



Lenovo ThinkSystem NE10032 RackSwitch Product Guide

The Lenovo ThinkSystem NE10032 RackSwitch that uses 100 Gb QSFP28 and 40 Gb QSFP+ Ethernet technology is specifically designed for the data center. It is ideal for today's big data, cloud, and enterprise workload solutions. It is an enterprise class Layer 2 and Layer 3 full featured switch that delivers line-rate, high-bandwidth switching, filtering, and traffic queuing without delaying data. Large data center-grade buffers help keep traffic moving, while the hot-swap redundant power supplies and fans (along with numerous high-availability features) help provide high availability for business sensitive traffic.

The NE10032 RackSwitch has 32x QSFP+/QSFP28 ports that support 40 GbE and 100 GbE optical transceivers, active optical cables (AOCs), and direct attach copper (DAC) cables. The QSFP+/QSFP28 ports can also be split out into four 10 GbE (for 40 GbE ports) or 25 GbE (for 100 GbE ports) connections by using breakout cables.

The NE10032 RackSwitch is ideal for latency sensitive applications, such as high-performance computing clusters and financial applications.

The NE10032 RackSwitch is shown in the following figure.



Figure 1. Lenovo ThinkSystem NE10032 RackSwitch

Did you know?

With exceptional port density and flexibility with break-out cables, the NE10032 RackSwitch can support up to 128x 10 GbE / 25 GbE Ethernet connections, or a mix of 10 GbE / 25 GbE server and storage connections with 40 GbE or 100 GbE upstream network connections, or up to 32x 40 GbE / 100 GbE connections in a 1U rack form factor.

The NE10032 RackSwitch runs the Lenovo Cloud Networking Operating System (CNOS) that provides a simple, open and programmable network infrastructure with cloud-scale performance. It delivers a software-defined Ethernet solution that is simple to manage and easy to deploy using common management tools, and it enables support of automation and orchestration applications for tight integration into the data center ecosystem.

Key features

The NE10032 RackSwitch runs the Cloud NOS that provides a simple, open and programmable network infrastructure designed to scale for your business needs. Its intelligent, cloud-scale performance delivers a software-defined Ethernet solution that is simple to manage and easy to deploy using common management tools. Cloud NOS is based on open, industry standards for better data center interoperability, and it enables support of automation and orchestration applications for tight integration into the data center ecosystem.

With its high-performance architecture and support for an extensive set of routing protocols, Cloud NOS provides reliable, high-performance fabric for traditional, converged and hyperscale solutions. Cloud NOS can help you consolidate server and storage networks into a single fabric. Converged Enhanced Ethernet delivers value for your iSCSI and NAS enterprise storage environments.

The NE10032 RackSwitch is considered particularly suited for the following environments:

- Mixed 10 GbE, 25 GbE, 40 GbE, and 100 GbE server and storage connectivity and upstream aggregation
- Cloud and virtualization solutions with VM-aware network automation and integration into Lenovo and third-party IT and cloud infrastructure management tools
- Converged SAN and LAN network via NAS and iSCSI storage connectivity
 - Reduced I/O cost (CAPEX) with fewer adapters and cables to purchase
 - Reduced complexity (OPEX) with fewer components to manage and lower energy cost
- Web-scale and hyperconverged solutions
- Applications demanding better performance and lower latency

The NE10032 RackSwitch offers the following features and benefits:

- High performance
The 10 Gb/25 Gb/40 Gb/100 Gb Ethernet NE10032 RackSwitch provides a combination of low latency, non-blocking line-rate switching, and ease of management with 6.4 Tbps throughput.
- Lower power and better cooling
The front-to-rear or rear-to-front cooling design of the NE10032 RackSwitch reduces data center air conditioning costs by having airflow match the servers in the rack. In addition, variable speed fans help reduce power consumption.
- Layer 3 functionality
The NE10032 RackSwitch includes Layer 3 functionality, which provides security and performance benefits, as inter-VLAN traffic stays within the switch. This switch also provides the full range of Layer 3 protocols from static routes for technologies, such as Open Shortest Path First (OSPF) and Border Gateway Protocol (BGP) for enterprise customers.
- Converged fabric
The NE10032 RackSwitch supports Converged Enhanced Ethernet (CEE) which helps enable customers to combine storage, messaging traffic, VoIP, video, and other data on a common data center lossless Ethernet infrastructure. As a result, customers can deploy a single server interface for multiple data types, which can simplify the deployment and management of server network connectivity while maintaining the high availability and robustness that is required for storage transactions.
- Fault tolerance
The NE10032 RackSwitch offers redundant hot-swap hardware components, learns alternate routes automatically, and performs faster convergence if there is a link, switch, or power failure.
- Seamless interoperability
RackSwitch switches perform seamlessly with other vendors' upstream switches.

- **Automated VM-aware network provisioning**
The Lenovo CNOS Network Policy Agent, a ThinkAgile Network Orchestrator feature, gives increased visibility of the virtual infrastructure, including VM and virtual network information. It provides automated VM-aware provisioning by automatically configuring VLANs in the physical network based on the auto-discovered virtual network topology. The agent also performs ongoing dynamic updates to the physical network configuration in response to new VMs, updated VMs, and deleted VMs and virtual networks, eliminating errors with manual configuration.
Note: The Network Policy Agent works with the Nutanix Acropolis Hypervisor (AHV) and Nutanix Acropolis software version 5.0.2 or higher.
- **Pro-active congestion monitoring**
Telemetry enables continuous monitoring of networking devices to detect potential congestion problems, such as packets dropped by the switch when ports are being used close to their line rate or switch buffers are being temporarily overflowed (for example, in case of microbursts).
- **Zero Touch Provisioning**
Zero Touch Provisioning (ZTP) enables a switch to automatically provision itself using the resources available on the network, without manual intervention. ZTP automatically handles the process of upgrading the switch software image and installing configuration files.
- **Python Scripting**
Network administrators can create and execute local Python scripts on switches to make small programs that allow a switch to automatically provision itself, perform fault monitoring, upgrade the image files, or auto-generate configuration files. Administrators can also implement version control systems, automatically generate alerts, create custom logging tools, and automate the management of network devices.
- **REST API Programming**
The Lenovo REpresentational State Transfer (REST) Application Program Interface (API) enables network administrators to remotely configure and manage a Lenovo switch using REST and HyperText Transfer Protocol (HTTP). It also allows switch management integration into management applications, such as Lenovo xClarity.

Components and connectors

The following figure shows the front (port-side) panel of the NE10032 RackSwitch.

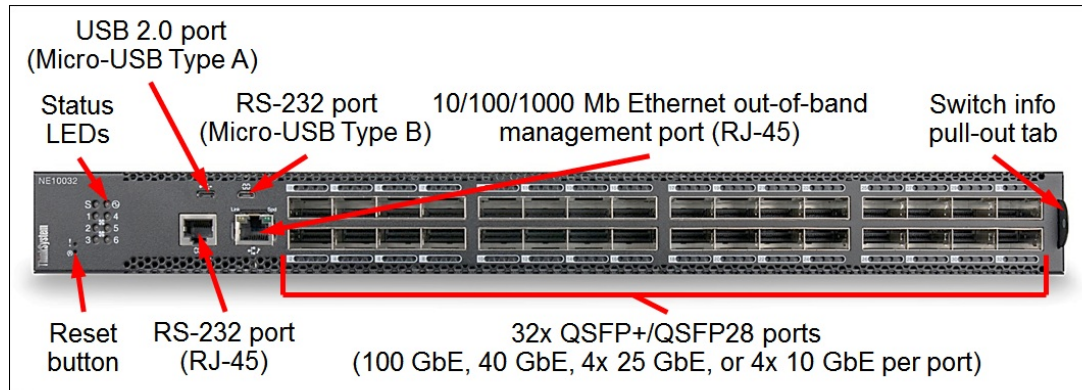


Figure 2. Front panel of the NE10032 RackSwitch

The front panel of the NE10032 RackSwitch includes the following components:

- 32x QSFP+/QSFP28 ports to attach QSFP+/QSFP28 transceivers, DAC cables and AOCs for 40 Gb or 100 Gb Ethernet connections or breakout cables for 4x 10 Gb Ethernet connections out of a 40 GbE port or 4x 25 GbE connections out of a 100 GbE port.
- One RJ-45 10/100/1000 Mb Ethernet port for out-of-band management.
- One RJ-45 RS-232 console port that provides another means to configure the switch.
- One Micro-USB Type B RS-232 console port that provides another means to configure the switch.
- One Micro-USB Type A port for mass storage devices.
- LEDs that display the status of the switch and the network.
- Reset button.
- Switch information pull-out tab.

