DATA SHEET

Brocade SLX 9850 Router

HIGHLIGHTS

- Delivers up to 230 Tbps non-blocking capacity in a midplane-free platform, providing industry-leading 100/40/10 GbE port density, cost-efficiency, scale, and performance with a 1.5U module architecture designed for future growth
- Supports on-device visibility into data plane traffic with the Brocade SLX Insight Architecture
- Enables customizable, real-time monitoring via the Brocade SLX Insight Architecture for improved troubleshooting with reduced MTTR, optimized use of off-device Big Data analytics and monitoring platforms, and intelligent automation
- Incorporates turnkey and customizable cross-domain workflow automation for the entire network lifecycle through Brocade Workflow Composer and network automation suites, helping to improve business agility and innovation

Next-Generation Modular Routing Platform for the Digital Era

With mobile connectivity, cloud services, and 4K HD video streaming for billions of devices the norm, and the Internet-of-Things (IoT) and augmented reality and virtual reality on the horizon, organizations must modernize the way they communicate and conduct business. In addition to consuming an enormous amount of network capacity, these services increase operational complexity just as organizations are striving to meet customer demands for greater business agility and performance.

To succeed in the digital era, organizations need network platforms that allow them to simplify and speed up operations, without increasing costs. Such platforms incorporate innovative software to analyze and automate network operations, thereby reducing OpEx, and provide flexible deployment options with forwarding performance and scale to dramatically reduce CapEx.

Extensible Routing Platform

The Brocade® SLX® 9850 Router is designed to cost-effectively deliver the density, scale, and performance needed to address the explosive growth in network bandwidth, devices, and services—today and well into the future. This flexible platform, powered by Brocade SLX-OS, provides carrier-class advanced features that leverage proven Brocade routing technology currently deployed in the most demanding data center, service provider, and enterprise networks. And it is all delivered through best-in-class forwarding hardware. The extensible architecture is designed for investment protection, to readily support future requirements for greater bandwidth, scale, and forwarding capabilities. In addition, the Brocade SLX 9850 helps address the increasing agility and analytics needs of digital organizations with innovative network automation and visibility enabled through Brocade Workflow Composer™ and the Brocade SLX Insight Architecture.

High Availability with 230 Tbps-scale Forwarding

The Brocade SLX 9850 is the industry's most powerful IPv4, IPv6, MPLS/Multi-VRF and BGP-EVPN data center router, providing a cost-efficient solution that is

purpose-built for the most demanding service provider and enterprise data center applications. The robust system architecture, versatile feature set, and high level of flexibility enable it to scale from the data center spine to the data center core.

Designed with state-of-the-art network processing technology, the Brocade SLX 9850 has a non-blocking switching capacity of up to 230 Tbps. An advanced distributed hardware architecture with fine-grained QoS support enables full-duplex, high-speed performance for any mix of IPv4, IPv6, MPLS and BGP-EVPN VXLAN Overlay services. This innovative system architecture offers several distinguishing characteristics:

- **Clos-based distributed non-blocking architecture:** Provides the foundation for a robust, scalable data center platform.
- **Midplane-free design:** Allows interface modules to communicate directly with switch fabric modules, enabling the chassis to have an efficient front-to-back airflow design and no signal integrity degradation.
- **High-availability implementation:** Provides a clear separation between the control plane and data plane at 10 Gigabit Ethernet (GbE) speed to enable operational performance at high loads.
- **Distributed network processing, ultra-deep packet buffers, and advanced QoS capabilities across the system:** Streamlines execution of a rich feature set at high data rates, even for bursty or long-lived traffic flows.
- **Complete redundancy:** Features a fully redundant architecture with redundant power supply modules, management modules, fan modules, and switch fabric modules to minimize single points of failure.

The Brocade SLX 9850 is available in two different models: the Brocade SLX 9850-4, a four interface-slot system, and the Brocade SLX 9850-8, an eight interface-slot system. Management modules, interface modules, and power supply modules are interchangeable across both the four- and eight-slot models, thereby decreasing inventory and maintenance costs. All modules are hot-pluggable, minimizing system disruption when adding or replacing a module.

FUTURE-READY PLATFORM

Maximize investment protection with cost-efficient density, scale, and performance to handle the exponential growth in network bandwidth, devices, and services.

