

Lenovo ThinkAgile SX for Microsoft Azure Stack Hub: SXM4400, SXM6400 (Xeon SP Gen 1) Product Guide (withdrawn product)

Lenovo ThinkAgile SX for Microsoft Azure Stack Hub delivers a pre-integrated, easy-to-deploy rack-level solution for hybrid cloud to dramatically reduce time-to-value and total cost of ownership (TCO). The solution is based on Lenovo's industry-leading data center infrastructure and Microsoft Azure Stack Hub, an extension of Microsoft Azure Services to on-premises environments.

Suggested workloads for the ThinkAgile SX for Microsoft Azure Stack Hub include virtual desktop infrastructure (VDI), back-office applications, server consolidation, enterprise applications, databases, test and development environments, and cloud implementation. Starting with as few as four nodes to keep your acquisition costs down, the solution offers “pay as you grow” scalability as your needs grow.



Figure 1. Lenovo ThinkAgile SX for Microsoft Azure Stack Hub

Did you know?

The ThinkAgile SX for Microsoft Azure Stack Hub ships fully integrated into a rack cabinet, tested, configured, and ready to be plugged in and turned on; it is designed to integrate into an existing infrastructure effortlessly, to accelerate time to value and reduce infrastructure maintenance costs.

There is no up-front cloud software license acquisition cost for the ThinkAgile SX for Microsoft Azure Stack Hub, monthly billing is based on the actual resource usage (capacity-based licenses are also available).

Lenovo provides ThinkAgile Advantage Single Point of Support for the entire ThinkAgile solution with the nodes, networking, and software, for quicker problem determination and minimized downtime.

Key features

Lenovo ThinkAgile SX for Microsoft Azure Stack Hub integrates computing, storage, networking, and management, and it is designed with industry-standard building blocks, including hyperconverged nodes that are built on powerful and highly reliable Lenovo ThinkSystem servers, RackSwitch networking, and Azure Stack software that extends Azure technologies on-premises.

The ThinkAgile SX for Microsoft Azure Stack Hub includes the ThinkAgile SXM4400 25U model that can be scaled from 4 to 8 nodes, the ThinkAgile SXM4400 42U model that can be scaled from 4 to 16 nodes, and the ThinkAgile SXM6400 model that ships with 16 nodes.

The ThinkAgile SX for Microsoft Azure Stack Hub can also be deployed in a customer-provided rack cabinet with scaling from 4 to 16 nodes.

ThinkAgile SX for Microsoft Azure Stack Hub offers the following key features:

- Scalable ThinkAgile SX for Microsoft Azure Stack Hub configurations of an on-premises, hyperconverged, hybrid cloud platform designed to optimize workload performance and provide the IT agility for business demands.
- Flexible monthly billing that is based on actual resource usage helps lower acquisition cost for the entire solution by eliminating upfront cloud software licensing fees.
- Factory-integrated, pre-configured ready-to-go solutions that are delivered in a Lenovo rack cabinet or can be installed in a customer-provided rack cabinet, with all the hardware customers need for their workloads: servers, storage, and network switches, plus Azure Stack Hub cloud software and Lenovo XClarity hardware management tools.
- Designed for effortless integration into existing infrastructures, thereby reducing deployment time and saving money.
- Lenovo deployment services that are included with the solution help get customers up and running quickly.
- Proven and reliable Lenovo ThinkSystem servers featuring the first generation of the Intel Xeon Scalable Processor Family provide compute power for a variety of workloads and applications.
- Lenovo ThinkSystem Ethernet switches deliver exceptional performance and low latency, along with cost savings, and are designed to perform seamlessly with other vendors' upstream switches.
- Microsoft Azure Stack Hub provides a scalable, highly available solution for hybrid cloud extension to deliver Microsoft Azure cloud services on-premises with integrated compute, networking, storage, security, and management services that manage VM lifecycle and automate and orchestrate workload provisioning.
- Microsoft Storage Spaces Direct (S2D), an integrated part of the Azure Stack Hub solution, delivers scalable, highly available distributed shared storage that provides extensive data protection and recovery with no performance bottlenecks and no single point of failure.
- Powerful tools to manage both hardware and applications that come with the ThinkAgile SX for Microsoft Azure Stack Hub simplify and automate the management of the entire cloud solution, allowing customers to manage the infrastructure as a single system, rather than as individual components.
- Lenovo ThinkAgile Advantage provides a single point of contact for all support issues that customers might encounter with the server, networking, storage, and software used in the solution, for quicker problem determination and minimized downtime.

Components

The ThinkAgile SX for Microsoft Azure Stack Hub consists of the following hardware components:

- One ThinkSystem SR630 management node.
- ThinkSystem SR650 hyperconverged nodes:
 - Hybrid storage: From 4 to 8 (SXM4400 25U), or from 4 to 16 (SXM4400 42U or customer-provided rack cabinet), or 16 (SXM6400).
 - All flash storage: From 4 to 8 (SXM4400 25U, SXM4400 42U, or customer-provided rack cabinet), or 8 (SXM6400).
- One ThinkSystem NE0152T RackSwitch 1 GbE management network switch.
- One G8052 RackSwitch 1 GbE management network switch.
- Two ThinkSystem NE2572 RackSwitch 25 GbE VM/storage network switches.

The SR630 management node provides hardware management services and includes the following software components:

- Windows Server 2016 with Hyper-V
- Lenovo XClarity VM: Provides hardware management services.

The SR650 hyperconverged nodes provide compute and storage resources and includes the following software components:

- Windows Server 2016 (Build 1907 or earlier) or 2019 (Build 1908 or later) with Hyper-V.
- Storage Spaces Direct (S2D): Provide highly available, scale-out storage for the cloud workloads.
- Azure Stack Hub software: Provides scalable hybrid cloud platform.

Network connectivity is provided by the Lenovo RackSwitch switches. The management network consists of one NE0152T 1 GbE switch that runs Cloud Network Operating System (CNOS) or G8052 1 GbE switch that runs Enterprise Network Operating System (ENOS), and the VM/storage network consists of two NE2572 25 GbE switches that run CNOS.

The front and rear views of the ThinkAgile SXM4400 25U are shown in the following figure.

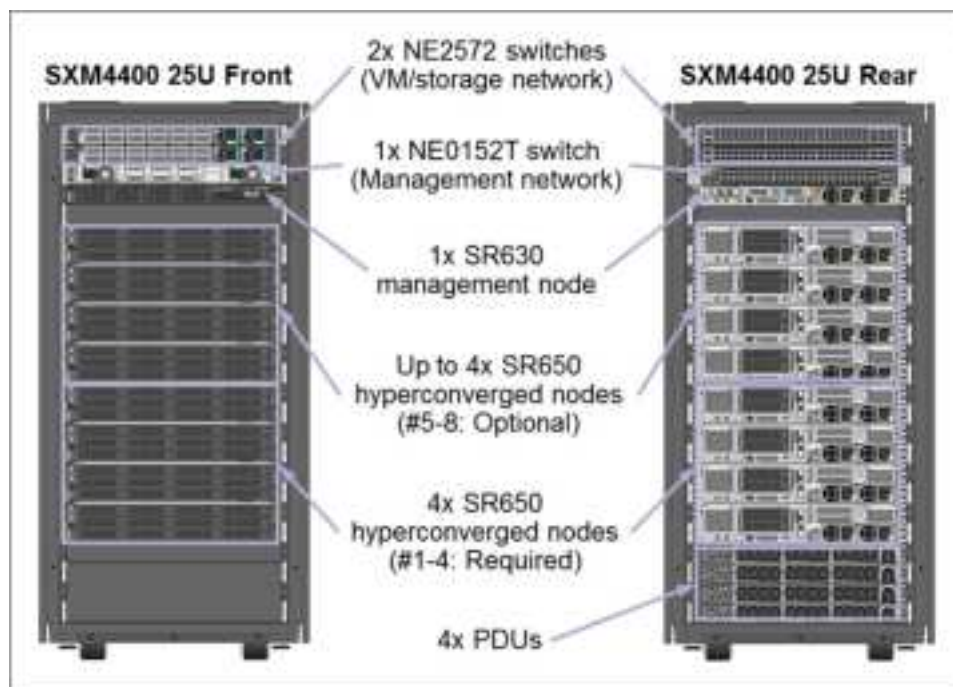


Figure 2. ThinkAgile SXM4400 25U front and rear views

The front and rear views of the ThinkAgile SXM4400 42U are shown in the following figure.

