

# Brocade 6910 Ethernet Access Switch



## HIGHLIGHTS

- Enables economical delivery of high-value Ethernet services with the reliability and service quality needed for mission-critical applications
- Provides a compact, hardened Ethernet switch designed for installation and resiliency in space-constrained, extreme environments
- Supports cost-effective managed services through remote Ethernet monitoring and management tools

## Carrier Ethernet Access Switch

Service providers today are focused on transforming their networks and business models to operate more efficiently and profitably. To meet these challenges, they 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 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 reliability.

The Brocade 6910 helps service providers reduce operational costs and improve agility for new services by providing greater flexibility and efficiency for deployment and sparing. 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.

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### KEY APPLICATIONS FOR THE BROCADE 6910

- *Managed Customer Premises Equipment (CPE) for enterprise business Ethernet services*
  - *Access switch for residential Ethernet triple-play services*
  - *Service aggregation switch deployed in business parks, Multi-Tenant Units/ Multi-Dwelling Units (MTUs/MDUs), and remote cabinets*
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## 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, and Multi-Tenant Unit/Multi-Dwelling Unit (MTU/MDU) deployments.

### **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 and residential broadband 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 20 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.

## Acquisition Options that Match Balance Sheet Objectives

Successful network deployments drive business forward, providing technical and financial agility. Brocade offers the broadest financing models, from

traditional leasing to Brocade Network Subscription. Network-as-a-Service allows operators to subscribe to network assets today then upgrade on demand, scale up or down, or return them with 60-day notification. Brocade Network Subscription plans can be structured to meet IASC guidelines for OpEx or CapEx treatment to align with financial goals. Learn more at [www.nonetworkcapex.com](http://www.nonetworkcapex.com).

