



AN ERICSSON COMPANY

## SmartEdge 1200 Multi-Service Edge Router



World's First Million Subscriber Rack for HDTV, HD VoD, and Broadband Mobility

### HIGHLIGHTS

- **Carrier-Grade Design:** Engineered to standards for deployment in carrier networks worldwide – NEBS and RoHS compliant
- **Resilient software architecture:** Modular design provides stability and protects against crashes and protocol errors
- **High performance programmable packet forwarding:** Based on a Packet Processing ASIC (PPA) developed by Redback
- **Session level reliability:** Supports Non-Stop Forwarding and keeps Subscriber Sessions running uninterrupted during a Route Processor fail-over
- Highly scalable routing platform with unmatched subscriber management and services
- Supports up to 512,000 active Multi-Play subscribers, 512,000 PPP/DHCP subscribers, 512,000 VLANs and 1.5 million MAC addresses
- Supports up to 8000 MPLS L2/L3 VPN, with 1280 BGP, 1280 t-LDP peers and up to 2.5 million BGP routes
- **Advanced services for VoIP with SIP/SBC, Security, and P2P applications**

Redback has developed the first million subscriber rack for triple-play services such as HDTV, HD VoD and broadband mobility. The routing innovation behind the SmartEdge platform is at the center of Ericsson efforts to deliver 'full service broadband'. By converging wired and wireless networks, Ericsson will enable a world where any network can deliver any service to any Internet-enabled device. The SmartEdge 1200 platform introduces three major innovations. It will double carrier capacity for new video upgrades, extend triple-play services to broadband mobile networks and integrate up to six network applications into a single router. The new network applications include deep-packet inspection for peer-to-peer traffic management, advanced session border capabilities and network security for carriers and their customers.

SmartEdge 1200 Multi-Service Edge Router (MSER) enables convergence of Fixed/Mobile networks to deliver Multi-Play services such as video (IPTV/HDTV), voice, data, interactive multimedia content, broadband mobility, in addition to L2/L3 VPNs. In its new controller card, the SE1200 has integrated the functionality to provide support for SIP/SBC (Session Border Controller) for IMS and VoIP application.

The SmartEdge1200 also enables advanced security functions to protect the network right at its edge closer to subscribers, for maximum effect. Security is provided via stateful Firewall, URL Filtering, and Intrusion Detection/Prevention System (IDS/IPS). With the ability to carry out Deep Packet Inspection, the SmartEdge1200 can identify and process P2P applications, and provide a more efficient and secure network operation. Example applications are detection of leading instant messaging (IM) services.

Support for the new applications in the SmartEdge1200 enables service providers to architect their network with minimal number of devices and reduce network and device overlay resulting in simpler network topology and operation.

Powered by the new generation of Redback's programmable ASICs, the SmartEdge MSERs support hundreds of thousands of users and sessions for massive physical and logical scalability. The SmartEdge 1200 MSER delivers 480Gbps of throughput using 12 slots, each capable of up to 20Gbps. The SmartEdge1200 packet mesh architecture uses no central switching fabric, common connectivity modules, or active backplane components. This architecture eliminates single point of failures and provides for a much smaller foot print relative to competitive platforms of the same capacity.

All SmartEdge MSER interface modules are hot-swappable and highly resilient with full session and stateful redundancy in the event of a failure or replacement. The SmartEdge 1200 uses the same highly resilient operating system that is used in all SmartEdge product lines. The SmartEdge operating system (SEOS) is modular and capable of hitless restart. This means that when a software task goes down the system will continue to operate as the task is restarted independently.

The SmartEdge1200 allows the 10GE, 1GE, ATM OC-3, and ATM OC-12 cards that are currently used in SE800 to be deployed in any of its slots with backwards compatibility. This interoperability results in easy upgrade and re-use of current resources.

### A HIGH-PERFORMANCE, FULL-FUNCTION MULTI-SERVICE EDGE ROUTER

The SmartEdge 1200 MSER unifies high-performance edge routing, Ethernet aggregation, advanced subscriber management, and advanced services. The SmartEdge1200 can be deployed in many advanced applications, e.g., as a major component of an IMS infrastructure providing security, call control, and high speed routing. The SmartEdge1200 provides the scalability that is required in large networks. Its routing scales to 4 million IPv4 and 2 million IPv6 routes. For its size, the SmartEdge1200 has the highest feature density with high availability that can provide continuous network operation.

## HARDWARE

### Chassis

- Dimensions : 24.5"(H) x 17.5" (W) x 16" (D)
- 15 RU, 3 or 4 chassis per 7' rack depending on configuration
- 19" or 23" rack mountable
- 14 slots, 2 for Route Processors; 12 slots for line cards.
- Cooling airflow: bottom front to top rear,
- Backplane capacity of 480 Gbps
- Up to 20Gbps slot to slot Forwarding Throughput

### Route Processor Module

- 2 per chassis (1:1 redundancy)
- 768 MB memory upgradeable to 8 GB memory (XCRP4)
- Compact Flash slot for secondary storage
- Management ports XCRP3: 2 craft ports: DB-9/RS-232, Asynchronous modem port, Ethernet 10/100TX. XCRP4 : 1 craft ports: DB-9/RS-232, Asynchronous modem port, 2 Ethernet 10/100/1000TX

### Line Cards

- Dual Packet Processing ASICs (PPA1/2/3/4); 1 for ingress, 1 for egress
- Fully meshed backplane – no slots used for switch fabric card

