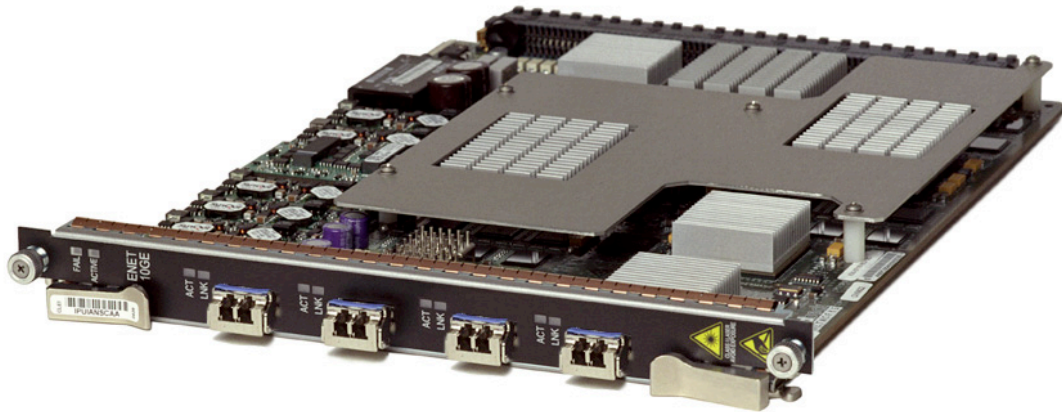# SMARTEDGE® 4X10GE LINE CARD

Carrier-class high throughput line card enables Bandwidth Intensive, Consumer and Business Applications

Key benefits

• Supported in SmartEdge 1200 –takes one slot in the chassis and the chassis can be completely populated by this line card

• 4x10GE, 2:1 over-subscribed. XFP Optical interfaces supported: SR, LR, ER, ZR,, and DWDM.

•.Supports a maximum of 20 Gbps throughput on all packet sizes.

• Managed by Ericsson's NetOp EMS and Policy Manager.

• Provides Remote Fault Indication. Can provide link notification after a 20ms Loss of Signal.

• Hot swappable for in-service insertion and removal; In-Service Software Upgrade for on-demand reconfiguration and in-service ASIC microcode updates

• Wire-speed, high-performance MPLS Provider and Provider Edge functionality

• High-capacity, efficient multicast replication for high-performance, large scale HD-IPTV deployments

• Distributed processing with no single-point-of-failure and local, wire-speed services and forwarding including RIP, OSPF, BGP4 and IS-IS

• Dynamically configurable queue sizes with up to 8 queues per port; each port can be programmed to support up to 8 different classes

• Support up to 32,000 queued subscribers and 48,000 subscribers without queues.

• Supports 40 byte packets to Jumbo frames at 9,198

Product overview

Ericsson has enhanced its SmartEdge Multi-Service Edge Router (MSER) with a high performance, high density 4-port 10 Gigabit Ethernet line card to address the service provider's requirements for network applications and services with large volumes of network traffic. The 10GE

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ports may be used to deliver Ethernet services, as uplinks to other switch/routers in the network or for co-located inter-chassis connectivity. They can also be used for user-side connectivity for a large pool of subscribers. The card is oversubscribed at a maximum of 2:1 (40Gbps over four 10GE faceplate ports with 20Gbps within the card and across the backplane). This 4X10 GE card has the same size as all the other SmartEdge line cards and occupies a single slot in the chassis.

Service delivery features, such as Quality of Service, with per subscriber per service QoS using DHCP, VLAN and PPPoE connections are also supported. This card is MEF-compliant per-VLAN policing, statistics, classification, and tagging. RFC2698 is supported to provide policing to committed and peak information rate. Traffic Management (TM) is supported in this card and can be turned on or off using configuration commands on a per port basis. When over-subscribed, traffic management is supported in two methods: priority (based on ports) with packet discard for traffic originating from trusted networks and random packet discard for non-trusted sources. On a per port basis, the card has the ability to classify, queue and schedule traffic based upon VLANs/802.1p, Q in Q, MPLS labels/EXP bits, and IP DSCP bits with 802.1p and DSCP marking and marking down of "yellow" (medium priority) frames. For congestion avoidance, Random Early Drops (RED) or Weighted RED algorithms are supported. Any combination of strict priority or packet-weighted round robin priority scheduling is supported in this card. For scheduling, Modified Deficit Round Robin (MDRR) algorithms are supported. This high performance line card supports simultaneous line rate operation on any two ports, or any distribution of traffic on all ports up to a maximum of 20Gbps.

