



Lenovo ThinkAgile VX 1U Certified Node Product Guide

Lenovo ThinkAgile VX Certified Nodes are designed for deploying industry-leading Hyper-Converged Infrastructure (HCI) software from VMware. They deliver fully validated and integrated Lenovo hardware and firmware that is certified with VMware software and preloaded with the VMware ESXi hypervisor. VMware offers a unique, software-defined approach to hyper convergence, leveraging the hypervisor to deliver compute, storage and management in a tightly integrated software stack.

The ThinkAgile VX 1U Certified Nodes are 1U rack-mount systems can be optimized for various types of workloads, including general purpose workloads for small and medium businesses, compute-heavy workloads (such as virtual desktop infrastructure (VDI), server virtualization, private/hybrid clouds, enterprise applications, and light databases), and high-performance workloads (such as databases, e-mail and collaboration, and load-balancing clusters).

The ThinkAgile 1U Certified Nodes are shown in the following figure.



Figure 1. Lenovo ThinkAgile VX 1U Certified Node with 4x LFF (top) or 10x SFF (bottom) drive bays

Did you know?

The ThinkAgile VX Certified Nodes are built on industry-leading Lenovo ThinkSystem servers that feature enterprise-class reliability, management, and security.

The ThinkAgile VX Certified Nodes offer ThinkAgile Advantage Single Point of Support for quick 24/7 problem reporting and resolution.

Key features

The ThinkAgile VX Certified Nodes offer the following key features:

- Offer quick and convenient path to implement a hyperconverged solution powered by VMware vSAN with a wide range of selection options for processors, memory, storage, and network connectivity.
- Built on proven and reliable Lenovo ThinkSystem servers featuring Intel Xeon Processor Scalable Family that provide compute power for a variety of workloads and applications.
- Meet various workload demands with cost-efficient hybrid or performance-optimized all-flash storage configurations.
- Deliver fully validated and integrated hardware and firmware that is certified with VMware software.
- Preloaded with the VMware ESXi hypervisor and ready for out-of-box deployment (software licenses are not included).
- Provide flexibility in using the existing VMware enterprise license agreements or purchasing new software licenses and support contracts from VMware or Lenovo.
- Include Lenovo ThinkAgile Advantage Single Point of Support for quick 24/7 problem reporting and resolution.
- Offer optional Lenovo deployment services to get customers up and running quickly.

The VMware software running on ThinkAgile VX Certified Nodes delivers the following key features:

- Distributed architecture that allows "pay-as-you-grow", non-disruptive scaling by adding new nodes to the cluster (scale-out) to increase capacity and performance.
- Advanced capacity management, including deduplication, compression, and erasure coding (RAID 5/6), which helps deliver greater storage utilization with dramatically lower storage capacity and costs.
- Automation of VM storage provisioning and control of storage service levels (capacity, performance, availability) with VM-centric policies to load balance storage resources.
- Native HCI security solution with two-factor authentication (SecurID and CAC) and data-at-rest encryption that does not require self-encrypting drives (SEDs).
- Stretched cluster with local and site failure protection between two geographically dispersed sites for higher level of availability with near zero downtime.
- Centralized management with provisioning, administering, and monitoring virtual resources across multiple hosts and clusters from a centralized interface.
- Rapid workload provisioning, simplified data center operations, increased business efficiency, and decreased CAPEX and OPEX costs.
- VM and data protection with agent-less, image-level virtual machine backups and application-aware protection for business-critical Microsoft applications (Exchange, SQL Server, SharePoint) along with WAN-efficient, encrypted backup data replication.
- Reduced unplanned downtime and virtually eliminated planned downtime for server and storage maintenance with live workload migration, high availability, and fault tolerance.
- Enhanced application performance and availability with resource management, load balancing, and access prioritization.
- Intelligent operations management and automation to proactively monitor and manage compute, storage, and networking resources, identify performance bottlenecks, and re-balance workloads by leveraging predictive analytics.
- Capacity planning and optimization guidance to address future needs with performance trends, projections and extended forecasts.
- Managing remote offices and branch offices with rapid provisioning of servers through virtualization, minimization of host configuration drift, and enhanced visibility into regulatory compliance, across multiple sites.

Components and connectors

The following figure shows the front view of the VX 1U Certified Node with ten SFF drive bays.

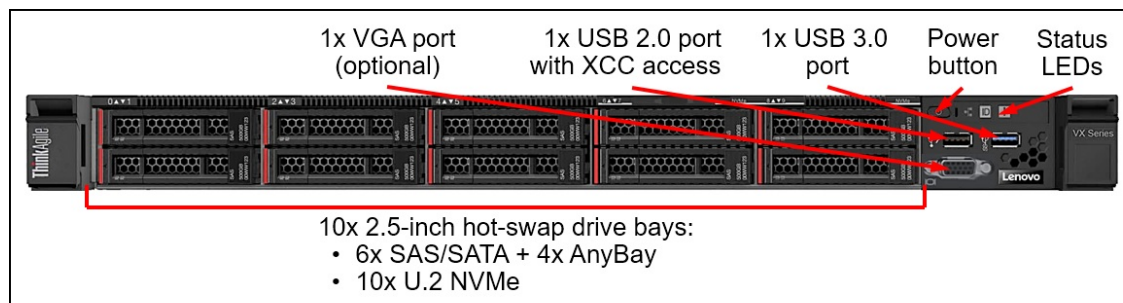


Figure 2. VX 1U Certified Node front view: 10x SFF drive bays

The following figure shows the front view of the VX 1U Certified Node with four LFF drive bays.

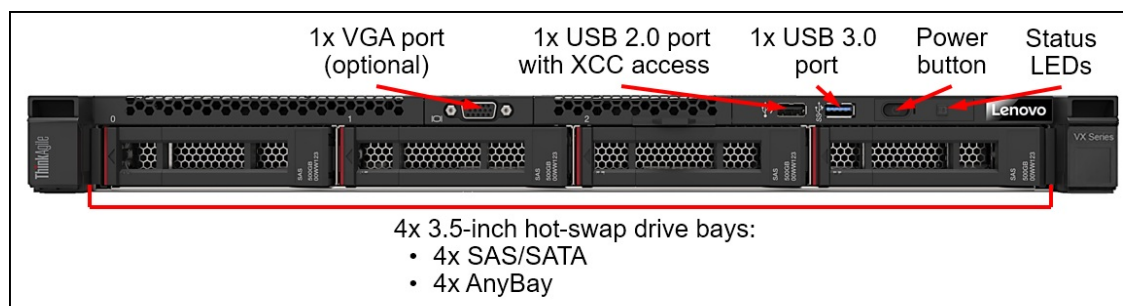


Figure 3. VX 1U Certified Node front view: 4x LFF drive bays

The front of the VX 1U Certified Node includes the following components:

- 10x SFF or 4x LFF hot-swap drive bays
- One VGA port (optional)
- One USB 2.0 port with XClarity Controller access
- One USB 3.0 port
- A Power button
- Status LEDs that display the status of the system

The following figure shows the rear view of the VX 1U Certified Node.

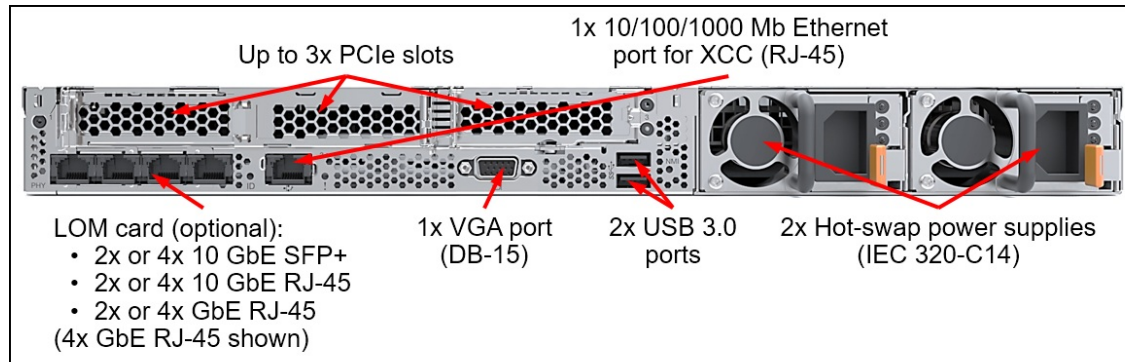


Figure 4. VX 1U Certified Node rear view

The rear of the VX 1U Certified Node includes the following components:

- Up to three PCIe expansion slots (depending on the riser cards selected)
- One LOM card slot
- One 1 GbE port for XClarity Controller
- One VGA port
- Two USB 3.0 ports
- Up to two hot-swap power supplies

System specifications

The following table lists the system specifications of the ThinkAgile VX 1U Certified Node.

Table 1. VX 1U Certified Node system specifications

| Attribute | Specification |
|-------------------|--|
| Form factor | 1U Rack-mount. |
| Processor | One or two Intel Xeon Bronze, Silver, Gold, or Platinum processors. |
| Chipset | Intel C624. |
| Memory | 24 DIMM sockets (Up to 12 DIMMs per processor; six memory channels per processor with two DIMMs per channel). Support for RDIMMs, LRDIMMs, or 3DS RDIMMs. Memory types cannot be intermixed. Memory speed up to 2666 MHz. |
| Memory capacity | <ul style="list-style-type: none"> • With RDIMMs: Up to 768 GB with 24x 32 GB RDIMMs and two processors. • With LRDIMMs: Up to 1.5 TB with 24x 64 GB LRDIMMs and two processors. • With 3DS RDIMMs: Up to 3 TB with 128 GB 3DS RDIMMs and two processors. (Requires processors that support 1.5 TB of memory per socket). |
| Memory protection | Error correction code (ECC), Single Device Data Correction (SDDC; for x4-based memory DIMMs), Adaptive Double Device Data Correction (ADDDC; for x4-based memory DIMMs, requires Intel Xeon Gold or Platinum processors), patrol scrubbing, and demand scrubbing. |
| Drive bays | <ul style="list-style-type: none"> • Up to 6 SAS/SATA hot-swap drive bays: 4x 3.5" (front) + 2x 2.5" (rear) • 4 LFF AnyBay hot-swap drive bays: 4x 3.5" (front) • Up to 12 SFF hot-swap drive bays: 6x 2.5" SAS/SATA & 4x 2.5" AnyBay (front) + 2x 2.5" SAS/SATA (rear) • 10 SFF U.2 NVMe PCIe SSD hot-swap drive bays |

| Attribute | Specification |
|---------------------|---|
| Drive capacities | 2.5-inch hot-swap drives: <ul style="list-style-type: none"> ● 12 Gbps SAS HDDs up to 2.4 TB ● 12 Gbps SAS SSDs up to 7.68 TB ● 6 Gbps SATA SSDs up to 7.68 TB ● U.2 NVMe PCIe 3.0 x4 SSDs up to 6.4 TB 3.5-inch hot-swap drives: <ul style="list-style-type: none"> ● 12 Gbps NL SAS HDDs up to 12 TB ● 12 Gbps SAS SSDs up to 3.84 TB (2.5" SSD in a 3.5" tray) ● 6 Gbps SATA SSDs up to 7.68 TB (2.5" SSD in a 3.5" tray) ● NVMe PCIe 3.0 x4 SSDs up to 6.4 TB (2.5" SSD in a 3.5" tray) <p>Note: NVMe PCIe SSDs are supported in the AnyBay or U.2 NVMe drive bays and require the second processor to be installed.</p> |
| Storage controller | 1x 430-8i or 16i HBA (12 Gbps SAS/6 Gbps SATA). |
| Network interfaces | <ul style="list-style-type: none"> ● 1 GbE RJ-45: 2 - 16 (LOM + Up to 3 network adapters) ● 10 GbE RJ-45 or SFP+: 2 - 10 (LOM + Up to 3 network adapters) ● 25 GbE SFP28: 1 - 6 (Up to 3 network adapters) ● 40 GbE QSFP+: 1 - 3 (Up to 3 network adapters) ● 100 GbE QSFP28: 1 - 4 (Up to 2 network adapters) |
| Boot drive | 2x 128 GB or 2x 480 GB M.2 non-hot-swap SSDs (RAID-1). |
| I/O expansion slots | Up to four slots. Slot 4 is the fixed slot on the system planar, and the remaining slots depend on the riser cards installed. The slots are as follows: <ul style="list-style-type: none"> ● Slot 1: PCIe 3.0 x8, ML2 x8, or ML2 x16; low profile (for a network adapter) ● Slot 2: PCIe 3.0 x16 or x8; low profile or full-height, half-length (for a network adapter) ● Slot 3: PCIe 3.0 x16; low profile (for a network adapter) ● Slot 4: PCIe 3.0 x8 (for an internal storage controller) <p>Slot 3 requires the second processor to be installed.</p> |
| Ports | <ul style="list-style-type: none"> ● Front: <ul style="list-style-type: none"> ○ 1x USB 2.0 port with XClarity Controller access ○ 1x USB 3.0 port ○ 1x VGA port (optional) ● Rear: <ul style="list-style-type: none"> ○ 2x USB 3.0 ports ○ 1x VGA port ○ 1x RJ-45 10/100/1000 Mb Ethernet port for systems management |
| Cooling | Five (one processor) or seven (two processors) hot-swap system fans with N+1 redundancy. |
| Power supply | One or two redundant hot-swap 750 W or 1100 W (100 - 240 V) High Efficiency Platinum power supplies, or 750 W (200 - 240 V) High Efficiency Titanium power supplies. |
| Video | Matrox G200 with 16 MB memory integrated into the XClarity Controller. Maximum resolution is 1920x1200 at 60 Hz with 16 bits per pixel. |
| Hot-swap parts | SSDs, HDDs, power supplies, and fans. |
| Systems management | Lenovo XClarity Controller (XCC) Standard, Advanced, or Enterprise (Pilot 4 chip), proactive platform alerts, light path diagnostics, Lenovo XClarity Administrator with Integrator for VMware vCenter (optional), Lenovo XClarity Energy Manager (optional). |
| Security features | Power-on password, administrator's password, secure firmware updates, Trusted Platform Module (TPM) 1.2 or 2.0 (configurable UEFI setting). Optional lockable front bezel. |

| Attribute | Specification |
|----------------------|--|
| Software | Software licenses that can be purchased from Lenovo or provided by the customer: <ul style="list-style-type: none"> VMware vSphere: Standard, Enterprise Plus, Operations Management Enterprise Plus, Standard for ROBO, or Advanced for ROBO. VMware vSAN: Standard, Advanced, Enterprise, for ROBO, or for Desktop. VMware vCenter Server: Foundation or Standard VMware Horizon: Standard, Advanced, or Enterprise. |
| Hypervisors | VMware ESXi 6.0 U3, 6.5 U1, 6.5 U2, or 6.7 (factory preload). |
| 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, 24x7x4, or 24x7x2 response (parts delivered or onsite) or 6-hour or 24-hour committed repair (select countries). Also available are 1-year and 2-year post-warranty extensions, Your Drive Your Data and Premier Support. |
| Software maintenance | One-, three-, or five-year software support and subscription is included with the VMware software licenses available from Lenovo (optional). |
| Dimensions | Height: 43 mm (1.7 in.), width: 434 mm (17.1 in.), depth: 715 mm (28.1 in.). |
| Weight | Maximum configuration: 18.8 kg (41.4 lb). |

Factory-integrated models

Factory-integrated models of the ThinkAgile VX Certified Nodes are configured by using the Lenovo Data Center Solution Configurator (DCSC):

<http://dcsc.lenovo.com>

During the configuration process, you are selecting one of the base Configure-to-Order (CTO) models first, and then you are selecting components (processors, memory, drives, network adapters, power supplies, and software) for that model.

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

The following table lists the base CTO models of the VX 1U Certified Nodes.

Table 2. Base CTO models

| Description | Machine Type/Model |
|---------------------------------|--------------------|
| ThinkAgile VX 1U Certified Node | 7Y93CTO4WW |

The following table lists the available chassis selection options for the VX 1U Certified Nodes.

Table 3. Chassis selection options

| Description | Machine Type/Model | Feature code |
|--------------------------------------|--------------------|--------------|
| ThinkAgile VX 1U 2.5" 10 Bay Chassis | 7Y93CTO4WW | B1DK |
| ThinkAgile VX 1U 3.5" 4 Bay Chassis | 7Y93CTO4WW | B1DL |

The VX 1U Certified Nodes ship with the following items:

- *Electronic Publications Flyer*
- Tool-less Slide Rail Kit (with or without 1U CMA depending on the rack installation option)
- One or two customer-selected power cables (depending on the quantity of the power supplies)

Processors

The VX 1U Certified Nodes can be configured with one or two processors listed in the following table.

