# Ruijie RG-RSR7708-X Router Datasheet

Ruijie Networks Co., Ltd.

# Revision Record

| Revision Date | Version | Revised Sections | Details | Authors |
|---|---|---|---|---|
| 2011-12 | V1.1 | Draft | Draft completed | HQ Headquarter |
| 2013-12-5 | V1.2 | All | - English translation completed | HK Translation Team |
| 2016-3-8 | V1.3 | - All<br>- Contact Us | - Updated banner<br>- Standardized all formatting (specs table based on latest at-a-glance, ordering info table updated) | HK Translation Team |
| 2016-3-30 | V1.4 | - Spec table | - Updated based on latest at-a-glance feedback from Router Team | HK Translation Team |

# Contents

# 1 Product Picture


RG-RSR7708-X

# 2 Product Overview

Ruijie RG-RSR7708-X Core Integrated Services Router is designed to power enterprise network cloud infrastructure and services. The router is an upgraded distributed version of the RG-RSR77 series. Based on Ruijie's Network Simplicity Solution and the development trend of mobile broadband networking, the overall performance of the RG-RSR7708-X Core Router is enhanced to provide strong support for the existing network requirements and superior development scalability for the coming decade.

The routing engine, fabric engine and service module of the RG-RSR7708-X Core Router are physically isolated. Building on the foundation of high-performance multicore platform and distributed architecture, the Router achieves totally separate management, control and data forwarding. The RG-RSR7708-X Core Router is the first to adopt dual data plane to improve performance and guarantee uninterrupted services.

Featuring unparalleled agility, performance, multi-services and robust security, the RG-RSR7708-X Core Router firmly supports enterprise operation and network, and offers exceptional cost efficiency. With the highly scalable architecture, the router can enhance the performance and achieves load balancing with an addition of module cards to achieve load. The RG-RSR7708-X Core Router is also fully compatible with the existing line cards of the RG-RSR77 Series for total investment protection.

With Ruijie's advanced RGOS (Ruijie General Operating System), the RG-RSR7708-X Core Router fully inherits the multi-service features of the RG-RSR77 Series supporting VCPU, REF and X-Flow with continuous enhancement on the simultaneous processing capability of multi-services. The distributed line cards support multiple interfaces with built-in full service features such as NAT, IPFIX, IPv6, BGP, IPsec, MPLS VPN, H-QoS and multicast.

The RG-RSR7708-X Core Router is mainly deployed in WAN network core, aggregation nodes, large campus network gateway and edge aggregation of various kinds of data centers in government, finance, network operators, education, medium and large-sized enterprises. The RG-RSR7708-X Core Router can team up with RG-RSR77, RG-RSR50 and RG-RSR30 Series aggregation routers to achieve a one-stop WAN solution.

# 3 Product Features

## 3.1 Comprehensive Architecture Upgrade

- The chassis of the RG-RSR7708-X Core Router is designed based on the scalable platform adopting the most advanced distributed multi-service processing architecture. With the independent fabric engine, routing engine, service engine and forwarding engine, the RG-RSR7708-X Core Router achieves separate management, control and data forwarding. The Router also implements the innovative dual-plane data exchange architecture which relies more on the independent fabric engine redundancy than the traditional high-end routers to further enhance the high-availability services.

## 3.2 Modular Design With Full Compatibility

- The RG-RSR7708-X Core Router adopts the design of isolated child and parent cards. Currently, the Router (8 service subcard slots) adopts a unified hardware and software platform. Both line cards are fully compatible and able to meet different application requirements at different network layers of growing enterprises.

- The RG-RSR7708-X Core Router is compatible with all service boards and service subcards of the RG-RSR77 Series to protect user investment.

## 3.3 Energy Saving Design

- The environmental protection and energy saving design is implemented in the RG-RSR77-X Series. Its chassis supports efficient modular power supply and independent partitioning power supply to enhance the efficiency of the power system and reduce the energy consumption.

- The chassis is physically partitioned for better heat dissipation. The smart fan module supports partitioned temperature control with multi-level speed control, energy-saving design and noise reduction to reduce energy consumption.

## 3.4 Built-in High-Performance Service Features

- The RG-RSR7708-X Core Router distributed service line card offers built-in service features such as NAT, IPv6, BGP, IPsec, MPLS VPN, H-QoS and multicast. When new features are required, users do not need to purchase additional software license or service cards, thereby saving user investment.