Brocade SLX 9850 Extensible Architecture

The Brocade SLX 9850 architecture is designed to support connectivity needs today and well into the future as bandwidth and application workload requirements grow. Its interface modules optimize port density and capabilities, leveraging the latest Intel x86 CPU and merchant silicon packet processor technology for optimal space, power, and cooling in a highly reliable, carrier-class routing platform. The Brocade SLX 9850 delivers:

- *Industry-leading 10/40/100 GbE port density/price per blade*
- *Interface modules with a 1.5U design for the highest density, routes, statistics, and policy scale*
- *Industry-leading deep buffers optimized for bursty traffic patterns*
- *Innovative midplane-free design, providing efficient airflow and internal signal integrity for optimal cooling and system performance*
- *Chassis capacity up to 230 Tbps to support massive traffic scale*

Modular, Virtualized Operating System

The Brocade SLX 9850 runs Brocade SLX-OS, a fully virtualized Linux-based operating system that delivers process-level resiliency and fault isolation.

Brocade SLX-OS supports advanced routing and MPLS features, and is highly programmable with support for REST and NETCONF, enabling full network lifecycle automation with Brocade Workflow Composer. In addition, Brocade SLX-OS is based on Ubuntu Linux, which provides all the advantages of open source and access to commonly used Linux tools.

Brocade SLX-OS runs in a virtualized environment over a KVM hypervisor, with the operating system compartmentalized and abstracted from the underlying hardware. The core operating system functions for the Brocade SLX 9850 are hosted in the system VM, which runs on both management modules in a redundant operation. The Brocade SLX 9850 interface module software is also virtualized, running in a KVM hypervisor on the local processor of the interface module.

This approach provides clean failure domain isolation for the router operating system while leveraging the x86 ecosystem, thereby removing single vendor lock-in for system tools development and delivery. Additionally, it supports a guest VM, which is an open KVM environment for running third-party and customized monitoring, troubleshooting, and analytics applications.

Embedded Network Visibility

The Brocade SLX 9850 includes the Brocade SLX Insight Architecture delivered through Brocade SLX-OS and Brocade SLX 9850 hardware innovation. This new approach to network monitoring and troubleshooting provides a highly differentiated solution that makes it faster, easier, and more cost-effective to get the comprehensive, real-time visibility needed for network operations and automation. By embedding network visibility on every switch or router, the Brocade SLX Insight Architecture can help organizations

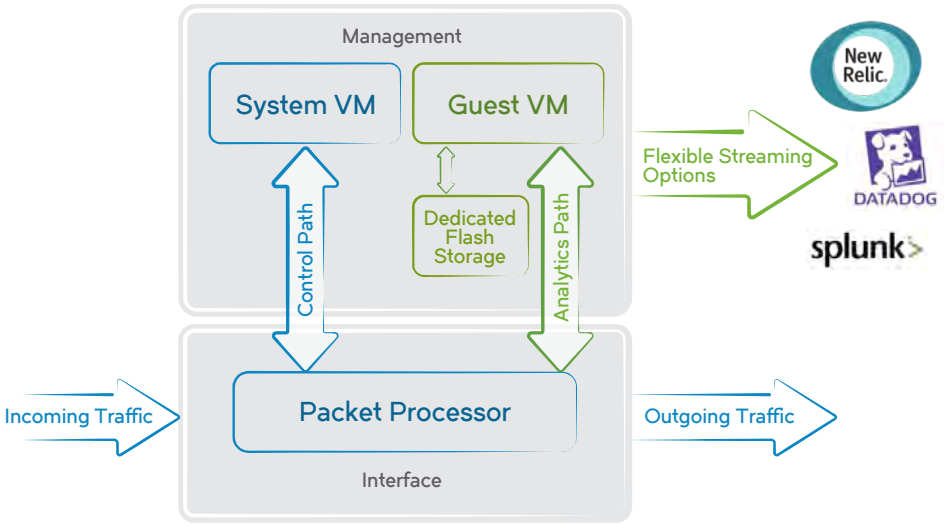


Figure 1. The Brocade SLX Insight Architecture, inherent in Brocade SLX switches and routers, delivers pervasive visibility in every device for greater insight into network traffic.

achieve pervasive visibility throughout the network to quickly and efficiently identify problems, accelerate mean-time-to-resolution, and improve overall service levels.

The highly flexible Brocade SLX Insight Architecture enables required data to be extracted from the network and optimized locally on-device for cost-effective delivery off-device to cloud-scale management, operational intelligence, and automation systems for additional analysis, action, or archiving.

