

18 December 2018



# Extreme SLX-OS Scale and Standards Matrix

Supporting the ExtremeRouting SLX 9850, SLX 9640, and ExtremeSwitching SLX 9540 Devices

© 2018, Extreme Networks, Inc. All Rights Reserved.

Extreme Networks and the Extreme Networks logo are trademarks or registered trademarks of Extreme Networks, Inc. in the United States and/or other countries. All other names are the property of their respective owners. For additional information on Extreme Networks Trademarks please see [www.extremenetworks.com/company/legal/trademarks](http://www.extremenetworks.com/company/legal/trademarks). Specifications and product availability are subject to change without notice.

## Contents

Document history .....	4
Preface .....	5
Contacting Extreme Technical Support.....	5
Extreme resources .....	5
Document feedback.....	6
RFC Compliance .....	7
General Protocols.....	7
Border Gateway Protocol Version 4 (BGPv4).....	9
Open Shortest Path First (OSPF) .....	11
Intermediate System to Intermediate System (IS-IS) .....	12
IPv4 Multicast.....	13
Quality of Service (QoS) .....	14
IPv6 Core .....	15
IPv6 Routing .....	17
Multiprotocol Label Switching (MPLS).....	18
Layer 2 Virtual Private Network (VPN) and Pseudowire Emulation Edge to Edge (PWE 3).....	20
Manageability and Visibility.....	22
Element Security .....	27
SLX-OS IEEE standards compliance .....	29
SLX 9850, 9640, and 9540 Scalability Matrix .....	31

# Document history

---

<b>Version</b>	<b>Summary of changes</b>	<b>Publication date</b>
1.0	Initial Release	December 18, 2018

---

# Preface

## Contacting Extreme Technical Support

As an Extreme customer, you can contact Extreme Technical Support using one of the following methods: 24x7 online or by telephone. OEM customers should contact their OEM/solution provider.

If you require assistance, contact Extreme Networks using one of the following methods:

- GTAC (Global Technical Assistance Center) for immediate support
- Phone: 1-800-998-2408 (toll-free in U.S. and Canada) or +1 408-579-2826. For the support phone number in your country, visit: [www.extremenetworks.com/support/contact](http://www.extremenetworks.com/support/contact).
- Email: [support@extremenetworks.com](mailto:support@extremenetworks.com). To expedite your message, enter the product name or model number in the subject line.
- GTAC Knowledge - Get on-demand and tested resolutions from the GTAC Knowledgebase, or create a help case if you need more guidance.
- The Hub - A forum for Extreme customers to connect with one another, get questions answered, share ideas and feedback, and get problems solved. This community is monitored by Extreme Networks employees, but is not intended to replace specific guidance from GTAC.
- Support Portal - Manage cases, downloads, service contracts, product licensing, and training and certifications.

Before contacting Extreme Networks for technical support, have the following information ready:

- Your Extreme Networks service contract number and/or serial numbers for all involved Extreme Networks products
- A description of the failure
- A description of any action(s) already taken to resolve the problem
- A description of your network environment (such as layout, cable type, other relevant environmental information)
- Network load at the time of trouble (if known)
- The device history (for example, if you have returned the device before, or if this is a recurring problem)
- Any related RMA (Return Material Authorization) numbers

## Extreme resources

Visit the Extreme website to locate related documentation for your product and additional Extreme resources.

White papers, data sheets, and the most recent versions of Extreme software and hardware manuals are available at [www.extremenetworks.com](http://www.extremenetworks.com). Product documentation for all supported releases is available to registered users at [www.extremenetworks.com/support/documentation](http://www.extremenetworks.com/support/documentation).

## Document feedback

Quality is our first concern at Extreme, and we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you.

You can provide feedback in two ways:

- Use our short online feedback form at <http://www.extremenetworks.com/documentation-feedback-pdf/>
- Email us at [internalinfodev@extremenetworks.com](mailto:internalinfodev@extremenetworks.com)

Provide the publication title, part number, and as much detail as possible, including the topic heading and page number if applicable, as well as your suggestions for improvement.

# RFC Compliance

The RFCs listed in this document were first introduced in Release 16r.1.01. Unless otherwise noted, the SLX-OS RFCs and IEEE standards are supported from Release 16r.1.01 forward.

