



RackSwitch G8052

Lenovo Press Product Guide

The RackSwitch™ G8052 (Figure 1) is a top-of-rack data center switch that delivers unmatched line-rate Layer 2/3 performance at a very attractive price. It has forty-eight 10/100/1000BASE-T RJ-45 ports and four 10 Gigabit Ethernet SFP+ ports (also supports 1 GbE SFP transceivers), and includes hot-swap redundant power supplies and fans as standard, minimizing your configuration requirements. Unlike most rack equipment that cools from side to side, the G8052 has rear-to-front or front-to-rear airflow that matches server airflow.



Figure 1. RackSwitch G8052

Did you know?

The RackSwitch G8052 is designed with line-rate throughput and low latency less than 2 microseconds.

The RackSwitch G8052 includes redundant and hot-swappable power supplies and fans.

The RackSwitch G8052 is designed specifically for the data center environment with server-matching airflow, high-availability hardware and software features, rich Layer 2/3 functionality, and ease of management.

The RackSwitch G8052 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.

The RackSwitch G8052 is also Cloud ready with its VMready® switch-resident software that helps reduce the complexity of configuring and managing virtual machines throughout the network, making it VM-aware.

Networking Operating System software features deliver seamless, standards-based integration into existing upstream switches.

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-HC1 | Feature code for MTM 7309-HC2 |
|---|-------------|-------------------------------|-------------------------------|
| Switch | | | |
| RackSwitch G8052 (Front to Rear) | 730952F | None | A1AB |
| RackSwitch G8052 (Rear to Front) | 7309G52 | A1AA | 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 442 mm RackSwitch | 00D6061 | A3KR | None |
| Hot-Swappable, Front-to-Rear Power Supply Spare | 49Y7937 | None | A2MJ |
| Hot-Swappable, Rear-to-Front Power Supply Spare | 49Y7938 | A2MH | 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 G8052 switches include the following items:

- One RackSwitch G8052 with two power supplies and three fan assemblies (rear-to-front airflow or front-to-rear airflow)
- Generic Rack Mount Kit (2-post)
- Console Cable Kit that includes:
 - o RJ-45 (plug) to RJ-45 (plug) serial cable (1 m)
 - o Mini-USB to RJ-45 (jack) adapter cable (0.2 m) with retention clip
 - o 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 G8052 switch supports up to two load-sharing, 450 W AC hot-swap redundant power supplies (two power supplies come standard with the switch) and up to four hot-swap fan assemblies (three fan assemblies come standard with the switch, and they provide N+1 cooling redundancy; if N+2 cooling redundancy is required, an additional fan assembly can be ordered separately). 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 G8052 switch also 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 G8052 switch supports optional adjustable 19-inch, 4-post rack installation kit, part number 00D6185. Optionally, Air Inlet Duct, part number 00D6061, can be ordered for the G8052 (rear-to-front airflow) switch for 4-post rack installations.

The G8052 (front-to-rear airflow) switch optionally supports Recessed 19-inch 4-Post Rail Kit (00CG089) and Switch Seal Kit (00Y3001) that are used when the switch is installed in the 1410 Intelligent Cluster Rack, 9363 Enterprise Rack, or PureFlex System Rack with NeXtScale System. The G8052 (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 G8052 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 (Part 1)

| Description | Part number | Feature code for MTM 7309-HC1 and 7309-HC2 |
|---|-------------|--|
| 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 |

Table 2. Power cables (Part 2)

| Description | Part number | Feature code for MTM 7309-HC1 and 7309-HC2 |
|--|-------------|--|
| Country-specific power 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 G8052 switch, clients can take advantage of the technologies that they require for multiple environments:

- For 1 GbE links, clients can use RJ-45 UTP cables up to 100 m. Clients that need longer distances can leverage the SFP/SFP+ ports by using a 1000BASE-SX transceiver, which can drive distances up to 220 meters by using 62.5 μ multi-mode fiber and up to 550 meters with 50 μ multi-mode fiber or the 1000BASE-LX transceivers that support distances up to 10 kilometers using single-mode fiber (1310 nm).
- For 10 GbE (supported on SFP+ ports), clients can use direct-attached copper (DAC) SFP+ cables for in-rack cabling for distances up to 7 m. These DAC 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 with LC connectors. The 10GBASE-LR transceivers can support distances up to 10 kilometers on single mode fiber with LC connectors. For extended distances, the 10GBASE-ER transceivers can support distances up to 40 kilometers on single mode fiber with LC connectors.

Table 3 lists the supported cables and transceivers.

Table 3. Supported SFP/SFP+ transceivers and DAC cables

| Description | Part number | Feature code (MTM 7309-HC1 / 7309-HC2) | Maximum quantity supported |
|--|-------------|--|----------------------------|
| SFP transceivers - 1 GbE | | | |
| Lenovo 1000BASE-T SFP Transceiver (does not support 10/100 Mbps) | 00FE333 | A5DL | 4 |
| Lenovo 1000BASE-SX SFP Transceiver | 81Y1622 | 3269 | 4 |
| Lenovo 1000BASE-LX SFP Transceiver | 90Y9424 | A1PN | 4 |
| SFP+ transceivers - 10 GbE | | | |
| Lenovo 10GBASE-SR SFP+ Transceiver | 46C3447 | 5053 | 4 |
| Lenovo 10GBASE-LR SFP+ Transceiver | 90Y9412 | A1PM | 4 |
| Lenovo 10GBASE-ER SFP+ Transceiver | 90Y9415 | A1PP | 4 |
| Optical cables for 1 GbE SFP SX and 10 GbE SFP+ SR transceivers | | | |
| Lenovo 0.5m LC-LC OM3 MMF Cable | 00MN499 | ASR5 | 4 |
| Lenovo 1m LC-LC OM3 MMF Cable | 00MN502 | ASR6 | 4 |
| Lenovo 3m LC-LC OM3 MMF Cable | 00MN505 | ASR7 | 4 |
| Lenovo 5m LC-LC OM3 MMF Cable | 00MN508 | ASR8 | 4 |
| Lenovo 10m LC-LC OM3 MMF Cable | 00MN511 | ASR9 | 4 |
| Lenovo 15m LC-LC OM3 MMF Cable | 00MN514 | ASRA | 4 |
| Lenovo 25m LC-LC OM3 MMF Cable | 00MN517 | ASRB | 4 |
| Lenovo 30m LC-LC OM3 MMF Cable | 00MN520 | ASRC | 4 |
| SFP+ passive direct-attach cables - 10 GbE | | | |
| Lenovo 0.5m Passive SFP+ DAC Cable | 00D6288 | A3RG | 4 |
| Lenovo 1m Passive SFP+ DAC Cable | 90Y9427 | A1PH | 4 |
| Lenovo 1.5m Passive SFP+ DAC Cable | 00AY764 | A51N | 4 |
| Lenovo 2m Passive SFP+ DAC Cable | 00AY765 | A51P | 4 |
| Lenovo 3m Passive SFP+ DAC Cable | 90Y9430 | A1PJ | 4 |
| Lenovo 5m Passive SFP+ DAC Cable | 90Y9433 | A1PK | 4 |
| Lenovo 7m Passive SFP+ DAC Cable | 00D6151 | A3RH | 4 |
| SFP+ active direct-attach cables - 10 GbE | | | |
| Lenovo 1m Active SFP+ DAC Cable | 95Y0323 | A25A | 4 |
| Lenovo 3m Active SFP+ DAC Cable | 95Y0326 | A25B | 4 |
| Lenovo 5m Active SFP+ DAC Cable | 95Y0329 | A25C | 4 |
| Lenovo 1m Active DAC SFP+ Cable (replaces 95Y0323) | 00VX111 | AT2R | 4 |
| Lenovo 3m Active DAC SFP+ Cable (replaces 95Y0326) | 00VX114 | AT2S | 4 |
| Lenovo 5m Active DAC SFP+ Cable (replaces 95Y0329) | 00VX117 | AT2T | 4 |

