VSU

NFPP

Ruijie RG-S2900G-E V3 Series Switches Datasheet

Ruijie RG-S2900G-E V3 Series is a collection of next-gen multiservice switches, offering remarkable performance and enhanced security. Implementing an industry-leading hardware design and Ruijie's latest RGOS11.X modular operating system, the switches offer better table capacity, improved hardware processing performance, and easier user operation.

FEATURE HIGHLIGHTS

- Network Virtualization (VSU) Support
- Dynamic Network Protection (CPP and NFPP Technologies)
- SDN (OpenFlow v1.3) Ready
- Layer 3 Routing Support (RIP, OSPF)
- Advanced Resiliency Features
- Support: ERPS (G.8032), VRRP, REUP
- Anti-Corrosion Coating Protection Against Moisture Environment
- Lightning Protection (Up to 6KV)

Figure 1: RG-S2928G-E V3

Figure 2: RG-S2952G-E V3

PRODUCT FEATURES

Comprehensive Security Policies

The RG-S2900G-E V3 Series effectively prevents and controls virus spread and hacker attacks with various inherent mechanisms such as anti-DoS attacks, hacker IP scanning, illegal ARP packets checking and multiple hardware ACL policies.

- Industry-leading CPU protection mechanism: The CPU Protect Policy (CPP) provides policies for protecting the CPU of a switch. In network environments, various attack packets spread, which may cause high CPU usages of the switches, affect protocol running and even difficulty in switch management. To this end, switch CPUs must be protected, that is, traffic control and priority-based processing must be performed for various incoming packets to ensure the processing capabilities of the switch CPUs.
  1. CPP can effectively prevent malicious attacks in the network and provide a clean environment for legitimate protocol packets.
  2. CPP is enabled by default. It provides protection during the entire operation of switches.
- IP/MAC binding: Implement flexible binding of a port or the system to the IP address and MAC address of users, strictly limiting user access on a port or in the entire system.
- DHCP snooping: Allow DHCP responses from trusted ports only; based on DHCP listening and by monitoring ARP dynamically and checking the user IP address, directly discard illegal packets inconsistent with binding entries to effectively prevents ARP frauds and source IP address frauds.
- Secure Shell and SNMPv3: Secure Shell (SSH) and Simple Network Management Protocol v3 (SNMPv3) cryptographic network protocol ensure the security of management information. Provides services such as multi-element binding, port security, time-based ACL and bandwidth rate limiting to block unauthorized users.

- NFPP: Network Foundation Protection Policy (NFPP) provides guards for switches. Malicious attacks are always found in the network environment. These attacks bring heavy burdens to switches, resulting in high CPU usage and operational troubles. These attacks are as follows:
  1. Denial of Service (DoS) attacks may consume lots of memory, entries, or other resources of a switch, which will cause system service termination.
  2. Massive attack traffic is directed to the CPU, occupying the entire bandwidth of the CPU. In this case, normal protocol traffic and management traffic cannot be processed by the CPU, causing protocol flapping or management failure. The forwarding in the data plane will also be affected and the entire network will become abnormal.

  NFPP can effectively protect the system from these attacks. Facing attacks, NFPP maintains the proper running of various system services with a low CPU load, thereby ensuring the stability of the entire network.

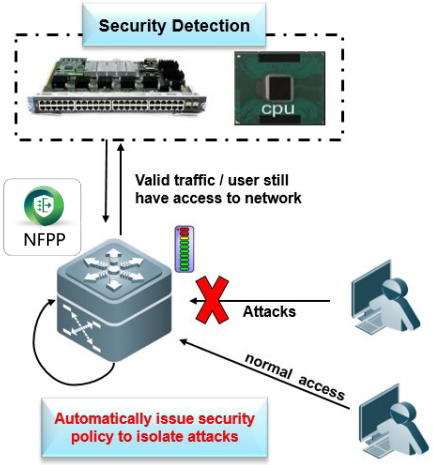


Figure 3: NFPP Network Protection

Virtual Switch Unit (VSU)

