Highlights

- Provides a scalable network visibility node for high-capacity network monitoring

- Delivers dynamic flow programming, enabling real-time, on-demand traffic visibility

- Enables wire-speed traffic aggregation, regeneration, optimization, and load balancing to deliver maximum tool productivity

- Provides industry-leading 10 GbE, 40 GbE, and 100 GbE port density and backplane capacity, maximizing scale while minimizing space

- Offers flexible 4-, 8-, 16-, and 32-slot chassis form factors to support diverse deployment scenarios

Extreme MLXe Packet Brokers

10 GbE, 40 GbE, 100 GbE Network Packet Brokers for Carrier-Grade Network Visibility

As network traffic continues on an exponential growth curve, service providers rely on a growing ecosystem of monitoring tools to effectively secure and manage their networks. But monitoring tools, like the networks they monitor, face significant scalability challenges that result in increased costs, higher operational complexity, and reduced productivity.

To manage escalating costs and enhance tool productivity, service providers need a scalable, programmable, and intelligent visibility infrastructure that can curate traffic in order to deliver relevant flows to each individual tool.

Extreme MLXe Packet Brokers are NEBS Level 3-certified, highly scalable visibility nodes that aggregate, optimize, filter, and forward replicated traffic flows from the production network to network monitoring tools. They support API-based, dynamic programmability for real-time, on-demand traffic visibility and are ideally suited for the high-density monitoring requirements of the most demanding networks.

Interface Modules

MLXe Packet Brokers support a wide range of leading-edge interface modules for 1 GbE, 10 GbE, 40 GbE, and 100 GbE. These modules are available in multiple versions to meet different scalability requirements. This flexibility allows network operators to use a single platform, which they can optimize, for many deployment needs.

- **20×1 GbE**
  Extreme MLX® 20-port 1 GbE SFP+ and SFP combo module. License upgradable to support 10 GbE.

- **20×10/1 GbE**
  Extreme MLX 20-port 10 GbE and 1 GbE SFP+ and SFP combo module

- **4×40 GbE**
  Extreme MLX 4-port 40 GbE module with IPv4/ IPv6/ MPLS hardware support and support for QSFP+ optics, including both LR and SR

- **2×100 GbE CFP2**
  Extreme MLX 2-port 100 GbE module with IPv4/ IPv6/ MPLS hardware support and support for CFP2 optics

Key Features

Flow Aggregation and Regeneration
Wire-speed 10 GbE, 40 GbE, and 100 GbE flow filtering and forwarding on ports in a single line card or across several line cards:

- Map bidirectional (uplink and downlink) flows to the same network port

- Replicate flows from any network port to any tool port on the same or different line cards

- Aggregate flows from multiple 1 GbE, 10 GbE, or 40 GbE network ports to a single 10 GbE, 40 GbE, or 100 GbE tool port

- Distribute flows from one 10 GbE, 40 GbE, or 100 GbE network port across multiple 1 GbE, 10 GbE, or 40 GbE tool ports

- Selectively forward flows from 10 GbE, 40 GbE, and 100 GbE network ports to lower-speed tool ports

- Mirror flows across tool ports

- Dual, concurrent IPv4 and IPv6 stack support

- Burst protection with buffering on network ports

Flow Filtering
Flow selection and filtering configurable on a per-tool basis, based on:

- Layer 2, 3, and 4 criteria (5-tuple)

- Deep-packet (up to 128 bytes) pattern matching

- GTP outer and inner headers

- Packet length

- International Mobile Subscriber Identity (IMSI)

- VLAN tags

Load Balancing
Balance traffic load across multiple egress ports based on:

- Round-robin packet distribution

- IP hash

- GTP TEID and payload (inner) IP address

- International Mobile Subscriber Identity (IMSI)

Layer 2–4 Flow Optimization
Packet modification features for optimized flow delivery:

- MPLS label and VLAN tag stripping

- Port labeling

- Packet slicing

- Time stamping

Mobile (Layer 7) Flow Optimization
Stateful optimization of mobile bearer and control flows:

- GTP correlation

- Subscriber (IMSI) aware forwarding

- Inter Radio Access Type (IRAT) transfer aware forwarding

- Bearer flow deduplication (based on inner IP payload)

- Automated mobile network topology learning

Programmability
API access for real-time (sub 1 millisecond flow programming)

Specifications

Network Management
- Extreme Networks Advisor Web-based Graphical User Interface (GUI)
- Integrated industry-standard Command Line Interface (CLI)
- sFlow (RFC 3176)
- Telnet
- SNMP v1, v2c, v3
- SNMP MIB II
- RMON
- Support for automated configuration management using NETCONF
- Entity MIB (Version 3)