Table 4. Processor options

| Description | Part number* | Feature code* | Quantity (min / max) |
|--|--------------|---------------|----------------------|
| Intel Xeon Bronze processors | | | |
| Intel Xeon Bronze 3104 6C 85W 1.7GHz Processor | 7XG7A05528 | AWEJ | 1 / 2 |
| Intel Xeon Bronze 3106 8C 85W 1.7GHz Processor | 7XG7A05526 | AWEH | 1 / 2 |
| Intel Xeon Silver processors | | | |
| Intel Xeon Silver 4108 8C 85W 1.8GHz Processor | 7XG7A05527 | AWEG | 1 / 2 |
| Intel Xeon Silver 4109T 8C 70W 2.0GHz Processor | 7XG7A05530 | AWET | 1 / 2 |
| Intel Xeon Silver 4110 8C 85W 2.1GHz Processor | 7XG7A05531 | AWEE | 1 / 2 |
| Intel Xeon Silver 4112 4C 85W 2.6GHz Processor | 7XG7A05533 | AWEF | 1 / 2 |
| Intel Xeon Silver 4114 10C 85W 2.2GHz Processor | 7XG7A05534 | AWEC | 1 / 2 |
| Intel Xeon Silver 4114T 10C 85W 2.2GHz Processor | 7XG7A05535 | AWES | 1 / 2 |
| Intel Xeon Silver 4116 12C 85W 2.1GHz Processor | 7XG7A05532 | AWER | 1 / 2 |
| Intel Xeon Silver 4116T 12C 85W 2.1GHz Processor | 7XG7A05529 | AWEA | 1 / 2 |
| Intel Xeon Gold processors | | | |
| Intel Xeon Gold 5115 10C 85W 2.4GHz Processor | 7XG7A05551 | AWDU | 1 / 2 |
| Intel Xeon Gold 5117 14C 105W 2.0GHz Processor | 4XG7A09083 | B137 | 1 / 2 |
| Intel Xeon Gold 5118 12C 105W 2.3GHz Processor | 7XG7A05536 | AWEP | 1 / 2 |
| Intel Xeon Gold 5119T 14C 85W 1.9GHz Processor | 7XG7A05537 | AWEQ | 1 / 2 |
| Intel Xeon Gold 5120 14C 105W 2.2GHz Processor | 7XG7A05539 | AWE6 | 1 / 2 |
| Intel Xeon Gold 5120T 14C 105W 2.2GHz Processor | 7XG7A05538 | AWE8 | 1 / 2 |
| Intel Xeon Gold 5122 4C 105W 3.6GHz Processor | 7XG7A05547 | AWED | 1 / 2 |
| Intel Xeon Gold 6126 12C 125W 2.6GHz Processor | 7XG7A05546 | AWEL | 1 / 2 |
| Intel Xeon Gold 6128 6C 115W 3.4GHz Processor | 7XG7A05544 | AWEB | 1 / 2 |
| Intel Xeon Gold 6130 16C 125W 2.1GHz Processor | 7XG7A05543 | AWEN | 1 / 2 |
| Intel Xeon Gold 6130T 16C 125W 2.1GHz Processor | 7XG7A05542 | AWE4 | 1 / 2 |
| Intel Xeon Gold 6132 14C 140W 2.6GHz Processor | 7XG7A05561 | AWDY | 1 / 2 |
| Intel Xeon Gold 6134 8C 130W 3.2GHz Processor | 7XG7A05560 | AWE9 | 1 / 2 |
| Intel Xeon Gold 6134M 8C 130W 3.2GHz Processor | 4XG7A09070 | B0X4 | 1 / 2 |
| Intel Xeon Gold 6136 12C 150W 3.0GHz Processor | 7XG7A05559 | AWE3 | 1 / 2 |
| Intel Xeon Gold 6138 20C 125W 2.0GHz Processor | 7XG7A05541 | AWDZ | 1 / 2 |
| Intel Xeon Gold 6138T 20C 125W 2.0GHz Processor | 7XG7A05540 | AWEM | 1 / 2 |
| Intel Xeon Gold 6140 18C 140W 2.3GHz Processor | 7XG7A05558 | AWE1 | 1 / 2 |
| Intel Xeon Gold 6140M 18C 140W 2.3GHz Processor | 7XG7A05557 | AWE2 | 1 / 2 |
| Intel Xeon Gold 6142 16C 150W 2.6GHz Processor | 7XG7A05556 | AWDW | 1 / 2 |
| Intel Xeon Gold 6142M 16C 150W 2.6GHz Processor | 4XG7A09069 | B0X3 | 1 / 2 |
| Intel Xeon Gold 6148 20C 150W 2.4GHz Processor | 7XG7A05553 | AWDX | 1 / 2 |
| Intel Xeon Gold 6150 18C 165W 2.7GHz Processor | 7XG7A05552 | AWDT | 1 / 2 |
| Intel Xeon Gold 6152 22C 140W 2.1GHz Processor | 7XG7A05550 | AWDV | 1 / 2 |
| Intel Xeon Platinum processors | | | |
| Intel Xeon Platinum 8153 16C 125W 2.0GHz Processor | 7XG7A05549 | AWDR | 1 / 2 |

| Description | Part number* | Feature code* | Quantity (min / max) |
|---|--------------|---------------|----------------------|
| Intel Xeon Platinum 8156 4C 105W 3.6GHz Processor | 7XG7A05548 | AWDL | 1 / 2 |
| Intel Xeon Platinum 8158 12C 150W 3.0GHz Processor | 7XG7A05569 | AWDS | 1 / 2 |
| Intel Xeon Platinum 8160 24C 150W 2.1GHz Processor | 7XG7A05568 | AWDP | 1 / 2 |
| Intel Xeon Platinum 8160M 24C 150W 2.1GHz Processor | 7XG7A05567 | AWDQ | 1 / 2 |
| Intel Xeon Platinum 8160T 24C 150W 2.1GHz Processor | 7XG7A05566 | AWEK | 1 / 2 |
| Intel Xeon Platinum 8164 26C 150W 2.0GHz Processor | 7XG7A05565 | AWDM | 1 / 2 |
| Intel Xeon Platinum 8170 26C 165W 2.1GHz Processor | 7XG7A05564 | AWDK | 1 / 2 |
| Intel Xeon Platinum 8170M 26C 165W 2.1GHz Processor | 4XG7A09068 | B0X2 | 1 / 2 |
| Intel Xeon Platinum 8176 28C 165W 2.1GHz Processor | 7XG7A05563 | AWDH | 1 / 2 |
| Intel Xeon Platinum 8176M 28C 165W 2.1GHz Processor | 7XG7A05562 | AWDG | 1 / 2 |

* For CTO configurations, the feature code represents a processor, and fans and heatsinks are derived by the configuration tool. For field upgrades, the part number includes a processor, a heatsink, and two additional system fans.

The following table lists the specifications of the processors for the certified nodes.

Table 5. Processor 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 Bronze processors | | | | | | | | | | | |
| 3104 | 1.7 / 1.7 GHz | 6 / 6 | 8.25 MB | 2133 MHz | 768 GB | 9.6 GT/s | 85 W | No | No | Yes | Yes |
| 3106 | 1.7 / 1.7 GHz | 8 / 8 | 11 MB | 2133 MHz | 768 GB | 9.6 GT/s | 85 W | No | No | Yes | Yes |
| Intel Xeon Silver processors | | | | | | | | | | | |
| 4108 | 1.8 / 3.0 GHz | 8 / 16 | 11 MB | 2400 MHz | 768 GB | 9.6 GT/s | 85 W | Yes | Yes | Yes | Yes |
| 4109T | 2.0 / 3.0 GHz | 8 / 16 | 11 MB | 2400 MHz | 768 GB | 9.6 GT/s | 70 W | Yes | Yes | Yes | Yes |
| 4110 | 2.1 / 3.0 GHz | 8 / 16 | 11 MB | 2400 MHz | 768 GB | 9.6 GT/s | 85 W | Yes | Yes | Yes | Yes |
| 4112 | 2.6 / 3.0 GHz | 4 / 8 | 8.25 MB | 2400 MHz | 768 GB | 9.6 GT/s | 85 W | Yes | Yes | Yes | Yes |
| 4114 | 2.2 / 3.0 GHz | 10 / 20 | 13.75 MB | 2400 MHz | 768 GB | 9.6 GT/s | 85 W | Yes | Yes | Yes | Yes |
| 4114T | 2.2 / 3.0 GHz | 10 / 20 | 13.75 MB | 2400 MHz | 768 GB | 9.6 GT/s | 85 W | Yes | Yes | Yes | Yes |
| 4116 | 2.1 / 3.0 GHz | 12 / 24 | 16.5 MB | 2400 MHz | 768 GB | 9.6 GT/s | 85 W | Yes | Yes | Yes | Yes |
| 4116T | 2.1 / 3.0 GHz | 12 / 24 | 16.5 MB | 2400 MHz | 768 GB | 9.6 GT/s | 85 W | Yes | Yes | Yes | Yes |
| Intel Xeon Gold processors | | | | | | | | | | | |
| 5115 | 2.4 / 3.2 GHz | 10 / 20 | 13.75 MB | 2400 MHz | 768 GB | 10.4 GT/s | 85 W | Yes | Yes | Yes | Yes |
| 5117 | 2.0 / 2.8 GHz | 14 / 28 | 19.25 MB | 2400 MHz | 768 GB | 10.4 GT/s | 105W | Yes | Yes | Yes | Yes |
| 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 |
| 5119T | 1.9 / 3.2 GHz | 14 / 28 | 19.25 MB | 2400 MHz | 768 GB | 10.4 GT/s | 85 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 |
| 5120T | 2.2 / 3.2 GHz | 14 / 28 | 19.25 MB | 2400 MHz | 768 GB | 10.4 GT/s | 105 W | Yes | Yes | Yes | Yes |
| 5122 | 3.6 / 3.7 GHz | 4 / 8 | 16.5 MB | 2666 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 |
| 6128 | 3.4 / 3.7 GHz | 6 / 12 | 19.25 MB | 2666 MHz | 768 GB | 10.4 GT/s | 115 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 |
| 6130T | 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 |
| 6134 | 3.2 / 3.7 GHz | 8 / 16 | 24.75 MB | 2666 MHz | 768 GB | 10.4 GT/s | 130 W | Yes | Yes | Yes | Yes |
| 6134M | 3.2 / 3.7 GHz | 8 / 16 | 24.75 MB | 2666 MHz | 1.5 TB | 10.4 GT/s | 130 W | Yes | Yes | Yes | Yes |
| 6136 | 3.0 / 3.7 GHz | 12 / 24 | 24.75 MB | 2666 MHz | 768 GB | 10.4 GT/s | 150 W | Yes | Yes | Yes | Yes |
| 6138 | 2.0 / 3.7 GHz | 20 / 40 | 27.5 MB | 2666 MHz | 768 GB | 10.4 GT/s | 125 W | Yes | Yes | Yes | Yes |

| 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 |
|---------------------------------------|--------------------------------|---------------------------|----------|--------------------|-----------------------|-----------|-------|-----|-----|------|------|
| 6138T | 2.0 / 3.7 GHz | 20 / 40 | 27.5 MB | 2666 MHz | 768 GB | 10.4 GT/s | 125 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 |
| 6140M | 2.3 / 3.7 GHz | 18 / 36 | 24.75 MB | 2666 MHz | 1.5 TB | 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 |
| 6142M | 2.6 / 3.7 GHz | 16 / 32 | 22 MB | 2666 MHz | 1.5 TB | 10.4 GT/s | 150 W | Yes | Yes | Yes | Yes |
| 6144 | 3.5 / 4.2 GHz | 8 / 16 | 24.75 MB | 2666 MHz | 768 GB | 10.4 GT/s | 150 W | Yes | Yes | Yes | Yes |
| 6146 | 3.2 / 4.2 GHz | 12 / 24 | 24.75 MB | 2666 MHz | 768 GB | 10.4 GT/s | 165 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 | | | | | | | | | | | |
| 8153 | 2.0 / 2.8 GHz | 16 / 32 | 22 MB | 2666 MHz | 768 GB | 10.4 GT/s | 125 W | Yes | Yes | Yes | Yes |
| 8156 | 3.6 / 3.7 GHz | 4 / 8 | 16.5 MB | 2666 MHz | 768 GB | 10.4 GT/s | 105 W | Yes | Yes | Yes | Yes |
| 8158 | 3.0 / 3.7 GHz | 12 / 24 | 24.75 MB | 2666 MHz | 768 GB | 10.4 GT/s | 150 W | Yes | Yes | Yes | Yes |
| 8160 | 2.1 / 3.7 GHz | 24 / 48 | 33 MB | 2666 MHz | 768 GB | 10.4 GT/s | 150 W | Yes | Yes | Yes | Yes |
| 8160M | 2.1 / 3.7 GHz | 24 / 48 | 33 MB | 2666 MHz | 1.5 TB | 10.4 GT/s | 150 W | Yes | Yes | Yes | Yes |
| 8160T | 2.1 / 3.7 GHz | 24 / 48 | 33 MB | 2666 MHz | 768 GB | 10.4 GT/s | 150 W | Yes | Yes | Yes | Yes |
| 8164 | 2.0 / 3.7 GHz | 26 / 52 | 35.75 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 |
| 8170M | 2.1 / 3.7 GHz | 26 / 52 | 35.75 MB | 2666 MHz | 1.5 TB | 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 |
| 8176M | 2.1 / 3.8 GHz | 28 / 56 | 38.5 MB | 2666 MHz | 1.5 TB | 10.4 GT/s | 165 W | Yes | Yes | Yes | Yes |

Memory

The ThinkAgile VX Certified Nodes support Lenovo TruDDR4 memory. TruDDR4 memory uses the highest-quality components sourced from Tier 1 DRAM suppliers and only memory that meets strict requirements is selected. It is compatibility tested and tuned to maximize performance and reliability.

The VX 1U Certified Nodes support up to 24 DIMMs. The following rules apply when selecting the memory configuration:

- The nodes support RDIMMs, LRDIMMs, or 3DS RDIMMs.
- Mixing different types of memory (RDIMMs, LRDIMMs, and 3DS RDIMMs) is not supported.
- Mixing x4 and x8 RDIMMs and RDIMMs of different capacity is supported.
- All DIMMs in the node operate at the same speed up to 2666 MHz, which is determined by the maximum memory speed supported by the specific processor.
Note: Maximum memory speed can be achieved when Max performance mode is enabled in UEFI.
- The following maximum memory capacities supported by the server:
 - RDIMMs: 768 GB (384 GB per processor).
 - LRDIMMs: 1.5 TB (768 GB per processor).
 - 3DS RDIMMs: 3 TB (1.5 GB per processor) (requires processors that support 1.5 TB of memory per socket).

The following memory protection technologies are supported:

- ECC
- SDDC (for x4-based memory DIMMs)
- ADDDC (for x4-based memory DIMMs; Gold and Platinum processors only)
- Patrol scrubbing
- Demand scrubbing

Single Device Data Correction (SDDC) works only in the independent channel mode (the default operational mode) and supports only x4-based memory DIMMs.

Adaptive Double Device Data Correction (ADDDC) works with x4-based memory DIMMs and requires two DIMM ranks per channel, Intel Xeon Gold or Platinum processors, and the Closed Page memory access mode.

The following table lists the memory options that are available for selection.

Table 6. Memory options

| Description | Part number | Feature code | Quantity* |
|--|-------------|--------------|--------------------------------------|
| RDIMMs | | | |
| ThinkSystem 8GB TruDDR4 2666 MHz (1Rx8 1.2V) RDIMM | 7X77A01301 | AUU1 | 4, 6, 8, 12 / 4, 6, 8, 12, 16, 24 |
| ThinkSystem 16GB TruDDR4 2666 MHz (1Rx4 1.2V) RDIMM | 7X77A01302 | AUNB | 4, 6, 8, 12 / 4, 6, 8, 12, 16, 24 |
| ThinkSystem 16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM | 7X77A01303 | AUNC | 4, 6, 8, 12 / 4, 6, 8, 12, 16, 24 |
| ThinkSystem 32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM | 7X77A01304 | AUND | 4, 6, 8, 12 / 4, 6, 8, 12, 16, 24 |
| LRDIMMs | | | |
| ThinkSystem 64GB TruDDR4 2666 MHz (4Rx4 1.2V) LRDIMM | 7X77A01305 | AUNE | 4, 6, 8, 12 / 4, 6, 8, 12, 16, 24 |
| 3DS RDIMMs | | | |
| ThinkSystem 128GB TruDDR4 2666 MHz (8Rx4 1.2V) 3DS RDIMM | 7X77A01307 | AUNF | 4, 6, 8, 12 / 4, 6, 8, 12, 16, 24 |

* The quantity shown is with one processor / two processors.

Internal storage

The ThinkAgile VX 1U Certified Node supports the following internal drive bay configurations to provide storage capacity:

1. Up to 6 SAS/SATA hot-swap drive bays: 4x 3.5" (front) + 2x 2.5" (rear)
2. 4 LFF AnyBay hot-swap drive bays: 4x 3.5" (front)
3. Up to 12 SFF hot-swap drive bays:
6x 2.5" SAS/SATA & 4x 2.5" AnyBay (front) + 2x 2.5" SAS/SATA (rear)
4. 10 SFF U.2 NVMe PCIe SSD hot-swap drive bays

Lenovo AnyBay is a unique drive bay type that allows a choice of drive interface types in the same drive bay: SAS drives, SATA drives, or NVMe PCIe drives.

The following figure shows the internal drive bay configurations.

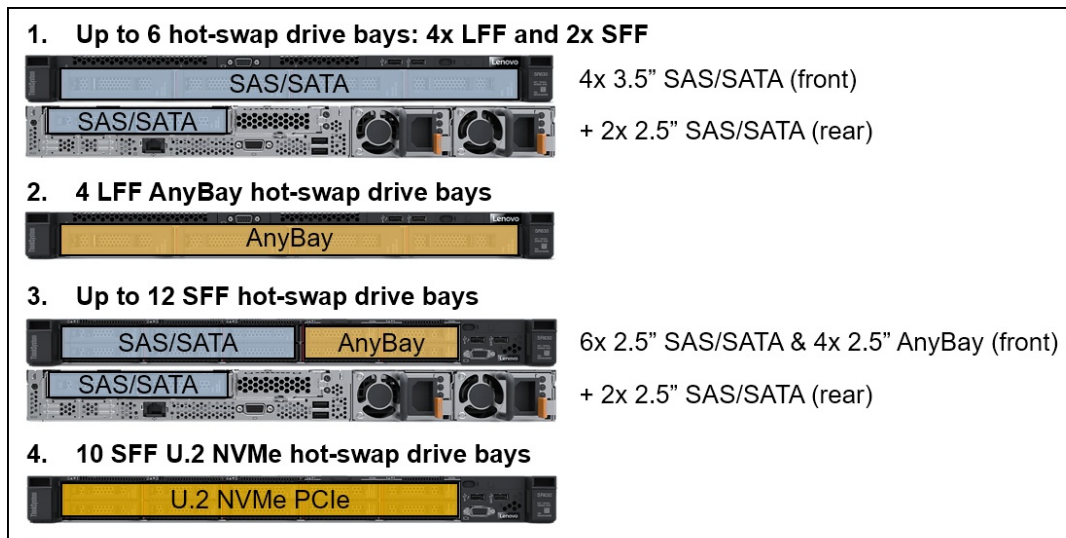


Figure 5. Internal drive bay configurations

The following table lists the internal storage options for the VX 1U Certified Node.