The Virtual Switch Unit technology, or VSU in short, enables interconnection of several physical devices by virtualizing them into one logical device. The logical device uses one single IP address, Telnet process, command-line interface (CLI), and enables auto version inspection and configuration. From the user perspective, the benefits are multiplied work efficiency and enhanced user experience of several devices operating at the same. And they only have to manage one device. The VSU technology also offers multiple benefits below:

- Easy management: Administrators can centrally manage all the devices at the same time. It is no longer necessary to configure and manage the switches one by one.
- Simplified typology: The VSU is regarded as one switch in the network. By connection of aggregation link and peripheral network devices, MSTP protocol is unnecessary as there is no Layer 2 loop network. All protocols operate as one switch.
- Millisecond failover: The VSU and peripheral devices are connected via the aggregation link. Upon failure event of any device or link, failover to another member link requires only 50 to 200ms.
- Exceptional scalability: The network is hot swappable, any devices leaving or joining the virtualized network cause zero impact on other devices.

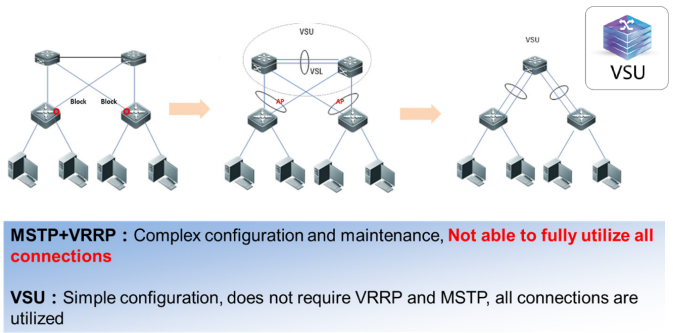


Figure 4: Simplified Network Topology Enabled by VSU

High Reliability

The RG-S2900G-E V3 Series supports spanning tree protocols of 802.1d, 802.1w, and 802.1s to ensure rapid convergence, improves fault tolerance capabilities, ensures stable running of networks and load balancing of links, and provides redundant links.

- Virtual Router Redundant Protocol (VRRP): Effectively ensure network stability.
- Rapid Link Detection Protocol (RLDP): Detect the connectivity of links and whether an optical fiber link is normal from both ends, and supports the loop detection function based on the port to prevent network faults caused by loops generated by the connection of devices such as hubs to ports.
- Ethernet Ring Protection Switching (ERPS) (G.8032): Implements loop blocking and link recovery on the master device. Other devices directly report link status to the

master device. Without passing through other standby devices, the failover time of loop interruption and recovery is hence faster than STP. The ERSP's link failover rate can be completed within milliseconds under ideal conditions.

- Rapid Ethernet Uplink Protection Protocol (REUP): When Spanning Tree Protocol (STP) is disabled, the Rapid Ethernet Uplink Protection Protocol (REUP) can provide basic link redundancy through the rapid uplink protection function and provide faster subsecond-level fault recovery than STP.

Software-Defined Networking (SDN)

With the all-new hardware architecture and Ruijie's latest RGOS11.X modular operating system, the RG-S2900G-E V3 Series fully supports OpenFlow 1.3. in collaboration with Ruijie's SDN controller, it forms a large-scale Layer 2 networking architecture with ease. Smooth upgrade of the whole network to a SDN one is also enabled. The switch series hence greatly simplifies the network management and minimizes network deployment savings.

Energy Efficiency

The RG-S2900G-E V3 Series adopts next-gen hardware architecture with a highly energy-saving circuit design and component selection. The device achieves a marked reduction in energy consumption. In addition to maximized energy saving, the RG-S2900G-E V3 Series also significantly lowers noise pollution. All models in the series deploy variable-speed axial fans, which support intelligent speed adjustment based on the current ambient temperature. All the features enable the switches to work smoothly and reduce power consumption and noise pollution at the same time.

The RG-S2900G-E V3 Series also supports auto-power-down mode. When an interface is down for a certain period of time, the system will automatically power it down for extra energy efficiency. EEE energy-saving mode is another feature highlight. The system will automatically turn an idle port into energy-saving mode. When there is a new packet, the system will issue listening streams to the port to resume service.

