Lenovo RackSwitch G8264CS
Product Guide (withdrawn product)

Many customers successfully use Ethernet and Fibre Channel connectivity from their servers to their LAN and SAN. These customers want to reduce the cost and complexity of these environments by using the capabilities of Ethernet and Fibre Channel convergence.

The Lenovo RackSwitch™ G8264CS top-of-rack switch offers the benefits of a converged infrastructure. As part of its forward-thinking design, this switch has the flexibility for growth and expansion. This switch is ideal for clients who want to connect to SANs and clients who want native Fibre Channel connectivity, in addition to support for such protocols as Ethernet, Fibre Channel over Ethernet (FCoE), and iSCSI.

The RackSwitch G8264CS includes the following features:

- Lossless Ethernet, Fibre Channel, and FCoE in one switch
- A total of 36 SFP+ ports that support 1 Gb or 10 Gb Ethernet
- Flexibility with 12 Omni Ports that support 10 Gb Ethernet or 4/8 Gb Fibre Channel connections
- Can aggregate FC or FCoE traffic and connect to SANs
- Future-proofed with four 40 Gb QSFP+ ports
- Low cost, low complexity, and simpler deployment and management

The RackSwitch G8264CS is shown in the following figure.

Figure 1. Lenovo RackSwitch G8264CS

Did you know?

The RackSwitch G8264CS simplifies deployment with its innovative and flexible Omni Port technology. The 12 Omni Ports on the G8264CS give clients the flexibility to choose a 10 Gb Ethernet, 4/8 Gb Fibre Channel, or both for upstream connections. In FC mode, Omni Ports provide convenient access to FC storage. The Omni Port technology that is provided on the G8264CS helps consolidate enterprise storage, networking, data, and management onto a simple-to-manage, efficient, and cost-effective single fabric. Also, the G8264CS can be used to create 252-node PODs or clusters with Flex System™ Interconnect Fabric.

Key features

The traditional approach of segmenting storage and data traffic has certain advantages, such as traffic isolation and independent administration. Nevertheless, it also poses several disadvantages, including higher infrastructure costs, complexity of management, and under-utilization of resources. Customers must invest in separate infrastructures for LAN, SAN, and inter-process communications (IPC) fabrics, including host adapters, cables, switching, routers, and other device-specific equipment.

The RackSwitch G8264CS is considered particularly suited for the following customers:

- Customers who want to implement a converged infrastructure with FCoE where the G8264CS acts as a Full Fabric FC/FCoE switch for the end-to-end FCoE configurations or as a Fibre Channel Forwarder (FCF) NPV Gateway that breaks out FC traffic for the native Fibre Channel SAN connectivity.
- Customers who are implementing a virtualized environment.
- Customers who require investment protection for 40 GbE network connectivity.
- Customers who want to reduce total cost of ownership (TCO) and improve performance while maintaining high levels of availability and security.
- Customers who want to avoid or minimize oversubscription, which can result in congestion and loss of performance.

The RackSwitch G8264CS offers the following features and benefits:

- Lowers the TCO with consolidation
  By consolidating LAN and SAN networks and converging to a single fabric, clients can reduce the equipment that is needed in their data centers. This benefit significantly reduces the costs that are associated with energy and cooling, management and maintenance, and capital costs.
- Improves performance and increases availability
  The G8264CS is an enterprise-class and full-featured data center switch that offers high-bandwidth performance with 36 1/10 Gb SFP+ connections, 12 Omni Ports that can be used for 10 Gb SFP+ connections, 4 Gb or 8 Gb Fibre Channel connections (or both) and four 40 Gb QSFP+ connections. The G8264CS switch delivers full line rate performance on Ethernet ports, which makes it an ideal choice for managing dynamic workloads across the network. This switch also provides a rich Layer 2 and Layer 3 feature set that is ideal for many of today's data centers. Combined with redundant hot-swappable power and fans and numerous high availability features, this switch comes fully equipped to handle the demands of business-sensitive traffic.
- High performance
  The 10 Gb/40 Gb switch provides the best combination of low latency, non-blocking line-rate switching, and ease of management. It has a throughput of up to 1.28 Tbps.
- Lower power and better cooling
  The G8264CS uses as little as 253 W of power, which is a fraction of the power consumption of most competitive offerings. The front-to-rear or rear-to-front cooling design of the G8264CS switch reduces the costs of data center air conditioning by having airflow match the servers in the rack. In addition, variable speed fans help to automatically reduce power consumption.
- Support for Virtual Fabric
  The G8264CS can help customers address I/O requirements for multiple NICs while reducing cost and complexity. By using Virtual Fabric, you can carve a physical dual-port NIC into multiple vNICs (2 - 8 vNICs) and create a virtual pipe between the adapter and the switch for improved performance, availability, and security. With support for FCoE, two vNICs can be configured as CNAs, which realizes more cost savings through convergence.

- VM-aware networking
  VMready software on the switch simplifies configuration and improves security in virtualized environments. VMready automatically detects virtual machine movement between physical servers and instantly reconfigures the network policies of each VM across VLANs to keep the network up and running without interrupting traffic or affecting performance. VMready works with all leading VM providers, such as VMware vSphere, Citrix Xen, and Microsoft Hyper-V.
- Layer 3 functionality
  The G8264CS includes Layer 3 functionality, which provides security and performance benefits, because 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.
- Seamless interoperability
  The G8264CS switches perform seamlessly with other vendors' upstream switches.
- Fault tolerance
  The G8264CS switches learn alternative routes automatically and perform faster convergence if there is a link, switch, or power failure. The switch uses proven technologies, such as L2 trunk failover, advanced VLAN-based failover, VRRP, and Hot Links.
- Multicast support
  These switches support IGMP Snooping v1, v2, and v3 with 2K IGMP groups. They also support Protocol Independent Multicast (PIM), such as PIM Sparse Mode or PIM Dense Mode.
- Transparent networking capability
  With a simple configuration change to easy connect mode, the RackSwitch G8264CS becomes a transparent network device that is invisible to the core, eliminates network administration concerns of Spanning Tree Protocol configuration/interoperability and VLAN assignments, and avoids any possible loops. By emulating a host NIC to the data center core, it accelerates the provisioning of VMs by eliminating the need to configure the typical access switch parameters.

