DATA SHEET

Brocade MLX 4-Port 40 GbE Module

HIGHLIGHTS

- Delivers high density and performance with up to 128 wire-speed ports of 40 Gigabit Ethernet (GbE) in a single Brocade MLXe chassis
- Leverages Brocade VersaScale-160 Packet Processors to enable service innovation without sacrificing performance
- Supports a rich set of Layer 2, IPv4, IPv6, MPLS, multicast, and VPLS features
- Delivers massive scalability by supporting up to 524,288 IPv4 routes, 131,072 IPv6 routes, and 1,048,576 MPLS labels
- Integrates seamlessly with existing networks to enable Software-Defined Networking (SDN) for increased agility and programmatic control, with support for OpenFlow in true hybrid port mode
- Provides a solution optimized for data center core to aggregation connectivity, data center interconnect, high-performance enterprise core, and metro Ethernet aggregation applications

Wire-Speed 40 GbE Performance and Scale for Data Center Networks

In the core of the data center, network operators need to be able to respond in real time to dynamic business needs by delivering applications and services on demand. At the same time, they must contain costs through more efficient resource utilization and simpler infrastructure design.

The Brocade® MLX® half-slot 4-port 40 Gigabit Ethernet (GbE) module for Brocade MLXe Core Routers delivers high density and performance with 128 40 GbE ports in a single chassis. Based on Brocade VersaScale-160 Packet Processors, this module provides flexibility to add new software features without compromising wire-speed performance. With support for OpenFlow, up to 524,288 IPv4 or 131,072 IPv6 routes in the Forwarding Information Base (FIB), 1,048,576 MPLS labels, and wire-speed throughput with Layer 2,

IPv4/IPv6, MPLS, VPLS/VLL, and L3 Virtual Private Network (VPN) services, the Brocade MLX 4-port 40 GbE module delivers leading density and performance to today's service provider and large enterprise networks.

High-Density Data Center Core and Interconnect

Traditional network topologies and solutions are not designed to support increasingly virtualized environments.

With the Brocade MLX 4-port 40 GbE module, in conjunction with Brocade VCS® Fabric technology, network operators can scale and extend the data center fabric across the Layer 3 boundary between and across data centers. High 40 GbE density combined with advanced Layer 3 capabilities helps consolidate devices and links needed in the data center core. Robust Link Aggregation Group (LAG) capabilities on the 40 GbE module provide capacity on demand and reduce management overhead. In addition, the module's rich feature set eliminates the need for additional edge routers by enabling Layer 3 data center interconnect with full-featured support for Access Control Lists (ACLs), routing, and forwarding in the data center core.

By consolidating devices and simplifying the network, organizations can reduce capital and operational expenditures—including power, space, and management costs—resulting in lower Total Cost of Ownership (TCO).

The Brocade VersaScale-160 Packet Processor

The Brocade MLX 4-port 40 GbE module is built on the Brocade VersaScale-160 Packet Processor. The processor is designed to enable service innovation through programmability and flexibility without sacrificing performance. The Brocade VersaScale-160 provides leading density, zero-packet loss, and line speed for all packet sizes—supporting up to 16,384 simultaneous multicast groups at line rate.

The Brocade VersaScale-160 is designed for mission-critical networks, and delivers a balance of scalability and feature richness. It provides extremely deep packet buffering to handle dynamic traffic and supports large-scale Equal-Cost Multi-Path (ECMP), which is ideal for cloud service providers, Web 2.0 companies, and High-Performance Computing (HPC) environments that need scalable solutions to handle explosive bandwidth growth and to optimize the core for efficient packet transport.

The Brocade VersaScale-160 has distributed network processing and advanced Quality of Service (QoS) capabilities to help tighten Service Level Agreements (SLAs) for traditional and value-add cloud services. As network virtualization increases through Software-Defined Networking (SDN), the ability to easily add new services and features becomes vital. The Brocade VersaScale-160 is SDN-enabled with OpenFlow support, and field-upgradable for future versions of OpenFlow and other overlay technologies.