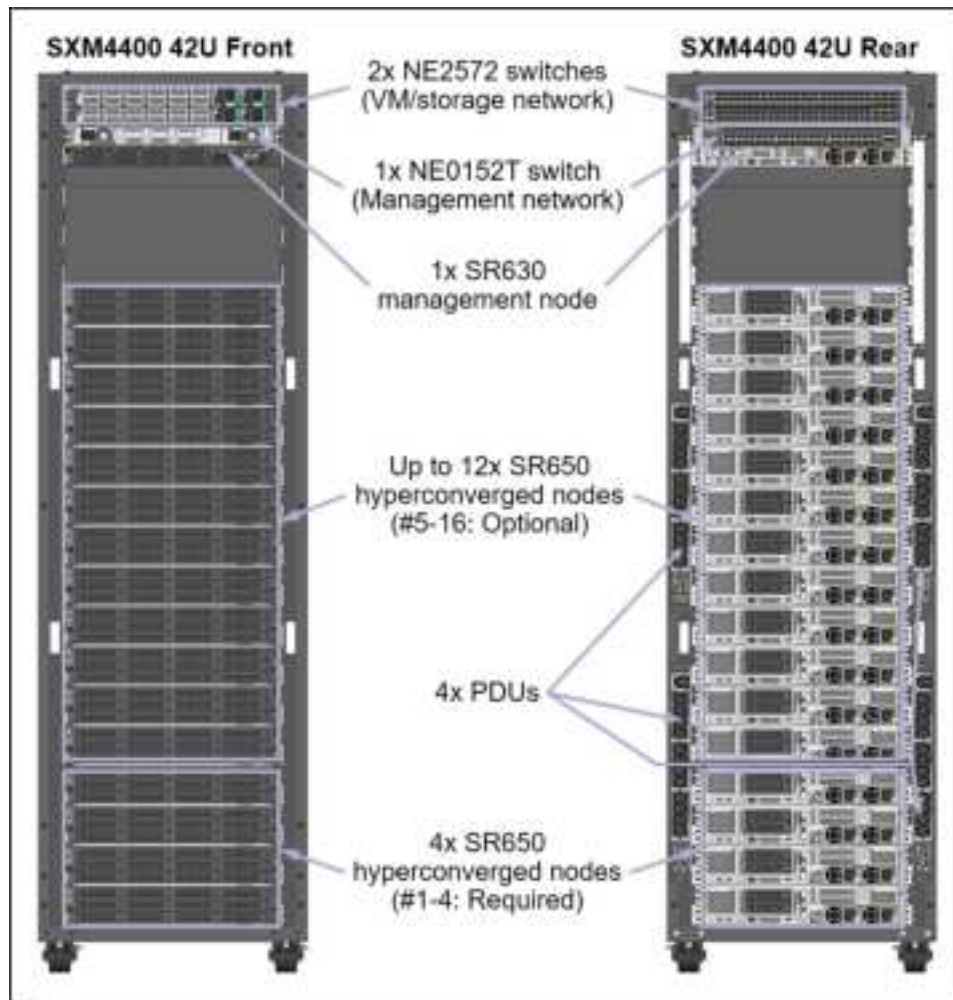


Figure 3. ThinkAgile SXM4400 42U front and rear views

Note: The maximum quantity of the all flash nodes in the SXM4400 is limited to 8.

The front and rear views of the ThinkAgile SXM6400 are shown in the following figure.

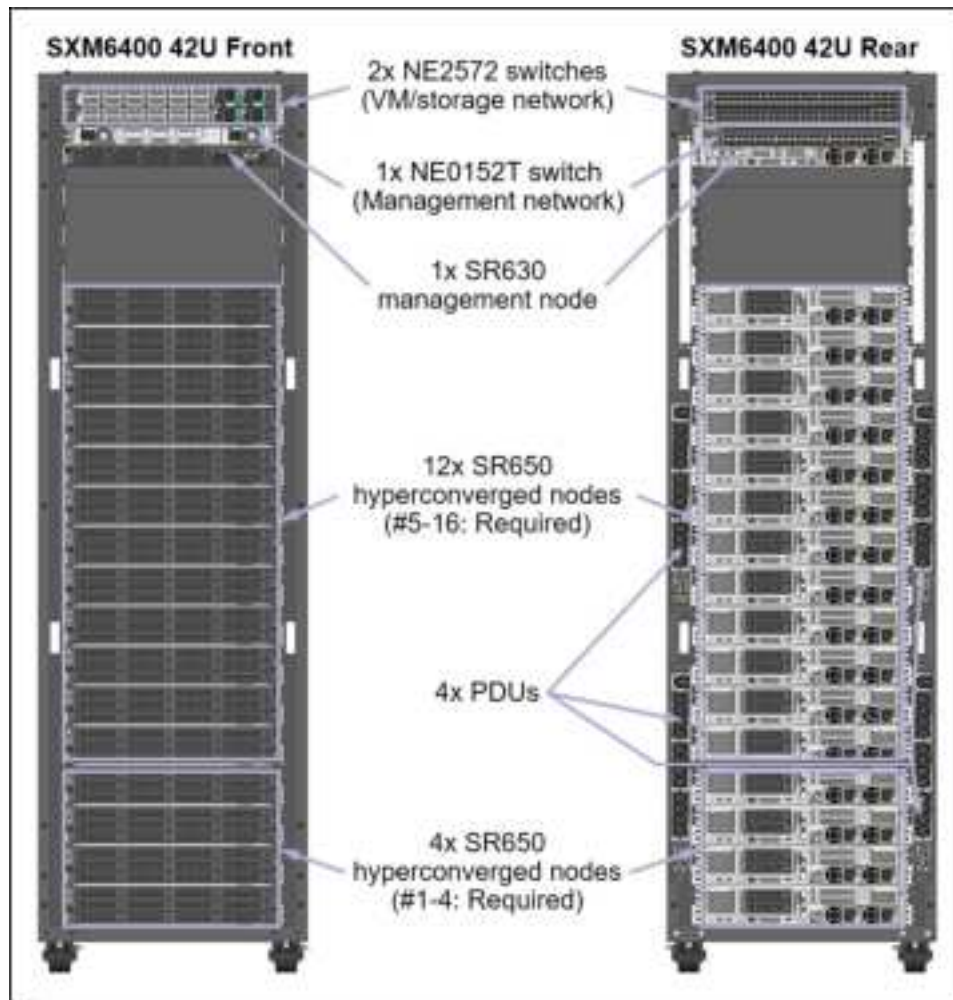


Figure 4. ThinkAgile SXM6400 front and rear views

Note: The maximum quantity of the all flash nodes in the SXM6400 is limited to 8.

System specifications

The following table lists the system specifications of the ThinkAgile SX for Microsoft Azure Stack Hub.

Table 1. ThinkAgile SX for Microsoft Azure Stack Hub system specifications

	ThinkAgile SX for Microsoft Azure Stack Hub model specifications		
Attribute	SXM4400 25U	SXM4400 42U or Customer-provided rack cabinet*	SXM6400
Form factor	25U Rack cabinet (9565-RCH)	42U Rack cabinet (9565-RCJ)	42U Rack cabinet (9565-RCK)
Dimensions	- Height: 1244 mm - Width: 605 mm - Depth: 1000 mm	- Height: 2009 mm - Width: 600 mm - Depth: 1096 mm	- Height: 2009 mm - Width: 600 mm - Depth: 1096 mm
Total rack load capacity	570 kg	953 kg	953 kg
Maximum rack weight	670 kg	1127 kg	1127 kg
AC power distribution	4x C13 PDUs: 1-Ph, 30A/208V, NEMA L6-30P 1-Ph, 32A/230V, IEC 309 P+N+G	4x C13 PDUs: 1-Ph, 60A/208V, IEC 309 2P+G 1-Ph, 63A/230V, IEC 309 P+N+G 3-Ph, 32A/380-415V, IEC 309 3P+N+G	
	All PDUs in a rack cabinet should be of the same type. IEC 320-C13 to C14 AC power cables for connecting all the equipment in a rack cabinet to PDUs are included.		
Hardware warranty	Three-, four-, or five-year customer-replaceable unit and onsite limited warranty with ThinkAgile Advantage Support and selectable service levels: 9x5 next business day (NBD) parts delivered or onsite response, 24x7x4 or 24x7x2 onsite response or 6-hour or 24-hour committed repair (select countries). Also available are 1-year and 2-year post-warranty extensions, YourDrive YourData, and Premier Support.		
Software	Microsoft Windows Server 2016 or 2019 with Hyper-V, Microsoft Storage Spaces Direct, Microsoft Azure Stack Hub, Lenovo XClarity Administrator with XClarity Pro.		
Management node			
Base model	Lenovo ThinkSystem SR630 for ThinkAgile SXM (7X02CTOAWW)		
Quantity	1		
Processor	Two Intel Xeon Bronze processors.		
Memory	64 GB (8x 8 GB or 4x 16 GB TruDDR4 RDIMMs). ECC, patrol scrubbing, and demand scrubbing memory protection.		
Drive bays	8x 2.5-inch SAS/SATA hot-swap.		
Internal storage	2x 2.5" 800 GB Performance 12 Gbps SAS SSDs (RAID-1 boot volume).		
Storage controller	1x RAID 530-8i (12 Gbps SAS).		
Network interfaces	- One dual-port 25 GbE SFP28 adapter (Mellanox ConnectX-4 Lx) (one port is connected to the management network switch with one 1m SFP+ DAC cable included). 1x 1 GbE dedicated XCC management port (RJ-45) connected to the management network switch with one UTP Category 5E cable included.		
Ports	- Front: 1x USB 2.0 port with XClarity Controller access, 1x USB 3.0 port. - Rear: 2x USB 3.0 ports and 1x VGA port.		

	ThinkAgile SX for Microsoft Azure Stack Hub model specifications		
Attribute	SXM4400 25U	SXM4400 42U or Customer-provided rack cabinet*	SXM6400
I/O expansion slots	Three slots: - Slot 1: PCIe 3.0 x8; low profile (for the network adapter) - Slot 2: PCIe 3.0 x16; low profile (not used) - Slot 4: PCIe 3.0 x8 (for the RAID 530-8i)		
Management features	Lenovo XClarity Controller (XCC) Enterprise (Pilot 4 chip), proactive platform alerts, light path diagnostics, Lenovo XClarity Administrator with Pro license.		
Security features	Power-on password, administrator's password, secure firmware updates, Trusted Platform Module (TPM) 1.2 or 2.0 (configurable UEFI setting).		
Video	Matrox G200 with 16 MB memory integrated into the XClarity Controller. Maximum resolution is 1920x1200 at 60 Hz with 32 bits per pixel.		
Cooling	Seven hot-swap system fans with N+1 redundancy.		
Power supplies	Two redundant hot-swap 550 W High Efficiency Platinum AC power supplies.		
Hyperconverged nodes - Hybrid storage			
Base model	Lenovo ThinkSystem SR650 for ThinkAgile SXM - Hybrid (7X06CTOAWW)		
Expansion model	Lenovo ThinkSystem SR650 for ThinkAgile SXM - Hybrid Expansion (7X06CTOBWW)		
Quantity	4 - 8	4 - 16	16
Processor	Two Intel Xeon Gold or Platinum processors.		
Memory	24 DIMM sockets with support for 16 GB or 32 GB TruDDR4 RDIMMs, or 64 GB TruDDR4 LRDIMMs. Memory speed up to 2666 MHz. ECC, SDDC (for x4-based memory DIMMs), ADDDC (for x4-based memory DIMMs), patrol scrubbing, and demand scrubbing memory protection technologies.		
Memory capacity	Up to 1536 GB with 24x 64 GB LRDIMMs.		
Drive bays	14x 3.5-inch hot-swap: 14x SAS/SATA or 10x SAS/SATA + 4x NVMe PCIe.		
Internal storage	- Boot volume: 2x M.2 480GB 6Gb SATA NHS SSDs in a RAID-1 drive group - Storage Spaces Direct: 40 TB: 4x 800GB Mainstream or Performance 12Gb SAS HS 3.5" SSDs + 10x 4TB 7.2K 6Gb NL SATA 3.5" HS 512n HDDs; or 60 TB: 4x 1.6TB Mainstream or Performance 12Gb SAS HS 3.5" SSDs + 10x 6TB 7.2K 6Gb NL SATA 3.5" HS 512e HDDs; or 80 TB: 4x 3.2TB Mainstream NVMe PCIe 3.0 x4 HS 3.5" SSDs + 10x 8TB 7.2K 6Gb NL SATA 3.5" HS 512e HDDs; or 100 TB: 4x 3.2TB Mainstream NVMe PCIe 3.0 x4 HS 3.5" SSDs + 10x 10TB 7.2K 6Gb NL SATA 3.5" HS 512e HDDs; or 120 TB: 4x 3.2TB Mainstream NVMe PCIe 3.0 x4 HS 3.5" SSDs + 10x 12TB 7.2K 6Gb NL SATA 3.5" HS 512e HDDs.		
Storage controller	1x M.2 Kit with Mirroring for boot volume. 1x 430-16i HBA (12 Gbps SAS/6 Gbps SATA) for Storage Spaces Direct. 1x Onboard NVMe interface (for the NVMe PCIe SSDs)		
Network interfaces	- One dual-port 25 GbE SFP28 adapter (Mellanox ConnectX-4 Lx) connected to the VM/storage network switches with two SFP28 DAC cable included. 1x 1 GbE dedicated XCC management port (RJ-45) connected to the management network switch with one UTP Category 5E cable included.		

