



RG-S6510-4C

Next-Generation Data Center and Cloud Computing Switch



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Product Pictures



Front View



Isometric View

Product Overview

The RG-S6510-4C switch is a next-generation modular switch launched by Ruijie Networks for cloud data centers. It is highlighted by its high performance and high density.

With a height of 2 RU, the RG-S6510-4C switch supports two types of line cards: M6500-24VS2CQ and M6500-08CQ. The RG-S6510-4C switch provides a maximum of $96 \times 25\text{GE}$ ports, $32 \times 100\text{GE}$ ports, or $64 \times 40\text{GE}$ ports. Each 100GE port is 100GE/40GE adaptive. The switch provides 1+1 power redundancy and 2+1 fan redundancy, and both the power modules and fan modules support hot swapping.



| Product Features

Setting Up a Non-Blocking Data Center Network with a Large Buffer

The whole series of switches designed for next-generation data centers and cloud computing are line-rate products. They are in line with the development trend of bidirectional traffic between the Internet and data centers and apply to heavy-traffic next-generation data centers.

With a height of 2 RU, the RG-S6510-4C switch provides 96 × 25GE ports and 8 × 100GE ports, or 32 × 100GE ports, or 64 × 40GE ports, achieving 1:1 oversubscription in the upstream and downstream directions. All the ports can forward data at the line rate.

To meet the requirements for non-blocking transmission of heavy-traffic data in data centers, the RG-S6510-4C switch offers powerful buffer capacity and uses the advanced buffer scheduling mechanism, to maximize the buffer capacity of the switch.

Data Center Virtualization

The RG-S6510-4C switch adopts the virtual switching unit (VSU) 2.0 technology to virtualize multiple physical devices into one logical device, which reduces network nodes and enhances network reliability. These physical switches can be operated and managed in a unified manner. The switch can implement fast link switching within 50 ms to 200 ms in the case of a link failure, thereby ensuring uninterrupted transmission of critical service traffic. The Multichassis Link Aggregation Group (M-LAG) feature implements dual-active uplinks for data through access servers and switches.

Data Center Overlay Networking

The RG-S6510-4C switch supports VXLAN to meet the data center overlay networking requirements. It resolves the challenges of limited VLAN capacity and scalability issues in conventional data center networks.

The basic network built based on the RG-S6510-4C switch can divide new subnets based on the overlay technology without changing the physical topology or considering the restrictions on IP addresses and broadcast domains of physical networks.

Data Center Layer-2 Network Expansion

The VXLAN technology encapsulates Layer 2 packets into

User Datagram Protocol (UDP) packets, which enables the establishment of a logical Layer 2 network on the Layer 3 network. The RG-S6510-4C switch supports the EVPN protocol to automatically discover and authenticate virtual tunnel endpoints (VTEPs), thereby reducing flooding on the VXLAN data plane and eliminating the dependency of VXLAN on underlying multicast services. This simplifies VXLAN deployment and improves the efficiency for building large Layer 2 networks, meeting the needs of large Layer 2 networks in data centers and Layer 2 interconnection requirements in dual-active data centers.

RDMA-based Lossless Ethernet

The switch implements low-latency forwarding of the lossless Ethernet based on the Remote Direct Memory Access (RDMA) and optimizes service forwarding performance. It significantly reduces the operation cost per bit of the entire network and enhances the competitive edge of products.

Hardware-based Traffic Visualization

The chip hardware enables the switch to visualize the end-to-end traffic of complex networks involving multiple paths and nodes. This enables centralized monitoring of the forwarding path and latency for each session, improving fault location efficiency by over ten times.

Carrier-Class High Reliability

The RG-S6510-4C switch is equipped with built-in redundant power modules and modular fan assemblies. All line cards, power modules, and fan modules can be hot-swapped without affecting service continuity on the switch. The switch provides fault detection and alarm functions for power modules and fan modules. It automatically adjusts the fan speed based on temperature changes, to better adapt to the environment in data centers. The switch also supports device-level and link-level reliability protection as well as overcurrent protection, overvoltage protection, and over temperature protection.