## 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](http://www.brocade.com).

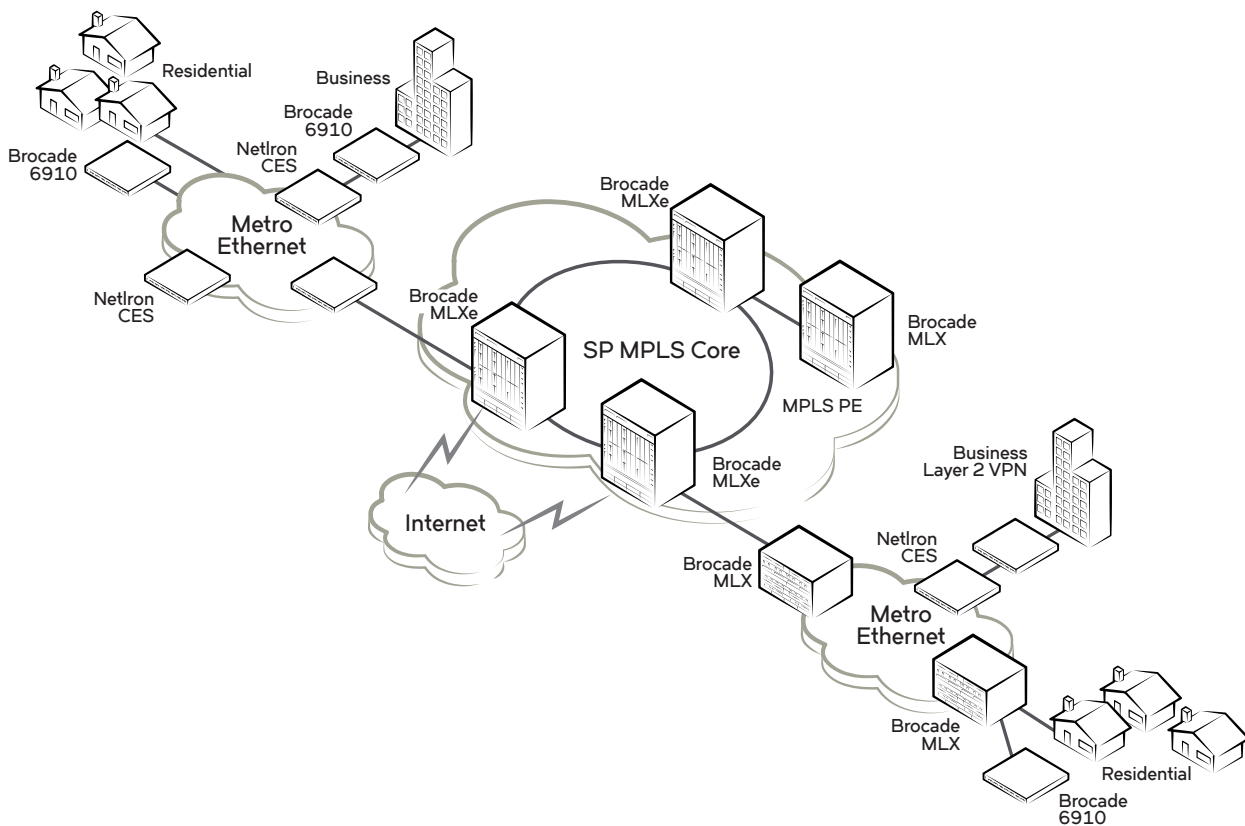


Figure 1: Brocade 6910 Ethernet Access Switches in a Metro Access Network (MAN).

## Key Features

### Carrier-grade Ethernet services

- Up to 16,000 MAC addresses
- Up to 4,000 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

- Extensive Layer 2 to Layer 7 traffic monitoring for IPv4 and Carrier Ethernet services enabled via hardware-based sFlow sampling

### Interface capabilities

- Jumbo frame support up to 9,216 bytes

### Redundancy

- Dual redundant AC/DC power supplies
- Fanless design

## Brocade 6910 Specifications

Features	BR-6910-EAS-H-AC	BR-6910-EAS-H-DC
Port density	<ul style="list-style-type: none"><li>• 12 10/100/1000 RJ45 or</li><li>• 12 100/1000 fiber SFP</li></ul>	<ul style="list-style-type: none"><li>• 12 10/100/1000 RJ45 or</li><li>• 12 100/1000 fiber SFP</li></ul>
Forwarding performance	<ul style="list-style-type: none"><li>• 24 Gbps</li></ul>	<ul style="list-style-type: none"><li>• 24 Gbps</li></ul>
Power supply	<ul style="list-style-type: none"><li>• Dual AC (1+1 redundant)</li></ul>	<ul style="list-style-type: none"><li>• Dual DC (1+1 redundant)</li></ul>
Power specification	<ul style="list-style-type: none"><li>• 100 to 240 VAC</li></ul>	<ul style="list-style-type: none"><li>• -20 to -60 VDC</li><li>• 20 to 60 VDC</li></ul>
Maximum power consumption	<ul style="list-style-type: none"><li>• 13 W</li></ul>	<ul style="list-style-type: none"><li>• 12 W</li></ul>
Maximum thermal output	<ul style="list-style-type: none"><li>• 44.36 BTU/hour</li></ul>	<ul style="list-style-type: none"><li>• 40.95 BTU/hour</li></ul>
Fan redundancy	<ul style="list-style-type: none"><li>• Fanless</li></ul>	<ul style="list-style-type: none"><li>• Fanless</li></ul>

## Brocade 6910 Specifications *(continued)*

### Dimensions

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Brocade 6910 Ethernet Access Switch AC	<ul style="list-style-type: none"><li>• 44.5 mm × 440 mm × 250 mm (H×W×D) 1.75 in. × 17.3 in. × 9.8 in.</li></ul>
Brocade 6910 Ethernet Access Switch DC	<ul style="list-style-type: none"><li>• 44.5 mm × 440 mm × 250 mm (H×W×D) 1.75 in. × 17.3 in. × 9.8 in.</li></ul>

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### IEEE compliance

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<ul style="list-style-type: none"><li>• IEEE 802.3 10Base-T</li><li>• IEEE 802.3u 100Base-TX, 100Base-FX, 100Base-LX</li><li>• IEEE 802.3z 1000Base-SX/LX</li><li>• IEEE 802.3ab 1000Base-T</li><li>• IEEE 802.3 CSMA/CD Access Method and Physical Layer Specifications</li><li>• IEEE 802.3x Flow Control</li><li>• IEEE 802.3ad Link Aggregation</li></ul>	<ul style="list-style-type: none"><li>• IEEE 802.1Q Virtual Bridged LANs</li><li>• IEEE 802.1D MAC Bridges</li><li>• IEEE 802.1w Rapid STP</li><li>• IEEE 802.1s Multiple Spanning Trees</li><li>• IEEE 802.1x Port-based Network Access Control</li><li>• IEEE 802.1ad Provider Bridges</li><li>• IEEE 802.1ag Connectivity Fault Management</li><li>• IEEE 802.1ab LLDP</li></ul>
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### MEF specifications

