BROCADE 6910 ETHERNET ACCESS SWITCH

CARRIER-CLASS ACCESS

Carrier Ethernet Access Switch

HIGHLIGHTS

- Provides a cost-efficient, compact switch design for space-constrained environments
- Enables service providers to economically deliver high-value Ethernet services
- Combines the low cost and high capacity of Ethernet switching with the reliability, management, and service quality needed for mission-critical applications
- Provides a state-of-the-art hardware design and field-proven operating system to help ensure high reliability and resiliency
- Enables managed services through remote Ethernet monitoring and management tools
- Reduces facilities costs and cooling requirements by being able to function in extreme temperature conditions

Service providers today are focused on transforming their networks and business models to operate more efficiently and profitably. To meet these challenges, service providers need to extend their reach and offer differentiated services while reducing both cost and complexity.

The Brocade® 6910 Ethernet Access Switch provides a flexible, easy-to-deploy solution to address these challenges. Optimized for pure-play Ethernet access within metro areas, the Brocade 6910 supports applications for business Ethernet services, mobile backhaul, and next-generation broadband offerings. In addition, it offers an energy-efficient and small form-factor solution that extends wire-speed Ethernet

services to the network edge without compromising on reliability.

The Brocade 6910 helps service providers reduce operational costs by providing greater flexibility and efficiency. In addition to supporting multiple fiber or copper configurations on a single switch, it allows the same ports to be configured to connect directly to the customer or as a network interface on the service side. This ideally positions the Brocade 6910 at the edge of a broadband access network for Ethernet service demarcation, access, and aggregation—enabling service providers to economically deliver high-value Ethernet services.

BROCADE

CARRIER-CLASS PLATFORM

The Brocade 6910 is a carrier-grade access switch that meets the requirements for non-stop networking with Layer 2 services. The platform provides dual-power input for redundancy, and has been architected with a state-of-the-art hardware design and field-proven operating system to help ensure high reliability and resiliency. It combines the low cost and high capacity of Ethernet with the reliability, management, and service quality needed for mission-critical applications. With its small form factor, fanless design, and temperature-hardened specifications, the Brocade 6910 is ideal for a variety of physical environments that support enterprise customers, managed service providers, Multi-Tenant Unit (MTU)/ Multi-Dwelling Unit (MDU) deployments, and wireless backhaul providers.

Optimized for Pure-Play Ethernet

Purpose-built as an Ethernet access switch, the Brocade 6910 efficiently delivers business services to the edge while providing broadband services and business Virtual Private Network (VPN) solutions.

The Brocade 6910 utilizes industry standards, enabling seamless deployment and interoperability within the network. It supports the full suite of Layer 2 features—including Ethernet Ring Protection (G.8032), Spanning Tree Protocols (STPs), Provider Bridging (PB), and IGMP snooping—as well as Layer 3 static routing for Internet connectivity.

Flexible Service Awareness

The Brocade 6910, with its full suite of Ethernet features, provides flexible service awareness and Service Level Agreement (SLA) adherence for business Ethernet, residential broadband, and mobile backhaul services. As a pure-play Ethernet product, it includes the latest innovations in Carrier Ethernet technology, Ethernet control plane protocols, and Ethernet Operations, Administration, and Maintenance (OAM) mechanisms. The result is a leading-edge access switch that delivers advanced Layer 2 features, comprehensive Quality of Service (QoS), and robust management and performance monitoring. Using these capabilities, the Brocade 6910 can support a wide range of services, including carrier-grade Ethernet services, high-speed Internet, high-quality IPTV, and Voice over IP (VoIP) services.

SIMPLIFIED SERVICE MANAGEMENT

To remain competitive, service providers must be able to ensure network reliability and quickly resolve issues that can impact quality or service. The Brocade 6910 simplifies service management by providing service monitoring and management at the network edge. It supports industry specifications, such as IEEE 802.1ag Connectivity Fault Management and ITU-T Y.1731 Service Framework, to enable fast, proactive monitoring of end-user services.

These service monitoring and management features allow service providers to identify connectivity and performance issues, and

isolate the problem from a remote location, avoiding costly dispatch to the onsite location. In addition, the Brocade 6910 enables service providers to monitor service availability, delay, and jitter to verify SLA conformance. It also helps support non-stop networking by providing proactive notification of performance degradation before a service outage occurs.