This line card is powered by two new ASICs on board: PPA3 and PMA3 which were designed in-house, by Ericsson. Two Packet Processing ASIC III (PPA3) chips provide packet processing – one for ingress and one for egress traffic, required for routing incoming and outgoing packets. The Packet Mesh ASIC III (PMA3) provides a high bandwidth bi-directional link across the SmartEdge backplane. This advanced chip increases the inter-card communication speed within SmartEdge by 300% or higher relative to previous generation ASICs, for faster packet processing and higher overall throughput. This line card is equipped to support round trip delay time over

200KM. This feature enables the card to exert flow control over a 200KM span without loss of packets. This is a configurable option.

All of SmartEdge advanced services are available on this card, such as advanced traffic engineering with hierarchical QoS, policing, shaping, and granular rate limiting on a per subscriber per service basis. Also available are rule-based classification engine and frame parser through layer 4, including support for IPv6. Support for subscriber management, L2/L3 VPNs (e.g., VPLS, H-VPLS, IP/VPN) and application-aware QoS management, including Layer 2 to Layer 3 QoS mapping are also available. By utilizing this line card, service providers are now able to simplify their network architecture to deliver bandwidth intensive applications and services to their subscribers.

The flexibility of this card allows for the use of any link to be configured as user-side or the network-side. In addition, the uplink (network-side) ports can be on any other card, per normal SmartEdge configuration and operation.

Applications

SmartEdge 4x10GE Ethernet cards are ideal for building high speed, high performance networks for delivery of services to a large population of business and residential subscribers. Advanced traffic management and QoS enable oversubscription of incoming data and establishing a balanced I/O to the network. For those services that require multicast for delivery, replication of packets are designed in to ensure an optimized data flow within the chassis. Multicast packets are replicated and can be delivered to multiple egress cards simultaneously. Other services such as L2/L3 VPN services can be delivered to numerous medium to large enterprises with security and bandwidth management (e.g., P2P rate limiting). The service creation capabilities of the SmartEdge platform combined with the flexibility and cost efficiency of Ethernet results in a Smart Broadband Network that is personalized, adaptive, and efficient.

Technical specifications for SmartEdge 4x10GE line card

Module specifications
- Packet Forwarding Engine: PPA3 programmable ASIC providing local routing and IP services in hardware.

Ethernet features and interfaces
- Media Access Control (MAC) with full-duplex operation;
- 4x10 Gigabit Ethernet IEEE 802.3 compatible with XFP plug-in types SR, LR, ER, ZR and DWDM

High availability and redundancy
- H-VPLS, VRRP, RSTP, and Link Aggregation (802.3ad)
- In Service Software Upgrade

LEDs
- Two character displays for port status and 2 LEDs for link status display:
      Port LEDs:
      – GREEN – Active Link
      – If there is LOS, GREEN goes off to show that the port is in DOWN state
      – YELLOW – for receive signal; blinking state is use to indicate the port is transmitting or receiving data
      Status LEDs:
      – RED – Board Failure
      – GREEN - Normal operation
- ACTIVE
      – GREEN – Board in Normal Operation
- Faceplate Pushbutton: enables status cycling on port LED

Physical specifications
- Dimensions (H x W x D): 16.0 x 1.12 x 9.97 in. (40.64 x 2.83 x 25.32 cm)
- Weight: 5.5 lbs (2.5 kg) with all ports populated

Environmental specifications
- Operating temperature, nominal: 41° to 104°F (5° to 40°C)
- Operating temperature, short term: 23° to 131°F (-5° to 55°C)
- Storage temperature: -38° to 150°F (-40° to 70°C)
- Operating relative humidity: 5% to 90% RH
- Storage relative humidity: 5% to 95% RH
- Operating altitude: 60 to 4000 meters

NEBS level III compliance
- GR-1089-CORE
- GR-63-CORE
- SR-3580

Management
- RFC 2665, and RFC 2819

Regulatory compliance

Safety
- UL 60950-1
- CAN/CSA-C22.2 No. 60950-1
- EN 60950-1
- IEC 60950-1
- AS/NZS 60950-1

Emission
- ETSI EN 300 386
- FCC CFR 47 Part 15 Class A
- ICES-003 Class A
- EN55022 Class A
- EN50082-1 Class A
- CISPR 22 Class A
- VCCI Class A

Immunity
- ETSI EN 300 386
- EN 50082-1
- EN61000-4-2 ESD immunity
- EN61000-4-3 Radiated RF field immunity
- EN61000-4-4 Immunity to electrical fast transients
- EN61000-4-6 RF conducted immunity

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