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<ul style="list-style-type: none"><li>• MEF 2 Requirements and Framework for Ethernet Service Protection</li><li>• MEF 4 Metro Ethernet Network Architecture Framework Part 1: Generic Framework</li><li>• MEF 6.1 Metro Ethernet Services Definitions Phase 2</li><li>• MEF 9 Abstract Test Suite for Ethernet Services at the UNI</li><li>• MEF 10.1 Ethernet Services Attributes Phase 2</li><li>• MEF 11 User Network Interface (UNI) Requirements and Framework</li></ul>	<ul style="list-style-type: none"><li>• MEF 12 Metro Ethernet Network Architecture Framework Part 2: Ethernet Services Layer</li><li>• MEF 13 User Network Interface (UNI) Type 1 Implementation Agreement</li><li>• MEF 14 Abstract Test Suite for Traffic Management Phase 1</li><li>• MEF 17 Service OAM Framework and Requirements (partial)</li><li>• MEF 21 Abstract Test Suite for UNI Type 2 Part 1 Link OAM</li></ul>
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### MEF certification

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<ul style="list-style-type: none"><li>• MEF 9 Abstract Test Suite for Ethernet Services at the UNI</li></ul>	<ul style="list-style-type: none"><li>• MEF 14 Abstract Test Suite for Traffic Management Phase 1</li></ul>
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### Network management

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<ul style="list-style-type: none"><li>• Brocade Network Advisor</li><li>• Integrated industry-standard Command Line Interface (CLI)</li><li>• Web management</li><li>• sFlow (RFC 3176)</li></ul>	<ul style="list-style-type: none"><li>• Telnet</li><li>• SNMPv1, v2c, v3</li><li>• RMON</li><li>• SNTp</li></ul>
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### Element security options

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<ul style="list-style-type: none"><li>• AAA</li><li>• RADIUS</li><li>• Secure Shell (SSH v2)</li><li>• HTTPs</li></ul>	<ul style="list-style-type: none"><li>• Username/Password</li><li>• TACACS/TACACS+</li><li>• Bi-level Access Mode (Standard and EXEC Level)</li></ul>
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### IP features

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<ul style="list-style-type: none"><li>• IPv4 Routing and Forwarding (static routing only)</li><li>• IPv4/IPv6 Management</li><li>• IPv6 Neighbor Discovery</li></ul>	<ul style="list-style-type: none"><li>• SNMP over IPv6</li><li>• HTTP over IPv6</li><li>• Remote IPv6 ping</li></ul>
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## Brocade 6910 Specifications *(continued)*

### Environmental

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Temperature	<ul style="list-style-type: none"><li>• Operating: -40°C to 65°C (-40°F to 149°F)</li><li>• Non-operating: -40°C to 70°C (-40°F to 158°F)</li></ul>
Humidity	<ul style="list-style-type: none"><li>• Relative: 10% to 93% at 65°C (149°F), non-condensing</li><li>• Non-operating: 93% maximum relative humidity, non-condensing</li></ul>
Altitude	<ul style="list-style-type: none"><li>• Operating: Up to 3,000 meters (9,842 feet)</li><li>• Non-operating and storage: Up to 12 kilometers (39,370 feet)</li></ul>

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### Safety agency approvals

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- 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
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### Electromagnetic emission

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- 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
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### Immunity

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- 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
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### Power and grounding

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- 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
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### Physical design and mounting

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Rack mount	19-inch rack-mount supporting racks compliant with: <ul style="list-style-type: none"><li>• ANSI/EIA-310-D</li><li>• ETS 300 119</li></ul>
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### Environmental regulatory compliance

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- EU 2002/95/EC RoHS
  - EU 2002/96/EC WEEE
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## Brocade 6910 Ordering Information

Product number	Description
BR-6910-EAS-H-AC	12x1 GbE combination copper 10/100/1000 Base-T (RJ45) and 12 100/1000 Base-X SFP ports (any 12 ports can be active, software selectable between copper/fiber), redundant AC power supply, temperature hardened
BR-6910-EAS-H-DC	12x1 GbE combination copper 10/100/1000 Base-T (RJ45) and 12 100/1000 Base-X SFP ports (any 12 ports can be active, software selectable between copper/fiber), redundant DC power supply, temperature hardened

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