Easy Network Maintenance

The RG-S2900G-E V3 Series supports abundant features such as SNMP V1/V2/V3, RMON, Syslog, and logs and configuration backup using USB for routine diagnosis and maintenance. Administrators can use a wide variety of methods for easier management and such include CLI, web management, Telnet, CWMP(TR069), etc.

The RG-S2900G-E V3 Series fully supports RG-SNC (Smart Network Commander) which is a network management system launched by Ruijie Networks especially designed for network performance management and configuration. With a friendly browser UI, the SNC provides an extensive array of features such as network topology display, device management, performance monitoring, configuration & software management, real-time alarm and log & report management.

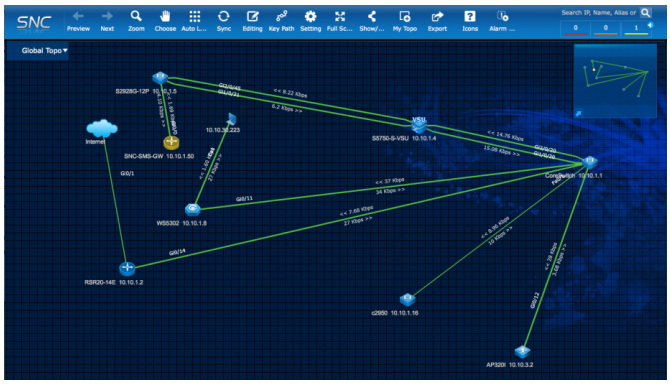


Figure 5: RG-SNC Topology Management

Design for Durability

In the corrosive gas, high humidity environment, electronic products will accelerate corrosion, reliability and lifetime will be shortened, However, deployment environments of access switch are different, there may be lack of temperature and humidity regulation and close to the source of pollution or the sea. Through the design for durability, RG-S29E V3 series switches can operate stably in a variety of deployment environments.

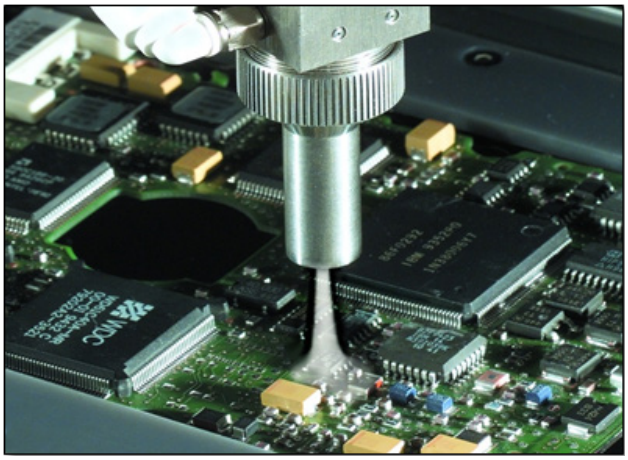


Figure 6: Conformal Coating Protection

- Conformal coating: Conformal coating is a special formula coating, coated on the surface of PCBA board, cured into a layer of about 100um thick transparent protective film, conformal coating has excellent insulation, moisture, dust, Anti-corrosion, anti-mildew, anti-salt spray performance.
- Fanless design: If the air flow on the surface of the electronic product is too fast, it will increase the degree of gas corrosion of the equipment and shorten the service life of the equipment. For low-power products, fanless design is the most effective anti-corrosion measures. The RG-S2928G-E uses a fanless design to reduce corrosive gases and dust ingress.

