RG-S6000C-48GT4XS-E

Data Center and Cloud Computing Switch

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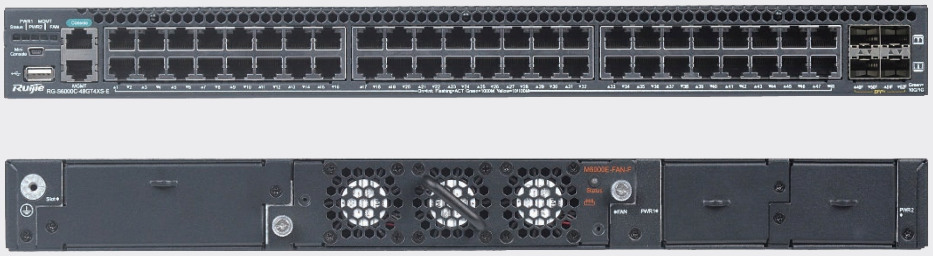
Product Pictures

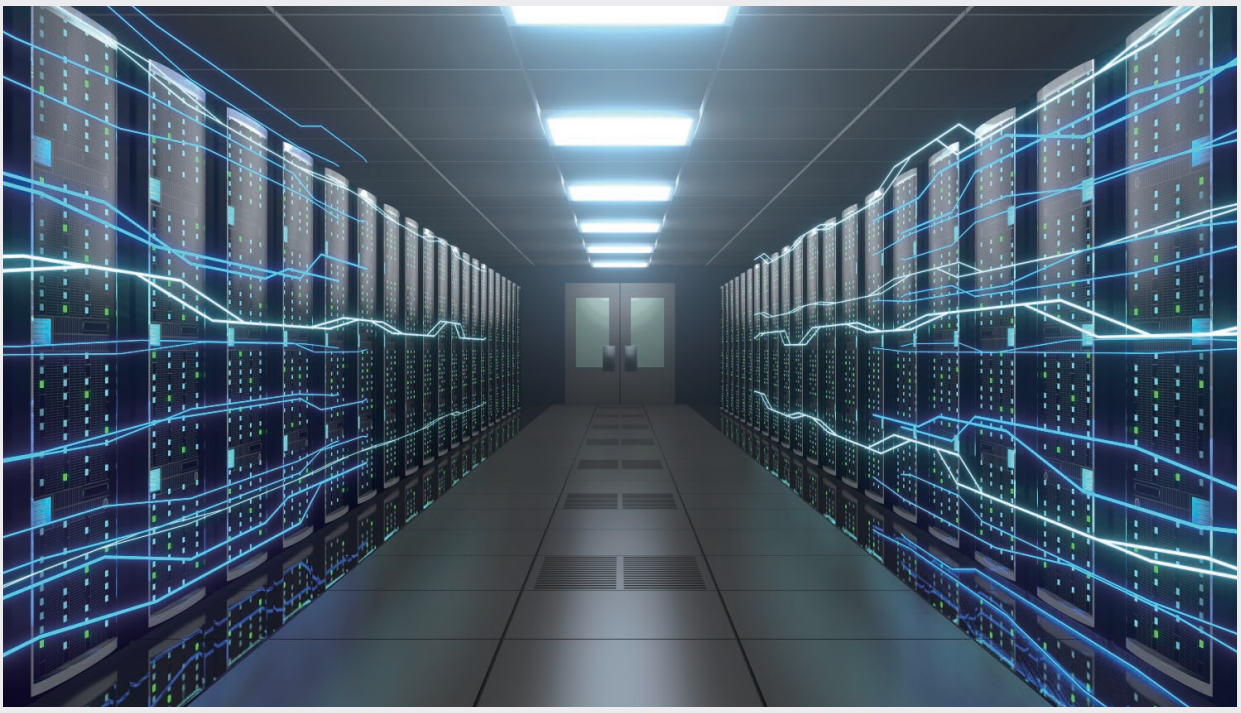


RG-S6000C-48GT4XS-E

Product Overview

The RG-S6000C-48GT4XS-E is launched by Ruijie Networks for next-generation data centers and cloud computing. It provides GE access and flexible and scalable 10GE uplink data exchange.