### Card Types

- 1 port OC-12/STM-4c (ATM)
- 4 port OC-3/STM-1c (ATM)
- 12 port 10/100TX Ethernet
- 4 port Gigabit Ethernet (GBIC or SFP)
- 10 port Gigabit Ethernet with SFP
- 20 port Gigabit Ethernet with SFP
- 1 port 10-Gigabit Ethernet with XFP
- 4 port 10-Gigabit Ethernet with XFP

### High Availability and Redundancy

- 1+1 for all common CPUs, clock and independent power to each line card
- Hot standby route processors
- Restartable software processes (for example PPP, BGP, SNMP, etc.)
- In Service System Upgrade

### Application Services

- SIP/SBC (Session Border Controller)
- Intrusion Detection/Prevention System (IDS/IPS) with signature detection, traffic and protocol anomalies
- Firewall with stateful inspection with application level filtering and stealth mode, application awareness such as H.323, SIP, VPN pass-through
- Heuristic based P2P Application Detection, e.g., Bit Torrent, Gnu Tella, Jabber IM, eDonkey, and other leading instant messaging services

### Operating Environment

- Temperature: 5 to 40 C degrees (long term), 5 to 55C (short term)
- Humidity: 5-85% RH
- Power Supply: -39 to -57.6 V DC, Dual 50Amp Load Zones Required
- System power is configuration dependent with maximum power of 2800 W
- NEBS Level III, CE Mark, SR-3580, UL 1950, GR-63 Core, GR-1089 Core, ETS 300 386-2 FCC Part 15, EN55022 class A, ETS 300 386-2
- RoHS-5 compliance

## SOFTWARE

### Architectural Features

- Modular Operating System, with separation of control, data and services planes; independent tasks with its own thread and memory space

### Broadband Subscriber Management

- RADIUS Authentication, Authorization, and Accounting (AAA), dynamic circuit binding, CoA
- Diameter
- Subscriber level bridging
- Dynamic / Static Clientless IP (CLIPs)

### Encapsulations

- PPP/HDLC, cHDLC, Ethernet, IEEE 802.1q, RFC 1490 routed IP over Frame Relay, MPLS, MLPPP, 802.3ad, MFLR
- PPP over Ethernet (RFC 2516), PPP over ATM, RFC 1483 bridged and routed IP over ATM

### Multicast Protocols

- PIM-SM (RFC 2362 + IETF Draft), PIM-DM (IETF Draft), IGMPv1, v2, v3 (RFC 3376), SSM (RFC 3569), MBGP (RFC 2858), MSDP (RFC 3618), IGMP snooping, IGMP filtering
- RFC3810 Multicast Listener Discovery Version 2 (MLDv2) for IPv6; IPv6 Mstatic Support; Enhance PIM Static Joins for V6 Support and Enhanced PIM SSM for V6

### Routing Protocols

- BGP-4 (RFC 1771), IS-IS (RFC 1195 & ISO/IEC10589), OSPFv2/v3, RIP v2, RIPng, VRRP (RFC 2338), LDP, RSVP
- LDP tunneling over RSVP LSPs (RFC 3209); BFD for OSPF, ISIS, BGP, static routes and individual links in 802.3ad link group
- OSPF V3, RIPNG
- Mobile IP (Home and Foreign Agents)

### Configuration and Network Management

- Command Line Interface (CLI) support via telnet or SSH
- RADIUS, Diameter, TACACS+

- SNMP v1/2/3

- L2 Control Protocol (L2CP) with support for DSL Sync Rate with Dynamic QoS change and ATM Ping command to DSLAM
- NetOp EMS support for event logs, SNMP traps, interface statistics for troubleshooting and performance monitoring, port views and chassis views.

### MPLS Features & Virtual Private Networking

- Traffic Engineering, RSVP (RFC 3209), LDP (RFC 3036, 3478), L2 VPN(martini) VPLS, H-VPLS, Transport Independent (MPLS VPN over soft GRE), Multicast over MPLS VPN
- MPLS VPNs (RFC 4364 previously known as 2547bis), Carrier of carriers and Inter-AS, MPLS VPN (options A, B, C) MPLS FRR, EoMPLS.

#### Layer 2 non-MPLS VPN:

- GRE, Hard GRE
- L2TP (RFC 2661) LAC, LTS, LNS
- 802.1Q Virtual LAN (VLAN) support with 802.1QinQ - with CoS mutation, 802.1Q tunneling with VLAN mapping

### Quality of Service

- 802.1p Class of Service (CoS), Differentiated Services Code Point (DSCP) ToS, IP Precedence, and MPLS EXP bits
- Packet classification (RFC 2474, 2475, 2597, 2598); DiffServ packet marking by ACL, ingress policing, or BGP attribute based QoS; class-based ingress policing and egress shaping; priority queuing and EDRR; RED and WRED; Hierarchical Scheduling aligned with DSL forum's WT-92 and TR-59 specifications.

### Security

- Reverse Path Forwarding (RPF), Secure ARP, MD5 support for routing protocols, key rollover, RADIUS, Diameter, TACACS+; Administrative ACLs, packet mirroring and sampling, Secure Shell (SSH) Protocol, Kerberos, SNMPv3, IGMP filtering, SSHv2, VLAN ACLs, IP security router ACLs, subscriber-based ACLs
- IPsec
- Lawful Intercept (CALEA)

### Subscriber Awareness

- Subscriber Name, Session, IP Address
- Address Management
- DHCP Relay, DHCP Proxy, IPCP parameter negotiation, IP pools, RADIUS

### Advanced Features

- H.248 MGCP
- Multiple contexts with inter-context routing
- Premium Service Insertion
- Cross connect support (for L2 traffic)
- Bulk stats
- Network Address Translation (NAT)
- Dynamically Verified Static Routing
- Policy routing
- Traffic mirroring with CALEA support

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