Lenovo ThinkSystem NE1064TO RackSwitch

Product Guide (withdrawn product)

The Lenovo ThinkSystem NE1064TO RackSwitch is designed for big data, cloud, and enterprise workloads in the data center, and it provides 1/10 Gb Ethernet (RJ-45) connectivity with 40 Gb/100 Gb Ethernet upstream links. The switch delivers line-rate, low-latency, and high-bandwidth switching, while providing high availability for business sensitive traffic with the hot-swap redundant power supplies and fans.

The ThinkSystem NE1064TO RackSwitch has 48x 1/10 Gb Ethernet (RJ-45) fixed ports and 6x QSFP28/QSFP+ ports that support 40 GbE QSFP+ and 100 GbE QSFP28 optical transceivers, active optical cables (AOCs), and direct attach copper (DAC) cables. Four of the QSFP28/QSFP+ ports can also be split out into two 50 GbE (for 100 GbE QSFP28), or four 10 GbE (for 40 GbE QSFP+) or 25 GbE (for 100 GbE QSFP28) connections by using breakout cables.

The ThinkSystem NE1064TO RackSwitch is shown in the following figure.

Figure 1. Lenovo ThinkSystem NE1064TO RackSwitch

Did you know?

With exceptional port density and flexibility with break-out cables, the ThinkSystem NE1064TO RackSwitch can support up to 64x 1/10 GbE connections or a mix of 1/10 GbE server and storage connections with up to six 40 GbE or 100 GbE upstream network connections in a 1U rack form factor.

The ThinkSystem NE1064TO RackSwitch includes the Open Network Install Environment (ONIE) which is an open, standards-based boot code that provides a deployment environment for loading certified ONIE networking operating systems onto networking devices.

Key features

The ThinkSystem NE1064TO RackSwitch provides a simple and open 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. The switch is based on industry standards for better data center interoperability, and it enables support of network virtualization, automation, and orchestration applications for tight integration into the data center ecosystem.

The ThinkSystem NE1064TO RackSwitch is considered particularly suited for the following environments:

- Open networking architectures that are based on the certified ONIE networking operating systems.
- 10 GbE UTP Category 6a or 7 server and storage connectivity with 40 GbE or 100 GbE upstream aggregation
- Data center interconnect fabric for accelerated, low-latency communications across clustered applications
- Cloud and virtualization solutions
- Web-scale and hyperconverged solutions

The ThinkSystem NE1064TO RackSwitch offers the following features and benefits:

- High performance
  The ThinkSystem NE1064TO RackSwitch offers 10/25/40/50/100 Gb Ethernet switching with low latency and non-blocking line-rate performance.
- Lower power and better cooling
  The rear-to-front cooling design of the ThinkSystem NE1064TO RackSwitch reduces data center air conditioning costs by having airflow match the servers in the rack cabinet. In addition, variable speed fans help reduce power consumption.
- Fault tolerance
  The ThinkSystem NE1064TO RackSwitch offers redundant hot-swap hardware components to provide availability for network communications across business-critical applications.
- Open Network Install Environment (ONIE)
  The ThinkSystem NE1064TO RackSwitch provides an open install environment for networking devices without operating systems. ONIE enables a network switch ecosystem for end users to choose among different Network Operating Systems by discovering NOS installer images and loading them onto the switch.
- Seamless interoperability
  Based on industry standards, the ThinkSystem NE1064TO RackSwitch interoperates seamlessly with other vendors' switches.

Components and connectors

The following figure shows the front (port-side) panel of the ThinkSystem NE1064TO RackSwitch.

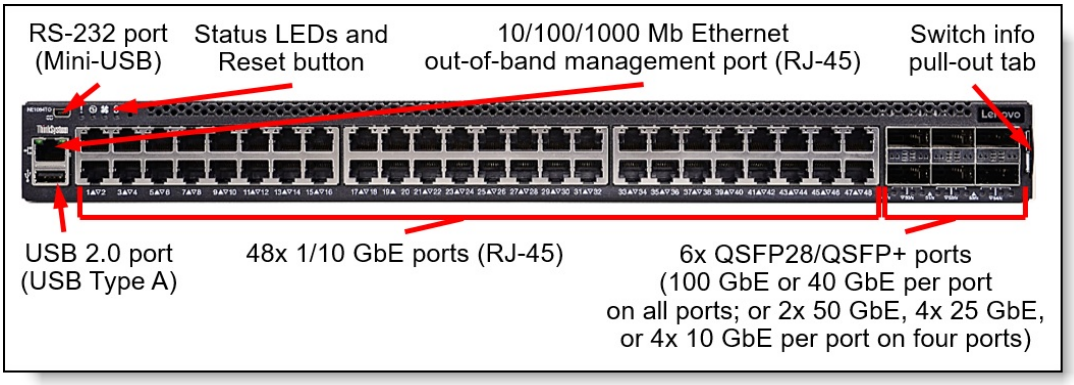

Figure 2. Front panel of the ThinkSystem NE1064TO RackSwitch

The front panel of the ThinkSystem NE1064TO RackSwitch includes the following components:

- 48x RJ-45 ports for 1 Gb or 10 Gb Ethernet connections over twisted pair.
- 6x QSFP28/QSFP+ ports to attach QSFP28/QSFP+ transceivers, DAC cables, and AOCs for 100 Gb or 40 Gb Ethernet connections or breakout cables for 2x 50 Gb or 4x 25 Gb Ethernet connections out of a 100 GbE port, or 4x 10 GbE connections out of a 40 GbE port.
- One RJ-45 10/100/1000 Mb Ethernet port for out-of-band management.
- One USB Type A port for mass storage devices.
- One Mini-USB RS-232 console port that provides another means to configure the switch.
- Status LEDs and Reset button.
- Switch information pull-out tab.

The following figure shows the rear (non-port-side) panel of the ThinkSystem NE1064TO RackSwitch.

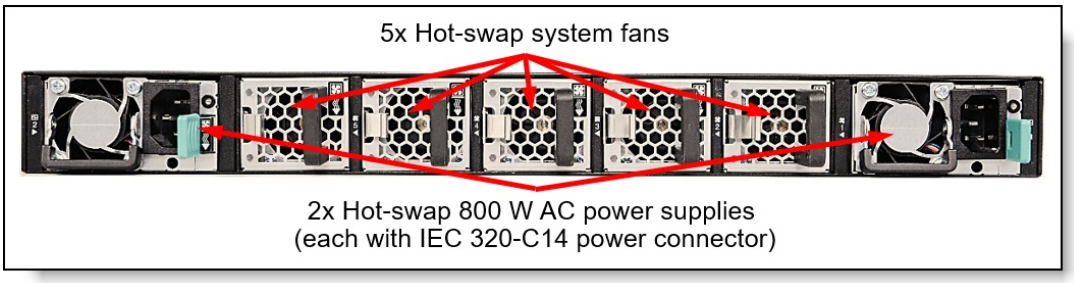

Figure 3. Rear panel of the ThinkSystem NE1064TO RackSwitch

The rear panel of the ThinkSystem NE1064TO RackSwitch includes the following components:

- Two redundant hot-swap 800 W AC power supplies (each with the IEC 320-C14 power connector).
- Five N+1 redundant hot-swap system fans.

System specifications

The following table lists the ThinkSystem NE1064TO RackSwitch hardware specifications.