With the non-blocking, unified, virtualized, transparent, and energy-saving design, the switch addresses issues such as excessive number of devices, high costs, and traffic bursts confronting conventional data centers, laying a solid foundation for building cloud computing networks. With a new hardware architecture and Ruijie RGOS11.X modular operating system, the switch provides more resource entries, faster hardware processing performance, and better operation experience, allowing for high-density access and high-performance aggregation.



Product Features

Setting Up a Non-Blocking Data Center Network

The RG-S6000C-48GT4XS-E provides 48 x 1GE ports, 4 x 10GE ports, and 1 x expansion module slot. All ports support data forwarding at the line rate to better handle heavy east-west traffic. This makes the RG-S6000C-48GT4XS-E an ideal choice for non-blocking networking of data centers with heavy traffic demands.

Data Center Virtualization

The RG-S6000C-48GT4XS-E adopts the virtual switching unit (VSU) technology to virtualize multiple physical devices into one logical device, which reduces network nodes and enhances network reliability. The switch implements fast switchover within 50 ms to 200 ms upon a link failure, thereby ensuring uninterrupted transmission of critical service traffic. M-LAG enables the RG-S6000C-48GT4XS-E to connect to access servers and switches through dual-active uplinks.

The RG-S6000C-48GT4XS-E supports Virtual Ethernet Port Aggregator (VEPA) defined in IEEE802.1Qbg. It can divert data flows generated by virtual machines (VMs) on a server to a physical network device for hard switching. This implements traffic policing of VMs and enforces access control policies uniformly. Compared with soft switching, hard switching does not occupy server resources. All these make the next-generation data center network solution better adapt to the virtual computing environment.

The RG-S6000C-48GT4XS-E supports VM detection and automatic migration of security policies. Security policies can be deployed uniformly for VM traffic in a large-scale server virtualization environment. Moreover, it can be used with the data center network management platform and VM management control platform. In this context, security policies can be migrated accordingly when VMs migrate on the entire network. This prevents network security vulnerabilities in the server virtualization environment and improves network maintenance efficiency.

Carrier-Class High Reliability

The RG-S6000C-48GT4XS-E supports modular power modules in 1+1 redundancy mode. All power modules and line cards can be hot swapped, and support overcurrent protection, overvoltage protection, and over temperature protection, ensuring device-level reliability.

The switch also supports a wide range of link-level reliability technologies including the Rapid Link Detection Protocol (RLDP), Rapid Ethernet Uplink Protection (REUP), and Virtual Router Redundant Protocol (VRRP), Spanning Tree Protocol (STP), Rapid Spanning Tree Protocol (RSTP), and Multiple Spanning Tree Protocol (MSTP). The switch also features Graceful Restart (GR) and Bidirectional Forwarding (BFD). On the network that carries multiple services and heavy traffic, these mechanisms enable fast network convergence and ensure smooth service rollout.

IPv4/IPv6 Dual-Stack Protocols and Multilayer Switching

The hardware of the RG-S6000C-48GT4XS-E supports IPv4 and IPv6 protocol stacks and multilayer line-rate switching, and differentiates and processes IPv4 and IPv6 packets. The switch also supports multiple tunneling technologies such as manually configured tunnels and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels. It is flexibly applicable to IPv6 inter-network communication solutions based on IPv6 network planning and network status quo.

The switch supports abundant IPv4 routing protocols, including static routing, Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Intermediate System to Intermediate System (IS-IS), and Border Gateway Protocol version 4 (BGP4).

The switch also supports various IPv6 routing protocols, including static routing, Routing Information Protocol next generation (RIPng), OSPFv3, IS-IS v6, and BGP4+. You can flexibly select an IPv6 routing protocol to upgrade the live network to an IPv6 network or establish a new IPv6 network.

Flexible and Comprehensive Security Policies

The RG-S6000C-48GT4XS-E switch can effectively defend against virus and hacker attacks through multiple built-in mechanisms, such as DoS attack defense, IP scanning attack defense, ARP packet validity check, and multiple hardware-based ACLs.

The hardware-based IPv6 ACLs can easily control the access of IPv6 users at the network edge even if there are IPv6 users on an IPv4 network. The switch allows IPv4 and IPv6 users to coexist and can control access permissions of IPv6 users, for example, restricting access to sensitive resources on a network.