In addition, the switch supports Graceful Restart (GR), Bidirectional Forwarding Detection (BFD), and other mechanisms. When multiple services and heavy traffic are carried over the network, these mechanisms can reduce the impact of exceptions on network services and enhance overall reliability.

IPv4/IPv6 Dual-Stack Protocols and Multilayer Switching

The hardware of the RG-S6510-4C switch supports IPv4 and IPv6 protocol stacks and multilayer line-rate switching. The hardware differentiates and processes IPv4 and IPv6 packets. The switch also integrates multiple tunneling technologies such as manually configured tunnels, automatic tunnels, and Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) tunnels. Users can flexibly work out IPv6 inter-network communication solutions by using this switch based on IPv6 network planning and network conditions.

The RG-S6510-4C switch supports various 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). Users can select required routing protocols based on network environments, to flexibly build networks.

The RG-S6510-4C switch also supports abundant IPv6 routing protocols, including static routing, Routing Information Protocol next generation (RIPng), OSPFv3, 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-S6510-4C 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 ACL can easily control the access of IPv6 users at the network boundary even if there are

IPv6 users on an IPv4 network. The switch supports the coexistence of IPv4 and IPv6 users and can control access permissions of IPv6 users, for example, restricting access to sensitive resources on the network.

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.

All-Round Management Performance

The switch provides various management ports such as the Console port, management port, and USB port, and supports SNMP v1/v2c/v3 as well as universal network management platform and service management software such as BMC. It supports CLI-based management, telnet, and cluster management, which facilitates switch management. The supported encryption modes such as SSH2.0 and SSL enhance management security.

In addition, the switch supports the switched port analyzer (SPAN), remote switched port analyzer (RSPAN), and multiple SPAN monitoring ports, making network traffic monitoring intuitive. The switch provides various network traffic analysis reports to help you promptly optimize the network architecture and schedule resources.

Technical Specifications

Hardware Specifications

Item	RG-S6510-4C
Dimensions (W × D × H)	442 mm x 520 mm x 86 mm (17.40 in. x 20.47 in. x 3.39 in.)
Rack height	2 RU

Item	RG-S6510-4C
Unit weight	14 kg (30.86 lbs., a chassis with two power modules and three fan modules)
Switching capacity	6.4 Tbps
Packet forwarding rate	2030 Mpps
Management port	1 x RJ45 console port 1 x RJ45 MGMT port
USB port	1 x USB 2.0 port (Type A connector)
Module Slot	4 x expansion module slots 2 x power module slots 3 x fan module slots
Power consumption	Maximum power consumption: 600 W Typical power consumption: 455 W Static power consumption: 202 W
Power input	RG-PA800I-F (AC input): Rated input voltage: 100 V AC to 127 V AC, 200 V AC to 240 V AC, 50 Hz/60 Hz Maximum input voltage: 90 V AC to 140 V AC, 180 V AC to 264 V AC, 47 Hz to 63 Hz Rated input current: 10 A to 5 A (100 V AC to 240 V AC) Power port type: C14 RG-PA800I-F (HVDC input): Rated input voltage: 240 V DC Maximum input voltage: 180 V DC to 310 V DC Rated input current: 5 A Power port type: C14 RG-PD800I-F (DC input): Rated input voltage: -48 V DC Maximum input voltage: -36 V DC to -72 V DC Rated input current: 23 A Power port: three-pin power connector
Temperature	Operating temperature: 0°C to 40°C (32°F to 104°F) Storage temperature: -40°C to +70°C (-40°F to +158°F) Note: At altitudes ranging from 2000 m (6561.68 ft.) to 5000 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: ≤ 5,000 m (16,404.20 ft.) Storage altitude: ≤ 5000 m (16,404.20 ft.)
Cooling	Air cooling, front-to-rear airflow (port-side intake)

