

# RS 8000/8600

# Multi-Service Metro Routers

## KEY APPLICATIONS

- Aggregation of access and data center traffic
- On-demand bandwidth provisioning using hardware-based rate limiting technology with kilobit resolution
- Create MPLS VPN, virtual leased line, or Transparent LAN services as an MPLS Label Edge Router
- Aggregate TDM or Ethernet traffic and uplink with Packet over SONET/SDH, and ATM

## PRODUCT OVERVIEW

The RS 8000 and 8600 are high-performance, all-purpose metro routers. Among the most recognized and highly deployed router platforms in the metro, the 8000 and 8600 combine powerful service creation capabilities with a full range of optical and copper interfaces in a compact, NEBS-compliant platform. The RS 8000 and 8600 provide an ideal service-provisioning platform for service providers in the metro, with powerful service creation tools like Riverstone's metro-optimized MPLS Layer 2 or 3 tunneling technology, dynamic bandwidth provisioning, and connection-oriented data collection architecture.

The RS 8000 and 8600 are best known for their ability to deliver services over the full range of networks found in the metro, including TDM, RPR, Packet-over SONET/SDH, ATM, and Gigabit Ethernet. The RS 8000 and 8600 already serve as trusted platforms in a diverse range of metro deployments, from Metro Ethernet aggregation and high-density access to broadband aggregation and content injection, and even as part of class-5 switch replacement solutions in the Telco central office. Overall, RS 8000/8600 routers are an established, trusted choice wherever the need for IP intelligence is found.

## CUSTOMER CHALLENGES & RS 8000/8600 SOLUTIONS

Challenge	Solution
Interoperability across legacy and emerging backbone media	Industry leading WAN connectivity including ATM, POS/SDH, T1/E1, T3/E3, WDM, Serial/Frame Relay
Manage bandwidth-hungry applications and manage network usage	Wire-speed application control including rate limiting, rate shaping prioritization, redirection, and load balancing. Wire-speed ability to establish traffic type, identify users, and subsequently account for the network utilization without loss of performance and defining Service Level Agreements (SLAs)
Achieve maximum network uptime	NEBS 3 compliant platform with redundant hardware support, standards-based VRRP, and self-healing route paths (OSPF multipath, MLPPP, and Port Trunking)



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## Ordering Information

Part No.	Product Description
G80-CHS	(RS 8000) 8-slot Router chassis, backplane, switch fabric, and fan (also requires G8M-CM, SYS-OS, G80-PAC, or G80-PDC)
G86-CHS	(RS 8600) 16-slot Router chassis, backplane, switch fabric, and fan (also requires G8M-CM, SYS-OS, G86-PAC, or G86-PDC)
G80-PAC	AC power supply (8-slot chassis)
G86-PAC	AC power supply (16-slot chassis)
G80-PDC	DC power supply (8-slot chassis)
G86-PDC	DC power supply (16-slot chassis)
G80-FAN	Spare fan tray for RS 8000
G86-FAN	Spare fan tray for RS 8600
G8M-CM2-128	Control Module 2 with 128 MB memory
G8M-CM3-256	Control Module 3 with 256 MB memory

## System Software

SYS-OS-32 RS Router operating system software (PC-card format) required for operation

For complete ordering information, including specific modules, contact your Riverstone representative at (408) 878-6500. You may also visit our Website at [www.riverstonenet.com](http://www.riverstonenet.com).

## Platform Features

### Feature-rich Wire-speed Services

- IP routing, unicast, and multicast
- Routing in hardware on each line card
- LSR and LER MPLS support in hardware
- RSVP-TE and LDP label distribution and signaling
- MPLS traffic engineering support
- Security (ACLs, L2 filters)
- Layer 4 application-flow switching and QoS
- Network Address Translation (NAT)
- Hardware-based Rate Limiting
- Jumbo Frame support
- VLANs based on port or protocol
- Server Load Balancing (LSNAT)

### Highly Fault Tolerant

- Redundant CPU, power supplies
- Hot-swappable media modules
- Standards-based VRRP
- Layer 2 and 3 redundant protocol support
- Redundant Switch Fabric (RS 8600)

### Extensive Management

- Wire-speed full RMON/RMON2
- SNMP manageable
- SSH
- RADIUS
- TACACS+
- RS-232 (out-of-band management)
- Command Line Interface (CLI)

## Interfaces

10/100 Base-TX	100 Base-FX	1000 Base-LH
1000 Base-SX	1000 Base-LX	1000 Base-T
Serial T1/E1		
Multirate WAN Module		
ATM DS-3, E-3, OC-3c, OC-12c		
Packet over SONET/SDH OC-3c, OC-12c		
Packet Ring OC-48		