	ThinkAgile SX for Microsoft Azure Stack Hub model specifications		
Attribute	SXM4400 25U	SXM4400 42U or Customer-provided rack cabinet*	SXM6400
Ports	- Front: 1x USB 2.0 port with XClarity Controller access, 1x USB 3.0 port. - Rear: 2x USB 3.0 ports and 1x VGA port.		
I/O expansion slots	Four slots: - Slot 4: PCIe 3.0 x8; low profile (for a network adapter) - Slot 5: PCIe 3.0 x16; full-height, half-length (not used) - Slot 6: PCIe 3.0 x16; full-height, half-length (for a single-port network adapter) - Slot 7: PCIe 3.0 x8 (for the 430-16i HBA)		
Management features	Lenovo XClarity Controller (XCC) Enterprise (Pilot 4 chip), proactive platform alerts, light path diagnostics, Lenovo XClarity Administrator with Pro license.		
Security features	Power-on password, administrator's password, secure firmware updates, Trusted Platform Module (TPM) 1.2 or 2.0 (configurable UEFI setting).		
Video	Matrox G200 with 16 MB memory integrated into the XClarity Controller. Maximum resolution is 1920x1200 at 60 Hz with 32 bits per pixel.		
Cooling	Six hot-swap system fans with N+1 redundancy.		
Power supplies	Two redundant hot-swap 1100 W High Efficiency Platinum AC power supplies.		
Hyperconverged nodes - All Flash storage			
Base model	Lenovo ThinkSystem SR650 for ThinkAgile SXM - All Flash (7X06CTOCWW)		
Expansion model	Lenovo ThinkSystem SR650 for ThinkAgile SXM - All Flash Expansion (7X06CTODWW)		
Quantity	4 - 8	8	
Processor	Two Intel Xeon Gold or Platinum processors.		
Memory	24 DIMM sockets with support for 16 GB or 32 GB TruDDR4 RDIMMs or 64 GB TruDDR4 LRDMMs. Memory speed up to 2666 MHz. ECC, SDDC (for x4-based memory DIMMs), ADDDC (for x4-based memory DIMMs), patrol scrubbing, and demand scrubbing memory protection technologies.		
Memory capacity	Up to 1536 GB with 24x 64 GB LRDIMMs.		
Drive bays	24x 2.5-inch hot-swap: 20x SAS/SATA + 4x NVMe PCIe.		
Internal storage	- Boot volume: 2x M.2 480GB 6Gb SATA NHS SSDs in a RAID-1 drive group - Storage Spaces Direct: 23 TB: 4x P4600 1.6TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSDs + 12x S4510 1.92TB Entry SATA 6Gb Hot Swap SSDs; or 30 TB: 4x P4600 1.6TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSDs + 16x S4510 1.92TB Entry SATA 6Gb Hot Swap SSDs; or 38 TB: 4x P4600 3.2TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSDs + 20x S4510 1.92TB Entry SATA 6Gb Hot Swap SSDs. 46 TB: 4x P4600 1.6TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSDs + 12x S4500/S4510 3.84TB Entry SATA 6Gb Hot Swap SSDs; or 61 TB: 4x P4600 1.6TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSDs + 16x S4500/S4510 3.84TB Entry SATA 6Gb Hot Swap SSDs; or 76 TB: 4x P4600 3.2TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSDs + 20x S4500/S4510 3.84TB Entry SATA 6Gb Hot Swap SSDs.		
Storage controller	1x M.2 Kit with Mirroring for boot volume. 3x 430-8i HBAs (12 Gbps SAS/6 Gbps SATA) for Storage Spaces Direct. 1x Onboard NVMe interface (for the NVMe PCIe SSDs)		

	ThinkAgile SX for Microsoft Azure Stack Hub model specifications		
Attribute	SXM4400 25U	SXM4400 42U or Customer-provided rack cabinet*	SXM6400
Network interfaces	- One dual-port or two single-port 25 GbE SFP28 adapters (Mellanox ConnectX-4 Lx) connected to the VM/storage network switches with two SFP28 DAC cable included. 1x 1 GbE dedicated XCC management port (RJ-45) connected to the management network switch with one UTP Category 5E cable included.		
Ports	- Front: 1x USB 2.0 port with XClarity Controller access, 1x USB 3.0 port. - Rear: 2x USB 3.0 ports and 1x VGA port.		
I/O expansion slots	Up to six slots: - Slot 1: PCIe 3.0 x16; full-height, half-length (for a single-port network adapter) - Slot 3: PCIe 3.0 x8; full-height, half-length (not used) - Slot 4: PCIe 3.0 x8; low profile (for a 430-8i HBA) - Slot 5: PCIe 3.0 x16; full-height, half-length (for a 430-8i HBA) - Slot 6: PCIe 3.0 x16; full-height, half-length (for a network adapter) - Slot 7: PCIe 3.0 x8 (for a 430-8i HBA)		
Management features	Lenovo XClarity Controller (XCC) Enterprise (Pilot 4 chip), proactive platform alerts, light path diagnostics, Lenovo XClarity Administrator with Pro license.		
Security features	Power-on password, administrator's password, secure firmware updates, Trusted Platform Module (TPM) 1.2 or 2.0 (configurable UEFI setting).		
Video	Matrox G200 with 16 MB memory integrated into the XClarity Controller. Maximum resolution is 1920x1200 at 60 Hz with 32 bits per pixel.		
Cooling	Six hot-swap system fans with N+1 redundancy.		
Power supplies	Two redundant hot-swap 1100 W High Efficiency Platinum AC power supplies.		
Networking			
Management network	1x RackSwitch NE0152T Gigabit Ethernet switch (7Y81CTO3WW) with 48x 1 GbE RJ-45 ports and 4x SFP/SFP+ uplink ports. 1x RackSwitch G8052 Gigabit Ethernet switch (7159-HCH) with 48x 1 GbE RJ-45 ports and 4x SFP/SFP+ uplink ports.		
VM/storage network	2x RackSwitch NE2572 25 Gb Ethernet switches (7159-HEA), each with 48x 25 GbE SFP28/SFP+ and 6x 100 GbE QSFP28/QSFP+ ports.		
VM network uplinks	4x 10 GbE SFP+ SR or 4x 25 GbE SFP28 SR upstream VLAG connections (2x per NE2572) with customer-supplied MMF OM3 or OM4 fiber optic cables with LC connectors.		
Management interfaces	- G8052: In-band management. - NE0152T: 1x 10/100/1000 Mb Ethernet. - NE2572: 1x 10/100/1000 Mb Ethernet.		
Software features	- G8052 (Enterprise Networking Operating System [ENOS]): Layer 2 and Layer 3 switching, VLANs, VLAN tagging, spanning tree, link aggregation, Hot Links, Layer 2 failover, VRRP, QoS, IP v4/v6 management and routing. - NE0152T (Cloud Networking Operating System [CNOS]): Layer 2 and Layer 3 switching, VLANs, VLAN tagging, spanning tree, link aggregation, virtual link aggregation, VRRP, QoS, IP v4/v6 management and routing. - NE2572 (CNOS): Layer 2 and Layer 3 switching, VLANs, VLAN tagging, spanning tree, link aggregation, virtual link aggregation, VRRP, QoS, CEE, IP v4/v6 management and routing.		
Cooling	- G8052: Three N+1 redundant hot-swap fans. - NE0152T: Three N+1 redundant hot-swap fans. - NE2572: Five N+1 redundant hot-swap fans.		

Attribute	ThinkAgile SX for Microsoft Azure Stack Hub model specifications		
	SXM4400 25U	SXM4400 42U or Customer-provided rack cabinet*	SXM6400
Power supplies	• G8052: Two redundant hot-swap 450 W AC. • NE0152T: Two redundant hot-swap 150 W AC. • NE2572: Two redundant hot-swap 770 W AC.		

* For customer-provided rack cabinets, the Form factor, Dimensions, Total rack load capacity, Maximum rack weight, and AC power distribution attributes do not apply.

Models

Factory-integrated models of the ThinkAgile SX for Microsoft Azure Stack Hub are configured by using the Lenovo Data Center Solution Configurator (DCSC):
<http://dcsc.lenovo.com>

Note: You are required to engage a Lenovo representative in the project that includes the ThinkAgile SX for Microsoft Azure Stack Hub.