- The RG-RSR7708-X Core Router offers built-in support for distributed NAT and IPFIX features which are applicable to campus gateway. The overall NAT ability can be improved by increasing the number of module cards so that the RG-RSR7708-X Core Router can integrate with the existing management system of the campus network to achieve intelligent operation and maintenance of the campus network.

- The RG-RSR7708-X Core Router supports built-in flow visualization and the international-standard Internet Protocol Flow Information Export (IPFIX) technology for 24/7 network traffic monitoring to timely discover traffic abnormities and failure risks, thereby ensuring the healthy and reliable operation of the network. With Ruijie's patented X-Flow technology, the RG-RSR7708-X Core Router can perform traffic sampling without affecting the overall router performance.

- The RG-RSR7708-X Core Router supports built-in VPN features such as IPsec, GRE and L2TP. The RG-RSR7708-X Core Router offers the advantage of distributed computing to improve its processing capability via adding service subcards. For example, the RG-RSR7708-X Core Router can support encryption performance of up to 20Gbps for IPsec VPN.

- Offering high-performance and flexible QoS, the RG-RSR7708-X Core Router supports up to 5 levels of H-QoS features for uplink and downlink. The RG-RSR7708-X Core Router meets the centralized QoS deployment standard of the high performance and ease of management which is applicable to the enterprise networking requirements of the finance industry, government and settings alike.

## 3.5 Strong Routing Processing Capability

- The RG-RSR7708-X Core Router supports IPv4/IPv6 static routing and various dynamic routing protocols in order to meet various networking requirements. Additionally, the RG-RSR7708-X Core Router supports the policy routing feature which can flexibly control and dispatch network traffic in order to meet routing requirements scenarios such as finance, government and enterprise.

- The X-Flow and fast forwarding technology together with features such as GR, FRR and BFD improve the convergence mechanism of the conventional routing protocols to achieve fast convergence of large-scale networks.

## 3.6 Robust Security Design

- The RG-RSR7708-X Core Router supports targeted security access control from the link layer to the application layer for MAC address, VLAN and URL. The built-in stateful firewall provides hardware protection features from the device ports to CPU. The flexible access policy helps clients to set the user authority of the access devices.

## 3.7 Comprehensive MPLS VPN Feature

- The RG-RSR7708-X Core Router supports the Multi-Protocol Label Switching (MPLS)

Protocol, high-performance P/PE applications, distributed Layer 2 and Layer 3 VPN services, and MPLS Traffic Engineering (MPLS TE) features. It also provides high-performance, security and multi-layer MPLS VPN solutions.

- The RG-RSR7708-X Core Router supports distributed multicast VPN. It can enable the high-performance multicast service online in the MPLS VPN network in order to meet requirements of multicast services such as video conference and remote learning.

## 3.8 IPv6 Compatibility

- The RG-RSR7708-X Core Router supports various IPv6 routing technologies, such as static routing, equivalent routing, policy routing, OSPFv3, Routing Information Protocol Next Generation (RIPng), BGP4+ and IS-ISv6 to meet the requirements of large-scale IPv6 network deployment in the future.
- The RG-RSR7708-X Core Router supports multiple IPv6 transition technologies, such as dual stack, manual channel, Site Automatic Tunnel Addressing Protocol (ISATAP), and IPv6-to-IPv4 tunneling. By using these transition technologies, the transition from the IPv4 network to the IPv6 network can be implemented.
- Additionally, the RG-RSR7708-X Core Router supports address automatic configuration and a wide range of IPv6 technologies such as ICMPv6, ICMPv6 redirection, ACL for IPv6, TCP/UDP for IPv6, QoS for IPv6 and IPv6 multicast.
- Full IPv6 compatibility can maximize the value of customers' existing investments and enable smooth migration from the current IPv4 network to IPv6 network.