TECHNICAL SPECIFICATIONS

Model	RG-S2928G-E V3	RG-S2952G-E V3
Ports	24 10/100/1000BASE-T ports 4 1G SFP ports (non-combo)	48 10/100/1000BASE-T ports 4 1G SFP ports (non-combo)
Fans	Fanless	Fixed
Management Ports	1 console port	
Switching Capacity	Up to 256Gbps	
Packet Forwarding Rate	Up to 96Mpps	Up to 132Mpps
Port Buffer	1.5MB	
ARP Table	1,000	
MAC Address	Up to 16K	
Routing Entries	500	
IP Host Entries (IPv4/IPv6)	500 (IPv4/IPv6)	
ACL Entries	Up to 1,500	
ACL	Standard/Extended/Expert ACL, Extended MAC ACL, ACL 80, IPv6 ACL, ACL logging, ACL counter, ACL remark, Global ACL, ACL redirect	
QoS	802.1p/DSCP/TOS traffic classification; Multiple queue scheduling mechanisms, such as SP, WRR, DRR, SP+WFQ, SP+WRR, SP+DRR; Input port-based speed limit; Port-based traffic recognition; Each port supports 8 queue priorities	
VLAN	4K 802.1q VLANs, Port-based VLAN, MAC-based VLAN, Protocol-based VLAN, Private VLAN, Voice VLAN, QinQ, IP subnet-based VLAN, GVRP	
QinQ	Basic QinQ, Flexible QinQ, 1:1 VLAN switching	
Port Mirroring	Many-to-one mirroring, One-to-Many mirroring, Flow-based mirroring, Over devices mirroring, VLAN-based mirroring, VLAN-filtering mirroring, AP-port mirroring, RSPAN, ERSPAN	
DHCP	DHCP server, DHCP client, DHCP snooping, DHCP relay, IPv6 DHCP snooping, IPv6 DHCP client, IPv6 DHCP relay	
Spanning Tree Protocols	IEEE802.1d STP, IEEE802.1w RSTP, Standard 802.1s MSTP, Port fast, BPDU filter, BPDU guard, TC guard, TC filter, TC protection, LOOP guard, ROOT guard	
Multiple Spanning Tree Protocol (MSTP) Instances	64	
Link Aggregation	AP, LACP, Flow balance	
Maximum Aggregation Port (AP)	Up to 128	
Multicast	IGMP v1/v2/v3 snooping, IGMP SGVL/IVGL, IGMP filter, IGMP fast leave	
EEE Format	Support IEEE 802.3az standard	
G.8032	Support	
L2 Features	MAC, EEE, ARP, VLAN, Basic QinQ, Felix QinQ, Link aggregation, Mirroring, STP, RSTP, MSTP, Broadcast storm control, IGMP v1/v2/v3 snooping, IGMP SGVL/IVGL, IGMP filter, IGMP fast leave, DHCP, Jumbo frame, RLDP, LLDP, REUP, G.8032 ERPS, Layer 2 protocol tunnel	
Layer 2 Protocols	IEEE802.3, IEEE802.3u, IEEE802.3z, IEEE802.3x, IEEE802.3ad, IEEE802.1p, IEEE802.1x, IEEE802.3ab, IEEE802.1Q (GVRP), IEEE802.1d, IEEE802.1w, IEEE802.1s	
Layer 3 Features	IPv4 static routing, IPv6 static routing, RIP, RIPng, OSPFv2/v3, ARP proxy, Neighbor Discovery, VRRP	
Layer 3 Protocols (IPv4)	Static routing, RIP, RIPng, OSPFv2/v3	