Table 1. ThinkSystem NE1064TO RackSwitch hardware specifications

Attribute	Specification
Form factor	1U rack mount
Ports	• 48x 10 Gb Ethernet fixed ports (RJ-45) • 6x QSFP28/QSFP+ ports
Media types	10 Gb Ethernet fixed ports • RJ-45 UTP Category 6a or 7 • RJ-45 UTP Category 5 or 5e for ports operating at 1 Gbps 40 Gb Ethernet QSFP+: • 40 GbE SR 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 • 40 GbE QSFP+ to 4x 10 GbE SFP+ active optical breakout cables • 40 GbE QSFP+ to QSFP+ DAC cables • 40 GbE QSFP+ to 4x 10 GbE SFP+ DAC breakout cables 100 Gb Ethernet QSFP28: • 100 GbE short-range (SR4) QSFP28 transceivers • 100 GbE long-range (LR4) QSFP28 transceivers • 100 GbE QSFP28 to QSFP28 active optical cables • 100 GbE QSFP28 to 4x 25 GbE SFP28 active optical breakout cables • 100 GbE QSFP28 to QSFP28 DAC cables • 100 GbE QSFP28 to 4x 25 GbE SFP28 DAC breakout cables • 100 GbE QSFP28 to 2x 50 GbE QSFP28 DAC breakout cables (not supplied by Lenovo)
Port speeds	• 10 GbE fixed ports: 1 Gbps or 10 Gbps (no auto-negotiation) • 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 • 100 GbE QSFP28 DAC cables: 100 Gbps, 2x 50 [2x 25] Gbps, or 4x 25 Gbps • 100 GbE QSFP28 SR4 transceivers and AOCs: 100 Gbps or 4x 25 Gbps • 100 GbE QSFP28 LR4 transceivers: 100 GbE
Performance	Non-blocking architecture with wire-speed forwarding of traffic: • 100% line-rate performance • Up to 2.16 Tbps aggregated throughput • Up to 1607 Million packets per second (Mpps) (64-byte packets)
Cooling	Five N+1 redundant hot-swap system fans. Rear (non-port side) to front (port side) airflow.
Power supply	Two load-sharing, redundant hot-swap 800 W AC (100 - 240 V) power supplies (each power supply has an IEC 320-C14 connector).
Hot-swap parts	QSFP28/QSFP+ transceivers, DAC cables, and AOCs; power supplies; fans.
Management ports	1x 10/100/1000 Mb Ethernet port (RJ-45); 1x RS-232 port (Mini-USB); 1x USB 2.0 Type A port (for additional firmware, log, and configuration files storage).
Hardware warranty	Three-year Customer Replaceable Unit (CRU) limited warranty with 9x5 coverage and Next Business Day (NBD) parts delivered.
Service and support	Optional service upgrades are available through Lenovo Services: 9x5 coverage with NBD onsite response, 24x7 coverage with 2-hour or 4-hour onsite response, 6-hour or 24-hour committed service repair (select areas), up to 5 years of warranty coverage, 1-year or 2-year post-warranty extensions, Premier support, and Basic Hardware Installation Services.

Attribute	Specification
Dimensions	Height: 44 mm (1.7 in.); width: 440 mm (17.3 in.); depth: 483 mm (19.0 in.)
Weight	10.0 kg (22.0 lb).

Models

Product availability: The ThinkSystem NE1064TO RackSwitch is withdrawn and no longer available for ordering.

The following table lists the ThinkSystem NE1064TO RackSwitch models.

Table 2. ThinkSystem NE1064TO RackSwitch models

Description	Part number	Machine Type/Model	Feature code
Lenovo ThinkSystem NE1064TO RackSwitch (Rear to Front, ONIE)	7Z330O11WW	7Z33CTO1WW	B6PB

The ThinkSystem NE1064TO RackSwitch models include the following items:

- One ThinkSystem NE1064TO RackSwitch with two power supplies and five system fans
- Generic Rack Mount Kit (2-post)
- RJ-45 (plug) to DB-9 (plug) serial console cable (3 m)
- Mini-USB to RJ-45 (jack) serial adapter cable
- *Electronic Publications Flyer*

Configuration notes:

- Power cables are not included and should be ordered for the switch (see Power supplies and cables for details).
- Transceivers and cables are not included and should be ordered for the switch (see Transceivers and cables for details).

Transceivers and cables

With the flexibility of the ThinkSystem NE1064TO RackSwitch, customers can choose the following connectivity technologies:

- For 1 GbE links, customers can use RJ-45 fixed ports with UTP cables for distances up to 100 meters.
- For 10 GbE links, customers can use RJ-45 fixed ports (10GBASE-T) with UTP Category 6a or 7 cables for distances up to 100 meters.

  To increase the number of available 10 GbE ports, customers can split out four 10 GbE ports for each QSFP28 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.
  Note: A maximum of four QSFP28 ports can be split out at the same time.
- For 25 GbE links, customers can split out four 25 GbE ports for each QSFP28 port by using QSFP28 to 4x SFP28 DAC breakout cables for distances up to 5 meters or active optical breakout cables for distances up to 20 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.
  Note: A maximum of four QSFP28 ports can be split out at the same time.

- For 40 GbE links, customers can use QSFP28 ports with 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 50 GbE links, customers can split out two 50 GbE ports for each QSFP28 port by using the QSFP28-2xQSFP28 DAC breakout cables (not supplied by Lenovo).
  Note: A maximum of four QSFP28 ports can be split out at the same time.

- For 100 GbE links, customers can use QSFP28 ports with QSFP28 DAC cables for distances up to 5 meters or QSFP28 active optical cables 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.

Configuration notes:

- If Port 49 is configured for break-out, Port 52 is disabled and cannot be used.
- If Port 54 is configured for break-out, Port 51 is disabled and cannot be used.