As seen in Figure 1, the key components of the Brocade SLX Insight Architecture include:

- **Flexible packet filtering:** The Brocade SLX Insight Architecture begins with flexible packet filtering in the packet processors for each interface. Organizations have access to a rich set of filters for capturing the desired traffic type for visibility processing.
- **Guest VM:** The Brocade SLX Insight Architecture provides an open KVM environment that runs third-party applications and customized monitoring, troubleshooting, and analytics tools. Enabled by Brocade SLX-OS, this preconfigured guest VM is on each Brocade SLX 9850 management module. It hosts third-party network operations and analytics applications on every device, extending visibility to the entire network.
- **Dedicated analytics path:** The Brocade SLX Insight Architecture provides an innovative internal analytics path (up to 10 GbE) between the packet processor for the Brocade SLX 9850 interface module and the architecture's open KVM environment running on the Brocade SLX 9850 management module. This enables applications running in the open KVM environment to extract data without disrupting the forwarding or control plane traffic of the Brocade SLX 9850.
- **Flexible streaming:** The Brocade SLX Insight Architecture provides flexible streaming options, enabling captured data to be delivered to analytics applications off the platform. This includes a dedicated 10 GbE services port on each management module for out-of-band streaming, as well as streaming via any interface module port.[1]
- **Dedicated analytics storage:** The Brocade SLX 9850 provides 256 GB of on-device storage dedicated to the Brocade SLX Insight Architecture for applications running in the open KVM environment. This enables real-time data capture for easy and fast access.

Business Agility with Workflow Automation

With DevOps-style automation, the Brocade SLX 9850 and Brocade Workflow Composer network automation platform help organizations improve business agility and accelerate innovation by automating the entire network lifecycle—from provisioning, validation, and troubleshooting to the remediation of network services. At the same time, these solutions align workflow automation to IT operations and modern DevOps tool chains.

EMBEDDED NETWORK VISIBILITY

Keep network traffic and operations running smoothly with pervasive, real-time network analytics, monitoring, and troubleshooting.

Brocade SLX Insight Architecture

The Brocade SLX Insight Architecture delivers dynamic flow identification, intelligent pre-processing, and flexible data streaming capabilities on each router. It can support the following key network operations use cases without disrupting network traffic:

- *Real-time monitoring*
- *Overlay and underlay visibility*
- *Intelligent automation*

[1] Streaming protocols are not currently supported in Brocade SLX-OS.

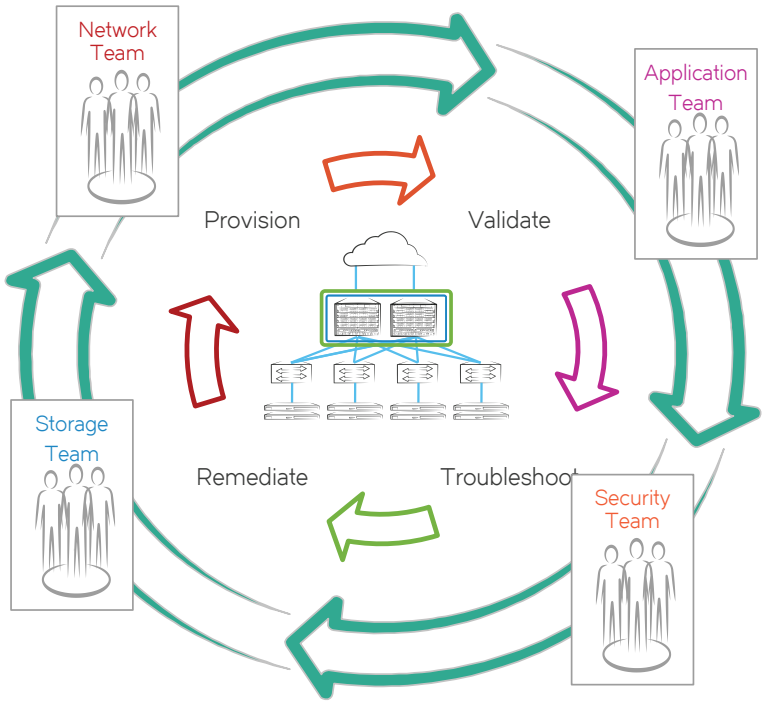


Figure 2: Software-driven workflow automation with Brocade Workflow Composer and the Brocade SLX 9850.

By automating and orchestrating across domains within the services delivery chain, Brocade Workflow Composer connects functional domains—such as the network, compute, storage, and applications—to minimize the number of transitions between functions. This streamlines the delivery of services and infrastructure changes so that they are fast, reliable, and repeatable (see Figure 2). In addition, turnkey automation suites enable organizations to easily deploy Brocade Workflow Composer with Brocade SLX switches and routers using a modular, customizable approach, helping to jumpstart the automation journey.

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.

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.

