Lenovo RackSwitch G8052
Product Guide

The Lenovo RackSwitch™ G8052 (as shown in Figure 1) is a top-of-rack data center switch that delivers unmatched line-rate Layer 2/3 performance at an attractive price. It features 48 10/100/1000BASE-T RJ-45 ports and four 10 Gigabit Ethernet SFP+ ports (it also supports 1 GbE SFP transceivers), and includes hot-swap redundant power supplies and fans as standard, which minimizes 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. Lenovo 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 it is 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.

The RackSwitch G8052 supports stacking for up to eight switches by using a single switch image and configuration file that shares one IP address and one management interface for simplified management.

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

Part number information

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

Table 1. Part numbers and feature codes for ordering

Description	Part number	Feature code for MTM 7159-HC1	Feature code for MTM 7159-HC2
Switch			
Lenovo RackSwitch G8052 (Front to Rear)	715952F	None	ASY1
Lenovo RackSwitch G8052 (Rear to Front)	7159G52	ASY2	None
Miscellaneous options			
Console Cable Kit Spare (RJ45/DB9)	90Y9462	A2MG	A2MG
Lenovo RackSwitch Adjustable 19" 4 Post Rail Kit	00D6185	A3KP	A3KP
Lenovo RackSwitch Recessed 19" 4 Post Rail Kit	00CG089	None	A51M
Switch Seal Kit	00Y3001	None	A4WX
Lenovo RackSwitch Mounting Kit for iDataPlex	90Y3535	None	A1SZ
Air Inlet Duct for 442 mm RackSwitch	00D6061	A3KR	None
Lenovo RackSwitch Hot-Swap, Front-to-Rear 450W Power Supply	49Y7937	None	A2MJ
Lenovo RackSwitch Hot-Swap, Rear-to-Front 450W Power Supply	49Y7938	A2MH	None
Lenovo RackSwitch Hot-Swap, Front-to-Rear Fan Assembly	00D6073	None	A54J
Lenovo RackSwitch Hot-Swap, Rear-to-Front Fan Assembly	00D6071	A54K	None

The part number for the G8052 switch includes the following items:
- One Lenovo 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:
  - 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 (for more information, see Table 2).

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, which provide N+1 cooling redundancy; if N+2 cooling redundancy is required, another fan assembly can be ordered separately). Spare power supplies and fan assemblies can be ordered, if required. Each Power Supply option contains one hot-swap power supply (rear-to-front or front-to-rear) and each Fan Assembly 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 includes 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

Optionally, the G8052 switch supports the adjustable 19-inch, 4-post rack installation kit (part number 00D6185). In addition, the Air Inlet Duct (part number 00D6061) can be ordered with the adjustable 4-post rack kit (part number 00D6185) for the G8052 (rear-to-front airflow) switch, if required.

The G8052 (front-to-rear airflow) switch optionally supports the Recessed 19-inch 4-Post Rail Kit (part number 00CG089) and the Switch Seal Kit (part number 00Y3001) that are required when the switch is installed in the Intelligent Cluster Rack (MT 1410), Enterprise Rack (MT 9363), or PureFlex System Rack (MT 9363) as a part of a NeXtScale™ System solution. The seal kit includes enough switch seals for six switches.

The G8052 (front-to-rear airflow) switch also supports the 4-post mounting kit for iDataPlex® (part number 90Y3535), which is required when the switch is installed in the iDataPlex Rack.

The G8052 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 Table 2.

Table 2. Power cables

Description	Part number	Feature code for MTMs 7159-HC1 and 7159-HC2
Rack power cables		
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	6201
1.8m, 10A/100-250V, 2xC13PM to IEC 320-C14 Rack Power Cable	None*	6568
2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	None*	6311
2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable	39Y7938	6204
4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7932	6263

Country-specific 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

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

Supported cables and transceivers

With the flexibility of the G8052 switch, clients can use the technologies that they require for the following environments:

- For 1 GbE links, clients can use RJ-45 UTP cables up to 100 meters. Clients that need longer distances can use 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 by 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 meters. These DAC cables have SFP+ connectors on each end and 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.

The supported cables and transceivers are listed in Table 3.

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

Description	Part number	Feature code (MTM 7159-HC1 / 7159-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 the following clients:
- Clients who want to use GbE in their infrastructure (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 total cost of ownership (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 wanting to simplify management by stacking up to eight switches and managing them as a single entity
- 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 low oversubscription ratio and a low latency of 1.8 microseconds.

- Lower power and better cooling
  The RackSwitch G8052 typically uses only 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 usage.