The configuration process includes the following steps:

- Model selection
 - SXM4400
 - SXM6400
 - Customer-provided rack cabinet
- Rack cabinet selection
 - 25U (SXM4400 only)
 - 42U (SXM4400 and SXM6400)
 - Customer-provided rack cabinet
- Power distribution infrastructure selection (SXM4400 and SXM6400 only; does not apply to the customer-provided rack cabinet)
 - 208 V AC single-phase
 - 230 V AC single-phase
 - 380-415 V AC three-phase WYE
- Node configuration
 - One management node is derived
 - Hyperconverged nodes:
 - Node type
 - Processor model
 - Memory capacity
 - Storage capacity
 - Node quantity

Note: The type and configuration of all hyperconverged nodes must be the same.
- Networking selection
 - Switch models are derived
- Software selection
 - Microsoft Azure Stack Hub software is derived
 - Lenovo XClarity Administrator with Pro license is derived
- Warranty:
 - Three, four, or five years of warranty service coverage
 - 9x5 Next Business Day response with parts delivered (default selection) or onsite response
 - 24x7 4-hour or 2-hour onsite response or 24x7 6-hour committed service repair (available only in select regions)
 - Premier services (optional)
 - YourDrive YourData (optional)
- Services:
 - Lenovo ThinkAgile Advantage services (included): Deployment services and single point of support
 - Health check (onsite firmware updates from Lenovo) (optional)
 - Managed services (remote monitoring and management by Lenovo managed services team) (optional)

The ThinkAgile SX for Microsoft Azure Stack Hub is designed for installation in a rack cabinet. The SXM4400 and SXM4600 models are factory-integrated and delivered in a rack cabinet. A rack cabinet for mounting the ThinkAgile SX for Microsoft Azure Stack Hub components can also be provided by the customer.

Lenovo deployments services are included; they provide remote preparation and planning, configuring platform components, validating installation, transferring knowledge, and developing post-installation documentation.

Lenovo basic installation services are optional; they provide mounting the components in a customer-provided rack cabinet, connecting components to network and electrical power, checking and updating firmware, verifying operations, and disposal of the packaging materials within the customer site.

The existing ThinkAgile SX for Microsoft Azure Stack Hub deployments can be expanded up to the maximum number of hyperconverged nodes supported by ordering the expansion node models. Field expansion is handled by Lenovo professional services via a service contract.

Note: The configuration of the expansion nodes must be the same as for the existing base nodes.

Rack cabinets

The following table lists the base models of the ThinkAgile SX for Microsoft Azure Stack Hub rack cabinets.

Table 2. Base models of the ThinkAgile SX for Microsoft Azure Stack Hub rack cabinets

Description	Machine Type-Model	Feature code	SXM4400 25U	SXM4400 42U	SXM6400	Customer rack
ThinkAgile SXM4400 25U Rack	9565-RCH	B1EB	Y	N	N	N
ThinkAgile SXM4400 42U Rack	9565-RCJ	B1EC	N	Y	N	N
ThinkAgile SXM6400 42U Rack	9565-RCK	B1ED	N	N	Y	N
ThinkAgile SXM Customer Provided Rack Kit	7Y34CTO2WW	B31R	N	N	N	Y

Configuration note: For SXM4400 and SXM4600 models, 1U, 3U, and 5U Filler panels are derived based on the number of nodes selected.

Power distribution

Power distribution units (PDUs) are used to distribute power from an uninterruptible power supply (UPS) or utility power to the equipment within the ThinkAgile SX for Microsoft Azure Stack Hub rack cabinet (SXM4400 or SXM6400) and to provide fault-tolerant power redundancy for high availability.

Each node, management network switch, and VM/storage network switch has two redundant power supplies, and each of two power supplies is connected to a separate PDU to support topologies with redundant AC power sources.

The power distribution topology is illustrated in the following figure.

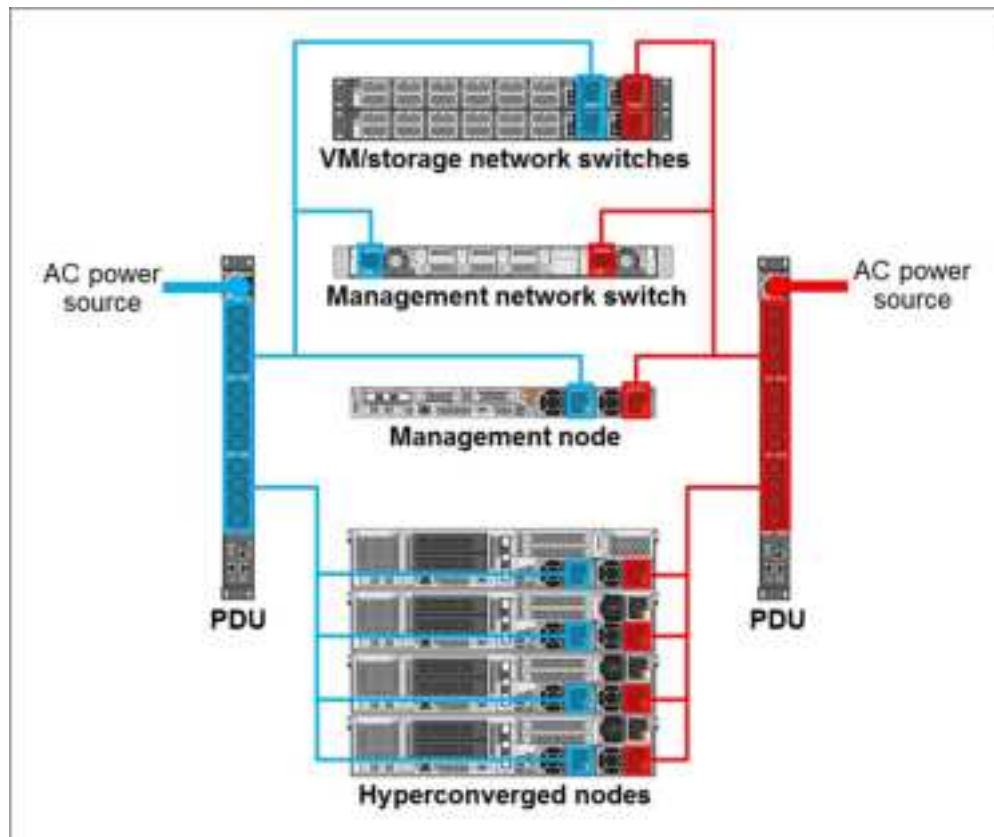


Figure 5. Power distribution topology

The following table lists the power distribution units for the ThinkAgile SX for Microsoft Azure Stack Hub rack cabinets.

Table 3. Power distribution units

Description	Feature code	Quantity	SXM4400 25U	SXM4400 42U	SXM6400
1U 12 C13 Switched and Monitored 30A/208V, NEMA L6-30P 1-Phase PDU	5908	4	Y	N	N
1U 12 C13 Switched and Monitored 32A/230V, IEC 309 P+N+G 1-Phase PDU	5910	4	Y	N	N
1U 12 C13 Switched and Monitored 60A/208V, IEC 309 2P+G 1-Phase PDU	5909	4	N	Y	Y
1U 12 C13 Switched and Monitored 63A/230V, IEC 309 P+N+G 1-Phase PDU	5911	4	N	Y	Y
1U 12 C13 Switched and Monitored 32A/380-415V, IEC 309 3P+N+G 3-Ph PDU	5912	4	N	Y	Y

Configuration notes:

- Only one type of PDUs is supported within the ThinkAgile SX for Microsoft Azure Stack Hub rack cabinet; different PDU types cannot be mixed within the rack cabinet.
- Power cables are derived based on the ThinkAgile SX for Microsoft Azure Stack Hub model and the number of nodes selected.

The following table summarizes the PDU specifications.

Table 4. PDU specifications

Feature	1U 12 C13 Switched and Monitored DPI PDU				
Feature code	5908	5910	5909	5911	5912
Phase	1-phase	1-phase	1-phase	1-phase	3-phase WYE
Voltage	208 V AC	230 V AC	208 V AC	230 V AC	380-415 V AC (220-240 V AC)
Line cord input amperage	24 A	32 A	48 A	63 A	32 A / phase
Line cord input connector	NEMA L6-30P	IEC 309 P+N+G	IEC 309 2P+G	IEC 309 P+N+G	IEC 309 3P+N+G
Output connectors	12x IEC 320-C13				

Management node

The ThinkAgile SX for Microsoft Azure Stack Hub uses the Lenovo ThinkSystem SR630 server as a management node.

The SR630 is a density-optimized, 1U dual-socket server that offers outstanding uptime to keep cloud deployments running safely and comprehensive systems management tools that help make deployment easier. Outstanding reliability, availability, and serviceability (RAS) and high-efficiency design improve your business environment and help save operational costs.

The following table lists the base configuration of the ThinkSystem SR630 for ThinkAgile SXM that is derived.

Table 5. ThinkSystem SR630 for ThinkAgile SXM base configuration

Machine Type-Model	Processor	Memory	Storage controller	Drives	Network	Power supply
7X02CTOAWW	2x Intel Xeon Bronze	64 GB	1x RAID 530-8i	2x 2.5" 800 GB SSDs	1x 25 GbE	2x 550W HS

Processors

The SR630 for ThinkAgile SXM requires two Intel Xeon Bronze processors. The following table lists the specifications of the processors for the SR630 for ThinkAgile SXM.

Table 6. Processor specifications (HT = Hyper-Threading, TB = Turbo Boost, VT = Virtualization Technology)

Processor model	Core frequency (Base / TB Max)	Number of cores / threads	Cache	Max DDR4 frequency	UPI speed	TDP	HT	TB	VT-x	VT-d
3106	1.7 / 1.7 GHz	8 / 8	11 MB	2133 MHz	9.6 GT/s	85 W	No	No	Yes	Yes
3206R	1.9 / 1.9 GHz	8 / 8	11 MB	2133 MHz	9.6 GT/s	85 W	No	No	Yes	Yes

The following table lists feature codes of the processors that are available for selection.

