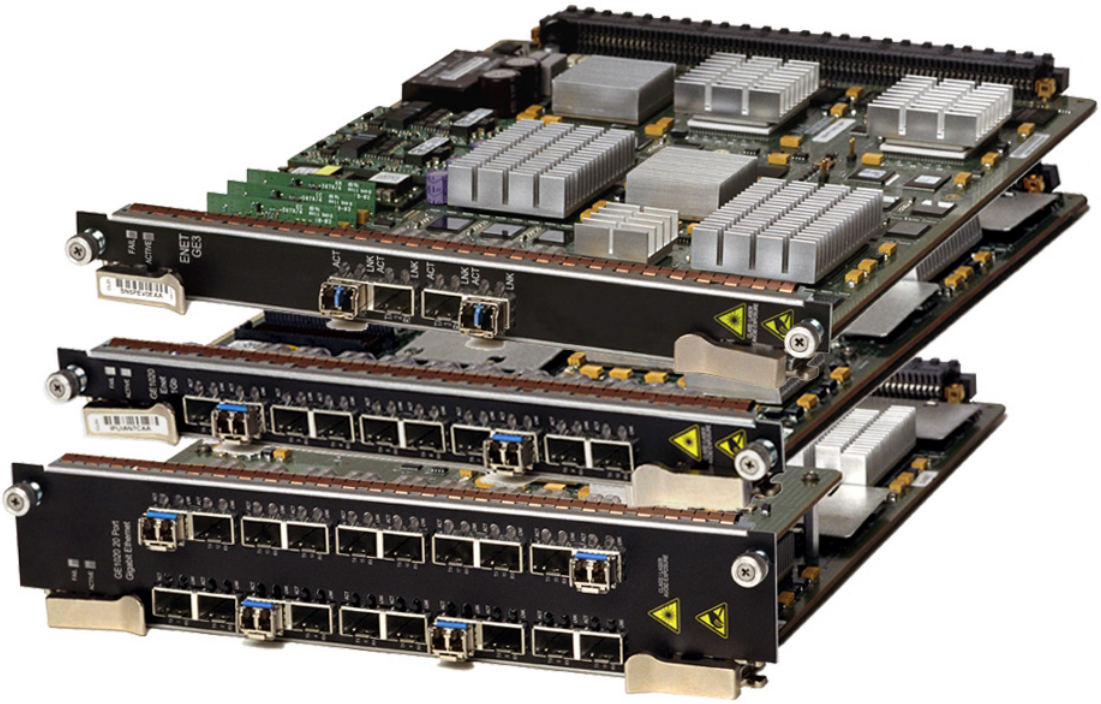
GIGABIT ETHERNET AGGREGATION MODULES 4-PORT, 10-PORT AND 20-PORT MODULES WITH ADVANCED TRAFFIC MANAGEMENT

SmartEdge® Gigabit Ethernet Aggregation modules with Advanced Traffic Management enable the deployment of highly efficient, next generation Smart Broadband Networks by facilitating the consolidation of the Ethernet aggregation network layer into the IP service network edge.



Key benefits

- Industry-leading Gigabit density with 480 wire-speed Gigabit Ethernet ports per seven-foot rack
- 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
- Distributed processing with no single-point-of-failure
- Subscriber awareness and control for up to 16,000 individual subscribers per module
- On-demand reconfiguration and in-service ASIC microcode updates
- Trans-generational interoperability for maximum investment preservation
- Hot swappable for in-service removal and insertion
- 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-

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performance modules enable highly-optimized IP services, inter/intra-POP and Metro Ethernet aggregation deployments.

SmartEdge Gigabit Ethernet Aggregation modules are available in 4-port, 10-port, and 20-port densities and are 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 20-port module is a dual-slot module that is oversubscribed on a 2:1 basis. This module is ideal for deployments where more dynamic traffic is anticipated or for the mass aggregation of lower capacity access devices. Although the 20-port module consumes two slots, aggregate chassis port density is maintained, enabling a lower cost-of-entry for transitional Ethernet deployments with a maximum port capacity per chassis.

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, SmartEdge Gigabit Ethernet Aggregation modules offer 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 Gigabit Ethernet Aggregation Modules

Module specifications

- Route/Switch Engine: PP\A2 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/LX/LH compliant with IEEE 802.3z specifications
- Support for additional SFPs including CWDM and DWDM, 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)
- Weight: 4-port Module: 4.75 lbs (2.16 kg), 10-port Module: 6.25 lbs (2.84 kg), 20-port Module: 7.25 lbs (3.29 kg)

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
- 21CRF1040, EN60825-1, EN60825-2 – Laser Safety

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)

Optical power budget

Fiber Interface	Power Budget	Output Power		Input Power	Input Sensitivity	Wavelength	
	Total	Min	Max	Max	Min	Min	Max
1000BaseSX SFP - Multi-mode fiber	7.5 dB	-9.5 dBm	-3.0 dBm	-3.0 dBm	-17.0 dBm	770 nm	860 nm
1000BaseLX SFP - Single-mode fiber	8.0 dB	-9.5 dBm	-3.0 dBm	-3.0 dBm	-19.0 dBm	1,270 nm	1,360 nm

Ericsson
100 Headquarters Drive
San Jose, CA 95134-1362 USA
Tel: +1 408 750 5000
Fax: +1 408 750 5599
www.ericsson.com

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