RS 1000/3000 Metro Access Routers

KEY APPLICATIONS

- Extending services to the metro access edge
- On-demand bandwidth provisioning using hardware-based rate limiting technology with kilobit resolution
- Creating MPLS/Ethernet VPNs, Transparent LAN Services, or Virtual Leased Lines at the access edge
- Delivering services over copper or optical infrastructure — Gigabit and 10/100 Ethernet, T1/E1, T3/E3, ATM, and DWDM

PRODUCT OVERVIEW

The RS 1000/3000 are Riverstone's metro access routers. Among the most highly deployed access platforms in the metro, they extend IP service delivery to the metro access edge, featuring Riverstone's metro-optimized MPLS services, full function routing and switching, and dynamic bandwidth provisioning with a connection-oriented data collection architecture. At the same time, the 1000/3000's combination of a compact form factor and high port density saves operational costs and improves service provider margins.

The key to the platform's popularity is its unique ability to deliver Layer 3/2 services to the access edge over either existing TDM or ATM networks or available dark fiber. Service providers have deployed the RS 1000 or 3000 to extend the reach of a Metro Ethernet deployment to customers with last-mile TDM access, to offer VLAN-based Transparent LAN services over a wide-area ATM network, or to simply provide fast Ethernet access with Gigabit uplinks. Both the 1000 and 3000 design feature two flexible media slots that accommodate Gigabit Ethernet, T1/E1/T3/E3 or ATM.

CUSTOMER CHALLENGES & RS 1000/3000 SOLUTIONS

Challenge	Solution
Rapidly establish new services over optical or legacy TDM infrastructure	Full complement of WAN interfaces from T1/E1 to 70km Gigabit Ethernet to ATM, combined with full function routing and switching
Establishing profitable tiered services without compromising performance	Implementing hardware-based traffic classification and accounting including rate limiting and advanced Quality of Service
Rapidly changing customer demands create need for new services and configurations — without costly truck rolls	Open APIs enable dynamic provisioning while MPLS enables rapid service creation from the metropolitan area through the Internet core
Initiating value-added services while delivering security and flexible addressing	Wire-speed security filters and hardware-based Network Address Translation (NAT) offers user, address, application, and port level security. MPLS tunnels and extended metro area VLANs provide traffic segregation

River STONE NETWORKS

RS 1000/3000 Metro Access Routers

Ordering Information

Part No.	Product Description
G10-B128	RS 1000 base unit with two expansion slots. Includes single AC power supply, RS RapidOS software, 128 MB RAM
G10-B128-DC	RS 1000 base unit with two expansion slots. Includes single DC power supply, RS RapidOS software, 128 MB RAM
G30-B128	RS 3000 base unit: 32-port 10/100 Base-TX with two expansion slots. Includes redundant AC power supplies, RS RapidOS software, 128 MB RAM
G30-B128-DC	RS 3000 base unit: 32-port 10/100 Base-TX with two expansion slots. Includes redundant DC power supplies, RS RapidOS software, 128 MB RAM
G30-B256	RS 3000 base unit: 32-port 10/100 Base-TX with two expansion slots. Includes redundant AC power supplies, RS RapidOS software, 256 MB RAM

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**.

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 power supplies (RS 3000)
- Hot-swappable media modules
- Standards-based VRRP
- Layer 2 and 3 redundant protocol support

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-SX
1000 Base-LX	1000 Base-TX	1000 Base-LH (70Km)
T1/E1	T3/E3	ATM-OC-3c

Specifications

Capacity and Performance

Up to 4,096 VLANs
Up to 256,000 routes
Up to 20,000 security/access control filters
Up to 512,000 Layer 4 application flows
Up to 256,000 Layer 2 MAC addresses
RS 1000: 12 Gbps non-blocking switching fabric
RS 1000: 4.6 million packets per second routing throughput
RS 3000: 20 Gbps non-blocking switching fabric
RS 3000: 9.5 million packets per second routing throughput
MTBF (predicted) > 200,000 hours

Physical

Dimensions:	3.25" H x 17" W x 18.5" D (8.25 cm x 43.2 cm x 47 cm)
Weight:	20 lbs. (9.1 kg)

Environmental Specifications

Operating Temp:	+0º to +40ºC (32º to 104ºF)
Non-operating Temp:	-40º to +70ºC (-40º to 158ºF)
Operating Relative Humidity:	10% to 90% (non-condensing)
Non-operating Relative Humidity:	5% to 95% maximum (non-condensing)
Altitude, Operating and Non-operating:	10,000 ft (3,000 m) maximum
Shock and Vibration:	GR63

Power Requirements

AC Input current:	3.0 A - 1.5 A
AC Input voltage:	100 to 240 VAC
AC Frequency:	50 to 60 Hz
DC Input current:	8.0 A
DC Input voltage:	-48 to -60 VAC

Agency Standards and Specifications

Safety:	Certified UL1950, CSA C22.2 No. 950, EN60950, IEC950, and 72/73/EEC
Electromagnetic compatibility:	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 951	BootP
RFC 1058	RIP v1
RFC 1075	DVMRP
RFC 1112	Host Extensions for IP Multicasting
RFC 1157	SNMPv1
RFC 1195	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 IPCP
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 IPXCP
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 SMIv2
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 2236	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 Version 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 (SMIv2)
RFC 2579	Textual Conventions for SMIv2
RFC 2580	Conformance Statements for SMIv2
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	Route 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 3209	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 SMIv2-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 SMIv2-MIB
RFC 2096	IP-Forward-MIB
RFC 2115	Frame-Relay-MIB
RFC 2233	IF using SMIv2-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 2787	VRRP-MIB

Standards and Protocols

IP routing:	RIPv1/v2, OSPF, BGP-4, IS-IS			
Multicast support:	IGMP, DVMRP, PIM-DM, PIM-SM			
QoS:	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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