Components and connectors

The front panel of the RackSwitch G8264CS is shown in the following figure.

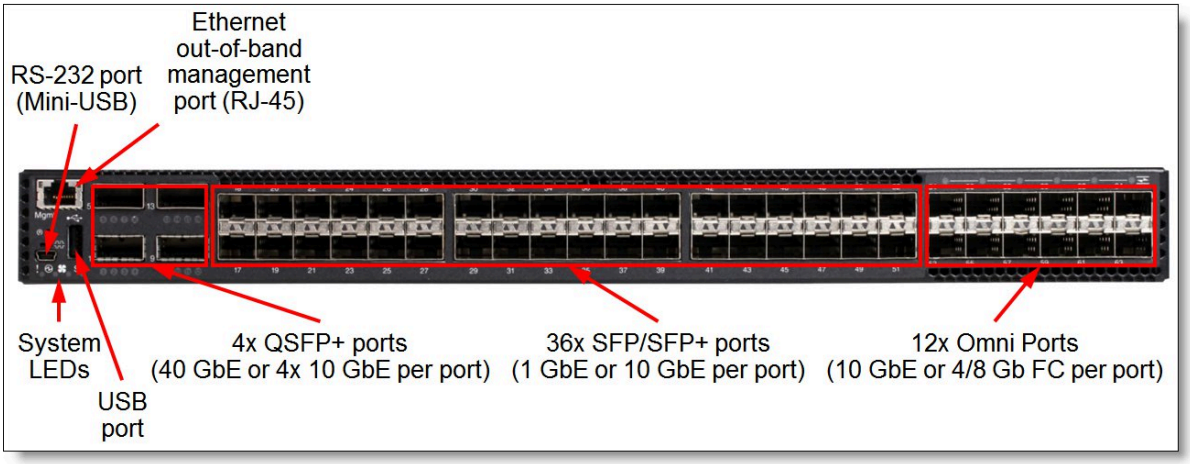

Figure 2. Front panel of the RackSwitch G8264CS

The front panel of the G8264CS includes the following components:

- LEDs that display the status of the switch and the network.
- One Mini-USB RS-232 console port that provides another means to configure the switch.
- One USB port for mass storage devices.
- 36x SFP/SFP+ ports to attach SFP/SFP+ transceivers for 1 Gb or 10 Gb Ethernet connections or DAC cables for 10 Gb Ethernet connections.
- 12x Omni Ports to attach SFP+ transceivers for 4/8 Gb Fibre Channel or 10 Gb Ethernet connections or DAC cables for 10 Gb Ethernet connections.
- 4x QSFP+ ports to attach QSFP+ transceivers or DAC cables for 40 Gb or 4x 10 Gb Ethernet connections.
- One RJ-45 10/100/1000 Mb Ethernet port for out-of-band management.

The rear panel of the RackSwitch G8264CS is shown in the following figure.

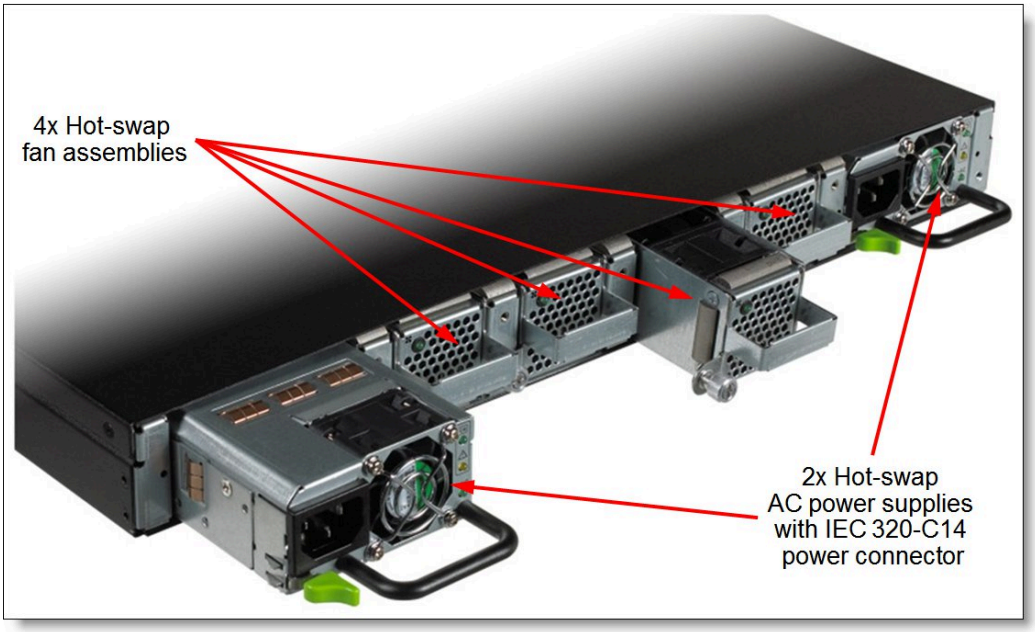

Figure 3. Rear panel of the RackSwitch G8264CS

The rear panel of the G8264CS includes the following components:

- Two redundant hot-swap AC power supplies (IEC 320-C14 power connector)
- Four 3+1 redundant hot-swap fan assemblies

System specifications

The following table lists the RackSwitch G8264CS system specifications.

