

Brocade SLX 9850 Router



HIGHLIGHTS

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

Next-Generation Modular Routing Platform for the Digital Era

With cloud services, 4kHD video streaming, Internet-Of-Things, and mobile connectivity for billions of devices becoming standard, organizations must modernize the way they communicate and conduct business. Not only do these new services consume an enormous amount of network capacity, they increase operational complexity just when organizations are striving to deliver the business agility and performance demanded by their customers.

In order to meet these demands, organizations require network platforms that deliver new capabilities to help analyze and automate network operations through software for reduced OpEx while providing forwarding performance and scale that dramatically reduces CapEx.

Extensible Routing Platform

The Brocade® SLX™ 9850 Router is designed to deliver the cost-effective density, scale, and performance needed to address the ongoing explosion of network bandwidth, devices and services today and in the future. This flexible platform powered by the Brocade SLX-OS provides carrier-class advanced features leveraging proven Brocade routing technology that is used in the most demanding data center, service provider, and enterprise networks today and delivered on best-in-class forwarding hardware. The extensible architecture of the Brocade SLX 9850 is designed for investment protection to readily support future needs for greater bandwidth,

scale and forwarding capabilities. Additionally, the Brocade SLX 9850 helps address the increasing agility and analytics needs of digital businesses with network automation and network visibility innovation supported through the Brocade Workflow Composer™ and the Brocade SLX Insight Architecture™.

High Availability with 230 Tbps-scale Forwarding

The Brocade SLX 9850 is the most powerful IPv4, IPv6, and MPLS/Multi-VRF data center router, providing a cost-efficient solution that is purpose-built for the most demanding service provider and enterprise data center applications.

FUTURE-READY PLATFORM

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

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 are designed to 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 price and port density per blade*
 - *Interface modules with a 1.5 RU design for the highest density, routes, statistics, and policy scale*
 - *Industry-leading deep buffers optimized for bursty traffic patterns*
 - *Innovative midplane-free design provides efficient airflow and internal signal integrity for optimal cooling and system performance*
 - *Chassis capacity up to 230 Tbps to support massive traffic scale*
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The robust system architecture, versatile feature set, and 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, and MPLS services. These capabilities are delivered through an innovative system architecture with several distinguishing characteristics:

- Clos-based distributed non-blocking architecture provides the foundation for a robust, scalable data center platform.
- A 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.
- A high-availability architecture with a clear separation between control plane and data plane at 10 Gigabit Ethernet (GbE) speed provides operational performance at high loads.
- Distributed network processing, ultra-deep packet buffers and advanced QoS capabilities across the system streamline execution of a rich feature set at high data rates even for bursty or long-lived traffic flows.
- A fully redundant architecture with redundant power supply modules, management modules, fan modules, and switch fabric modules minimizes 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.

Modular Virtualized Operating System

The Brocade SLX 9850 runs the Brocade SLX-OS, a fully virtualized Linux-based operating system that delivers process-level resiliency and fault isolation. The 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. It is based on Ubuntu Linux, which brings with it all the open-source advantages and access to commonly used Linux tools.

The Brocade SLX-OS runs in a virtualized environment over a KVM hypervisor, with the operating system compartmentalized and abstracted from 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 with the Brocade SLX-OS provides clean failure domain isolation for the router operating system while providing the ability to leverage the x86 ecosystem, removing single vendor lock-in for system tools app development and delivery. Additionally it enables support of a Guest VM which is an open Kernel-based Virtual Machine (KVM) environment to run third-party and customer-specific monitoring, troubleshooting, and analytics applications.

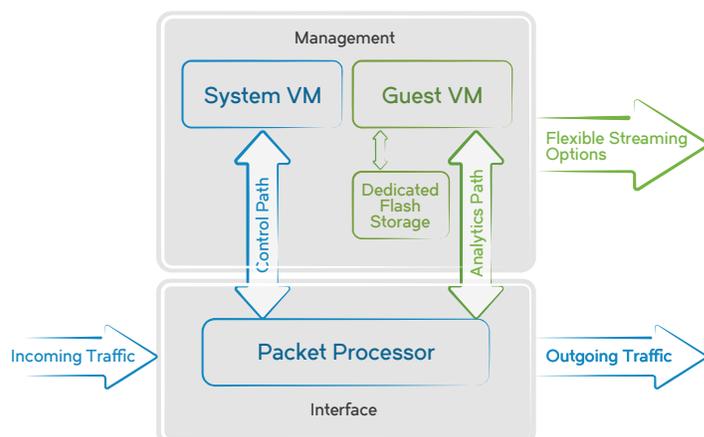


Figure 1. The Brocade SLX Insight Architecture in Brocade SLX Switches and Brocade SLX Routers delivers open visibility capability in every device for customized pervasive insight into network traffic.

Embedded Network Visibility

The Brocade SLX 9850 includes the Brocade SLX Insight Architecture delivered through the 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 router, the Brocade SLX Insight Architecture can help organizations achieve pervasive visibility throughout the network to help quickly identify problems, accelerate mean-time-to-remediation, and improve overall service levels.