Benefits

The RackSwitch G8052 switch is considered particularly suited for these clients:

- Clients who want to leverage GbE in their infrastructure (both servers and networking)
- Clients who are implementing a virtualized environment and require multiple GbE ports
- Clients who require investment protection for 10 GbE ports
- Clients who want to reduce TCO and improve performance while maintaining high levels of availability and security
- Clients who want to avoid or minimize oversubscription, which can result in congestion and loss of performance
- Clients who want to implement a converged infrastructure with NAS or iSCSI

The switch offers the following key benefits:

- **High performance:** The RackSwitch G8052 provides up to 176 Gbps throughput and supports four SFP+ 10 G uplink ports for a very low oversubscription ratio, in addition to a low latency of 1.8 microseconds.
- **Lower power and better cooling:** The RackSwitch G8052 typically consumes just 130 W of power, a fraction of the power consumption of most competitive offerings. Unlike side-cooled switches, which can cause heat recirculation and reliability concerns, the G8052's rear-to-front or front-to-rear cooling design reduces data center air conditioning costs by matching airflow to the server's configuration in the rack. Variable speed fans assist in automatically reducing power consumption.
- **VM-Aware network virtualization:** VMready software on the switch simplifies configuration and improves security in virtualized environments. VMready automatically detects VM movement between physical servers and instantly reconfigures each VM's network policies across VLANs to keep the network up and running without interrupting traffic or impacting performance. VMready works with all leading hypervisors, such as VMware, Citrix Xen, Red Hat KVM, Microsoft Hyper V, and IBM PowerVM hypervisor
- **Layer 3 functionality:** The RackSwitch G8052 includes Layer 3 functionality, which provides security and performance benefits plus the full range of Layer 3 static and dynamic routing protocols, including Open Shortest Path First (OSPF) and Border Gateway Protocol (BGP) for enterprise customers at no additional cost.
- **Fault tolerance:** These switches learn alternate routes automatically and perform 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, HotLink, IGMP V3 snooping, and OSPF.
- **OpenFlow enabled:** The RackSwitch G8052 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. The G8052 can also be used with any industry compliant OpenFlow controller.
- **Seamless interoperability:** RackSwitch switches interoperate seamlessly with other vendors' upstream switches.

Features and specifications

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

The G8052 switch has the following features and specifications:

- Form factor: 1U rack mount switch
- Ports
 - Forty-eight auto-sensing 10/100/1000 Mb Ethernet ports with RJ-45 connectors
 - Four ports for 1 Gb or 10 Gb Ethernet SFP/SFP+ transceivers (support for 1000BASE-SX, 1000BASE-LX, 1000BASE-T, 10GBASE-SR, 10GBASE-LR, or 10GBASE-ER) or SFP+ direct-attach copper (DAC) cables. SFP+ modules or DAC cables are not included and must be purchased separately.
 - One RS-232 serial port (Mini-USB connector) that provides an additional means to configure the switch module
 - One USB port for mass storage devices
- Scalability and performance
 - 1 Gb and 10 Gb Ethernet ports for bandwidth optimization and performance
 - Non-blocking architecture with wire-speed forwarding of traffic; up to 176 Gbps of full duplex switching throughput
 - Up to 132 Million packets per second (Mpps) with switching latency of 1.8 microseconds
 - Media access control (MAC) address learning: Automatic update, support of up to 32,000 MAC addresses
 - Static and LACP (IEEE 802.3ad) link aggregation
 - Support for jumbo frames (up to 12,288 bytes)
 - Broadcast/multicast storm control
 - IGMP snooping for 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 for rapid STP convergence
- Availability and 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 single switch
 - IEEE 802.1w Rapid STP (RSTP) (provides rapid STP convergence for critical delay-sensitive traffic such as voice or video)
 - Per-VLAN Rapid STP (PVRST) enhancements
 - 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
 - Port-based and protocol-based VLANs
 - Up to 4094 VLANs supported per switch (2048 active VLANs), with VLAN numbers 1 - 4094
 - 802.1Q VLAN tagging support on all ports
 - Ingress VLAN tagging support to tunnel packets through a public domain without altering the original 802.1Q tagging information
 - 802.1x with dynamic guest VLAN assignment
 - Private VLANs support as defined in RFC 5517
- OpenFlow 1.0 and 1.3.1 support
- Virtualization
 - Virtual Link Aggregation support
 - Supports 802.1Qbg Edge Virtual Bridging (EVB) which 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
- 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 priority queues per port for processing qualified traffic
 - Weighted random early detection with explicit congestion notification (WRED/ECN)
 - Control plane protection (CoPP)
 - IPv4/IPv6 ACL metering