DEVOPS-STYLE AUTOMATION

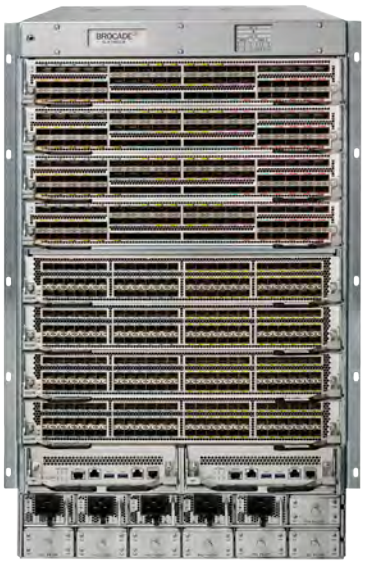
Improve business agility and accelerate innovation with cross-domain network automation.

Brocade SLX 9850 and Brocade Workflow Composer

The Brocade SLX 9850 combined with Brocade Workflow Composer enables automation of the entire network lifecycle with event-driven automation, including:

- *Automation for provisioning, validation, troubleshooting, and remediation of network services*
- *End-to-end IT workflow automation through cross-domain integration*
- *Customizable or do-it-yourself workflow automation options in multivendor network environments*
- *DevOps methodologies, open source technologies, and a thriving technical community*
- *Industry-standard REST/NETCONF-based APIs with Yang models, OpenFlow, scripting languages, and streaming APIs*
- *Turnkey automation with Brocade Workflow Composer Automation Suites for network essentials, IP fabric and IXP workflows, and Brocade SLX switches and routers*

Brocade SLX 9850 Router Features

Item	Brocade SLX 9850-4	Brocade SLX 9850-8
Front view		
Rear view with fan modules		

Brocade SLX 9850 Router Features *(continued)*

Item	Brocade SLX 9850-4	Brocade SLX 9850-8
Rear view with fan modules removed and showing switch fabric modules		
Interface module slots	4	8
Management module slots	2	2
Power supply module slots	6	12
Fan module slots	3	3
Switch fabric module slots	6	6
Maximum 100 GbE ports	144	288
Maximum 40 GbE ports	240	480
Maximum 10 GbE ports	960	1,920
Maximum 1 GbE ports	288	576
Switch fabric capacity (up to)	115 Tbps	230 Tbps
Management module redundancy	1:1	1:1
Switch fabric module redundancy	N+1	N+1
Airflow	Front to back	Front to back
Typical AC power consumption (W)	4,177[2]	8,099[2]
Maximum AC power consumption (W)	5,947	11,492
Maximum thermal output (BTU/HR)	19,465	37,980
Height (inches/centimeters/rack units)	17.50 in./44.45 cm/10 RU	29.75 in./75.57 cm/17 RU
Width (inches/centimeters)	17.22 in./43.74 cm	17.22 in./43.74 cm
Depth chassis only without ejector or fan handles (inches/centimeters)	30.0 in./76.20 cm	30.0 in./76.2 cm
Weight chassis only (pounds/kilograms)	107 lb/49 kg	179 lb/82 kg
Weight chassis with all modules (pounds/kilograms)	303 lb/138 kg	541 lb/246 kg

[2] Typical power calculation for a four-slot system is based on the interface module enabled, optics on all ports, 50 percent line-rate traffic, and 25 °C ambient temperature for a system with two management-modules, four flex-speed (D) interface modules, six switch fabric modules, and three fan modules.

Brocade SLX 9850 Interface Module Specifications

The Brocade SLX 9850 supports the following interface modules. For more information on these modules, please see the Brocade SLX 9850 Interface Modules data sheet.

Item	Modules			
	Dual-Speed (D) 72-port 10 GbE	Flex-Speed (D) 36-port 100 GbE	Dual-Speed (M) 72-port 10 GbE	Flex-Speed (M) 36-port 100 GbE
Front view of module				
Rear view of module				
100 GbE ports per module	N/A	36	N/A	36
40 GbE ports per module	N/A	60	N/A	60
10 GbE ports per module	72	240	72	240
1 GbE ports per module	72	N/A	72	N/A
Port type	10 GbE 1 GbE	100 GbE QSFP-28 40 GbE 10 GbE breakout	10 GbE 1 GbE	100 GbE QSFP-28 40 GbE 10 GbE breakout
Packet buffers per module	8 GB	24 GB	12 GB	36 GB
Route scale	256,000 (IPv4)	256,000 (IPv4)	1,000,000 (IPv4)[3]	1,000,000 (IPv4)[3]
MPLS	No	No	Yes	Yes
Carrier Ethernet 2.0	No	No	Yes[4]	Yes[4]
Typical AC power consumption (W)	250	617	250	617
Maximum AC power consumption (W)	362	856	362	856

[3] Dual-speed (M) and flex-speed (M) modules support only 256,000 (IPv4) routes in the current release of Brocade SLX-OS.