## General Protocols

RFC number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 768	User Datagram Protocol (UDP)	X	X	X
RFC 791	Internet Protocol (IP)	X	X	X
RFC 792	Internet Control Message Protocol (ICMP)	X	X	X
RFC 793	Transmission Control Protocol (TCP)	X	X	X
RFC 826	ARP	X	X	X
RFC 894	IP over Ethernet	X	X	X
RFC 903	RARP	X	X	X
RFC 906	TFTP Bootstrap	X	X	X
RFC 950	Subnet	X	X	X
RFC 951	BootP	X	X	X
RFC 1027	Proxy ARP	X	X	X
RFC 1042	Standard for The Transmission of IP	X	X	X
RFC 1166	Internet Numbers	X	X	X
RFC 1122	Requirements for Internet Hosts	X	X	X
RFC 1191	Path MTU Discovery	X	X	X
RFC 3232	Assigned Numbers	X	X	X
RFC 4632	Classless Interdomain Routing (CIDR)	X	X	X
RFC 1542	BootP Extensions	X	X	X
RFC 1591	DNS (client)	X	X	X
RFC 2819	RMON Groups 1, 2, 3, 9	X	X	X
RFC 1812	Requirements for IP Version 4 Routers	X	X	X
RFC 1858	Security Considerations for IP Fragment Filtering	X	X	X
RFC 2131	BootP/DHCP Helper	X	X	X
RFC 2784	Generic Routing Encapsulation (GRE)	X	X	X
RFC 3021	Using 31-Bit Prefixes on IPv4 Point-to-Point Links	X	X	X
RFC 3768	Virtual Router Redundancy Protocol (VRRP)	X	X	X
RFC 4001	INET-ADDRESS-MIB	X	X	X

RFC number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 4950	ICMP Extensions for MPLS	X	X	X
RFC 5880	Bidirectional Forwarding Detection	X	X	X
RFC 5881	Bidirectional Forwarding Detection for IPv4 and IPv6 (Single Hop)	X	X	X
RFC 5882	Generic Application of Bidirectional Forwarding Detection	X	X	X
RFC 5884	Bidirectional Forwarding Detection for Multihop Paths3	X	X	X



## Border Gateway Protocol Version 4 (BGPv4)

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 1745	OSPF Interactions	X	X	X
RFC 1772	Application of BGP in the Internet	X	X	X
RFC 1997	Communities and Attributes	X	X	X
RFC 2385	BGP Session Protection via TCP MD5	X	X	X
RFC 2439	Route Flap Dampening	X	X	X
RFC 2918	Route Refresh Capability	X	X	X
RFC 3392	Capability Advertisement	X	X	X
RFC 3682	Generalized TTL Security Mechanism for eBGP Session Protection	X	X	X
RFC 4271	BGPv4	X	X	X
RFC 4364	BGP/MPLS IP Virtual Private Networks	X	X	X
RFC 4456	Route Reflection	X	X	X
RFC 4486	Sub codes for BGP Cease Notification Message	X	X	X
RFC 4724	Graceful Restart Mechanism for BGP	X	X	X
RFC 6793	BGP Support for Four-octet AS Number Space	X	X	X
RFC 5065	BGP4 Confederations	X	X	X

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 5291	Outbound Route Filtering Capability for BGP-4	X	X	X
RFC 5396	Textual Representation of Autonomous System (AS) Numbers	X	X	X
RFC 5668	4-Octet AS specific BGP Extended Community	X	X	X
Draft-ietf-rtgwg-bgp-pic-07.txt BGP Prefix Independent Convergence		X	X	X
RFC 5575	Dissemination of Flow Specification Rules (BGP Flow Spec)	X	X	X
RFC 8092	BGP Large Community Attribute	X	X	X
sFlow BGP AS path		X	X	X

## Open Shortest Path First (OSPF)

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 1745	OSPF Interactions	X	X	X
RFC 1765	OSPF Database Overflow	X	X	X
RFC 2154	OSPF w/Digital Signatures (Password, MD-5)	X	X	X
RFC 2328	OSPF v2	X	X	X
RFC 3101	OSPF NSSA	X	X	X
RFC 3137	OSPF Stub Router Advertisement	X	X	X
RFC 3623	Graceful OSPF Restart	X	X	X
RFC 3630	TE Extensions to OSPF v2	X	X	X
RFC 4222	Prioritized Treatment of Specific OSPF Version 2	X	X	X
RFC 5250	OSPF Opaque LSA Option	X	X	X