The following tables list the supported cables and transceivers:

- Optical transceivers and cables
- Active optical cables
- DAC cables

Table 3. Optical transceivers and cables

Description	Part number	Feature code	Maximum quantity
QSFP+ transceivers - 40 GbE			
Lenovo 40GBASE QSFP+ Bi-Directional Transceiver	00YL631	ATYW	6
Lenovo 40GBASE-SR4 QSFP+ Transceiver	49Y7884	A1DR	6
Lenovo 40GBASE-iSR4 QSFP+ Transceiver	00D9865	ASTM	6
Lenovo 40GBASE-eSR4 QSFP+ Transceiver	00FE325	A5U9	6
Lenovo 40GBASE-LR4 QSFP+ Transceiver	00D6222	A3NY	6
QSFP28 transceivers - 100 GbE			
Lenovo 100GBASE-SR4 QSFP28 Transceiver	7G17A03539	AV1D	6
Lenovo 100GBASE-LR4 QSFP28 Transceiver	7G17A03540	AV1E	6
UTP Category 5E cables for RJ-45 fixed ports operating at 1 Gbps and 1 GbE RJ-45 management ports			
0.6m Blue Cat5e Cable	40K5679	3801	49
0.6m Green Cat5e Cable	40K5563	3796	49
0.6m Yellow Cat5e Cable	40K8933	3791	49
0.75m Blue Cat5e Cable	00WE111	AVFT	49
0.75m Green Cat5e Cable	00WE099	AVFQ	49
1.0m Blue Cat5e Cable	00WE115	AVFU	49

Description	Part number	Feature code	Maximum quantity
1.0m Green Cat5e Cable	00WE103	AVFR	49
1.25m Blue Cat5e Cable	00WE119	AVFV	49
1.25m Green Cat5e Cable	00WE107	AVFS	49
1.5m Green Cat5e Cable	40K5643	3797	49
1.5m Yellow Cat5e Cable	40K8951	3792	49
3m Blue Cat5e Cable	40K5581	3803	49
3m Green Cat5e Cable	40K5793	3798	49
3m Yellow Cat5e Cable	40K8957	3793	49
10m Blue Cat5e Cable	40K8927	3804	49
10m Green Cat5e Cable	40K5794	3799	49
10m Yellow Cat5e Cable	40K8801	3794	49
25m Blue Cat5e Cable	40K8930	3805	49
25m Green Cat5e Cable	40K8869	3800	49
25m Yellow Cat5e Cable	40K8807	3795	49
UTP Category 6 cables for 10 GbE RJ-45 fixed ports and 1 GbE RJ-45 management ports			
0.75m Green Cat6 Cable	00WE123	AVFW	49
1.0m Green Cat6 Cable	00WE127	AVFX	49
1.25m Green Cat6 Cable	00WE131	AVFY	49
1.5m Green Cat6 Cable	00WE135	AVFZ	49
3m Green Cat6 Cable	00WE139	AVG0	49
10m Blue Cat6 Cable	90Y3721	A1MU	49
10m Green Cat6 Cable	90Y3718	A1MT	49
10m Yellow Cat6 Cable	90Y3715	A1MS	49
25m Blue Cat6 Cable	90Y3730	A1MX	49
25m Green Cat6 Cable	90Y3727	A1MW	49
25m Yellow Cat6 Cable	90Y3724	A1MV	49
OM3 optical cables for 40 GbE SR QSFP+ BiDi transceivers			
Lenovo 0.5m LC-LC OM3 MMF Cable	00MN499	ASR5	6
Lenovo 1m LC-LC OM3 MMF Cable	00MN502	ASR6	6
Lenovo 3m LC-LC OM3 MMF Cable	00MN505	ASR7	6
Lenovo 5m LC-LC OM3 MMF Cable	00MN508	ASR8	6
Lenovo 10m LC-LC OM3 MMF Cable	00MN511	ASR9	6
Lenovo 15m LC-LC OM3 MMF Cable	00MN514	ASRA	6
Lenovo 25m LC-LC OM3 MMF Cable	00MN517	ASRB	6
Lenovo 30m LC-LC OM3 MMF Cable	00MN520	ASRC	6
OM4 optical cables for 40 GbE SR QSFP+ BiDi transceivers			
Lenovo 0.5m LC-LC OM4 MMF Cable	4Z57A10845	B2P9	6
Lenovo 1m LC-LC OM4 MMF Cable	4Z57A10846	B2PA	6
Lenovo 3m LC-LC OM4 MMF Cable	4Z57A10847	B2PB	6
Lenovo 5m LC-LC OM4 MMF Cable	4Z57A10848	B2PC	6
Lenovo 10m LC-LC OM4 MMF Cable	4Z57A10849	B2PD	6