Table 7. Internal storage options

| Description | Part number | Feature code | Maximum supported |
|---|-------------|--------------|-------------------|
| Backplanes | | | |
| ThinkSystem SR530/SR630 4x3.5" SATA/SAS Backplane | None* | AUW8 | 1 |
| ThinkSystem SR630 3.5" AnyBay 4-Bay Backplane | None* | B0WJ | 1 |
| ThinkSystem SR630 10x2.5" AnyBay Backplane | None* | AUW9 | 1 |
| ThinkSystem SR630 2.5" U.2 10-Bay Backplane | None* | AVKF | 1 |
| ThinkSystem SR630 Rear HDD Kit | 7XH7A06252 | AUWJ | 1 |
| M.2 enablement kit | | | |
| ThinkSystem M.2 with Mirroring Enablement Kit | 7Y37A01093 | AUMV | 1 |

* Factory-installed.

Configuration notes:

- The 2.5" Rear HDD Kit is installed in place of the PCIe Riser Card 1; PCIe slots 1 and 2 are not present.
- The 2.5" Rear HDD Kit is supported only with the processors of up to 125 W TDP.
- NVMe PCIe SSDs are supported in the NVMe or AnyBay drive bays and require the second processor to be installed.
- NVMe PCIe SSDs are not supported with VMware ESXi 6.0 U3.
- Models with 10x 2.5-inch drive bays (6x SAS/SATA + 4x AnyBay) and an 8-port SAS RAID controller or HBA support only NVMe drives in the AnyBay drive bays.
- The M.2 with Mirroring Enablement Kit (7Y37A01093) is connected to the Intel PCH via the PCIe link, and the kit supports two M.2 SATA SSDs configured in a RAID-1 drive group for a hypervisor boot volume.

The following table lists M.2 drive selection options for the hypervisor boot volume.

Table 8. Drive options for hypervisor boot volume

| Description | Part number | Feature code | Quantity |
|--|-------------|--------------|----------|
| ThinkSystem M.2 CV3 128GB SATA 6Gbps Non-Hot-Swap SSD | 7N47A00130 | AUUV | 2 |
| ThinkSystem M.2 5100 480GB SATA 6Gbps Non-Hot-Swap SSD | 7SD7A05703 | B11V | 2 |

The following table lists the storage controllers for internal storage of the VX 1U Certified Node.

Table 9. Controllers for internal storage

| Description | Part number | Feature code | Maximum supported | I/O slots supported |
|---|-------------|--------------|-------------------|---------------------|
| 12 Gb SAS/SATA non-RAID HBAs | | | | |
| ThinkSystem 430-8i SAS/SATA 12Gb HBA | 7Y37A01088 | AUNL | 1 | 4 |
| ThinkSystem 430-16i SAS/SATA 12Gb HBA | 7Y37A01089 | AUNM | 1 | 4 |
| NVMe PCIe interfaces (non-RAID) | | | | |
| Onboard NVMe interface (4-port) | None | None | 1 | - |
| ThinkSystem 1610-4P NVMe Switch Adapter | 7Y37A01081 | AUV2 | 2 | 2, 3* |
| ThinkSystem 810-4P NVMe Switch Adapter | 4Y37A09719 | B22D | 2 | 4, 1 |

* Requires a PCIe x16 riser card.

Configuration notes:

- Low profile SAS HBAs for internal storage are supported in the dedicated PCIe x8 slot 4 on the system board.
- The 1610-4P NVMe Switch Adapters are supported in the low-profile PCIe x16 slots supplied by the PCIe Riser Cards 1 and 2.
- The 810-4P NVMe Switch Adapters are supported in the dedicated PCIe x8 slot 4 on the system board and a low-profile PCIe x8 slot supplied by the PCIe Riser Card 1.
- The total quantity of the 1610-4P and 810-4P NVMe Switch Adapters in the node must not exceed 2.

The onboard NVMe interface provides 4x PCIe 3.0 x4 ports for JBOD (non-RAID) connectivity to U.2 NVMe PCIe SSDs in the AnyBay drive bays.

For 10x U.2 NVMe configurations, the onboard NVMe interface and two NVMe Switch Adapters provide JBOD (non-RAID) connectivity with PCIe 3.0 x4 links to each of the U.2 NVMe PCIe SSDs. The 1610-4P NVMe Switch Adapter has a PCIe 3.0 x16 host interface, and the 810-4P NVMe Switch Adapter has a PCIe 3.0 x8 host interface.

The following tables list supported internal storage configurations with the SAS/SATA and AnyBay backplanes.

Table 10. Internal storage configurations: 3.5-inch front drive bays

| Drive bay configuration | Backplane kit type and quantity | | | Storage controller type and quantity* |
|--|---------------------------------|----------------|------------------|---------------------------------------|
| | 4x 3.5" SATA/SAS | 4x 3.5" AnyBay | 2x 2.5" Rear HDD | |
| 4x 3.5" chassis (Feature code B1DL) | | | | |
| 4x 3.5-in. SAS/SATA hot-swap (front) | 1 | 0 | 0 | 1x 430-8i HBA (4) |
| 4x 3.5-in. SAS/SATA hot-swap (front) + 2x 2.5-in. SAS/SATA hot-swap (rear) | 1 | 0 | 1 | 1x 430-8i HBA (6) |
| 4x 3.5-in. AnyBay hot-swap (front) | 0 | 1 | 0 | 1x 430-8i HBA (4) + Onboard NVMe (4) |

* The number in brackets (x) specifies the quantity of drive bays connected to each of the controllers.

Table 11. Internal storage configurations: 2.5-inch front drive bays

| Drive bay configuration | Backplane kit type and quantity | | | Storage controller type and quantity* |
|--|---------------------------------|--------------|------------------|---|
| | 10x 2.5" AnyBay | 10x U.2 NVMe | 2x 2.5" Rear HDD | |
| 10x 2.5" chassis (Feature code B1DK) | | | | |
| 6x 2.5-in. SAS/SATA + 4x 2.5-in. AnyBay hot-swap (front) | 1 | 0 | 0 | 1x 430-16i HBA (10) + Onboard NVMe (4) |
| 6x 2.5-in. SAS/SATA + 4x 2.5-in. AnyBay (NVMe only**) hot-swap (front) | 1 | 0 | 0 | 1x 430-8i HBA (6) + Onboard NVMe (4) |
| 6x 2.5-in. SAS/SATA + 4x 2.5-in. AnyBay hot-swap (front) + 2x 2.5-in. SAS/SATA hot-swap (rear) | 1 | 0 | 1 | 1x 430-16i HBA (12) + Onboard NVMe (4) |
| 10x 2.5-in. U.2 NVMe (8x NVMe drives only) hot-swap (front) | 0 | 1 | 0 | Onboard NVMe (4) + 1x 1610-4P/810-4P (4) |
| | | | | Onboard NVMe (4) + 2x 810-4P (2+2) |
| 10x 2.5-in. U.2 NVMe hot-swap (front) | 0 | 1 | 0 | Onboard NVMe (4) + 1x 1610-4P (4) + 1x 810-4P (2) |
| | | | | Onboard NVMe (4) + 2x 1610-4P (4+2) |

* The numbers in brackets (x or x+y) specify the quantity of drive bays connected to each of the controllers.

** Two NVMe SSDs are required in the 2.5" AnyBay configuration with an 8-port storage controller.

Drives for internal storage

The following tables list drive options for the VX 1U Certified Node.

Table 12. Drive options for internal storage: 2.5-inch hot-swap drives

| Description | Part number | Feature code | Maximum supported |
|--|-------------|--------------|-------------------|
| 2.5-inch hot-swap HDDs - 12 Gbps SAS | | | |
| ThinkSystem 2.5" 900GB 10K SAS 12Gb Hot Swap 512n HDD | 7XB7A00026 | AUM0 | 12 |
| ThinkSystem 2.5" 900GB 15K SAS 12Gb Hot Swap 512e HDD | 7XB7A00023 | AULX | 12 |
| ThinkSystem 2.5" 1.2TB 10K SAS 12Gb Hot Swap 512n HDD | 7XB7A00027 | AUM1 | 12 |
| ThinkSystem 2.5" 1.8TB 10K SAS 12Gb Hot Swap 512e HDD | 7XB7A00028 | AUM2 | 12 |
| ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD | 7XB7A00069 | B0YS | 12 |
| 2.5-inch hot-swap HDDs - 12 Gbps NL SAS | | | |
| ThinkSystem 2.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD | 7XB7A00034 | AUM6 | 12 |
| ThinkSystem 2.5" 2TB 7.2K SAS 12Gb Hot Swap 512n HDD | 7XB7A00035 | AUM7 | 12 |
| 2.5-inch hot-swap SSDs - SS300 Performance 12 Gbps SAS | | | |
| ThinkSystem 2.5" HUSMM32 400GB Performance SAS 12Gb Hot Swap SSD | 7N47A00124 | AUMG | 12 |
| ThinkSystem 2.5" HUSMM32 800GB Performance SAS 12Gb Hot Swap SSD | 7N47A00125 | AUMH | 12 |
| ThinkSystem 2.5" HUSMM32 1.6TB Performance SAS 12Gb Hot Swap SSD | 7N47A00126 | AVRB | 12 |
| 2.5-inch hot-swap SSDs - PM1635a Mainstream 12 Gbps SAS | | | |
| ThinkSystem 2.5" PM1635a 400GB Mainstream SAS 12Gb Hot Swap SSD | 7N47A00117 | AUMC | 12 |
| ThinkSystem 2.5" PM1635a 800GB Mainstream SAS 12Gb Hot Swap SSD | 7N47A00118 | AUMD | 12 |
| ThinkSystem 2.5" PM1635a 1.6TB Mainstream SAS 12Gb Hot Swap SSD | 7N47A00119 | AVRG | 12 |
| ThinkSystem 2.5" PM1635a 3.2TB Mainstream SAS 12Gb Hot Swap SSD | 7N47A00120 | AVRJ | 12 |
| 2.5-inch hot-swap SSDs - 5100 Mainstream 6 Gbps SATA | | | |
| ThinkSystem 2.5" 5100 480GB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05764 | B10X | 12 |
| ThinkSystem 2.5" 5100 960GB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05763 | B10Y | 12 |
| ThinkSystem 2.5" 5100 1.92TB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05762 | B10Z | 12 |
| ThinkSystem 2.5" 5100 3.84TB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05761 | B110 | 12 |
| 2.5-inch hot-swap SSDs - S4600 Mainstream 6 Gbps SATA | | | |
| ThinkSystem 2.5" Intel S4600 480GB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05722 | B0ZQ | 12 |
| ThinkSystem 2.5" Intel S4600 960GB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05721 | B0ZR | 12 |
| ThinkSystem 2.5" Intel S4600 1.92TB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05720 | B0ZS | 12 |
| 2.5-inch hot-swap SSDs - PM1633a Capacity 12 Gbps SAS | | | |
| ThinkSystem 2.5" PM1633a 3.84TB Capacity SAS 12Gb Hot Swap SSD | 7N47A00121 | AUMK | 12 |
| ThinkSystem 2.5" PM1633a 7.68TB Capacity SAS 12Gb Hot Swap SSD | 7N47A00122 | AUML | 12 |
| 2.5-inch hot-swap SSDs - 5100 Entry 6 Gbps SATA | | | |
| ThinkSystem 2.5" 5100 960GB Entry SATA 6Gb Hot Swap SSD | 4XB7A08503 | B10P | 12 |
| ThinkSystem 2.5" 5100 1.92TB Entry SATA 6Gb Hot Swap SSD | 4XB7A08504 | B10Q | 12 |
| ThinkSystem 2.5" 5100 3.84TB Entry SATA 6Gb Hot Swap SSD | 4XB7A08505 | B10R | 12 |
| 2.5-inch hot-swap SSDs - 5200 Entry 6 Gbps SATA | | | |
| ThinkSystem 2.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD | 4XB7A10154 | B2X3 | 12 |
| ThinkSystem 2.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD | 4XB7A10155 | B2X4 | 12 |
| ThinkSystem 2.5" 5200 3.84TB Entry SATA 6Gb Hot Swap SSD | 4XB7A10156 | B2X5 | 12 |
| ThinkSystem 2.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD | 4XB7A10157 | B2X6 | 12 |

| Description | Part number | Feature code | Maximum supported |
|--|-------------|--------------|-------------------|
| 2.5-inch hot-swap SSDs - PM863a Entry 6 Gbps SATA | | | |
| ThinkSystem 2.5" PM863a 960GB Entry SATA 6Gb Hot Swap SSD | 7N47A00113 | AVCZ | 12 |
| ThinkSystem 2.5" PM863a 1.92TB Entry SATA 6Gb Hot Swap SSD | 7N47A00114 | AVRC | 12 |
| 2.5-inch hot-swap SSDs - S4500 Entry 6 Gbps SATA | | | |
| ThinkSystem 2.5" Intel S4500 480GB Entry SATA 6Gb Hot Swap SSD | 7SD7A05741 | B0YZ | 12 |
| ThinkSystem 2.5" Intel S4500 960GB Entry SATA 6Gb Hot Swap SSD | 7SD7A05740 | B0Z0 | 12 |
| ThinkSystem 2.5" Intel S4500 1.92TB Entry SATA 6Gb Hot Swap SSD | 7SD7A05739 | B0Z1 | 12 |
| ThinkSystem 2.5" Intel S4500 3.84TB Entry SATA 6Gb Hot Swap SSD | 7SD7A05738 | B0Z2 | 12 |
| 2.5-inch hot-swap SSDs - P4800X Performance U.2 NVMe PCIe | | | |
| ThinkSystem U.2 Intel P4800X 375GB Performance NVMe PCIe 3.0 x4 HS SSD | 7N47A00081 | AUMJ | 10 |
| ThinkSystem U.2 Intel P4800X 750GB Performance NVMe PCIe 3.0 x4 HS SSD | 7N47A00083 | B2ZJ | 10 |
| 2.5-inch hot-swap SSDs - P4600 Mainstream U.2 NVMe PCIe | | | |
| ThinkSystem U.2 Intel P4600 1.6TB Mainstream NVMe PCIe 3.0 x4 HS SSD | 7SD7A05772 | B11J | 10 |
| ThinkSystem U.2 Intel P4600 3.2TB Mainstream NVMe PCIe 3.0 x4 HS SSD | 7SD7A05771 | B11K | 10 |
| ThinkSystem U.2 Intel P4600 6.4TB Mainstream NVMe PCIe 3.0 x4 HS SSD | 7SD7A05770 | B11L | 10 |
| 2.5-inch hot-swap SSDs - P4500 Entry U.2 NVMe PCIe | | | |
| ThinkSystem U.2 Intel P4500 1.0TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD | 7SD7A05779 | B11C | 10 |
| ThinkSystem U.2 Intel P4500 2.0TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD | 7SD7A05778 | B11D | 10 |
| ThinkSystem U.2 Intel P4500 4.0TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD | 7SD7A05777 | B11E | 10 |
| 2.5-inch hot-swap SSDs - PM963 Entry U.2 NVMe PCIe | | | |
| ThinkSystem U.2 PM963 1.92TB Entry 2.5" NVMe PCIe 3.0 x4 Hot Swap SSD | 7N47A00984 | AUV0 | 10 |
| ThinkSystem U.2 PM963 3.84TB Entry 2.5" NVMe PCIe 3.0 x4 Hot Swap SSD | 7N47A00985 | AUUU | 10 |

Table 13. Drive options for internal storage: 3.5-inch hot-swap drives

| Description | Part number | Feature code | Maximum supported |
|--|-------------|--------------|-------------------|
| 3.5-inch hot-swap HDDs - 12 Gbps SAS | | | |
| ThinkSystem 3.5" 900GB 15K SAS 12Gb Hot Swap 512e HDD | 7XB7A00040 | AUUC | 4 |
| 3.5-inch hot-swap HDDs - 12 Gbps NL SAS | | | |
| ThinkSystem 3.5" 8TB 7.2K SAS 12Gb Hot Swap 512e HDD | 7XB7A00045 | B0YR | 4 |
| ThinkSystem 3.5" 10TB 7.2K SAS 12Gb Hot Swap 512e HDD | 7XB7A00046 | AUUG | 4 |
| ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD | 7XB7A00067 | B117 | 4 |
| 3.5-inch hot-swap SSDs - SS300 Performance 12 Gbps SAS | | | |
| ThinkSystem 3.5" HUSMM32 400GB Performance SAS 12Gb Hot Swap SSD | 7N47A00997 | B16Z | 4 |
| ThinkSystem 3.5" HUSMM32 800GB Performance SAS 12Gb Hot Swap SSD | 7N47A00998 | B170 | 4 |
| ThinkSystem 3.5" HUSMM32 1.6TB Performance SAS 12Gb Hot Swap SSD | 7N47A00999 | B171 | 4 |
| 3.5-inch hot-swap SSDs - PM1635a Mainstream 12 Gbps SAS | | | |
| ThinkSystem 3.5" PM1635a 800GB Mainstream SAS 12Gb Hot Swap SSD | 4XB7A10188 | B2XD | 4 |
| ThinkSystem 3.5" PM1635a 1.6TB Mainstream SAS 12Gb Hot Swap SSD | 4XB7A10187 | B2XE | 4 |
| ThinkSystem 3.5" PM1635a 3.2TB Mainstream SAS 12Gb Hot Swap SSD | 4XB7A10189 | B2XL | 4 |
| 3.5-inch hot-swap SSDs - 5100 Mainstream 6 Gbps SATA | | | |
| ThinkSystem 3.5" 5100 480GB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05759 | B112 | 4 |