Table 1. System specifications

Attribute	Specification
Form factor	1U rack mount
Ports	• 36x SFP/SFP+ ports (for 1 GbE SFP or 10 GbE SFP+ media) • 12x SFP+ Omni Ports (for 10 GbE SFP+ or 8 Gb SFP+ FC media; no 1 GbE SFPs) • 4x QSFP+ ports (for 40 GbE QSFP+ media)
Media types	40 Gb Ethernet QSFP+: • 40 GbE short-range (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 (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 10 Gb Ethernet SFP+: • 10 GbE short-range (SR) SFP+ transceivers • 10 GbE long-range (LR) SFP+ transceivers • 10 GbE extended-range (ER) SFP+ transceivers • 10 GbE SFP+ active optical cables • 10 GbE SFP+ DAC cables 1/10 Gb Ethernet SFP+: • 1/10 GbE SX/SR SFP+ transceivers 1 Gb Ethernet SFP: • 1 GbE short-wavelength (SX) SFP transceivers • 1 GbE long-wavelength (LX) SFP transceivers • 1 GbE RJ-45 SFP transceivers 8 Gb Fibre Channel SFP+: • 8 Gb FC short-wave (SW) SFP+ transceivers • 8 Gb FC long-wave (LW) SFP+ transceivers
Port speeds	• 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 • 10 GbE SFP+ transceivers, DAC cables and AOCs: 10 Gbps • 1/10 GbE SFP+ transceivers: 1 Gbps or 10 Gbps (Omni Ports: 10 Gbps only) • 1 GbE SFP transceivers: 1 Gbps • 8 Gb FC SFP+ transceivers: 4/8 Gbps
Switching method	Cut-through.
Data traffic types	Unicast, multicast, broadcast.
Software features	Lenovo Networking OS: 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), Hot Links, Layer 2 failover, quality of service (QoS), Edge Virtual Bridging (EVB), VMready, IPv4/IPv6 management, IPv4/IPv6 routing, IPv4 virtual router redundancy protocol (VRRP), virtual NICs, Converged Enhanced Ethernet, Fibre Channel over Ethernet (FCoE) full fabric switch operations, FCoE N_Port Virtualization (NPV) gateway operations.

Attribute	Specification
Performance	Non-blocking architecture with wire-speed forwarding of traffic: • Up to 1.28 Tbps aggregated throughput • 100% line-rate performance with low latency • Up to 9,216-byte jumbo frames • Receive buffer size: 9 MB
Scalability	• MAC address forwarding database entries: 128,000 • VLANs: 4,095 • Per VLAN Rapid Spanning Tree (PVRST) instances: 256 • Multiple STP (MSTP) instances: 32 • Link aggregation groups: 64 • Ports in a link aggregation group: 32
Cooling	Four 3+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 550 W (front to rear) or 750 W (rear to front) AC (100 - 240 V) power supplies (1x IEC 320-C14 connector on each power supply).
Hot-swap parts	SFP/SFP+/QSFP+ transceivers, SFP+/QSFP+ DAC cables, power supplies, fans.
Management ports	1x 10/100/1000 Mb Ethernet port (RJ-45); 1x RS-232 port (Mini-USB); 1x USB port (for additional firmware, log, and configuration files storage).
Management interfaces	Industry standard command line interface (isCLI); SNMP v1 and v3; Netconf (XML). Optional Lenovo XClarity for discovery, inventory, monitoring and events.
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); port-based network access control (IEEE 802.1x).
Hardware warranty	Three-year Customer Replaceable Unit limited warranty with 9x5 Next Business Day Parts Delivered. Optional warranty service upgrades are available through Lenovo: onsite service, 24x7 coverage, 2-hour or 4-hour response time, 1-year or 2-year post-warranty extensions, Premier support, and basic installation services.
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	225,317 hours with ambient operating temperature of 40° C.
Dimensions	Height: 44 mm (1.7 in.); width: 439 mm (17.3 in.); depth: 483 mm (19.0 in.)
Weight	10.4 kg (22.9 lb).

Models

The following table lists the G8264CS switch models.

Table 2. G8264CS switch models

Description	Part number	Machine Type-Model	Feature code
Lenovo RackSwitch G8264CS (Rear to Front)	7159DRX	7159-HCK	ASY0
Lenovo RackSwitch G8264CS (Front to Rear)	7159DFX	7159-HCM	ASWZ

The part numbers for the G8264CS switches include the following items:

- One Lenovo RackSwitch G8264CS with two power supplies and four fan assemblies
- Generic Rack Mount Kit (2-post)
- Console Cable Kit that includes:
  - RJ-45 (plug) to RJ-45 (plug) serial cable (1 m)
  - Mini-USB to RJ-45 (jack) adapter cable (0.2 m) with retention clip
  - DB-9 to RJ-45 (jack) adapter
- Documentation Package

Configuration notes:

- Power cables are not included and must be ordered together with the switch (see "Power supplies and cables" for details).
- QSFP+ and SFP/SFP+ transceivers and cables are not included and should be ordered together with the switch (see "Transceivers and cables" for details).

Transceivers and cables

With the flexibility of the G8264CS switch, customers can choose the following connectivity technologies:

- For 1 GbE links, customers can use RJ-45 SFP transceivers with UTP cables up to 100 meters. Customers that need longer distances can use a 1000BASE-SX transceiver, which can drive distances up to 220 meters with 62.5 µ multimode fiber (OM1) and up to 550 meters with 50 µ multimode fiber (OM2), or the 1000BASE-LX transceivers that support distances up to 10 kilometers with single-mode fiber (1310 nm).
- For 10 GbE links, customers can use SFP+ direct-attached copper (DAC) cables for in-rack cabling for distances up to 7 meters or SFP+ active optical cables (AOCs) for distances up to 20 meters. These cables have SFP+ connectors on each end, and they do not need separate transceivers.

  For longer distances, the 10GBASE-SR transceiver can support distances up to 300 meters over OM3 multimode fiber or up to 400 meters over OM4 multimode fiber. The 10GBASE-LR transceivers can support distances up to 10 kilometers on single mode fiber. For extended distances, the 10GBASE-ER transceivers can support distances up to 40 kilometers on single mode fiber.

  To increase the number of available 10 GbE ports, 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. For distances up to 100 meters, the 40GBASE-iSR4 QSFP+ transceivers can be used with OM3 optical MPO-to-LC breakout cables or up to 150 meters with OM4 optical MPO-to-LC breakout cables. For longer distances, the 40GBASE-eSR4 transceivers can be used with OM3 optical MPO-to-LC breakout cables for distances up to 300 meters or OM4 optical MPO-to-LC breakout cables for distances up to 400 meters.

- For 40 GbE to 40 GbE connectivity, customers can use the affordable 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.

  With multimode fiber LC cables, customers can use the 40GBASE QSFP+ bi-directional transceivers for distances up to 100 meters with OM3 or up to 150 meters with OM4 MMF LC cables.

