

RackSwitch G8264T

Product Guide (withdrawn product)

The RackSwitch™ G8264T that uses 10Gbase-T and 40 Gb QSFP+ Ethernet technology is specifically designed for the data center and is ideal for today's big data, cloud, and optimized workload solutions. It is an enterprise class Layer 2 and Layer 3 full-featured switch that delivers line-rate, high-bandwidth switching, filtering, and traffic queuing without delaying data. Large data-center grade buffers help keep traffic moving, while the redundant power and fans and numerous high availability features help provide high availability for business-sensitive traffic.

The G8264T shown in Figure 1 is part of a comprehensive 10GBase-T solution that includes servers, storage, and networking. This solution also provides improved virtualization, better management, and smarter connectivity options for next generation data centers. G8264T provides flexible connectivity across distances up to 100 m at a low cost, making the G8264T an optimal choice for clients who want to connect high-speed server and storage devices.



Figure 1. RackSwitch G8264T

Did you know?

- The G8264T offers forty-eight 10Gbase-T connections, allowing for the use of cost-effective CAT6/6A cables for distances up to 100 m.
- The RackSwitch G8264T supports numerous types of configurations, including 1 Gb, 10 Gb, and 40 Gb, network-attached storage (NAS), and iSCSI.
- The G8264T offers the on-switch VMready® software that reduces the complexity of managing virtual machines (VMs) in the network. For more information about VMready, go to: <http://www.ibm.com/systems/networking/software/vmready>
- G8264T is SDN ready with its OpenFlow support. With OpenFlow, you can easily create user-controlled virtual networks, optimize performance dynamically, and minimize complexity when used with an OpenFlow controller.

Part number information

The part numbers to order the switch and additional options are shown in Table 1.

Table 1. Part numbers and feature codes for ordering

Description	Part number	Feature code for MTM 7309-HCD	Feature code for MTM 7309-HCE
Switch			
RackSwitch G8264T (front to rear)	7309CF9	None	A2X4
RackSwitch G8264T (rear to front)	7309CR9	A2X5	None
Miscellaneous options			
Console Cable Kit Spare	90Y9462	A2MG	A2MG
Adjustable 19" 4 Post Rail Kit	00D6185	A3KP	A3KP
Recessed 19" 4 Post Rail Kit	00CG089	None	A51M
Switch Seal Kit	00Y3001	None	A4WX
iDataPlex Rail Kit	90Y3535	None	A1SZ
Air Inlet Duct for 483 mm RackSwitch	00D6060	A3KQ	None
Hot-Swappable, 750W CFF Power Supply Spare (front to rear)	00D5857	None	A2X6
Hot-Swappable, 750W CFF Power Supply Spare (rear to front)	00D5858	A2X7	None
Hot-Swappable, Front-to-Rear Fan Assembly Spare	00D6073	None	A54J
Hot-Swappable, Rear-to-Front Fan Assembly Spare	00D6071	A54K	None

The part numbers for the G8264T switches include the following items:

- One RackSwitch G8264T with two power supplies and four fan assemblies (rear-to-front airflow or front-to-rear airflow)
- 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
- Warranty Flyer
- Important Notices Flyer
- Documentation CD-ROM

Note: Power cables are not included and must be ordered separately (see Table 2 for details).

The G8264T switch supports up to two hot-swap power supplies (two power supplies come standard with the switch) and up to four hot-swap fan assemblies (four fan assemblies come standard with the switch). Spare power supplies and fan assemblies can be ordered, if required. Each Power Supply Spare option contains one hot-swap power supply (rear-to-front or front-to-rear), and each Fan Assembly Spare option contains one hot-swap fan assembly (rear-to front or front-to-rear).

The G8264T switch comes standard with the Console Cable Kit for management through a serial interface. Spare serial management cables can be ordered, if required. The Console Cable Kit Spare option contains the following

items:

- 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

The G8264T switch supports optional adjustable 19-inch, 4-post rack installation kit, part number 00D6185. Optionally, Air Inlet Duct, part number 00D6060, can be ordered with the G8264T (rear-to-front airflow) switch for 4-post rack installations with the Adjustable 4-post Rail Kit (00D6185).