## Intermediate System to Intermediate System (IS-IS)

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 1142	OSI IS-IS Intra-domain Routing Protocol	X	X	X
RFC 1195	Routing in TCP/IP and Dual Environments	X	X	X
RFC 3277	IS-IS Blackhole Avoidance	X	X	X
RFC 5120	IS-IS Multi-Topology Support	X	X	X
RFC 5301	Dynamic Host Name Exchange	X	X	X
RFC 5302	Domain-wide Prefix Distribution	X	X	X
RFC 5303	Three-Way Handshake for IS-IS Point-to-Point	X	X	X
RFC 5304	IS-IS Cryptographic Authentication (MD-5)	X	X	X
RFC 5306	Restart Signaling for ISIS (helper mode)	X	X	X
RFC 5309	Point-to-point operation over LAN in link state routing protocol	X	X	X

## IPv4 Multicast

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 1112	IGMP v1	X	X	X
RFC 2236	IGMP v2	X	X	X
RFC 3376	IGMP v3	X	X	X
RFC 4601	PIM-SM	X	X	X
RFC 4607	PIM-SSM	X	X	X
RFC 4610	Anycast RP using PIM	X	X	X
RFC 5059	BSR for PIM	X	X	X
PIM IPv4 MCT		X	X	X

## Quality of Service (QoS)

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 2474	DiffServ Definition	X	X	X
RFC 2475	An Architecture for Differentiated Services	X	X	X
RFC 2597	Assured Forwarding PHB Group	X	X	X
RFC 2697	Single Rate Three-Color Marker	X	X	X
RFC 2698	A Two-Rate Three-Color Marker	X	X	X
RFC 3246	An Expedited Forwarding PHB	X	X	X

## IPv6 Core

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 1887	IPv6 unicast address allocation architecture	X	X	X
RFC 1981	IPv6 Path MTU Discovery	X	X	X
RFC 8201	IPv6 Path MTU Discovery	X	X	X
RFC 2375	IPv6 Multicast Address Assignments	X	X	X
RFC 2450	Proposed TLA and NLA Assignment Rules	X	X	X
RFC 2460	IPv6 Specification	X	X	X
RFC 8200	IPv6 Specification	X	X	X
RFC 4861	IPv6 Neighbor Discovery	X	X	X
RFC 4862	IPv6 Stateless Address Auto-configuration	X	X	X
RFC 2464	Transmission of IPv6 over Ethernet Networks	X	X	X
RFC 2471	IPv6 Testing Address allocation	X	X	X
RFC 3701	IPv6 Testing Address allocation	X	X	X
RFC 2711	IPv6 Router Alert Option	X	X	X
RFC 3315	Dynamic Host Configuration Protocol for IPv6 (DHCPv6)	X	X	X
RFC 3587	IPv6 Global Unicast Address Format	X	X	X
RFC 4193	Unique Local IPv6 Unicast Addresses	X	X	X

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 4291	IPv6 Addressing architecture	X	X	X
RFC 4301	IP Security Architecture	X	X	X
RFC 4303	Encapsulating Security Payload (ESP)	X	X	X
RFC 4305	ESP and AH cryptography	X	X	X
RFC 4443	ICMPv6	X	X	X
RFC 4552	Auth for OSPFv3 using AH/ESP	X	X	X
RFC 4835	Cryptographic Alg. Req. for ESP	X	X	X
RFC 4861	Neighbor Discovery for IP version 6 (IPv6)	X	X	X
RFC 3315	Dynamic Host Configuration Protocol for IPv6 (DHCPv6)	X	X	X



## IPv6 Routing

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 1724	RIPv2-MIB	X	X	X
RFC 5340	OSPFv3 for IPv6	X	X	X
RFC 5308	Routing IPv6 with IS-IS	X	X	X
RFC 2545	Use of BGP-MP for IPv6	X	X	X
RFC 8106	Support for IPv6 Router Advertisements with DNS Attributes	X	X	X
RFC 6164	Using 127-Bit IPv6 Prefixes on Inter-Router Links	X	X	X