## 3.9 WAN Link Transmission Optimization

- The RG-RSR7708-X Core Router supports built-in WAN link transmission optimization technology which doubles the efficiency of cross-operator visits and cross-regional visits inside the enterprise network.
- Under the project implementation of the Intelligent Cities, City-wide IP Surveillance and Financial Security Video Surveillance, the RG-RSR7708-X Core Router acts as the video surveillance aggregation router which supports robust scalability and high-fidelity municipal monitoring network. The RG-RSR7708-X Core Router also improves the clarity and fluency of the surveillance video in 3G/4G network environments to enhance the quality of the Intelligent Cities, City-wide IP Surveillance and Financial Security Video Surveillance.

## 3.10 Carrier-Class Reliability

- Key module redundancy: routing engine redundancy, fabric engine redundancy, N+N power redundancy, double boot mapping files, and double configuration files.

- Hot-swappable key components: routing engines, service boards/modules, and power/fan modules all support hot swapping.

- Comprehensive fast rerouting technology: Support IP-FRR and integration with static routing, policy based routing, RIP, OSPF, IS-IS, BGP, etc. The RG-RSR7708-X Core Router can also integrate with BFD features to achieve fast route switching of the fault links. The RG-RSR7708-X Core Router support MPLS TE FRR with BFD features to reduce service downtime due to link failure.

- The comprehensive GR (Graceful Restart) feature supports protocols such as OSFP, RIP, BGP and MPLS LDP to achieve continuous forwarding of the active-standby routing engine.

- The RG-RSR7708-X Core Router support Virtual Router Redundancy Protocol (VRRP) and integrates with Bidirectional Forwarding Detection/Device Link Detection Protocol (BFD/DLDP) implement VRRP switchover. Additionally, link backup and the routing backup are supported.

- Unified RGOS operating system: All RSR series routers deploy the RGOS operating system for easy maintenance.

## 3.11 Flexible Device Management

- The RG-RSR7708-X Core Router supports user classification management and password protection. By using the multi-core CPU technology, the control and forwarding separation can be implemented. Devices can be managed in any environment. In terms of authentication of login users, different management permissions are granted to different users of different levels in order to ensure the security of devices.

## 3.12 Comprehensive Hardware Virtualization

- With the router management and flexible virtualization architecture design, the RG-RSR7708-X Core Router provides management for multiple routers and centralized data processing to ensure the high availability of the network core layer and offer exceptional reliability protection for users' key services.

# 4 Technical Specifications

| Model | RG-RSR7708-X |
|---|---|
| Module Slots | 10 |
| Routing Engine Slots | 2 |
| Independent Fabric Engine Slots | 2 |
| SIP Carrier Board Slots | 4 |
| Daughter Card Slots | 16 |
| Fixed Ports on Routing Engine | 2 USB2.0 ports<br>1 USB-Console port<br>1 MGMT port<br>1 console port<br>1 AUX port<br>1 SD card slot |
| Available Modules | OC-48c/STM-16c POS<br>OC-12c/STM-4c POS<br>OC-3/STM-1 POS<br>OC-3/STM-1 CPOS channelized to E1/T1/64K<br>OC-48/STM-16 CPOS channelized to E1/T1<br>OC-12/STM-4 CPOS channelized to E1/T1<br>OC-192c/STM-64c POS<br>OC-192/STM-64 CPOS channelized to 155M<br>OC-192c/STM-64c RPR Interface Module<br>40GE/10GE/GE/FE<br>E1/CE1<br>OC-3/STM-1 ATM<br>OC-12/STM-4 ATM<br>High-speed synchronous serial interface |
| Flash | 512MB |
| Memory | 2GB |
| Switching Capacity | 16Tbps |
| Packet Forwarding Rate | 2,880Mpps |
| LAN Protocol | IEEE802.3u (100BASE-T), (1000BASE-T),<br>IEEE802.3an (10GBASE-T), sub-interface |
| WAN Protocol | HDLC，PPP，Frame-relay，MP |
| Routing Protocol | Static routing, RIPv1/v2, OSPFv2, BGP4, IS-IS<br>v4,IGMP v1/v2/v3, PIM-SM, PIM-DM,PBR |