The following figure shows the rear (non-port-side) panel of the NE10032 RackSwitch.

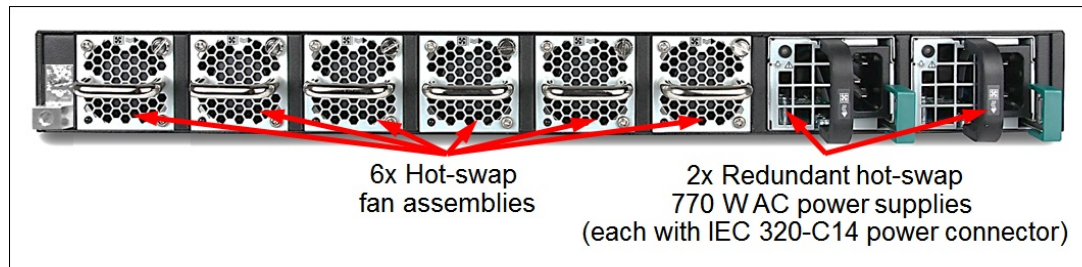


Figure 3. Rear panel of the NE10032 RackSwitch

The rear panel of the NE10032 RackSwitch includes the following components:

- Two redundant hot-swap 770 W AC power supplies (each with the IEC 320-C14 power connector).
- Six N+1 redundant hot-swap fan assemblies.

System specifications

The following table lists the NE10032 RackSwitch system specifications.

Note: The supported hardware options and software features listed in this product guide are based on the Lenovo Cloud Networking Operating System (CNOS) version 10.4.2. For details about specific CNOS software releases that introduced support for certain hardware options and software features, refer to the Change history of the particular software release that can be found at:

<http://datacentersupport.lenovo.com/us/en/products/networking/rackswitch/NE10032/7159/downloads>

Table 1. NE10032 RackSwitch system specifications

| Component | Specification |
|--------------------|--|
| Form factor | 1U rack mount |
| Ports | 32x QSFP+/QSFP28 ports |
| Media types | 100 Gb Ethernet QSFP28: <ul style="list-style-type: none"> • 100 GbE short-range (SR4) QSFP28 transceivers • 100 GbE long-range (LR4) QSFP28 transceivers • 100 GbE QSFP28 to QSFP28 active optical cables (AOCs) • 100 GbE QSFP28 to QSFP28 direct attach copper (DAC) cables • 100 GbE QSFP28 to 4x 25 GbE SFP28 DAC breakout cables 40 Gb Ethernet QSFP+: <ul style="list-style-type: none"> • 40 GbE short-range (SR4) QSFP+ bi-directional (BiDi) transceivers • 40 GbE short-range (SR4/iSR4/eSR4) QSFP+ transceivers • 40 GbE long-range (LR4) QSFP+ transceivers • 40 GbE QSFP+ to QSFP+ active optical cables (AOCs) • 40 GbE QSFP+ to 4x 10 GbE SFP+ active optical breakout cables • 40 GbE QSFP+ to QSFP+ direct attach copper (DAC) cables • 40 GbE QSFP+ to 4x 10 GbE SFP+ DAC breakout cables |
| Port speeds | <ul style="list-style-type: none"> • 100 GbE QSFP28 SR4 transceivers: 100 GbE or 4x 25 GbE • 100 GbE QSFP28 LR4 transceivers: 100 GbE • 100 GbE QSFP28 active optical cables: 100 GbE • 100 GbE QSFP28 DAC cables: 100 GbE or 4x 25 GbE • 40 GbE QSFP+ SR BiDi/SR4/LR4 transceivers: 40 GbE • 40 GbE QSFP+ iSR4/eSR4 transceivers, DAC cables and AOCs: 40 GbE or 4x 10 GbE |
| Switching method | Cut-through. |
| Data traffic types | Unicast, multicast, broadcast. |
| Software features | Lenovo Cloud Networking OS (CNOS): Layer 2 switching, Layer 3 switching, virtual local area networks (VLANs), VLAN tagging, spanning tree protocol (STP), link aggregation (trunk) groups (LAGs), virtual LAGs (vLAGs), quality of service (QoS), IPv4/IPv6 management, IPv4/IPv6 routing, IPv4/IPv6 virtual router redundancy protocol (VRRP), IPv4/IPv6 policy-based routing (PBR), Converged Enhanced Ethernet, Network Policy Agent, Python scripting, REST API programming, Telemetry agent. |
| Performance | Non-blocking architecture with wire-speed forwarding of traffic: <ul style="list-style-type: none"> • 100% line-rate performance • Up to 6.4 Tbps switching throughput • As low as 490 ns port-to-port switching latency • Up to 2,702 Million packets per second (Mpps) (128-byte packets) • Up to 9,216-byte jumbo frames • Buffer size: 16 MB |

| Component | Specification |
|-----------------------------------|--|
| Scalability | <ul style="list-style-type: none"> • MAC address forwarding database entries: 104,000 • VLANs: 4,095 (3,999 user-configurable; 96 reserved) • Rapid Per VLAN Spanning Tree (RPVST) instances: 500 • Multiple STP (MSTP) instances: 64 • Link aggregation groups: 128 • Active ports in a link aggregation group: 32 • Maximum ingress ACL entries: 3,072 • Maximum egress ACL entries: 512 |
| Cooling | Six N+1 redundant hot-swap fans. Rear (non-port side) to front (port side) or front to rear airflow. |
| Power supply | Two load-sharing, redundant hot-swap 770 W AC (100 - 240 V) power supplies (each power supply has an IEC 320-C14 connector). |
| Hot-swap parts | QSFP+/QSFP28 transceivers, QSFP+/QSFP28 DAC cables and AOCs, power supplies, fans. |
| Management ports | 1x 10/100/1000 Mb Ethernet port (RJ-45); 1x RS-232 port (RJ-45), 1x RS-232 port (Micro-USB Type B); 1x USB 2.0 port (Micro-USB Type A) for additional firmware, log, and configuration files storage. |
| Management interfaces | Industry standard command line interface (isCLI); SNMP v1, V2, and v3; REST API. Optional Lenovo XClarity for discovery, inventory, monitoring and events. Optional Lenovo Networking Content Pack for VMware vRealize Log Insight. Optional Lenovo Networking Neutron Plugin for OpenStack-based environments. Ansible support for IT automation. Ganglia support for telemetry analytics. |
| Security features | Secure Shell (SSH); Secure Copy (SCP); Secure FTP (SFTP); user level security; Role-based Access Control (RBAC); LDAP, RADIUS, and TACACS+ authentication; access control lists (ACLs); Trusted Platform Module (TPM) 1.2. |
| Hardware warranty | Three-year (Machine Type 7159) Customer Replaceable Unit limited warranty with 9x5 Next Business Day Parts Delivered. Optional warranty service upgrades are available through Lenovo: Technician Installed Parts, 24x7 coverage, 2-hour or 4-hour response time, 1-year or 2-year warranty and post-warranty extensions, 1-year or 3-year Remote Technical Support (RTS). |
| Software maintenance | Three-year software support and subscription is included in the base warranty. Optional 1-year and 2-year warranty extensions include software support and subscription. |
| Mean Time Between Failures (MTBF) | 230,018 hours. |
| Dimensions | Height: 44 mm (1.7 in.); width: 441 mm (17.3 in.); depth: 487 mm (19.2 in.) |
| Weight | 11.3 kg (24.9 lb). |

Models

The following table lists the NE10032 RackSwitch models.