Software Specifications

Item	RG-S6510-4C
Layer 2 Protocols	IEEE802.3ad (Link Aggregation Control Protocol), IEEE802.1p, IEEE802.1Q, IEEE802.1D (STP), IEEE802.1w (RSTP), IEEE802.1s (MSTP), IGMP Snooping, MLD Snooping, Jumbo Frame (9 KB), IEEE802.1ad (QinQ and selective QinQ), GVRP
Layer 3 Protocols (IPv4)	BGP4, OSPFv2, RIPv1, RIPv2, MBGP, LPM Routing, Policy-based Routing (PBR), Route-policy, Equal-Cost Multi-Path Routing (ECMP), WCMP, VRRP, IGMP v1/v2/v3, PIM-SSM/SM/DM, MSDP, Any-RP
IPv6 Basic Protocols	Neighbor Discovery, ICMPv6, Path MTU Discovery, DNSv6, DHCPv6, ICMPv6, ICMPv6 redirection, ACLv6, TCP/UDP for IPv6, SNMP v6, Ping/Traceroute v6, IPv6 RADIUS, Telnet/SSH v6, FTP/TFTP v6, NTP v6, IPv6 MIB support for SNMP, VRRP for IPv6, IPv6 QoS
IPv6 Features	Static routing, ECMP, PBR, OSPFv3, RIPng, BGP4+, MLDv1/v2, PIM-SMv6, manual tunnel, automatic tunnel, IPv4 over IPv6 tunnel, and ISATAP tunnel
Data Center Features	VXLAN routing and VXLAN bridging EVPN VXLAN IPv6 VXLAN over IPv4 PFC, ECN, and other data center features RDMA M-LAG OpenFlow 1.3
Visualization	gRPC sFLOW sampling INT
QoS	Mapping of IEEE 802.1p, DSCP, and ToS priorities ACL-based traffic classification Priority marking/remarking Multiple queue scheduling mechanisms, including SP, WRR, DRR, SP+WRR, and SP+DRR Congestion avoidance mechanisms such as WRED and tail discarding
Virtualization	Virtual Switching Unit
Buffer Management	Buffer status monitoring and management, and identification of burst traffic
HA Design	GR for RIP/OSPF/BGP, BFD, REUP dual-link fast switching and RLDP unidirectional link detection, 1+1 power redundancy, and fan redundancy, and hot swapping for all line cards and power supply modules
Security Features	Network Foundation Protection Policy (NFPP), CPP, DDoS attack defense, illegitimate data packet detection, data encryption, source IP spoofing prevention, IP scanning prevention, RADIUS/TACACS, IPv4/v6 packet filtering by basic ACL, extended ACL or VLAN-based ACL, plaintext-based and MD5 ciphertext-based authentication for OSPF, RIPv2, and BGPv4 packets, telnet login and password mechanisms for restricted IP addresses, uRPF, broadcast packet suppression, DHCP Snooping, gateway ARP spoofing prevention, and ARP check

Item	RG-S6510-4C
Management Mode	SNMP v1/v2c/v3, Netconf, telnet, console, MGMT, RMON, SSHv1/v2, FTP/TFTP, NTP clock, Syslog, SPAN/RSPAN, Telemetry, ZTP, Python, fan and power supply alarm, and temperature alarm
Other Protocols	DHCP Client, DHCP Relay, DHCP Server, DNS Client, UDP relay, ARP Proxy, and Syslog

Ordering Guide

The configuration procedure for RG-S6510-4C series switches is as follows:

- Select the switch, fan, and power supply modules.
- Select expansion modules based on port requirements.
- Select optical transceivers.

Ordering Information

Chassis, Fan, and Power Modules

Product Model	Description
RG-S6510-4C	Four expansion module slots, supporting hot swapping. Two power supply module slots and three fan module slots The power supply model is RG-PA800I-F, and the fan model is M6500-FAN-F.
RG-PA800I-F	Power module, supporting 1+1 redundancy, hot swapping, front-to-rear ventilation design, AC and HVDC
RG-PD800I-F	Power module, supporting 1+1 redundancy, hot swapping, front-to-rear airflow design, and LVDC
M6500-FAN-F	Fan module, supporting 2+1 redundancy, hot swapping, and front-to-rear ventilation design

Expansion Modules

Product Model	Description
M6500-08CQ	8 x QSFP28 ports The QSFP28 port supports a speed of 40 Gbps/100 Gbps.
M6500-24VS2CQ	24 25GE SFP28 ports and two QSFP28 ports SFP28 supports a speed of 10G/25G rates. The QSFP28 port supports a speed of 40 Gbps/100 Gbps. One QSFP port can be split into four 10GE or 25GE ports.