- IP v4 Layer 3 functions
 - Host management
 - IP forwarding
 - IP filtering with ACLs, up to 640 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)
- IP v6 Layer 3 functions
 - IPv6 host management
 - IPv6 forwarding
 - Up to 128 static routes
 - Support for OSPF v3 routing protocol
 - IPv6 filtering with ACLs, up to 128 IPv6 ACLs supported
- 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
 - Service Location Protocol (SLP)
 - Link Layer Discovery Protocol (LLDP) for discovering network devices
 - Serial interface for CLI
 - Scriptable CLI
 - Dual software images
 - Firmware image update via TFTP, FTP, and Secure FTP (sFTP)
 - Network Time Protocol (NTP) for switch clock synchronization
 - Netconf (XML)
 - Switch Center management application

- Monitoring
 - Switch LEDs for port status and switch module status indication
 - Remote Monitoring (RMON) agent to collect statistics and proactively monitor switch performance
 - Port mirroring for analyzing network traffic passing through the switch
 - Change tracking and remote logging with the 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)
- Virtual Router Redundancy Protocol (VRRP)
- Protocol Independent Multicast (PIM)
- sFLOW

Standards supported

The G8052 switch supports the following IEEE standards:

- IEEE 802.1D Spanning Tree Protocol (STP)
- IEEE 802.1s Multiple STP (MSTP)
- IEEE 802.1w Rapid STP (RSTP)
- IEEE 802.1p Class of Service (CoS) prioritization
- IEEE 802.1Q Tagged VLAN (frame tagging on all ports when VLANs are enabled)
- IEEE 802.1x port-based authentication
- IEEE 802.3 10BASE-T Ethernet
- IEEE 802.3u 100BASE-TX Fast Ethernet
- IEEE 802.3ab 1000BASE-T copper twisted-pair Gigabit Ethernet
- IEEE 802.3z 1000BASE-SX short range fiber optics Gigabit Ethernet
- IEEE 802.3z 1000BASE-LX long range fiber optics Gigabit Ethernet
- IEEE 802.3ad Link Aggregation Control Protocol
- IEEE 802.3x Full-duplex Flow Control
- 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
- 10GSFP+Cu SFP+ Direct Attach copper

Connectors and LEDs

Figure 2 shows the front panel of the RackSwitch G8052.