Element Security Options
- TLS 1.1 and 1.2
- AAA
- RADIUS
- Secure Shell (SSH v2)
- Secure Copy (SCP v2)
- HTTPs, TACACS/TACACS+
- Username/Password (Challenge and Response)
- Bi-level Access Mode (Standard and EXEC Level)
- Protection against Denial of Service (DoS) attacks, such as TCP SYN or Smurf Attacks

Environmental
- Operating temperature: 0°C to 40°C (32°F to 104°F)
- Storage temperature: -25°C to 70°C (-13°F to 158°F)
- Relative humidity: 5% to 90%, at 40°C (104°F), non-condensing
- Storage humidity: 95% maximum relative humidity, non-condensing
- Operating altitude: 6,600 feet (2,012 meters)
- Storage altitude: 15,000 feet (4,500 meters) maximum

Safety Agency Approvals
- CAN/CSA-C22.2 No. 60950-1-3
- UL 60950-1
- IEC 60950-1
- EN 60950-1 Safety of Information Technology Equipment
- EN 60825-1 Safety of Laser Products — Part 1: Equipment Classification
- Requirements and User's Guide
- EN 60825-2 Safety of Laser Product — Part 2: Safety of Optical Fibre Communication Systems

Electromagnetic Emission
- ICES-003 Electromagnetic Emission
- FCC Class A
- EN 55022/CISPR-22 Class A/VCCI Class A
- AS/NZS 55022, EN 61000-3-2 Power Line Harmonics
- EN 61000-3-3 Voltage Fluctuation and Flicker
- EN 61000-6-3 Emission Standard (supersedes EN 50081-1)

Immunity
- EN 61000-6-1 Generic Immunity and Susceptibility (supersedes EN 50082-1)
- EN 55024 Immunity Characteristics. Supersedes:
  - EN 61000-4-2 ESD
  - EN 61000-4-3 Radiated, radio frequency, electromagnetic field
  - EN 61000-4-4 Electrical fast transient
  - EN 61000-4-5 Surge
  - EN 61000-4-6 Conducted disturbances induced by radio-frequency fields
  - EN 61000-4-8 Power frequency magnetic field
  - EN 61000-4-11 Voltage dips and sags

TELCO NEBS/ETSI

Designed to meet the following specifications (formal testing under way):

- Telcordia GR-63-CORE NEBS Requirements: Physical Protection
- Telcordia GR-1089-CORE EMC and Electrical Safety
- Telcordia SR-3580 Level 3
- •ETSI ETS 300-019 Physical Protection:
  - Part 1-1, Class 1.1, Partly Temperature Controlled Storage Locations
  - Part 1-2, Class 2.3, Public Transportation
  - Part 1-3, Class 3.1 Temperature Controlled Locations (Operational)
- ETSI ETS 300-386 EMI/EMC

Power and Grounding

- ETS 300 132-1 Equipment Requirements for AC Power Equipment Derived from DC Sources
- ETS 300 132-2 Equipment Requirements for DC Powered Equipment
- ETS 300 253 Facility Requirements

Physical Design and Mounting

19-inch rack-mount supporting racks compliant with:

- ANSI/EIA-310-D
- ETS 300 119
- GR-63-CORE Seismic Zone 4

Environmental Regulatory Compliance

- EU 2002/95/EC RoHS (with lead exemption)
- EU 2002/96/EC WEEE

Network Equipment Building Standards (NEBS)

- GR-1089-CORE NEBS EMC and Safety
- GR-63 CORE: NEBS Physical Protection
- SR-3580: NEBS Criteria Levels (Level 3)

Extreme MLXe Packet Brokers at a Glance				
Capacity and Performance	**MLXe-4**	**MLXe-8**	**MLXe-16**	**MLXe-32**
Interface module slots	4	8	16	32
Switch fabric capacity	1.92 Tbps	3.84 Tbps	7.68 Tbps	15.36 Tbps
Packet forwarding performance	1.6 billion pps	2.38 billion pps	4.75 billion pps	9.5 billion pps
Ports				
Maximum 1 GbE ports	80	160	320	640
Maximum 10 GbE ports	80	160	320	640
Maximum 40 GbE ports	16	32	64	128
Maximum 100 GbE ports	8	16	32	64
Redundancy				
Management module redundancy	1:1	1:1	1:1	1:1
Switch fabric redundancy	N+1	N+1	N+1	N+1
Power supply redundancy	1+1	1+1	1+1	1+1
Power and Cooling				
Maximum DC power consumption (W)	2,083	4,060	7,107	14,232
Maximum AC power consumption (W) (100 to 240 VAC)	2,083	4,060	7,107	14,232
Maximum thermaloutput (BTU/HR)	7,108	13,858	24,255	48,575
Airflow	Side to back	Side to back	Front to back	Front to back
Dimensions				
Height (inches/centimeters/rack units)	8.71 in./22.12 cm/5U	12.21 in./31.01 cm/7U	24.50 in./62.16 cm/14U	57.75 in./146.69 cm/33U
Width (inches/centimeters)	17.20 in./43.69 cm	17.20 in./43.69 cm	17.20 in./43.69 cm	17.45 in./44.32 cm
Depth (inches/centimeters)	23.0 in./58.42 cm	24.0 in./60.96 cm 2	4.18 in./61.42 cm	26.88 in./68.28 cm
Weight (pounds/kilograms)	117 lb/53 kg	171 lb/78 kg	351 lb/159 kg	505 lb/229 kg