The G8264T (front-to-rear airflow) switch optionally supports recessed 19-inch, 4-post rack kit (00CG089) which is used when the switch is installed in the Intelligent Cluster® Rack (MT 1410), Enterprise Rack (MT 9363), or PureFlex® System Rack (MT 9363) with NeXtScale™ System. The G8264T (front-to-rear airflow) switch also supports 4-post iDataPlex® rack kit (90Y3535) which is used when the switch is installed in the iDataPlex Rack.

The G8264T switch ships standard without any AC power cables. Table 2 lists the part numbers and feature codes to order the power cables (two power cables are required per switch).

Table 2. Power cables

Description	Part number	Feature code for MTM 7309-HCD and 7309-HCE
Rack power cables		
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	6201
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		
European 10A line C13 to CEE 7/7 (2.8M)	39Y7917	6212
Denmark 10A line C13 to DK2-5A (2.8M)	39Y7918	6213
Switzerland 10A line C13 to SEV 1011 (2.8M)	39Y7919	6216
Israel 10A line C13 to SI 32 (2.8M)	39Y7920	6218
South Africa 10A line C13 to SABS 164/1 (2.8M)	39Y7922	6214
United Kingdom 10A line C13 to BS 1363 (2.8M)	39Y7923	6215
Australia/NZ 10A line C13 to SAA-AS C112 (2.8M)	39Y7924	6211
Korea 7A line C13 to KETI 15A/250V (2.8M)	39Y7925	6219
India 6A line C13 to Fig 68 (2.8M)	39Y7927	6269
China 6A line C13 to GB 2099.1 (2.8M)	39Y7928	6210
Brazil 10A line C13 to NBR 6147 (2.8M)	39Y7929	6223
Argentina 10A line C13 to IRAM 2063 (2.8M)	39Y7930	6222
10A/250V C13 to NEMA 6-15P 2.8m power cord	46M2592	A1RF
Japan 10A/100V C13 to JIS C-8303 2.8m power cord	46M2593	A1RE

Supported cables and transceivers

With the flexibility of the G8264T switch, clients can take advantage of the technologies that they require for multiple environments:

- For 1 GbE links, clients can simply use Category 5 or 5E UTP cables with RJ-45 connectors for distances up to 100 m.
- For 10 GbE connectivity, clients can use Category 5E or 6 UTP cables with RJ-45 connectors for distances up to 55 m or Category 6A UTP cables for distances up to 100 m.
To increase the number of available 10 GbE ports, clients can split out four 10 GbE ports for each 40 GbE port using QSFP+ DAC Breakout Cables for distances up to 5 meters. For distances up to 100 m, optical MTP-to-LC break-out cables can be used with the 40GBASE-SR4 transceiver, but Lenovo does not supply these optical breakout cables.
- For 40 GbE to 40 GbE connectivity, clients can use the affordable QSFP+ to QSFP+ DAC cables for distances up to 7 meters. For distances up to 100 m, the 40GBASE-SR4 QSFP+ transceiver can be used with OM3 multimode fiber with MTP connectors or up to 150 m when using OM4 multimode fiber with MTP connectors. For distances up to 10 km, the 40GBASE-LR QSFP+ transceiver can be used with single mode fiber with LC connectors.

Table 3 lists the supported cables and transceivers.

Table 3. Supported transceivers and direct-attach cables

Description	Part number	Feature code (MTM 7309-HCD / 7309-HCE)	Maximum quantity supported
QSFP+ transceiver and cables - 40 GbE			
Lenovo 40GBASE-SR4 QSFP+ Transceiver	49Y7884	A1DR	4
Lenovo 40GBASE-LR4 QSFP+ Transceiver	00D6222	A3NY	4
Optical cables for 40 GbE QSFP+ SR transceivers			
Lenovo 10m QSFP+ MTP-MTP OM3 MMF Cable	90Y3519	A1MM	4
Lenovo 30m QSFP+ MTP-MTP OM3 MMF Cable	90Y3521	A1MN	4
Lenovo 10m QSFP+ MTP-MTP OM3 MMF Cable (replaces 90Y3519)	00VX003	AT2U	4
Lenovo 30m QSFP+ MTP-MTP OM3 MMF Cable (replaces 90Y3521)	00VX005	AT2V	4
QSFP+ breakout cables - 40 GbE to 4x10 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
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