| Description | Part number | Feature code | Maximum supported |
|---|--------------------|---------------------|--------------------------|
| ThinkSystem 3.5" 5100 960GB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05758 | B113 | 4 |
| ThinkSystem 3.5" 5100 1.92TB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05757 | B114 | 4 |
| ThinkSystem 3.5" 5100 3.84TB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05756 | B115 | 4 |
| 3.5-inch hot-swap SSDs - S4600 Mainstream 6 Gbps SATA | | | |
| ThinkSystem 3.5" Intel S4600 480GB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05717 | B0ZU | 4 |
| ThinkSystem 3.5" Intel S4600 960GB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05716 | B0ZV | 4 |
| ThinkSystem 3.5" Intel S4600 1.92TB Mainstream SATA 6Gb Hot Swap SSD | 7SD7A05715 | B109 | 4 |
| 3.5-inch hot-swap SSDs - PM1633a Capacity 12 Gbps SAS | | | |
| ThinkSystem 3.5" PM1633a 3.84TB Capacity SAS 12Gb Hot Swap SSD | 4XB7A10173 | B2XC | 4 |
| 3.5-inch hot-swap SSDs - 5100 Entry 6 Gbps SATA | | | |
| ThinkSystem 3.5" 5100 480GB Entry SATA 6Gb Hot Swap SSD | 4XB7A08506 | B10S | 4 |
| ThinkSystem 3.5" 5100 960GB Entry SATA 6Gb Hot Swap SSD | 4XB7A08507 | B10T | 4 |
| ThinkSystem 3.5" 5100 1.92TB Entry SATA 6Gb Hot Swap SSD | 4XB7A08508 | B10U | 4 |
| ThinkSystem 3.5" 5100 3.84TB Entry SATA 6Gb Hot Swap SSD | 4XB7A08509 | B10V | 4 |
| 3.5-inch hot-swap SSDs - 5200 Entry 6 Gbps SATA | | | |
| ThinkSystem 3.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD | 4XB7A10159 | B2X8 | 4 |
| ThinkSystem 3.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD | 4XB7A10160 | B2X9 | 4 |
| ThinkSystem 3.5" 5200 3.84TB Entry SATA 6Gb Hot Swap SSD | 4XB7A10161 | B2XA | 4 |
| ThinkSystem 3.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD | 4XB7A10162 | B2XB | 4 |
| 3.5-inch hot-swap SSDs - S4500 Entry 6 Gbps SATA | | | |
| ThinkSystem 3.5" Intel S4500 480GB Entry SATA 6Gb Hot Swap SSD | 7SD7A05736 | B0Z4 | 4 |
| ThinkSystem 3.5" Intel S4500 960GB Entry SATA 6Gb Hot Swap SSD | 7SD7A05735 | B0Z5 | 4 |
| ThinkSystem 3.5" Intel S4500 1.92TB Entry SATA 6Gb Hot Swap SSD | 7SD7A05734 | B0Z6 | 4 |
| ThinkSystem 3.5" Intel S4500 3.84TB Entry SATA 6Gb Hot Swap SSD | 7SD7A05733 | B0Z7 | 4 |
| 3.5-inch hot-swap SSDs - P4600 Mainstream NVMe PCIe | | | |
| ThinkSystem 3.5" Intel P4600 1.6TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD | 4XB7A08528 | B2XF | 4 |
| ThinkSystem 3.5" Intel P4600 3.2TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD | 4XB7A08529 | B2XG | 4 |
| ThinkSystem 3.5" Intel P4600 6.4TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD | 4XB7A08530 | B2XH | 4 |
| 3.5-inch hot-swap SSDs - PM963 Entry NVMe PCIe | | | |
| ThinkSystem 3.5" PM963 1.92TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD | 7N47A00987 | AUUX | 4 |
| ThinkSystem 3.5" PM963 3.84TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD | 7N47A00988 | AUVZ | 4 |

I/O expansion

The VX 1U Certified Node supports one LOM card slot and up to four PCIe slots: one slot on the system planar that is dedicated to an internal storage controller and up to three PCIe slots with different riser cards installed into two riser sockets on the system planar (one riser socket supports installation of one riser card).

The slot form factors are as follows:

- LOM card slot
- Slot 1: PCIe 3.0 x8, ML2 x8, or ML2 x16; low profile
- Slot 2: PCIe 3.0 x16 or x8; low profile or full-height, half-length
- Slot 3: PCIe 3.0 x16; low profile
- Slot 4: PCIe 3.0 x8 (dedicated to an internal storage controller)

Configuration notes:

- Slot 3 requires the second processor to be installed.
- Slots 1 and 2 are not present if the Rear HDD Kit is installed.

The locations of the PCIe slots are shown in the following figure.

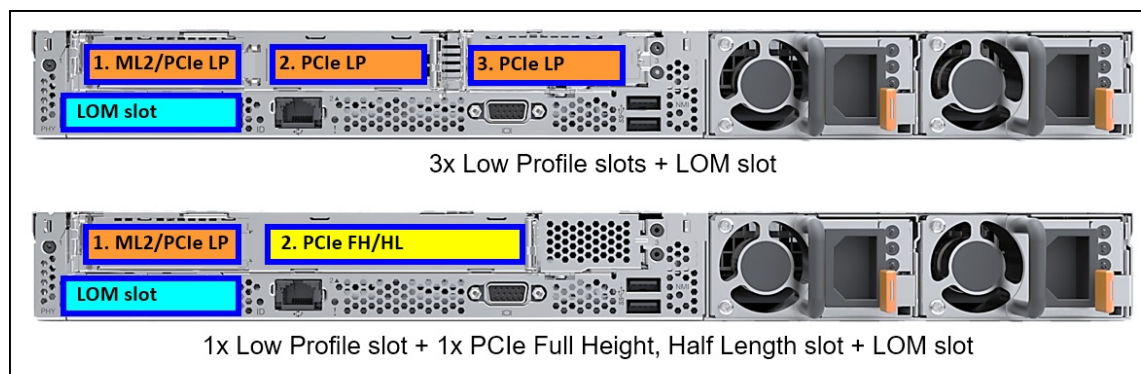


Figure 6. Slot locations

Riser 1 supplies slots 1 and 2, and Riser 2 supplies slot 3. The slots that are available for use depend on the number of riser cards that are installed and whether the second processor is installed, as shown in the following table.

Table 14. Slots available for use

| Riser Card 1 | Riser Card 2 | Slots available for use |
|--|--------------|-------------------------|
| One processor | | |
| None | None | LOM, 4 |
| PCIe x8/x16, PCIe x8ML2/x16, or PCIe x16ML2/x8 | None | LOM, 1, 2, 4 |
| Two processors | | |
| None | None | LOM, 4 |
| None | PCIe x16 | LOM, 3, 4 |
| PCIe x8/x16, PCIe x8ML2/x16, or PCIe x16ML2/x8 | None | LOM, 1, 2, 4 |
| PCIe x8/x16, PCIe x8ML2/x16, or PCIe x16ML2/x8 | PCIe x16 | LOM, 1, 2, 3, 4 |

The following table lists available PCIe riser card options.

Table 15. PCIe riser cards and miscellaneous options

| Description | Part number | Feature code | Maximum supported |
|--|-------------|--------------|-------------------|
| x8 Riser Card 1 options (Riser card 1 supplies slots 1 and 2) | | | |
| ThinkSystem SR530/SR570/SR630 x8/x16 PCIe LP+LP Riser 1 Kit | 7XH7A02682 | AUWC | 1 |
| ThinkSystem SR530/SR570/SR630 x8/x16 PCIe LP+FH Riser 1 Kit | 7XH7A05893 | None* | 1 |
| ThinkSystem SR630 x8ML2/x16 PCIe LP+LP Riser 1 Kit | 7XH7A02683 | AUWE | 1 |
| ThinkSystem SR630 x8ML2/x16 PCIe LP+FH Riser 1 Kit | 7XH7A05894 | None* | 1 |
| ThinkSystem SR630 x16ML2/x8 PCIe LP+LP Riser 1 Kit | 7XH7A02684 | AUWD | 1 |
| ThinkSystem SR630 x16ML2/x8 PCIe LP+FH Riser 1 Kit | 7XH7A05895 | None* | 1 |
| Riser Card 2 option (Riser card 2 supplies slot 3) | | | |
| ThinkSystem SR530/SR570/SR630 x16 PCIe LP Riser 2 Kit | 7XH7A02685 | AUWA | 1 |

* The LP+FH Riser 1 can be factory-installed by selecting the feature codes of the LP+LP Riser 1 (AUWC, AUWD, or AUWE) and LP+FH Bracket (AUWS).

Network connectivity

The ThinkAgile VX 1U Certified Nodes provide two- or four-port 1/10 GbE RJ-45 or 10 GbE SFP+ network connectivity with the onboard Intel X722 NIC and a LOM card installed in the node. Additional 1/10 GbE RJ-45, 10 GbE SFP+, 25 GbE SFP28, 40 GbE QSFP+, or 100 GbE QSFP28 ports can be selected, if required.

The VX 1U Certified Nodes also support ML2 adapters that are installed in the custom ML2 slot provided by an ML2 riser card. The LOM cards and ML2 network adapters support direct connectivity to the XClarity Controller via the Network Controller Sideband Interface (NSCI) for out-of-band systems management.

The following table lists the network adapter options that are available for selection.

Table 16. Network adapters

| Description | Part number | Feature code | Max qty# | I/O slots supported |
|---|-------------|--------------|----------|---------------------|
| LOM cards - 1 Gb Ethernet | | | | |
| ThinkSystem 1Gb 2-port RJ45 LOM | 7ZT7A00544 | AUKG | 1 | LOM slot |
| ThinkSystem 1Gb 4-port RJ45 LOM | 7ZT7A00545 | AUKH | 1 | LOM slot |
| LOM cards - 10 Gb Ethernet | | | | |
| ThinkSystem 10Gb 2-port Base-T LOM | 7ZT7A00548 | AUKL | 1 | LOM slot |
| ThinkSystem 10Gb 2-port SFP+ LOM | 7ZT7A00546 | AUKJ | 1* | LOM slot |
| ThinkSystem 10Gb 4-port Base-T LOM | 7ZT7A00549 | AUKM | 1 | LOM slot |
| ThinkSystem 10Gb 4-port SFP+ LOM | 7ZT7A00547 | AUKK | 1* | LOM slot |
| ML2 adapters - 10 Gb Ethernet | | | | |
| Broadcom NX-E ML2 10Gb 2-Port Base-T Ethernet Adapter | 7ZT7A00497 | AUKQ | 1 | 1 (ML2) |
| Emulex VFA5.2 ML2 Dual Port 10GbE SFP+ Adapter | 00AG560 | AT7U | 1* | 1 (ML2) |
| Intel X710-DA2 ML2 2x10GbE SFP+ Adapter | 00JY940 | ATRH | 1* | 1 (ML2) |
| ML2 adapters - 25 Gb Ethernet | | | | |
| Mellanox ConnectX-4 Lx ML2 1x25GbE SFP28 Adapter | 00MN990 | ATZR | 1* | 1 (ML2) |
| Mellanox ConnectX-4 Lx ML2 25Gb 2-Port SFP28 Ethernet Adapter | 7ZT7A00507 | AUKU | 1* | 1 (ML2) |
| PCIe Low Profile adapters - 1 Gb Ethernet | | | | |
| Broadcom NetXtreme PCIe 1Gb 2-Port RJ45 Ethernet Adapter | 7ZT7A00482 | AUZX | 2 / 3 | 1, 2, 3 |

| Description | Part number | Feature code | Max qty# | I/O slots supported |
|--|-------------|--------------|----------|---------------------|
| Broadcom NetXtreme PCIe 1Gb 4-Port RJ45 Ethernet Adapter | 7ZT7A00484 | AUZV | 2 / 3 | 1, 2, 3 |
| ThinkSystem I350-T2 PCIe 1Gb 2-Port RJ45 Ethernet Adapter | 7ZT7A00534 | AUZY | 2 / 3 | 1, 2, 3 |
| ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter | 7ZT7A00535 | AUZW | 2 / 3 | 1, 2, 3 |
| PCIe Low Profile adapters - 10 Gb Ethernet | | | | |
| Broadcom NX-E PCIe 10Gb 2-Port Base-T Ethernet Adapter | 7ZT7A00496 | AUKP | 2 / 3 | 1, 2, 3 |
| Emulex VFA5.2 2x10 GbE SFP+ PCIe Adapter | 00AG570 | AT7S | 2 / 3* | 1, 2, 3 |
| Intel X550-T2 Dual Port 10GBase-T Adapter | 00MM860 | ATPX | 2 / 3 | 1, 2, 3 |
| Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter | 7ZT7A00537 | AUKX | 2 / 3* | 1, 2, 3 |
| PCIe Full Height adapters - 10 Gb Ethernet | | | | |
| Emulex OCe14104B-NX PCIe 10Gb 4-Port SFP+ Ethernet Adapter | 7ZT7A00493 | AUKN | 1 / 1* | 2 |
| PCIe Low Profile adapters - 25 Gb Ethernet | | | | |
| Broadcom NX-E PCIe 25Gb 1-Port SFP28 Ethernet Adapter | 7ZT7A00505 | AUKS | 2 / 3* | 1, 2, 3 |
| Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter | 7XC7A05523 | B0WY | 2 / 3* | 1, 2, 3 |
| Mellanox ConnectX-4 Lx 2x25GbE SFP28 Adapter | 01GR250 | AUAJ | 2 / 3* | 1, 2, 3 |
| QLogic QL41262 PCIe 25Gb 2-Port SFP28 Ethernet Adapter | 4XC7A08228 | B21R | 2 / 3* | 1, 2, 3 |
| PCIe Low Profile adapters - 40 Gb Ethernet | | | | |
| Mellanox ConnectX-4 Lx 1x40GbE QSFP+ Adapter | 00MM950 | ATRN | 2 / 3* | 1, 2, 3 |
| PCIe x16 Low Profile adapters - 100 Gb Ethernet | | | | |
| Mellanox ConnectX-4 1x100GbE/EDR IB QSFP28 VPI Adapter | 00KH924 | ASWQ | 1 / 2* | 2, 3 |
| Mellanox ConnectX-4 2x100GbE/EDR IB QSFP28 VPI Adapter | 00MM960 | ATRP | 1 / 2* | 2, 3 |

The maximum quantity shown is with one processor / two processors (this does not apply to LOM cards and ML2 adapters).

* The adapter comes without transceivers or cables; for ordering transceivers or cables, see the configuration notes below the table.

Configuration notes:

- ML2 network adapters are supported in the ML2 x8 slot 1 supplied by the x8ML2/x16 Riser Card 1 (7XH7A02683 or 7XH7A05894).
- PCIe full-height network adapters are supported in the full-height PCIe x8 or x16 slot 2 supplied by the riser card 1.
- PCIe x16 Low Profile network adapters are supported in the full-height and low profile PCIe x16 slots supplied by the riser cards 1 and 2.
- PCIe Low Profile network adapters (except PCIe x16 adapters) are supported in the full-height and low profile PCIe x8 and x16 slots supplied by the riser cards 1 and 2.
- Supported transceivers or DAC cables should be purchased for the SFP+, SFP28, QSFP+, and QSFP28 adapters, and UTP Category 6 or Category 5e cables should be purchased for the 10 GbE (Category 6) or 1 GbE (Category 5e or 6) RJ-45 adapters. The maximum number of transceivers or cables that are supported per adapter equals the quantity of the adapter ports, and all adapter ports must have the same type of the transceiver or cable selected.

The following transceiver and cables can be purchased:

- [UTP cables for 10 GbE and 1 GbE RJ-45 adapters](#)
- [Transceivers and cables for 10 GbE SFP+ adapters](#)
- [Transceivers and cables for 25 GbE SFP28 adapters](#)
- [Transceivers and cables for 40 GbE QSFP+ adapters](#)
- [Transceivers and cables for 100 GbE QSFP28 network adapters](#)

The following table lists cables for the 10 GbE and 1 GbE RJ-45 adapters.

Table 17. Cables for 10 GbE and 1 GbE RJ-45 adapters

| Description | Part number | Feature code |
|---|-------------|--------------|
| UTP Category 6 cables (Green) for 10 GbE and 1 GbE RJ-45 adapters | | |
| 0.75m Cat6 Green Cable | 00WE123 | AVFW |
| 1.0m Cat6 Green Cable | 00WE127 | AVFX |
| 1.25m Cat6 Green Cable | 00WE131 | AVFY |
| 1.5m Cat6 Green Cable | 00WE135 | AVFZ |
| 3m Cat6 Green Cable | 00WE139 | AVG0 |
| 10m Cat6 Green Cable | 90Y3718 | A1MT |
| 25m Cat6 Green Cable | 90Y3727 | A1MW |
| UTP Category 5e cables (Blue) for 1 GbE RJ-45 adapters | | |
| 0.75m Blue Cat5e Cable | 00WE111 | AVFT |
| 1.0m Blue Cat5e Cable | 00WE115 | AVFU |
| 1.25m Blue Cat5e Cable | 00WE119 | AVFV |
| 1.5m Blue Cat5e Cable | 40K8785 | 3802 |
| 3m Blue Cat5e Cable | 40K5581 | 3803 |
| 10m Blue Cat5e Cable | 40K8927 | 3804 |
| 25m Blue Cat5e Cable | 40K8930 | 3805 |
| UTP Category 5e cables (Green) for 1 GbE RJ-45 adapters | | |
| 0.75m Green Cat5e Cable | 00WE099 | AVFQ |
| 1.0m Green Cat5e Cable | 00WE103 | AVFR |
| 1.25m Green Cat5e Cable | 00WE107 | AVFS |
| 1.5m Green Cat5e Cable | 40K5643 | 3797 |
| 3m Green Cat5e Cable | 40K5793 | 3798 |
| 10m Green Cat5e Cable | 40K5794 | 3799 |
| 25m Green Cat5e Cable | 40K8869 | 3800 |

The following table lists transceivers and cables for the 10 GbE SFP+ adapters.