Table 2. NE10032 RackSwitch models

| Description | Part number | Machine Type-Model | Feature code |
|---|-------------|--------------------|--------------|
| Lenovo ThinkSystem NE10032 RackSwitch (Rear to Front) | 7159D1X | 7159-HE1 | AV17 |
| Lenovo ThinkSystem NE10032 RackSwitch (Front to Rear) | 7159D2X | 7159-HE2 | AV18 |

The part numbers for the NE10032 RackSwitch models include the following items:

- One NE10032 RackSwitch with two power supplies and six fan assemblies (rear-to-front airflow or front-to-rear airflow)
- Generic Rack Mount Kit (2-post)
- Cable Kit that includes the following items:
 - DB-9 (plug) to RJ-45 (plug) serial console cable
 - Micro-USB Type B (plug) to USB Type A (plug) serial console cable
 - Micro-USB Type A (plug) to USB Type A (jack) data cable
- *Electronic Publications Flyer*

Configuration notes:

- Power cables are not included and must be ordered together with the switch (see [Power supplies and cables](#) for details).
- QSFP28 and QSFP+ transceivers and cables are not included and should be ordered together with the switch (see [Transceivers and cables](#) for details).

The NE10032 RackSwitch supports Features on Demand (FoD) license keys to enable additional features. The Advanced Instrumentation Tools FoD option enables access to low-level switch diagnostics for advanced troubleshooting.

The following table lists the FoD upgrade options for the NE10032 RackSwitch.

Table 3. FoD upgrade options

| Description | Part number | Feature code |
|--|-------------|--------------|
| Lenovo ThinkSystem NE10032 RackSwitch Advanced Instrumentation Tools | 7ZN7A04597 | AXD7 |

Transceivers and cables

With the flexibility of the NE10032 RackSwitch, customers can choose the following connectivity technologies:

- For 10 GbE links, customers can split out four 10 GbE ports for each 40 GbE port by using QSFP+ to 4x SFP+ DAC or active optical breakout cables for distances up to 5 meters. The 40GBASE-iSR4 QSFP+ transceivers can be used for distances up to 100 meters on OM3 or up to 150 meters on OM4 MMF MPO-to-LC breakout cables. For longer distances, the 40GBASE-eSR4 transceivers can be used for up to 300 meters on OM3 or up to 400 meters on OM4 MMF MPO-to-LC breakout cables.
- For 25 GbE links, customers can split out four 25 GbE ports for each 100 GbE port by using QSFP28 to 4x SFP28 DAC breakout cables for distances up to 5 meters. For longer distances, the 100GBASE-SR4 QSFP28 transceivers can be used for up to 70 meters on OM3 or up to 100 meters on OM4 MMF MPO-to-LC breakout cables.
- For 40 GbE links, customers can use the QSFP+ to QSFP+ DAC cables for distances up to 7 meters or QSFP+ to QSFP+ active optical cables for distances up to 20 meters. These DAC cables and AOCs have QSFP+ connectors on each end, and they do not need separate transceivers.

For longer distances, customers can use the 40GBASE QSFP+ bi-directional transceivers or 40GBASE-SR4/iSR4 QSFP+ transceivers for distances up to 100 meters on OM3 or up to 150 meters on OM4 MMF cables. The 40GBASE-eSR4 QSFP+ transceiver can be used for distances up to 300 meters on OM3 or up to 400 meters on OM4 MMF cables. The 40GBASE-LR4 QSFP+ transceiver can be used for distances up to 10 kilometers on SMF cables.

- For 100 GbE links, customers can use the QSFP28 DAC cables for distances up to 5 meters or QSFP28 active optical cables (AOCs) for distances up to 20 meters. These DAC cables and AOCs have QSFP28 connectors on each end, and they do not need separate transceivers.

For longer distances, the 100GBASE-SR4 QSFP28 transceivers support distances up to 70 meters on OM3 or up to 100 meters on OM4 MMF cables. The 100GBASE-LR4 QSFP28 transceiver can be used for distances up to 10 kilometers on SMF LC cables.

The following table lists the supported cables and transceivers.

Table 4. Supported QSFP+/QSFP28 transceivers, AOCs and DAC cables

| Description | Part number | Feature code | Maximum quantity supported |
|--|-------------|--------------|----------------------------|
| QSFP28 transceivers - 100 GbE | | | |
| Lenovo 100GBase-SR4 QSFP28 Transceiver | 7G17A03539 | AV1D | 32 |
| Lenovo 100GBase-LR4 QSFP28 Transceiver | 7G17A03540 | AV1E | 32 |
| Optical cables for 100 GbE QSFP28 SR4 transceivers | | | |
| Lenovo 5m MPO-MPO OM4 MMF Cable | 7Z57A03567 | AV25 | 32 |
| Lenovo 10m MPO-MPO OM4 MMF Cable | 7Z57A03569 | AV27 | 32 |
| Lenovo 20m MPO-MPO OM4 MMF Cable | 7Z57A03571 | AV29 | 32 |
| Optical breakout cables for 100 GbE QSFP28 SR4 transceivers | | | |
| Lenovo 1m MPO-4xLC Breakout OM4 MMF Cable | 7Z57A03573 | AV2B | 32 |
| Lenovo 3m MPO-4xLC Breakout OM4 MMF Cable | 7Z57A03574 | AV2C | 32 |
| Lenovo 5m MPO-4xLC Breakout OM4 MMF Cable | 7Z57A03575 | AV2D | 32 |
| QSFP28 active optical cables - 100 GbE | | | |
| Lenovo 3m 100G QSFP28 Active Optical Cable | 7Z57A03546 | AV1L | 32 |
| Lenovo 5m 100G QSFP28 Active Optical Cable | 7Z57A03547 | AV1M | 32 |
| Lenovo 10m 100G QSFP28 Active Optical Cable | 7Z57A03548 | AV1N | 32 |
| Lenovo 20m 100G QSFP28 Active Optical Cable | 7Z57A03550 | AV1Q | 32 |
| QSFP28 direct attach copper cables - 100 GbE | | | |
| Lenovo 1m Passive 100G QSFP28 DAC Cable | 7Z57A03561 | AV1Z | 32 |
| Lenovo 3m Passive 100G QSFP28 DAC Cable | 7Z57A03562 | AV20 | 32 |
| Lenovo 5m Passive 100G QSFP28 DAC Cable | 7Z57A03563 | AV21 | 32 |
| QSFP28 direct attach copper breakout cables - 100 GbE | | | |
| Lenovo 1m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable | 7Z57A03564 | AV22 | 32 |
| Lenovo 3m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable | 7Z57A03565 | AV23 | 32 |
| Lenovo 5m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable | 7Z57A03566 | AV24 | 32 |
| QSFP+ transceivers - 40 GbE | | | |
| Lenovo 40GBase QSFP+ Bi-Directional Transceiver | 00YL631 | ATYW | 32 |
| Lenovo 40GBASE-SR4 QSFP+ Transceiver | 49Y7884 | A1DR | 32 |
| Lenovo 40GBASE-iSR4 QSFP+ Transceiver | 00D9865 | ASTM | 32 |
| Lenovo 40GBASE-eSR4 QSFP+ Transceiver | 00FE325 | A5U9 | 32 |
| Lenovo 40GBASE-LR4 QSFP+ Transceiver | 00D6222 | A3NY | 32 |
| Optical cables for 40 GbE QSFP+ SR4/iSR4/eSR4 transceivers | | | |
| Lenovo 10m MPO-MPO OM3 MMF Cable | 00VX003 | AT2U | 32 |
| Lenovo 30m MPO-MPO OM3 MMF Cable | 00VX005 | AT2V | 32 |
| Optical cables for 40 GbE SR QSFP+ BiDi transceivers | | | |
| Lenovo 0.5m LC-LC OM3 MMF Cable | 00MN499 | ASR5 | 32 |
| Lenovo 1m LC-LC OM3 MMF Cable | 00MN502 | ASR6 | 32 |
| Lenovo 3m LC-LC OM3 MMF Cable | 00MN505 | ASR7 | 32 |