## Specifications

Up to 4,096 VLANs  
Up to 250,000 routes  
Up to 20,000 security/access control filters  
MTBF (predicted) > 200,000 hours

### RS 8000 (8-slot chassis) Capacity and Performance:

32 Gbps non-blocking switching fabric  
15 million packets per second routing throughput  
Up to 2,000,000 Layer-4 application flows  
Up to 400,000 Layer-2 MAC addresses performance

### Physical

Dimensions: 8.75" H x 17.25" W x 12.25" D  
(22.23cm x 43.82cm x 31.12cm)

Weight: 44.5 lbs (20.2kg)

### RS 8600 (16-slot chassis) Capacity and Performance:

64 Gbps non-blocking switching fabric  
30 million packets per second routing throughput  
Up to 4,000,000 Layer-4 application flows  
Up to 800,000 Layer-2 MAC addresses performance

### Physical

Dimensions: 19.25" H x 17.25" W x 12.25" D  
(48.9cm x 43.82cm x 31.12cm)

Weight: 61.75 lbs (28kg)

### Environmental Specifications

Operating temp: +0° to +40°C (32° to 104°F)  
Non-operating temp: -40° to +70°C (-40° to 158°F)  
Operating: 10 to 90% (non-condensing)  
Non-operating: 5 to 95% maximum (non-condensing)  
Altitude, operating 10,000 ft (3,000 m) maximum  
and non-operating:  
Shock and vibration: GR63

### Power Requirements

	RS 8000	RS 8600
AC Input current:	5 A; 3 A	10 A; 6 A
AC Input voltage:	100 - 125 VAC; 200 - 240 VAC	100 - 125 VAC; 200 - 240 VAC
AC Frequency:	50 to 60 Hz	50 to 60 Hz
DC Input current:	14 A	27 A
DC Input voltage:	-48 to -60 VDC	-48 to -60 VDC
NEBS:	Level 3 Compliant	

### Agency Standards and Specifications

Safety: Certified UL1950, CSA C22.2 No. 950, EN60950, IEC950, and 72/73/EEC  
Electromagnetic: Compliant with the requirements of FCC Part 15, CSA C108.8, EN55022, VCCI, EN50082-1, and 89/336/EEC

## Standards Supported

### IETF Standards Support

RFC No.	Title
RFC 768	UDP
RFC 783	TFTPv2
RFC 791	IP
RFC 792	ICMP
RFC 793	TCP
RFC 826	ARP
RFC 854	Telnet
RFC 851	BootP
RFC 1058	RIP v1
RFC 1075	DVMRP
RFC 1112	Host Extensions for IP Multicasting
RFC 1157	SNMPv1
RFC 1196	Use of OSI IS-IS for Routing in TCP/IP and Dual Environments
RFC 1245	OSPF Protocol Analysis
RFC 1246	Experience with the OSPF Protocol
RFC 1256	ICMP Router Discover Message
RFC 1265	BGP Protocol Analysis
RFC 1266	Experience with the BGP Protocol
RFC 1267	BGP-3
RFC 1269	Definitions of Managed Objects for BGP-3
RFC 1332	PPP ICP
RFC 1349	Type of Service in the Internet Protocol Suite
RFC 1397	Default Route Advertisement in BGP-2 and BGP-3
RFC 1403	BGP OSPF Interaction
RFC 1519	CIDR: an Address Assignment and Aggregation Strategy
RFC 1542	Clarifications and Extensions for the Bootstrap Protocol