Software Feature Highlights

Comprehensive IPv4/IPv6 and Layer 2 support:

- High-performance, robust routing using Forwarding Information Base (FIB) programming in hardware
- RIP/RIPng, OSPF/OSPFv3, IS-IS/IS-IS for IPv6, and BGP-4/BGP-MP for IPv6
- Secure Multi-VRF routing for supporting virtual routing applications over non-MPLS backbones
- VRRP and VRRP-E
- Connecting IPv6 islands over IPv4 MPLS using IPv6 Provider Edge (6PE) routers
- 6VPE enabling IPv6 multitenancy to the edge of the cloud
- BFD Holdover for OSPFv2/3 and IS-IS
- BFD for Static Routes
- BFD for OSPFv3
- ND6 IPv6 Prefix Suppress
- IS-IS Graceful Restart Helper Mode
- 127-Bit IPv6 Interface Addresses

Software-Defined Networking (SDN):

- OpenFlow 1.0
- Brocade OpenFlow hybrid port mode with support for sFlow, IP, and MPLS/VPLS (uplinks) with protected VLAN for additional flexibility
- 12-tuple matching for a diverse set of applications
- Support for up to 32,000 OpenFlow flows per module

MPLS support:

- IPoMPLS
- 6PE, 6VPE
- MPLS VPNS: L3 VPNs, L2 VPNs (VPLS, VLL)
- BGP auto-discovery for VPLS endpoints
- MPLS-PBB- (B-VID + I-SID) based interworking
- MPLS over GRE
- BFD for RSVP-TE LSPs
- LDP Inbound and Outbound FEC Filtering
- RSVP Liberal Bypass LSP Selection
- Link Protection Request for RSVP Fast Reroute
- RSVP Hello Messages for Neighbor Failure Detection
- RSVP TE Link Metric for CSPF Computation
- Static Route over RSVP LSP

Phenomenal scale:

- Carrier trunks: Advanced LAG, ECMP, LSP load balancing
- 64×40 GbE LAG

Comprehensive OAM support:

- 802.1ag, Y.1731, 802.3ah, UDLD
- BFD for BGP, OSPF, IS-IS, RSVP LSPs
- Fine-grained timers (3.3 ms) with 802.1ag

Advanced resiliency:

- NSR for OSPF, IS-IS, multicast
- Graceful restart for BGP, OSPF
- In-Service Software Upgrades (ISSU)

Scalable Carrier Ethernet:

- MEF 9, MEF 14 compliant
- G.8032 v1/v2 for ring resiliency
- MRP (Metro Ring Protocol)
- Virtual Switch Redundancy (VSRP)
- Multi-Chassis Trunking (MCT)
- Provider Backbone Bridging (PBB)

Advanced visibility, statistics:

- sFlow for granular network traffic accounting
- sFlow support for MPLS LSR and LER interfaces
- Flow- and port-based mirroring
- Per-queue counters
- Per-VLAN, port+VLAN, per-VE counters

40 GbE Port Density on Brocade MLX Series Routers

Brocade MLXe Chassis	Wire-Speed 40 GbE Ports
Brocade MLXe-4	16
Brocade MLXe-8	32
Brocade MLXe-16	64
Brocade MLXe-32	128

Brocade MLX 4-Port 40 GbE Module Specifications

Item	Maximum Capacity per Module
MAC entries	262,144
IPv4 routes	524,288
IPv6 routes	131,072
MPLS labels	1,048,576
Access Control List (ACL)	131,072

40 GbE Optics Support

Optic Type	Ethernet Standards	Domestic Safety Standards	International Safety Standards	Wavelength (nm)	Fiber Type	Maximum Cable Distance	Digital Optical Monitoring
40G-QSFP-SR4	802.3ba	FDA 21CFR 1040.10 Class 1, CSA 60950-1-03/ UL 60950-1	EN 60825-1, EN 60950-1	850	OM3 MMF	100 m	Yes
					OM4 MMF	150 m	
40G-QSFP-LR4	802.3ba			1264.5 to 1337.5	SMF	10 km	
40G-QSFP-ER4	802.3bm					40 km	

40 GbE Base QSFP+ Direct Attach Cables Ordering Information

Part Number	Description
40G-QSFP-QSFP-C-0101	40GE QSFP+ optics Active Copper Cable: 1 m
40G-QSFP-QSFP-C-0301	40GE QSFP+ optics Active Copper Cable: 3 m
40G-QSFP-QSFP-C-0501	40GE QSFP+ optics Active Copper Cable: 5 m
40G-QSFP-QSFP-AOC-1001	40GE QSFP+ optics Active Optical Cable: 10 m

Brocade MLX 4-Port 40 GbE Module Ordering Information

Part Number	Description
BR-MLX-40Gx4-M	Brocade MLXe 4-port 40 GbE (M) module with IPv4/ IPv6/MPLS hardware support—requires QSFP+ optics. Supports 524,288 IPv4 or 131,072 IPv6 routes in FIB. Requires high-speed switch fabric modules.

Brocade Global Services

Brocade Global Services has the expertise to help organizations build scalable, efficient cloud infrastructures. Leveraging 15 years of expertise in storage, networking, and virtualization, Brocade Global Services delivers world-class professional services, technical support, and education services, enabling organizations to maximize their Brocade investments, accelerate new technology deployments, and optimize the performance of networking infrastructures.

Affordable Acquisition Options

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Maximizing Investments

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