## Multiprotocol Label Switching (MPLS)

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 2205	RSVP v1 Functional Specification	X	X	X
RFC 2209	RSVP v1 Message Processing Rules	X	X	X
RFC 2674	P-BRIDGE-MIB	X	X	X
RFC 2702	TE over MPLS	X	X	X
RFC 2961	RSVP Refresh Overhead Reduction Extensions	X	X	X
RFC 3031	MPLS Architecture	X	X	X
RFC 3032	MPLS Label Stack Encoding	X	X	X
RFC 3037	LDP Applicability	X	X	X
RFC 3097	RSVP Cryptographic Authentication	X	X	X
RFC 3209	RSVP-TE	X	X	X
RFC 3270	MPLS Support of Differentiated Services	X	X	X
RFC 3478	LDP Graceful Restart	X	X	X
RFC 3813	MPLS-LSR-STD-MIB	X	X	X
RFC 3815	MPLS-LDP-STD-MIB MPLS-LDP-GENERIC-STD-MIB	X	X	X
RFC 4090	Fast Re-Route for RSVP-TE for LSP Tunnels; partial support	X	X	X
RFC 4379	OAM	X	X	X

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 4448	Encapsulation Methods for Transport of Ethernet over MPLS Networks	X	X	X
RFC 5036	LDP Specification	X	X	X
RFC 5305	ISIS-TE	X	X	X
RFC 5443	LDP IGP Synchronization	X	X	X
RFC 5561	LDP Capabilities	X	X	X
RFC 5712	MPLS traffic Engineering Soft Preemption	X	X	X
RFC 5918	LDP "Typed Wildcard" FEC	X	X	X
RFC 5919	Signaling LDP Label Advertisement Completion	X	X	X

## Layer 2 Virtual Private Network (VPN) and Pseudowire Emulation Edge to Edge (PWE 3)

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 3343	TTL Processing in MPLS Networks	X	X	X
RFC 3985	Pseudowire Emulation Edge to Edge (PWE3) Architecture	X	X	X
RFC 4265	VPN-TC-STD-MIB	X	X	X
RFC 4364	BGP/MPLS IP Virtual Private Networks4	X	X	X
RFC 4447	Pseudowire Setup and Maintenance using LDP	X	X	X
RFC 4448	Encapsulation Methods for Transport of Ethernet Frames Over IP/MPLS Networks	X	X	X
RFC 4664	Framework for Layer 2 Virtual Private Networks	X	X	X
RFC 4665	Service Requirements for Layer 2 Provider- Provisioned Virtual Private Networks	X	X	X
RFC 4762	Virtual Private LAN Service (VPLS) Using LDP Signaling	X	X	X
RFC 5542	PW-TC-STD-MIB	X	X	X
RFC 5601	IANA-PWE3-MIB PW-STD-MIB	X	X	X
RFC 6391	Flow-Aware Transport of Pseudowires	X	X	X

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 6870	PW Preferential Forwarding Status Bit3	X	X	X
RFC 7432	BGP MPLS-Based Ethernet VPN - Partial4	X	X	X
RFC 7348	Virtual eXtensible Local Area Network (VXLAN): A Framework for Overlaying Virtualized Layer 2 Networks over Layer 3 Networks (Partial)	X	X	X
draft-sd-l2vpn-evpn-overlay-03 (A Network Virtualization Overlay Solution using EVPN) Partial4		X	X	X
draft-ietf-bess-evpn-overlay-04 (A Network Virtualization Overlay Solution using EVPN with VXLAN encapsulation) Partial4		X	X	X
draft-ietf-bess-evpn-overlay-12 A Network Virtualization Overlay Solution using EVPN		X	X	X
draft-ietf-bess-evpn-igmp-mln-proxy-00 (IGMP and MLD Proxy for EVPN)		X	X	X

## Manageability and Visibility

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
	Integrated industry-standard Command Line Interface (CLI)	X	X	X
RFC 854	Telnet	X	X	X
RFC 1513	TOKEN-RING-RMON-MIB	X	X	X
RFC 1573	IANAifType-MIB	X	X	X
RFC 2068	HTTP	X	X	X
RFC 2571	SNMP-FRAMEWORK-MIB	X	X	X
RFC 2572	SNMP-MPD-MIB	X	X	X
RFC 2573	SNMP-TARGET-MIB SNMP-NOTIFICATION-MIB	X	X	X
RFC 2574	SNMP-USER-BASED-SM-MIB	X	X	X
RFC 2575	SNMP-VIEW-BASED-ACM-MIB	X	X	X
RFC 2576	SNMP-COMMUNITY-MIB	X	X	X
RFC 2818	HTTPS	X	X	X
RFC 2665	Ethernet Interface MIB	X	X	X
RFC 2677	IANA-ADDRESS-FAMILY-NUMBERS-MIB	X	X	X
	IANA ifType-MIB [ <a href="https://www.iana.org/assignments/ianaiftype-mip/ianaiftype-mib">https://www.iana.org/assignments/ianaiftype-mip/ianaiftype-mib</a> ]	X	X	X
RFC 2790	HOST-RESOURCES-MIB	X	X	X
RFC 2856	HCNUM-TC	X	X	X
RFC 2863	IF-MIB	X	X	X