| Description | Part number | Feature code | Maximum quantity supported |
|--|--------------------|---------------------|-----------------------------------|
| Lenovo 5m LC-LC OM3 MMF Cable | 00MN508 | ASR8 | 32 |
| Lenovo 10m LC-LC OM3 MMF Cable | 00MN511 | ASR9 | 32 |
| Lenovo 15m LC-LC OM3 MMF Cable | 00MN514 | ASRA | 32 |
| Lenovo 25m LC-LC OM3 MMF Cable | 00MN517 | ASRB | 32 |
| Lenovo 30m LC-LC OM3 MMF Cable | 00MN520 | ASRC | 32 |
| Optical breakout cables for 40 GbE QSFP+ iSR4/eSR4 transceivers | | | |
| Lenovo 1m MPO-4xLC OM3 MMF Breakout Cable | 00FM412 | A5UA | 32 |
| Lenovo 3m MPO-4xLC OM3 MMF Breakout Cable | 00FM413 | A5UB | 32 |
| Lenovo 5m MPO-4xLC OM3 MMF Breakout Cable | 00FM414 | A5UC | 32 |
| QSFP+ active optical cables - 40 GbE | | | |
| Lenovo 3m QSFP+ to QSFP+ Active Optical Cable | 00YL652 | ATZ3 | 32 |
| Lenovo 5m QSFP+ to QSFP+ Active Optical Cable | 00YL655 | ATZ4 | 32 |
| Lenovo 7m QSFP+ to QSFP+ Active Optical Cable | 00YL658 | ATZ5 | 32 |
| Lenovo 15m QSFP+ to QSFP+ Active Optical Cable | 00YL661 | ATZ6 | 32 |
| Lenovo 20m QSFP+ to QSFP+ Active Optical Cable | 00YL664 | ATZ7 | 32 |
| QSFP+ active optical breakout cables - 40 GbE to 4x10 GbE | | | |
| Lenovo 1m QSFP+ to 4xSFP+ Active Optical Cable | 00YL667 | ATZ8 | 32 |
| Lenovo 3m QSFP+ to 4xSFP+ Active Optical Cable | 00YL670 | ATZ9 | 32 |
| Lenovo 5m QSFP+ to 4xSFP+ Active Optical Cable | 00YL673 | ATZA | 32 |
| QSFP+ direct-attach copper cables - 40 GbE | | | |
| Lenovo 1m Passive QSFP+ DAC Cable | 49Y7890 | A1DP | 32 |
| Lenovo 3m Passive QSFP+ DAC Cable | 49Y7891 | A1DQ | 32 |
| Lenovo 5m Passive QSFP+ DAC Cable | 00D5810 | A2X8 | 32 |
| Lenovo 7m Passive QSFP+ DAC Cable | 00D5813 | A2X9 | 32 |
| QSFP+ breakout cables - 40 GbE to 4x 10 GbE | | | |
| Lenovo 1m Passive QSFP+ to SFP+ Breakout DAC Cable | 49Y7886 | A1DL | 32 |
| Lenovo 3m Passive QSFP+ to SFP+ Breakout DAC Cable | 49Y7887 | A1DM | 32 |
| Lenovo 5m Passive QSFP+ to SFP+ Breakout DAC Cable | 49Y7888 | A1DN | 32 |

The network cables that can be used with the switch are listed in the following table.

Table 5. NE10032 network cabling requirements

| Transceiver | Standard | Cable | Connector |
|-------------------------------|-----------------|--|--------------------|
| 100 Gb Ethernet | | | |
| 100Gb SR4 QSFP28 (7G17A03539) | 100GBASE-SR4 | Up to 20 m with MPO-MPO fiber optic cables or up to 5 m with MPO-4xLC breakout cables supplied by Lenovo (see Table 4); up to 70 m with OM3 or up to 100 m with OM4 multimode fiber optic cables | MPO |
| 100Gb LR4 QSFP28 (7G17A03540) | 100GBASE-LR4 | 1310 nm single-mode fiber optic cable up to 10 km | LC |
| Active optical cable | 100GBASE-SR4 | QSFP28 to QSFP28 active optical cables up to 20 m (see Table 4) | QSFP28 |
| Direct attach copper cable | 100GBASE-CR4 | QSFP28 to QSFP28 DAC cables up to 5 m; QSFP28 to 4x QSFP28 DAC breakout cables up to 5 m for 4x 25 GbE QSFP28 connections out of a 100 GbE port (see Table 4) | QSFP28 |
| 40 Gb Ethernet | | | |
| 40Gb SR QSFP+ BiDi (00YL631) | 40GBASE-SR BiDi | Up to 30 m with fiber optic cables supplied by Lenovo (see Table 4); up to 100 m with OM3 or up to 150 m with OM4 multimode fiber optic cable | LC |
| 40Gb SR4 QSFP+ (49Y7884) | 40GBASE-SR4 | 10 m or 30 m MPO fiber optic cables supplied by Lenovo (see Table 4); support for up to 100 m with OM3 or up to 150 m with OM4 multimode fiber optic cable | MPO |
| 40Gb iSR4 QSFP+ (00D9865) | 40GBASE-SR4 | 10 m or 30 m MPO fiber optic cables or MPO-4xLC breakout cables up to 5 m supplied by Lenovo (see Table 4); support for up to 100 m with OM3 or up to 150 m with OM4 multimode fiber optic cable | MPO |
| 40Gb eSR4 QSFP+ (00FE325) | 40GBASE-SR4 | 10 m or 30 m MPO fiber optic cables or MPO-4xLC breakout cables up to 5 m supplied by Lenovo (see Table 4); support for up to 300 m with OM3 or up to 400 m with OM4 multimode fiber optic cable | MPO |
| 40Gb LR4 QSFP+ (00D6222) | 40GBASE-LR4 | 1310 nm single-mode fiber optic cable up to 10 km | LC |
| Active optical cable | 40GBASE-SR4 | QSFP+ to QSFP+ active optical cables up to 20 m; QSFP+ to 4x SFP+ active optical break-out cables up to 5 m for 4x 10 GbE SFP+ connections out of a 40 GbE port (see Table 4) | QSFP+ |
| Direct attach copper cable | 40GBASE-CR4 | QSFP+ to QSFP+ DAC cables up to 7 m; QSFP+ to 4x SFP+ DAC break-out cables up to 5 m for 4x 10 GbE SFP+ connections out of a 40 GbE port (see Table 4) | QSFP+ |
| Management ports | | | |
| 1 GbE mgmt. port | 1000BASE-T | UTP Category 5, 5E, and 6 up to 100 meters | RJ-45 |
| RJ-45 serial port | RS-232 | DB-9 to RJ-45 cable (comes with the switch) | RJ-45 |
| Micro-USB serial port | RS-232 | Micro-USB (Type B) to USB (Type A) cable (comes with the switch) | Micro-USB (Type B) |
| Micro-USB storage port | USB 2.0 | Micro-USB (Type A) to USB (Type A) cable (comes with the switch) | Micro-USB (Type A) |

Software features

The NE10032 RackSwitch with Cloud NOS has the following software features and specifications:

- Scalability and performance:
 - Media access control (MAC) address learning with automatic updates
 - Static and LACP (IEEE 802.3ad) link aggregation
 - Broadcast and multicast storm control
 - IGMP snooping to limit flooding of IP multicast traffic
 - IGMP filtering to control multicast traffic for hosts participating in multicast groups
 - Configurable traffic distribution schemes over trunk links based on source or destination IP or MAC addresses, or both
 - Fast port forwarding and fast uplink convergence for rapid STP convergence
- Availability and redundancy:
 - IEEE 802.1D STP for providing L2 redundancy
 - IEEE 802.1s Multiple STP (MSTP) for topology optimization
 - IEEE 802.1w Rapid STP (RSTP) provides rapid STP convergence for critical delay-sensitive traffic, such as voice or video
 - Per-VLAN Rapid STP (PVRST) enhancements
- VLAN support:
 - Up to 4095 VLANs:
 - VLAN 1 is the default VLAN
 - VLAN numbers 2 - 3999 are user-configurable
 - VLAN numbers 4000 - 4095 are reserved for the use by the switch
 - Port-based VLANs
 - 802.1Q VLAN tagging support
 - Ingress VLAN tagging support to tunnel packets through a public domain without altering the original 802.1Q tagging information
- Security:
 - VLAN-based, MAC-based, and IP-based access control lists (ACLs)
 - Multiple user IDs and passwords
 - User access control
 - Radius and TACACS+ authentication and authorization
- Quality of Service (QoS):
 - Support for IEEE 802.1p, IP ToS/DSCP, and ACL-based (MAC/IP source and destination addresses and VLANs) traffic classification and processing
 - Traffic shaping and re-marking that is based on defined policies
 - Eight output Class of Service (COS) queues per port for processing qualified traffic
 - Weighted Random Early Detection (WRED) to avoid congestion
 - Control Plane Protection (CoPP)
 - IPv4 ACL metering
- IP v4 Layer 3 functions:
 - Host management
 - IP forwarding
 - IP filtering with ACLs
 - Virtual Router Redundancy Protocol (VRRP) for router redundancy
 - Static routes
 - Routing protocols (OSPF v2 and BGP)
 - Policy-based routing (PBR)
 - DHCP Relay and DHCP Snooping
 - IGMP snooping
 - DNS client

