

# RG-S6150-X Series Next-Generation High-Performance Switches



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**Ruijie**

## Product Pictures



RG-S6150-24VS8CQ-X



RG-S6150-48VS8CQ-X

## Product Overview

RG-S6150-X series switches are high-performance multi-service 10GE Ethernet switches designed by Ruijie Networks for next-generation integrated networks. The switches integrate abundant features of campuses and data centers. With the advanced hardware architecture and Ruijie latest modular OS, the RG-S6150-X series switches are capable of providing faster hardware processing speed and better operation experience.

The RG-S6150-X series switches flexibly provide access services through 10G/25G fiber ports. The switches can be connected to uplink devices through high-performance 40G/100G ports, fully meeting users' requirements for high-density access and high-performance convergence.

The RG-S6150-X series switches provide robust performance, sound end-to-end service quality, and rich security settings for the distribution layer of large-sized networks, the core layer of small- and medium-sized networks and the access layer of the data center server. They can meet requirements of enterprise networks for high speed, security, and intelligence.

The RG-S6150-X series switches adopt chips and components provided by domestic vendors to ensure continuous update and stable operation of basic networks for users.



# Product Features

## High Performance and Scalability

The RG-S6150-X series switches flexibly provide access services at multiple rates (10G/25G) on the ports. Each switch of the RG-S6150-X series provides eight 40G/100G fiber ports, which can be selected as needed and fully meet the deployment requirements for the distribution layer of large-sized networks, the core layer of small- and medium-sized networks. The RG-S6150-X series switches provide large table capacity. The capacity is 2 to 3 times larger than that of the fixed distribution switch.

## IPv4/IPv6 Dual-Stack Multi-Layer Switching

The hardware of the RG-S6150-X series switches supports line-rate IPv4/IPv6 dual-stack multi-layer switching, and differentiates and processes IPv4 and IPv6 protocol packets. Networks can be planned using the switches based on IPv6 network requirements, or flexible IPv6 network communication solutions can be drawn up, with the network status quo unchanged. The RG-S6150-X series switches support a wide range of IPv4 routing protocols, including static routing, Routing Information Protocol (RIP), Open Shortest Path First version 2 (OSPFv2), Intermediate System to Intermediate System version 4 (IS-ISv4), and Border Gateway Protocol version 4 (BGP4). Users can select appropriate routing protocols based on network environments, to flexibly build networks. The RG-S6150-X series switches also support abundant IPv6 routing protocols, including static routing, Routing Information Protocol next generation (RIPng), OSPFv3, IS-ISv6, and BGP4+. A routing protocol can be selected flexibly to either upgrade the existing network to an IPv6 network or build a new IPv6 network.

## Virtual Switching Unit

The RG-S6150-X series switches support the Virtual Switch Unit (VSU) technology, in which multiple physical devices are connected through aggregate links and virtualized into one logical device. The devices use the same IP address, telnet process, command line interface (CLI) for management, and support automatic version check and automatic configuration. Users need to manage only this logical device to enjoy the work efficiency and use experience brought by multiple devices.

Aggregate links can be 40G/100G interfaces, which can maximize the return on investment for users. The maximum stacking bandwidth is 800 Gbps.

**Simplified management:** Administrators can manage multiple switches in a unified manner, with no need to connect to each switch for configuration and management.

**Simplified network topology:** A VSU serves as a switch on a network and connects to peripheral devices through aggregate links. Therefore, no layer-2 loop exists and the Multiple Spanning Tree Protocol (MSTP) does not need to be configured. Various control protocols run on the VSU.

**Fault recovery within milliseconds:** A VSU connects to peripheral devices through aggregate links. If one device or member link in the VSU malfunctions, data and services can be switched to another member link within only 50–200 milliseconds.

**High scalability:** User devices can be added to or removed from a virtualized network in a "hot swap" manner, without affecting normal operation of other devices.