Table 18. Transceivers and cables for 10 GbE SFP+ adapters

| Description | Part number | Feature code |
|--|-------------|--------------|
| 10 GbE SFP+ SR transceivers for 10 GbE SFP+ adapters | | |
| Lenovo 10GBASE-SR SFP+ Transceiver | 46C3447 | 5053 |
| Lenovo 10GBASE-LR SFP+ Transceiver | 00FE331 | B0RJ |
| Optical cables for 10 GbE SFP+ SR transceivers | | |
| Lenovo 0.5m LC-LC OM3 MMF Cable | 00MN499 | ASR5 |
| Lenovo 1m LC-LC OM3 MMF Cable | 00MN502 | ASR6 |
| Lenovo 3m LC-LC OM3 MMF Cable | 00MN505 | ASR7 |
| Lenovo 5m LC-LC OM3 MMF Cable | 00MN508 | ASR8 |
| Lenovo 10m LC-LC OM3 MMF Cable | 00MN511 | ASR9 |
| Lenovo 15m LC-LC OM3 MMF Cable | 00MN514 | ASRA |
| Lenovo 25m LC-LC OM3 MMF Cable | 00MN517 | ASRB |
| Lenovo 30m LC-LC OM3 MMF Cable | 00MN520 | ASRC |

| Description | Part number | Feature code |
|--|-------------|--------------|
| Passive SFP+ DAC cables for 10 GbE SFP+ adapters | | |
| Lenovo 0.5m Passive SFP+ DAC Cable | 00D6288 | A3RG |
| Lenovo 1m Passive SFP+ DAC Cable | 90Y9427 | A1PH |
| Lenovo 1.5m Passive SFP+ DAC Cable | 00AY764 | A51N |
| Lenovo 2m Passive SFP+ DAC Cable | 00AY765 | A51P |
| Lenovo 3m Passive SFP+ DAC Cable | 90Y9430 | A1PJ |
| Lenovo 5m Passive SFP+ DAC Cable | 90Y9433 | A1PK |
| Lenovo 7m Passive SFP+ DAC Cable | 00D6151 | A3RH |
| Active SFP+ DAC cables for 10 GbE SFP+ adapters* | | |
| Lenovo 1m Active DAC SFP+ Cable | 00VX111 | AT2R |
| Lenovo 3m Active DAC SFP+ Cable | 00VX114 | AT2S |
| Lenovo 5m Active DAC SFP+ Cable | 00VX117 | AT2T |

* The Emulex VFA5.2 ML2 (00AG560) and PCIe (00AG570) network adapters do not support active SFP+ DAC cables.

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

Table 19. Transceivers and cables for 25 GbE SFP28 adapters

| Description | Part number | Feature code |
|--|-------------|--------------|
| 25 GbE SFP28 SR transceivers for 25 GbE SFP28 adapters | | |
| Lenovo 25GBase-SR SFP28 Transceiver | 7G17A03537 | AV1B |
| Optical cables for 25 GbE SFP28 SR transceivers | | |
| Lenovo 0.5m LC-LC OM3 MMF Cable | 00MN499 | ASR5 |
| Lenovo 1m LC-LC OM3 MMF Cable | 00MN502 | ASR6 |
| Lenovo 3m LC-LC OM3 MMF Cable | 00MN505 | ASR7 |
| Lenovo 5m LC-LC OM3 MMF Cable | 00MN508 | ASR8 |
| Lenovo 10m LC-LC OM3 MMF Cable | 00MN511 | ASR9 |
| Lenovo 15m LC-LC OM3 MMF Cable | 00MN514 | ASRA |
| Lenovo 25m LC-LC OM3 MMF Cable | 00MN517 | ASRB |
| Lenovo 30m LC-LC OM3 MMF Cable | 00MN520* | ASRC* |
| Passive copper cables for 25 GbE SFP28 network adapters | | |
| Lenovo 1m Passive 25G SFP28 DAC Cable | 7Z57A03557* | AV1W* |
| Lenovo 3m Passive 25G SFP28 DAC Cable | 7Z57A03558 | AV1X |
| Lenovo 5m Passive 25G SFP28 DAC Cable | 7Z57A03559 | AV1Y |
| Active optical cables for 25 GbE SFP28 network adapters* | | |
| Lenovo 3m 25G SFP28 Active Optical Cable | 7Z57A03541 | AV1F |
| Lenovo 5m 25G SFP28 Active Optical Cable | 7Z57A03542 | AV1G |
| Lenovo 10m 25G SFP28 Active Optical Cable | 7Z57A03543 | AV1H |
| Lenovo 15m 25G SFP28 Active Optical Cable | 7Z57A03544 | AV1J |
| Lenovo 20m 25G SFP28 Active Optical Cable | 7Z57A03545 | AV1K |

* Not supported with the Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter (7XC7A05523).

The following table lists transceivers and cables for the 40 GbE QSFP+ adapters.

Table 20. Transceivers and cables for 40 GbE QSFP+ adapters

| Description | Part number | Feature code |
|---|-------------|--------------|
| 40 GbE QSFP+ transceivers for 40 GbE network adapters | | |
| Lenovo 40GBASE-SR4 QSFP+ Transceiver | 49Y7884 | A1DR |
| Optical cables for 40 GbE QSFP+ SR4 transceivers | | |
| Lenovo 10m QSFP+ MPO-MPO OM3 MMF Cable | 00VX003 | AT2U |
| Lenovo 30m QSFP+ MPO-MPO OM3 MMF Cable | 00VX005 | AT2V |

The following table lists transceivers and cables for the 100 GbE QSFP28 network adapters.

Table 21. Transceivers and cables for 100 GbE QSFP28 network adapters

| Description | Part number | Feature code |
|--|-------------|--------------|
| 100 GbE QSFP28 transceivers for 100 GbE QSFP28 network adapters | | |
| Lenovo 100GBase-SR4 QSFP28 Transceiver | 7G17A03539 | AV1D |
| Optical cables for 100 GbE QSFP28 SR4 transceivers | | |
| Lenovo 5m MPO-MPO OM4 MMF Cable | 7Z57A03567 | AV25 |
| Lenovo 10m MPO-MPO OM4 MMF Cable | 7Z57A03569 | AV27 |
| Lenovo 20m MPO-MPO OM4 MMF Cable | 7Z57A03571 | AV29 |
| Optical breakout cables for 100 GbE QSFP28 SR4 transceivers | | |
| Lenovo 1m MPO-MPO Breakout OM4 MMF Cable | 7Z57A03573 | AV2B |
| Lenovo 3m MPO-MPO Breakout OM4 MMF Cable | 7Z57A03574 | AV2C |
| Lenovo 5m MPO-MPO Breakout OM4 MMF Cable | 7Z57A03575 | AV2D |
| Passive copper cables for 100 GbE QSFP28 network adapters | | |
| Lenovo 1m Passive 100G QSFP28 DAC Cable | 7Z57A03561 | AV1Z |
| Lenovo 3m Passive 100G QSFP28 DAC Cable | 7Z57A03562 | AV20 |
| Lenovo 5m Passive 100G QSFP28 DAC Cable | 7Z57A03563 | AV21 |
| Passive copper breakout cables for 100 GbE QSFP28 network adapters | | |
| Lenovo 1m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable | 7Z57A03564 | AV22 |
| Lenovo 3m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable | 7Z57A03565 | AV23 |
| Lenovo 5m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable | 7Z57A03566 | AV24 |
| Active optical cables for 100 GbE QSFP28 network adapters | | |
| Lenovo 3m 100G QSFP28 Active Optical Cable | 7Z57A03546 | AV1L |
| Lenovo 5m 100G QSFP28 Active Optical Cable | 7Z57A03547 | AV1M |
| Lenovo 10m 100G QSFP28 Active Optical Cable | 7Z57A03548 | AV1N |
| Lenovo 15m 100G QSFP28 Active Optical Cable | 7Z57A03549 | AV1P |
| Lenovo 20m 100G QSFP28 Active Optical Cable | 7Z57A03550 | AV1Q |

For more information, see the list of Product Guides in the Ethernet Adapters category:

<http://lenovopress.com/servers/options/ethernet#rt=product-guide>

Power supplies and cables

The VX 1U Certified Nodes can be configured with one or two power supplies. The following table lists the power supply options that are available for selection.

Table 22. Power supplies

| Description | Part number | Feature code | Maximum supported |
|--|-------------|--------------|-------------------|
| ThinkSystem 750W (230/115V) Platinum Hot-Swap Power Supply | 7N67A00883 | AVWA | 2 |
| ThinkSystem 750W (230V) Titanium Hot-Swap Power Supply | 7N67A00884 | AVW9 | 2 |
| ThinkSystem 1100W (230V/115V) Platinum Hot-Swap Power Supply | 7N67A00885 | AVWB | 2 |

Configuration notes:

- Minimum of 1 and maximum of 2 power supplies per system.
- For N+N power redundancy, the power supplies should provide sufficient power without oversubscription for the selected node configuration. To ensure that the right power supply is chosen, you should always validate your node configuration using the latest version of the Lenovo Capacity Planner: <http://datacentersupport.lenovo.com/us/en/solutions/Invo-lcp>
- If two power supplies are installed, they must be identical.
- The power supplies support AC (Worldwide) and HVDC (China only) power sources.

The VX 1U Certified Nodes ship with one or two customer-configured power cords (A hot-swap power supply option does not contain a power cord). The following table lists the rack power cables and country-specific line cords that can be ordered for the VX 1U Certified Nodes.

Table 23. Power cables

| Description | Part number | Feature code |
|--|-------------|--------------|
| Rack power cables | | |
| 1.0m, 10A/125-250V, C13 to IEC 320-C14 Rack Power Cable | 00Y3043 | A4VP |
| 1.0m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08367 | B0N5 |
| 1.2m, 16A/100-250V, 2 Short C13s to Short C20 Rack Power Cable | 47C2491 | A3SW |
| 1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 39Y7937 | 6201 |
| 1.5m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08368 | B0N6 |
| 2.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08365 | B0N4 |
| 2.0m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08369 | 6570 |
| 2.5m, 16A/100-250V, 2 Long C13s to Short C20 Rack Power Cable | 47C2492 | A3SX |
| 2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08366 | 6311 |
| 2.8m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08370 | 6400 |
| 2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable | 39Y7938 | 6204 |
| 2.8m, 16A/100-250V, 2 Short C13s to Long C20 Rack Power Cable | 47C2493 | A3SY |
| 4.1m, 16A/100-250V, 2 Long C13s to Long C20 Rack Power Cable | 47C2494 | A3SZ |
| 4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 39Y7932 | 6263 |
| 4.3m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08371 | 6583 |
| Country-specific line cords | | |
| Argentina 2.8m, 10A/250V, C13 to IRAM 2073 Line Cord | 39Y7930 | 6222 |
| Argentina 4.3m, 10A/250V, C13 to IRAM 2073 Line Cord | 81Y2384 | 6492 |
| Australia/New Zealand 2.8m, 10A/250V, C13 to AS/NZS 3112 Line Cord | 39Y7924 | 6211 |

| Description | Part number | Feature code |
|--|-------------|--------------|
| Australia/New Zealand 4.3m, 10A/250V, C13 to AS/NZS 3112 Line Cord | 81Y2383 | 6574 |
| Brazil 2.8m, 10A/250V, C13 to NBR 14136 Line Cord | 69Y1988 | 6532 |
| Brazil 4.3m, 10A/250V, C13 to NBR14136 Line Cord | 81Y2387 | 6404 |
| China 2.8m, 10A/250V, C13 to GB 2099.1 Line Cord | 39Y7928 | 6210 |
| China 4.3m, 10A/250V, C13 to GB 2099.1 Line Cord | 81Y2378 | 6580 |
| Denmark 2.8m, 10A/250V, C13 to DK2-5a Line Cord | 39Y7918 | 6213 |
| Denmark 4.3m, 10A/250V, C13 to DK2-5a Line Cord | 81Y2382 | 6575 |
| Europe 2.8m, 10A/250V, C13 to CEE7-VII Line Cord | 39Y7917 | 6212 |
| Europe 4.3m, 10A/250V, C13 to CEE7-VII Line Cord | 81Y2376 | 6572 |
| India 2.8m, 10A/250V, C13 to IS 6538 Line Cord | 39Y7927 | 6269 |
| India 4.3m, 10A/250V, C13 to IS 6538 Line Cord | 81Y2386 | 6567 |
| Israel 2.8m, 10A/250V, C13 to SI 32 Line Cord | 39Y7920 | 6218 |
| Israel 4.3m, 10A/250V, C13 to SI 32 Line Cord | 81Y2381 | 6579 |
| Italy 2.8m, 10A/250V, C13 to CEI 23-16 Line Cord | 39Y7921 | 6217 |
| Italy 4.3m, 10A/250V, C13 to CEI 23-16 Line Cord | 81Y2380 | 6493 |
| Japan 2.8m, 12A/125V, C13 to JIS C-8303 Line cord | 46M2593 | A1RE |
| Japan 2.8m, 12A/250V, C13 to JIS C-8303 Line Cord | 4L67A08357 | 6533 |
| Japan 4.3m, 12A/125V, C13 to JIS C-8303 Line Cord | 39Y7926 | 6335 |
| Japan 4.3m, 12A/250V, C13 to JIS C-8303 Line Cord | 4L67A08362 | 6495 |
| Korea 2.8m, 12A/250V, C13 to KS C8305 Line Cord | 39Y7925 | 6219 |
| Korea 4.3m, 12A/250V, C13 to KS C8305 Line Cord | 81Y2385 | 6494 |
| South Africa 2.8m, 10A/250V, C13 to SABS 164 Line Cord | 39Y7922 | 6214 |
| South Africa 4.3m, 10A/250V, C13 to SABS 164 Line Cord | 81Y2379 | 6576 |
| Switzerland 2.8m, 10A/250V, C13 to SEV 1011-S24507 Line Cord | 39Y7919 | 6216 |
| Switzerland 4.3m, 10A/250V, C13 to SEV 1011-S24507 Line Cord | 81Y2390 | 6578 |
| Taiwan 2.8m, 10A/125V, C13 to CNS 10917-3 Line Cord | 23R7158 | 6386 |
| Taiwan 2.8m, 10A/250V, C13 to CNS 10917-3 Line Cord | 81Y2375 | 6317 |
| Taiwan 2.8m, 15A/125V, C13 to CNS 10917-3 Line Cord | 81Y2374 | 6402 |
| Taiwan 4.3m, 10A/125V, C13 to CNS 10917-3 Line Cord | 4L67A08363 | AX8B |
| Taiwan 4.3m, 10A/250V, C13 to CNS 10917-3 Line Cord | 81Y2389 | 6531 |
| Taiwan 4.3m, 15A/125V, C13 to CNS 10917-3 Line Cord | 81Y2388 | 6530 |
| United Kingdom 2.8m, 10A/250V, C13 to BS 1363/A Line Cord | 39Y7923 | 6215 |
| United Kingdom 4.3m, 10A/250V, C13 to BS 1363/A Line Cord | 81Y2377 | 6577 |
| United States 2.8m, 10A/125V, C13 to NEMA 5-15P Line Cord | 90Y3016 | 6313 |
| United States 2.8m, 10A/250V, C13 to NEMA 6-15P Line Cord | 46M2592 | A1RF |
| United States 2.8m, 13A/125V, C13 to NEMA 5-15P Line Cord | 00WH545 | 6401 |
| United States 4.3m, 10A/125V, C13 to NEMA 5-15P Line Cord | 4L67A08359 | 6370 |
| United States 4.3m, 10A/250V, C13 to NEMA 6-15P Line Cord | 4L67A08361 | 6373 |
| United States 4.3m, 13A/125V, C13 to NEMA 5-15P Line Cord | 4L67A08360 | AX8A |

Configuration note: If the 1100 W AC power supplies (7N67A00885) in the VX 1U Certified Node are connected to a low-voltage power source (100 - 125 V), the only supported power cables are those that are rated above 10A; cables that are rated at 10A are not supported.

Rack installation

The VX 1U Certified Nodes ship with a rail kit with or without CMA depending on the rack installation option selected. The following table lists the rack installation options that are available for the VX 1U Certified Nodes.

Table 24. Rack installation options

| Description | Part number | Feature code | Maximum supported |
|---|-------------|--------------|-------------------|
| 4-post rail kits | | | |
| ThinkSystem Tool-less Slide Rail | 7M27A05702 | AXCA | 1 |
| ThinkSystem Tool-less Slide Rail Kit with 1U CMA | 7M27A05701 | AXCB | 1 |
| Cable management arm (CMA) upgrade | | | |
| ThinkSystem 1U CMA Upgrade Kit for Tool-less Slide Rail | 7M27A05699 | None^ | 1* |
| Front VGA port | | | |
| ThinkSystem SR530/SR630 Front VGA Connector (for 3.5" models) | None** | AUWU | 1 |
| ThinkSystem SR530/SR570/SR630 Front VGA Connector Upgrade Kit (for 2.5" models) | 7Z17A02579 | AUWW | 1 |
| Lockable front bezel | | | |
| ThinkSystem 1U Security Bezel | 7Z17A02581 | AUWR | 1 |

^ Field upgrade only.

* The CMA Upgrade Kit for Tool-less Slide Rail is supported with the Tool-less Slide Rail (7M27A05702) only.

** Factory-installed only; no field upgrade.

The following table summarizes the features of the rail kits that are available for selection.

Table 25. Rail kit features and specifications summary

| Feature | Tool-less Slide Rail | |
|---|---|-------------------|
| | Without CMA | With CMA |
| Part number | 7M27A05702 | 7M27A05701 |
| CMA | 7M27A05699 | Included |
| Rail length | 730 mm (28.74 in.) | 807 mm (31.8 in.) |
| Rail type | Full-out slide (ball bearing) | |
| Tool-less installation | Yes | |
| In-rack server maintenance | Yes | |
| 1U PDU support | Yes | |
| 0U PDU support | Limited* | |
| Rack type | IBM and Lenovo 4-post, IEC standard-compliant | |
| Mounting holes | Square or round | |
| Mounting flange thickness | 2 mm (0.08 in.) – 3.3 mm (0.13 in.) | |
| Distance between front and rear mounting flanges^ | 609.6 mm (24 in.) – 863.6 mm (34 in.) | |

* If a 0U PDU is used, the rack cabinet must be at least 1100 mm (43.31 in.) deep if no CMA is used, or at least 1200 mm (47.24 in.) deep if a CMA is used.

^ Measured when mounted on the rack, from the front surface of the front mounting flange to the rear most point of the rail.

Software

The ThinkAgile VX Certified Nodes support the following VMware HCI components:

- VMware vSphere ESXi hypervisor
- VMware vSAN distributed enterprise storage
- VMware vCenter Server centralized management

The VMware ESXi hypervisor is factory-preinstalled on the 2x 128 GB or 2x 480 GB M.2 SSDs configured in a RAID-1 drive group.

The following table lists the VMware ESXi hypervisor versions that are available for selection.