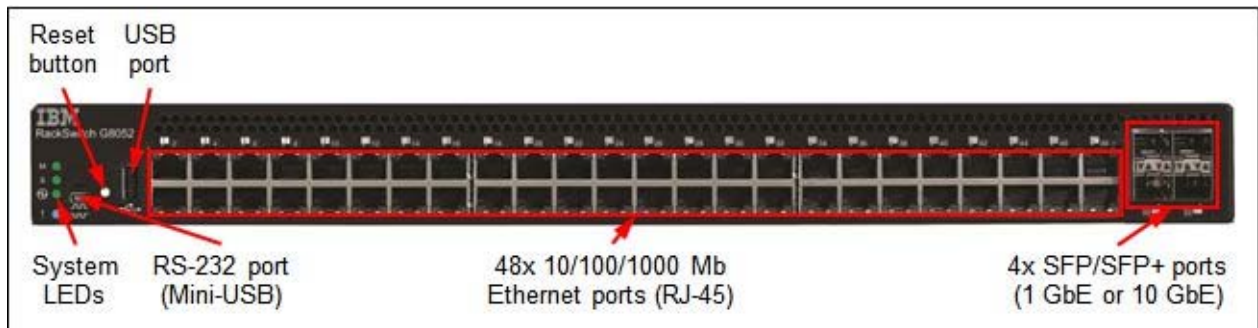


Figure 2. Front panel of the RackSwitch G8052

The front panel of the G8052 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 module.
- One USB port for mass storage devices.
- Forty-eight 1000BASE-T Ethernet ports for 10/100/1000 Mbps connections.
- Four SFP+ port connectors to attach SFP/SFP+ transceivers for 1 Gb or 10 Gb connections or DAC cables.
- 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 G8052.

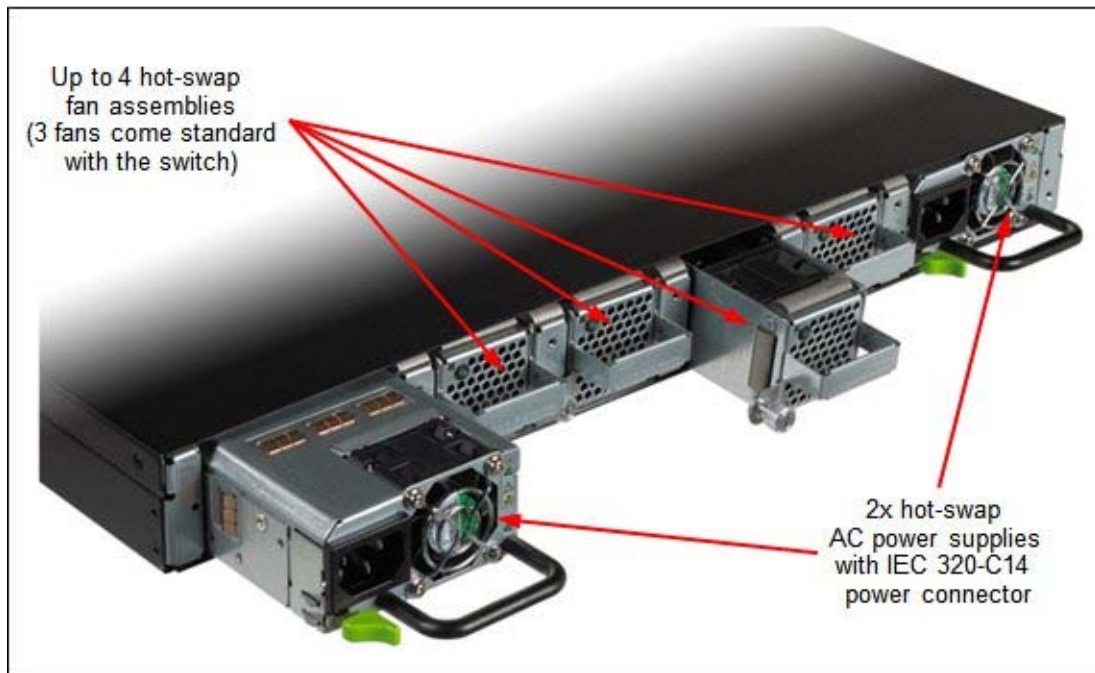


Figure 3. Rear panel of the RackSwitch G8052

The rear panel of the G8052 contains the following components:

- Two redundant hot-swap AC power supplies (IEC 320-C14 power connector)
- Up to four hot-swap fan assemblies (three fans come standard with the switch)

Network cabling requirements

The network cables that can be used with the switch are listed in Table 4.