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 2932	IANA-RTPROTO-MIB	X	X	X
RFC 3176	sFlow	X	X	X
sFlow extension to VXLAN		X	X	X
RFC 3273	RMON2-MIB	X	X	X
RFC 3289	DIFFSERV-DSCP-TC INTEGRATED-SERVICES-MIB DIFFSERV-MIB	X	X	X
RFC 3418	SNMPv2-MIB	X	X	X
RFC 3584	Coexistence between Version 1, Version 2, and Version 3 of the Internet-standard Network Management Framework	X	X	X
RFC 3419	TRANSPORT-ADDRESS-MIB	X	X	X
RFC 3593	PerfHist-TC-MIB	X	X	X
RFC 3705	HC-PerfHist-TC-MIB	X	X	X
sFlow Version 5 and sFlow VxLAN extensions		X	X	X
Secure Copy (SCP v2) SFTP		X	X	X
SFTP		X	X	X
RFC 8040	RESTCONF Protocol – PATCH, PUT, POST, DELETE support	X	X	X
RFC 4022	TCP-MIB	X	X	X
RFC 4087	IP Tunnel MIB	X	X	X
RFC 4113	UDP-MIB	X	X	X
RFC 4133	Entity MIB	X	X	X
RFC 4253	Secure Shell (SSH)	X	X	X

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 4254	Secure Shell (SSH) Connection Protocol	X	X	X
RFC 4344	SSH Transport Layer Encryption Modes	X	X	X
RFC 4419	Diffie-Hellman Group Exchange for the Secure Shell (SSH) Transport Layer Protocol	X	X	X
draft-ietf-secsh-filexfer-13.txt SSH File Transfer Protocol (SFTP)		X	X	X
Secure Copy (SCP v2)		X	X	X
RFC 4293	IP MIB	X	X	X
RFC 4741	NETCONF (Partial)	X	X	X
OpenFlow 1.3		X	X	X
Chrome		X	X	X
Curl		X	X	X
Tcpdump		X	X	X
Wireshark		X	X	X
SNMP v1/v2c/v3		X	X	X
RFC 1157	Simple Network Management Protocol	X	X	X
RFC 1908	Coexistence between Version 1 and Version 2 of the Internet-standard Network Management Framework	X	X	X
RFC 2578	Structure of Management Information Version 2	X	X	X
RFC 2579	Textual Conventions for SMIV2	X	X	X



RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 2580	Conformance Statements for SMIV2	X	X	X
RFC 3410	Introduction and Applicability Statements for Internet Standard Management Framework	X	X	X
RFC 3411	An Architecture for Describing SNMP Management Frameworks	X	X	X
RFC 3412	Message Processing and Dispatching	X	X	X
RFC 3413	SNMP Applications	X	X	X
RFC 3414	User-based Security Model	X	X	X
RFC 3415	View-based Access Control Model	X	X	X
RFC 3416	Version 2 of SNMP Protocol Operations	X	X	X
RFC 3417	Transport Mappings	X	X	X
RFC 2819	RMON Groups 1, 2, 3, 9	X	X	X
IEEE8021-PAE-MIB		X	X	X
IEEE802 LLDP MIB		X	X	X
IEEE8023-LAGMIB		X	X	X
RFC 1213	MIB-II	X	X	X
RFC 4292	IP-FORWARD-MIB	X	X	X
RFC 4188	BRIDGE-MIB	X	X	X
RFC 4750	OSPF-MIB	X	X	X