25GE Optical Transceivers

Product Model	Description
VG-SFP-SR-SM850	25G SR optical transceiver, SFP28 form factor, LC, 850 nm, 100 m (328.08 ft.) over multimode fiber (MMF)
VG-SFP-LR-SM1310	25G LR optical transceiver, SFP28 form factor LC, 1310 nm, 10 km (32,808.40 ft.) over single-mode fiber (SMF)
VG-SFP-AOC5M	25G active optical cable (AOC), SFP28 form factor, 5 m (16.40 ft.)

40G Optical Transceivers

Product Model	Description
40G-QSFP-SR-MM850	40G SR optical transceiver, QSFP+ form factor, MPO, 150 m (492.13 ft.) over MMF
40G-QSFP-LR4-SM1310	40G LR4 optical transceiver, QSFP+, Duplex LC, 10 km (32,808.40 ft.) over SMF
40G-QSFP-LSR-MM850	40G SR optical transceiver, QSFP+ form factor, MPO, 400 m (1,312.34 ft.) over MMF
40G-QSFP-iLR4-SM1310	40G iLR4 optical transceiver, QSFP+, Duplex LC, 2 km (6,561.68 ft.) over SMF
40G-QSFP-LX4-SM1310	40G LX4 optical transceiver, QSFP+, Duplex LC, 150 m (492.13 ft.) over OM3/OM4 MMF, 2 km (6,561.68 ft.) over SMF
40G-AOC-30M	40G QSFP+ AOC, 30 m (98.43 ft.)
40G-AOC-5M	40G QSFP+ AOC, 5 m (16.40 ft.)

100G Optical Transceivers

Product Model	Description
100G-QSFP-SR-MM850	100G SR optical transceiver, QSFP28 form factor, MPO, 850 nm, 100 m (328.08 ft.) over MMF
100G-QSFP-LR4-SM1310	100G LR4 optical transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 10 km (32,808.40 ft.) over SMF
100G-QSFP-iLR4-SM1310	100G iLR4 optical transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 2 km (6,561.68 ft.) over SMF
100G-QSFP-ER4-SM1310	100GE ER4 optical transceiver, QSFP28 form factor, Duplex LC, 1310 nm, 40 km (131,233.60 ft.) over SMF

Product Model	Description
100G-AOC-5M	100G AOC), QSFP28 form factor, 5 m (16.40 ft.)
100G-AOC-10M	100G AOC), QSFP28 form factor, 10 m (32.81 ft.)

GE Optical Transceivers

Product Model	Description
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
MINI-GBIC-LH40-SM1310	1G LH optical transceiver, SFP form factor, Duplex LC, 40 km (131,233.60 ft.) over SMF
MINI-GBIC-LX-SM1310	1G LX optical transceiver, SFP form factor, Duplex LC, 10 km (32,808.40 ft.) over SMF
MINI-GBIC-SX-MM850	1G SR optical transceiver, SFP form factor, Duplex LC, 550 m (1,804.46 ft.) over MMF
MINI-GBIC-ZX80-SM1550	1G ZX optical transceiver, SFP form factor, Duplex LC, 80 km (262,467.19 ft.) over SMF

GE Copper Transceivers

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

10GE Optical Transceivers

Product Model	Description
XG-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-LR-SM1310	10G LR optical transceiver, SFP + form factor, Duplex LC, 10 km (32,808.40 ft.) over SMF

Dimensions and Weight	RG-AP880-AR
XG-SFP-SR-MM850	10G SR optical transceiver, SFP + form factor, Duplex LC, 300 m (984.25 ft.) over MMF
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-SFP-AOC1M	10G AOC, SFP+ form factor, 1 m (3.28 ft.)
XG-SFP-AOC3M	10G AOC, SFP+ form factor, 3 m (9.84 ft.)
XG-SFP-AOC5M	10G AOC, SFP+ form factor, 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-Summary/>

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>
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