## VxLAN Feature

The hardware of the RG-S6150-X series switches supports VxLAN (Virtual Extensible LAN). By upgrading the software, a logical layer-2 network can be set up on the basis of the layer-3 network.

## Sound Security Protection Policies

The RG-S6150-X series switches effectively defend against and control the virus spread and hacker attacks by using multiple inherent mechanisms such as anti-DoS attack, anti-IP scanning, validity check of ARP packets on ports, and multiple hardware ACL policies.

The RG-S6150-X series switches support hardware-based IPv6 ACLs, which can easily control the access of IPv6 users at the network boundary even in the presence of IPv6 users on an IPv4 network. The switches allow the coexistence of IPv4 and IPv6 users and can control the access permissions of IPv6 users, for example, restrict the access to sensitive resources on the network.

The hardware CPU protection mechanism provided by the RG-S6150-X series switches is a unique CPU protection policy, in which data traffic sent to the CPU is classified and processed by queue priority, and the bandwidth rate is limited as required. This mechanism fully protects the CPU against illegitimate traffic occupancy, malicious attacks, and resource consumption, thereby ensuring the CPU security and protecting the switches.

The RG-S6150-X series switches adopt the Network Foundation Protection Policy (NFPP) to limit the rate of ARP packets, ICMP requests, DHCP requests, and other packets sent from users to networks. The switches discard packets whose rate exceeds the threshold, identify attack behaviors, and isolate users launching attacks. In this way, the basic networks are protected against network attacks, and therefore the network stability is guaranteed.

The hardware of the RG-S6150-X series switches flexibly binds a port or switch to a user's IP address and MAC address, to strictly restrict the access of users connected to a port or the switch.

DHCP snooping enables the RG-S6150-X series switches to receive DHCP responses only from trusted ports and prevent spoofing from unauthorized DHCP servers. With DHCP snooping, the switches dynamically monitor ARP packets, check users' IP addresses, and discard illegitimate packets whose addresses do not match bound entries, thereby effectively preventing ARP spoofing and source IP address spoofing.

The switches support the source IP-based Telnet device access control, which can prevent unauthorized users and hackers from maliciously attacking and controlling the devices, thereby enhancing the network management security of the devices.

Through the Secure Shell (SSH) and Simple Network Management Protocol version 3 (SNMPv3), the RG-S6150-X series switches can encrypt management information in the telnet and SNMP processes, to ensure information security of management devices and prevent hackers from attacking and controlling the devices.

The RG-S6150-X series switches prevent unauthorized users from accessing networks by using multiple measures. Such measures include multi-element binding, port security, time-based ACL, and data flow-based bandwidth limit. These measures can help enterprise networks and campus networks control user access and restrict the communication of unauthorized users.

## High Reliability

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The Spanning Tree Protocols (STPs) (802.1d, 802.1w, and 802.1s) help the RG-S6150-X series switches achieve fast convergence, improve the fault tolerance capability, and ensure stable network operation and load balance of links. The switches utilize network channels appropriately to raise the utilization of redundant links.

The Virtual Router Redundancy Protocol (VRRP) helps the switches effectively ensure the network stability.

With the Rapid Link Detection Protocol (RLDP), the switches can quickly detect the link connectivity and unidirectional optical fiber links. The port loop detection function helps the switches prevent network failures caused by loops resulting from unauthorized port connection to hubs.

The RG-S6150-X series switches support the Ethernet Ring Protection Switching (ERPS) technology, which is an international L2 link redundancy backup protocol designed for the core Ethernet. The loop blocking and link recovery of ERPS are implemented on the controlling device, and non-controlling devices directly report their link status to the controlling device, without processing from other non-controlling devices. Therefore, loop disruption and recovery time of ERPS is faster than that of STP. Based on the above differences, ERPS supports link recovery within milliseconds in the ideal environment.

When STP is disabled, the Rapid Ethernet Uplink Protection Protocol (REUP) can still provide basic link redundancy and millisecond-level fault recovery faster than STP.