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 4363	Q-BRIDGE-MIB	X	X	X
RFC 3635	EtherLike-MIB	X	X	X
RFC 3811	MPLS TC STD MIB	X	X	X
RFC 3812	MPLS-TE-STD-MIB	X	X	X
RFC 3813	MPLS-LSR-STD-MIB	X	X	X
RFC 3826	SNMP-USM-AES MIB	X	X	X
RFC 4273	BGP4-MIB	X	X	X
RFC 4318	RSTP-MIB	X	X	X
RFC 4444	ISIS-MIB	X	X	X
RFC 4878	DOT3-OAM-MIB	X	X	X
RFC 7257	VPLS-GENERIC-MIB VPLS-LDP-MIB VPLS-BGP-MIB	X	X	X
RFC 7330	BFD-TC-STD-MIB IANA-BFD-TC-STD-MIB	X	X	X
RFC 7331	BFD-STD-MIB	X	X	X

## Element Security

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
AAA		X	X	X
Username/Password (Challenge and Response)		X	X	X
Bi-level Access Mode (Standard and EXEC Level)		X	X	X
Role-based Access Control (RBAC)		X	X	X
RFC 2865	RADIUS	X	X	X
RFC 2866	RADIUS Accounting	X	X	X
TACACS/TACACS+		X	X	X
RFC 5905	NTP Version 4	X	X	X
RFC 3986	Uniform Resource Identifier (URI): Generic Syntax	X	X	X
RFC 6241	NETCONF Configuration Protocol (Partial)	X	X	X
RFC 4742	“Using the NETCONF Configuration Protocol over Secure Shell (SSH)”	X	X	X
RFC 6020	“YANG – A Data Modeling Language for the Network Configuration Protocol (NETCONF)”	X	X	X
RFC 6021	“Common YANG Data Types”	X	X	X
NTP client and NTP server		X	X	X
RFC 5961	TCP Security	X	X	X

RFC Number	RFC Name	SLX 9850	SLX 9640	SLX 9540
RFC 4251	Secure Shell (SSH) Protocol Architecture	X	X	X
RFC 4253	Secure Shell (SSH)	X	X	X
RFC 4346	TLS 1.1	X	X	X
RFC 5246	TLS 1.2	X	X	X
Protection against Denial of Service (DoS) attacks such as TCP SYN or Smurf Attacks		X	X	X

# SLX-OS IEEE standards compliance

IEEE standard number	IEEE standard name	SLX 9850	SLX 9640	SLX 9540
IEEE Std 802.1AB-2005	LLDP-MIB LLDP-EXT-DOT1-MIB LLDP-EXT-DOT3-MIB	X	X	X
IEEE P802.1AG D8.1	IEEE8021-CFM-MIB	X	X	X
IEEE 802.1AP	IEEE8021-CFM-V2-MIB	X	X	X
IEEE 802.3-2005	CSMA/CD Access Method and Physical Layer Specifications	X	X	X
IEEE 802.3AB	1000BASE-T	X	X	X
IEEE 802.3AE	10G Ethernet	X	X	X
IEEE 802.3U	100BASE-TX, 100BASE-T4 100BASE-FX Fast Ethernet at 100 Mbps with Auto-Negotiation	X	X	X
IEEE 802.3X	Flow Control	X	X	X
IEEE 802.3Z	1000BASE-X Gigabit Ethernet over fiber optic at 1 Gbps	X	X	X
IEEE 802.3AD	LAG-MIB	X	X	X
IEEE 802.1Q	Virtual Bridged VLANs	X	X	X
IEEE 802.1D	MAC Bridges	X	X	X
IEEE 802.1W	Rapid Spanning Tree Protocol	X	X	X
IEEE 802.1S	Multiple Spanning Trees	X	X	X

IEEE standard number	IEEE standard name	SLX 9850	SLX 9640	SLX 9540
IEEE 802.1AG	Connectivity Fault Management (CFM)	X	X	X
IEEE 8023.BA	100 Gigabit Ethernet	X	X	X
IEEE 802.1AB	Link Layer Discovery Protocol	X	X	X
IEEE 802.1X	Port-Based Network Access Control	X	X	X
IEEE 802.3AH	Ethernet in the First Mile Link OAM3	X	X	X
IEEE 8021	PAE-MIB	X	X	X
ITU-T G.8013/Y.1731	OAM mechanisms for Ethernet4	X	X	X
MEF	MEF-SOAM-TC-MIB	X	X	X
MEF	MEF-SOAM-PM-MIB	X	X	X

# SLX 9850, 9640, and 9540 Scalability Matrix

Scalability matrix for 18r.2.00 release.