Table 26. VMware ESXi hypervisor selection options

| Description | Feature code |
|--|--------------|
| VMware ESXi 6.0 U3 (Factory installed) | AXFS |
| VMware ESXi 6.5 U1 (Factory installed) | AXFT |
| VMware ESXi 6.5 U2 (Factory Installed) | B3VW |
| VMware ESXi 6.7 (Factory Installed) | B3VX |

Configuration note: If the ESXi 6.0 U3 preload is selected, the NVMe SSDs cannot be used.

VMware software licenses and support are not included with ThinkAgile VX Certified Nodes. Customers can use the existing VMware software licenses and active support contracts, or they can purchase software licenses and support from VMware or Lenovo.

Lenovo offers the following VMware software license and support options for ThinkAgile VX Certified Nodes:

- [VMware vSAN License and Subscription](#)
- [VMware vSphere License and Subscription](#)
- [VMware HCI Kit License and Subscription](#)
- [VMware Horizon License and Subscription](#)
- [VMware vCenter Server License and Subscription](#)

Configuration notes:

- The selection of VMware software licenses is optional.
- VMware software licenses are available with 1-year, 3-year, or 5-year software support.
- The quantity of processor-based licenses is derived by the configuration tool based on the number of processors selected.
- The quantity of VM-based licenses can be specified based on VM requirements.

VMware vSAN License and Subscription

Lenovo offers the following VMware vSAN License and Subscription options that can be purchased for ThinkAgile VX Certified Nodes:

- VMware Virtual SAN 6 Standard for 1 Processor
Virtual SAN Standard provides support for hybrid and all-flash storage configurations.
- VMware Virtual SAN 6 Advanced for 1 Processor
Virtual SAN Advanced provides support for hybrid and all-flash storage configurations with space efficiency features (compression, deduplication, and erasure coding).
- VMware Virtual SAN 6 Enterprise for 1 Processor
Virtual SAN Enterprise provides support for hybrid and all-flash storage configurations with space efficiency features (compression, deduplication, and erasure coding), stringent security (data-at-rest encryption), and advanced failure protection (stretched cluster).

- VMware Virtual SAN 6 for Remote Office Branch Office (25 VM Pack)
Virtual SAN for ROBO provides support for hybrid and all-flash storage configurations for up to 25 virtual machines at remote locations.
- VMware Virtual SAN 6 for Desktop (10 or 100 Concurrent User Pack)
Virtual SAN for Desktop provides support for hybrid and all-flash storage configurations for customers using vSAN exclusively for virtual desktop infrastructure.

The following table lists ordering information for the VMware vSAN License and Subscription options.

Table 27. VMware vSAN License and Subscription options

| Description | Part number | Feature code |
|--|-------------|--------------|
| vSAN 6 Standard | | |
| VMware vSAN 6 Standard for 1 Processor w/1Yr Support | 7S06001HWW | B28W |
| VMware vSAN 6 Standard for 1 Processor w/3Yr Support | 7S06004TWW | B2C6 |
| VMware vSAN 6 Standard for 1 Processor w/5Yr Support | 7S060083WW | B2FG |
| vSAN 6 Advanced | | |
| VMware vSAN 6 Advanced for 1 Processor w/1Yr Support | 7S06001MWW | B290 |
| VMware vSAN 6 Advanced for 1 Processor w/3Yr Support | 7S06004XWW | B2CA |
| VMware vSAN 6 Advanced for 1 Processor w/5Yr Support | 7S060087WW | B2FL |
| vSAN 6 Enterprise | | |
| VMware vSAN 6 Enterprise for 1 Processor w/1Yr Support | 7S06001RWW | B294 |
| VMware vSAN 6 Enterprise for 1 Processor w/3Yr Support | 7S060051WW | B2CE |
| VMware vSAN 6 Enterprise for 1 Processor w/5Yr Support | 7S06008BWW | B2FQ |
| vSAN 6 Standard for Remote Office Branch Office (ROBO) | | |
| VMware vSAN 6 Standard for Rmt Off Brnch Off 25VM Pk w/1Yr Support | 7S06001LWW | B28Z |
| VMware vSAN 6 Standard for Rmt Off Brnch Off 25VM Pk w/3Yr Support | 7S06004WWW | B2C9 |
| VMware vSAN 6 Standard for Rmt Off Brnch Off 25VM Pk w/5Yr Support | 7S060086WW | B2FK |
| vSAN 6 Advanced for Remote Office Branch Office (ROBO) | | |
| VMware vSAN 6 Advanced for Rmt Off Brnch Off 25VM Pk w/1Yr Support | 7S06001QWW | B293 |
| VMware vSAN 6 Advanced for Rmt Off Brnch Off 25VM Pk w/3Yr Support | 7S060050WW | B2CD |
| VMware vSAN 6 Advanced for Rmt Off Brnch Off 25VM Pk w/5Yr Support | 7S06008AWW | B2FP |
| vSAN 6 Enterprise for Remote Office Branch Office (ROBO) | | |
| VMware vSAN 6 Enterprise for Rmt Off Brnch Off 25VM Pk w/1Yr Support | 7S06001UWW | B297 |
| VMware vSAN 6 Enterprise for Rmt Off Brnch Off 25VM Pk w/3Yr Support | 7S060054WW | B2CH |
| VMware vSAN 6 Enterprise for Rmt Off Brnch Off 25VM Pk w/5Yr Support | 7S06008EWW | B2FT |
| vSAN 6 Standard for Desktop | | |
| VMware vSAN 6 Standard for Desktop 10 Conc User Pk w/1Yr Support | 7S06001JWW | B28X |
| VMware vSAN 6 Standard for Desktop 10 Conc User Pk w/3Yr Support | 7S06004UWW | B2C7 |
| VMware vSAN 6 Standard for Desktop 10 Conc User Pk w/5Yr Support | 7S060084WW | B2FH |
| VMware vSAN 6 Standard for Desktop 100 Conc User Pk w/1Yr Support | 7S06001KWW | B28Y |
| VMware vSAN 6 Standard for Desktop 100 Conc User Pk w/3Yr Support | 7S06004VWW | B2C8 |
| VMware vSAN 6 Standard for Desktop 100 Conc User Pk w/5Yr Support | 7S060085WW | B2FJ |
| vSAN 6 Advanced for Desktop | | |
| VMware vSAN 6 Advanced for Desktop 10 Conc User Pk w/1Yr Support | 7S06001NWW | B291 |
| VMware vSAN 6 Advanced for Desktop 10 Conc User Pk w/3Yr Support | 7S06004YWW | B2CB |

| Description | Part number | Feature code |
|---|-------------|--------------|
| VMware vSAN 6 Advanced for Desktop 10 Conc User Pk w/5Yr Support | 7S060088WW | B2FM |
| VMware vSAN 6 Advanced for Desktop 100 Conc User Pk w/1Yr Support | 7S06001PWW | B292 |
| VMware vSAN 6 Advanced for Desktop 100 Conc User Pk w/3Yr Support | 7S06004ZWW | B2CC |
| VMware vSAN 6 Advanced for Desktop 100 Conc User Pk w/5Yr Support | 7S060089WW | B2FN |
| vSAN 6 Enterprise for Desktop | | |
| VMware vSAN 6 Enterprise for Desktop 10 Conc User Pk w/1Yr Support | 7S06001SWW | B295 |
| VMware vSAN 6 Enterprise for Desktop 10 Conc User Pk w/3Yr Support | 7S060052WW | B2CF |
| VMware vSAN 6 Enterprise for Desktop 10 Conc User Pk w/5Yr Support | 7S06008CWW | B2FR |
| VMware vSAN 6 Enterprise for Desktop 100 Conc User Pk w/1Yr Support | 7S06001TWW | B296 |
| VMware vSAN 6 Enterprise for Desktop 100 Conc User Pk w/3Yr Support | 7S060053WW | B2CG |
| VMware vSAN 6 Enterprise for Desktop 100 Conc User Pk w/5Yr Support | 7S06008DWW | B2FS |

The following table compares features of the VMware vSAN software editions.

Table 28. VMware vSAN software editions feature comparison

| Feature | VMware vSAN software edition | | |
|---|---|----------|------------|
| | Standard | Advanced | Enterprise |
| Licensing for data center | Processor-based (per 1 processor) | | |
| Licensing for ROBO | VM-based (per 25 VMs)* | | |
| Licensing for Desktop | Concurrent user-based (per 10 or 100 users) | | |
| Cluster size | 2 - 64 | 2 - 64 | 2 - 64 |
| Storage-Policy Based Management | Yes | Yes | Yes |
| Flash Read/Write Caching | Yes | Yes | Yes |
| Distributed RAID | Yes | Yes | Yes |
| Virtual Distributed Switch | Yes | Yes | Yes |
| Rack Awareness | Yes | Yes | Yes |
| vSphere Replication | Yes | Yes | Yes |
| Software Checksum | Yes | Yes | Yes |
| All-Flash Hardware | Yes | Yes | Yes |
| iSCSI Target Service | Yes | Yes | Yes |
| IOPS Limit | Yes | Yes | Yes |
| Deduplication and Compression | No | Yes** | Yes** |
| RAID-5/6 Erasure Coding | No | Yes** | Yes** |
| Data-at-Rest Encryption | No | No | Yes |
| Stretched Cluster with Local Failure Protection | No | No | Yes |

* A maximum of 25 VMs is supported at any single location under the ROBO license. Two or more nodes can be used in a cluster under the ROBO license, however, the maximum number of VMs at the location must not exceed 25.

** Requires All-Flash configurations; hybrid configurations not supported.

VMware vSphere License and Subscription

Lenovo offers the following VMware vSphere License and Subscription options that can be purchased for ThinkAgile VX Certified Nodes:

- VMware vSphere 6 Standard for 1 Processor
vSphere Standard Edition provides an entry-level solution for basic server consolidation and business continuity.
- VMware vSphere 6 Enterprise Plus for 1 Processor
vSphere Enterprise Plus Edition offers resource management with enhanced application availability and performance for server virtualization and cloud solutions.
- VMware vSphere 6 with Operations Management Enterprise Plus for 1 Processor
vSphere with Operations Management Enterprise Plus offers intelligent operations management and automation with predictive analytics, along with resource management and enhanced application availability and performance, for server virtualization and cloud solutions.
- VMware vSphere 6 for Remote Office Branch Office (ROBO) Standard (25 VM Pack)
vSphere for ROBO Standard provides remote site server virtualization platform with business continuity and backup features.
- VMware vSphere 6 for Remote Office Branch Office Advanced (25 VM Pack)
vSphere for ROBO Advanced provides remote site server virtualization platform that offers business continuity and backup with advanced features such as standardization of host configurations.

The following table lists ordering information for the VMware vSphere License and Subscription options.

Table 29. VMware vSphere License and Subscription options

| Description | Part number | Feature code |
|--|-------------|--------------|
| vSphere 6 Standard | | |
| VMware vSphere 6 Standard for 1 Processor w/1Yr Support | 7S060003WW | B27G |
| VMware vSphere 6 Standard for 1 Processor w/3Yr Support | 7S06003DWW | B2AS |
| VMware vSphere 6 Standard for 1 Processor w/5Yr Support | 7S06006PWW | B2E2 |
| vSphere 6 Enterprise Plus | | |
| VMware vSphere 6 Enterprise Plus for 1 Processor w/1Yr Support | 7S060004WW | B27H |
| VMware vSphere 6 Enterprise Plus for 1 Processor w/3Yr Support | 7S06003EWW | B2AT |
| VMware vSphere 6 Enterprise Plus for 1 Processor w/5Yr Support | 7S06006QWW | B2E3 |
| vSphere 6 with Operations Management Enterprise Plus | | |
| VMware vSphere 6 w/Operations Mgmt Ent Plus for 1 Proc w/1Yr Support | 7S060005WW | B27J |
| VMware vSphere 6 w/Operations Mgmt Ent Plus for 1 Proc w/3Yr Support | 7S06003FWW | B2AU |
| VMware vSphere 6 w/Operations Mgmt Ent Plus for 1 Proc w/5Yr Support | 7S06006RWW | B2E4 |
| vSphere 6 Standard for Remote Office Branch Office | | |
| VMware vSphere 6 Remote Off Branch Off Std (25 VM Pk) w/1Yr Support | 7S060009WW | B27N |
| VMware vSphere 6 Remote Off Branch Off Std (25 VM Pk) w/3Yr Support | 7S06003KWW | B2AY |
| VMware vSphere 6 Remote Off Branch Off Std (25 VM Pk) w/5Yr Support | 7S06006VWW | B2E8 |
| vSphere 6 Advanced for Remote Office Branch Office | | |
| VMware vSphere 6 Remote Off Branch Off Adv (25 VM Pk) w/1Yr Support | 7S06000AWW | B27P |
| VMware vSphere 6 Remote Off Branch Off Adv (25 VM Pk) w/3Yr Support | 7S06003LWW | B2AZ |
| VMware vSphere 6 Remote Off Branch Off Adv (25 VM Pk) w/5Yr Support | 7S06006WWW | B2E9 |

The following table compares features of the VMware vSphere software editions.

Table 30. VMware vSphere software editions feature comparison

| Feature | VMware vSphere software edition | | | | |
|---|-----------------------------------|-----------------|---------------------------------------|-----------------------|-------------------|
| | Standard | Enterprise Plus | Operations Management Enterprise Plus | Standard for ROBO | Advanced for ROBO |
| Licensing | Processor-based (per 1 processor) | | | VM-based (per 25 VMs) | |
| Hypervisor | Yes | Yes | Yes | Yes | Yes |
| vMotion | Yes | Yes | Yes | Yes | Yes |
| Storage vMotion | Yes | Yes | Yes | Yes | Yes |
| Cross-Switch vMotion | Yes | Yes | Yes | No | No |
| High Availability and Fault Tolerance | 2 vCPU | 4 vCPU | 4 vCPU | 2 vCPU | 4 vCPU |
| Data Protection and Replication | Yes | Yes | Yes | Yes | Yes |
| Virtual Volumes | Yes | Yes | Yes | Yes | Yes |
| Storage-Policy Based Management | Yes | Yes | Yes | Yes | Yes |
| APIs for Storage Awareness | Yes | Yes | Yes | No | No |
| APIs for Array Integration, Multipathing | Yes | Yes | Yes | No | No |
| Content Library | Yes | Yes | Yes | No | No |
| vCenter High Availability | Yes* | Yes* | Yes* | No | No |
| vCenter Backup and Restore | Yes* | Yes* | Yes* | No | No |
| vCenter Server Appliance Migration Tool | Yes* | Yes* | Yes* | No | No |
| Virtual Machine Encryption | No | Yes | Yes | No | No |
| Proactive High Availability | No | Yes | Yes | No | No |
| vSphere Integrated Containers | No | Yes | Yes | No | Yes |
| Distributed Resource Scheduler (DRS) | No | Yes | Yes | No | No |
| Distributed Power Management | No | Yes | Yes | No | No |
| Big Data Extensions | No | Yes | Yes | No | No |
| Distributed Switch | No | Yes | Yes | No | Yes |
| Storage DRS | No | Yes | Yes | No | No |
| I/O Controls (Network and Storage) and SR-IOV | No | Yes | Yes | No | No |
| Host Profiles and Auto Deploy | No | Yes | Yes | No | Yes |
| Flash Read Cache | No | Yes | Yes | No | No |
| Cross-vCenter and Long Distance vMotion | No | Yes | Yes | No | No |
| vGPU | No | Yes | Yes | No | No |
| Predictive DRS | No | Yes** | Yes | No | No |
| vSphere Monitoring | No | No | Yes | No | No |
| Capacity Optimization | No | No | Yes | No | No |
| Operations Visibility | No | No | Yes | No | No |

* Requires vCenter Server Standard.

** Requires vRealize Operations Standard.

VMware HCI Kit License and Subscription

Lenovo offers the following VMware HCI license bundles that include both vSphere and vSAN License and Subscription options:

- VMware HCI Kit Standard (Per CPU):
 - vSphere Standard
 - vSAN Standard
- VMware HCI Kit Advanced (Per CPU):
 - vSphere Enterprise Plus
 - vSAN Advanced
- VMware HCI Kit Enterprise (Per CPU):
 - vSphere with Operations Management Enterprise Plus
 - vSAN Enterprise
- VMware HCI Kit Standard for ROBO (Per 25 VMs):
 - vSphere Standard for ROBO
 - vSAN Standard for ROBO
- VMware HCI Kit Advanced for ROBO (Per 25 VMs):
 - vSphere Advanced for ROBO
 - vSAN Advanced for ROBO

The following table lists ordering information for the VMware HCI Kit License and Subscription options.

Table 31. VMware HCI Kit License and Subscription options

| Description | Part number | Feature code |
|---|-------------|--------------|
| HCI Kit Standard | | |
| VMware HCI Kit Standard (Per CPU) w/1Yr Support | 7S06001XWW | B29A |
| VMware HCI Kit Standard (Per CPU) w/3Yr Support | 7S060057WW | B2CL |
| VMware HCI Kit Standard (Per CPU) w/5Yr Support | 7S06008HWW | B2FW |
| HCI Kit Advanced | | |
| VMware HCI Kit Advanced (Per CPU) w/1Yr Support | 7S06001YWW | B29B |
| VMware HCI Kit Advanced (Per CPU) w/3Yr Support | 7S060058WW | B2CM |
| VMware HCI Kit Advanced (Per CPU) w/5Yr Support | 7S06008JWW | B2FX |
| HCI Kit Enterprise | | |
| VMware HCI Kit Enterprise (Per CPU) w/1Yr Support | 7S06001ZWW | B29C |
| VMware HCI Kit Enterprise (Per CPU) w/3Yr Support | 7S060059WW | B2CN |
| VMware HCI Kit Enterprise (Per CPU) w/5Yr Support | 7S06008KWW | B2FY |
| HCI Kit Standard for Remote Office Branch Office | | |
| VMware HCI Kit for Rmt Off Brnch Off Std (25 VM Pack) w/1Yr Support | 7S060021WW | B29E |
| VMware HCI Kit for Rmt Off Brnch Off Std (25 VM Pack) w/3Yr Support | 7S06005BWW | B2CQ |
| VMware HCI Kit for Rmt Off Brnch Off Std (25 VM Pack) w/5Yr Support | 7S06008MWW | B2G0 |
| HCI Kit Advanced for Remote Office Branch Office | | |
| VMware HCI Kit for Rmt Off Brnch Off Adv (25 VM Pack) w/1Yr Support | 7S060022WW | B29F |
| VMware HCI Kit for Rmt Off Brnch Off Adv (25 VM Pack) w/3Yr Support | 7S06005CWW | B2CR |
| VMware HCI Kit for Rmt Off Brnch Off Adv (25 VM Pack) w/5Yr Support | 7S06008NWW | B2G1 |

VMware Horizon 7

Optionally, Lenovo offers VMware Horizon 7 Standard, Advanced, and Enterprise licenses for Virtual Desktop Infrastructure (VDI) deployments of the ThinkAgile VX Certified Nodes. The Standard license is available in 10-user or 100-user packs for concurrent users, and it includes VMware vSphere Desktop (delivers the full range of vSphere 6 Enterprise Plus features for desktop workloads) and vCenter Server for Desktop. The Advanced and Enterprise licenses are available in 10-user or 100-user packs for concurrent or named users, and they include VMware vSphere Desktop, vCenter Server for Desktop, and vSAN Advanced for Desktop with All-Flash.