Table 7. Processor feature codes

Description	Feature code
Intel Xeon Bronze 3106 8C 85W 1.7GHz Processor	AWEH
Intel Xeon Bronze 3206R 8C 85W 1.9GHz Processor	B7N3

Memory

The SR630 for ThinkAgile SXM supports 64 GB of memory with 8x 8 GB or 4x 16 GB TruDDR4 RDIMMs. Each processor has six memory channels, and there is one DIMM per channel installed in four (8 GB RDIMMs) or two (16 GB RDIMMs) channels, and the remaining channels remain unpopulated. The operating memory speed is up to 2133 MHz.

The following memory protection technologies are supported:

- ECC
- Patrol scrubbing
- Demand scrubbing

The following table lists memory RDIMMs for the SR630 for ThinkAgile SXM that are available for selection.

Table 8. Memory RDIMMs

Description	Feature code	Quantity
ThinkSystem 8GB TruDDR4 2666 MHz (1Rx8 1.2V) RDIMM	AUU1	8
ThinkSystem 16GB TruDDR4 2666 MHz (1Rx4 1.2V) RDIMM	AUNB	4
ThinkSystem 16GB TruDDR4 2933 MHz (1Rx4 1.2V) RDIMM	B4LY	4*

* Available for selection only in the configurations with the Intel Xeon Bronze 3206R processor.

Internal storage

The SR630 management node has 8x 2.5" hot-swap drive bays connected to the ThinkSystem RAID 530-8i PCIe 12Gb Adapter.

The following table lists the internal drive configuration for the management node.

Table 9. Internal drive configuration: Management node

Model	4x 2.5-inch hot-swap front drive bays		
	Quantity, drive types	Drive layout	Storage controller
SR630 for ThinkAgile SXM	2x 800GB 12Gb SAS SSDs	RAID-1 (2x SSDs) boot volume	1x RAID 530-8i

The following table lists the SSDs for the SR630 management node.

Table 10. SSDs for management node

Description	Feature code	Quantity
ThinkSystem 2.5" HUSMM32 800GB Performance SAS 12Gb Hot Swap SSD	AUMH	2
ThinkSystem 2.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	B8HU	2

Network connectivity

For the management network, the SR630 for ThinkAgile SXM uses 25 GbE connectivity with the dual-port 25 GbE Mellanox ConnectX-4 Lx network adapter: One port that operates at 10 Gbps is connected to the management switch via the 10 GbE link. Also, the 1 GbE dedicated management port on the XCC is connected to the management network switch. For more information, refer to [Networking](#).

The following table lists the network adapter derived for the management node.

Table 11. Network adapter

Description	Feature code	Quantity
Mellanox ConnectX-4 Lx 2x25GbE SFP28 Adapter	AUAJ	1

Configuration note: The 1.5 m UTP Cat5e cable (1 GbE) and 1 m 10 GbE SFP+ DAC cable for the management network connections are included.

For more information about the SR630 server, refer to the Lenovo Press Product Guide: <http://lenovopress.com/lp0643>

Hyperconverged nodes

The ThinkAgile SX for Microsoft Azure Stack Hub uses the Lenovo ThinkSystem SR650 servers as hyperconverged nodes.

The SR650 is a versatile 2U dual-socket server that offers outstanding uptime to keep cloud deployments running safely and comprehensive systems management tools that help make deployment easier. Outstanding reliability, availability, and serviceability (RAS) and high-efficiency design improve your business environment and help save operational costs.

The following table lists the base configuration of the ThinkSystem SR650 for ThinkAgile SXM.

Table 12. ThinkSystem SR650 for ThinkAgile SXM base configuration

Machine Type-Model	Intel Xeon processor	Memory (min / max)	Storage controller	Drives	Network	Power supply
Initial deployment						
7X06CTOAWW (Hybrid storage)	2x Gold or Platinum*	384 GB / 1,536 GB**	1x 430-16i HBA 1x M.2 Kit with Mirroring	2x 480 GB M.2 SSDs 4x 3.5" SSDs*** 10x 3.5" HDDs***	2x 25 GbE	2x 1100W HS
7X06CTOCWW (All Flash storage)	2x Gold or Platinum*	384 GB / 1,536 GB**	3x 430-8i HBAs 1x M.2 Kit with Mirroring	2x 480 GB M.2 SSDs 4x 2.5" NVMe SSDs*** 12/16/20x 3.5" SATA SSDs***	2x 25 GbE	2x 1100W HS
Field expansion						
7X06CTOBWW (Hybrid storage)	2x Gold or Platinum*	384 GB / 1,536 GB**	1x 430-16i HBA 1x M.2 Kit with Mirroring	2x 480 GB M.2 SSDs 4x 3.5" SSDs*** 10x 3.5" HDDs***	2x 25 GbE	2x 1100W HS
7X06CTODWW (All Flash storage)	2x Gold or Platinum*	384 GB / 1,536 GB**	3x 430-8i HBAs 1x M.2 Kit with Mirroring	2x 480 GB M.2 SSDs 4x 2.5" NVMe SSDs*** 12/16/20x 3.5" SATA SSDs***	2x 25 GbE	2x 1100W HS

* Processor model is selectable (See [Processors](#) for details).

** Memory capacity is configurable (See [Memory](#) for details).

*** Drive capacity is configurable (See [Internal storage](#) for details).

Processors

The SR650 for ThinkAgile SXM requires two Intel Xeon Gold or Platinum processors. The following table lists the specifications of the processors for the SR650 for ThinkAgile SXM.

Table 13. CPU specifications (HT = Hyper-Threading, TB = Turbo Boost, VT = Virtualization Technology)

CPU model	Core frequency (Base / TB Max)	Number of cores / threads	Cache	Max DDR4 frequency	Max memory per socket	UPI speed	TDP	HT	TB	VT-x	VT-d
Intel Xeon Gold processors											
5118	2.3 / 3.2 GHz	12 / 24	16.5 MB	2400 MHz	768 GB	10.4 GT/s	105 W	Yes	Yes	Yes	Yes
5120	2.2 / 3.2 GHz	14 / 28	19.25 MB	2400 MHz	768 GB	10.4 GT/s	105 W	Yes	Yes	Yes	Yes
6126	2.6 / 3.7 GHz	12 / 24	19.25 MB	2666 MHz	768 GB	10.4 GT/s	125 W	Yes	Yes	Yes	Yes
6130	2.1 / 3.7 GHz	16 / 32	22 MB	2666 MHz	768 GB	10.4 GT/s	125 W	Yes	Yes	Yes	Yes
6132	2.6 / 3.7 GHz	14 / 28	19.25 MB	2666 MHz	768 GB	10.4 GT/s	140 W	Yes	Yes	Yes	Yes
6140	2.3 / 3.7 GHz	18 / 36	24.75 MB	2666 MHz	768 GB	10.4 GT/s	140 W	Yes	Yes	Yes	Yes
6142	2.6 / 3.7 GHz	16 / 32	22 MB	2666 MHz	768 GB	10.4 GT/s	150 W	Yes	Yes	Yes	Yes
6148	2.4 / 3.7 GHz	20 / 40	27.5 MB	2666 MHz	768 GB	10.4 GT/s	150 W	Yes	Yes	Yes	Yes
6150	2.7 / 3.7 GHz	18 / 36	24.75 MB	2666 MHz	768 GB	10.4 GT/s	165 W	Yes	Yes	Yes	Yes
6152	2.1 / 3.7 GHz	22 / 44	30.25 MB	2666 MHz	768 GB	10.4 GT/s	140 W	Yes	Yes	Yes	Yes
Intel Xeon Platinum processors											
8160	2.1 / 3.7 GHz	24 / 48	33 MB	2666 MHz	768 GB	10.4 GT/s	150 W	Yes	Yes	Yes	Yes
8170	2.1 / 3.7 GHz	26 / 52	35.75 MB	2666 MHz	768 GB	10.4 GT/s	165 W	Yes	Yes	Yes	Yes
8176	2.1 / 3.8 GHz	28 / 56	38.5 MB	2666 MHz	768 GB	10.4 GT/s	165 W	Yes	Yes	Yes	Yes

The following table lists feature codes of the supported processors that are available for selection.

Table 14. Processor options

Description	Feature code
Intel Xeon Gold processors	
Intel Xeon Gold 5118 12C 105W 2.3GHz Processor	AWEP
Intel Xeon Gold 5120 14C 105W 2.2GHz Processor	AWE6
Intel Xeon Gold 6126 12C 125W 2.6GHz Processor	AWEL
Intel Xeon Gold 6130 16C 125W 2.1GHz Processor	AWEN
Intel Xeon Gold 6132 14C 140W 2.6GHz Processor	AWDY
Intel Xeon Gold 6140 18C 140W 2.3GHz Processor	AWE1
Intel Xeon Gold 6142 16C 150W 2.6GHz Processor	AWDW
Intel Xeon Gold 6148 20C 150W 2.4GHz Processor	AWDX
Intel Xeon Gold 6150 18C 165W 2.7GHz Processor	AWDT
Intel Xeon Gold 6152 22C 140W 2.1GHz Processor	AWDV
Intel Xeon Platinum processors	
Intel Xeon Platinum 8160 24C 150W 2.1GHz Processor	AWDP
Intel Xeon Platinum 8170 26C 165W 2.1GHz Processor	AWDK
Intel Xeon Platinum 8176 28C 165W 2.1GHz Processor	AWDH

Memory

The SR650 for ThinkAgile SXM supports up to 1.5 TB of memory with 24x TruDDR4 DIMMs. Each processor has six memory channels, and there are two DIMMs per channel. All DIMMs in the system operate at the same memory speed up to 2666 MHz.

Note: Maximum memory speed can be achieved when Max performance mode is enabled in UEFI.

Lenovo TruDDR4 memory uses the highest-quality components sourced from Tier 1 DRAM suppliers and only memory that meets strict requirements is selected. It is compatibility tested and tuned on every ThinkSystem server to maximize performance and reliability.