Benefits

The RackSwitch G8264T is considered particularly suited for these clients:

- Clients who want to implement a low-cost 10 GbE solution while leveraging the existing 1 GbE network connectivity and cabling
- Clients who are looking for 10 GbE low-cost cabling to reach distances up to 100 m.
- Clients who are using 10GBASE-T server and storage connectivity in their infrastructures.
- Clients who require 40 GbE upstream connectivity.
- Clients interested in Software Defined Networking using the OpenFlow standard.
- Clients who want to implement a converged infrastructure with NAS, iSCSI or FCoE. For FCoE implementations, the G8264T acts as a transit switch forwarding FCoE traffic upstream to FC forwarders where the FC traffic is broken out.

The RackSwitch G8264T offers the following benefits:

- **Low cost cabling**
The ability to use CAT6 or CAT6A cabling can save clients thousands of dollars for connections anywhere from a couple of feet to 100 meters, compared to SFP+ models.
- **High performance**
If you require the use of 10GBase-T, the 10 Gb/40 Gb capabilities provide the best combination of nonblocking line-rate switching with throughput of 1.2 Tbps.
- **Lower power and better cooling**
The typical power consumption of the RackSwitch G8264T is 385 W, which is a fraction of the power consumption of most competitive 10GBase-T offerings. Unlike side-cooled switches, which can cause heat recirculation and reliability concerns, the front-to-rear or rear-to-front cooling design of the G8264T reduces data center air conditioning costs by having airflow match the servers in the rack. In addition, variable speed fans assist in automatically reducing power consumption.
- **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 the VLANs to keep the network up and running without interrupting traffic or impacting performance. VMready works with all leading VM hypervisors.
- **Layer 3 functionality**
The G8264T switch includes Layer 3 functionality, which provides security and performance benefits, as inter-VLAN traffic stays within the switch. This switch also provides the full range of Layer 3 protocols from static routes for technologies such as Open Shortest Path First (OSPF) and Border Gateway Protocol (BGP) for enterprise customers.
- **Seamless interoperability**
The G8264T switch performs seamlessly with upstream switches from other vendors.
- **Fault tolerance**
The G8264T switch learns alternate routes automatically and performs faster convergence in the unlikely case of a link, switch, or power failure. The switch uses proven technologies, such as L2 trunk failover, advanced VLAN-based failover, VRRP, and Hot Links.
- **OpenFlow enabled**
The RackSwitch G8264T offers benefits of OpenFlow. OpenFlow is the new open application programming interface (API) that enables the network administrator to easily configure and manage virtual networks that control traffic on a “per-flow” basis. It creates multiple independent virtual networks and related policies without dealing with the complexities of the underlying physical network and protocols.
- **Multicast**

Supports IGMP Snooping v1, v2, and v3 with 2K IGMP groups, in addition to Protocol Independent Multicast (PIM) such as PIM Sparse Mode or PIM Dense Mode.

- Converged fabric

The G8264T switch supports CEE and connectivity to FCoE gateways. CEE helps enable clients to combine storage, messaging traffic, VoIP, video, and other data on a common data center Ethernet infrastructure. FCoE helps enable highly efficient block storage over Ethernet for consolidating server network connectivity. As a result, clients can deploy a single server interface for multiple data types, which can simplify both deployment and management of server network connectivity, while maintaining the high availability and robustness required for storage transactions.

Table 4 compares the features of the RackSwitch G8264 with the RackSwitch G8264T.