[4] Carrier Ethernet 2.0 in dual-speed (M) and flex-speed (M) modules is not supported in the current release of Brocade SLX-OS.

Brocade SLX 9850 Router Specifications

IEEE Compliance		
Ethernet	• 802.3-2005 CSMA/CD Access Method and Physical Layer Specifications • 802.3ab 1000BASE-T • 802.3ae 10 Gigabit Ethernet • 802.3u 100BASE-TX, 100BASE-T4, 100BASE-FX Fast Ethernet at 100 Mbps with Auto-Negotiation • 802.3x Flow Control • 802.3z 1000BASE-X Gigabit Ethernet over fiber optic at 1 Gbps • 802.3ad Link Aggregation	• 802.1Q Virtual Bridged LANs • 802.1D MAC Bridges • 802.1w Rapid STP • 802.1s Multiple Spanning Trees • 802.1ag Connectivity Fault Management (CFM) • 8023.ba 100 Gigabit Ethernet • 802.1ab Link Layer Discovery Protocol • 802.1x Port-Based Network Access Control • 802.3ah Ethernet in the First Mile Link OAM[5] • ITU-T G.8013/Y.1731 OAM mechanisms for Ethernet[6]

[5] Supported with Brocade SLX-OS 17r.1.00 and later software.

[6] Supported with Brocade SLX-OS 17r.1.01 and later software.

Brocade SLX 9850 Router Specifications *(continued)*

RFC Compliance

General Protocols	• RFC 768 UDP • RFC 791 IP • RFC 792 ICMP • RFC 793 TCP • RFC 826 ARP • RFC 854 TE LNET • RFC 894 IP over Ethernet • RFC 903 RARP • RFC 906 TFTP Bootstrap • RFC 950 Subnet • RFC951 BootP • RFC 1027 Proxy ARP • RFC 1042 Standard for The Transmission of IP • RFC 1166 Internet Numbers • RFC 1122 Host Extensions for IP Multicasting • RFC 1191 Path MTU Discovery • RFC 1340 Assigned Numbers • RFC 1519 CIDR • RFC 1542 BootP Extensions	• RFC 1591 DNS (client) • RFC 1812 Requirements for IPv4 Routers • RFC 1858 Security Considerations for IP Fragment Filtering • RFC 2131 BootP/DHCP Helper • RFC 2578 Structure of Management Information Version 2 • RFC 2784 Generic Routing Encapsulation • RFC 3021 Using 31-Bit Prefixes on IPv4 Point-to- Point Links • RFC 3768 VRRP • RFC 4001 Textual Conventions for Internet Network Addresses • RFC 4950 ICMP Extensions for MPLS • RFC 4459 MTU and Fragmentation • RFC 5880 Bidirectional Forwarding Detection[5] • RFC 5881 Bidirectional Forwarding Detection for IPv4 and IPv6 (Single Hop)[5] • RFC 5882 Generic Application of Bidirectional Forwarding Detection[5] • RFC 5883 Bidirectional Forwarding Detection for Multihop Paths[5]
Other Protocols	• RFC 2474 DiffServ Definition • RFC 2475 An Architecture for Differentiated Services • RFC 2597 Assured Forwarding PHB Group • RFC 2697 Single Rate Three-Color Marker • RFC 2698 A Two-Rate Three-Color Marker • RFC 3246 An Expedited Forwarding PHB • RFC 1354 IP Forwarding MIB • RFC 1757 RMON Groups 1, 2, 3, 9 • RFC 2068 HTTP • RFC 2665 Ethernet Interface MIB • RFC 2784 Generic Routing Encapsulation (GRE)	• RFC 2865 RADIUS • RFC 2863 Interfaces Group MIB • RFC 3176 sFlow • RFC 4087 IP Tunnel MIB • RFC 4133 Entity MIB • RFC 4293 - IP MIB • RFC 4741 NET CONF (Partial) • RFC 5880 Bidirectional Forwarding Detection • RFC 5905 NTP Version 4 • RFC 5961 TCP Security
BGP4	• RFC 1745 OSPF Interactions • RFC 1772 Application of BGP in the Internet • RFC 1997 Communities and Attributes • RFC 2385 BGP Session Protection via TCP MD5 • RFC 2439 Route Flap Dampening • RFC 2918 Route Refresh Capability • RFC 3392 Capability Advertisement • RFC 3682 Generalized TT L Security Mechanism for eBGP Session Protection • RFC 4271 BGPv4 • RFC 4273 BGP-4 MIB	• RFC 4364 BGP/MPLS IP Virtual Private Networks • RFC 4456 Route Reflection • RFC 4486 Sub Codes for BGP Cease Notification Message • RFC 4724 Graceful Restart Mechanism for BGP • RFC 4893 BGP Support for Four-octet AS Number Space • RFC 5065 BGP4 Confederations • RFC 5291 Outbound Route Filtering Capability for BGP-4 • RFC 5396 Textual Representation of Autonomous System (AS) Numbers • RFC 5668 4-Octect AS specific BGP Extended Community
OSPF	• RFC 2328 OSPF v2 • RFC 3101 OSPF NSSA • RFC 1745 OSPF Interactions • RFC 1765 OSPF Database Overflow • RFC 1850 OSPF v2 MIB • RFC 2154 OSPF with Digital Signature (Password, MD-5)	• RFC 3137 OSPF Stub Router Advertisement • RFC 3630 TE Extensions to OSPF v2 • RFC 3623 Graceful OSPF Restart • RFC 4222 Prioritized Treatment of Specific OSPF Version 2 • RFC 5250 OSPF Opaque LSA option