High Reliability

The Brocade 6910 helps provide a foundation for high reliability and continuous availability. It supports G.8032 Ethernet Ring Protection Switching—which enables the network to detect and recover from incidents without impacting users—and meets the most demanding quality and availability requirements.

DIFFERENTIATED SERVICES WITH ADVANCED QoS

Today's network designs must include stringent QoS metrics that allow service providers to not only reliably deliver services, but also provide service differentiation. Typical business services are often tiered under different service levels, ranging from premium to "best-effort" services.

At each level of service, service providers must meet or exceed customer agreements—failing to do so can lead to strict financial penalties and loss of business. The Brocade 6910 supports advanced QoS capabilities (such as the use of two-rate, three-color traffic policers and priority remarking) to offer a deterministic "hard QoS" capability that meets business VPN SLAs. Each port on

the Brocade 6910 supports eight hardware queues—each with a distinct priority level—enabling service providers to sell multi-tiered business VPN services and maximize their revenue opportunities.

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, network monitoring services, and education, enabling organizations to maximize their Brocade investments, accelerate new technology deployments, and optimize the performance of networking infrastructures.
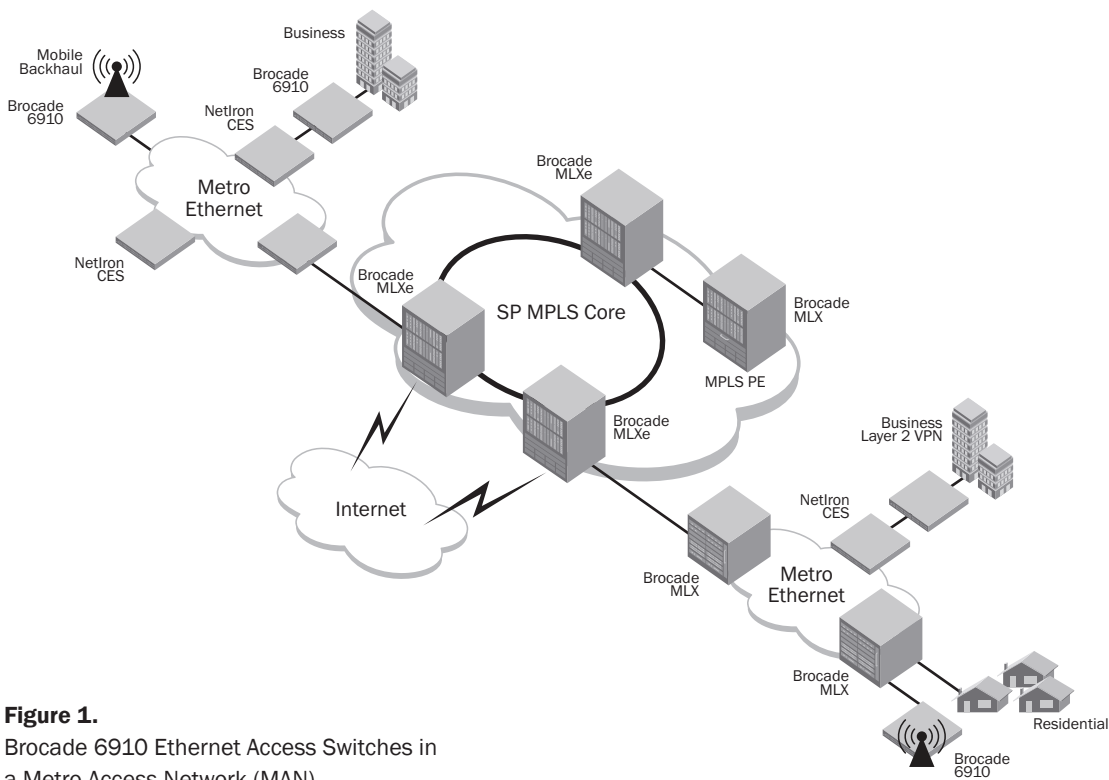
Figure 1.
Brocade 6910 Ethernet Access Switches in a Metro Access Network (MAN).

CLOUD-OPTIMIZED NETWORK ACQUISITION

Brocade helps organizations easily address their information technology requirements by offering flexible network acquisition and support alternatives to meet their financial needs. Organizations can select from purchase, lease, and Brocade Network Subscription options to align network acquisition with their unique capital requirements and risk profiles. To learn more, visit www.Brocade.com/CapitalSolutions.