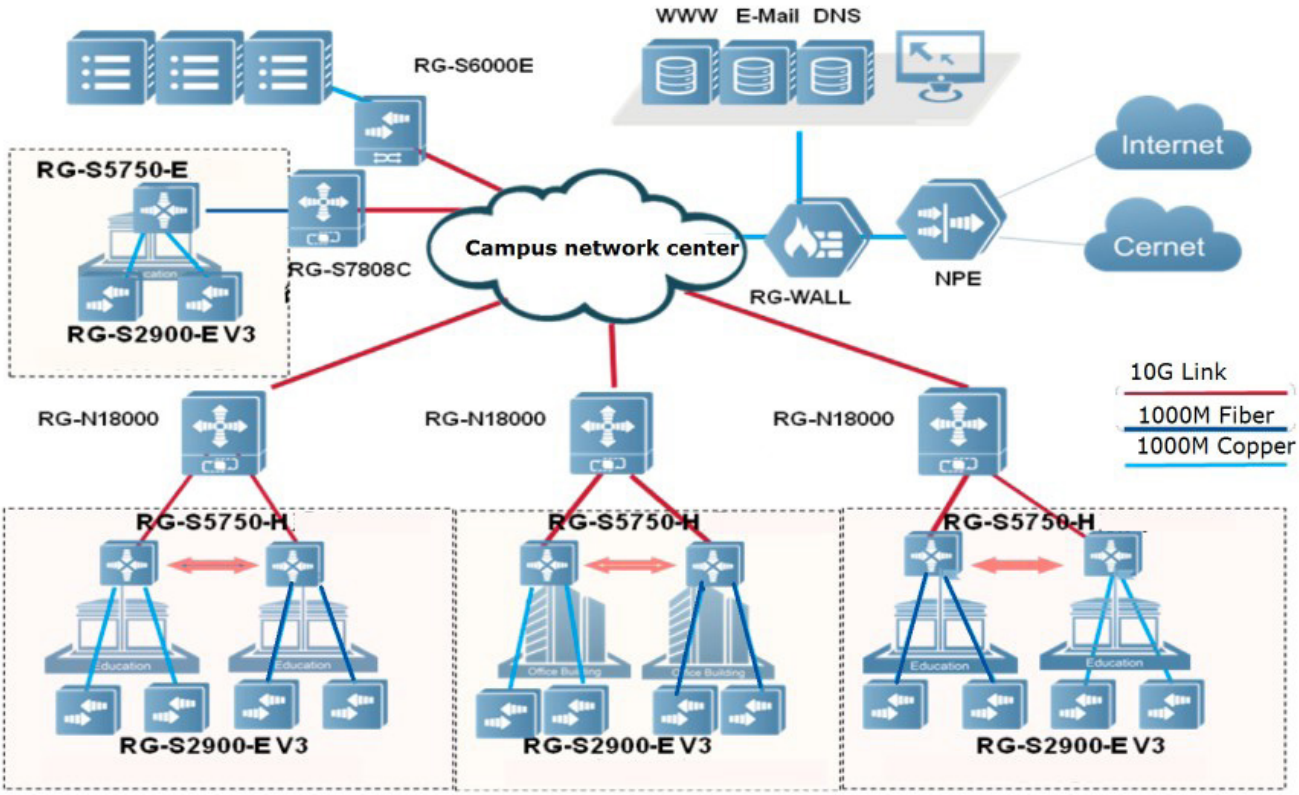
Model	RG-S2928G-E V3	RG-S2952G-E V3
IPv4 Features	Ping, Traceroute	
IPv6 Features	0-64 any length mask, ICMPv6, Neighbor Discovery, Manually configure local address, Automatically create local address, IPv6 Ping, IPv6 Tracert, IPv6 extender option head, VRRP v3	
Basic IPv6 Protocols	IPv6 addressing, Neighbor Discovery (ND), IPv6 ACL, ICMPv6, IPv6 Ping, IPv6 Tracert	
IPv6 Routing Protocols	Static routing, RIPng, OSPFv3	
VSU (Virtual Switch Unit)	Support (up to 9 stack members, to ensure the effectiveness of the use, 4 members are recommended)	
Security	Binding of the IP address, MAC address, and port address; Binding of the IPv6, MAC address, and port address; Filter illegal MAC addresses; Port-based and MAC-based 802.1x; MAB; Portal and Portal 2.0 authentication; ARP-check; DAI; Restriction on the rate of ARP packets; Gateway anti-ARP spoofing; Broadcast suppression; Hierarchical management by administrators and password protection; RADIUS and TACACS+; AAA security authentication (IPv4/IPv6) in device login management; SSH and SSH V2.0; BPDU guard; IP source guard; CPP, NFPP; Port protection	
SDN	OpenFlow 1.0, future support OpenFlow 1.3	
Zero Configuration	CWMP(TR069)	
Smart Temperature Control	Fanless	Auto fan speed adjustment; Fan malfunction alerts; Fan status check
Reliability	RAS VSU (virtualization technology for virtualizing multiple devices into 1); GR for RIP/OSPF; ERPS (G.8032); REUP dual-link fast switching technology; RLDP (Rapid Link Detection Protocol)	
Manageability	SNMPv1/v2c/v3, CLI (Telnet/Console), RMON (1, 2, 3, 9), SSH, Syslog/Debug, RSPAN/ERSPAN, NTP/SNTP, FTP, TFTP, Web, SFLOW, support cable detection and port sleep mode	
Dimensions (W x D x H) (mm)	440 × 260 × 43.6	
Rack Height	1RU	
Weight	≤3.5kg	≤4kg
MTBF	>200K hours	
Lightning Protection	6KV	
Power Supply	AC input: Rated voltage range: 100V to 240V AC Maximum voltage range: 90V to 264V AC Frequency: 50 to 60Hz HVDC input: Input voltage range: 192V to 290V DC	
Power Consumption	≤24W	≤40W
Temperature	Operating temperature: 0°C to 50°C	
	Storage temperature: -40°C to 70°C	
Humidity	Operating humidity: 10% to 90%RH	
	Storage humidity: 5% to 95%RH	
Operating Altitude	-500m to 5,000m	
Safety Standards	IEC 60950-1,EN60950-1	
Emission Standards	EN 300 386, EN 55032, EN 61000-3-2, EN 61000-3-3, EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11	