- IPv6 Layer 3 functions:
 - IPv6 host management
 - IPv6 forwarding
 - Virtual Router Redundancy Protocol (VRRP) for router redundancy
 - Static routes
 - Routing protocols (BGP)
 - Policy-based routing (PBR)
 - DHCP Relay
 - DNS client
- Virtualization:
 - Virtual link aggregation groups (vLAGs)
 - Two switches (vLAG peers) act as a single virtual entity for a multi-port aggregation
 - vLAG Peer Gateway for improved usage of the link between the vLAG peers
 - Two-tier vLAGs with VRRP enables active/active VRRP to reduce routing latency
 - Network Policy Agent gives increased visibility of the virtual infrastructure and automates VM-aware network provisioning and configuration updates for VLANs, virtual NICs, virtual networks, ACLs, and QoS based on the VM associations in a hyperconverged Nutanix environment (requires the AHV and software version 5.0.2 or higher).
- Converged Enhanced Ethernet:
 - Priority-Based Flow Control (PFC) (IEEE 802.1Qbb) extends 802.3x flow control to allow the switch to pause traffic that is based on the 802.1p priority value in each packet's VLAN tag.
 - Enhanced Transmission Selection (ETS) (IEEE 802.1Qaz) provides a method for allocating link bandwidth that is based on the 802.1p priority value in each packet's VLAN tag.
 - Data Center Bridging Capability Exchange Protocol (DCBX) (IEEE 802.1AB) allows neighboring network devices to exchange information about their capabilities.
- Monitoring:
 - Switch LEDs for port status and switch status indication
 - Port mirroring for analyzing network traffic passing through switch
 - Change tracking and remote logging with syslog feature
 - Telemetry agent for real-time analytics: Buffer statistics and congestion drop counters
- Manageability:
 - Industry-standard command line interface (isCLI)
 - Simple Network Management Protocol (SNMP V1, V2, and V3)
 - Telnet interface for CLI
 - Secure Shell (SSH) v1 and v2 for CLI
 - Secure Copy (SCP) for uploading and downloading the configuration file via secure channels
 - Service Location Protocol (SLP)
 - Link Layer Discovery Protocol (LLDP) for discovering network devices
 - Serial interface for CLI
 - Scriptable CLI
 - Dual software images
 - Firmware image update via TFTP, FTP, Secure FTP (sFTP), or USB storage
 - Network Time Protocol (NTP) for switch clock synchronization
 - Lenovo XClarity (optional; sold separately) for discovery, inventory, monitoring and events
 - Third-party tools integration
 - Lenovo Networking Content Pack for VMware vRealize Log Insight (optional download) for automated log management
 - Integration with Nutanix Prism management via Network Policy Agent
 - Lenovo Networking Neutron Plugin to automate VLAN provisioning and configuration updates for OpenStack-based cloud environments
 - Integration with Ansible management
 - Ganglia plug-in for telemetry data analytics

Ethernet standards

The NE10032 RackSwitch supports the following Ethernet standards:

- IEEE 802.1AB Data Center Bridging Capability Exchange Protocol (DCBX)
- IEEE 802.1D Spanning Tree Protocol (STP)
- IEEE 802.1p Class of Service (CoS) prioritization
- IEEE 802.1s Multiple STP (MSTP)
- IEEE 802.1Q Tagged VLAN (frame tagging on all ports when VLANs are enabled)
- IEEE 802.1Qbb Priority-Based Flow Control (PFC)
- IEEE 802.1Qaz Enhanced Transmission Selection (ETS)
- IEEE 802.1w Rapid STP (RSTP)
- IEEE 802.3 10BASE-T Ethernet
- IEEE 802.3ab 1000BASE-T copper twisted pair Gigabit Ethernet
- IEEE 802.3ad Link Aggregation Control Protocol
- IEEE 802.3ae 10GBASE-SR short range fiber optics 10 Gb Ethernet
- IEEE 802.3ba 40GBASE-SR4 short range fiber optics 40 Gb Ethernet
- IEEE 802.3ba 40GBASE-CR4 copper 40 Gb Ethernet
- IEEE 802.3ba 100GBASE-LR4 long range fiber optics 100 Gb Ethernet
- IEEE 802.3bj 100GBASE-CR4 copper 100 Gb Ethernet
- IEEE 802.3bm 100GBASE-SR4 short range fiber optics 100 Gb Ethernet
- IEEE 802.3u 100BASE-TX Fast Ethernet
- IEEE 802.3x Full-duplex Flow Control
- SFF-8431 10 Gb SFP+ Direct attach copper cable
- SFF-8436 40 Gb QSFP+ Direct attach copper cable

Cooling

The NE10032 RackSwitch ships with six variable speed, hot-swap fan assemblies that provide N+1 cooling redundancy.

Power supplies and cables

The NE10032 RackSwitch supports up to two load-sharing, redundant hot-swap 770 W AC power supplies (two power supplies come standard with the switch).

The NE10032 RackSwitch ships without any power cables. The part numbers and feature codes to order the power cables (two power cables are required per switch) are listed in the following table.

Table 6. AC power cable options

| Description | Part number | Feature code |
|---|-------------|--------------|
| Rack power cables | | |
| 1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 39Y7937 | 6201 |
| 1.8m, 10A/100-250V, 2xC13PM to IEC 320-C14 Rack Power Cable | None* | 6568 |
| 2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | None* | 6311 |
| 2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable | 39Y7938 | 6204 |
| 4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 39Y7932 | 6263 |
| Country-specific line cords | | |
| Argentina 10A/250V C13 to IRAM 2073 2.8m line cord | 39Y7930 | 6222 |
| Australia/NZ 10A/250V C13 to AS/NZ 3112 2.8m line cord | 39Y7924 | 6211 |
| Brazil 10A/125V C13 to NBR 6147 2.8m line cord | 39Y7929 | 6223 |
| China 10A/250V C13 to GB 2099.1 2.8m line cord | 39Y7928 | 6210 |
| Denmark 10A/250V C13 to DK2-5a 2.8m line cord | 39Y7918 | 6213 |
| European 10A/230V C13 to CEE7-VII 2.8m line cord | 39Y7917 | 6212 |
| India 10A/250V C13 to IS 6538 2.8m line cord | 39Y7927 | 6269 |
| Israel 10A/250V C13 to SI 32 2.8m line cord | 39Y7920 | 6218 |
| Italy 10A/250V C13 to CEI 23-16 2.8m line cord | 39Y7921 | 6217 |
| Japan 12A/125V C13 to JIS C-8303 2.8m line cord | 46M2593 | A1RE |
| Korea 12A/250V C13 to KETI 2.8m line cord | 39Y7925 | 6219 |
| South Africa 10A/250V C13 to SABS 164 2.8m line cord | 39Y7922 | 6214 |
| Switzerland 10A/250V C13 to SEV 1011-S24507 2.8m line cord | 39Y7919 | 6216 |
| Taiwan 10A/250V C13 to CNS 10917-3 2.8m line cord | 00CG265 | A53E |
| Taiwan 15A/125V C13 to CNS 10917-3 2.8m line cord | 00CG267 | A53F |
| United Kingdom 10A/250V C13 to BS 1363/A 2.8m line cord | 39Y7923 | 6215 |
| United States 10A/125V C13 to NEMA 5-15P 4.3m line cord | 39Y7931 | 6207 |
| United States 10A/250V C13 to NEMA 6-15P 2.8m line cord | 46M2592 | A1RF |

* Available for factory-built custom configurations and solutions only.