Extreme MLXe Packet Brokers Ordering Information	
Part Number	**Description**
BR-MLXE-4-MR2-X-AC	Extreme MLXe-4 AC system with one MR2 (X) management module, two high-speed switch fabric modules, one 1,800 W AC power supply, four exhaust fan assembly kits, and air filter. Power cord not included.
BR-MLXE-4-MR2-X-DC	Extreme MLXe-4 DC system with one MR2 (X) management module, two high-speed switch fabric modules, one 1,800 W DC power supply, four exhaust fan assembly kits, and air filter. Power cord not included.
BR-MLXE-8-MR2-X-AC	Extreme MLXe-8 AC system with one MR2 (X) management module, two high-speed switch fabric modules, one 1,800 W AC power supply, four exhaust fan assembly kits, and air filter. Power cord not included.
BR-MLXE-8-MR2-X-DC	Extreme MLXe-8 DC system with one MR2 (X) management module, two high-speed switch fabric modules, one 1,800 W DC power supply, four exhaust fan assembly kits, and air filter. Power cord not included.
BR-MLXE-16-MR2-X-AC	Extreme MLXe-16 AC system with one MR2 (X) management module, two high-speed switch fabric modules, one 1,800 W AC power supply, four exhaust fan assembly kits, and air filter. Power cord not included.
BR-MLXE-16-MR2-X-DC	Extreme MLXe-16 DC system with one MR2 (X) management module, two high-speed switch fabric modules, one 1,800 W DC power supply, four exhaust fan assembly kits, and air filter. Power cord not included.
BR-MLXE-32-MR2-X-AC	Extreme MLXe-32 AC system with one MR2 (X) management module, two high-speed switch fabric modules, one 1,800 W AC power supply, four exhaust fan assembly kits, and air filter. Power cord not included.
BR-MLXE-32-MR2-X-DC	Extreme MLXe-32 DC system with one MR2 (X) management module, two high-speed switch fabric modules, one1,800 W DC power supply, four exhaust fan assembly kits, and air filter. Power cord not included.
BR-MLX-MR2-X	Extreme MLXe system management module, 4 GB SDRAM, 2 GB internal compact flash, external compact flash slot, EIA/TIA-232 and 10/100/1000 Mbps Ethernet ports for out-of-band management
BR-MLX-32-MR2-X	Extreme MLXe 32-slot system management module, 4 GB SDRAM, 2 GB internal compact flash, external compact flash slot, EIA/TIA-232 and 10/100/1000 Mbps Ethernet ports for out-of-band management
NI-X-4-HSF	Extreme MLX 4-slot system high-speed switch fabric module
NI-X-16-8-HSF	Extreme MLX 8/16-slot system high-speed switch fabric module
NI-X-32-HSF	Extreme MLX 32-slot system high-speed switch fabric module
BR-MLX-1GX20-U10G-X2	Extreme MLX 20-port 1 GbE (X2) module. Upgradable to 10 GbE using additional software license. Supports SFP with up to 2 million IPv4 routes or 800,000 IPv6 routes in hardware. Integrated hardware-enabled MACsec.
BR-MLX-1GX20-U10GX2UPG	Extreme MLX 20-port license to upgrade from 1 GbE to 10 GbE (X2).
BR-MLX-10GX20-X2	Extreme MLX 20-port 10 GbE/1 GbE (X2) SFP+ and SFP combo module with extended route table support for up to 2.4 million IPv4 or 1.8 million IPv6 routes in hardware. Integrated hardware-enabled MACsec.
BR-MLX-40Gx4-M	Extreme MLX Series 4-port 40 GbE (M) module with IPv4/IPv6/MPLS hardware support and support for QSFP+ optics, including both LR and SR versions. Supports up to 512,000 IPv4 routes or 128,000 IPv6 routes. Requires high-speed switch fabric modules.
BR-MLX-100GX2-CFP2-X2	Extreme MLX 2-port 100 GbE (X2) CFP2 module with extended route table support for up to 2.4 million IPv4 or 1.8 million IPv6 routes in hardware.
BR-NVA-GCC	Control and management module for the Extreme MLXe Packet Brokers. Performs GTP Correlation, control functions, and dynamically reprograms outbound flows from the Extreme MLXe.

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