Table 4. G8052 network cabling requirements

| Transceiver | Standard | Cable | Connector |
|---------------------------------------|-------------|---|-----------|
| 10 Gb Ethernet | | | |
| 10GBASE-SR SFP+ Transceiver (46C3447) | 10GBASE-SR | Up to 30 m with fiber optic cables supplied by Lenovo (see Table 3); 850 nm OM3 multimode fiber cable up to 300 m or up to 400 m with OM4 multimode fiber | LC |
| 10GBASE-LR SFP+ Transceiver (90Y9412) | 10GBASE-LR | 1310 nm single-mode fiber cable up to 10 km | LC |
| 10GBASE-ER SFP+ Transceiver (90Y9415) | 10GBASE-ER | 1310 nm single-mode fiber cable up to 40 km | LC |
| Direct attach cable | 10GSFP+Cu | SFP+ DAC cables up to 7 m (see Table 3) | SFP+ |
| 1 Gb Ethernet | | | |
| RJ-45 ports (fixed) | 1000BASE-T | UTP Category 5, 5E, and 6 up to 100 meters | RJ-45 |
| 1000BASE-T SFP Transceiver (00FE333) | 1000BASE-T | UTP Category 5, 5E, and 6 up to 100 meters | RJ-45 |
| 1000BASE-SX SFP Transceiver (81Y1622) | 1000BASE-SX | Up to 30 m with fiber optic cables supplied by Lenovo (see Table 3); 850 nm multimode fiber cable up to 550 m (50 μ) or up to 220 m (62.5 μ) | LC |
| 1000BASE-LX SFP Transceiver (90Y9424) | 1000BASE-LX | 1310 nm single-mode fiber cable up to 10 km | LC |
| Management ports | | | |
| Ethernet management port | 1000BASE-T | UTP Category 5, 5E, and 6 up to 100 meters | RJ-45 |
| RS-232 serial console 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 G8052 comes with a limited 3-year hardware warranty with Next Business Day (NBD), 9x5, Customer Replaceable Unit (CRU) warranty service and includes a 3-year software license, which provides entitlement to upgrades over that period. The following optional warranty and maintenance upgrades are available for the G8052 through Lenovo service upgrade offerings:

- 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 country-specific; that is, each country 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 country.

For more information about the Lenovo warranty service upgrade offerings that are available in your country, 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 G8052 switch are as follows:

- Height: 44 mm (1.7 in.)
- Width: 440 mm (17.3 in.)
- Depth: 445 mm (17.5 in.)
- Weight: 5.5 kg (12.0 lb)

Operating environment

The G8052 switch is supported in the following operating environment:

- Temperature: 0 to 45 °C (32 to 113 °F).
- Relative humidity: Non-condensing, 10 - 85%
- Altitude: up to 3,049 m (10,000 feet)
- Acoustic noise: Less than 65 dB
- Airflow: Front-to-rear or rear-to-front cooling
- Electrical input: 50-60 Hz, 100-240 V AC auto-switching
- Typical power: 200 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
 - EN 300386
 - CE
- NEBS
 - GR-63-Core: NEBS, Physical Protection
 - GR-1089-Core: EMC and Electrical Safety for Network Telecommunications Equipment
 - Non PoE models: 24 port and 48 port
- Environmental
 - Reduction of Hazardous Substances (ROHS) 6

Typical configurations

In this section, we discuss popular configurations.