- 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 affecting performance. VMready works with all leading hypervisors, such as VMware, Citrix Xen, Red Hat KVM, and Microsoft Hyper V.

- Layer 3 functionality
  The RackSwitch G8052 includes Layer 3 functionality, which provides security and performance benefits and 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 extra cost.

- Stacking support
  Supports up to eight switches that use a single switch image and configuration file that shares one IP address and one management interface for simplified management.

- Fault tolerance
  These 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, Hot Links, 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: The features and specifications that are listed in this section are based on Networking OS 8.3.

The G8052 switch has the following features and specifications:
- Form factor: 1U rack mount switch:
  - RackSwitch G8052 Rear-to-Front version for ports in the rear of the rack matching Lenovo

System x®, ThinkServer®, BladeCenter®, and Flex System™ designs
- RackSwitch G8052 Front-to-Rear version for ports in the front of the rack matching airflow of iDataPlex and NeXtScale System designs

- Ports:
  - A total of 48 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 (for more information, see Table 3).
  - One RS-232 serial port (Mini-USB connector) that provides another 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 or 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 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 1,024 virtual entities (VEs)
  - Automatic VE discovery
  - Up to 1,024 local or distributed VM groups for VEs
  - NMotion® feature for automatic network configuration migration

- Stacking: Up to eight switches in a stack; single IP management

- Security:
  - VLAN-, MAC-, 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

- Stacking

- 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

The following features are not supported with Stacking (for a full list of features, see the Networking OS Application Guide):
- IGMP Relay

- IPv6

- Policy-based routing

- Routing protocols (RIP, OSPF, BGP)

- sFLOW

- Virtual Router Redundancy Protocol (VRRP)

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

The front panel of the RackSwitch G8052 is shown in Figure 2.
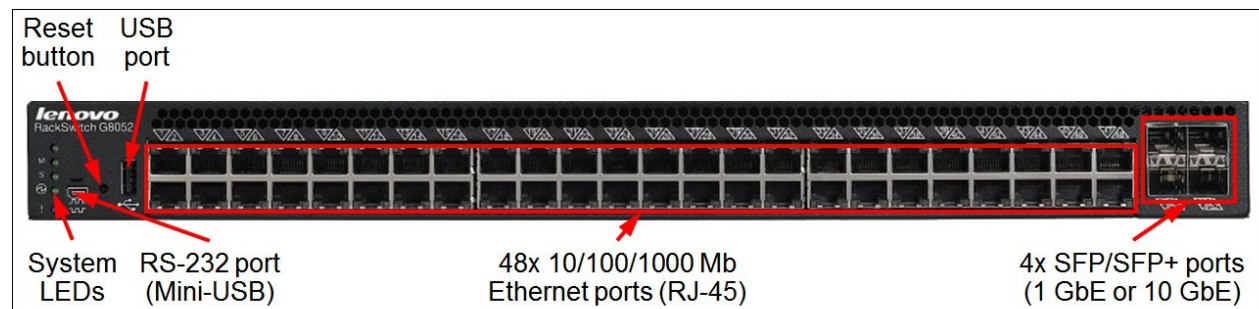

Figure 2. Front panel of the RackSwitch G8052

The front panel of the G8052 features 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 module.
- One USB port for mass storage devices.
- A total of 48 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.

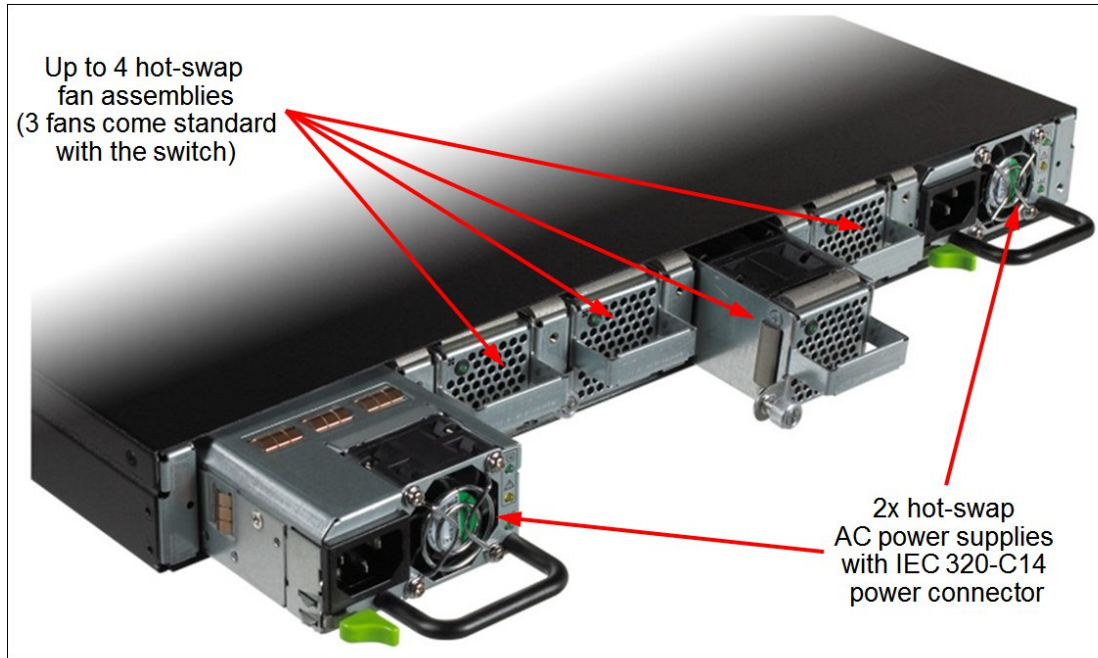The rear panel of the RackSwitch G8052 is shown in Figure 3.