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
<b>LAYER 2 SWITCHING</b>			
Number of Trunk Groups supported	Default profile - 256 groups with 64 Ports  Lag-profile-1 - 512 groups with 32 ports	Default profile - 256 groups with 64 Ports  Tested:  Total 60 LAG as follows: 8 LAGs (1/10GbE) with breakout,  10 LAGs (1 GbE) w/o breakout, 38 LAGs (1/10GbE) w/o breakout,  2 LAGs (40GbE)  2 LAGs (100GbE)	Default profile - 256 groups with 64 Ports  Tested:  Total 53 LAG as follows: 24 LAGs (1/10GbE) with breakout,  2 LAGs (1 GbE) w/o breakout, 22 LAGs (1/10GbE) w/o breakout,  2 LAGs (40GbE)  3 LAGs (100GbE)
Number of Ports per Trunk Group	64	64  Tested: 32 (1/10GbE)	64  Tested: 48 (1/10GbE)
Maximum LACP Trunk threshold	64	64	64
<b>LAYER 2 SWITCHING</b>			
Maximum number of MAC Addresses per Switch	750K	750K	750K
Jumbo Frames	9216 bytes	9216 bytes	9216 bytes
Number of VLANs	4096	4096	4096
Maximum number of Spanning-Tree instances (RSTP)	RSTP is 1 instance only,	RSTP is 1 instance only,	RSTP is 1 instance only,

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
	RPVST/PVST 128, MSTP 32	RPVST/PVST 128, MSTP 32	RPVST/PVST 128, MSTP 32
Maximum number of bridge domains	4K	4K	4K
Maximum IGMPv2/v3 L3 entries	16K	16K	16K
L2 Multicast Cache	16K	16K	16K
IPv4 Software Multicast Cache for PIM/SM	32K	20K	20K
IPv4 Hardware Multicast Entries	32K	20K	20K
Maximum IGMP snooping vlans	500	500	500
Maximum IGMP snooping vlans (MCT)	500	500	500
Maximum static entry (IGMPv2) with uplink - IPv4	1000	1000	1000
Maximum static entry (IGMPv3) with uplink - IPv4	1000	1000	1000
Snoop Multicast IGMP Join rate per port	1000	1000	1000
Snoop Multicast IGMP leave rate per port	1000	1000	1000
IGMP Join rate (with PIM-SM)	4000	4000	4000
IGMP Leave rate (with PIM-SM)	4000	4000	4000
PIM SM Maximum local receivers (IGMP)	4000	4000	4000
PIM SM Maximum OIF's per system	64000	64000	64000
PIM SM Maximum OIF's per S,G	128	128	128



	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
MSDP Static Peer	100	100	100
Maximum number of vlan replication per entry	128	128	128
Maximum number of multicast VRFs	50	50	50
Maximum number of IGMP groups per system	16K	16K	16K
Maximum number of IGMP groups per interface	128	128	128
Maximum number of IGMP OIF per system	8000	8000	8000
Maximum number of Mcast Prefix advertised by a RP	250	250	250
Maximum number of BSR RP per mcast domain	56	56	56
Maximum number of Static RP per system	56	56	56
Maximum number of RPset x RP per system	56	56	56
Maximum number of PIM Anycast RPs per system	56	56	56
Maximum number of Anycast RP peers per system	8	8	8
Maximum number of MSDP peering per system	100	100	100
Maximum number of MSDP SA cache per system	16000	16000	16000

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
PIM Fast Hello	Min Hello : 1 Sec, Neighbor Removal : 3 Sec	Min Hello : 1 Sec, Neighbor Removal : 3 Sec	Min Hello : 1 Sec, Neighbor Removal : 3 Sec
Multicast ECMP Paths	32	32	32
<b>LAYER 3 FEATURES - IPv4</b>			
Maximum number of IP interfaces per system (ipv4, ipv6)	4090	4090	4090
Maximum number of Virtual Ethernet interfaces per system	4090	4090	4090
Maximum number of ARP entries	96K (Tested 98304)	96K (Tested 98304)	96K (Tested 98304)
Maximum number of ND entries	32K	32K	32K
Maximum number of Static ARP entries	96K (Tested 98304)	96K (Tested 98304)	96K (Tested 98304)
Maximum number of directly connected host routes (or IP Next- hops)	2K	2K	2K
Number of possible secondary IP Addresses	255	255	255
Maximum. number of Loopback interfaces	255	255	255
Maximum number of OSPF areas (Per VRF)	200	200	200
Number of OSPF routers in a single area	200	200	200
Number of OSPF adjacencies	200	200	200
Maximum Number of OSPF Routes	100K	100K	100K
Maximum Number of Static Route Entries	25K	25K	25K