Description	Part number	Feature code	Maximum quantity
Lenovo 15m LC-LC OM4 MMF Cable	4Z57A10850	B2PE	6
Lenovo 25m LC-LC OM4 MMF Cable	4Z57A10851	B2PF	6
Lenovo 30m LC-LC OM4 MMF Cable	4Z57A10852	B2PG	6
Optical cables for 40 GbE QSFP+ SR4/iSR4/eSR4 and 100 GbE QSFP28 SR4 transceivers			
Lenovo 5m MPO-MPO OM4 MMF Cable	7Z57A03567	AV25	6
Lenovo 7m MPO-MPO OM4 MMF Cable	7Z57A03568	AV26	6
Lenovo 10m MPO-MPO OM4 MMF Cable	7Z57A03569	AV27	6
Lenovo 15m MPO-MPO OM4 MMF Cable	7Z57A03570	AV28	6
Lenovo 20m MPO-MPO OM4 MMF Cable	7Z57A03571	AV29	6
Lenovo 30m MPO-MPO OM4 MMF Cable	7Z57A03572	AV2A	6
Optical breakout cables for 40 GbE QSFP+ iSR4/eSR4 and 100 GbE QSFP28 SR4 transceivers			
Lenovo 1m MPO-4xLC Breakout OM4 MMF Cable	7Z57A03573	AV2B	4
Lenovo 3m MPO-4xLC Breakout OM4 MMF Cable	7Z57A03574	AV2C	4
Lenovo 5m MPO-4xLC Breakout OM4 MMF Cable	7Z57A03575	AV2D	4

Table 4. Active optical cables

Description	Part number	Feature code	Maximum quantity
QSFP+ active optical cables - 40 GbE			
Lenovo 1m QSFP+ to QSFP+ Active Optical Cable	7Z57A04256	AX42	6
Lenovo 3m QSFP+ to QSFP+ Active Optical Cable	00YL652	ATZ3	6
Lenovo 5m QSFP+ to QSFP+ Active Optical Cable	00YL655	ATZ4	6
Lenovo 7m QSFP+ to QSFP+ Active Optical Cable	00YL658	ATZ5	6
Lenovo 15m QSFP+ to QSFP+ Active Optical Cable	00YL661	ATZ6	6
Lenovo 20m QSFP+ to QSFP+ Active Optical Cable	00YL664	ATZ7	6
QSFP+ active optical breakout cables - 40 GbE to 4x 10 GbE			
Lenovo 1m QSFP+ to 4xSFP+ Active Optical Cable	00YL667	ATZ8	4
Lenovo 3m QSFP+ to 4xSFP+ Active Optical Cable	00YL670	ATZ9	4
Lenovo 5m QSFP+ to 4xSFP+ Active Optical Cable	00YL673	ATZA	4
QSFP28 active optical cables - 100 GbE			
Lenovo 1m 100G QSFP28 Active Optical Cable	4Z57A10844	B2UZ	6
Lenovo 3m 100G QSFP28 Active Optical Cable	7Z57A03546	AV1L	6
Lenovo 5m 100G QSFP28 Active Optical Cable	7Z57A03547	AV1M	6
Lenovo 10m 100G QSFP28 Active Optical Cable	7Z57A03548	AV1N	6
Lenovo 15m 100G QSFP28 Active Optical Cable	7Z57A03549	AV1P	6
Lenovo 20m 100G QSFP28 Active Optical Cable	7Z57A03550	AV1Q	6
QSFP28 active optical breakout cables - 100 GbE to 4x 25 GbE			
Lenovo 3m 100G to 4x25G Breakout Active Optical Cable	7Z57A03551	AV1R	4
Lenovo 5m 100G to 4x25G Breakout Active Optical Cable	7Z57A03552	AV1S	4
Lenovo 10m 100G to 4x25G Breakout Active Optical Cable	7Z57A03553	AV1T	4

Description	Part number	Feature code	Maximum quantity
Lenovo 15m 100G to 4x25G Breakout Active Optical Cable	7Z57A03554	AV1U	4
Lenovo 20m 100G to 4x25G Breakout Active Optical Cable	7Z57A03555	AV1V	4