[5] Supported with Brocade SLX-OS 17r.1.00 and later software.

Brocade SLX 9850 Router Specifications *(continued)*

IS-IS	• RFC 1195 Routing in TCP/IP and Dual Environments • RFC 1142 OSI IS-IS Intra-domain Routing Protocol • RFC 3277 IS-IS Blackhole Avoidance • RFC 5120 IS-IS Multi-Topology Support • RFC 5301 Dynamic Host Name Exchange	• RFC 5302 Domain-wide Prefix Distribution • RFC 5303 Three-Way Handshake for IS-IS Point-to-Point • RFC 5304 IS-IS Cryptographic Authentication (MD-5) • RFC 5306 Restart Signaling for ISIS (helper mode) • RFC 5309 Point-to-point operation over LAN in link state routing protocols
IPv4 Multicast	• RFC 1112 IGMP v1 • RFC 2236 IGMP v2 • RFC 4601 PIM-SM • RFC 3376 IGMP v3	• RFC 4607 PIM-SSM • RFC 4610 Anycast RP using PIM • RFC 5059 BSR for PIM
QoS	• RFC 2474 DiffServ Definition • RFC 2475 An Architecture for Differentiated Services • RFC 2597 Assured Forwarding PHB Group	• RFC 2697 Single Rate Three-Color Marker • RFC 2698 A Two-Rate Three-Color Marker • RFC 3246 An Expedited Forwarding PHB
IPv6 Core	• RFC 1887 IPv6 unicast address allocation architecture • RFC 1981 IPv6 Path MTU Discovery • RFC 2375 IPv6 Multicast Address Assignments • RFC 2450 Proposed TLA and NLA Assignment Rules • RFC 2460 IPv6 Specification • RFC 2462 IPv6 Stateless Address—Auto-Configuration • RFC 2464 Transmission of IPv6 over Ethernet Networks • RFC 2471 IPv6 Testing Address allocation • RFC 2711 IPv6 Router Alert Option • RFC 3587 IPv6 Global Unicast—Address Format	• RFC 4193 Unique Local IPv6 Unicast Addresses • RFC 4291 IPv6 Addressing Architecture • RFC 4301 IP Security Architecture • RFC 4303 Encapsulation Security Payload • RFC 4305 ESP and AH cryptography • RFC 4443 ICMPv6 • RFC 4552 Auth for OSPFv3 using AH /ESP • RFC 4835 Cryptographic Alg. Req. for ESP • RFC 4816 Neighbor Discovery for IP version 6 (IPv6)
IPv6 Routing	• RFC 2740 OSPFv3 for IPv6 • RFC 5308 Routing IPv6 with IS-IS • RFC 2545 Use of BGP-MP for IPv6	• RFC 6106 Support for IPv6 Router Advertisements with DNS Attributes • RFC 6164 Using 127-Bit IPv6 Prefixes on Inter-Router Links
MPLS	• RFC 2205 RSVP v1 Functional Specification • RFC 2209 RSVP v1 Message Processing Rules • RFC 2702 TE over MPLS • RFC 2961 RSVP Refresh Overhead Reduction Extensions • RFC 3031 MPLS Architecture • RFC 3032 MPLS Label Stack Encoding • RFC 3037 LDP Applicability • RFC 3097 RSVP Cryptographic Authentication • RFC 3209 RSVP-TE • RFC 3270 MPLS Support of Differentiated Services • RFC 3813 MPLS LSR MIB • RFC 3815 Definition of Managed Objects for the MPLS, LDP • RFC 4090 Fast Reroute Extensions to RSVP-TE for LSP Tunnels; partial support	• RFC 4364 BGP/MPLS IP Virtual Private Networks • RFC 4379 OAM • RFC 4448 Encapsulation methods for transport of Ethernet over MPLS networks • RFC 4461 Signaling Requirements for Point-to-Multipoint Traffic-Engineered MPLS Label Switched Path (LSR) • RFC 4875 Extensions to RSVP-TE for P2MP TE LSPs • RFC 5036 LDP Specification • RFC 5305 ISIS-TE • RFC 5443 LDP IG P Synchronization • RFC 5561 LDP Capabilities • RFC 5712 MPLS Traffic Engineering Soft Preemption • RFC 5918 LDP “Typed Wildcard” FEC • RFC 5919 Signaling LDP Label Advertisement Completion