Table 4. Comparison of the RackSwitch G8264 and RackSwitch G8264T features

	RackSwitch G8264	RackSwitch G8264T
Port types	Based on SFP+	Based on 10GBase-T
Latency	Lower latency - 880 nanosecond	3.2 microseconds
Stacking	Yes	No
Typical power	Lower power - 330 watts	Competitive versus other 10GBase-T - 385 W
Copper cable length	Up to 7 m	Up to 100 m
Total distance	Up to 40 km with Transceiver	Limited to 100 m
TCO	Less than other SFP+	Lower TCO – for 100 m and less (based on adapter, cables and switch)

Features and specifications

Note: Features and specifications listed in this section are based on Networking OS 7.9.

The RackSwitch G8264T has the following features and specifications:

- Form factor: 1U rack mount switch
 - RackSwitch G8264T Rear-to-Front version for ports located in the rear of the rack matching ThinkServer®, System x®, BladeCenter® and Flex System® designs
 - RackSwitch G8264T Front-to-Rear version for ports located in the front of the rack matching airflow of iDataPlex and NeXtScale System designs
- Ports
 - 48 RJ-45 ports for 1 Gb or 10 Gb Ethernet (support for 1000BASE-T or 10GBASE-T)
 - 4 ports for 40 Gb Ethernet QSFP+ transceivers, QSFP+ to QSFP+ DAC cables, or QSFP+ to 4x 10 Gb SFP+ break-out cables. QSFP+ modules and DAC cables are not included and must be purchased separately (see Table 3).
 - One 10/100/1000 Ethernet port (RJ-45 connector) for out of band (OOB) management
 - One RS-232 serial port (mini-USB connector) that provides an additional means to configure the switch
 - One USB port for mass storage devices
- Scalability and performance
 - 1 Gb, 10 Gb, and 40 Gb Ethernet connectivity for bandwidth optimization and performance
 - Up to 64 10 Gb Ethernet connections (with optional break-out cables)
 - Non-blocking architecture with wire-speed forwarding of traffic and aggregated throughput of 1.28 Tbps
 - Full line rate performance with 3.2 microseconds switching latency
 - Media access control (MAC) address learning: automatic update, support for up to 128,000 MAC addresses
 - 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, up to 64 trunk groups with up to 16 member ports per trunk group
 - Support for jumbo frames (up to 9,216 bytes)
 - 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
 - Virtual Router Redundancy Protocol (VRRP) for Layer 3 router redundancy
 - IEEE 802.1D STP for providing L2 redundancy
 - IEEE 802.1s Multiple STP (MSTP) for topology optimization, up to 32 STP instances are supported by a single switch
 - IEEE 802.1w Rapid STP (RSTP) provides rapid STP convergence for critical delay-sensitive traffic like voice or video
 - Per-VLAN Rapid STP (PVRST) enhancements
 - Layer 2 Trunk Failover to support active/standby configurations of network adapter teaming on compute nodes
 - 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 ranging from 1 to 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, VLANs) traffic classification and processing
 - Traffic shaping and re-marking 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
 - IPv4/IPv6 ACL metering
- IP v4 Layer 3 functions
 - Host management
 - IP forwarding
 - IP filtering with ACLs, up to 256 IPv4 ACLs supported
 - VRRP for router redundancy
 - Support for up to 128 static routes
 - Routing protocol support (RIP v1, RIP v2, OSPF v2, BGP)
 - Support for policy-based routing (PBR)
 - Support for DHCP Relay
 - Support for IGMP snooping and IGMP relay
 - Support for Protocol Independent Multicast (PIM) in Sparse Mode (PIM-SM) and Dense Mode (PIM-DM).
- IPv6 Layer 3 functions
 - IPv6 host management
 - IPv6 forwarding
 - Support for static routes
 - Support for OSPF v3 routing protocol
 - IPv6 filtering with ACLs, up to 128 IPv6 ACLs supported
- OpenFlow 1.0 and 1.3.1 support
- Virtualization
 - Virtual NICs (vNICs) with Ethernet, iSCSI, or FCoE traffic on vNICs
 - Virtual link aggregation groups (vLAGs)
 - 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 providing 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 will 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 4,096 virtual entities (VEs)
 - Automatic VE discovery
 - Up to 4,093 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 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 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 over Ethernet (FCoE)
 - FC-BB5 FCoE specification compliant
 - FCoE transit switch operations
 - FCoE Initialization Protocol (FIP) support for automatic ACL configuration
 - FCoE Link Aggregation Group (LAG) support
 - Supports 2,048 FCoE sessions with FIP Snooping by using Class ID ACLs
- Manageability
 - Industry-standard command line interface (isCLI)
 - Simple Network Management Protocol (SNMP V1, V2 and V3)
 - HTTP/HTTPS browser GUI
 - 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, and Secure FTP (sFTP)
 - Network Time Protocol (NTP) and Precision Time Protocol (PTP) for switch clock synchronization
 - Netconf (XML)
 - Switch Center management application
- 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
 - Support for 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)
- Border Gateway Protocol (BGP)
- Protocol Independent Multicast (PIM)
- Virtual Router Redundancy Protocol (VRRP)
- sFLOW