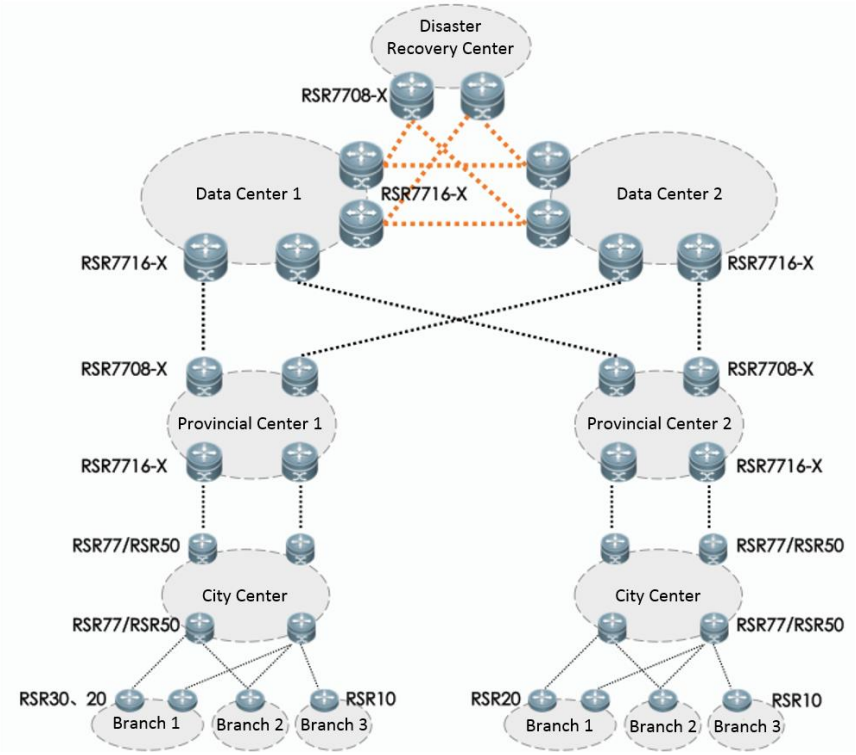
| | | |
|---|---|---|
| MPLS | | MPLS Forwarding，LDP, MPLS L3 VPN, MPLS L2 VPN, MPLS Multicast VPN |
| IP Application | | Ping, Trace, Telnet/Reverse Telnet, DHCP, NTP, DNS, IPFIX,TFTP,FTP, UDP Helper, uRPF, Multi-link load-balancing |
| IP Rating | | IP30 |
| IPv6 | Basic IPv6 Functions | IPv6 Forwarding, ND, IPv6 PMTU, IPv6 FIB, IPv6 ACL, IPv6 Ping, IPv6 Tracert |
| | IPv6 Transition Technology | Manual tunnel, Auto tunnel, GRE tunnel, 6to4 tunnel, ISA Manual tunnel, Auto tunnel, GRE tunnel, 6to4 tunnel, ISATAP tunnel TAP tunnel |
| | Dynamic Routing Protocol | RIPng, OSPFv3, BGP4+ |
| QoS | Congestion management | FIFO, PQ, WFQ, CBWFQ, LLQ, RTPQ, MQC |
| | Congestion avoidance | WRED |
| | Flow classifying | Standard ACL, extended ACL, DSCP, IP Precedence |
| | Flow supervision | CAR, LCAR |
| | Flow shaping | GTS |
| | Link efficiency | CTCP, CRTP |
| | Others | VLAN sub-interface QoS, channelized interface, MP QoS |
| Network Security | AAA | Local User, Radius, TACACS+, IP Account |
| | SSH | SSH v1.5, SSH v2.0 |
| | Firewall | Dynamic packet filter, state detection, attack defense, URL filtering, ARP and DOS attack protection |
| | NAT | NAT, NAPT, NAT Log, cross VPN NAT |
| | GRE | Support |
| | IPIP | Support |
| | VPDN | L2TP, PPTP |
| | IPsec | IPsec VPN, reverse route injection, certificate import, NAT traversal, IPsec VRRP backup, QoS for Ipsec |
| | ACL | Standard ACL, extended ACL |
| | Authentication modes | MAC binding with IP |
| | IPFIX traffic management and analytics | Support |
| IPsec | IPsec Tunnel | 4K |