MAXIMIZING INVESTMENTS

To help optimize technology investments, Brocade and its partners offer complete solutions that include professional services, technical support, and education. For more information, contact a Brocade sales partner or visit www.brocade.com.

KEY FEATURES

Carrier-grade Ethernet services
- Up to 16,000 MAC addresses
- Up to 4000 VLANs
- IEEE 802.1ad Provider Bridges
- IEEE 802.1ag Connectivity Fault Management
- ITU Y.1731 End-to-end performance measurement
- Comprehensive set of Layer 2 control protocols: RSTP, MSTP, and ITU G.8032
- MEF 9 and MEF 14 certification
- E-LINE (EPL and EVPL) ,E-LAN, and E-TREE
- Protocol tunneling of STP BPDUs
- Link aggregation with up to eight ports per LAG
- Link Aggregation Control Protocol (LACP)
- IGMP snooping
- Multicast VLAN Registration (MVR)

Traffic management
- Inbound and outbound two-rate, three-color traffic policers
- Eight queues per port, each with a distinct priority level
- Multiple queue servicing disciplines: Strict Priority, Weighted Round Robin, and hybrid

Comprehensive hardware-based security and policies
- Hardware-based ACLs (both inbound and outbound)
- Layer 2/Layer 3/Layer 4 ACL (both inbound and outbound)
- IPv6 ACL (both inbound and outbound)

Advanced monitoring capabilities
- Hardware-based sFlow sampling that allows extensive Layer 2-7 traffic monitoring for IPv4 and Carrier Ethernet services
- sFlow support

Interface capabilities
- Jumbo frame support up to 9216 bytes

Redundancy
- Dual redundant AC/DC power supplies
- Fanless design

BROCADE 6910 SPECIFICATIONS

Features	BR-6910-EAS-AC BR-6910-EAS-H-AC	BR-6910-EAS-DC BR-6910-EAS-H-DC
Port density	12 10/100/1000 RJ45 or 12 100/1000 fiber SFP	12 10/100/1000 RJ45 or 12 100/1000 fiber SFP
Forwarding performance	24 Gbps	24 Gbps
Power supply	Dual AC (1+1 redundant)	Dual DC (1+1 redundant)
Power specification	100 to 240 VAC	−20 to −60 VDC 20 to 60 VDC
Maximum power consumption	13 W (with copper RJ45 connectors) 16 W (with Brocade-approved fiber SFP transceivers)	13 W (with copper RJ45 connectors) 16 W (with Brocade-approved fiber SFP transceivers)
Maximum thermal output	44.37 BTU/hour (with copper RJ45 connectors) 54.61 BTU/hour (with Brocade-approved fiber SFP transceivers)	44.37 BTU/hour (with copper RJ45 connectors) 54.61 BTU/hour (with Brocade-approved fiber SFP transceivers)
Fan redundancy	Fanless	Fanless
Dimensions		
Brocade 6910 Ethernet Access Switch AC	44.5 mm × 440 mm × 250 mm (H×W×D) 1.75 in. × 17.3 in. × 9.8 in.	
Brocade 6910 Ethernet Access Switch DC	44.5 mm × 440 mm × 250 mm (H×W×D) 1.75 in. × 17.3 in. × 9.8 in.	

IEEE compliance

- IEEE 802.3 10Base-T
- IEEE 802.3u 100Base-TX, 100Base-FX, 100Base-LX
- IEEE 802.3z 1000Base-SX/LX
- IEEE 802.3ab 1000Base-T
- IEEE 802.3 CSMA/CD Access Method and Physical Layer Specifications
- IEEE 802.3x Flow Control
- IEEE 802.3ad Link Aggregation
- IEEE 802.1Q Virtual Bridged LANs
- IEEE 802.1D MAC Bridges
- IEEE 802.1w Rapid STP
- IEEE 802.1s Multiple Spanning Trees
- IEEE 802.1x Port-based Network Access Control
- IEEE 802.1ad Provider Bridges
- IEEE 802.1ag Connectivity Fault Management
- IEEE 802.1ab LLDP