Rack installation

The NE10032 RackSwitch ships with the 2-post rack mount kit.

For 4-post rack installations, the NE10032 RackSwitch supports the optional adjustable 19-inch, 4-post rail kit and the air inlet duct (optional for the 4-post rail kit; supported only with the models with rear to front airflow).

When the NE10032 RackSwitch (front to rear airflow) is installed in the Intelligent Cluster Rack (Machine Type 1410) or Enterprise Rack (Machine Type 9363) as a part of a NeXtScale System solution, the recessed 19-inch 4-post rail kit is required.

The following table lists rack installation options for the NE10032 RackSwitch switches with rear to front and front to rear airflow.

Table 7. Rack installation options

| Description | Part number | Feature code |
|--|-------------|--------------|
| Rear to front airflow (7159-HE1) | | |
| Lenovo RackSwitch Adjustable 19" 4 Post Rail Kit | 00D6185 | A3KP |
| Air Inlet Duct for 487 mm RackSwitch | 00FM507 | ASTN |
| Front to rear airflow (7159-HE2) | | |
| Lenovo RackSwitch Adjustable 19" 4 Post Rail Kit | 00D6185 | A3KP |
| Lenovo RackSwitch Recessed 19" 4 Post Rail Kit | 00CG089 | A51M |

Physical specifications

The NE10032 RackSwitch features the following physical specifications:

- Height: 44 mm (1.7 in.)
- Width: 441 mm (17.3 in.)
- Depth: 487 mm (19.2 in.)
- Maximum weight: 11.3 kg (24.9 lb)

Operating environment

The NE10032 RackSwitch is supported in the following operating environment:

- Temperature: 0 - 40 °C (32 - 104 °F).
- Relative humidity: 10 - 90% (Non-condensing)
- Altitude: Up to 2,000 m (6,561 feet)
- Airflow: Front-to-rear or rear-to-front cooling with variable speed fans for reduced power draw
- Electrical input: 50 / 60 Hz, 100 - 240 V AC auto-switching
- Power consumption
 - Typical: 212 W
 - Maximum: 436 W
- Heat dissipation
 - Typical: 723 BTU/hour
 - Maximum: 1488 BTU/hour

Warranty and maintenance

The NE10032 RackSwitch comes with a 3-year Customer Replaceable Unit (CRU) hardware limited warranty with 9x5 Next Business Day (NBD) Parts Delivered and includes a 3-year software license, which provides entitlement to upgrades over that period.

The following optional warranty and maintenance upgrades are available for the NE10032 RackSwitch through Lenovo service upgrade offerings:

- Warranty service upgrades (3, 4, or 5 years):
 - 24x7 Technician Installed Parts repair with 2-hour target response time
 - 24x7 Technician Installed Parts repair with 4-hour target response time
 - 9x5 Technician Installed Parts repair with 4-hour target response time
 - 9x5 Technician Installed Parts repair with next business day target response time
 - 9x5 Parts Delivered Next Business Day
- Maintenance (post-warranty) service offerings (1 or 2 years):
 - 24x7 Technician Installed Parts repair with 2-hour target response time
 - 24x7 Technician Installed Parts repair with 4-hour target response time
 - 9x5 Technician Installed Parts repair with 4-hour target response time
 - 9x5 Technician Installed Parts repair with next business day target response time
 - 9x5 Parts Delivered Next Business Day
- Remote Technical Support (1 or 3 years)
Remote Technical Support (RTS) provides comprehensive technical call center support. RTS can reduce problem resolution time, which decreases the cost to address technical problems and increases uptime.
- Hardware Installation Services - Networking
Lenovo experts can seamlessly manage the physical installation of your networking hardware. Working at a time convenient for you (business hours or off shift), the technician will unpack and inspect the switches on your site, install options, mount in a rack cabinet, connect to power and network, check and update firmware to the latest levels, verify operation, and dispose of the packaging, allowing your team to focus on other priorities.

Lenovo warranty service upgrade offerings are country-specific. Not all warranty service upgrades are available in every country. For more information about Lenovo warranty service upgrade offerings that are available in your country, refer to the Lenovo Enterprise Solutions Configurator (LESC): <http://lesc.lenovo.com>

The options that are installed in the switch assume the switch's base warranty and any Lenovo warranty service upgrade for the switch.

Regulatory compliance

The NE10032 RackSwitch conforms to the following regulations:

- Argentina IEC60950-1
- AS/NZS CISPR 22, Class A
- Canada ICES-003, Issue 4, Class A
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, and EN61000-3-3)
- China CCC GB4943, GB9254 Class A, GB17625.1
- CISPR 22, Class A
- CSA C22.2 No. 60950-1
- FCC: Verified to comply with Part 15 of the FCC Rules, Class A
- IEC 60950-1 (CB Certificate and CB Test Report)
- Japan VCCI, Class A
- Korea KN22, Class A; KN24
- NOM-019
- Russia/GOST ME01, IEC-60950-1, GOST R 51318.22, 51318.24, 51317.3.2, and 51317.3.3
- Taiwan BSMI CNS13438, Class A; CNS14336-1
- TUV-GS (EN60950-1/IEC60950-1, EK1-ITB2000)
- UL/IEC 60950-1
- Reduction of Hazardous Substances (ROHS)

Network connectivity

The following table lists the network switches with rear-to-front airflow that are offered by Lenovo that can be used with the NE10032 RackSwitch in network connectivity solutions for System x, ThinkServer, and Flex System hosts.

Table 8. Network switches (rear-to-front airflow)

| Description | Part number |
|---|-------------|
| 10 Gb Ethernet switches | |
| Lenovo ThinkSystem NE1032 RackSwitch (Rear to Front) | 7159A1X |
| Lenovo ThinkSystem NE1032T RackSwitch (Rear to Front) | 7159B1X |
| Lenovo ThinkSystem NE1072T RackSwitch (Rear to Front) | 7159C1X |
| Lenovo RackSwitch G8124E (Rear to Front) | 7159BR6 |
| Lenovo RackSwitch G8264 (Rear to Front) | 7159G64 |
| Lenovo RackSwitch G8264CS (Rear to Front) | 7159DRX |
| Lenovo RackSwitch G8272 (Rear to Front) | 7159CRW |
| Lenovo RackSwitch G8296 (Rear to Front) | 7159GR6 |
| 40 Gb Ethernet switches | |
| Lenovo RackSwitch G8332 (Rear to Front) | 7159BRX |

The following table lists the network switches with front-to-rear airflow that are offered by Lenovo that can be used with the NE10032 RackSwitch in network connectivity solutions for NeXtScale System hosts.

Table 9. Network switches (front-to-rear airflow)

| Description | Part number |
|---|-------------|
| 10 Gb Ethernet switches | |
| Lenovo ThinkSystem NE1032 RackSwitch (Front to Rear) | 7159A2X |
| Lenovo ThinkSystem NE1032T RackSwitch (Front to Rear) | 7159B2X |
| Lenovo ThinkSystem NE1072T RackSwitch (Front to Rear) | 7159C2X |
| Lenovo RackSwitch G8124E (Front to Rear) | 7159BF7 |
| Lenovo RackSwitch G8264 (Front to Rear) | 715964F |
| Lenovo RackSwitch G8264CS (Front to Rear) | 7159DFX |
| Lenovo RackSwitch G8272 (Front to Rear) | 7159CFV |
| Lenovo RackSwitch G8296 (Front to Rear) | 7159GF5 |
| 40 Gb Ethernet switches | |
| Lenovo RackSwitch G8332 (Front to Rear) | 7159BFX |

For more information, see the list of Product Guides in the following categories:

- Top-of-rack Switches:
<http://lenovopress.com/servers/options/switches?rt=product-guide>
- Embedded I/O Modules:
<http://lenovopress.com/networking/embedded/10gb?rt=product-guide>

Storage connectivity

The following table lists the external storage systems that are currently offered by Lenovo that can be used with the NE10032 RackSwitch for external NAS or iSCSI SAN storage connectivity.