Rack-optimized server aggregation of 1 GbE attached rack servers

Examples of possible high-concentration configurations for rack or blade server implementations are as follows:

- System x® or ThinkServer® 1U or 2U servers with a 1 GbE adapter installed
- System x 4U servers with multiple 1 GbE adapters per server
- Blade servers (BladeCenter® or Flex System®) using any of the following modules in the chassis:
 - BladeCenter Layer 2/3 Copper and Fiber Gigabit Ethernet Switch Modules
 - BladeCenter 1/10Gb Uplink Ethernet Switch Module
 - Intelligent Copper Pass-Thru Module for BladeCenter
 - Server Connectivity Module for BladeCenter
 - Flex System using EN2092 Ethernet modules in the chassis
 - Low-profile, high-performance, 48-port GbE switch needed to perform aggregation function per rack

Table 5 lists the features and benefits of the G8052 for server aggregation.

Table 5. Features and benefits of the G8052 for server aggregation

| Features | Benefits |
|---|---|
| Line-rate, non-blocking, all 48-ports | Supports massive compute and virtualization workloads |
| 1.8 microseconds latency | Faster application response times |
| Four 10 GbE uplink ports (40 Gb bandwidth to the core or upstream switch) | Minimal oversubscription 1:08 (~1 to 1) |
| Standards-based Layer 2/3 protocols, industry standard CLI | Interoperate with existing network, no learning curve |

Figure 4 shows rack-optimized server aggregation 1 GbE attached rack servers.

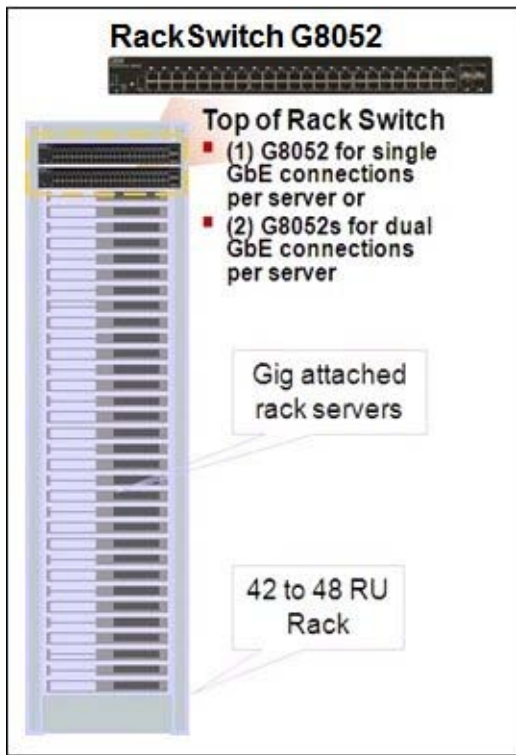


Figure 4. Rack-optimized server aggregation 1GbE attached rack servers

A design goal is to interoperate with the existing Layer 2/3 Switch and deploy RackSwitch G8052s at the Data Center Edge:

- Logical configuration: Configure RackSwitch G8052s for Layer 2. Apply VLAN domains (1 and 2) at core switches.
- Full Layer 2/3 Feature Set: STP, MSTP, RSTP, PVRST+; RIP v1/2, static routes, OSPF.
- Security: 802.1X; RADIUS/TACACS+; Wire Speed ACLs, SSH v1, v2; HTTPS Secure BBI.
- QoS: Up to eight queues/port, IEEE 802.1p and DiffServ prioritization.

Figure 5 shows an example of a rack-optimized server aggregation logical design.