Table 5. DAC cables

Description	Part number	Feature code	Maximum quantity
QSFP+ passive direct-attach copper cables - 40 GbE			
Lenovo 1m Passive QSFP+ DAC Cable	49Y7890	A1DP	6
Lenovo 3m Passive QSFP+ DAC Cable	49Y7891	A1DQ	6
Lenovo 5m Passive QSFP+ DAC Cable	00D5810	A2X8	6
Lenovo 7m Passive QSFP+ DAC Cable	00D5813	A2X9	6
QSFP+ passive copper breakout cables - 40 GbE to 4x 10 GbE			
Lenovo 1m Passive QSFP+ to SFP+ Breakout DAC Cable	49Y7886	A1DL	6
Lenovo 3m Passive QSFP+ to SFP+ Breakout DAC Cable	49Y7887	A1DM	6
Lenovo 5m Passive QSFP+ to SFP+ Breakout DAC Cable	49Y7888	A1DN	6
QSFP28 direct attach copper cables - 100 GbE			
Lenovo 1m Passive 100G QSFP28 DAC Cable	7Z57A03561	AV1Z	6
Lenovo 3m Passive 100G QSFP28 DAC Cable	7Z57A03562	AV20	6
Lenovo 5m Passive 100G QSFP28 DAC Cable	7Z57A03563	AV21	6
QSFP28 direct attach copper breakout cables - 100 GbE			
Lenovo 1m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable	7Z57A03564	AV22	4
Lenovo 3m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable	7Z57A03565	AV23	4
Lenovo 5m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable	7Z57A03566	AV24	4

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

Table 6. ThinkSystem NE1064TO RackSwitch network cabling requirements

Transceiver	Standard	Cable	Connector
40 Gb Ethernet			
40Gb SR QSFP+ BiDi (00YL631)	40GBASE-SR BiDi	Up to 30 m with fiber optic cables supplied by Lenovo (see Table 3); up to 100 m with OM3 or up to 150 m with OM4 multimode fiber optic cables.	LC
40Gb SR4 QSFP+ (49Y7884)	40GBASE-SR4	Up to 30 m with MPO-MPO fiber optic cables supplied by Lenovo (see Table 3); up to 100 m with OM3 or up to 150 m with OM4 multimode fiber optic cables.	MPO
40Gb iSR4 QSFP+ (00D9865)	40GBASE-SR4	Up to 30 m with MPO-MPO fiber optic cables or up to 5 m with MPO-4xLC breakout cables supplied by Lenovo (see Table 3); up to 100 m with OM3 or up to 150 m with OM4 multimode fiber optic cables.	MPO
40Gb eSR4 QSFP+ (00FE325)	40GBASE-SR4	Up to 30 m with MPO-MPO fiber optic cables or up to 5 m with MPO-4xLC breakout cables supplied by Lenovo (see Table 3); up to 300 m with OM3 or up to 400 m with OM4 multimode fiber optic cables.	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+

Transceiver	Standard	Cable	Connector
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 5).	QSFP+
50 Gb (2x 25 Gb) Ethernet			
Direct attach copper cable	25G/50G Eth. Consortium	QSFP28 to 2x QSFP28 DAC breakout cables (not supplied by Lenovo).	QSFP28
100 Gb Ethernet			
100Gb SR4 QSFP28 (7G17A03539)	100GBASE-SR4	Up to 30 m with MPO-MPO fiber optic cables or up to 5 m with MPO-4xLC breakout cables supplied by Lenovo (see Table 3); 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; QSFP28 to 4x SFP28 active optical breakout cables up to 20 m for 4x 25 GbE connections out of a 100 GbE port (see Table 4).	QSFP28
Direct attach copper cable	100GBASE-CR4	QSFP28 to QSFP28 DAC cables up to 5 m; QSFP28 to 4x SFP28 DAC breakout cables up to 5 m for 4x 25 GbE connections out of a 100 GbE port (see Table 5).	QSFP28
Management ports			
1 GbE port	1000BASE-T	Up to 25 m with UTP cables supplied by Lenovo (see Table 3); UTP Category 5, 5E, or 6 up to 100 meters.	RJ-45
Mini-USB serial port	RS-232	For Mini-USB to RJ-45 adapter cable (comes with the switch): RJ-45 to DB-9 serial cable (comes with the switch).	Mini-USB

Software

The ThinkSystem NE1064TO RackSwitch includes the Open Network Install Environment (ONIE) which is a small Linux-based operating system that provides an open install environment for networking devices without operating systems. ONIE enables a network switch ecosystem for end users to choose among different Network Operating Systems by discovering NOS installer images and loading them onto the switch.

Software support: Lenovo does not provide support for third-party software that is certified with the switch. Customers should contact a third-party software vendor directly to submit a software support request, and the software vendor will own the software-related problem resolution until closure.