TruDDR4 memory has a unique signature programmed into the DIMM, which enables Lenovo servers to verify whether the memory installed is qualified and supported. Lenovo qualified and supported TruDDR4 memory is covered by Lenovo warranty, and service and support provided worldwide.

The following memory protection technologies are supported:

- ECC
- SDDC (for x4-based memory DIMMs)
- ADDDC (for x4-based memory DIMMs)
- Patrol scrubbing
- Demand scrubbing

The following table lists memory selection options available for the SR650 for ThinkAgile SXM.

Table 15. Memory options

Capacity	Description	Feature code	Quantity supported
384 GB	ThinkSystem 16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	AUNC	24
576 GB	ThinkSystem 16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	AUNC	12
	ThinkSystem 32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	AUND	12
768 GB	ThinkSystem 32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	AUND	24
1.5 TB	ThinkSystem 64GB TruDDR4 2666 MHz (4Rx4 1.2V) LRDIMM	AUNE	24

Internal storage

The SR650 hyperconverged node for hybrid storage has 14x 3.5" hot-swap drive bays (12 on the front; 2 on the rear) connected to the ThinkSystem 430-16i SAS/SATA HBA (JBOD mode), and an internal M.2 Kit with Mirroring for 2x M.2 non-hot-swap SSDs.

The SR650 hyperconverged node for all flash storage has 24x 2.5" hot-swap drive bays connected to three ThinkSystem 430-8i SAS/SATA HBAs (JBOD mode), and an internal M.2 Kit with Mirroring for 2x M.2 non-hot-swap SSDs.

For the boot volume, the hyperconverged nodes use 2x M.2 480GB SSDs installed in the M.2 Kit with Mirroring. The drives are configured in a RAID-1 group that provides highly available boot volume for the system software.

The following table lists the internal drive configuration for the data storage of the hyperconverged nodes.

Table 16. Internal drive configuration: Data storage

Model	12x 3.5-inch (front) + 2x 3.5-inch (rear) hot-swap drive bays (data storage)		
	Quantity, drive types	Drive layout	Storage controller
SR650 for ThinkAgile SXM Hybrid	Config 1: 40 TB 4x 800GB 12Gb SAS SSDs 10x 4TB 7.2K 6Gb NL SATA HDDs	4x SSDs (JBOD) S2D caching 10x HDDs (JBOD) S2D capacity	1x 430-16i
	Config 2: 60 TB 4x 1.6TB 12Gb SAS SSDs 10x 6TB 7.2K 6Gb NL SATA HDDs	4x SSDs (JBOD) S2D caching 10x HDDs (JBOD) S2D capacity	1x 430-16i
	Config 3: 80 TB 4x 3.2TB NVMe PCIe 3.0 x4 SSDs 10x 8TB 7.2K 6Gb NL SATA HDDs	4x SSDs (JBOD) S2D caching 10x HDDs (JBOD) S2D capacity	1x Onboard NVMe 1x 430-16i
	Config 4: 100 TB 4x 3.2TB NVMe PCIe 3.0 x4 SSDs 10x 10TB 7.2K 6Gb NL SATA HDDs	4x SSDs (JBOD) S2D caching 10x HDDs (JBOD) S2D capacity	1x Onboard NVMe 1x 430-16i
	Config 5: 120 TB 4x 3.2TB NVMe PCIe 3.0 x4 SSDs 10x 12TB 7.2K 6Gb NL SATA HDDs	4x SSDs (JBOD) S2D caching 10x HDDs (JBOD) S2D capacity	1x Onboard NVMe 1x 430-16i
SR650 for ThinkAgile SXM All Flash	Config 1: 23 TB 4x 1.6TB NVMe PCIe 3.0 x4 SSDs 12x 1.92TB 6Gb SATA SSDs	4x SSDs (JBOD) S2D caching 12x SSDs (JBOD) S2D capacity	1x Onboard NVMe 3x 430-8i
	Config 2: 30 TB 4x 1.6TB NVMe PCIe 3.0 x4 SSDs 16x 1.92TB 6Gb SATA SSDs	4x SSDs (JBOD) S2D caching 16x SSDs (JBOD) S2D capacity	1x Onboard NVMe 3x 430-8i
	Config 3: 38 TB 4x 3.2TB NVMe PCIe 3.0 x4 SSDs 20x 1.92TB 6Gb SATA SSDs	4x SSDs (JBOD) S2D caching 20x SSDs (JBOD) S2D capacity	1x Onboard NVMe 3x 430-8i
	Config 4: 46 TB 4x 1.6TB NVMe PCIe 3.0 x4 SSDs 12x 3.84TB 6Gb SATA SSDs	4x SSDs (JBOD) S2D caching 12x SSDs (JBOD) S2D capacity	1x Onboard NVMe 3x 430-8i
	Config 5: 61 TB 4x 1.6TB NVMe PCIe 3.0 x4 SSDs 16x 3.84TB 6Gb SATA SSDs	4x SSDs (JBOD) S2D caching 16x SSDs (JBOD) S2D capacity	1x Onboard NVMe 3x 430-8i
	Config 6: 76 TB 4x 3.2TB NVMe PCIe 3.0 x4 SSDs 20x 3.84TB 6Gb SATA SSDs	4x SSDs (JBOD) S2D caching 20x SSDs (JBOD) S2D capacity	1x Onboard NVMe 3x 430-8i

The following table lists the internal drive configurations for the boot volume of the hyperconverged nodes.

Table 17. Internal drive configurations: Boot volume

Model	2.5-inch non-hot-swap internal drive bays (boot volume)		
	Quantity, drive types	Drive layout	Storage controller
SR650 for ThinkAgile SXM	2x M.2 480GB SATA 6Gbps Non-Hot-Swap SSDs	1x RAID 1 (2x SSDs) boot volume	M.2 Kit with Mirroring

The following table lists the HDD and SSD selection options for the SR650 hyperconverged nodes for hybrid and all flash storage.

Table 18. HDDs and SSDs for hyperconverged nodes: Hybrid storage

Description	Feature code	Quantity				
		40 TB	60 TB	80 TB	100 TB	120 TB
Capacity drives - 6 Gbps SATA HDDs						
ThinkSystem 3.5" 4TB 7.2K SATA 6Gb Hot Swap 512n HDD	AUU8	10	-	-	-	-
ThinkSystem 3.5" 6TB 7.2K SATA 6Gb Hot Swap 512e HDD	AUUA	-	10	-	-	-
ThinkSystem 3.5" 8TB 7.2K SATA 6Gb Hot Swap 512e HDD	AUU9	-	-	10	-	-
ThinkSystem 3.5" 10TB 7.2K SATA 6Gb Hot Swap 512e HDD	AUUB	-	-	-	10	-
ThinkSystem 3.5" 12TB 7.2K SATA 6Gb Hot Swap 512e HDD	B118	-	-	-	-	10
Cache drives - 12 Gbps SAS SSDs						
ThinkSystem 3.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	B4Y8	4	-	-	-	-
ThinkSystem 3.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	B8HT	4	-	-	-	-
ThinkSystem 3.5" HUSMM32 800GB Performance SAS 12Gb Hot Swap SSD	B170	4	-	-	-	-
ThinkSystem 3.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD	B4Y9	-	4	-	-	-
ThinkSystem 3.5" PM1645a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	B8JN	-	4	-	-	-
ThinkSystem 3.5" HUSMM32 1.6TB Performance SAS 12Gb Hot Swap SSD	B171	-	4	-	-	-
Cache drives - P4600 NVMe PCIe 3.0 x4 SSDs						
ThinkSystem 3.5" Intel P4600 3.2TB Mainstream NVMe PCIe 3.0 x4 HS SSD	B2XG	-	-	4	4	4
Cache drives - P4610 NVMe PCIe 3.0 x4 SSDs						
ThinkSystem 3.5" Intel P4610 3.2TB Mainstream NVMe PCIe 3.0 x4 HS SSD	B58D	-	-	4	4	4

Table 19. SSDs for hyperconverged nodes: All flash storage

Description	Feature code	Quantity					
		23 TB	30 TB	38 TB	46 TB	61 TB	76 TB
Capacity drives - 6 Gbps SATA HDDs							
ThinkSystem 2.5" Intel S4510 1.92TB Entry SATA 6Gb Hot Swap SSD	B49B	12	16	20	-	-	-
ThinkSystem 2.5" Intel S4510 3.84TB Entry SATA 6Gb Hot Swap SSD	B49C	-	-	-	12	16	20
ThinkSystem 2.5" Intel S4500 3.84TB Entry SATA 6Gb Hot Swap SSD	B0Z2	-	-	-	12	16	20
Cache drives - P4600 NVMe PCIe 3.0 x4 SSDs							
ThinkSystem U.2 Intel P4600 1.6TB Mainstream NVMe PCIe 3.0 x4 HS SSD	B11J	4	4	-	4	4	-
ThinkSystem U.2 Intel P4600 3.2TB Mainstream NVMe PCIe 3.0 x4 HS SSD	B11K	-	-	4	-	-	4
Cache drives - P4610 NVMe PCIe 3.0 x4 SSDs							
ThinkSystem U.2 Intel P4610 1.6TB Mainstream NVMe PCIe 3.0 x4 HS SSD	B589	4	4	-	4	4	-
ThinkSystem U.2 Intel P4610 3.2TB Mainstream NVMe PCIe 3.0 x4 HS SSD	B58A	-	-	4	-	-	4

The following table lists the SSDs for the boot volume of the SR650 hyperconverged nodes.

Table 20. Boot volume SSDs

Description	Feature code	Quantity
ThinkSystem M.2 5100 480GB SATA 6Gbps Non-Hot-Swap SSD	B11V	2
ThinkSystem M.2 5300 480GB SATA 6Gbps Non-Hot Swap SSD	B919	2

Network connectivity

For the management network, the SR650 for ThinkAgile SXM uses 1 GbE connectivity with the 1 GbE dedicated management port on the XCC that is connected to the management network switch.

For the VM/storage network, the SR650 for ThinkAgile SXM provides two-port 25 GbE connectivity: Each port is connected to a separate VM/storage switch. For more information, refer to [Networking](#).