Table 10. External storage systems

| Description | Part number |
|--|-------------|
| Lenovo ThinkSystem DS Series Storage (iSCSI host connectivity) | |
| Lenovo ThinkSystem DS2200 LFF FC/iSCSI Dual Controller Unit (US English documentation) | 4599A31* |
| Lenovo ThinkSystem DS2200 LFF FC/iSCSI Dual Controller Unit (Simplified Chinese documentation) | 4599A3C^ |
| Lenovo ThinkSystem DS2200 LFF FC/iSCSI Dual Controller Unit (Japanese documentation) | 4599A3J** |
| Lenovo ThinkSystem DS2200 SFF FC/iSCSI Dual Controller Unit (US English documentation) | 4599A11* |
| Lenovo ThinkSystem DS2200 SFF FC/iSCSI Dual Controller Unit (Simplified Chinese documentation) | 4599A1C^ |
| Lenovo ThinkSystem DS2200 SFF FC/iSCSI Dual Controller Unit (Japanese documentation) | 4599A1J** |
| Lenovo ThinkSystem DS4200 LFF FC/iSCSI Dual Controller Unit (US English documentation) | 4617A31* |
| Lenovo ThinkSystem DS4200 LFF FC/iSCSI Dual Controller Unit (Simplified Chinese documentation) | 4617A3C^ |
| Lenovo ThinkSystem DS4200 LFF FC/iSCSI Dual Controller Unit (Japanese documentation) | 4617A3J** |
| Lenovo ThinkSystem DS4200 SFF FC/iSCSI Dual Controller Unit (US English documentation) | 4617A11* |
| Lenovo ThinkSystem DS4200 SFF FC/iSCSI Dual Controller Unit (Simplified Chinese documentation) | 4617A1C^ |
| Lenovo ThinkSystem DS4200 SFF FC/iSCSI Dual Controller Unit (Japanese documentation) | 4617A1J** |

| Description | Part number |
|--|-------------|
| Lenovo ThinkSystem DS6200 SFF FC/iSCSI Dual Controller Unit (US English documentation) | 4619A11* |
| Lenovo ThinkSystem DS6200 SFF FC/iSCSI Dual Controller Unit (Simplified Chinese documentation) | 4619A1C^ |
| Lenovo Storage S Series (iSCSI host connectivity) | |
| Lenovo Storage S2200 LFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD | 64114B1 |
| Lenovo Storage S2200 LFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD | 64114B2 |
| Lenovo Storage S2200 SFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD | 64114B3 |
| Lenovo Storage S2200 SFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD | 64114B4 |
| Lenovo Storage S3200 LFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD | 64116B1 |
| Lenovo Storage S3200 LFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD | 64116B2 |
| Lenovo Storage S3200 SFF Chassis FC/iSCSI Single Controller, Rack Kit, 9x5NBD | 64116B3 |
| Lenovo Storage S3200 SFF Chassis FC/iSCSI Dual Controller, Rack Kit, 9x5NBD | 64116B4 |
| Lenovo Storage V Series (iSCSI host connectivity) | |
| Lenovo Storage V3700 V2 LFF Control Enclosure | 6535C1D |
| Lenovo Storage V3700 V2 LFF Control Enclosure (TopSeller) | 6535EC1 |
| Lenovo Storage V3700 V2 SFF Control Enclosure | 6535C2D |
| Lenovo Storage V3700 V2 SFF Control Enclosure (TopSeller) | 6535EC2 |
| Lenovo Storage V3700 V2 XP LFF Control Enclosure | 6535C3D |
| Lenovo Storage V3700 V2 XP LFF Control Enclosure (TopSeller) | 6535EC3 |
| Lenovo Storage V3700 V2 XP SFF Control Enclosure | 6535C4D |
| Lenovo Storage V3700 V2 XP SFF Control Enclosure (TopSeller) | 6535EC4 |
| Lenovo Storage V5030 LFF Control Enclosure 3Yr S&S | 6536C12 |
| Lenovo Storage V5030 LFF Control Enclosure 5Yr S&S | 6536C32 |
| Lenovo Storage V5030 SFF Control Enclosure 3Yr S&S | 6536C22 |
| Lenovo Storage V5030 SFF Control Enclosure 5Yr S&S | 6536C42 |
| Lenovo Storage V5030F SFF Control Enclosure 3Yr S&S | 6536B1F |
| Lenovo Storage V5030F SFF Control Enclosure 5Yr S&S | 6536B2F |
| IBM Storwize for Lenovo (iSCSI host connectivity) | |
| IBM Storwize V3500 3.5-inch Dual Control Storage Controller Unit | 6096CU2^ |
| IBM Storwize V3500 2.5-inch Dual Control Storage Controller Unit | 6096CU3^ |
| IBM Storwize V3700 3.5-inch Storage Controller Unit | 6099L2C |
| IBM Storwize V3700 2.5-inch Storage Controller Unit | 6099S2C |
| IBM Storwize V7000 2.5-inch Storage Controller Unit, w/3 Yr S&S (Model 524) | 6195SC5† |
| IBM Storwize V7000 2.5-inch Storage Controller Unit, w/3 Yr S&S (LA) (Model 524) | 6195SCL‡ |
| IBM Storwize V7000 2.5-inch Storage Controller Unit, w/5 Yr S&S (Model 524) | 61951F1† |
| IBM Storwize V7000 2.5-inch Storage Controller Unit, w/5 Yr S&S (LA) (Model 524) | 61951FL‡ |
| IBM Storwize V7000 SFF Control Enclosure, 3YR SWMA (Model HC1 [Gen2+]) | 6195C32† |
| IBM Storwize V7000 SFF Control Enclosure, 3YR SWMA, LA (Model HC1 [Gen2+]) | 6195C3L‡ |
| IBM Storwize V7000 SFF Control Enclosure, 5YR SWMA (Model HC1 [Gen2+]) | 6195C52† |
| IBM Storwize V7000 SFF Control Enclosure, 5YR SWMA, LA (Model HC1 [Gen2+]) | 6195C5L‡ |
| Lenovo Storage DX8200 Series (NAS or iSCSI connectivity) | |
| Lenovo Storage DX8200D Storage Virtualization Entry, 4TB, 3yr SW S&S | 5135A2x# |

| Description | Part number |
|---|-------------|
| Lenovo Storage DX8200D Storage Virtualization Entry, 4TB, 4yr SW S&S | 5135J2x# |
| Lenovo Storage DX8200D Storage Virtualization Entry, 4TB, 5yr SW S&S | 51351Vx# |
| Lenovo Storage DX8200D Storage Virtualization Mid, 16TB, 3yr SW S&S | 5135B2x# |
| Lenovo Storage DX8200D Storage Virtualization Mid, 16TB, 4yr SW S&S | 5135L2x# |
| Lenovo Storage DX8200D Storage Virtualization Mid, 16TB, 5yr SW S&S | 51352Vx# |
| Lenovo Storage DX8200D Storage Virtualization High, 64TB, 3yr SW S&S | 5135C3x# |
| Lenovo Storage DX8200D Storage Virtualization High, 64TB, 4yr SW S&S | 5135M3x# |
| Lenovo Storage DX8200D Storage Virtualization High, 64TB, 5yr SW S&S | 51353Wx# |
| Lenovo Storage DX8200D ServerSAN Entry, 8TB, 3yr SW S&S | 5135D2x# |
| Lenovo Storage DX8200D ServerSAN Entry, 8TB, 4yr SW S&S | 5135N2x# |
| Lenovo Storage DX8200D ServerSAN Entry, 8TB, 5yr SW S&S | 51354Vx# |
| Lenovo Storage DX8200D ServerSAN Mid, 16TB, 3yr SW S&S | 5135F2x# |
| Lenovo Storage DX8200D ServerSAN Mid, 16TB, 4yr SW S&S | 5135P2x# |
| Lenovo Storage DX8200D ServerSAN Mid, 16TB, 5yr SW S&S | 51355Vx# |
| Lenovo Storage DX8200D ServerSAN High, 32TB, 3yr SW S&S | 5135G3x# |
| Lenovo Storage DX8200D ServerSAN High, 32TB, 4yr SW S&S | 5135Q3x# |
| Lenovo Storage DX8200D ServerSAN High, 32TB, 5yr SW S&S | 51356Wx# |
| Lenovo Storage DX8200N with 1x N2226 HBA (Requires a supported external drive enclosure) | 5128A1x# |
| Lenovo Storage DX8200N with 2x N2226 HBAs (Requires a supported external drive enclosure) | 5128A2x# |
| Lenovo Storage DX8200 Series (S3 cloud storage) | |
| Lenovo Storage DX8200C 56TB (14x 4TB HDDs) with Cloudian HyperStore - 3yr HW/SW S&S | 5120C1x# |
| Lenovo Storage DX8200C 84TB (14x 6TB HDDs) with Cloudian HyperStore - 3yr HW/SW S&S | 5120C3x# |
| Lenovo Storage DX8200C 112TB (14x 8TB HDDs) with Cloudian HyperStore - 3yr HW/SW S&S | 5120C2x# |
| Lenovo Storage DX8200C 140TB (14x 10TB HDDs) with Cloudian HyperStore - 3yr HW/SW S&S | 5120C4x# |