Ethernet standards

The ThinkSystem NE1064TO RackSwitch supports the following Ethernet standards:

- IEEE 802.1Q VLAN tagging
- IEEE 802.3 10BASE-T Ethernet (Ethernet management port)
- IEEE 802.3u 100BASE-TX Fast Ethernet (Ethernet management port)
- IEEE 802.3ab 1000BASE-T copper twisted pair Gigabit Ethernet
- IEEE 802.3an 10GBASE-T copper twisted pair 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 802.3bm 100GBASE-SR4 short range fiber optics 100 Gb Ethernet
- IEEE 802.3ba 100GBASE-LR4 long range fiber optics 100 Gb Ethernet
- IEEE 802.3bj 100GBASE-CR4 copper 100 Gb Ethernet
- 25G/50G Ethernet Consortium

Cooling

The ThinkSystem NE1064TO RackSwitch ships with five variable speed, hot-swap system fans that provide N+1 cooling redundancy.

Power supplies and cables

The ThinkSystem NE1064TO RackSwitch supports two load-sharing, redundant hot-swap 800 W AC power supplies.

The ThinkSystem NE1064TO 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 7. 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	43V6034	6568
2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08366	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
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

Rack installation

The ThinkSystem NE1064TO RackSwitch ships with the 2-post rack mount kit. For 4-post rack installations, the ThinkSystem NE1064TO RackSwitch supports the optional adjustable 19-inch 4-post rail kit and the air inlet duct (optional for the 4-post rail kit).

The following table lists rack installation options for the ThinkSystem NE1064TO RackSwitch.

Table 8. Rack installation options

Description	Part number	Feature code
Lenovo RackSwitch Adjustable 19" 4 Post Rail Kit	00D6185	A3KP
Air Inlet Duct for 483 mm RackSwitch	00D6060	A3KQ

Physical specifications

The ThinkSystem NE1064TO RackSwitch has the following physical specifications:

- Height: 44 mm (1.7 in.)
- Width: 440 mm (17.3 in.)
- Depth: 483 mm (19.0 in.)
- Maximum weight: 10.0 kg (22.0 lb)

Operating environment

The ThinkSystem NE1064TO RackSwitch is supported in the following operating environment:

- Temperature: 0 - 45 ºC (32 - 113 ºF).
- Relative humidity: 10 - 90% (non-condensing)
- Altitude: Up to 2000 m (6,561 feet)
- Electrical input: 50 / 60 Hz, 100 - 240 V AC auto-switching
- Power consumption (maximum): 562 W
- Heat dissipation (maximum): 1918 BTU/hour
- Airflow: Non-port side to port side

Warranty and support

The ThinkSystem NE1064TO RackSwitch comes with a 3-year Customer Replaceable Unit (CRU) hardware limited warranty with 9x5 Next Business Day (NBD) parts delivered. The hardware options that are installed in the switch assume the switch's base warranty and any Lenovo warranty service upgrade for the switch.

Software support: Lenovo does not provide support for third-party software that is certified with the switch. Customers should contact a third-party software vendor directly to submit a software support request, and the software vendor will own the software-related problem resolution until closure.

Lenovo's additional support services provide a sophisticated, unified support structure for a customer's data center, with an experience consistently ranked number one in customer satisfaction worldwide.

The following Lenovo support services are available:

- **Premier Support** provides a Lenovo-owned customer experience and delivers direct access to technicians skilled in hardware, software, and advanced troubleshooting, in addition to the following capabilities:
    - Direct technician-to-technician access through a dedicated phone line.
    - 24x7x365 remote support.
    - Single point of contact service.
    - End to end case management.
    - 3rd Party collaborative software support.
    - Online case tools and live chat support.
    - On-demand remote system analysis.
- **Warranty Upgrades (Preconfigured Support)** are available to meet the on-site response time targets that match the criticality of customer's systems:
    - 3, 4, or 5 years of service coverage.
    - 1-year or 2-year post-warranty extensions.
    - **Foundation Service:** 9x5 service coverage with next business day onsite response.
    - **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select regions).
    - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select regions).
- **Managed Services**
  Lenovo Managed Services provide continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of a customer's data center using state of the art tools, systems, and practices by a team of highly skilled and experienced Lenovo services professionals.