The RG-S6150-X series switches support Bidirectional Forwarding Detection (BFD), which provides upper-level protocols (such as routing protocols) with a method of rapidly detecting connectivity of the forwarding path between two routers. BFD greatly shortens the convergence time for the upper-level protocols in the case of link status changes.

The switches support dual-boot at the hardware level, which uses two FLASH chips to store the boot software (system boot program) to achieve hardware-level boot redundancy backup and to avoid the switch boot failure due to the FLASH chip fault.

## Strong Multi-Service Support Capability

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The RG-S6150-X series switches support the IPv4 and IPv6 multicast functions as well as multiple multicast protocols, including IGMP snooping, IGMP, Multicast Listener Discovery

(MLD), Protocol Independent Multicast (PIM), PIM for IPv6). The IGMP source port and source IP check function supported by the switches can effectively eliminate illegitimate multicast sources and enhance the network security.

A variety of layer-3 features and service features, such as equal-cost multi-path routing (ECMP), are available to meet communication requirements in the case of different network link plans.

## Sound QoS Policies

The RG-S6150-X series switches are capable of classifying and controlling various flows including MAC flows, IP flows, and application flows, to implement fine flow bandwidth control, forwarding priority, and other flow policies. Furthermore, the switches can provide services based on applications and characteristics of the service quality required by different applications.

The DiffServ-centered QoS guarantee system supports 802.1p, IP ToS, layer-2 to layer-7 traffic filtering, SP, WRR, and other QoS policies, and implements the QoS logic for multiple services throughout the network.

## Energy Efficiency

The RG-S6150-X series switches adopt the next-generation

hardware architecture, advanced energy-efficient circuit design and components, to reduce energy consumption and noise. The RG-S6150-X series switches are equipped with variable-speed axial fans to intelligently control the fan speed based on the current ambient temperature, so as to reduce the power consumption and noise while ensuring stable operation of the devices.

## Easy Network Maintenance

The RG-S6150-X series switches support the Simple Network Management Protocol (SNMP), Remote Network Monitoring (RMON), log and configuration backup using USB flash drives, and Syslog for routine network diagnosis and maintenance. Administrators can also use CLI, Web-based management, telnet, and other diversified methods to manage and maintain devices conveniently.

The RG-S6150-X series switches support OpenFlow and NETCONF, and allow the whole network to be smoothly upgraded to a software-defined networking (SDN) network. The switches substantially reduce network maintenance costs while greatly simplifying network management.

The gRPC-based telemetry technology enables the switches to periodically collect information about CPU, memory, and other components.

# Technical Specifications

## Basic Features

Model	RG-S6150-24VS8CQ-X	RG-S6150-48VS8CQ-X
Ports and Modules	24 x 10G/25G SFP28 ports 8 x 40G/100G QSFP28 ports 4 fan modules 2 hot-swappable power supply modules	48 x 10G/25G SFP28 ports 8 x 40G/100G QSFP28 ports 4 fan modules 2 hot-swappable power supply modules
Management Ports	One MGMT port, one console port, and one USB port (compliant with the USB 2.0 standard)	
Switching Capacity	2.8 Tbps	4 Tbps
Packet Forwarding Rate	1024Mpps/1680Mpps	1024Mpps/2800Mpps
Power Consumption (Full Load)	270 W	300 W