The highly flexible Brocade SLX Insight Architecture enables organizations to easily deploy monitoring and troubleshooting applications throughout their networks, providing the pervasive real-time visibility they need without impacting production traffic. Embedding network visibility directly on every router in the network helps reduce costs and provides for improved service levels and monetization. Required data can

be optimized locally on-device for cost effective delivery off-device to cloud-scale management, operational intelligence or 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. This provides organizations with a rich set of filters with which they can select the exact type of traffic they want to capture for visibility processing.
- **Guest VM:** The Brocade SLX Insight Architecture provides an open KVM environment that runs third-party applications and customer-specific monitoring, troubleshooting, or analytics tools. Enabled by the Brocade SLX-OS, this preconfigured guest VM environment is provided on each Brocade SLX 9850 management module to host third-party network operations and analytics applications on every router, extending visibility to the entire network.

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 that support key network operations use cases with no disruption to network traffic:

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

- **Dedicated Analytics Path:** The Brocade SLX Insight Architecture provides an innovative internal analytics path up to 10 GbE between the packet processor on the Brocade SLX 9850 interface module and the Brocade SLX Insight Architecture 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 streaming¹ via any interface module port.
- **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, enabling real-time data capture for easy and fast access.

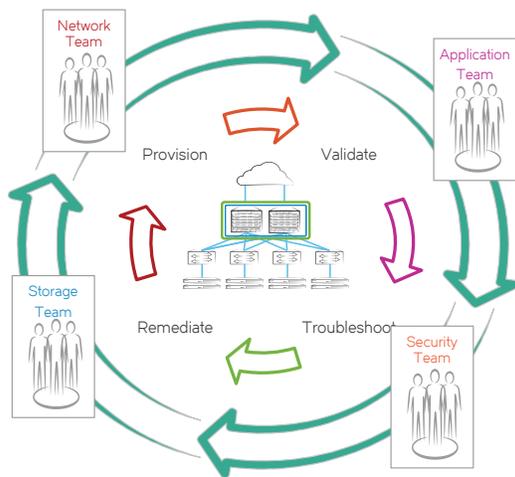


Figure 2. Software-driven workflow automation with the Brocade Workflow Composer and the Brocade SLX 9850.

Business Agility with Network 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 networks services—while also aligning to IT operations and modern DevOps tool chains.

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 they are fast, reliable, and repeatable (see Figure 2).

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.

Affordable Acquisition Options

Brocade Capital Solutions helps organizations easily address their IT requirements by offering flexible network acquisition and support alternatives. Organizations can select from purchase, lease, Brocade Network Subscription, and Brocade Subscription Plus options to align network acquisition with their unique capital requirements and risk profiles. To learn more, visit www.brocade.com/capital.

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 the Brocade Workflow Composer delivers automation for provisioning, validation, troubleshooting, and remediation of network services, including:

- *Automation of the entire network lifecycle with event-driven automation*
- *End-to-end IT workflow automation through cross-domain integration*
- *Turnkey automation with Brocade Workflow Composer automation suites for Network Essentials, IP Fabric, and IXP workflows and Brocade SLX Switches and Brocade SLX Routers*
- *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*

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

Brocade SLX 9850 Router Features

Item

SLX 9850-4

SLX 9850-8

Front view



Rear view with fan modules



Brocade SLX 9850 Router Features (Continued)

Item	SLX 9850-4	SLX 9850-8
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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

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|-----------------|--|---|
| Ethernet | <ul style="list-style-type: none">• 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 | <ul style="list-style-type: none">• 802.1Q Virtual Bridged LANs• 802.1D MAC Bridges• 802.1w Rapid STP• 802.1s Multiple Spanning Trees• 802.1ag Connectivity Fault Management (CFM)• 802.3.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• ITU-T G.8013/Y.1731 OAM mechanisms for Ethernet |
|-----------------|--|---|
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RFC Compliance

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|--------------------------|---|---|
| General Protocols | <ul style="list-style-type: none">• 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 | <ul style="list-style-type: none">• 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• RFC 5881 Bidirectional Forwarding Detection for IPv4 and IPv6 (Single Hop)• RFC 5882 Generic Application of Bidirectional Forwarding Detection• RFC 5883 Bidirectional Forwarding Detection for Multihop Paths |
|--------------------------|---|---|
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|------------------------|--|---|
| Other Protocols | <ul style="list-style-type: none">• 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 | <ul style="list-style-type: none">• 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 |
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|-------------|--|---|
| BGP4 | <ul style="list-style-type: none">• 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 TTL Security Mechanism for eBGP Session Protection• RFC 4271 BGPv4• RFC 4273 BGP-4 MIB | <ul style="list-style-type: none">• 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-Octet AS specific BGP Extended Community |
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Brocade SLX 9850 Router Specifications (Continued)