  With multimode fiber MPO cables, customers can use the 40GBASE-SR4/iSR4 QSFP+ transceivers for distances up to 100 meters with OM3 or up to 150 meters with OM4 MMF MPO cables. For distances up to 300 meters, the 40GBASE-eSR4 QSFP+ transceiver can be used with OM3 or up to 400 meters with OM4 MMF MPO cables.

  For distances up to 10 kilometers, the 40GBASE-LR4 QSFP+ transceiver can be used with single mode fiber LC cables.

- For 8 Gb or 4 Gb FC links (supported on Omni Ports only), customers can use 8 Gb FC SFP+ SW optical transceivers for distances up to 150 meters (at 8 Gbps speed) or up to 380 m (at 4 Gbps speed) with 50 µ OM3 multimode fiber. For longer distances, the 8 Gb FC LW optical transceivers can support up to 10 kilometers on single-mode fiber. These transceivers can operate at 8 Gbps or 4 Gbps speeds.

The supported cables and transceivers are listed in the following table.

Table 3. Supported transceivers and DAC cables

Description	Part number	Feature code	Maximum quantity supported
SFP transceivers - 1 GbE			
Lenovo 1000BASE-T (RJ-45) SFP Transceiver (no support for 10/100 Mbps)	00FE333	A5DL	36
RJ45 1Gbps SFP Transceiver	00AY240	A4M8	36
Lenovo 1000BASE-SX SFP Transceiver	81Y1622	3269	36
Lenovo 1000BASE-LX SFP Transceiver	90Y9424	A1PN	36
SFP+ transceivers - 10 GbE			
Lenovo Dual Rate 1/10Gb SX/SR SFP+ Transceiver	00MY034	ATTJ	48
Lenovo 10Gb SFP+ SR Transceiver (10GBASE-SR)	46C3447	5053	48
Lenovo 10GBASE-LR SFP+ Transceiver (CS)	00D6180	A3NZ	48
Lenovo 10GBASE-LR SFP+ Transceiver	00FE331	B0RJ	48
Lenovo 10Gb SFP+ ER Transceiver (10GBASE-ER)	90Y9415	A1PP	6
Optical cables for 1 GbE SX SFP, 10 GbE SR SFP+, 40 GbE SR QSFP+ BiDi, and 8 Gb FC SW SFP+ transceivers			
Lenovo 0.5m LC-LC OM3 MMF Cable	00MN499	ASR5	48
Lenovo 1m LC-LC OM3 MMF Cable	00MN502	ASR6	48
Lenovo 3m LC-LC OM3 MMF Cable	00MN505	ASR7	48
Lenovo 5m LC-LC OM3 MMF Cable	00MN508	ASR8	48
Lenovo 10m LC-LC OM3 MMF Cable	00MN511	ASR9	48
Lenovo 15m LC-LC OM3 MMF Cable	00MN514	ASRA	48
Lenovo 25m LC-LC OM3 MMF Cable	00MN517	ASRB	48
Lenovo 30m LC-LC OM3 MMF Cable	00MN520	ASRC	48
SFP+ active optical cables - 10 GbE			
Lenovo 1m SFP+ to SFP+ Active Optical Cable	00YL634	ATYX	48

Description	Part number	Feature code	Maximum quantity supported
Lenovo 3m SFP+ to SFP+ Active Optical Cable	00YL637	ATYY	48
Lenovo 5m SFP+ to SFP+ Active Optical Cable	00YL640	ATYZ	48
Lenovo 7m SFP+ to SFP+ Active Optical Cable	00YL643	ATZ0	48
Lenovo 15m SFP+ to SFP+ Active Optical Cable	00YL646	ATZ1	48
Lenovo 20m SFP+ to SFP+ Active Optical Cable	00YL649	ATZ2	48
SFP+ passive direct-attach cables - 10 GbE			
Lenovo 0.5m Passive SFP+ DAC Cable	00D6288	A3RG	48
Lenovo 1m Passive SFP+ DAC Cable	90Y9427	A1PH	48
Lenovo 1.5m Passive SFP+ DAC Cable	00AY764	A51N	48
Lenovo 2m Passive SFP+ DAC Cable	00AY765	A51P	48
Lenovo 3m Passive SFP+ DAC Cable	90Y9430	A1PJ	48
Lenovo 5m Passive SFP+ DAC Cable	90Y9433	A1PK	48
Lenovo 7m Passive SFP+ DAC Cable	00D6151	A3RH	48
SFP+ active direct-attach cables - 10 GbE			
Lenovo 1m Active DAC SFP+ Cable	00VX111	AT2R	48
Lenovo 3m Active DAC SFP+ Cable	00VX114	AT2S	48
Lenovo 5m Active DAC SFP+ Cable	00VX117	AT2T	48
QSFP+ transceivers - 40 GbE			
Lenovo 40GBase QSFP+ Bi-Directional Transceiver	00YL631	ATYW	4
Lenovo 40GBASE-SR4 QSFP+ Transceiver	49Y7884	A1DR	4
Lenovo 40GBASE-iSR4 QSFP+ Transceiver	00D9865	ASTM	4
Lenovo 40GBASE-eSR4 QSFP+ Transceiver	00FE325	A5U9	4
Lenovo 40GBASE-LR4 QSFP+ Transceiver	00D6222	A3NY	4
Optical cables for 40 GbE QSFP+ SR4/iSR4/eSR4 transceivers			
Lenovo 10m QSFP+ MPO-MPO OM3 MMF Cable	00VX003	AT2U	4
Lenovo 30m QSFP+ MPO-MPO OM3 MMF Cable	00VX005	AT2V	4
Optical breakout cables for 40 GbE QSFP+ iSR4/eSR4 transceivers			
Lenovo 1m MPO-4xLC OM3 MMF Breakout Cable	00FM412	A5UA	4
Lenovo 3m MPO-4xLC OM3 MMF Breakout Cable	00FM413	A5UB	4
Lenovo 5m MPO-4xLC OM3 MMF Breakout Cable	00FM414	A5UC	4
QSFP+ active optical cables - 40 GbE			
Lenovo 1m QSFP+ to QSFP+ Active Optical Cable	7Z57A04256	AX42	4
Lenovo 3m QSFP+ to QSFP+ Active Optical Cable	00YL652	ATZ3	4
Lenovo 5m QSFP+ to QSFP+ Active Optical Cable	00YL655	ATZ4	4
Lenovo 7m QSFP+ to QSFP+ Active Optical Cable	00YL658	ATZ5	4
Lenovo 15m QSFP+ to QSFP+ Active Optical Cable	00YL661	ATZ6	4
Lenovo 20m QSFP+ to QSFP+ Active Optical Cable	00YL664	ATZ7	4
QSFP+ active optical breakout cables - 40 GbE to 4x10 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