**Product Features**

Model		RG-S6150-24VS8CQ-X	RG-S6150-48VS8CQ-X
VLAN		4K 802.1Q VLAN Port-based VLAN Private VLAN Voice VLAN GVRP	
QinQ		Basic QinQ Selective QinQ	
Link Aggregation		LACP (802.3ad)	
Spanning Tree Protocols		STP, RSTP, MSTP	
DHCP		DHCP server DHCP client DHCP snooping DHCP relay IPv6 DHCP server IPv6 DHCP snooping IPv6 DHCP client IPv6 DHCP relay	
IPv6 Basic Protocols		IPv6 addressing, Neighbor Discovery (ND), ICMPv6, Stateless Auto Configuration, Path MTU Discovery	
IP Routing		Static routing RIP, RIPng OSPFv2, OSPFv3, IS-ISv4, IS-ISv6 BGP4, BGP4+ ECMP Packet-based and flow-based load balancing MCE	
Multicast		IGMP v1, IGMPv2, IGMPv3, IGMP proxy IGMP v1/v2/v3 snooping IGMP filtering, IGMP immediate leave PIM-DM, PIM-SM, PIM-SSM MLD snooping, MLD PIM for IPv6	
MPLS		MPLS L3VPN	
ACL & QoS	ACL	The following flexible and diversified hardware ACLs are supported: Standard IP ACLs (IP-based hardware ACLs) Extended IP ACLs (hardware ACLs based on IP addresses or TCP/UDP port IDs) MAC-based extended ACLs (hardware ACLs based on source MAC addresses, destination MAC addresses, and optional Ethernet type) Time-based ACLs	



Model		RG-S6150-24VS8CQ-X	RG-S6150-48VS8CQ-X
ACL & QoS	ACL	Expert-level ACLs (hardware ACLs based on flexible combinations of the Ethernet type, MAC address, IP address, TCP/UDP port ID, protocol type, and time) ACL 80 IPv6 ACLs	
	QoS	Port traffic identification Port traffic rate limiting 802.1p/DSCP/ToS traffic classification Eight priority queues per port SP, DRR, SP+DRR, RED/WRED queue scheduling mechanisms	
Security Features		3-tuple binding (IP address, MAC address, and port) 3-tuple binding (IPv6 address, MAC address, and port) Filtering of invalid MAC addresses Port- and MAC-based 802.1x authentication MAB authentication Portal authentication and Portal 2.0 authentication ARP check DAI ARP packet rate limiting Gateway ARP spoofing prevention Broadcast storm suppression Hierarchical management of administrators and password protection RADIUS and TACACS+ AAA (IPv4/IPv6) for device login management SSH BPDU guard IP source guard CPP, NFPP Port protection	
Management Features		SNMP, CLI (Telnet/Console), RMON, SSH, Syslog, NTP/SNTP, SNMP over IPv6, IPv6 MIB support for SNMP, SSHv6, Telnet v6, FTP/TFTP v6, DNS v6, NTP for v6, Traceroute v6 sFlow, which utilizes the random sampling technology to conduct flow information sampling on the traffic of a switch. MACC-based management	
High Reliability		VSU (virtualizing multiple devices into one device) GR for RIP, OSPF, BGP, and other routing protocols BFD ERPS (G.8032) REUP RLDP 1+1 power redundancy Hot swapping of power modules	

## Physical Features

Model	RG-S6150-24VS8CQ-X	RG-S6150-48VS8CQ-X
Power Supply	AC input: Rated voltage range: 100 V AC to 240 V AC Maximum voltage range: 90 V AC to 264 V AC Frequency: 50/60 Hz  HVDC input: Rated voltage: 240 V DC Maximum voltage range: 192 V DC to 288 V DC	
Fan	3+1 redundancy, at least three fan modules are required for the system. Fan speed regulating and fault alarming	
Temperature Alarming	Supported	
Temperature	Operating temperature: 0°C to 45°C (32°F to 113°F) Storage temperature: -40°C to 70°C (-40°F to 158°F)	
Humidity	Operating humidity: 10% to 90% (non-condensing) Storage humidity: 5% to 95%	