| | | |
|---|---|---|
| | IPsec one-way forwarding capacity (AES256) | 1.26Gbps |
| | IPsec VPN QoS | Support |
| High Availability | | VRRP, DLDP, TRACK, BFD for USR, BFD for RIP, BFD for OSPF, BFD for BGP, BFD for VRRP, BFD for MPLS, IP FRR, GR for RIP, GR for OSPF, GR for ISIS, GR for BGP, GR for LDP |
| Management | | SNMP v1/v2/v3, MIB, SYSLOG, Console login, Telnet (VTY) remote, SSH management |
| Dimensions (D x W x H) (mm) | | 440 × 460 × 355 |
| Rack Height | | 8RU |
| Weight (Maximum) | | ≤50kg |
| MTBF | | >200K hours |
| Power Consumption | | 650W |
| Input Voltage | | 100V to 240V AC, 50Hz to 60Hz<br>-36V to -72V DC |
| Input Frequency | | 50Hz to 60Hz |
| Power Redundancy | | 1 + 1/2+1 |
| Temperature | | Operating temperature: -0°C to 45°C |
| | | Storage temperature: -40°C to 70°C |
| Humidity | | Operating humidity: 10% to 90% RH |
| | | Storage humidity: 5% to 95% RH |

# 5 Typical Applications

The RG-RSR7708-X Core Router can be deployed in the IP backbone network, IP MAN, or at the core and convergence layer in various large-scale IP networks. Offering high availability, performance, multi-services, security, hot plugging and hot backup, the Router supports the service operation of industrial and enterprise users and the construction of bearer networks, effectively increasing network values and reducing the cost of the network construction.

## 5.1 National Backbone Network Solution

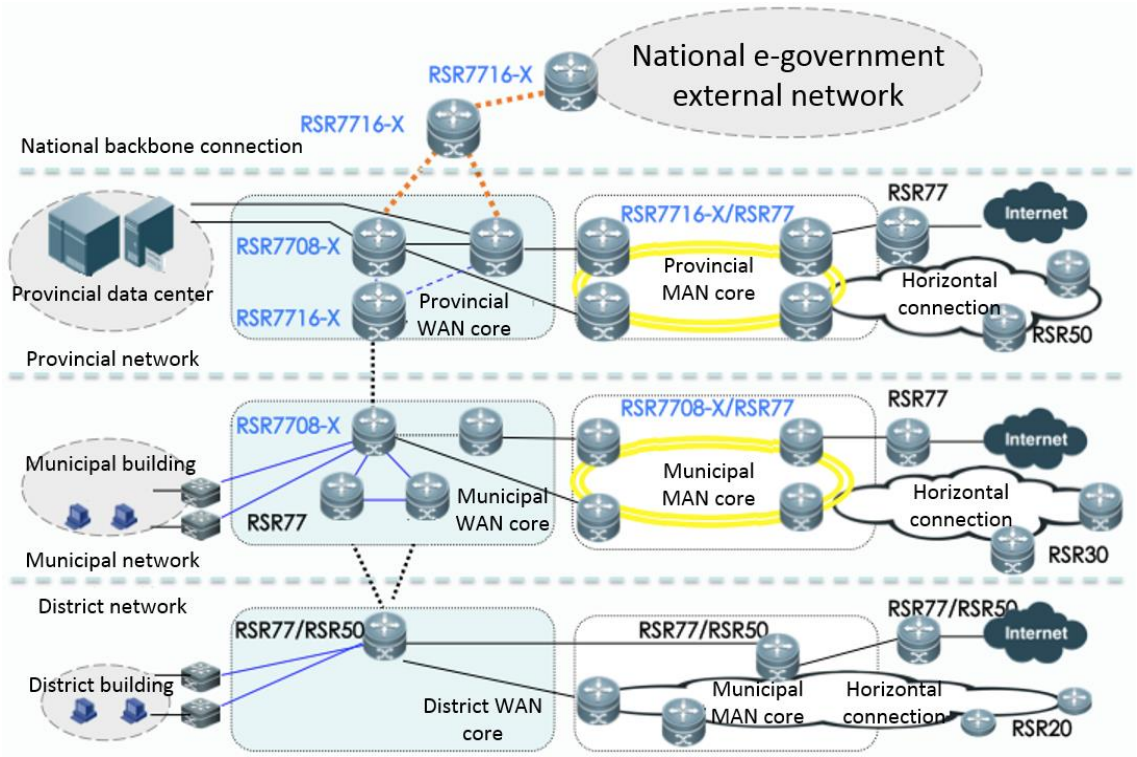



Application features:

- The RG-RSR7708-X Core Router supports high-performance service processing with high-availability design of carrier-class Core Router to meet the construction requirements of the enterprise nationwide backbone network.
- The RG-RSR7708-X Core Router and the existing RG-RSR77, RG-RSR50,

RG-RSR30 Series offer an overall solution with full network coverage, which meets the application requirements of the nationwide networks for the government, energy companies, finance and other medium to large-sized enterprises.