The switch provides CPU Protection Policy (CPP), an industry-leading hardware-based CPU protection mechanism. CPP enables the switch to classify data traffic sent to the CPU, process the traffic by queue priority, and apply rating limiting on traffic as required. CPP fully protects the CPU from being occupied by unauthorized traffic, malicious attacks, and resource consumption, which ensures the security of the CPU and switch.

The switch and its ports can be flexibly bound to a user's IP address and MAC address, which strictly restricts the access of users connected to the ports or the switch.

DHCP snooping enables the switch to receive DHCP messages only from trusted ports and prevent spoofing from unauthorized DHCP servers. With DHCP snooping, the switch dynamically monitors ARP packets, checks users' IP addresses, and discards unauthorized packets that do not match binding entries, thereby effectively preventing ARP spoofing and source IP address spoofing.

The switch supports Telnet access control based on source IP addresses, which prevents unauthorized users and hackers from attacking and controlling the switch, thus enhancing network management security.

Through the Secure Shell (SSH) and Simple Network Management Protocol version 3 (SNMPv3), the switch can encrypt management information in Telnet and SNMP processes. This ensures information security of management devices and prevents hackers from attacking and controlling the devices.

The switch denies unauthorized network access and enables authorized network access by employing multi-tuple binding, port security, time range-based ACL, and traffic-based rate limiting. The switch can strictly control user access to enterprise networks and campus networks and deny communication requirements of unauthorized users.

Software-Defined Networking

The RG-S6000C-48GT4XS-E supports OpenFlow 1.3, and can work with Ruijie Networks' self-developed SDN controller to easily realize large-scale two-tier data center architecture networking. It also supports smooth upgrade of the entire network to an SDN network, which significantly simplifies network management while substantially reducing maintenance costs.

Energy-Saving Design

The RG-S6000C-48GT4XS-E switch adopts the next-generation hardware architecture, advanced energy-efficient circuit design and components, thereby reducing power consumption and noise. The switch is equipped with variable-speed axial fan modules to intelligently control the fan speed based on the ambient temperature. This ensures stable operation while minimizing power consumption and noise levels.

The switch supports the auto-power-down function. If a port goes Down for a period of time, the system automatically powers the port off and switches it to the energy-saving mode. Energy Efficient Ethernet (EEE) is another highlight of the switch. If a port is idle for a period of time, the system switches the port to the energy-saving mode. When the port needs to receive or send packets, the system resumes services on the port by periodically sending listening streams, realizing energy saving.

Easy Network Maintenance

The RG-S6000C-48GT4XS-E switch supports SNMPv1/v2c/v3, RMON, Syslog, and USB-based log and configuration backup for routine network diagnosis and maintenance. An administrator can utilize diversified management and maintenance methods, including the command line interface (CLI), web-based management, and Telnet to facilitate device management.

Product Specifications

Hardware Specifications

Item	RG-S6000C-48GT4XS-E
Dimensions (W x D x H)	440 mm x 300 mm x 44 mm (17.32 in. x 11.81 in. x 1.73 in.)
Rack height	1 RU
Unit weight	3.6 kg (7.94 lbs., empty chassis) 4.8 kg (10.58 lbs., a chassis with two power modules and one fan module)
Switching capacity	256Gbps
Packet forwarding rate	192 Mpps
Service port	48 x 10/100/1000BASE-T ports 4 x 10G/1G SFP+ ports
Management port	1 x RJ45 console port 1 x RJ45 MGMT port
USB port	1 x USB 2.0 port (Type A connector) 1 x mini-b USB 2.0 serial port
Module slot	2 x power module slots 1 x fan module slot
Power consumption	Maximum power consumption: 60 W Typical power consumption: 50 W Static power consumption: 34.2 W
Power input	RG-PA70I (AC input): Rated input voltage: 100 V AC to 240 V AC, 50 Hz/60 Hz Maximum input voltage: 90 V AC to 264 V AC, 47 Hz to 63 Hz Rated input current: 2 A (100 V AC to 240 V AC) Power port type: C14 RG-PA70I (HVDC input): Rated input voltage: 120 V DC to 340 V DC Maximum input voltage: 110 V DC to 380 V DC Rated input current: 2 A Power port type: C14