Description	Part number	Feature code	Maximum quantity supported
QSFP+ direct-attach cables - 40 GbE			
Lenovo 1m Passive QSFP+ DAC Cable	49Y7890	A1DP	4
Lenovo 3m Passive QSFP+ DAC Cable	49Y7891	A1DQ	4
Lenovo 5m Passive QSFP+ DAC Cable	00D5810	A2X8	4
Lenovo 7m Passive QSFP+ DAC Cable	00D5813	A2X9	4
QSFP+ breakout cables - 40 GbE to 4x 10 GbE			
Lenovo 1m Passive QSFP+ to SFP+ Breakout DAC Cable	49Y7886	A1DL	4
Lenovo 3m Passive QSFP+ to SFP+ Breakout DAC Cable	49Y7887	A1DM	4
Lenovo 5m Passive QSFP+ to SFP+ Breakout DAC Cable	49Y7888	A1DN	4
SFP+ transceivers - 8 Gb FC (supported in Omni Ports only)			
Lenovo 8Gbps Fibre Channel SW SFP+ Transceiver (supports 4/8 Gbps)	44X1964	5075	12
Lenovo 8Gbps Fibre Channel LW SFP+ Transceiver (supports 4/8 Gbps)	00FM472	ASCK	12
Spare console cables			
Console Cable Kit Spare (RJ-45/DB9)	90Y9462	A2MG	1

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

Table 4. G8264CS 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	10 m or 30 m 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	10 m or 30 m MPO fiber optic cables or MPO-4xLC breakout cables up to 5 m 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	10 m or 30 m MPO fiber optic cables or MPO-4xLC breakout cables up to 5 m 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 3)	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 3)	QSFP+
10 Gb Ethernet			
Active optical cable	10GBASE-SR	SFP+ active optical cables up to 20 m (see Table 3)	SFP+

Transceiver	Standard	Cable	Connector
10Gb SR SFP+ (46C3447) 1/10Gb SFP+ (00MY034)	10GBASE-SR	Up to 30 m with fiber optic cables supplied by Lenovo (see Table 3); up to 300 m with OM3 or up to 400 m with OM4 multimode fiber optic cables	LC
10Gb LR SFP+ (00D6180, 00FE331)	10GBASE-LR	1310 nm single-mode fiber optic cable up to 10 km	LC
10Gb ER SFP+ (90Y9415)	10GBASE-ER	1310 nm single-mode fiber optic cable up to 40 km	LC
Direct attach copper cable	10GSFP+Cu	SFP+ DAC cables up to 7 m (see Table 3)	SFP+
1 Gb Ethernet			
1Gb RJ-45 SFP (00FE333, 00AY240)	1000BASE-T	UTP Category 5, 5E, and 6 up to 100 meters	RJ-45
1Gb SX SFP (81Y1622) 1/10Gb SFP+ (00MY034)	1000BASE-SX	Up to 30 m with fiber optic cables supplied by Lenovo (see Table 3); 850 nm multimode fiber optic cable 50 µ (OM2) up to 550 m or 62.5 µ (OM1) up to 220 m	LC
1Gb LX SFP (90Y9424)	1000BASE-LX	1310 nm single-mode fiber optic cable up to 10 km	LC
8 Gb Fibre Channel (operating at 8 Gbps or 4 Gbps)			
8Gb FC SW SFP+ (44X1964)	FC-PI-4 (8GFC, 4GFC)	Up to 30 m with fiber optic cables supplied by Lenovo (see Table 3); 850 nm multimode fiber optic cable, 50 µ OM3 up to 150 m at 8 Gbps or up to 380 m at 4 Gbps	LC
8Gb FC LW SFP+ (00FM472)	FC-PI-4 (8GFC, 4GFC)	1310 nm single-mode fiber optic cable up to 10 km (at 8 Gbps or 4 Gbps)	LC
Management ports			
1GbE management port	1000BASE-T	UTP Category 5, 5E, and 6 up to 100 meters	RJ-45
RS-232 management port	RS-232	DB-9/RJ-45-to-mini-USB (comes with the switch)	Mini-USB

Software features

Note: The features and specifications that are listed in this section are based on Networking OS 8.3.

The RackSwitch G8264CS includes the following software features:

- Scalability and performance:
  - Media access control (MAC) address learning with automatic updates
  - Up to 128 IP interfaces per switch (IP interface 128 is reserved for out-of-band management)
  - Static and LACP (IEEE 802.3ad) link aggregation
  - Broadcast/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/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 delay-sensitive traffic
  - Per-VLAN Rapid STP (PVRST) enhancements
  - Layer 2 Failover to support active/standby configurations of NIC teaming on servers
  - Hot Links provides basic link redundancy with fast recovery for network topologies that require Spanning Tree to be turned off
- VLAN support:
  - Up to 4095 VLANs supported per switch, with VLAN numbers 1 - 4095 (VLAN 4095 is used by the management network.)
  - Port-based and protocol-based VLANs
  - 802.1Q VLAN tagging support
  - Private VLANs support as defined in RFC 5517
- Security:
  - VLAN-based, MAC-based, and IP-based access control lists (ACLs)
  - 802.1x port-based authentication
  - Multiple user IDs and passwords
  - User access control
  - Radius, TACACS+, and LDAP authentication and authorization
  - NIST 800-131A Encryption
  - Selectable encryption protocol
- 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) with Explicit Congestion Notification (ECN) to help avoid congestion
  - Control plane protection (CoPP)
  - IPv4/IPv6 ACL metering
- IP v4 Layer 3 functions:
  - Host management
  - IP forwarding
  - IP filtering with ACLs; up to 256 IPv4 ACLs supported
  - Virtual Router Redundancy Protocol (VRRP) for router redundancy
  - Up to 128 static routes