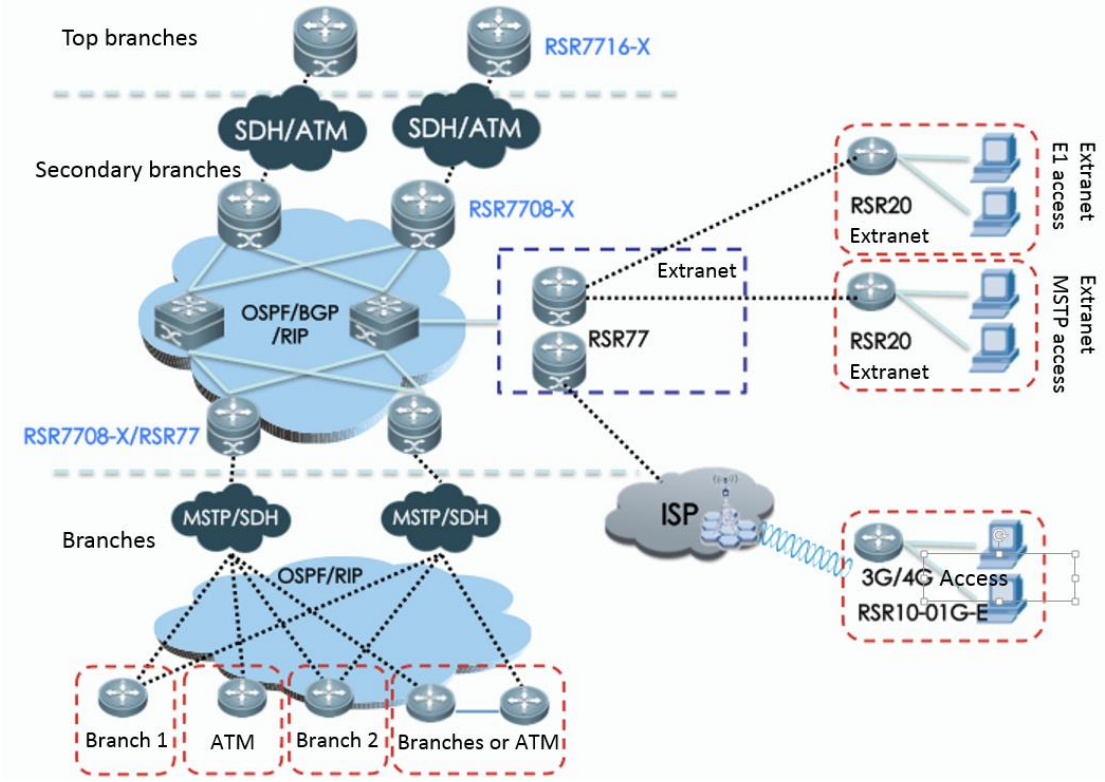
## 5.2 Government Backbone Network Solution




Application features:

- The RG-RSR7708-X Core Router supports the MPLS VPN solution for government agencies.
- This solution fully meets requirements of private network applications, such as e-government external/internal network, party affairs internal network, and ministries (public security departments, environmental protection departments, and tax administration departments).