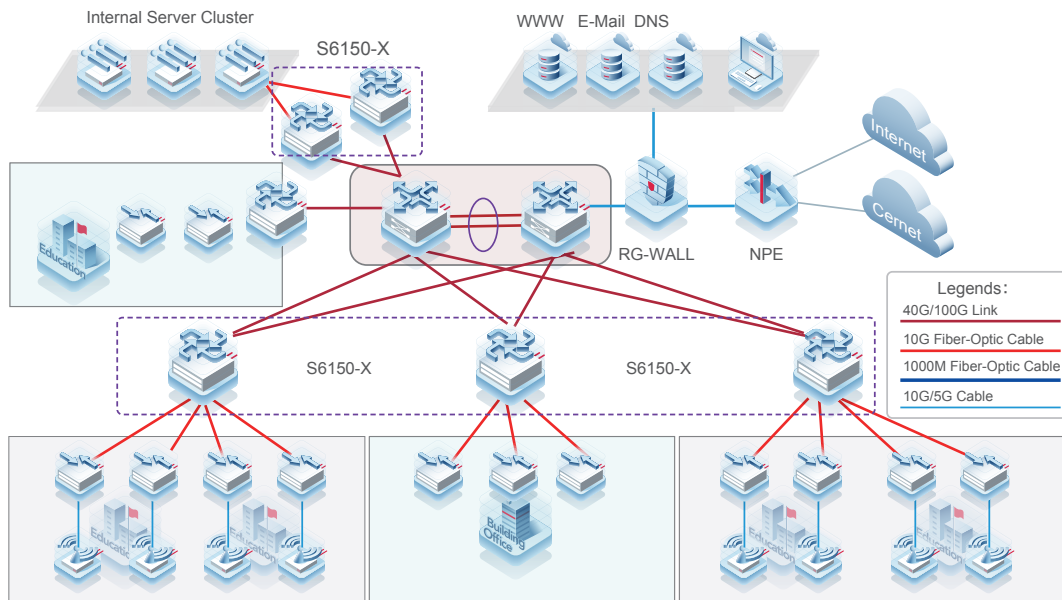
## Typical Applications

- The RG- S6150-X series switches can be used in the distribution layer of large-sized networks, core layer of small- and medium- sized networks, and access layer of the server cluster. The switches can provide full gigabit layer-3 access services on large-sized enterprise networks or campus networks.
- Each switch of the series provides eight 100G fiber ports to meet users' requirements for high bandwidth.
- The abundant security management mechanisms provide robust network security defense, high-security access control, and effective network access control.
- Sound management policies can be configured to help manage bandwidth so as to guarantee the bandwidth required by voice, multicast audio and video services, video on demand, and other key services.



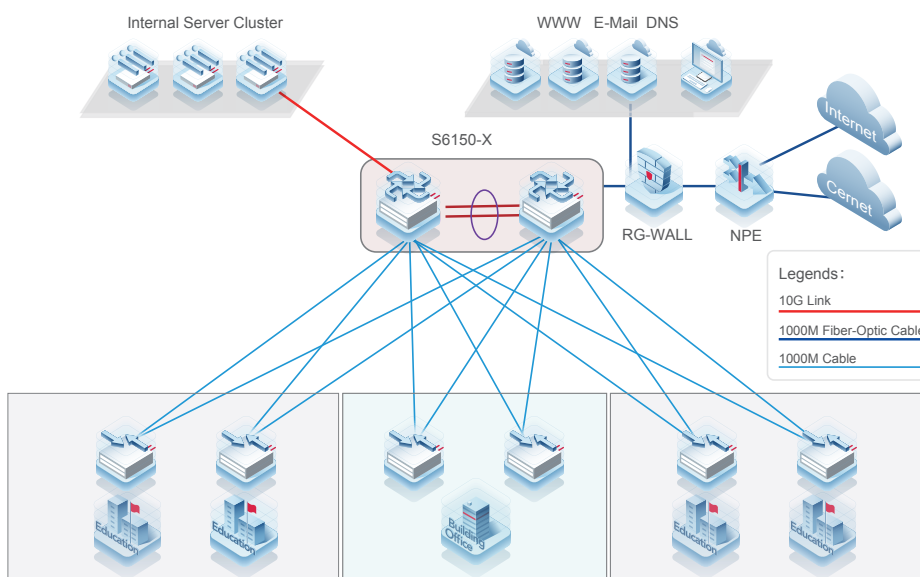
## Scenario 1

The RG-S6150-X series switches serve as distribution devices on large-sized campus networks. The switches provide 10G/25G bandwidth links for the access layer and high-performance 40G/100G bandwidth links for the core layer, to cope with increasing information amount of access users.