Item	RG-S6000C-48GT4XS-E
Temperature	Operating temperature: 0°C to 50°C (32°F to 122°F) Storage temperature: –40°C to +70°C (–40°F to +158°F) Note: At altitudes ranging from 3,000 m (9,842.52 ft.) to 5,000 m (16,404.20 ft.), the maximum temperature decreases by 1°C (1.8°F) for every 200 m (656.17 ft.) increase in elevation.
Humidity	Operating humidity: 10% RH to 90% RH (non-condensing) Storage humidity: 5% RH to 95% RH (non-condensing)
Altitude	Operating altitude: ≤ 3,000 m (9,842.52 ft.) Storage altitude: ≤ 5,000 m (16,404.20 ft.)
Cooling	Air cooling, front-to-rear airflow (port-side intake)

Software Specifications

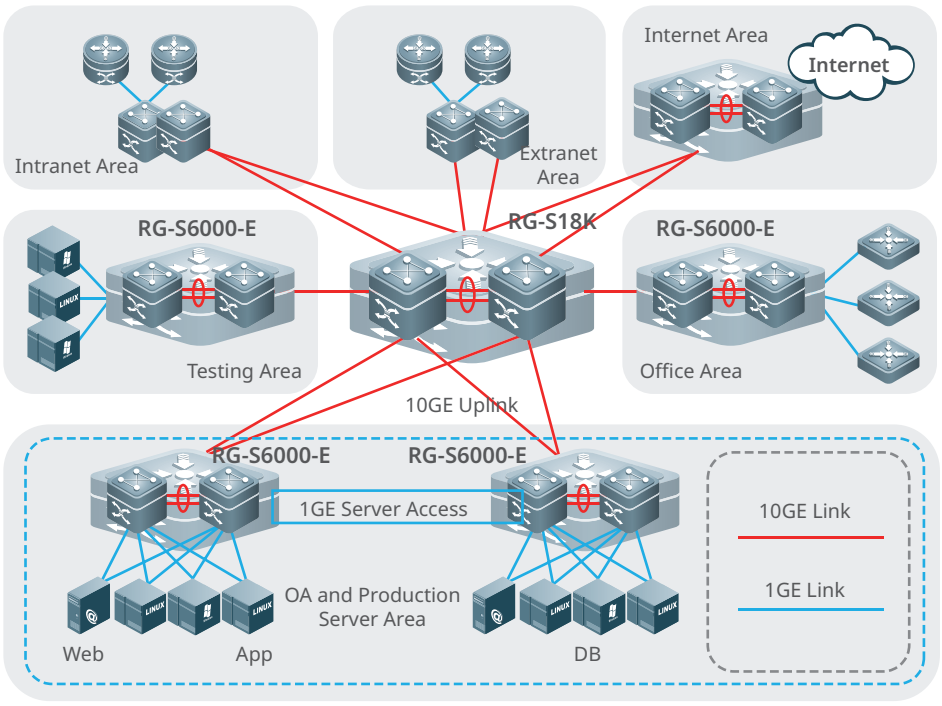
Item	RG-S6000C-48GT4XS-E
VLAN	4K IEEE 802.1Q VLANs Port-based VLAN MAC-based VLAN Protocol-based VLAN Private VLAN Voice VLAN Private VLAN IP subnet-based VLAN GVRP
QinQ	Basic QinQ Selective QinQ N:1 and 1:1 VLAN switching
Link aggregation	LACP (IEEE 802.3ad)
SPAN	N:1 mirroring 1:N mirroring Traffic-based mirroring
Spanning Tree Protocol	STP, RSTP, and MSTP
DHCP	DHCP server DHCP client DHCP snooping DHCP relay IPv6 DHCP snooping IPv6 DHCP client IPv6 DHCP relay
Basic IPv6 protocols	IPv6 addressing, Neighbor Discovery (ND), ND Snooping, ICMPv6, Stateless Auto Configuration, Path MTU Discovery