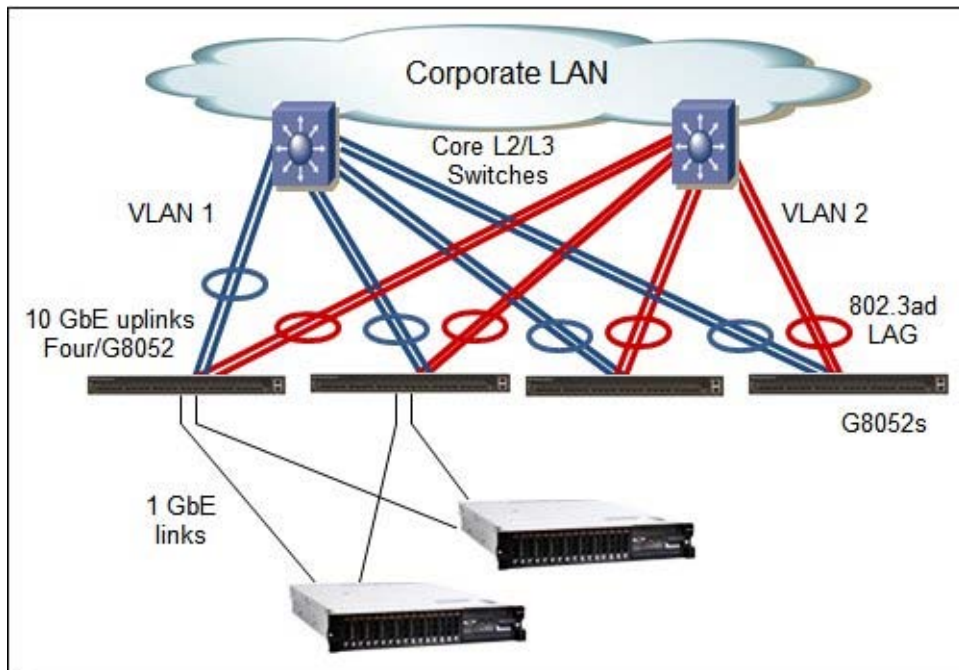


Figure 5. Rack-optimized server aggregation logical design

Server 1 GbE aggregation and connection to storage

Here are the features of the server 1 GbE aggregation and connection to storage:

- A good price/performance point for a data center environment with 1 Gigabit performance and investment protection for 10 GbE
- Good for connectivity to network attached storage (NAS):
 - o LenovoEMC px4-300r
 - o LenovoEMC px4-400r
 - o LenovoEMC px12-400r
 - o LenovoEMC px12-450r
- Ideal for connectivity to iSCSI:
 - o Storwize V3700
 - o Storwize V5000
 - o Storwize V7000

Figure 6 shows NAS and iSCSI storage connectivity.

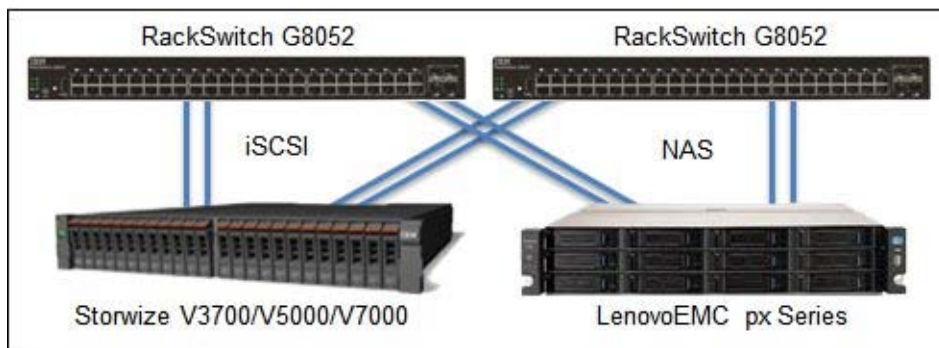


Figure 6. NAS and iSCSI storage connectivity

Related publications and links

For more information, visit <http://www-947.ibm.com/support/entry/portal/Documentation> to see the following RackSwitch G8052 product resources:

- *RackSwitch G8052 Installation Guide*
- *RackSwitch G8052 isCLI Command Reference*
- *RackSwitch G8052 Application Guide*
- *RackSwitch G8052 Browser-Based Interface Quick Guide*
- *RackSwitch G8052 Menu-Based Command Reference*

For more information, refer to the following resources:

- US Announcement Letter, RackSwitch G8052 and G8264 for System x and iDataPlex:
<http://ibm.biz/BdxHAI>

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