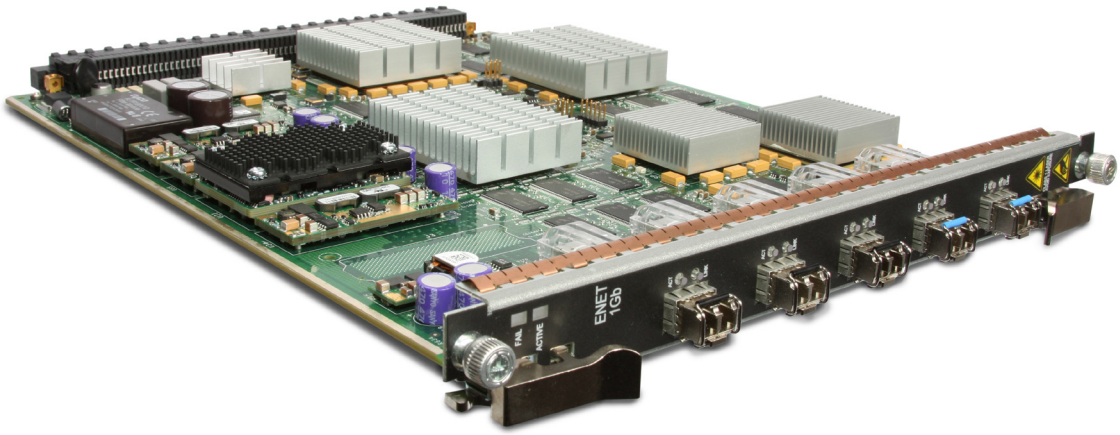
SMARTEDGE® 5X1GE LINE CARD

Carrier-class high performance line card supports feature to enable high availability for mission-critical applications



Key benefits

- Supported in SmartEdge SE400, SE800 and SE1200 – takes one slot in the chassis and the chassis can be completely populated by this line card
- Advanced Traffic Management provides hierarchical QoS, scheduling, policing, rate-limiting and shaping per-subscriber/per-application
- Dynamically configurable queues per module with up to eight (8) queues per subscriber
- High-capacity, efficient multicast replication for high-performance, large scale IP Video deployments
- Subscriber awareness and control for up to 32,000 individual subscribers per module
- Trans-generational interoperability for maximum investment preservation
- Hot swappable for in-service removal and insertion
- Supports 64 byte packets to Jumbo frames at 9,198
- Small form factor pluggable (SFP) optics for maximum deployment flexibility with optical distances of up to 70 km

Product overview

SmartEdge Gigabit Ethernet Aggregation modules are IEEE 802.3 standards-based and deliver the full range of SmartEdge Multi-Service Edge Router functionality to support the most demanding converged and triple-play broadband network deployments. These high-performance modules enable -optimized mission-critical IP services such as inter/intra-POP and Metro Ethernet aggregation deployments.

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Similar to other SmartEdge Gigabit Ethernet Aggregation modules (4-port,10-port, and 20-port densities), this card is deployable in any SmartEdge chassis line card slot. These non-blocking modules are ideal for configurations requiring the highest-levels of sustained throughput, such as higher concentrated subscriber aggregation with highly sensitive service levels.

The five port 1x GE line card will support a minimum of 32,000 active circuits. The card supports a minimum of 24,000 circuits with PWFQ policies (i.e. circuits that are subject to software-based PWFQ scheduling on egress data path), with up to eight traffic classes (or queues) per circuit.

The PPA2 programmable ASIC with 32 RISC core processors provides local routing and IP services in hardware.

Increases the reliability of the system by adding very fast detection and mechanism to find alternate paths. GE links support the BFD implementation in SEOS 5.x release for rapid fault-detection.