The following table lists ordering information for the VMware Horizon License and Subscription options.

Table 32. VMware Horizon License and Subscription options

| Description | Part number | Feature code |
|--|-------------|--------------|
| Horizon 7 Standard | | |
| VMware Horizon 7 Standard 10 Concurrent User Pack w/1Yr Support | 7S06000KWW | B27Y |
| VMware Horizon 7 Standard 10 Concurrent User Pack w/3Yr Support | 7S06003VWW | B2B8 |
| VMware Horizon 7 Standard 10 Concurrent User Pack w/5Yr Support | 7S060075WW | B2EJ |
| VMware Horizon 7 Standard 100 Concurrent User Pack w/1Yr Support | 7S06000LWW | B27Z |
| VMware Horizon 7 Standard 100 Concurrent User Pack w/3Yr Support | 7S06003WWW | B2B9 |
| VMware Horizon 7 Standard 100 Concurrent User Pack w/5Yr Support | 7S060076WW | B2EK |
| Horizon 7 Advanced | | |
| VMware Horizon 7 Advanced 10 Concurrent User Pack w/1Yr Support | 7S06000PWW | B282 |
| VMware Horizon 7 Advanced 10 Concurrent User Pack w/3Yr Support | 7S06003ZWW | B2BC |
| VMware Horizon 7 Advanced 10 Concurrent User Pack w/5Yr Support | 7S060079WW | B2EN |
| VMware Horizon 7 Advanced 10 Named User Pack w/1Yr Support | 7S06000RWW | B284 |
| VMware Horizon 7 Advanced 10 Named User Pack w/3Yr Support | 7S060041WW | B2BE |
| VMware Horizon 7 Advanced 10 Named User Pack w/5Yr Support | 7S06007BWW | B2EQ |
| VMware Horizon 7 Advanced 100 Concurrent User Pack w/1Yr Support | 7S06000QWW | B283 |
| VMware Horizon 7 Advanced 100 Concurrent User Pack w/3Yr Support | 7S060040WW | B2BD |
| VMware Horizon 7 Advanced 100 Concurrent User Pack w/5Yr Support | 7S06007AWW | B2EP |
| VMware Horizon 7 Advanced 100 Named User Pack w/1Yr Support | 7S06000SWW | B285 |
| VMware Horizon 7 Advanced 100 Named User Pack w/3Yr Support | 7S060042WW | B2BF |
| VMware Horizon 7 Advanced 100 Named User Pack w/5Yr Support | 7S06007CWW | B2ER |
| Horizon 7 Enterprise | | |
| VMware Horizon 7 Enterprise 10 Concurrent User Pack w/1Yr Support | 7S06000XWW | B28A |
| VMware Horizon 7 Enterprise 10 Concurrent User Pack w/3Yr Support | 7S060047WW | B2BL |
| VMware Horizon 7 Enterprise 10 Concurrent User Pack w/5Yr Support | 7S06007HWW | B2EW |
| VMware Horizon 7 Enterprise 10 Named User Pack w/1Yr Support | 7S06000ZWW | B28C |
| VMware Horizon 7 Enterprise 10 Named User Pack w/3Yr Support | 7S060049WW | B2BN |
| VMware Horizon 7 Enterprise 10 Named User Pack w/5Yr Support | 7S06007KWW | B2EY |
| VMware Horizon 7 Enterprise 100 Concurrent User Pack w/1Yr Support | 7S06000YWW | B28B |
| VMware Horizon 7 Enterprise 100 Concurrent User Pack w/3Yr Support | 7S060048WW | B2BM |
| VMware Horizon 7 Enterprise 100 Concurrent User Pack w/5Yr Support | 7S06007JWW | B2EX |
| VMware Horizon 7 Enterprise 100 Named User Pack w/1Yr Support | 7S060010WW | B28D |
| VMware Horizon 7 Enterprise 100 Named User Pack w/3Yr Support | 7S06004AWW | B2BP |
| VMware Horizon 7 Enterprise 100 Named User Pack w/5Yr Support | 7S06007LWW | B2EZ |

The following table compares key features of the VMware Horizon software editions.

Table 33. VMware Horizon software editions feature comparison

| Feature | VMware Horizon software edition | | |
|---|----------------------------------|----------|------------|
| | Standard | Advanced | Enterprise |
| Licensing | User-based (per 10 or 100 users) | | |
| Concurrent Users | Yes | Yes | Yes |
| Named Users | No | Yes | Yes |
| Windows Virtual Desktops | Yes | Yes | Yes |
| Linux Virtual Desktops | No | No | Yes |
| Packaged Applications | Yes | Yes | Yes |
| Hosted Applications | No | Yes | Yes |
| Session-based Desktops | No | Yes | Yes |
| Single Sign-On for Application and Desktop Access | No | Yes | Yes |
| Image Management for Physical Desktop | No | Yes | Yes |
| Virtualization Pack for Skype for Business | No | Yes | Yes |
| Session Collaboration | No | No | Yes |
| Real-time Application Delivery | No | No | Yes |
| Just-in-Time Delivery with Instant Clone Technology | No | No | Yes |
| User, Profile, and Policy Management | No | No | Yes |
| Health Monitoring and Performance Analytics | No | No | Yes |
| Capacity Management: Planning and Optimization | No | No | Yes |
| Help Desk Tool | No | No | Yes |

VMware vCenter Server

VMware vCenter Server provides centralized management of vSphere environments to simplify day-to-day operations and reduce the complexity of managing virtual infrastructure.

vCenter Server is required for managing ThinkAgile VX Certified Nodes. The nodes can be added to an existing installation of vCenter Server, or the software license for the vCenter Server instance can be purchased from Lenovo by selecting one of the following License and Subscription options:

- VMware vCenter Server 6 Foundation for vSphere 6 (Per Instance) (manages up to 4 hosts)
- VMware vCenter Server 6 Standard for vSphere 6 (Per Instance) (unlimited hosts)

The vCenter Server licenses purchased from Lenovo include one, three, or five years of support and subscription.

The following table lists ordering information for the VMware vCenter License and Subscription options.

Table 34. VMware vCenter Server License and Subscription options

| Description | Part number | Feature code |
|--|-------------|--------------|
| vCenter Server Foundation | | |
| VMware vCenter Srv 6 Fdn for vSph 6 (Per Instance) w/1Yr Support | 7S0600DWW | B27S |
| VMware vCenter Srv 6 Fdn for vSph 6 (Per Instance) w/3Yr Support | 7S06003PWW | B2B2 |
| VMware vCenter Srv 6 Fdn for vSph 6 (Per Instance) w/5Yr Support | 7S06006ZWW | B2EC |
| vCenter Server Standard | | |
| VMware vCenter Srv 6 Std for vSph 6 (Per Instance) w/1Yr Support | 7S0600CWW | B27R |

| Description | Part number | Feature code |
|--|-------------|--------------|
| VMware vCenter Srv 6 Std for vSph 6 (Per Instance) w/3Yr Support | 7S06003NWW | B2B1 |
| VMware vCenter Srv 6 Std for vSph 6 (Per Instance) w/5Yr Support | 7S06006YWW | B2EB |

VMware vCenter Server offers the following key features:

- Centralized management of virtualized hosts and virtual machines from a single console.
- Centralized inventory of virtual machines, hosts, datastores and networks.
- Alerts and notifications can trigger automated workflows to remedy and preempt problems.
- Host profiles standardize and simplify configuration and management of VMware ESXi hosts.
- Resource management for virtual machines allows to control allocation of processor, memory, disk and network resources.
- Continuously monitors utilization across resource pools and intelligently allocates available resources among virtual machines according to predefined rules
- Automatically restarts virtual machines that have failed without manual intervention with VMware vSphere HA.
- Maintains records of significant configuration changes and exports reports for event tracking.
- Patch management enforces compliance to patch standards through automated scanning and patching of online ESXi hosts and select Microsoft and Linux virtual machines.

Systems management

The ThinkAgile VX 1U Certified Nodes support the following systems management tools:

- Lenovo XClarity Controller
- Light path diagnostics
- Lenovo XClarity Administrator
- Lenovo XClarity Integrator for VMware vCenter
- Lenovo XClarity Energy Manager

Lenovo XClarity Controller

The ThinkAgile VX Certified Nodes contain Lenovo XClarity Controller (XCC), which provides advanced service-processor control, monitoring, and alerting functions. XClarity Controller offers three functional levels: Standard, Advanced, and Enterprise.

By default, the VX Certified Nodes include XClarity Controller Standard features, and they can be configured for Advanced or Enterprise functionality by using the Features on Demand (FoD) upgrades.

XClarity Controller Standard offers the following capabilities:

- Gathering and viewing system information and inventory
- Monitoring system status and health
- Alerting and notifications
- Event logging
- Configuring network connectivity
- Configuring security
- Updating system firmware
- Configuring server settings and devices
- Real-time power usage monitoring
- Remotely controlling server power (Power on, Power off, Restart)
- Managing FoD activation keys
- Redirecting serial console via IPMI
- Capturing the video display contents when an operating system hang condition is detected

XClarity Controller Advanced Upgrade adds the following functionality to the Standard features:

- Remotely viewing video with graphics resolutions up to 1920x1200 at 60 Hz with 16 bits per pixel
- Remotely accessing the server using the keyboard and mouse from a remote client
- Remotely deploying an operating system
- Syslog alerting
- Redirecting serial console via SSH
- Displaying graphics for real-time and historical power usage data and temperature

XClarity Controller Enterprise Upgrade adds the following functionality to the Advanced features:

- Capping power usage
- Mapping the ISO and image files located on the local client as virtual drives for use by the server
- Mounting the remote ISO and image files via HTTPS, SFTP, CIFS, and NFS
- Collaborating across up to six users of the virtual console
- Controlling quality and bandwidth usage

The XClarity Controller provides remote server management through the following interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3
- Common Information Model (CIM)
- Data Center Manageability Interface (DCMI) Version 1.5
- Redfish REpresentational State Transfer (REST) API
- Web browser with HTML5 support
- Command-line interface
- Virtual Operator Panel with XClarity Mobile App via the front USB port with XClarity Controller access

Virtual Operator Panel provides quick access to system status, firmware, network, health, and alerts information. With proper authentication, it also allows to configure systems management and network settings and to control system power (Power on, Power off, Restart). The Virtual Operator Panel can be accessed from the XClarity Mobile App running on the Android or iOS mobile device that is connected to the front USB port with XClarity Controller access (See [Components and connectors](#)).

The following table lists the XClarity Controller FoD upgrades.

Table 35. XClarity Controller FoD upgrades

| Description | Part number | Feature code | Maximum supported |
|--|-------------|--------------|-------------------|
| ThinkSystem XClarity Controller Standard to Advanced Upgrade | 4L47A09132 | AVUT | 1 |
| ThinkSystem XClarity Controller Standard to Enterprise Upgrade | None* | AUPW | 1 |
| ThinkSystem XClarity Controller Advanced to Enterprise Upgrade | 4L47A09133 | None** | 1 |

* Factory-installed only.

** Field-upgrade only.

Configuration notes:

- For factory-installed upgrades, either Standard to Advanced Upgrade (feature AVUT) or Standard to Enterprise Upgrade (feature AUPW) can be selected, but not both.
- For field upgrades, the Advanced to Enterprise Upgrade (4L47A09133) requires the Standard to Advanced Upgrade to be activated on the server previously with either the factory-installed feature AVUT or field upgrade 4L47A09132.

Light path diagnostics

The ThinkAgile VX 1U Certified Nodes include basic light path diagnostics, which provides the system LEDs on the front of the node and the LEDs near the monitored components (for example, the DIMM error LEDs on the system board).

Lenovo XClarity Administrator

Lenovo XClarity Administrator is a centralized systems management solution that helps administrators deliver infrastructure faster. This solution integrates easily with Lenovo x86 servers, ThinkAgile VX Series appliances and certified nodes, RackSwitch switches, and DS Series storage, providing automated agent-less discovery, monitoring, firmware updates, and configuration management across multiple systems.

Lenovo XClarity Administrator is an optional software component for managing ThinkAgile VX Certified Nodes which can be downloaded and used at no charge to discover and monitor the nodes and manage firmware upgrades for them.

If software support is required for XClarity Administrator and XClarity Integrator for vCenter, Lenovo XClarity Pro software subscription should be ordered. Lenovo XClarity Pro is licensed on a per managed system basis, that is, each managed Lenovo system requires a license.

The following table lists the geo-specific Lenovo XClarity software license options.

Table 36. Lenovo XClarity software options

| Description | Part number (NA, AP, Japan)* | Part number (EMEA, LA)** |
|--|------------------------------|--------------------------|
| Lenovo XClarity Pro, per Mngd Server w/1 Yr SW S&S | 00MT201 | 00MT207 |
| Lenovo XClarity Pro, per Mngd Server w/3 Yr SW S&S | 00MT202 | 00MT208 |
| Lenovo XClarity Pro, per Mngd Server w/5 Yr SW S&S | 00MT203 | 00MT209 |

* NA = North America; AP = Asia Pacific.

** EMEA = Europe, Middle East, Africa; LA = Latin America.

Lenovo XClarity Administrator offers the following standard features that are available at no charge:

- Auto-discovery and monitoring of Lenovo x86 servers, appliances, certified nodes, RackSwitch switches, Flex System chassis, and DS Series storage systems
- Firmware updates and compliance enforcement
- External alerts and notifications via SNMP traps, syslog remote logging, and e-mail
- Secure connections to managed endpoints
- NIST 800-131A or FIPS 140-2 compliant cryptographic standards between the management solution and managed endpoints
- Integration into existing higher level management systems such as cloud automation and orchestration tools through REST APIs, providing extensive external visibility and control over hardware resources
- An intuitive, easy-to-use GUI
- Scripting with Windows PowerShell, providing command-line visibility and control over hardware resources

Lenovo XClarity Administrator offers the following premium features that require an optional Pro license:

- Pattern-based configuration management that allows to define configurations once and apply repeatedly without errors when deploying new servers or redeploying existing servers without disrupting the fabric
- Bare-metal deployment of operating systems and hypervisors to streamline infrastructure provisioning

For more information, refer to the Lenovo XClarity Administrator Product Guide:

<http://lenovopress.com/tips1200>

Lenovo XClarity Integrator for VMware vCenter

Lenovo XClarity Integrator for VMware vCenter is a software plug-in module for Lenovo XClarity Administrator that allows administrators to manage physical infrastructure from leading external virtualization management software tool from VMware.

Lenovo XClarity Integrator for VMware vCenter offers the following features:

- Ability to discover, manage, and monitor Lenovo node hardware from the virtualization management tool
- Deployment of firmware updates to VX Certified Nodes from the virtualization management tool
- Non-disruptive server maintenance in clustered environments that reduces workload downtime by dynamically migrating workloads from affected hosts during rolling server updates or reboots
- Greater service level uptime and assurance in clustered environments during unplanned hardware events by dynamically triggering workload migration from impacted hosts when impending hardware failures are predicted

Lenovo XClarity Integrator for VMware vCenter can be downloaded and used at no charge. For more information, refer to the Lenovo XClarity Integrator for VMware vCenter web page:

<https://support.lenovo.com/us/en/solutions/Invo-vmware>

Lenovo XClarity Energy Manager

Lenovo XClarity Energy Manager provides a stand-alone, web-based agent-less power management console that provides real time data and enables you to observe, plan and manage power and cooling for Lenovo servers, appliances, and certified nodes. Using built-in intelligence, it identifies server power consumption trends and ideal power settings and performs cooling analysis so that you can define and optimize power-saving policies.

Lenovo XClarity Energy Manager offers the following capabilities:

- Monitors room, row, rack, and device levels in the data center
- Reports vital system information, such as power, temperature and resource utilization
- Monitors inlet temperature to locate hot spots, reducing the risk of data or device damage
- Provides finely-grained controls to limit platform power in compliance with IT policy
- Generates alerts when a user-defined threshold is reached

Lenovo XClarity Energy Manager is an optional software component for VX Certified Nodes that is licensed on a per managed node basis, that is, each managed system requires a license. The 1-node Energy Manager license is included in the XClarity Controller Enterprise upgrade.

To manage systems without XClarity Controller Enterprise licenses, a node license pack should be purchased. The following table lists the geo-specific Lenovo XClarity Energy Manager software license options.

Table 37. Lenovo XClarity Energy Manager software options

| Description | Part number (NA, AP, Japan)* | Part number (EMEA, LA)** |
|--|------------------------------|--------------------------|
| Lenovo XClarity Energy Manager, 1 Node w/ 1 Yr S&S | 01DA225 | 01DA228 |

* NA = North America; AP = Asia Pacific.