Figure 3. Rear panel of the RackSwitch G8052

The rear panel of the G8052 features 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 and provide N+1 redundancy)

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 (for more information, see Table 3); 850 nm OM3 multimode fiber cable (50 μ or 62.5 μ) 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 (for more information, 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 (for more information, see Table 3); 850 nm multimode fiber cable (50 μ or 62.5 μ) up to 550 m	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-RJ-45 (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. Optional warranty and maintenance upgrades are available for the G8052 through the following 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 service upgrade offerings that are available in your country, see the ServicePac Product Selector that is available at this website:
https://www-304.ibm.com/sales/gss/download/spst/servicepac

Physical specifications

The G8052 switch features the following approximate dimensions and weight:
- 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 - 45 °C (32 - 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: 120 W

Agency approvals

The switch conforms to the following regulations:
- Safety certifications:
  - UL60950-1
  - CAN/CSA 22.2 No.60950-1
  - TUV/GS to EN 60950-1
  - IEC60950-1
  - GB17625.1-2012
  - CNS 14336-1, 2010

- 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

Popular configurations that use the switch are described.

Rack-optimized server aggregation of 1 GbE attached rack servers

Possible high-concentration configurations for rack or blade server implementations include the following examples:
- 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) that uses 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

The features and benefits of the G8052 for server aggregation are listed in Table 5.

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

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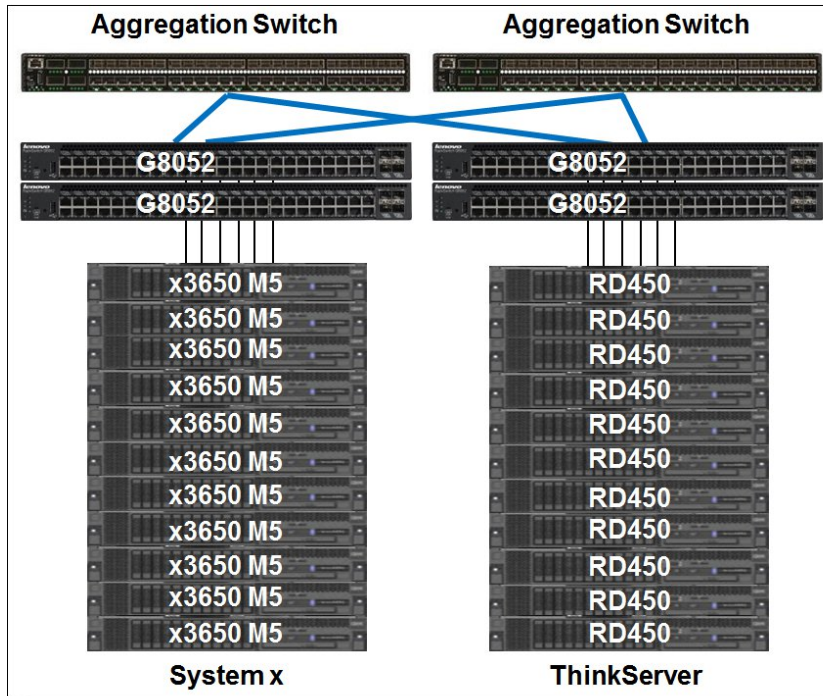
Figure 4. Rack-optimized server aggregation 1 GbE attached rack servers

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

- 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.