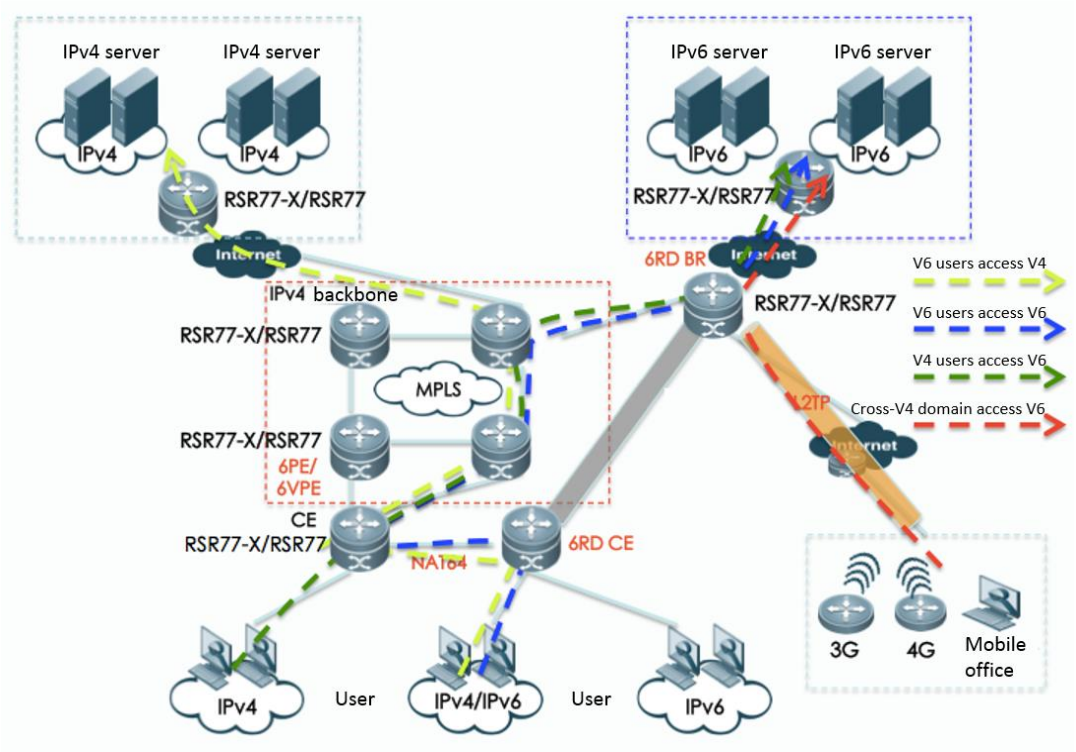
## 5.3 Financial Backbone Network Solution




Application features:

- The RG-RSR7708-X Core Router supports the convergence of large capacity branches. It can ensure high performances after enabling multiple services. This solution fully meets requirements of backbone networks in following industries including banking, insurance, postal service, and postal savings.