Standards supported

The switch supports the following 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 802.3an 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 802.3u 100BASE-TX Fast Ethernet (management port only)
- IEEE 802.3x Full-duplex Flow Control

Connectors and LEDs

Figure 2 shows the front panel of the RackSwitch G8264T.

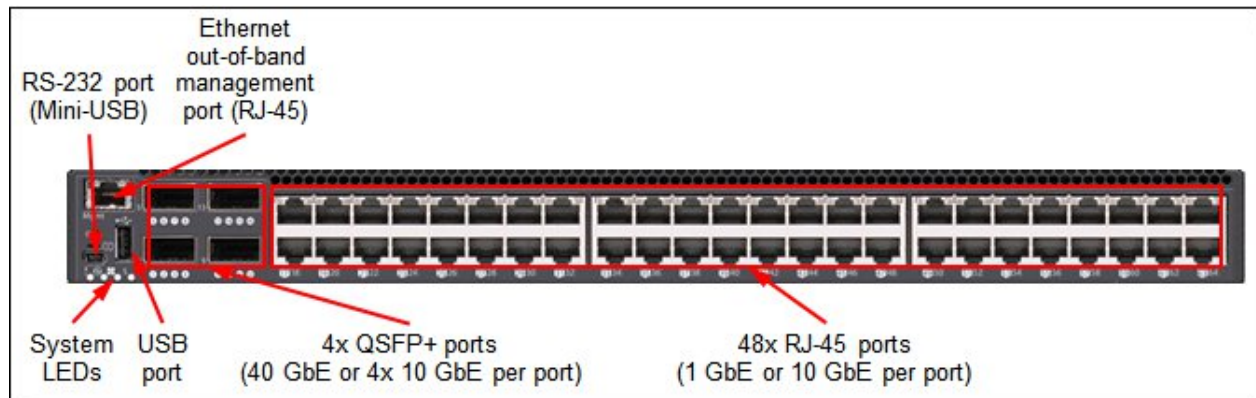


Figure 2. Front panel of the RackSwitch G8264T

The front panel of the G8264T contains the following components:

- LEDs that display the status of the switch and the network.
- One Mini-USB RS-232 console port that provides an additional means to configure the switch.
- One USB port for mass storage devices.
- 48x RJ-45 port connectors for 1 Gb or 10 Gb Ethernet connections.
- 4x QSFP+ port connectors to attach QSFP+ transceivers for 40 Gb Ethernet connections or DAC cables for 40 Gb or 4x 10 Gb Ethernet connections.
- An Ethernet link OK LED and an Ethernet Tx/Rx LED for each Ethernet port on the switch.

Figure 3 shows the rear panel of the RackSwitch G8264T.