Item	RG-S6000C-48GT4XS-E
IP routing	Static routing RIP, RIPng OSPF, OSPFv3, IS-IS, IS-IS v6 BGP, BGP4+ Equal-cost multi-path routing (ECMP) Packet-based and traffic-based load balancing Multi-VPN-Instance CE (MCE)
Multicast	IGMPv1/v2/v3 and IGMP proxy IGMPv1/v2/v3 snooping IGMP filtering, IGMP fast leave PIM-DM, PIM-SM, PIM-SSM MLD snooping, MLD PIM for IPv6 MSDP
MPLS	MPLS forwarding、LDP、LSP
IPv6 tunneling	Manually configured tunnel, automatic tunnel, ISATAP, IPv4 over IPv6, GRE tunnel, and other tunneling technologies
ACL	The following flexible and diversified hardware ACLs are available: Standard IP ACL (IP-based hardware ACL) Extended IP ACL (hardware ACL based on the IP address or TCP/UDP port ID) Extended MAC ACL (hardware ACL based on the source MAC address, destination MAC address, and optional Ethernet type) Time-based ACL Expert-level ACL (hardware ACL based on flexible combinations of the VLAN ID, Ethernet type, MAC address, IP address, TCP/UDP port ID, protocol type, and time) ACL80 IPv6 ACL
QoS	Port traffic identification Port traffic rate limiting 802.1p/DSCP/ToS traffic classification Eight priority queues per port SP, WRR, DRR, SP+WFQ, SP+WRR, SP+DRR, and RED/WRED queue scheduling
Security features	3-tuple binding (IP address, MAC address, and port) 3-tuple binding (IPv6 address, MAC address, and port) MAC address filtering Port- and MAC-based 802.1x authentication MAC Bypass Authentication (MAB) Portal authentication and Portal 2.0 authentication ARP check Dynamic ARP inspection (DAI) ARP rate limiting ARP spoofing prevention Broadcast storm suppression Hierarchical management and password protection RADIUS and TACAS+ AAA (IPv4/IPv6) for device login management SSH and SSHv2.0 BPDU Guard IP source guard CPP and NFPP Port protection

Item	RG-S6000C-48GT4XS-E
Management features	SNMPv1/v2c/v3, CLI (Telnet/Console), RMON (1,2,4,9), SSH, Syslog, NTP/SNTP, SNMP over IPv6, IPv6 MIB support for SNMP, SSHv6, Telnet v6, FTP/TFTPv6, DNSv6, NTP for v6, Traceroute v6 sFLOW using the random sampling technology to conduct flow information sampling on the switch traffic
High reliability	VSU GR for RIP, GR for OSPF, GR for BGP, and GR for other routing protocols BFD ERPS (G.8032) REUP RLDP 1+1 power redundancy One modular fan module with front-to-rear airflow 2+1 fan redundancy Hot swapping of power modules
Energy Efficient Ethernet (EEE)	IEEE 802.3az-compliant EEE: When EEE is enabled, power consumption of ports is significantly reduced.

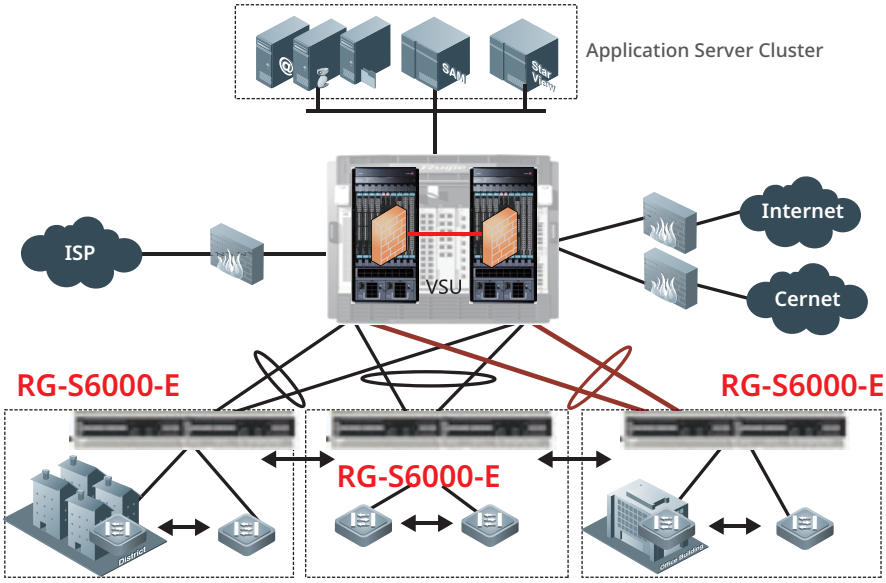
Typical Applications

Large-Scale High-Performance Data Center Solution (1GE Server Access)