Brocade SLX 9850 Router Specifications *(continued)*

Layer 2 VPN and PWE3	• RFC 3343 TT L Processing in MPLS networks • RFC 3985 Pseudowire Emulation Edge to Edge (PWE3) Architecture • RFC 4364 BGP/MPLS IP Virtual Private Networks[6] • RFC 4447 Pseudowire Setup and Maintenance using LDP[5] • RFC 4448 Encapsulation Methods for Transport of Ethernet over MPLS Networks • RFC 4664 Framework for Layer 2 Virtual Private Networks • RFC 4665 Service Requirements for Layer 2 Provider-Provisioned Virtual Private Networks • RFC 4762 VPLS using LDP Signaling	• RFC 5542 Definitions of Textual Conventions for Pseudowire (PW) Management • RFC 5601 Pseudowire (PW) Management Information Base • RFC 6870 PW Preferential Forwarding Status Bit[5] • RFC 7432 BGP MPLS-Based Ethernet VPN - Partial[6] • draft-sd-l2vpn-evpn-overlay-03 A Network Virtualization Overlay Solution using EVPN[6] • draft-ietf-bess-evpn-overlay-04 A Network Virtualization Overlay Solution using EVPN with VXLAN encapsulation[6]

Network Management

• 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 NET CONF 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 55°C (–13°F to 131°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 ft (2,012 m) • Storage altitude: 15,000 ft (4,500 m) maximum

Safety Agency Approvals

• CAN/CSA-C22.2 No. 60950-1-07 • ANSI/UL 60950-1 • IEC 60950-1	• EN 60950-1 Safety of Information Technology Equipment • EN 60825-1 • EN 60825-2

Electromagnetic Emission

• ICES-003 Electromagnetic Emission • FCC Title 47, Part 15, Subpart B, Class A • EN 55032; AS/NZS CISPR 32 Class A/VCCI Class A • AS/NZS 55032	• EN 61000-3-2 Power Line Harmonics • EN 61000-3-3 Voltage Fluctuation and Flicker • IICES-003 Electromagnetic Emission

Immunity

• EN 55024 Immunity Characteristics. • 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 radiofrequency fields • EN 61000-4-8 Power frequency magnetic field • EN 61000-4-11 Voltage dips and sags

[5] Supported with Brocade SLX-OS 17r.1.00 and later software.

[6] Supported with Brocade SLX-OS 17r.1.01 and later software.

Brocade SLX 9850 Router Specifications *(continued)*

Telco NEBS/ETSI

Designed to meet the following specifications (formal testing underway):

- Telcordia GR-63-CORE NEBS Requirements: Physical Protection
- Telcordia GR-1089-CORE EMC and Electrical Safety
- ETSI ETS 300-019 Physical Protection
- ETSI EN 300-386 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

Rack mount 19-inch rack mount supporting racks compliant with:

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

Environmental Regulatory Compliance

- EU 2011/65/EU RoHS
- EU 2012/19/EU WEEE
- EC/1907/2006 REACH

Brocade SLX 9850 Ordering Information

Part Number	Description
Brocade SLX 9850 Chassis Bundles	
BR-SLX9850-4-BND-AC	Brocade SLX 9850 four-slot chassis with one management module, five switch fabric modules, two 3,000 W AC power supplies, three fan modules, and accessory kit. Power cord not included.
BR-SLX9850-4-BND-DC	Brocade SLX 9850 four-slot chassis with one management module, five switch fabric modules, two 3,000 W DC power supplies, three fan modules, and accessory kit. Power cord not included.
BR-SLX9850-8-BND-AC	Brocade SLX 9850 eight-slot chassis with one management module, five switch fabric modules, four 3,000 W AC power supplies, three fan modules, and accessory kit. Power cord not included.
BR-SLX9850-8-BND-DC	Brocade SLX 9850 eight-slot chassis with one management module, five switch fabric modules, four 3,000 W DC power supplies, three fan modules, and accessory kit. Power cord not included.
Brocade SLX 9850 Interface Modules	
BR-SLX9850-10GX72S-D	Brocade SLX 9850 72-port 10 GbE/1 GbE dual-speed (D) interface module with IPv4/IPv6 hardware support. Requires SFP+ optics for 10 GbE connectivity, and SFP optics for 1 GbE connectivity. Supports 750,000 MAC, 256,000 IPv4 routes, and 64,000 IPv6 routes.
BR-SLX9850-100GX36CQ-D	Brocade SLX 9850 36-port 100 GbE, 60-port 40 GbE, or 240-port 10 GbE flex-speed (D) interface module with IPv4/IPv6 hardware support. Requires QSFP28 optics for 100 GbE connectivity, QSFP+ optics for 40 GbE connectivity, and 40 GbE to 10 GbE breakout for 10 GbE connectivity. Supports 750,000 MAC, 256,000 IPv4 routes, and 64,000 IPv6 routes.
BR-SLX9850-10GX72S-M	Brocade SLX 9850 72-port 10 GbE/1 GbE dual-speed (M) interface module with IPv4/IPv6/MPLS hardware support. Requires SFP+ optics for 10 GbE connectivity and SFP optics for 1 GbE connectivity. Supports 750,000 MAC, 256,000 IPv4 routes, and 64,000 IPv6 routes.
BR-SLX9850-100GX36CQ-M	Brocade SLX 9850 36-port 100 GbE, 60-port 40 GbE, or 240-port 10 GbE flex-speed (M) interface module with IPv4/IPv6/MPLS hardware support. Requires QSFP28 optics for 100 GbE, QSFP+ optics for 40 GbE, and 40 GbE to 10 GbE breakout for 10 GbE connectivity. Supports 750,000 MAC, 256,000 IPv4 routes, and 64,000 IPv6 routes.

Brocade SLX 9850 Ordering Information *(continued)*

Brocade SLX 9850 Field-Replaceable Units	
XBR-SLX9850-4-S	Brocade SLX 9850 spare four-slot chassis.
XBR-SLX9850-8-S	Brocade SLX 9850 spare eight-slot chassis.
BR-SLX9850-MM	Brocade SLX 9850 management module for four-slot and eight-slot systems. Includes 16 GB RAM, two internal Solid State Drives, four-core Intel CPU, two USB 3.0 ports, two RJ-45 console ports, and 10 GbE services port.
BR-SLX9850-4-SFM	Brocade SLX 9850 switch fabric module for four-slot chassis.
BR-SLX9850-8-SFM	Brocade SLX 9850 switch fabric module for eight-slot chassis.
XBR-SLX9850-ACPWR-3000	Brocade SLX 9850 AC 3,000 W power supply for four- and eight-slot chassis, 90 V to 270 V AC input.
XBR-SLX9850-DCPWR-3000	Brocade SLX 9850 DC 3,000 W power supply for four- and eight-slot chassis, 48 V DC input.
XBR-SLX9850-4-FANM	Brocade SLX 9850 fan module for four-slot chassis. Fan module has two fans.
XBR-SLX9850-8-FANM	Brocade SLX 9850 fan module for eight-slot chassis. Fan module has four fans.
XBR-SLX9850-4-CAB	Brocade SLX 9850 Cable Management Kit for four-slot chassis.
XBR-SLX9850-8-CAB	Brocade SLX 9850 Cable Management Kit for eight-slot chassis.
XBR-SLX9850-4-SFMPNL	Brocade SLX 9850 switch fabric module blank panel for four-slot chassis.
XBR-SLX9850-8-SFMPNL	Brocade SLX 9850 switch fabric module blank panel for eight-slot chassis.
XBR-SLX9850-PWRPNL	Brocade SLX 9850 power supply blank panel for four-slot and eight-slot chassis.
XBR-SLX9850-IMPNL	Brocade SLX 9850 interface module blank panel for four-slot and eight-slot chassis.
XBR-SLX9850-MMPNL	Brocade SLX 9850 management module blank panel for four-slot and eight-slot chassis.
XBR-SLX9850-4-4PRM-KIT	Brocade SLX 9850 four-post rack mounting kit for four-slot chassis. Includes 27 to 31-inch flush and recessed mounting.
XBR-SLX9850-4-2PRM-KIT	Brocade SLX 9850 two-post rack mounting kit for four-slot chassis. Include telco flush and midplane mounting.
XBR-SLX9850-8-4PRM-KIT	Brocade SLX 9850 four-post rack mounting kit for eight-slot chassis. Includes flush and recessed mounting.

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