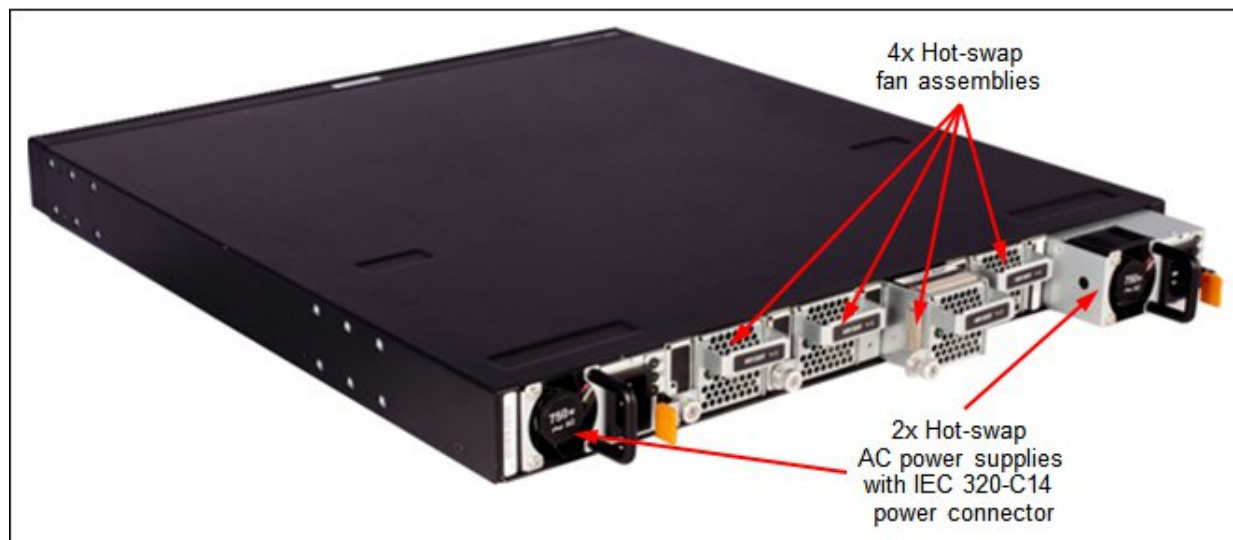


Figure 3. Rear panel of the RackSwitch G8264T

The rear panel of the G8264T contains the following components:

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

Network cabling requirements

The network cables that can be used with the switch are listed in Table 5.

Table 5. G8264T network cabling requirements

Transceiver	Standard	Cable	Connector
40 Gb Ethernet			
40GBASE-SR4 QSFP+ Transceiver (49Y7884)	40GBASE-SR4	10 m or 30 m MTP fiber optics cables supplied by Lenovo (see Table 3); support for up to 100/150 m with OM3/OM4 multimode fiber	MTP
40GBASE-LR4 QSFP+ Transceiver (00D6222)	40GBASE-LR4	1310 nm single-mode fiber cable up to 10 km	LC
Direct attach cable	40GBASE-CR4	QSFP+ to QSFP+ DAC cables up to 7 m (see Table 3)	QSFP+
10 Gb Ethernet			
Fixed 10 GbE ports (operating at 10 Gbps)	10GBASE-T	Up to 100 m with Category 6A UTP cables or up to 55 m with Category 5E or 6 UTP cables	RJ-45
1 Gb Ethernet			
Fixed 10 GbE ports (operating at 1 Gbps)	1000BASE-T	UTP Category 5, 5E, and 6 up to 100 meters	RJ-45
Management ports			
1 GbE management port	1000BASE-T	UTP Category 5, 5E, and 6 up to 100 meters	RJ-45
RS-232 management port	RS-232	DB-9-to-mini-USB or RJ-45-to-mini-USB console cable (comes standard with the switch)	Mini-USB

Warranty

The RackSwitch G8264 comes with a standard 3-year hardware warranty with Next Business Day (NBD), 9x5, Customer Replaceable Unit (CRU) warranty service from Lenovo. Software Upgrade Entitlement is based on the switch's warranty or post warranty extension and service contracts. Optional warranty and maintenance upgrades are available for the G8264 switch through Lenovo Services:

- Warranty service upgrades (3, 4, or 5 years)
 - 24x7 onsite repair with 2-hour target response time
 - 24x7 onsite repair with 4-hour target response time
 - 9x5 onsite repair with 4-hour target response time
- Maintenance (post-warranty) service offerings (1 or 2 years)
 - 24x7 onsite repair with 2-hour target response time
 - 24x7 onsite repair with 4-hour target response time
 - 9x5 onsite repair with 4-hour target response time
 - 9x5 onsite repair with next business day target response time

Lenovo service upgrade offerings are region-specific, that is, each region might have its own service types, service levels, response times, and terms and conditions. Not all covered types of Lenovo service upgrade offerings might be available in a particular region.