    - Routing protocols (RIP v1, RIP v2, OSPF v2, and BGP)
    - DHCP Relay
    - IGMP snooping and IGMP relay
    - Protocol Independent Multicast (PIM) in Sparse Mode (PIM-SM) and Dense Mode (PIM-DM).
- IPv6 Layer 3 functions:
    - IPv6 host management
    - IPv6 forwarding
    - Static routes
    - OSPF v3 routing protocol
    - IPv6 filtering with ACLs, up to 128 IPv6 ACLs supported
- Virtualization:
    - Virtual Fabric vNICs (virtual NICs) with Ethernet, iSCSI, or FCoE traffic on vNICs
    - 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
    - 802.1Qbg Edge Virtual Bridging (EVB) is an emerging IEEE standard for allowing networks to become virtual machine (VM)-aware:
        - Virtual Ethernet Bridging (VEB) and Virtual Ethernet Port Aggregator (VEPA) are mechanisms for switching between VMs on the same hypervisor.
        - Edge Control Protocol (ECP) is a transport protocol that operates between two peers over an IEEE 802 LAN that provides reliable, in-order delivery of upper layer protocol data units.
        - Virtual Station Interface (VSI) Discovery and Configuration Protocol (VDP) allows centralized configuration of network policies that persist with the VM, independent of its location.
        - EVB Type-Length-Value (TLV) is used to discover and configure VEPA, ECP, and VDP.
    - VMready support:
        - Up to 2,048 virtual entities (VEs)
        - Automatic VE discovery
        - Up to 32 local or distributed VM groups for VEs
        - NMotion® feature for automatic network configuration migration
- Converged Enhanced Ethernet:
    - Priority-Based Flow Control (PFC) (IEEE 802.1Qbb) extends 802.3x standard 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.

- Fibre Channel and Fibre Channel over Ethernet (FCoE):
  - FC-BB5 FCoE specification compliant
  - Native FC Forwarder (FCF) switch operations
  - End-to-end FCoE support (initiator to target)
  - FCoE Initialization Protocol (FIP) support for automatic ACL configuration
  - Link Aggregation Group (LAG) support for FCoE connections
  - Supports 2,048 FCoE sessions with FIP Snooping by using Class ID ACLs
  - Omni Ports support 4 Gb or 8 Gb FC when FC SFPs+ are installed in these ports
  - Support for F_port, E_Port ISL, NP_port and VF_port Fibre Channel port types
  - Full Fabric mode for end-to-end FCoE or FCoE gateway; NPV Gateway mode for external FC SAN attachments
  - Fabric services in Full Fabric mode:
    - Name Server
    - Fabric login services
    - Fabric Shortest Path First (FSPF)
    - Fabric-Device Management Interface (FDMI)
    - Port security
    - Zoning
- 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 switch configuration via secure channels
  - Link Layer Discovery Protocol (LLDP) for discovering network devices
  - Serial interface for CLI
  - Scriptable CLI
  - Dual software images
  - Firmware image update via TFTP, FTP, or Secure FTP (sFTP)
  - Network Time Protocol (NTP) for switch clock synchronization
  - Netconf (XML)
  - Lenovo XClarity (optional) for discovery, inventory, monitoring and events
- Monitoring:
  - Switch LEDs for port status and switch status indication
  - Remote Monitoring (RMON) agent to collect statistics and proactively monitor switch performance
  - Port mirroring for analyzing network traffic passing through switch
  - Change tracking and remote logging with syslog feature
  - sFLOW agent for monitoring traffic in data networks (separate sFLOW analyzer required elsewhere)

The following features are not supported with IPv6:

- Bootstrap Protocol (BOOTP) and DHCP
- RADIUS, TACACS+ and LDAP
- VMware Virtual Center (vCenter) for VMready
- Routing Information Protocol (RIP)
- Internet Group Management Protocol (IGMP)
- Border Gateway Protocol (BGP)
- Protocol Independent Multicast (PIM)
- Virtual Router Redundancy Protocol (VRRP)
- sFLOW

Ethernet standards

The switch 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 802.1Qbg Edge Virtual Bridging
- IEEE 802.1Qbb Priority-Based Flow Control (PFC)
- IEEE 802.1Qaz Enhanced Transmission Selection (ETS)
- IEEE 802.1x port-based authentication
- IEEE 802.1w Rapid STP (RSTP)
- IEEE 802.3 10BASE-T Ethernet (management port only)
- 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 802.3ae 10GBASE-LR long range fiber optics 10 Gb Ethernet
- IEEE 802.3ae 10GBASE-ER extended range fiber optics 10 Gb Ethernet
- IEEE 802.3ba 40GBASE-SR4 short range fiber optics 40 Gb Ethernet
- IEEE 802.3ba 40GBASE-LR4 long range fiber optics 40 Gb Ethernet
- IEEE 802.3ba 40GBASE-CR4 copper 40 Gb Ethernet
- IEEE 802.3u 100BASE-TX Fast Ethernet (management port only)
- IEEE 802.3x Full-duplex Flow Control
- IEEE 802.3z 1000BASE-SX short range fiber optics Gigabit Ethernet
- IEEE 802.3z 1000BASE-LX long range fiber optics Gigabit Ethernet
- 10GSFP+Cu SFP+ direct-attach copper cable

Fibre Channel standards

The switch supports the following Fibre Channel standards:

- FC-PH, Revision 4.3 (ANSI/INCITS 230-1994)
- FC-PH, Amendment 1 (ANSI/INCITS 230-1994/AM1 1996)
- FC-PH, Amendment 2 (ANSI/INCITS 230-1994/AM2-1999)
- FC-PH-2, Revision 7.4 (ANSI/INCITS 297-1997)
- FC-PH-3, Revision 9.4 (ANSI/INCITS 303-1998)
- FC-PI, Revision 13 (ANSI/INCITS 352-2002)
- FC-PI-2, Revision 10 (ANSI/INCITS 404-2006)
- FC-PI-4, Revision 7.0
- FC-FS, Revision 1.9 (ANSI/INCITS 373-2003)
- FC-FS-2, Revision 0.91
- FC_FS_3 Revision 1.11
- FC-LS, Revision 1.2
- FC-SW-2, Revision 5.3 (ANSI/INCITS 355-2001)
- FC-SW-3, Revision 6.6 (ANSI/INCITS 384-2004)
- FC-SW-5, Revision 8.5 (ANSI/INCITS 461-2010)
- FC-GS-3, Revision 7.01 (ANSI/INCITS 348-2001)
- FC-GS-4, Revision 7.91 (ANSI/INCITS 387-2004)
- FC-GS-6 Revision 9.4 (ANSI/INCITS 463-2010)
- FC-BB-5, Revision 2.0 for FCoE
- FCP, Revision 12 (ANSI/INCITS 269-1996)
- FCP-2, Revision 8 (ANSI/INCITS 350-2003)
- FCP-3, Revision 4 (ANSI/INCITS 416-2006)
- FC-MI, Revision 1.92 (INCITS TR-30-2002, except for FL-ports and Class 2)
- FC-MI-2, Revision 2.6 (INCITS TR-39-2005)
- FC-SP, Revision 1.6
- FC-DA, Revision 3.1 (INCITS TR-36-2004)

Cooling

The G8264CS switch supports up to four variable speed, hot-swap fan assemblies (four fan assemblies come standard with the switch and they provide 3+1 redundancy). Spare fan assemblies can be ordered, if required (see the following table). Each option contains one hot-swap fan assembly (rear-to front or front-to-rear).

Table 5. Fan assembly spare options

Description	Part number	Feature code
Rear to front airflow (7159-HCK)		
Lenovo RackSwitch Hot-Swap, Rear-to-Front Fan Assembly	00D6071	A54K
Front to rear airflow (7159-HCM)		
Lenovo RackSwitch Hot-Swap, Front-to-Rear Fan Assembly	00D6073	A54J

Power supplies and cables

The G8264CS switch supports up to two load-sharing, hot-swap 550 W (front to rear airflow) or 750 W (rear to front airflow) AC power supplies (two power supplies come standard with the switch). Spare power supplies can be ordered, if required (see the following table). Each option contains one hot-swap power supply (rear-to-front or front-to-rear).

Table 6. Power supply spare options

Description	Part number	Feature code
Rear to front airflow (7159-HCK)		
Lenovo RackSwitch Hot-Swap, Rear-to-Front 750W CFF Power Supply	00D5858	A2X7
Front to rear airflow (7159-HCM)		
Lenovo RackSwitch Hot-Swap, Front-to-Rear 550W CFF Power Supply	00D5961	A3FN

The G8264CS switch ships standard without any AC 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	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
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
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
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 G8264CS switch includes a 2-post rack mount kit.

For 4-post rack installations, the G8264CS switch 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 G8264CS switch (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 and the switch seal kit is required. The seal kit includes enough switch seals for six switches.

The following table lists rack installation options for the G8264CS switches with rear to front and front to rear airflow.

Table 8. Rack installation options

Description	Part number	Feature code
Rear to front airflow (7159-HCK)		
Lenovo RackSwitch Adjustable 19" 4 Post Rail Kit	00D6185	A3KP
Air Inlet Duct for 483 mm RackSwitch	00D6060	A3KQ
Front to rear airflow (7159-HCM)		
Lenovo RackSwitch Adjustable 19" 4 Post Rail Kit	00D6185	A3KP
Lenovo RackSwitch Recessed 19" 4 Post Rail Kit	00CG089	A51M
Switch Seal Kit	00Y3001	A4WX

Physical specifications

The G8264CS switch features the following approximate dimensions and weight:

- Height: 44 mm (1.7 in.)
- Width: 439 mm (17.3 in.)
- Depth: 483 mm (19.0 in.)
- Weight: 10.4 kg (22.9 lb)

Operating environment

The G8264CS switch is supported in the following operating environment:

- Temperature: 0 - 40 °C (32 - 104 °F).
- Relative humidity: Non-condensing, 10 - 90%
- Altitude: up to 1,800 m (6,000 feet)
- Acoustic noise: Less than 65 dB
- 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
- Electrical power
    - Typical: 253 W
    - Maximum: 300 W
- Heat dissipation
    - Typical: 863 BTU/hour
    - Maximum: 1,024 BTU/hour

Warranty and maintenance

The RackSwitch G8264CS 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 options that are installed in the switch assume the switch's base warranty and any Lenovo warranty service upgrade for the switch. Lenovo also allows one no-charge support call within 90 days of purchase to get assistance and help resolve problems with the configuration of recently purchased Lenovo network switches.

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 spares parts.

Also available are Lenovo Services warranty maintenance upgrades and post-warranty maintenance agreements, with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

Lenovo warranty service upgrade offerings are region-specific. Not all warranty service upgrades are available in every region. For information about Lenovo warranty service upgrade offerings that are available in your region, refer to the following resources:

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

In general, the following Lenovo warranty service upgrades are available:

- Warranty and maintenance service upgrades:
  - 3, 4, or 5 years of warranty 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)
- Premier Support
  Premier Support service offers direct access to Lenovo's most advanced technicians for faster troubleshooting with single point of contact for end-to-end problem resolution and collaborative third-party software support.
- Basic Hardware Installation Services
  Lenovo experts can seamlessly manage the physical installation of your server, storage, or networking hardware. Working at a time convenient for you (business hours or off shift), the technician will unpack and inspect the systems 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.

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

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

Regulatory compliance

The switch conforms to the following regulations:

- Safety Certifications and Standards:
  - UL60950-1
  - CAN/CSA 22.2 No.60950-1
  - TUV GS to EN 60950-1
  - IEC60950-1, all country deviations
  - CNS 14336-1
  - Argentina Smark to IEC60950-1
  - GB 4943.1-2011
  - GOST R MEK 60950-1-2005
  - NOM-019
- Electromagnetic Compatibility Certifications:
  - FCC 47CFR Part 15 Class A
  - EN 55022 Class A
  - ICES-003 Class A
  - VCCI Class A
  - AS/NZS CISPR 22 Class A
  - CISPR 22 Class A
  - EN 55024
  - KC Class A
  - CE
- Environmental: Reduction of Hazardous Substances (ROHS) 6

Network connectivity

The following table lists the network switches with rear-to-front airflow that are offered by Lenovo that can be used in RackSwitch G8264CS network connectivity solutions for System x, ThinkServer, and Flex System hosts.