An example of a rack-optimized server aggregation logical design is shown in Figure 5.
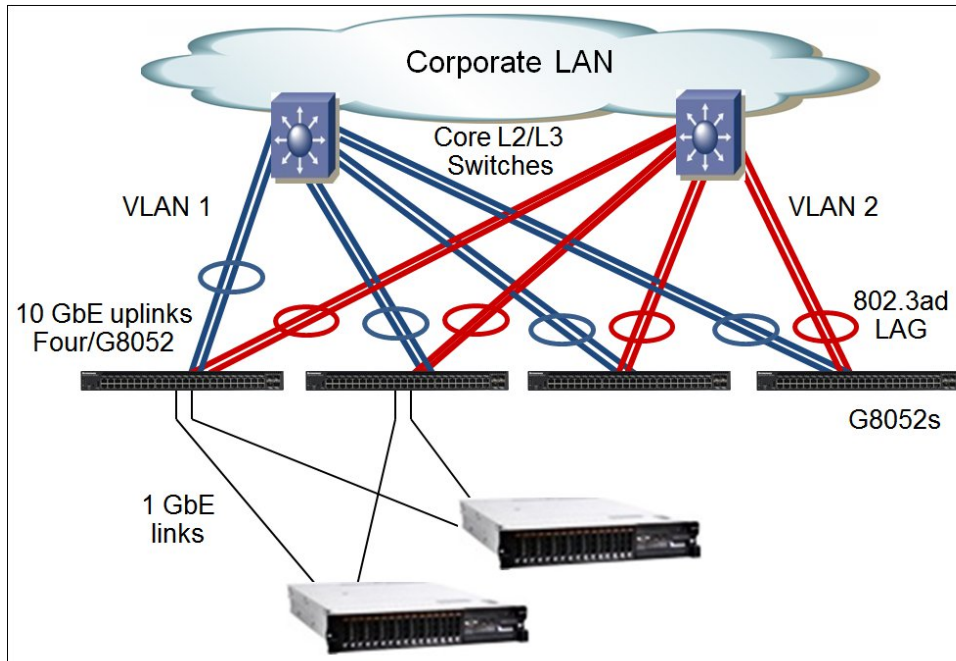
Figure 5. Rack-optimized server aggregation logical design

Server 1 GbE aggregation and connection to storage

The server 1 GbE aggregation and connection to storage includes the following features:
- A good price and 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):
  - Lenovo Storage N3310
  - Lenovo Storage N4610

- Ideal for connectivity to iSCSI:
  - Storwize V3700
  - Storwize V5000
  - Storwize V7000

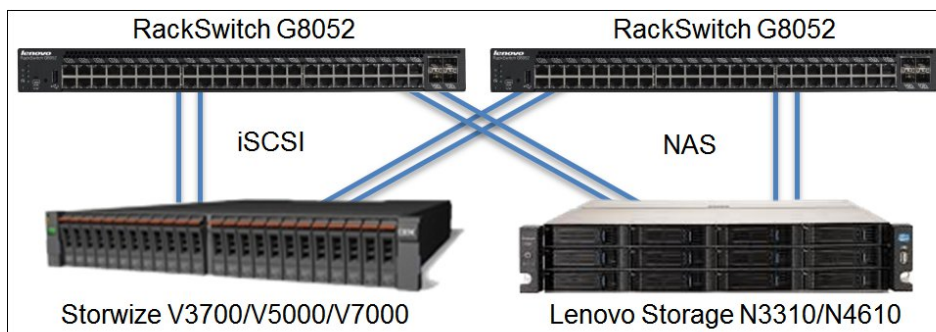NAS and iSCSI storage connectivity is shown in Figure 6.

Figure 6. NAS and iSCSI storage connectivity

Related publications and links

For more information about RackSwitch G8052, see the following publications, which are available at this website:
http://www-947.ibm.com/support/entry/portal/Documentation

- *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, see *US Announcement Letter 115-044*, which is available at this website:
http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS115-044

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
1009 Think Place - Building One
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION ”AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

This document, TIPS1270, was created or updated on May 19, 2015.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
  http://lenovopress.com/TIPS1270
- Send your comments in an e-mail to:
  comments@lenovopress.com

This document is available online at http://lenovopress.com/TIPS1270.

Trademarks

Lenovo, the Lenovo logo, and For Those Who Do are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at http://www.lenovo.com/legal/copytrade.html.

The following terms are trademarks of Lenovo in the United States, other countries, or both:
Lenovo®
ThinkServer®
BladeCenter®
iDataPlex®
NeXtScale System®
NMotion®
System x®
VMready®
Flex System™
Intelligent Cluster™
NeXtScale™
RackSwitch™

The following terms are trademarks of other companies:

Microsoft® is a trademark of Microsoft Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.