- Rapid Spanning Tree
- Employ Link aggregation by utilizing the extra port on the 5-port GE card as the “protecting port”

Improved Ethernet Resiliency:

Added support for LAG for Cross-connect circuits, DHCP, CLIPs

Improve high availability of DHCP subscribers with DHCP split lease BRAS – DHCP:

- Allow DHCP and CLIPS subs on same circuit
- Allow DHCP and CLIPS subs to have the same MAC Address
- Last Resort Interface support for DHCP and CLIPS

Metro Ethernet:

- Save resources by utilizing one GE port with “Bridged Virtual Interface” that combines the bridging domains and routing domains
- Save resources and operate more efficiently
- Enhance interworking by offering IP services on layer 2 attachment circuits

Advanced services and applications

Today’s converged network deployments are driven by time-sensitive and bandwidth-intensive applications that can be easily impacted by latency, jitter, and packet loss. To optimize service and application delivery across the broadband network, this new SmartEdge Gigabit Ethernet Aggregation module offers a sophisticated range of Advanced Traffic Management services including hierarchical QoS, scheduling, policing, rate limiting and traffic shaping. These Advanced Traffic Management services, coupled with inherent subscriber and application awareness, enables SmartEdge Multi-Service Edge Router to become the hierarchical access network control point that can apply network-wide control from the consolidated edge/aggregation network layer.

Controlling all traffic from a single IP-based network control-point enables simplified end-to-end traffic control and congestion management to be achieved in networks with existing legacy and layer 2 access and aggregation hardware and greatly reduces deployment complexities.

SmartEdge Gigabit Ethernet Aggregation Modules are ideal for building Smart Broadband Networks for DSLAM, CMTS, wireless or FTTx aggregation, ATM to Ethernet Migration, and Metro Ethernet Aggregation. 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 5x1GE line card

Module specifications

- Route/Switch Engine: PPA2 programmable ASIC with 32 RISC core processor providing local routing and IP services in hardware
- Interface Types: Optional Universal Small Form-factor Pluggable optics (SFPs) providing a LC-duplex connector with support for the following fiber interfaces:
  - 1000BaseSX compliant with IEEE 802.3z specifications
  - Support for additional SFPs including CWDM and DWDM, SX, LX, TX, ZX 1000BASE-X IEEE 802.3z compliant (supported in a future software release)

LEDs

- 2 LEDs per module for module status indication: ACTIVE (green or off) and FAIL (red or off)
- 2 LEDs per port for port-level indications:
  - LNK (green or off) indicates Ethernet link status
  - ACT (yellow or off) indicates whether link is receiving/transmitting frames

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)

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

Network equipment building systems

- SR-3580: Network Equipment Building Systems (NEBS): Criteria Levels (Level 3-compliant)
- GR-1089-Core: Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment
- GR-63-Core: Networks Equipment Building System (NEBS) Requirements: Physical Protection

Regulatory compliance

- UL 60950-1: 2001 - Safety of information technology equipment
- CSA 22.2 No. 60950-1-03 1st Ed, April 1, 2003 - Safety of information technology equipment
- EN 60950-1: 2001 + IEC 60950-1: 2001 - Safety of information technology equipment
- ACA TS001 - Safety Requirement for customer equipment

NEBS level III compliance

- GR-1089-CORE
- GR-63-CORE
- SR-3580

Emissions certification

- FCC CFR 47 Part 15 Class A
- EN55022: Class A
- CISPR 22:Class A
- VCCI V-3/97.04 Class A
- AS/NZS 3548: Class A
- CNS-13438 Class A - BSMI in Taiwan

Immunity

- EN61000-4-2 ESD immunity
- EN61000-4-3 Radiated RF field immunity
- EN61000-4-4 Immunity to electrical fast transients
- EN61000-4-5 Surge immunity
- EN61000-4-6 RF conducted immunity

European Telecommunication Standards Institute

- ETSI EN 300 386 : Electromagnetic compatibility and radio spectrum Matters (ERM); Telecommunication network equipment; electromagnetic Compatibility (EMC) requirements

Ethernet features

- Media Access Control (MAC) with full-duplex operation
- Compliant with Ethernet standards, including: 802.1d, 802.1p/q, 802.3z, 802.3x flow control, 802.3ad (Ethernet Link Aggregation)

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