** EMEA = Europe, Middle East, Africa; LA = Latin America.

For more information, refer to the Lenovo XClarity Energy Manager web page:

<http://datacentersupport.lenovo.com/us/en/solutions/Invo-lxem>

Physical specifications

The ThinkAgile VX 1U Certified Nodes have the following dimensions and weight (approximate):

- Height: 43 mm (1.7 in.)
- Width: 434 mm (17.1 in.)
- Depth: 715 mm (28.1 in.)
- Weight (maximum): 18.8 kg (41.4 lb)

Operating environment

The ThinkAgile VX 1U Certified Nodes comply with ASHRAE class A2 specifications. The node performance might be impacted when the operating temperature is outside the ASHRAE A2 specifications. Depending on the hardware configuration, some VX Certified Nodes comply with ASHRAE class A3 and class A4 specifications. To comply with ASHRAE class A3 and class A4 specifications, the nodes must meet the following hardware configuration requirements at the same time:

- Two power supplies installed.
- NVMe drives not installed.
- Processors with TDP more than or equal to 150 W not installed.
- Intel Xeon 4112, 5122, 6126, 6128, 6132, 6134, 6134M, and 8156 processors not installed.

The ThinkAgile VX 1U Certified Nodes are supported in the following environment:

- Air temperature:
 - Operating:
 - ASHRAE Class A4: 5 °C - 45 °C (41 °F - 113 °F); for altitudes above 900 m (2,953 ft), decrease the maximum ambient temperature by 1 °C for every 125-m (410-ft) increase in altitude
 - ASHRAE Class A3: 5 °C - 40 °C (41 °F - 104 °F); for altitudes above 900 m (2,953 ft), decrease the maximum ambient temperature by 1 °C for every 175-m (574-ft) increase in altitude
 - ASHRAE Class A2: 10 °C - 35 °C (50 °F - 95 °F); for altitudes above 900 m (2,953 ft), decrease the maximum ambient temperature by 1 °C for every 300-m (984-ft) increase in altitude
 - Non-operating: 5 °C - 45 °C (41 °F - 113 °F)
 - Storage: -40 °C - +60 °C (-40 °F - 140 °F)
- Maximum altitude: 3,050 m (10,000 ft)
- Humidity:
 - Operating:
 - ASHRAE Class A4: 8% - 90% (non-condensing); maximum dew point: 24 °C (75 °F)
 - ASHRAE Class A3: 8% - 85% (non-condensing); maximum dew point: 24 °C (75 °F)
 - ASHRAE Class A2: 8% - 80% (non-condensing); maximum dew point: 21 °C (70 °F)
 - Storage: 8% - 90% (non-condensing)
- Electrical:
 - 100 - 127 (nominal) V AC; 50 Hz / 60 Hz (750 W Platinum and 1100 W power supplies only)
 - 200 - 240 (nominal) V AC; 50 Hz / 60 Hz
 - 180 - 300 V DC (supported in China only)
- Acoustics (maximum configuration, operating): 6.5 bels
- Vibration:
 - Operating: 0.21 G rms at 5 Hz to 500 Hz for 15 minutes across 3 axes
 - Non-operating: 1.04 G rms at 2 Hz to 200 Hz for 15 minutes across 6 surfaces
- Shock:
 - Operating: 15 G for 3 milliseconds in each direction (positive and negative X, Y, and Z axes)
 - Non-operating:
 - 12 kg - 22 kg: 50 G for 152 in./sec velocity change across 6 surfaces
 - 23 kg - 31 kg: 35 G for 152 in./sec velocity change across 6 surfaces

The following table lists the maximum system power load, rated inlet current, and system heat output based on the power supply and source voltage.

Table 38. Rated system power, inlet current, and system heat output

| Power supply | Source voltage | Maximum power load per system (two power supplies) | Rated current per inlet | System heat output |
|-------------------|----------------|--|-------------------------|--------------------|
| 750W AC Platinum | 100 - 127 V AC | 984 W | 8.4 A | 3357 BTU/hour |
| | 200 - 240 V AC | 958 W | 4.1 A | 3269 BTU/hour |
| | 180 - 300 V DC | 958 W | 3.5 A | 3269 BTU/hour |
| 750W AC Titanium | 200 - 240 V AC | 949 W | 4.1 A | 3238 BTU/hour |
| | 180 - 300 V DC | 948 W | 3.5 A | 3235 BTU/hour |
| 1100W AC Platinum | 100 - 127 V AC | 1382 W | 12 A | 4715 BTU/hour |
| | 200 - 240 V AC | 1408 W | 6 A | 4804 BTU/hour |
| | 180 - 300 V DC | 1408 W | 5.1 A | 4804 BTU/hour |

Regulatory compliance

The ThinkAgile VX Certified Nodes conform to the following regulations:

- United States FCC Part 15, Class A
- Canada ICES-003/NMB-03, Class A
- UL/CSA 60950-1
- Mexico NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22, Class A
- China CCC GB4943.1, GB9254 Class A, GB17625.1
- Taiwan BSMI CNS13438, Class A; CNS14336-1
- Korea KN22, Class A; KN24
- Russia/GOST ME01; IEC-60950-1; GOST R 51318.22, 51318.24, 51317.3.2, and 51317.3.3
- IEC 60950-1 (CB Certificate and CB Test Report)
- Europe CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
- Germany TUV-GS (EN60950-1/IEC60950-1, EK1-ITB2000)
- Reduction of Hazardous Substances (ROHS)
- Energy Star 2.1

Warranty services and upgrades

The ThinkAgile VX Certified Nodes can be configured with a three-, four, or five-year hardware warranty with 24x7 ThinkAgile Advantage Single Point of Support (Lenovo server hardware and VMware software; requires an active software support contract purchased either from VMware or Lenovo) 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 VMware, on behalf of the customer, for software-related problem determination. VMware will contact the customer and will own the software-related problem resolution until closure.

Some countries might have different warranty terms and conditions than the standard warranty. This is due to local business practices or laws in the specific country. Local service teams can assist in explaining country-specific terms when needed. Examples of country-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 spares parts.

Lenovo warranty service coverage levels are country-specific. Not all warranty service levels are available in every country. For information about Lenovo warranty services that are available in your country or area, 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/>

The following Lenovo warranty service levels are available for the ThinkAgile VX Certified Nodes:

- 3, 4, or 5 years of warranty service coverage with 1-year or 2-year post-warranty extensions:
 - Base warranty: 9x5 Next Business Day response with parts delivered
 - 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 countries)
 - Advanced Service: 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select countries)
- Premier Support
Premier Support service offers direct access to Lenovo's most advanced technicians for faster troubleshooting with single point of contact for end-to-end problem resolution and collaborative third-party software support.
- YourDrive YourData
Lenovo's YourDrive YourData service (where applicable) 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 system. 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 with Foundation, Essential, or Advanced Service upgrades and extensions.

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

- Lenovo Statement of Limited Warranty for Data Center Group (DCG) 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>

Software maintenance

For the VMware software and subscription licenses provided by the customer, software support that is provided by VMware is based on the support level included with these licenses.

Lenovo offers optional one-, three-, or five-year VMware software support and subscription for ThinkAgile VX Certified Nodes that entitles customers to submit service requests to troubleshoot VMware software issues and receive code updates, including fixes, patches, and new software releases.

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

For the VMware vSphere, vSAN, and vCenter Server software and subscription licenses purchased from Lenovo together with the ThinkAgile VX Certified Nodes, software support that is provided by VMware includes Production-level support with 24x7 phone and web coverage with the following target response times (priorities are defined by VMware based on the impact on productivity):

- Severity 1 (Critical: Substantial loss or disruption of service, significant risk of data loss): 30 minutes
- Severity 2 (Major: Operations are severely constrained, significant impact): 4 business hours
- Severity 3 (Minor: Non-critical loss of functionality, minimal impact): 8 business hours
- Severity 4 (Cosmetic: General questions): 12 business hours

Deployment services

The following optional Lenovo basic installation services are available for the ThinkAgile VX Certified Nodes:

- Unpacking and inspecting the systems
- 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)

The following optional Lenovo deployment services are available for the ThinkAgile VX Certified Nodes to get customers up and running quickly:

- Conducting remote preparation and planning
- Verifying firmware versions and performing firmware updates, if needed
- Configuring network switches
- Configuring XCC management settings
- Configuring hypervisor settings
- Configuring vSAN
- Configuring VMware vCenter Server and discovering hosts and storage
- Configuring Lenovo XClarity network settings and performing discovery and inventory
- Transferring knowledge
- Developing post-installation documentation

For more information, refer to the Data Center Deployment Services web page:

<https://www.lenovo.com/us/en/p/Deployment-Services>

Ethernet LAN switches

The following table lists the Ethernet LAN switches that are offered by Lenovo that can be used with the ThinkAgile VX Certified Nodes.

Table 39. Ethernet LAN switches

| Description | Part number | Feature code |
|---|-------------|--------------|
| 1 Gb Ethernet switches (Out-of-band hardware management and 1 GbE host connectivity) | | |
| Lenovo RackSwitch G7028 (Rear to Front) | 7159BAX | AT09 |
| Lenovo RackSwitch G7052 (Rear to Front) | 7159CAX | AT0A |
| Lenovo RackSwitch G8052 (Rear to Front) | 7159G52 | ASY2 |
| 10 Gb Ethernet switches (10 GbE host connectivity) | | |
| Lenovo ThinkSystem NE1032 RackSwitch (Rear to Front) | 7159A1X | AU3A |
| Lenovo ThinkSystem NE1032T RackSwitch (Rear to Front) | 7159B1X | AU38 |
| Lenovo ThinkSystem NE1072T RackSwitch (Rear to Front) | 7159C1X | AU36 |
| Lenovo RackSwitch G8124E (Rear to Front) | 7159BR6 | AT0B |
| Lenovo RackSwitch G8272 (Rear to Front) | 7159CRW | ASRD |
| Lenovo RackSwitch G8296 (Rear to Front) | 7159GR6 | ASVM |
| 25 Gb Ethernet switches (10/25 GbE host connectivity) | | |
| Lenovo ThinkSystem NE2572 RackSwitch (Rear to Front) | 7159E1X | AV19 |
| 40 Gb Ethernet switches (40 GbE host connectivity; 10 GbE breakout host connectivity) | | |
| Lenovo RackSwitch G8332 (Rear to Front) | 7159BRX | ASY4 |
| 100 Gb Ethernet switches (40 GbE/100 GbE host connectivity; 10 GbE/25 GbE breakout host connectivity) | | |
| Lenovo ThinkSystem NE10032 RackSwitch (Rear to Front) | 7159D1X | AV17 |

For more information, see the list of Product Guides in the Top-of-rack Switches category:

<http://lenovopress.com/servers/options/switches#rt=product-guide>

Rack cabinets

The following table lists the rack cabinets that are offered by Lenovo that can be used with the ThinkAgile VX Certified Nodes.

Table 40. Rack cabinets

| Description | Part number | Feature code |
|---|-------------|--------------|
| 25U S2 Standard Rack (1000 mm deep; 2 sidewall compartments) | 93072RX | 1042 |
| 25U Static S2 Standard Rack (1000 mm deep; 2 sidewall compartments) | 93072PX | 6690 |
| 42U S2 Standard Rack (1000 mm deep; 6 sidewall compartments) | 93074RX | 1043 |
| 42U 1100mm Enterprise V2 Dynamic Rack (6 sidewall compartments) | 93634PX | A1RC |
| 42U 1100mm Enterprise V2 Dynamic Expansion Rack (6 sidewall compartments) | 93634EX | A1RD |
| 42U 1200mm Deep Dynamic Rack (6 sidewall compartments) | 93604PX | 7649 |
| 42U 1200mm Deep Static Rack (6 sidewall compartments) | 93614PX | 7651 |
| 42U Enterprise Rack (1105 mm deep; 4 sidewall compartments) | 93084PX | 5621 |
| 42U Enterprise Expansion Rack (1105 mm deep; 4 sidewall compartments) | 93084EX | 5622 |

For more information, see the list of Product Guides in the Rack Cabinets category:
<http://lenovopress.com/servers/options/racks#rt=product-guide>

Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo that can be used with the ThinkAgile VX Certified Nodes.

Table 41. Power distribution units

| Description | Part number | Feature code |
|---|-------------|--------------|
| 0U Basic PDUs | | |
| 0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord | 00YJ776 | ATZY |
| 0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord | 00YJ777 | ATZZ |
| 0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 cord | 00YJ778 | AU00 |
| 0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord | 00YJ779 | ATZX |
| Switched and Monitored PDUs | | |
| 0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P cord | 00YJ781 | AU03 |
| 0U 20 C13/4 C19 Switched / Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 cord | 00YJ780 | AU01 |
| 0U 18 C13/6 C19 Sw. / Mon. 32A/200-240/346-415V/3Ph PDU w/ IEC60309 532P6 cord | 00YJ782 | AU02 |
| 0U 12 C13/12 C19 Switched / Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 cord | 00YJ783 | AU04 |
| 1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord) | 46M4002 | 5896 |
| 1U 9 C19/3 C13 Switched and Monitored 60A 3Ph PDU with IEC 309 3P+Gnd cord | 46M4003 | 5897 |
| 1U 12 C13 Switched and Monitored DPI PDU (without line cord) | 46M4004 | 5894 |
| 1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord | 46M4005 | 5895 |
| Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets) | | |
| Ultra Density Enterprise C19/C13 PDU Module (without line cord) | 71762NX | 6050 |
| Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord | 71763NU | 6051 |
| C13 Enterprise PDUs (12x IEC 320 C13 outlets) | | |
| DPI C13 Enterprise PDU+ (without line cord) | 39M2816 | 6030 |

| Description | Part number | Feature code |
|--|--------------------|---------------------|
| DPI Single Phase C13 Enterprise PDU (without line cord) | 39Y8941 | 6010 |
| C19 Enterprise PDUs (6x IEC 320 C19 outlets) | | |
| DPI Single Phase C19 Enterprise PDU (without line cord) | 39Y8948 | 6060 |
| DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord | 39Y8923 | 6061 |
| Front-end PDUs (3x IEC 320 C19 outlets) | | |
| DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord | 39Y8938 | 6002 |
| DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord | 39Y8939 | 6003 |
| DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord | 39Y8934 | 6005 |
| DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord | 39Y8940 | 6004 |
| DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord | 39Y8935 | 6006 |
| Universal PDUs (7x IEC 320 C13 outlets) | | |
| DPI Universal 7 C13 PDU (with 2 m IEC 320-C19 to C20 rack power cord) | 00YE443 | 5950 |
| Line cords for PDUs that ship without a line cord | | |
| DPI 30a Line Cord (NEMA L6-30P) | 40K9614 | 6500 |
| DPI 32a Line Cord (IEC 309 P+N+G) | 40K9612 | 6502 |
| DPI 32a Line Cord (IEC 309 3P+N+G) | 40K9611 | 6504 |
| DPI 60a Cord (IEC 309 2P+G) | 40K9615 | 6501 |
| DPI 63a Cord (IEC 309 P+N+G) | 40K9613 | 6503 |
| DPI Australian/NZ 3112 Line Cord (32A) | 40K9617 | 6505 |
| DPI Korean 8305 Line Cord (30A) | 40K9618 | 6506 |

For more information, see the list of Product Guides in the Power Distribution Units category:
<http://lenovopress.com/servers/options/pdu#rt=product-guide>

Uninterruptible power supply units

The following table list the uninterruptible power supply (UPS) units that are currently offered by Lenovo that can be used with the ThinkAgile VX Certified Nodes.

Table 42. Uninterruptible power supply units

| Description | Part number |
|--|-------------|
| Worldwide models | |
| RT1.5kVA 2U Rack or Tower UPS (100-125VAC) (8x NEMA5-15R 12A outlets) | 55941AX |
| RT1.5kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A outlets) | 55941KX |
| RT2.2kVA 2U Rack or Tower UPS (100-125VAC) (8x NEMA 5-20R 16A outlets) | 55942AX |
| RT2.2kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 1x IEC 320 C19 16A outlets) | 55942KX |
| RT3kVA 2U Rack or Tower UPS (100-125VAC) (6x NEMA5-20R 16A, 1x NEMA L5-30R 24A outlets) | 55943AX |
| RT3kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 1x IEC 320 C19 16A outlets) | 55943KX |
| RT5kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets) | 55945KX |
| RT6kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets) | 55946KX |
| RT8kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets) | 55948KX |
| RT11kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets) | 55949KX |
| RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets) | 55948PX |
| RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets) | 55949PX |
| ASEAN, HTK, INDIA, and PRC models | |
| ThinkSystem RT3kVA 2U Standard UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets) | 55943KT |
| ThinkSystem RT3kVA 2U Long Backup UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets) | 55943LT |
| ThinkSystem RT6kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output) | 55946KT |
| ThinkSystem RT10kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output) | 5594XKT |

For more information, see the list of Product Guides in the Uninterruptible Power Supply Units category:
<http://lenovopress.com/servers/options/ups#rt=product-guide>

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.lenovofs.com>

Related publications and links

For more information, see these resources:

- Lenovo ThinkAgile VX Series
<http://www3.lenovo.com/us/en/p/WMD00000340>
- Lenovo Data Center Solution Configurator (DCSC):
<http://dcsc.lenovo.com>
- ThinkAgile VX - Best Recipes
<http://datacentersupport.lenovo.com/us/en/solutions/HT505302>
- VMware documentation
<https://docs.vmware.com/>
- Lenovo Data Center Support
<http://datacentersupport.lenovo.com>

Related product families

Product families related to this document are the following:

- [ThinkAgile VX Series for VMware vSAN](#)
- [VMware Alliance](#)
- [Hyperconverged Infrastructure](#)
- [Hyperconverged Infrastructure](#)

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.
1009 Think Place - Building One
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 2018. All rights reserved.

This document, LP0932, was created or updated on August 28, 2018.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
<http://lenovopress.com/LP0932>
- Send your comments in an e-mail to:
comments@lenovopress.com

This document is available online at <http://lenovopress.com/LP0932>.

Trademarks

Lenovo, the Lenovo logo, and For Those Who Do 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 <http://www3.lenovo.com/us/en/legal/copytrade/>.

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

AnyBay
Flex System
Lenovo Services
Lenovo XClarity
Lenovo®
RackSwitch
ThinkAgile
ThinkSystem
TruDDR4

The following terms are trademarks of other companies:

Intel® and Xeon® are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux® is a trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft®, PowerShell, SQL Server®, SharePoint®, Skype®, Windows PowerShell®, and Windows® 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.