## Scenario 2

The RG-S6150-X series switches serve as core switches on small- and medium-sized enterprise networks. The VSU technology helps simplify the network architecture and substantially improves the reliability and efficiency of the network system.



# Ordering Information

The switch, expansion module, power module, and other components can be ordered as needed. Before ordering an expansion module or power module, please contact the online customer service personnel for the latest support information about the module.

Model	Description
RG-S6150-24VS8CQ-X	24 x 10G/25G SFP28 ports (default: 10G; the rate can be increased to 25G with a license.) 8 x 40G/100G QSFP28 ports 4 fan modules 2 power supply module slots At least one RG-PA550I II-F power supply module needs to be purchased.
RG-S6150-48VS8CQ-X	48 x 10G/25G SFP28 ports (default: 10G; the rate can be increased to 25G with a license.) 8 x 40G/100G QSFP28 ports 4 fan modules 2 power supply module slots At least one RG-PA550I II-F power supply module needs to be purchased.
RG-PA550I II-F	550 W AC power supply module
Mini-GBIC-GT	1000BASE-GT mini GBIC module
XG-SFP-SR-MM850	10G LC interface module (62.5/125 $\mu$ m: 33 m; 50/125 $\mu$ m: 66 m; 300-meter transmission at modal bandwidth of 2000 MHz·km), applicable to SFP+ ports
XG-SFP-LR-SM1310	10G LC interface module (1310 nm), 10 km, applicable to SFP+ ports
XG-SFP-ER-SM1550	10G LC interface module (1550 nm), 40 km, applicable to SFP+ ports
XG-SFP-AOC1M	10G SFP+ fiber-optic cable, 1 m, including one cable and two interface modules
XG-SFP-AOC3M	10G SFP+ fiber-optic cable, 3 m, including one cable and two interface modules
XG-SFP-AOC5M	10G SFP+ fiber-optic cable, 5 m, including one cable and two interface modules
VG-SFP-SR-MM850	25G SFP28 module, MMF, max cabling distance: 100 m
VG-SFP-SR-MM1310	25G SFP28 module, SMF, max cabling distance: 10 km
VG-SFP-AOC5M	25G Base SFP+ fiber-optic cable (including modules on both ends), 5 m
40G-QSFP-SR-MM850	40G SR multi-mode fiber module, applicable to QSFP+ ports (OM3/OM4 MPO connector, 8 core, 850-nm wave length, max cabling distance: 100 m(OM3), 150 m(OM4))
40G-QSFP-LR4 SM1310	40G LR single-mode fiber module, applicable to QSFP+ ports, max cabling distance:10 km (LC interface, 2 core, 1310-nm wave length)
40G-AOC-5M	40G QSFP+ fiber-optic cable, 5 m, including one cable and two interface modules

Model	Description
40G-AOC-10M	40G QSFP+ fiber-optic cable, 10 m, including one cable and two interface modules
100G-QSFP-SR-MM850	100G SR fiber module, QSFP28 encapsulation, MPO connector, 850-nm wave length, max cabling distance: 100 m(OM4), 70 m (OM3)
100G-QSFP-LR4-SM1310	100G LR fiber module, QSFP28 encapsulation, LC interface, 1310-nm wave length, max cabling distance: 10 km (SMF)
100G-AOC-1M	100G QSFP28 fiber-optic cable, 1 m, including one cable and two interface modules
100G-AOC-5M	100G QSFP28 fiber-optic cable, 5 m, including one cable and two interface modules
100G-AOC-10M	100G QSFP28 fiber-optic cable, 10 m, including one cable and two interface modules

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