The following table lists the network adapters available for selection.

Table 21. Network adapter

Description	Feature code	Quantity
Mellanox ConnectX-4 Lx 2x25GbE SFP28 Adapter	AUAJ	1
Mellanox ConnectX-4 Lx 1x40GbE QSFP+ Adapter	ATRN	2

Configuration notes:

- Either one dual-port or two single port adapters can be selected to provide dual-port connectivity.
- If single-port adapters are selected, the Mellanox QSA 100G to 25G Cable Adapters are derived by the configurator to provide 25 GbE SFP28 connectivity.
- The 3 m UTP Cat5e cable for the 1 GbE management network connection and two 3 m passive 25 GbE SFP28 DAC cables for the VM/storage network connections are included for each hyperconverged node.

For more information about the ThinkSystem SR650 server, refer to the Lenovo Press Product Guide: <http://lenovopress.com/lp0644>

Networking

The ThinkAgile SX for Microsoft Azure Stack Hub uses one Lenovo RackSwitch NE0152T or G8052 1 GbE switch for management network connectivity and two Lenovo ThinkSystem NE2572 25 GbE switches for VM/storage network connectivity.

Dedicated XClarity Controller (XCC) management ports (on the management node and hyperconverged nodes) and management ports on the NE2572 VM/storage network switches are connected to the NE0152T or G8052 management network switch via the 1 GbE links. The management node (25 GbE port operating at 10 Gbps) also is connected to the management switch via the 10 GbE link. Two VM/storage network switches (25 GbE ports operating at 10 Gbps) are connected to the management switch via the 20 GbE virtual link aggregation group (VLAG) connection.

25 GbE hyperconverged node ports on the dual-port adapters or two single-port adapters are connected to a pair of the NE2572 VM/storage network switches. The switches are connected to each other via two 100 GbE links (provided by two 100 Gb QSFP+ active optical cables (AOCs) included) that are configured in a link aggregation group (LAG). Each of two NE2572 switches provides two 10 GbE uplinks (10 GbE SR SFP+ transceivers) or two 25 GbE uplinks (25 GbE SR SFP28 Transceiver) that are configured in a virtual link aggregation group for upstream network integration.

The network connectivity topology is illustrated in the following figure.

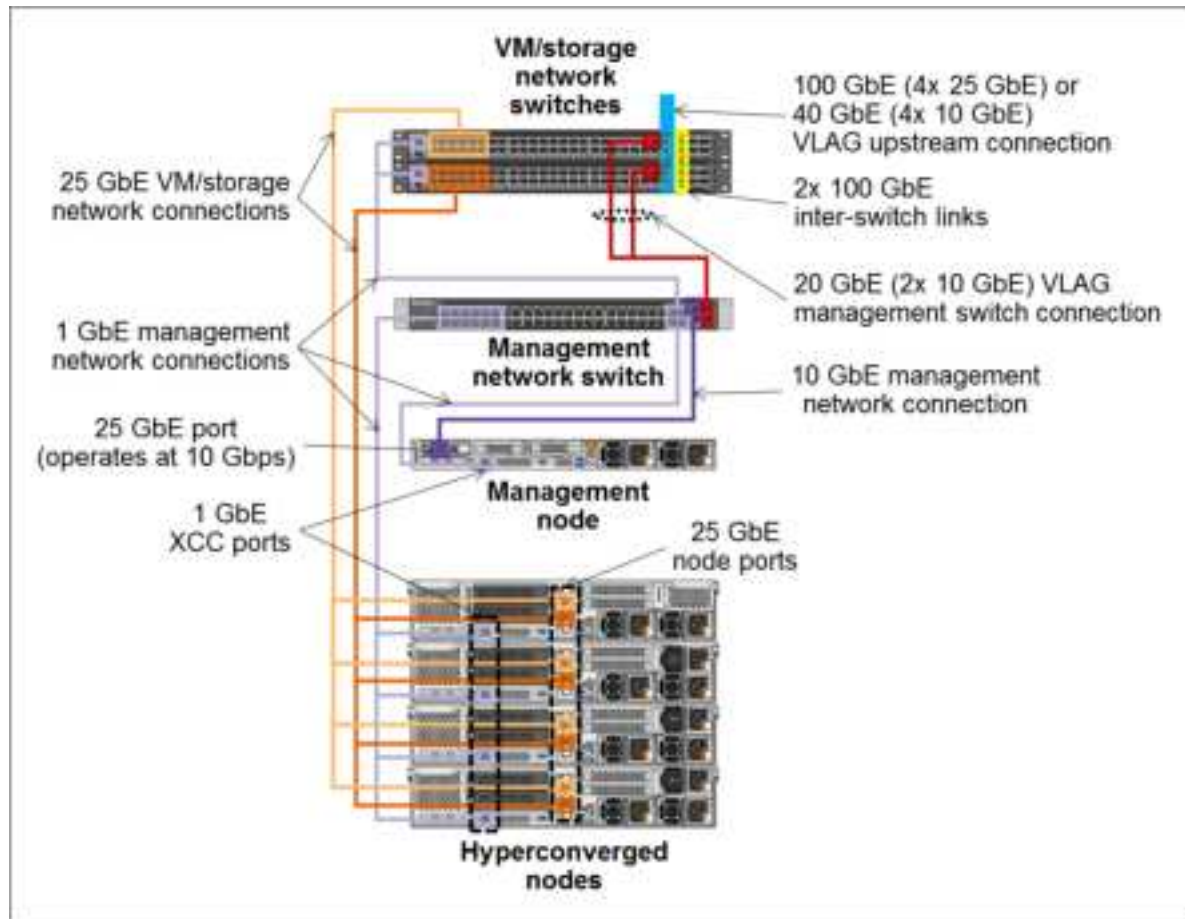


Figure 6. Network connectivity topology

The following table lists the derived network switches.

Table 22. RackSwitch for ThinkAgile SXM Series

Description	Machine Type-Model	Feature code	Quantity
1 GbE management network			
RackSwitch G8052 (Rear to Front) for ThinkAgile SXM	7159-HCH	AX80	1
RackSwitch NE0152T (Rear to Front) for ThinkAgile SXM	7Y81CTO3WW	B6UN	1
25 GbE VM/storage network			
RackSwitch NE2572 25GbE (Rear to Front) for ThinkAgile SXM	7159-HEA	B1EE	2

The following table summarizes specifications of the Lenovo Ethernet switches for ThinkAgile SXM.

Table 23. RackSwitch specifications summary

Feature	G8052	NE0152T	NE2572
Software	Enterprise NOS (ENOS)	Cloud NOS (CNOS)	Cloud NOS (CNOS)
Ports	48x GbE RJ-45 fixed 4x SFP/SFP+	48x GbE RJ-45 fixed 4x SFP/SFP+	48x SFP28/SFP+ 6x QSFP28/QSFP+
Media types	- RJ-45: UTP Category 5, 5e, 6 - SFP+: 10 GbE DAC cables	- RJ-45: UTP Category 5, 5e, 6 - SFP+: 10 GbE DAC cables	- SFP28: 25 GbE DAC cables - SFP+: 10 GbE SR SFP+ 10 GbE DAC cables - QSFP28: 100 GbE AOCs
Management ports	In-band management	1x 1 GbE RJ-45	1x 1 GbE RJ-45
Layer 2 switching	Yes	Yes	Yes
Layer 3 switching	Yes	Yes	Yes
VLANs	Yes	Yes	Yes
VLAN tagging	Yes	Yes	Yes
Link aggregation	Yes	Yes	Yes
Virtual link aggregation	Yes	Yes	Yes
Quality of Service	Yes	Yes	Yes
IPv4/IPv6 management	Yes	Yes	Yes
IPv4/IPv6 routing	Yes	Yes	Yes
Converged Enhanced Ethernet	No	No	Yes
Cooling	3x hot-swap fans (N+1 redundancy)	3x hot-swap fans (N+1 redundancy)	5x hot-swap fans (N+1 redundancy)
Power supplies	2x 450 W AC redundant hot-swap	2x 150 W AC redundant hot-swap	2x 770 W AC redundant hot-swap

The following table lists the transceivers that are available for the NE2572 uplink ports.

Table 24. Transceiver for the NE2572 uplinks

Description	Feature code	Quantity (min / max)
Lenovo 10 GbE SFP+ SR Transceiver (default selection)	5053	0 / 2
Lenovo 25GBASE-SR SFP28 Transceiver (optional selection)	AV1B	0 / 2

Configuration notes:

- All UTP Category 5E cables for the 1 GbE management network and 25 GbE SFP28 DAC cables for the VM/storage network are derived based on the number of nodes selected.
- VM/storage network uplinks require customer-supplied MMF OM3 or OM4 fiber optic cables with LC connectors.