OSPF	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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
IS-IS	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • RFC 1112 IGMP v1 • RFC 2236 IGMP v2 • RFC 4601 PIM-SM • RFC 3376 IGMP v3 	<ul style="list-style-type: none"> • RFC 4607 PIM-SSM • RFC 4610 Anycast RP using PIM • RFC 5059 BSR for PIM
QoS	<ul style="list-style-type: none"> • RFC 2474 DiffServ Definition • RFC 2475 An Architecture for Differentiated Services • RFC 2597 Assured Forwarding PHB Group 	<ul style="list-style-type: none"> • RFC 2697 Single Rate Three-Color Marker • RFC 2698 A Two-Rate Three-Color Marker • RFC 3246 An Expedited Forwarding PHB
IPv6 Core	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • RFC 2740 OSPFv3 for IPv6 • RFC 5308 Routing IPv6 with IS-IS • RFC 2545 Use of BGP-MP for IPv6 	<ul style="list-style-type: none"> • RFC 6106 Support for IPv6 Router Advertisements with DNS Attributes • RFC 6164 Using 127-Bit IPv6 Prefixes on Inter-Router Links
MPLS	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 TTL Processing in MPLS networks
- RFC 3985 Pseudowire Emulation Edge to Edge (PWE3) Architecture
- RFC 4364 BGP/MPLS IP Virtual Private Networks
- RFC 4447 Pseudowire Setup and Maintenance using LDP
- 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

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

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

Brocade SLX 9850 Router Specifications (Continued)

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 4-slot chassis with 1 management module, 5 switch fabric modules, 2 3000 W AC power supplies, 3 fan modules, and accessory kit. Power cord not included.		
BR-SLX9850-4-BND-DC	Brocade SLX 9850 4-slot chassis with 1 management module, 5 switch fabric modules, 2 3000 W DC power supplies, 3 fan modules, and accessory kit. Power cord not included.		
BR-SLX9850-8-BND-AC	Brocade SLX 9850 8-slot chassis with 1 management module, 5 switch fabric modules, 4 3000 W AC power supplies, 3 fan modules, and accessory kit. Power cord not included.		
BR-SLX9850-8-BND-DC	Brocade SLX 9850 8-slot chassis with 1 management module, 5 switch fabric modules, 4 3000 W DC power supplies, 3 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.		
Part Number		Description	
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 Field-Replaceable Units			
XBR-SLX9850-4-S	Brocade SLX 9850 Spare 4-slot chassis.		
XBR-SLX9850-8-S	Brocade SLX 9850 Spare 8-slot chassis.		
BR-SLX9850-MM	Brocade SLX 9850 management module for 4-slot and 8-slot systems, includes 16 GB RAM, 2 internal Solid State Drives, 4-Core Intel CPU, 2 USB 3.0 ports, 2 RJ-45 console ports, and 10 GbE Services port.		

Brocade SLX 9850 Ordering Information (Continued)

BR-SLX9850-4-SFM	Brocade SLX 9850 switch fabric module for 4-slot chassis.
BR-SLX9850-8-SFM	Brocade SLX 9850 switch fabric module for 8-slot chassis.
XBR-SLX9850-ACPWR-3000	Brocade SLX 9850 AC 3000 W power supply for 4- and 8-slot chassis, 90-270V AC input.
XBR-SLX9850-DCPWR-3000	Brocade SLX 9850 DC 3000 W power supply for 4- and 8-slot chassis, 48 V DC input.
XBR-SLX9850-4-FANM	Brocade SLX 9850 fan module for 4-slot chassis. Fan module has 2 fans.
XBR-SLX9850-8-FANM	Brocade SLX 9850 fan module for 8-slot chassis. Fan module has 4 fans.
XBR-SLX9850-4-CAB	Brocade SLX 9850 Cable Management Kit for 4-slot chassis.
XBR-SLX9850-8-CAB	Brocade SLX 9850 Cable Management Kit for 8-slot chassis.
XBR-SLX9850-4-SFMPNL	Brocade SLX 9850 switch fabric module blank panel for 4-slot chassis.
XBR-SLX9850-8-SFMPNL	Brocade SLX 9850 switch fabric module blank panel for 8-slot chassis.
XBR-SLX9850-PWRPNL	Brocade SLX 9850 power supply blank panel for 4-slot and 8-slot chassis.
XBR-SLX9850-IMPNL	Brocade SLX 9850 interface module blank panel for 4-slot and 8-slot chassis.
XBR-SLX9850-MMPNL	Brocade SLX 9850 management module blank panel for 4-slot and 8-slot chassis.
XBR-SLX9850-4-4PRM-KIT	Brocade SLX 9850 four-post rack mounting kit for 4-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 4-slot chassis. Include telco flush and midplane mounting.
XBR-SLX9850-8-4PRM-KIT	Brocade SLX 9850 four-post rack mounting kit for 8-slot chassis. Includes flush and recessed mounting.
XBR-SLX9850-8-2PRM-KIT	Brocade SLX 9850 two-post rack mounting kit for 8-slot chassis. Includes telco flush and midplane mounting.

Corporate Headquarters

San Jose, CA USA
T: +1-408-333-8000
info@brocade.com

European Headquarters

Geneva, Switzerland
T: +41-22-799-56-40
emea-info@brocade.com

Asia Pacific Headquarters

Singapore
T: +65-6538-4700
apac-info@brocade.com



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