MEF specifications

- MEF 2 Requirements and Framework for Ethernet Service Protection
- MEF 4 Metro Ethernet Network Architecture Framework Part 1: Generic Framework
- MEF 6.1 Metro Ethernet Services Definitions Phase 2
- MEF 9 Abstract Test Suite for Ethernet Services at the UNI
- MEF 10.1 Ethernet Services Attributes Phase 2
- MEF 11 User Network Interface (UNI) Requirements and Framework
- MEF 12 Metro Ethernet Network Architecture Framework Part 2: Ethernet Services Layer
- MEF 13 User Network Interface (UNI) Type 1 Implementation Agreement
- MEF 14 Abstract Test Suite for Traffic Management Phase 1
- MEF 17 Service OAM Framework and Requirements (partial)
- MEF 21 Abstract Test Suite for UNI Type 2 Part 1 Link OAM

BROCADE 6910 SPECIFICATIONS (CONTINUED)

MEF certification

- MEF 9 Abstract Test Suite for Ethernet Services at the UNI
- MEF 14 Abstract Test Suite for Traffic Management Phase 1

Network management

- Brocade Network Advisor
- Integrated industry-standard Command Line Interface (CLI)
- Web management
- sFlow (RFC 3176)
- Telnet
- SNMPv1, v2c, v3
- RMON
- SNTP

Element security options

- AAA
- RADIUS
- Secure Shell (SSH v2)
- HTTPs
- Username/Password
- TACACS/TACACS+
- Username/Password
- Bi-level Access Mode (Standard and EXEC Level)

IP features

- IPv4 static routing
- IPv4/IPv6 Management
- IPv6 Neighbor Discovery
- SNMP over IPv6
- HTTP over IPv6
- Remote IPv6 ping

Environmental

Temperature	Operating for regular models: 0°C to 55°C (32°F to 131°F)
	Operating for hardened models: −40°C to 65°C (−40°F to 149°F)
	Non-operating: −40°C to 70°C (−40°F to 158°F)
Humidity	Relative: 10% to 93% at 65°C (149°F), non-condensing
	Non-operating: 93% maximum relative humidity, non-condensing
Altitude	Operating: Up to 3000 meters (9842 feet)
	Non-operating and storage: Up to 12 kilometers (39,370 feet)

Safety agency approvals

- CAN/CSA-C22.2 No. 60950-1-3
- UL 60950-1 Information Technology Equipment - Safety - Part 1: General Requirements
- IEC 60950-1 Safety of information technology equipment
- EN 60950-1 Safety of information technology equipment, including electrical business equipment
- EN 60825-1 Safety of Laser Products—Part 1: Equipment Classification, Requirements and User's Guide
- EN 60825-2 Safety of Laser Products—Part 2: Safety of Optical Fibre Communication Systems

BROCADE 6910 SPECIFICATIONS (CONTINUED)

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

Immunity

- EN 61000-6-1 Generic Immunity and Susceptibility
- EN 55024 Immunity Characteristics:
  - EN 61000-4-2 Electrostatic discharge immunity test
  - EN 61000-4-3 Radiated, radio-frequency, electromagnetic field immunity test
  - EN 61000-4-4 Electrical fast transient/burst immunity test
  - EN 61000-4-5 Surge immunity test
  - EN 61000-4-6 Immunity to conducted disturbances, induced by radio-frequency fields
  - EN 61000-4-8 Power frequency magnetic field immunity test
  - EN 61000-4-11 Voltage dips, short interruptions, and voltage variations immunity tests

Power and grounding

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

Physical design and mounting

Rack mount	19-inch rack-mount supporting racks compliant with: • ANSI/EIA-310-D • ETS 300 119

Environmental regulatory compliance

- EU 2002/95/EC RoHS
- EU 2002/96/EC WEEE

BROCADE 6910 ORDERING INFORMATION

Product number	Description
BR-6910-EAS-AC	12×1 GbE combination copper 10/100/1000 Base-T (RJ45) or 100/1000 Base-X SFP ports, redundant AC power supply
BR-6910-EAS-DC	12×1 GbE combination copper 10/100/1000 Base-T (RJ45) or 100/1000 Base-X SFP ports, redundant DC power supply
BR-6910-EAS-H-AC	12×1 GbE combination copper 10/100/1000 Base-T (RJ45) or 100/1000 Base-X SFP ports, redundant AC power supply, temperature hardened
BR-6910-EAS-H-DC	12×1 GbE combination copper 10/100/1000 Base-T (RJ45) or 100/1000 Base-X SFP ports, redundant DC power supply, temperature hardened

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