For more information about the Lenovo warranty service upgrade offerings that are available in your region, visit the Product Selector at the following website:

<https://www-304.ibm.com/sales/gss/download/spst/servicepac>

Physical specifications

The approximate dimensions and weight of the G8264T switch are as follows:

- Height: 44 mm (1.7 in.)
- Width: 439 mm (17.3 in.)
- Depth: 516 mm (20.3 in.)
- Weight: 11.1 kg (24.5 lb)

Operating environment

The G8264T switch is supported in the following operating environment:

- Temperature: 0 to 40 °C (32 to 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 redundant variable speed fans for reduced power draw
- Electrical input: 50-60 Hz, 100-240 V AC auto-switching
- Typical power: 385 W

Agency approvals

The switch conforms to the following regulations:

- Safety certifications
 - UL-UL60950-1 (First Edition)
 - C-UL to CAN/CSA 22.2 No.60950-1 (First Edition)
 - TUV/GS to EN 60950-1, Amendment A1-A4, A11
 - CB-IEC60950-1, all country deviations
- 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
 - CE
- Environmental
 - Reduction of Hazardous Substances (ROHS) 6

Typical configurations

This section describes the following common configurations for the G8264T:

- Rack-optimized server aggregation for rack servers using 10GBase-T
- IP storage over 10 GbE: Changing the economics of storage

Rack-optimized server aggregation for rack servers using 10GBase-T

The RackSwitch G8264T is an ideal networking device for port aggregation, allowing the consolidation of one to three racks full of System x or ThinkServer servers before connecting to an upstream switch. Servers can use a 10GBase-T adapter installed, such as the Broadcom NetXtreme II Dual Port 10GBase-T Adapter, and then Category 6 or 6A UTP cables can be used to connect upstream to the G8264T. The RackSwitch G8332 would be an attractive offering for 40 GbE upstream aggregation from the G8264T helping clients create a flat two layer networking implementation as shown in Figure 4.