  Quarterly reviews check error logs, verify firmware and operating system device driver levels, and software as needed. Lenovo will also maintain records of latest patches, critical updates, and firmware levels, to ensure customer's systems are providing business value through optimized performance.
- **Technical Account Management (TAM)**
  A Lenovo Technical Account Manager helps customers optimize operations of their data centers based on a deep understanding of customer's business. Customers gain direct access to a Lenovo TAM, who serves as their single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. Also, a TAM helps proactively make service recommendations and manage service relationship with Lenovo to make certain that customer's needs are met.
- **Health Check**
  Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that customer systems and business are always running at their best. Health Check supports Lenovo-branded server, storage, and networking devices, as well as select Lenovo-supported products from other vendors that are sold by Lenovo or a Lenovo-Authorized Reseller.

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

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

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

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

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

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

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

Services

Lenovo Services is a dedicated partner to customer success. Lenovo's goal for customers is to reduce capital outlays, mitigate IT risks, and accelerate time to productivity.

Here is a more in-depth look at what Lenovo can do for their customers:

- **Asset Recovery Services**
  Asset Recovery Services (ARS) helps customers recover the maximum value from their end-of-life equipment in a cost-effective and secure way. On top of simplifying the transition from old to new equipment, ARS mitigates environmental and data security risks associated with data center equipment disposal. Lenovo ARS is a cash-back solution for equipment based on its remaining market value, yielding maximum value from aging assets and lowering total cost of ownership for customers. For more information, see the ARS page, http://lenovopress.com/lp1266.

- **Assessment Services**
  An assessment helps solve customer IT challenges through an onsite, multi-day session with a Lenovo technology expert. Lenovo performs a tools-based assessment which provides a comprehensive and thorough review of a company's environment and technology systems. In addition to the technology-based functional requirements, the consultant also discusses and records the non-functional business requirements, challenges, and constraints. Assessments help organizations, no matter how large or small, get a better return on their IT investment and overcome challenges in the ever-changing technology landscape.

- **Design Services**
  Professional Services consultants perform infrastructure design and implementation planning to support customer's strategy. The high-level architectures provided by the assessment service are turned into low level designs and wiring diagrams, which are reviewed and approved prior to implementation. The implementation plan will demonstrate an outcome-based proposal to provide business capabilities through infrastructure with a risk-mitigated project plan.

- **Basic Hardware Installation**
  Lenovo experts can seamlessly manage the physical installation of customer's server, storage, or networking hardware. Working at a time convenient for the customer (business hours or off shift), the technician will unpack and inspect the systems on customer 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 customers to focus on other priorities.

- **Deployment Services**
  When investing in new IT infrastructures, customers need to ensure that their business will see quick time to value with little to no disruption. Lenovo deployments are designed by development and engineering teams who know Lenovo products and solutions better than anyone else, and Lenovo technicians own the process from delivery to completion. Lenovo will conduct remote preparation and planning, configure and integrate systems, validate systems, verify and update appliance firmware, train on administrative tasks, and provide post-deployment documentation. Customer’s IT teams leverage Lenovo skills to enable IT staff to transform with higher level roles and tasks.

- **Integration, Migration, and Expansion Services**
  Integration, Migration, and Expansion Services allow to move existing physical and virtual workloads easily, or to determine technical requirements to support increased workloads while maximizing performance. These services include tuning, validation, and documenting ongoing run processes, and they leverage migration assessment planning documents to perform necessary migrations.

Some service options may not be available in every region. For more information about Lenovo service offerings that are available in a specific region, contact a local Lenovo sales representative or business partner.

Regulatory compliance

The ThinkSystem NE1064TO RackSwitch conforms to the following regulations:

- FCC Part 15 Class A
- CAN/CSA-C22.2 60950-1
- CISPR 32 Class A
- IEC60950-1
- EN55032 Class A
- EN60825-1
- EN60950-1
- EN61000-3-2
- EN61000-3-3
- UL60950-1
- Reduction of Hazardous Substances (ROHS)

Related publications and links

For more information about the ThinkSystem NE1064TO RackSwitch, see the following resources:

- Lenovo RackSwitch InfoCenter
  http://systemx.lenovofiles.com/help/topic/com.lenovo.systemx.common.nav.doc/overview_rack_switches.html
  - *Lenovo ThinkSystem NE1064TO RackSwitch Installation Guide*
  - *Lenovo ThinkSystem NE1064TO ONIE User Guide*
- Lenovo Data Center Solution Configurator (DCSC):
  http://dcsc.lenovo.com
- Lenovo Data Center Support:
  http://datacentersupport.lenovo.com

Related product families

Product families related to this document are the following:

- 25 Gb Ethernet Connectivity
- Top-of-Rack Switches

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