For more information about the RackSwitch switches, see the following Lenovo Press Product Guides:

- Lenovo RackSwitch G8052
<http://lenovopress.com/tips1270>
- Lenovo ThinkSystem NE0152T RackSwitch
<http://lenovopress.com/lp0965>
- Lenovo ThinkSystem NE2572 RackSwitch
<http://lenovopress.com/lp0608>

Software

The ThinkAgile SX for Microsoft Azure Stack Hub includes the following software components:

- Microsoft Azure Stack Hub
- Lenovo XClarity Pro

Microsoft Azure Stack Hub

The Microsoft Azure Stack Hub running on ThinkAgile SXM offers the following key features:

- Administrator portal
 - Provides a web-based interface for the cloud infrastructure to perform administrative tasks
 - Supports management of cloud resources and services
 - Enables creation of plans, offers, and subscriptions for tenant users
 - Allows monitoring of health and alerts and managing capacity
- User (Tenant) portal
 - Provides a web-based self-service interface for tenants to interact with the cloud
 - Supports provisioning, monitoring, and management of services for subscribed tenants
- Identity management
 - Provides authentication and authorization for cloud services
 - Uses Azure Active Directory (AAD) or Active Directory Federation Services (AD FS)
 - Supports role-based access control (RBAC) to manage access to resources and services
- Compute Resource Provider
 - Manages lifecycle of Virtual Machines (VMs) in a cloud environment
 - Creates, updates, and deletes VM images
 - Manages VM snapshots, restore points, and availability sets
- Network Resource Provider
 - Delivers Software Defined Networking (SDN) and Network Function Virtualization (NFV)
 - Implements network isolation and segmentation with virtual networks
 - Enables communications across virtual networks with traffic routing
 - Secures cloud resources by filtering network traffic with network security groups
 - Offers load balancing across multiple instances for enhanced availability and performance
- Storage Resource Provider
 - Delivers cloud storage services
 - Supports unstructured objects, structured datasets, message queuing, and SMB file storage
 - Offers storage cloud administration service
- Azure Resource Manager
 - Interacts with resource providers and enables cloud orchestration
 - Automates the deployment of infrastructure, services, and applications
 - Provisions cloud resources from JavaScript Object Notation (JSON) templates
 - Supports security, auditing, and tagging of cloud resources
- Usage data reporting
 - Provides metering for the cloud
 - Monitors various cloud resources and system components
 - Collects and aggregates the resource usage data across all resource providers
 - Transmits collected data to Azure commerce for billing processing

Microsoft Azure Stack Hub uses Storage Spaces Direct (S2D) unified storage that offers the following features:

- Provides distributed scale-out storage for cloud services and resources
- Scales easily by simply adding more hyperconverged nodes
- Protects from node or drive failures with data redundancy and self-healing

Lenovo XClarity

Lenovo XClarity offers the following features for the ThinkAgile SX for Microsoft Azure Stack Hub:

- Auto-discovery and monitoring of the management node, hyperconverged nodes, and switches
- Firmware updates and compliance enforcement
- Pattern-based configuration management
- Bare-metal deployment of operating systems and hypervisors
- External alerts and notifications via SNMP traps, syslog remote logging, and e-mail
- Secure connections to managed endpoints
- NIST 800-131A or FIPS 140-2 compliant cryptographic standards between the management solution and managed endpoints
- Integration into existing higher level management systems such as cloud automation and orchestration tools through REST APIs, providing extensive external visibility and control over hardware resources
- An intuitive, easy-to-use GUI

Warranty and support

The ThinkAgile SX for Microsoft Azure Stack Hub can be configured with a three-, four, or five-year customer-replaceable unit (CRU) and onsite (for field-replaceable units [FRUs] only) limited hardware warranty with 24x7 ThinkAgile Advantage Single Point of Support (Lenovo hardware and Microsoft Azure Stack Hub software; requires an active Azure Stack Hub software support contract with Microsoft) 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 Microsoft, on behalf of the customer, for software-related problem determination. Microsoft will contact the customer and will own the software-related problem resolution until closure.

A Microsoft Azure Stack Hub subscription and software support contract for ThinkAgile SX for Microsoft Azure Stack Hub should be obtained from Microsoft by the customer.

The base warranty provides 9x5 Next Business Day response with parts delivered. Lenovo's additional support services provide a sophisticated, unified support structure for a customer's data center, with an experience consistently ranked number one in customer satisfaction worldwide.

The following additional Lenovo support services are available for selection:

- **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 capabilities:
 - Direct technician-to-technician access through a dedicated phone line.
 - 24x7x365 remote support.
 - Single point of contact service.
 - End to end case management.
 - 3rd Party collaborative software support.
 - Online case tools and live chat support.
 - On-demand remote system analysis.

- **Warranty service level upgrades (Preconfigured Support)** are available to meet the on-site response time targets that match the criticality of customer's systems:
 - 3, 4, or 5 years of service coverage.
 - 1-year or 2-year post-warranty extensions.
 - **Foundation Service:** 9x5 service coverage with next business day onsite response.
 - **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select regions).
 - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select regions).

- **Managed Services**

Lenovo Managed Services provide continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of a customer's data center using state of the art tools, systems, and practices by a team of highly skilled and experienced Lenovo services professionals.

Quarterly reviews check error logs, verify firmware and operating system device driver levels, and software as needed. Lenovo will also maintain records of latest patches, critical updates, and firmware levels, to ensure customer's systems are providing business value through optimized performance.

- **Technical Account Management (TAM)**

A Lenovo Technical Account Manager helps customers optimize operations of their data centers based on a deep understanding of customer's business. Customers gain direct access to a Lenovo TAM, who serves as their single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. Also, a TAM helps proactively make service recommendations and manage service relationship with Lenovo to make certain that customer's needs are met.

- **YourDrive YourData**

Lenovo's YourDrive YourData service is a multi-drive retention offering that ensures that customer's data is always under their control, regardless of the number of drives that are installed in their Lenovo server. In the unlikely event of a drive failure, customers retain possession of their drive while Lenovo replaces the failed drive part. Customer's data stays safely on customer premises, in their hands. The YourDrive YourData service can be purchased in convenient bundles with Foundation, Essential, or Advanced services.

- **Health Check**

Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that customer systems and business are always running at their best. Health Check supports Lenovo-branded server, storage, and networking devices, as well as select Lenovo-supported products from other vendors that are sold by Lenovo or a Lenovo-Authorized Reseller.

Some regions might have different warranty terms and conditions than the standard warranty. This is due to local business practices or laws in the specific region. Local service teams can assist in explaining region-specific terms when needed. Examples of region-specific warranty terms are second or longer business day parts delivery or parts-only base warranty.

If warranty terms and conditions include onsite labor for repair or replacement of parts, Lenovo will dispatch a service technician to the customer site to perform the replacement. Onsite labor under base warranty is limited to labor for replacement of parts that have been determined to be field-replaceable units (FRUs). Parts that are determined to be customer-replaceable units (CRUs) do not include onsite labor under base warranty.

If warranty terms include parts-only base warranty, Lenovo is responsible for delivering only replacement parts that are under base warranty (including FRUs) that will be sent to a requested location for self-service. Parts-only service does not include a service technician being dispatched onsite. Parts must be changed at customer's own cost and labor and defective parts must be returned following the instructions supplied with the spare parts.

Lenovo support services are region-specific. Not all support services are available in every region. For information about Lenovo support services that are available in a specific region, refer to the following resources:

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

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

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

Deployment services

The following Lenovo Professional Services are included with the ThinkAgile SX for Microsoft Azure Stack Hub to get customers up and running quickly:

- Conducting remote preparation and planning
- Verifying firmware versions and performing firmware updates, if needed
- Configuring XCC management settings
- Installing Lenovo XClarity
- Configuring Lenovo XClarity network settings and performing discovery and inventory
- Installing Azure Stack Hub software
- Transferring knowledge
- Developing post-installation documentation

The optional basic hardware installation services are also available from Lenovo Services, including unpacking and inspecting the system on the customer site, connecting to power and network, verifying operation, and disposing of the packaging.

Physical specifications

The ThinkAgile SXM4400 25U model has the following dimensions and weight (approximate):

- Height: 1244 mm (49.0 in)
- Width: 605 mm (23.8 in)
- Depth: 1000 mm (39.4 in)
- Total rack load capacity: 570 kg (1256.6 lb)
- Total rack weight (maximum): 670 kg (1477.1 lb)

The ThinkAgile SXM4400 42U and SXM6400 models have the following dimensions and weight (approximate):

- Height: 2009 mm (79.1 in)
- Width: 600 mm (23.6 in)
- Depth: 1096 mm (43.1 in)
- Total rack load capacity: 953 kg (2101 lb)
- Total rack weight (maximum): 1127 kg (2484.6 lb)

Operating environment

The ThinkAgile SX for Microsoft Azure Stack Hub models are supported in the following environment:

- Air temperature: 5 °C - 35 °C (41 °F - 95 °F)
- Humidity: 10% to 80% (non-condensing)
- Power load (rated maximum):
 - SXM4400 25U (fully configured solution): 12641 W
 - SXM4400 42U / SXM6400 (fully configured solution): 23905 W
 - Solution components:
 - SR630: 722 W
 - SR650: 1408 W
 - G8052: 200 W
 - NE0152T: 77 W
 - NE2572: 289 W
- Heat output (maximum):
 - SXM4400 25U (fully configured solution): 43132 BTU/hour
 - SXM4400 42U / SXM6400 (fully configured solution): 81564 BTU/hour
 - Solution components:
 - SR630: 2463 BTU/hour
 - SR650: 4804 BTU/hour
 - G8052: 683 BTU/hour
 - NE0152T: 261 BTU/hour
 - NE2572: 986 BTU/hour

Regulatory compliance

The ThinkAgile SX for Microsoft Azure Stack Hub solution components conform to the following regulations:

- AS/NZS CISPR 22, Class A
- CE Mark
- CISPR 22, Class A
- CNS13438, Class A; CNS14336-1
- EN55022 Class A
- EN55024
- EN60950-1
- FCC Part 15, Class A
- GB4943.1, GB9254 Class A, GB17625.1
- ICES-003, Class A
- Reduction of Hazardous Substances (ROHS)
- TUV-GS
- UL/CSA/IEC 60950-1
- VCCI, Class A

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:
<http://www.lenovo.com/us/en/landingpage/lenovo-financial-services>

Related publications and links

For more information, see these resources:

- Lenovo ThinkAgile SX for Microsoft Azure Stack Hub home page
<http://www3.lenovo.com/us/en/p/WMD00000272>
- Lenovo Data Center Solution Configurator (DCSC):
<http://dcsc.lenovo.com>
- Lenovo ThinkAgile SX for Microsoft Azure Stack Hub Documentation
http://thinkagile.lenovofiles.com/help/topic/com.lenovo.thinkagile.sxm.doc/sxm_introduction.html
- Lenovo ThinkAgile SX for Microsoft Azure Stack Hub Best Recipes
<http://datacentersupport.lenovo.com/us/en/solutions/HT505122>

Related product families

Product families related to this document are the following:

- [Microsoft Alliance](#)
- [ThinkAgile SX for Microsoft Azure Stack](#)
- [Hyperconverged Infrastructure](#)
- [Hyperconverged Infrastructure](#)

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This document, LP0771, was created or updated on May 26, 2020.

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