* Available worldwide (except China and Japan).

^ Available only in China.

** Available only in Japan.

† Available worldwide except Latin America.

‡ Available only in Latin America.

x represents a geo-specific letter (for example: U = North America, G = EMEA). Ask a Lenovo representative for specifics.

For more information, see the list of Product Guides in the following categories:

- Lenovo DS Series, S Series, and V Series storage:
<http://lenovopress.com/storage/san/lenovo?rt=product-guide>
- IBM Storwize for Lenovo storage:
<http://lenovopress.com/storage/san/ibm?rt=product-guide>
- Lenovo NAS storage:
<http://lenovopress.com/storage/nas?rt=product-guide>
- Lenovo Cloud storage:
<http://lenovopress.com/storage/cloud?rt=product-guide>

Rack cabinets

The following table lists the rack cabinets that are offered by Lenovo that can be used with the NE10032 RackSwitch in IT solutions.

Table 11. Rack cabinets

| Description | Part number |
|---|-------------|
| 25U S2 Standard Rack (1000 mm deep; 2 sidewall compartments) | 93072RX |
| 25U Static S2 Standard Rack (1000 mm deep; 2 sidewall compartments) | 93072PX |
| 42U S2 Standard Rack (1000 mm deep; 6 sidewall compartments) | 93074RX |
| 42U 1100mm Enterprise V2 Dynamic Rack (6 sidewall compartments) | 93634PX |
| 42U 1100mm Enterprise V2 Dynamic Expansion Rack (6 sidewall compartments) | 93634EX |
| 42U 1200mm Deep Dynamic Rack (6 sidewall compartments) | 93604PX |
| 42U 1200mm Deep Static Rack (6 sidewall compartments) | 93614PX |
| 42U Enterprise Rack (1105 mm deep; 4 sidewall compartments) | 93084PX |
| 42U Enterprise Expansion Rack (1105 mm deep; 4 sidewall compartments) | 93084EX |

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 NE10032 RackSwitch in IT solutions.

Table 12. Power distribution units

| Description | Part number |
|---|-------------|
| 0U Basic PDUs | |
| 0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord | 00YJ776 |
| 0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord | 00YJ777 |
| 0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 line cord | 00YJ778 |
| 0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord | 00YJ779 |
| Switched and Monitored PDUs | |
| 0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P line cord | 00YJ781 |
| 0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 line cord | 00YJ780 |
| 0U 18 C13/6 C19 Switched / Monitored 32A/200-240V/346-415V/3Ph PDU w/ IEC60309 532P6 cord | 00YJ782 |
| 0U 12 C13/12 C19 Switched and Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 line cord | 00YJ783 |
| 1U 9 C19/3 C13 Switched and Monitored DPI PDU (without a line cord) | 46M4002 |
| 1U 9 C19/3 C13 Switched and Monitored 60A 3Ph PDU with IEC 309 3P+Gnd cord | 46M4003 |
| 1U 12 C13 Switched and Monitored DPI PDU (without a line cord) | 46M4004 |
| 1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord | 46M4005 |
| Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets) | |
| Ultra Density Enterprise C19/C13 PDU Module (without a line cord) | 71762NX |

| Description | Part number |
|---|-------------|
| Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord | 71763NU |
| C13 Enterprise PDUs (12x IEC 320 C13 outlets) | |
| DPI C13 Enterprise PDU+ (without a line cord) | 39M2816 |
| DPI Single Phase C13 Enterprise PDU (without a line cord) | 39Y8941 |
| C19 Enterprise PDUs (6x IEC 320 C19 outlets) | |
| DPI Single Phase C19 Enterprise PDU (without a line cord) | 39Y8948 |
| DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord | 39Y8923 |
| Front-end PDUs (3x IEC 320 C19 outlets) | |
| DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord | 39Y8938 |
| DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord | 39Y8939 |
| DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord | 39Y8934 |
| DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord | 39Y8940 |
| DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord | 39Y8935 |
| Universal PDUs (7x IEC 320 C13 outlets) | |
| DPI Universal 7 C13 PDU (with 2 m IEC 320-C19 to C20 rack power cord) | 00YE443 |
| NEMA PDUs (6x NEMA 5-15R outlets) | |
| DPI 100-127V PDU with fixed NEMA L5-15P line cord | 39Y8905 |
| Line cords for PDUs that ship without a line cord | |
| DPI 30a Line Cord (NEMA L6-30P) | 40K9614 |
| DPI 32a Line Cord (IEC 309 P+N+G) | 40K9612 |
| DPI 32a Line Cord (IEC 309 3P+N+G) | 40K9611 |
| DPI 60a Cord (IEC 309 2P+G) | 40K9615 |
| DPI 63a Cord (IEC 309 P+N+G) | 40K9613 |
| DPI Australian/NZ 3112 Line Cord (32A) | 40K9617 |
| DPI Korean 8305 Line Cord (30A) | 40K9618 |

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 lists the uninterruptible power supply (UPS) units that are offered by Lenovo that can be used with the NE10032 RackSwitch in IT solutions.

Table 13. Uninterruptible power supply units

| Description | Part number |
|---|-------------|
| 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 |

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>

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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.

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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 about the NE10032 RackSwitch, see the following publications that are available at the RackSwitch InfoCenter:

http://systemx.lenovofiles.com/help/topic/com.lenovo.thinksystem.ne10032.doc/ts_ne10032.html

- *Lenovo ThinkSystem NE10032 RackSwitch Installation Guide*
- *Lenovo ThinkSystem NE10032 RackSwitch Application Guide*
- *Lenovo ThinkSystem NE10032 RackSwitch REST API Guide*
- *Lenovo ThinkSystem NE10032 RackSwitch Python Programming Guide*

The software for the NE10032 RackSwitch can be downloaded from Lenovo Data Center Support:

<http://datacentersupport.lenovo.com/us/en/products/networking/rackswitch/NE10032/downloads>

For more information about the following management plug-ins for the NE10032 RackSwitch, see Network Management:

<http://www3.lenovo.com/us/en/data-center/networking/networking-software/network-management>

- ThinkAgile Network Orchestrator
- Lenovo Networking Plug-In for VMware vRealize Orchestrator
- Lenovo Networking Content Pack for VMware vRealize Log Insight
- Lenovo Networking Bundle for VMware vRealize
- Lenovo Networking Plug-In for OpenStack Neutron
- Integration with Ansible
- Lenovo Telemetry Analytics Tool: Ganglia Plugins

Related product families

Product families related to this document are the following:

- [10 Gb Ethernet Switches](#)
- [Network TOR 100Gb](#)
- [Top-of-Rack Switches](#)

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