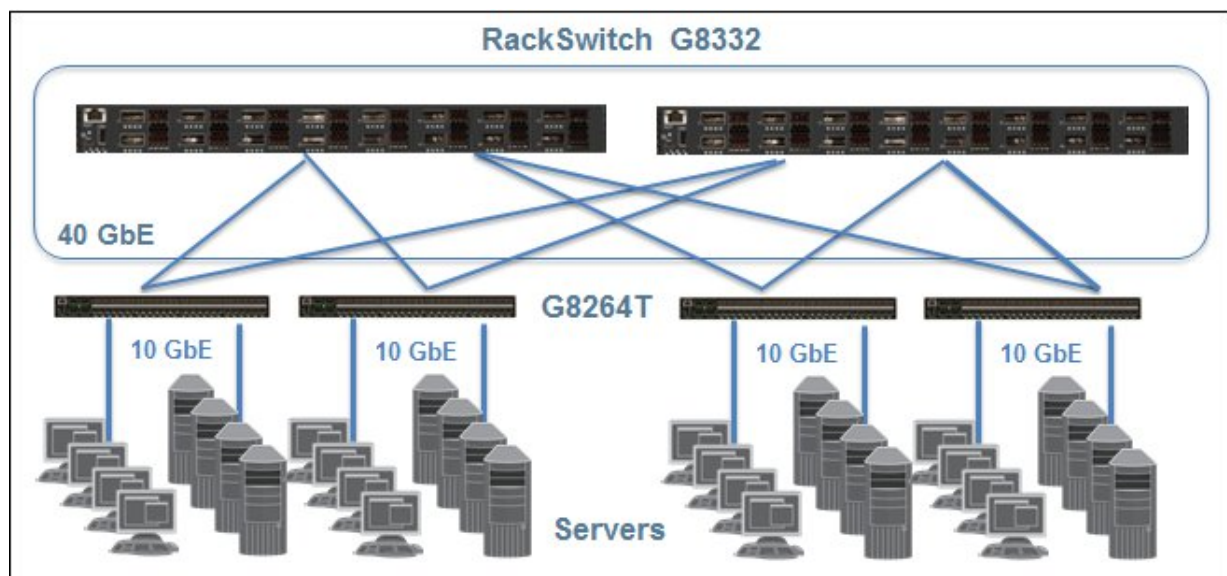


Figure 4. G8332 Aggregation for multiple G8264T switches

For more information, see *Broadcom NetXtreme II Dual Port 10GBase-T Adapter*, TIPS0846, at: <http://www.redbooks.ibm.com/abstracts/tips0846.html?Open>

IP storage over 10 GbE: Changing the economics of storage

G8264T benefits for IP storage applications are as follows:

- Lossless Ethernet Fabric
- Line-rate, high-bandwidth performance
- Low power consumption with fewer components
- Low-cost, pay-as-you-grow 10 Gb/40 Gb storage network

Figure 5 shows IP storage connectivity.

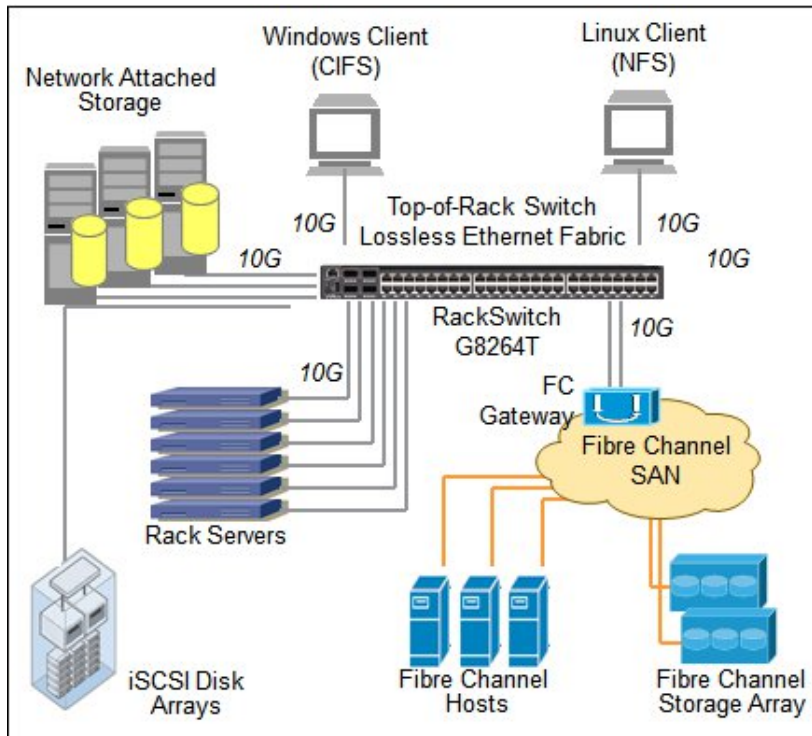


Figure 5. IP storage connectivity

Related publications and links

For more information, see the following references:

- Offering Information page (to search on announcement letters, sales manuals, or both):
http://www.ibm.com/common/ssi/index.wss?request_locale=en
 On this page, enter G8264T RackSwitch, select the information type, and then click **Search**. On the next page, narrow your search results by geography and language.
- RackSwitch G8264T product publications
<http://ibm.com/support/entry/portal/documentation>:
 - Application Guide
 - Industry-Standard CLI Reference
 - Browser-Based Interface (BBI) Quick Guide
 - [Menu-based CLI Command Reference](#)
- VMready
<http://www.ibm.com/systems/networking/software/vmready>

Related product families

Product families related to this document are the following:

- [10 Gb Ethernet Connectivity](#)
- [Top-of-Rack Switches](#)

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