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

Description	Part number
1 Gb Ethernet switches	
Lenovo RackSwitch G7028 (Rear to Front)	7159BAX
Lenovo RackSwitch G7052 (Rear to Front)	7159CAX
Lenovo RackSwitch G8052 (Rear to Front)	7159G52
10 Gb Ethernet switches	
Lenovo RackSwitch G8124E (Rear to Front)*	7159BR6
Lenovo RackSwitch G8264 (Rear to Front)*	7159G64
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

* Supports FCoE transit switch operations when connected to the RackSwitch G8264CS.

The following table lists the network switches with front-to-rear airflow that are offered by Lenovo that can be used in RackSwitch G8264CS network connectivity solutions for NeXtScale System hosts.

Table 10. Network switches (front-to-rear airflow)

Description	Part number
1 Gb Ethernet switches	
Lenovo RackSwitch G8052 (Front to Rear)	715952F
10 Gb Ethernet switches	
Lenovo RackSwitch G8124E (Front to Rear)*	7159BF7
Lenovo RackSwitch G8264 (Front to Rear)*	715964F
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

* Supports FCoE transit switch operations when connected to the RackSwitch G8264CS.

For more information, see the list of Product Guides in the Top-of-rack Switches category:
http://lenovopress.com/servers/options/switches

Storage connectivity

The following table lists the external storage systems that are currently offered by Lenovo that can be used with the RackSwitch G8264CS for external NAS or iSCSI, FC, or FCoE SAN storage connectivity.

Table 11. External storage systems

Description	Part number
Lenovo ThinkSystem DE Series Storage (iSCSI host connectivity)	
Lenovo ThinkSystem DE2000H 10GBASE-T Hybrid Flash Array LFF	7Y70A003WW
Lenovo ThinkSystem DE2000H 10GBASE-T Hybrid Flash Array SFF	7Y71A002WW
Lenovo ThinkSystem DE2000H iSCSI Hybrid Flash Array LFF	7Y70A004WW
Lenovo ThinkSystem DE2000H iSCSI Hybrid Flash Array SFF	7Y71A003WW
Lenovo ThinkSystem DE4000H iSCSI Hybrid Flash Array 4U60	7Y77A000WW
Lenovo ThinkSystem DE4000H iSCSI Hybrid Flash Array LFF	7Y74A002WW
Lenovo ThinkSystem DE4000H iSCSI Hybrid Flash Array SFF	7Y75A001WW
Lenovo ThinkSystem DE4000F iSCSI All Flash Array SFF	7Y76A002WW
Lenovo ThinkSystem DE6000H iSCSI Hybrid Flash Array 4U60	7Y80A002WW
Lenovo ThinkSystem DE6000H iSCSI Hybrid Flash Array SFF	7Y78A002WW
Lenovo ThinkSystem DE6000F iSCSI All Flash Array SFF	7Y79A002WW
Lenovo ThinkSystem DM Series Storage (NAS or iSCSI host connectivity)	
Lenovo ThinkSystem DM3000H Hybrid Storage Array (2U12 LFF, CTO only)	7Y42CTO1WW
Lenovo ThinkSystem DM5000H Hybrid Storage Array (2U24 SFF, CTO only)	7Y57CTO1WW
Lenovo ThinkSystem DM5000F Flash Storage Array (2U24 SFF, CTO only)	7Y41CTO1WW
Lenovo ThinkSystem DM7000H Hybrid Storage Array (3U, CTO only)	7Y56CTO1WW
Lenovo ThinkSystem DM7000F Flash Storage Array (3U, CTO only)	7Y40CTO1WW
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**
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 V Series (iSCSI or FCoE 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

Description	Part number
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 or FCoE 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 V7000 SFF Control Enclosure, 3YR SWMA	6195C32†
IBM Storwize V7000 SFF Control Enclosure, 3YR SWMA, LA	6195C3L‡
IBM Storwize V7000 SFF Control Enclosure, 5YR SWMA	6195C52†
IBM Storwize V7000 SFF Control Enclosure, 5YR SWMA, LA	6195C5L‡

* Available worldwide (except China and Japan).
^ Available only in China.
** Available only in Japan.
† Available worldwide except Latin America.
‡ Available only in Latin America.

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

- Lenovo DE Series, DM Series, DS 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

The following table lists the FC SAN switches that are offered by Lenovo that can be used in RackSwitch G8264CS FC SAN storage connectivity solutions.

Note: The RackSwitch G8264CS is supported only in NPV mode when connected to FC SAN switches.

Table 12. FC SAN switches

Description	Part number
8 Gb FC	
Lenovo B300, 8 ports activated w/ 8Gb SWL SFPs, 1 PS, Rail Kit	3873AR3
16 Gb FC	
Lenovo B6505, 12 ports activated w/ 16Gb SWL SFPs, 1 PS, Rail Kit	3873AR5
Lenovo B6510, 24 ports activated w/ 16Gb SWL SFPs, 2 PS, Rail Kit	3873BR3

For more information, see the list of Product Guides in the Rack SAN Switches category:
http://lenovopress.com/storage/switches/rack

Rack cabinets

The following table lists the rack cabinets that are offered by Lenovo that can be used in RackSwitch G8264CS solutions.

Table 13. 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 in RackSwitch G8264CS solutions.

Table 14. 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 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 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 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 line cord)	39M2816
DPI Single Phase C13 Enterprise PDU (without line cord)	39Y8941
C19 Enterprise PDUs (6x IEC 320 C19 outlets)	
DPI Single Phase C19 Enterprise PDU (without 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

Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are offered by Lenovo that can be used in RackSwitch G8264CS solutions.

Table 15. Uninterruptible power supply units

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

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

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Related publications and links

For more information about the RackSwitch G8264CS, see the following publications that are available at the following page:
https://serveroption.lenovo.com/rack_switches/g8264cs

- *RackSwitch G8264CS Installation Guide*
- *RackSwitch G8264CS Application Guide*
- *RackSwitch G8264CS Industry Standard CLI Command Reference*

Related product families

Product families related to this document are the following:

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

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