RFC 1552	PPP IPCP
RFC 1570	PPP LCP Extensions
RFC 1586	Guidelines for Running OSPF Over Frame Relay Networks
RFC 1587	OSPF NSSA Option
RFC 1631	IP NAT
RFC 1638	PPP BCP
RFC 1657	Definitions of Managed Objects for BGP-4 using SMIPv2
RFC 1661	PPP
RFC 1662	PPP in HDLC-like Framing
RFC 1745	BGP-4/IDRP for IP and OSPF Interaction
RFC 1765	OSPF Database Overflow
RFC 1771	BGP-4
RFC 1772	Application of BGP in the Internet
RFC 1773	Experience with the BGP-4 Protocol
RFC 1774	BGP-4 Protocol Analysis
RFC 1793	Extending OSPF to Support Demand Circuits
RFC 1812	Router Requirements
RFC 1918	Address Allocation for Private Internet Space
RFC 1923	RIPv1 Applicability Statement for Historic Status
RFC 1930	Guidelines for creation, selection, and registration of an AS
RFC 1966	BGP Route Reflection Alternative to full mesh IBGP
RFC 1990	PPP MLP
RFC 1997	BGP Communities Attribute
RFC 1998	BGP Community Attribute in Multi-home Routing
RFC 2082	RIP-2 MD5 Authentication
RFC 2131	DHCP
RFC 2225	Classical IP and ARP over ATM
RFC 2236	Internet Group Management Protocol, Version 2
RFC 2270	Using a Dedicated AS for Sites Homed to a Single Provider
RFC 2328	OSPFv2
RFC 2329	OSPF Standardization Report
RFC 2336	IGMP-2
RFC 2338	VRRP
RFC 2362	PIM-SM
RFC 2370	OSPF Opaque LSA Option
RFC 2385	Protection of BGP Sessions via the TCP MD5 Signature Option
RFC 2390	Inverse Address Resolution Protocol
RFC 2391	LSNAT Load Sharing using IP Network Address Translation
RFC 2427	Multi-protocol Interconnect over Frame Relay
RFC 2439	BGP Flap Damping
RFC 2547	BGP/MPLS VPNs
RFC 2453	RIPv2
RFC 2519	A Framework for Inter-Domain Route Aggregation
RFC 2570	Introduction to Ver. 3 of the Internet-standard Network Management Framework
RFC 2571	An Architecture for Describing SNMP Management Frameworks
RFC 2572	Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
RFC 2573	SNMP Applications
RFC 2574	User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)
RFC 2575	View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)
RFC 2576	Coexistence between Version 1, Version 2, and Version 3 of the Internet-standard Network Management Framework
RFC 2578	Structure of Management Information Version 2 (SMIPv2)
RFC 2579	Textual Conventions for SMIPv2
RFC 2580	Conformance Statements for SMIPv2
RFC 2615	PPP over SONET/SDH
RFC 2684	Multi-protocol Encapsulation over ATM Adaptation Layer 5
RFC 2702	Requirements for Traffic Engineering over MPLS
RFC 2763	Dynamic Hostname Exchange Mechanism for IS-IS
RFC 2796	BGP Route Reflection Alternative to full mesh IBGP
RFC 2842	Capabilities Advertisement with BGP-4
RFC 2858	Multi-protocol Extensions for BGP-4
RFC 2865	Remote Authentication Dial In User Service (RADIUS)
RFC 2866	RADIUS Accounting
RFC 2918	Radius Refresh Capability for BGP-4
RFC 2925	Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations
RFC 2963	Dynamic Hostname Exchange Mechanism for IS-IS
RFC 2966	Domain-wide Prefix Distribution with Two-Level IS-IS
RFC 2973	IS-IS Mesh Groups
RFC 3031	Multi-protocol Label Switching Architecture
RFC 3032	MPLS Label Stack Encoding
RFC 3036	LDP Specification
RFC 3065	Autonomous System Confederations for BGP
RFC 3137	OSPF Stub Router Advertisement
RFC 3197	RSVP-TE Extensions to RSVP for LSP Tunnels
RFC 3210	Applicability Statement for Extensions to RSVP for LSP Tunnels

### IETF Standards MIB Support

RFC No.	Title
RFC 1471	PPP-LCP-MIB
RFC 1472	PPP-Sec-MIB
RFC 1473	PPP-IP-NCP-MIB
RFC 1474	PPP-Bridge-NCP-MIB
RFC 1493	Bridge-MIB
RFC 1657	BGP4 using SMIPv2-MIB
RFC 1595	SONET/SDH Interface Type-MIB
RFC 1695	ATM-MIB
RFC 1757	RMON-MIB
RFC 1724	RIPv2-MIB
RFC 1850	OSPFv2-MIB
RFC 1907	SNMPv2-MIB
RFC 2011	IP-MIB
RFC 2012	UDP-MIB
RFC 2013	TCP-MIB
RFC 2021	RMON2 using SMIPv2-MIB
RFC 2096	IP-Forward-MIB
RFC 2115	Frame-Relay-MIB
RFC 2233	IP using SMIPv2-MIB
RFC 2358	EtherLike-MIB
RFC 2495	DS1, E1, DS2, E2 Interface Types-MIB
RFC 2496	DS3/E3-MIB
RFC 2618	Radius-Auth-Client-MIB
RFC 2668	IEEE 802.3 Medium Attachment Units (MAUs)-MIB
RFC 2674	P-Bridge-MIB, Q-Bridge-MIB
RFC 2767	VRRP-MIB

### Standards and Protocols

IP routing: RIPv1/v2, OSPF, BGP-4, IS-IS  
Multicast support: IGMP, DVMRP, PIM-DM, PIM-SM  
CoS: Application level, RSVP

IEEE 802.1D	IEEE 802.1p	IEEE 802.1Q	IEEE 802.1x
IEEE 802.3	IEEE 802.3ad	IEEE 802.3u	IEEE 802.3x
			IEEE 802.3z



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