TYPICAL APPLICATION

The RG-S2900-E/P V3 gigabit secure and intelligent access switches are ideal for the following and scenarios alike.

- Full gigabit access to LANs of large-scale enterprises and institutions, such as government buildings, large manufacturing, energy, and metallurgy enterprises Full gigabit access to server clusters
- Secure access through flexible and diverse security control policies that can defend and control network viruses and attacks
- Full gigabit access to business systems, such as hospitals, libraries, exhibition centers, and websites

This networking topology enables RG-S2900-E V3 series to cooperate with convergence switches (eg.RG-S5750-H) in an entire building and core switches (eg.RG-N18000 series) in the core area to provide gigabit services for desktops. The 10G high-bandwidth links converge in the core area to satisfy user requirements for increasing information volumes in universities, libraries, laboratories, financial centers, offices, and exhibition centers.



ORDERING INFORMATION

Model	Description
RG-S2928G-E V3	24 10/100/1000BASE-T ports 4 1G SFP ports (non-combo)
RG-S2952G-E V3	48 10/100/1000BASE-T ports 4 1G SFP ports (non-combo)
Mini-GBIC-GT	1000BASE-GT mini GBIC Transceiver
MINI-GBIC-SX-MM850	1000BASE-SX mini GBIC Transceiver (850nm)
MINI-GBIC-LX-SM1310	1000BASE-LX mini GBIC Transceiver (1310nm)
MINI-GBIC-LH40-SM1310	1000BASE-LH mini GBIC Transceiver (1310nm, 40km)
MINI-GBIC-ZX50-SM1550	1000BASE-ZX mini GBIC Transceiver (1550nm, 50km)
MINI-GBIC-ZX80-SM1550	1000BASE-ZX mini GBIC Transceiver (1550nm, 80km)
MINI-GBIC-ZX100-SM1550	1000BASE-ZX mini GBIC Transceiver (1550nm, 100km)
GE-SFP-LX20-SM1310-BIDI	1000BASE-LX, SFP Transceiver, BIDI-TX1310/RX1550, 20km, LC
GE-SFP-LX20-SM1550-BIDI	1000BASE-LX, SFP Transceiver, BIDI-TX1550/RX1310, 20km, LC
GE-SFP-LH40-SM1310-BIDI	1000BASE-LH, SFP Transceiver, BIDI-TX1310/RX1550, 40km, LC
GE-SFP-LH40-SM1550-BIDI	1000BASE-LH, SFP Transceiver, BIDI-TX1550/RX1310, 40km, LC

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