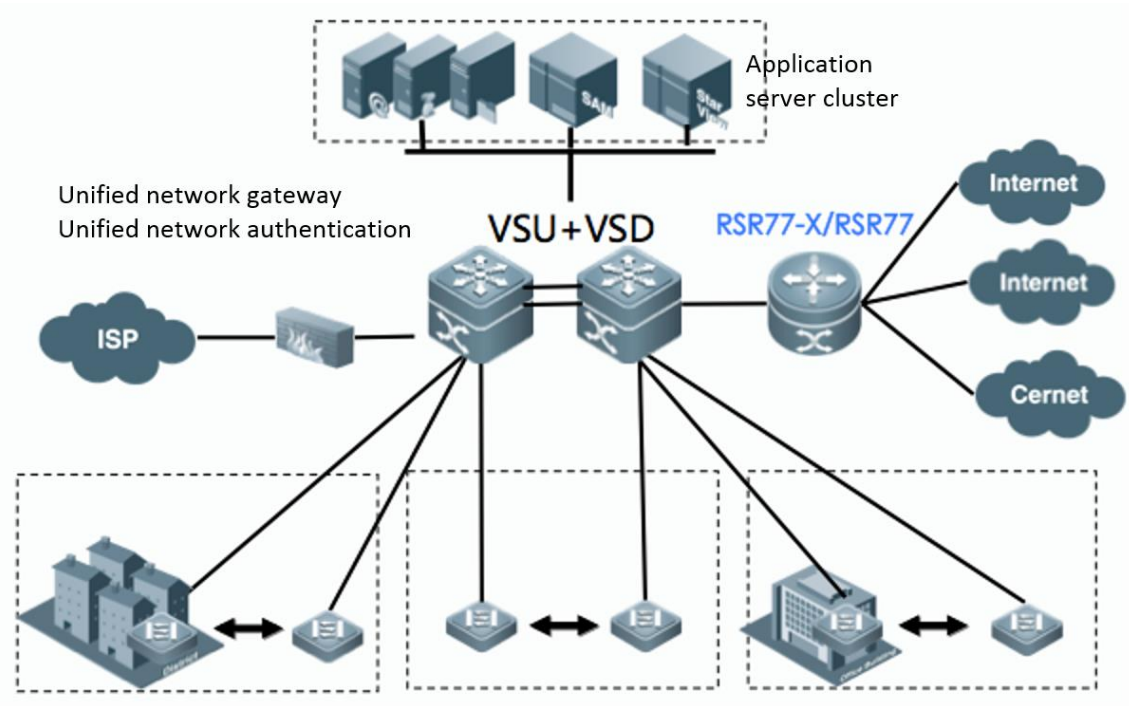
# 5.4 IPv6 Solution




Application features:

- The built-in IPv4 and IPv6 transition technology of RG-RSR7708-X Core Router the network requirements of V4/V6 scenario.
- All RSR series routers support IPv4 and IPv6 transition technology to complete the construction of the hybrid network.

## 5.5 Simplified Campus Gateway Solution




Application features:

- The RG-RSR7708-X Core Router supports high-performance NAT capability to meet the campus network gateway requirements for over 100000 end devices. The RG-RSR7708-X Core Router can also enhance the overall performance by increasing the number of distributed subcards.

- All RSR series routers support Ruijie RG-SAM campus network operation and maintenance system to complete the campus network management compatibility design.

# 6 Ordering Information

| Model | Description |
|---|---|
| RSR7708-X | RSR7708-X main chassis (2 routing engine slots, 2 independent fabric engine slots, 4 service board slots, 8 service card slots, air filter and redundant fan modules); Routing engines, fabric engines, service boards, subcards, and power supply (Hot plug support) are purchased |
| Optional Accessories | |
| RSR7708-SRCMI-X | RSR7708-X routing engine, with 2 USB2.0 ports, 1 USB-console port, 1 MGMT port, 1 console port, 1 AUX port and 1 SD card slot |
| RSR7708-DSF-X | RSR7708-X fabric engine |
| RSR77-X Bundle Pack (RSR7708-X-0-2AC) | RSR7708-X Bundle Pack, include:<br>1x RG-RSR7708-X Chassis<br>2x RSR7708-SCRMI-X Routing Engine<br>2x RSR7708-DSF-X Fabric Engine<br>2x RG-PA600-RI Power Module (AC) |
| Power Modules | |
| RG-PA600-RI | AC power module of the RSR77-X series router |
| RG-PD600-RI | DC power module of the RSR77-X series router |
| RG-PA1600-RI | Maximum AC power module of the RSR77-X series route |
| SIP Carrier Boards | |
| RSR77-SIP1-X | FNM service interface card, with 512M Memory, 2 FNM service interface card slots |
| FNM Modules | |
| FNM-8GE | 8-port Gigabit Ethernet combo interface module (fiber/copper)RSR77-X series router |
| FNM-2XS | 2-port 10G interface module for RSR77-X series router |

# 7 More Information

For more information about the Ruijie RG-RSR7708-X Router, please visit http://www.ruijienetworks.com or contact your local Ruijie sales representative.

Innovation Beyond Networks

**Beijing**
Fax: (8610) 6815-4205
Phone: (8610) 5171-5996
Email: info@ruijienetworks.com
Address: 11/F, East Wing, ZhongYiPengao Plaza, No. 29 Fuxing Road, Haidian District, Beijing 100036, China

**Hong Kong**
Fax: (852) 3620-3470
Phone: (852) 3620-3460
Email: sales-HK@ruijienetworks.com
Address: Unit 09, 20/F, Millennium City 2, 378 Kwun Tong Road, Kowloon, Hong Kong

**Malaysia**
Fax: (603) 2181-1071
Phone: (603) 2181-1071
Email: sales-MY@ruijienetworks.com
Address: Office Suite 19-12-3A, Level 12, UOA Center, No. 19 Jalan Pinang, 50450 Kuala Lumpur, Malaysia

**OEM Cooperation Division**
Phone: (8610) 5171-5995
Email: OEM@ruijienetworks.com
Address: 11/F, East Wing, ZhongYiPengao Plaza, No. 29 Fuxing Road, Haidian District, Beijing 100036, China

For further information, please visit our website http://www.ruijienetworks.com