical overview of the ThinkSystem DM series products. Course DDMO101 – Lenovo ThinkSystem DM & DE Series Overview is recommended prior to this course.

By the end of this course, you should be able to:

- Recognize the components of the Lenovo Data Management portfolio
- Discuss the features of the Lenovo Data Management components
- Describe the features of the SnapCenter software components

Published: 2022-10-28

Length: 25 minutes

Employee link: [Grow@Lenovo](#)

Course code: DDM200

24. **Lenovo ThinkAgile HX VDI Solution**

2022-08-26 | 10 minutes | Employees Only

In this lightboard video, Eric Kern whiteboards Lenovo's ThinkAgile HX VDI Solution. Sellers will learn how it works and customer benefits. Updated August 26th, 2022.

Objectives for this course:

- Understand how the VDI solution leverages the ThinkAgile HX platform with Citrix.
- Describe what actions a system administrator can perform in the Citrix portal.
- Explain how to manage the system remotely from a cloud infrastructure with Citrix.

Published: 2022-08-26

Length: 10 minutes

Employee link: [Grow@Lenovo](#)

Course code: DSVC129

25. **Lenovo's value-added Solutions Software and SDI -ThinkAgile HX - Best practices for Selling Software/ SDI Process**

2022-08-23 | 60 minutes | Employees Only

ThinkAgile HX is one of the most important parts of the ThinkAgile Lenovo Portfolio of SDI, Software Defined Infrastructure but it can be challenging to manage the deal registration and quoting for ThinkAgile HX. Listen in on Part 1 of this recent North America webinar where Mike Tilt, Sales Engineer Director, discusses the overview of ThinkAgile HX sales process and how to obtain Deal protection. He also discusses best practices for interactions with Nutanix sellers and shares personal experiences as a former SDI focused seller.

Published: 2022-08-23

Length: 60 minutes

Employee link: [Grow@Lenovo](mailto:Grow@Lenovo)

Course code: DCLDO121

26. **Lenovo's value-added Solutions Software and SDI -ThinkAgile HX - Best practices for Selling Software/ SDI Process**

2022-08-23 | 60 minutes | Employees Only

In this Part 2, a continuation of a recent North American Webinar, Mike Tilt, Sales Engineer Director, continues discussion of ThinkAgile HX sales process and dives into VLS. He also discusses best practices for interactions with Nutanix sellers and shares personal experiences as a former SDI focused seller.

Published: 2022-08-23

Length: 60 minutes

Employee link: [Grow@Lenovo](mailto:Grow@Lenovo)

Course code: DCLDO122

27. **Lenovo TruScale for Hosted Desktops with Nutanix**

2022-08-22 | 15 minutes | Employees and Partners

By exemplifying the case of a customer who wants to move to a remote desktop public cloud solution, this 15-minute course offers an overview of the Lenovo TruScale for Hosted Desktops with Nutanix solution, including benefits, architecture, and value proposition.

Published: 2022-08-22

Length: 15 minutes

Employee link: [Grow@Lenovo](mailto:Grow@Lenovo)

Partner link: [Lenovo Partner Learning](#)

Course code: DSOLO109

28. **Lenovo's value-added Solutions Software and SDI - ThinkAgile HX Licensing Update from Nutanix**

2022-08-22 | 60 minutes | Employees Only

In this continuous series of recorded webinar for ThinkAgile, Ed Stickney, Nutanix Worldwide OEM Sales Strategy and Enablement Leader, reviews with the North American region the recent changes made to the Nutanix simplified licensing model and how it benefits your customers. He also discusses how the new licensing maps to the current licensing and how you can migrate your customers to the new licensing. Ed also provides you valuable feedback from audience questions.

Published: 2022-08-22

Length: 60 minutes

Employee link: [Grow@Lenovo](mailto:Grow@Lenovo)

Course code: DCLDO120

29. **Partner Technical Webinar - sizing ThinkAgile HX & VX**

2022-08-01 | 60 minutes | Partners Only

In this 60-minute replay, we demonstrated how to size ThinkAgile VX and ThinkAgile HX. First Lenovo Solution Architect Joe Murphy reviewed the sizing methodology. Next, Lenovo Solution Architect Richard Smutzer demonstrated how to size ThinkAgile HX using Nutanix's sizing tool. Lenovo Solution Architect David Cianchetta closed the webinar by demonstrating ThinkAgile VX sizing using the VSAN sizer from VMware.

Published: 2022-08-01

Length: 60 minutes

Partner link: [Lenovo Partner Learning](#)

Course code: 072922

30. **Partner Technical Webinar - Nutanix and ThinkAgile HX**

2022-07-20 | 60 minutes | Partners Only

In this 60-minute replay, Brandon Saxton, Lenovo NA Product Manager, and Brendan McDermott, Senior Sales Engineer, reviewed the Nutanix Lenovo Partnership, the technology and the ThinkAgile HX offerings including both Integrated Systems and Certified Nodes. Based on some questions, a few slides were added at the end to compare ThinkAgile HX with the other ThinkAgile offerings.

Published: 2022-07-20

Length: 60 minutes

Partner link: [Lenovo Partner Learning](#)

Course code: 071522

31. **ThinkAgile Advantage Services**

2022-07-20 | 15 minutes | Employees and Partners

The goal of this training is to go through the details of ThinkAgile Advantage, and to provide everything you need to have customer conversations and to order ThinkAgile Advantage and recommended services.

Course objectives:

1. Learn about the customer challenges and benefits of ThinkAgile Advantage
2. Discover what it includes
3. Understand how to make the most of ThinkAgile products and solutions with the elevator pitch for customer conversations.

Published: 2022-07-20

Length: 15 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: DSVC121r2

32. **Start the Conversation - Lenovo Cloud Strategy**

2021-10-25 | 25 minutes | Employees and Partners

The purpose of this course is to help sellers use the Lenovo cloud strategy as a foundation to start the customer cloud conversation. Topics include:

- Why customers choose the cloud
- The Lenovo Cloud Strategy
- Starting the customer cloud conversation

Published: 2021-10-25

Length: 25 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: DCLDS103r2

## 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  
<https://my.nutanix.com/>
- Lenovo ThinkAgile HX Series Best Recipes  
<http://datacentersupport.lenovo.com/us/en/solutions/ht505413>
- Lenovo Data Center Support  
<http://datacentersupport.lenovo.com>

## Related product families

Product families related to this document are the following:

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

## Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.  
8001 Development Drive  
Morrisville, NC 27560  
U.S.A.  
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

© Copyright Lenovo 2024. All rights reserved.

This document, LP1650, was created or updated on April 2, 2024.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:  
<https://lenovopress.lenovo.com/LP1650>
- Send your comments in an e-mail to:  
[comments@lenovopress.com](mailto:comments@lenovopress.com)

This document is available online at <https://lenovopress.lenovo.com/LP1650>.

## Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at <https://www.lenovo.com/us/en/legal/copytrade/>.

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo®

AnyBay®

Lenovo Services

ThinkAgile®

ThinkSystem®

XClarity®

The following terms are trademarks of other companies:

Microsoft® and Hyper-V® are trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.