Large-Scale High-Performance Data Center Solution

1GE Aggregation Solution for Large-Scale Campus Network



1GE Aggregation Solution for Large-Scale Campus Network

Ordering Information

Chassis and Modules

Model	Description
RG-S6000C-48GT4XS-E	RG-S6000C-48GT4XS-E chassis, 48 x 10/100/1000BASE-T ports, 4 x 1GE/10GE SFP+ ports, 1 x expansion module slot, 2 x power module slots, 1 x fan module slot. The chassis is configured with two RG-PA70I modules and one M6000E-FAN-F module.
RG-PA70I	AC power module
M6000E-FAN-F	Fan module (front-to-rear airflow)

1000M Optical Transceivers

Model	Description
MINI-GBIC-SX-MM850	1G SR optical transceiver, SFP form factor, Duplex LC, 550 m (1,804.46 ft.) over MMF

Model	Description
MINI-GBIC-LX-SM1310	1G LX optical transceiver, SFP form factor, Duplex LC, 10 km (32,808.40 ft.) over SMF
MINI-GBIC-LH40-SM1310	1G LH optical transceiver, SFP form factor, Duplex LC, 40 km (131,233.60 ft.) over SMF
MINI-GBIC-ZX80-SM1550	1G ZX optical transceiver, SFP form factor, Duplex LC, 80 km (262,467.19 ft.) over SMF
GE-SFP-LH40-SM1310-BIDI	1G LH optical transceiver, SFP form factor, BIDI LC, 40 km (131,233.60 ft.) over SMF
GE-SFP-LX20-SM1310-BIDI	1G LX optical transceiver, SFP form factor, BIDI LC, 20 km (65,616.80 ft.) over SMF
GE-SFP-LX20-SM1550-BIDI	1G LX optical transceiver, SFP form factor, BIDI LC, 20 km (65,616.80 ft.) over SMF

1000M Copper Transceivers

Model	Description
Mini-GBIC-GT	1G SFP copper transceiver, SFP form factor, RJ45, 100 m (328.08 ft.) over Cat 5e/6/6a

10G Optical Transceivers

Model	Description
XG-SFP-SR-MM850	10G SR optical transceiver, SFP+ form factor, Duplex LC, 300 m (984.25 ft.) over MMF
XG-SFP-LR-SM1310	10G LR optical transceiver, SFP+ form factor, Duplex LC, 10 km ((32,808.40 ft.) over SMF
XG-SFP-ER-SM1550	10G ER optical transceiver, SFP+ form factor, Duplex LC, 40 km (131,233.60 ft.) over SMF
XG-SFP-ZR-SM1550	10G ZR optical transceiver, SFP+ form factor, Duplex LC, 80 km (262,467.19 ft.) over SMF
XG-SR-MM850	10G SR optical transceiver, SFP+ form factor, Duplex LC, 300 m (984.25 ft.) over MMF
XG-LR-SM1310	10G LR optical transceiver, SFP+ form factor, Duplex LC, 10 km ((32,808.40 ft.) over SMF
XG-SFP-AOC1M	10G SFP+ active optical cable (AOC), 1 m (3.28 ft.)
XG-SFP-AOC3M	10G SFP+ AOC, 3 m (9.84 ft.)
XG-SFP-AOC5M	10G SFP+ AOC, 5 m (16.40 ft.)

Warranty

For more information about warranty terms and period, contact your local sales agency:

- Warranty terms: https://www.ruijie.com/support/servicepolicy
- Warranty period: https://www.ruijie.com/support/servicepolicy/Service-Support-Summany/

Note: The warranty terms are subject to the terms of different countries and distributors.

More Information

For more information about Ruijie Networks, visit the official Ruijie website or contact your local sales agency:

- Ruijie Networks official website: https://www.ruijie.com/
- Online support: https://www.ruijie.com/support
- Hotline support: https://www.ruijie.com/support/hotline
- Email support: service_rj@ruijie.com

Ruijie Networks Co., Ltd.

For more information, visit www.ruijie.com or call 86-400-620-8818.