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
Maximum BGP Peer-Groups	250	250	250
Maximum BGP Routes in RIB	9M IN, 14M OUT	9M IN, 14M OUT	9M IN, 14M OUT
BGP Peers (IPv4 and IPv6 concurrent)	2400	2400	2400
Maximum Number of IS-IS Routes	25K	25K	25K
Number of ISIS adjacencies	Broadcast : 255 P2P : 1024	Broadcast : 255 P2P : 1024	Broadcast : 255 P2P : 1024
Number of ISIS LSP's	255	255	255
Maximum Number of IPv4 Routes	1M (with compression)	1M (with compression)	4M
Maximum number of routes in hardware (IPv4 and IPv6 concurrent)	Optiscale Profile LPM : 256K (Routes except /23, /24 and /32) LEM : 750K (Routes with /23, /24 and /32 )	Optiscale Profile LPM : 256K (Routes except /23, /24 and /32) LEM : 750K (Routes with /23, /24 and /32 )	Default Profile : 4M IPv4 and 256K IPv6 routes V4-V6 Profile : 4M IPV4, 700K IPv6 routes IPv6-route Profile : 1M IPv4, 1M IPv6 routes
Maximum VE per system	4K	4K	4K
Maximum VRFs per system (BGP VRF IPv4/IPv6)	1024 (Tested : 512)	1024 (Tested : 512)	1024 (Tested : 512)
Maximum VRFs per system (OSPF VRF IPv4/IPv6)	1024	1024	1024
Maximum VRFs per system (Static VRF IPv4/IPv6)	1024	1024	1024
Number of ISIS routers in a level	255	255	255
ECMP Support	64	64	64

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
Number of VRRP/VRRPe Instances per system (ipv4, ipv6)	2K	1K	1K
Number of VRRP instances per IP interface	16	16	16
Number of VRRP/VRRPe instances with Time Scale	255	128	128
Maximum Number of GRE Tunnels	256	256	256
Maximum ISIS interfaces	Broadcast : 255 P2P : 1024	Broadcast : 255 P2P : 1024	Broadcast : 255 P2P : 1024
Policy Based Routing (PBR)	64 Route maps per PBR	64 Route maps per PBR	64 Route maps per PBR
PBR Over GRE	NA	NA	NA
ICMP Error Message handling	5000	5000	5000
<b>LAYER 3 FEATURES - IPv6</b>			
Maximum Number of IPv6 Static Route Entries	32K	32K	32K
Maximum Number of IPv6 Routes	Optiscale Profile LPM : 64K (Routes except /47 and /48) LEM : 180K (Routes with /47 and /48)	Optiscale Profile LPM : 64K (Routes except /47 and /48) LEM : 180K (Routes with /47 and /48 )	Default Profile : 256K routes V4-V6 Profile : 700K routes IPv6-route Profile : 1M Routes
Maximum Number of OSPFv3 Routes	64K	64K	64K
Maximum Number of OSPFv3 Interfaces	256	256	256
Maximum Number of OSPFv3 Neighbors	256	256	256

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
Maximum Number of OSPFv3 area	10	10	10
Maximum Number of BGPv6 Routes in the RIB	64K	64K	1M
Maximum Number of BGPv6 Neighbors	2400	2400	2400
IPv6 PBR	200 route maps per PBR	200 route maps per PBR	200 route maps per PBR
<b>BGP Flow Spec</b> ( *MAX TCAM entries are 6K shared across all L3 user ACLS )			
Maximum Number of Local Flow spec rules alone *	1K	1K	1K
Maximum Number of Remote Flow spec rules alone *	3K	3K	3K
Maximum Number of Local and remote Flow spec rules together *	1K	1K	2K
<b>BGP large-community</b>			
Maximum number of Large-community that can be added/replaced/deleted for incoming route updates(NLRI) using set directive.	32	32	32
Maximum number large-community standard/extended Acl type	1024 rules per list. Max Seq # is 65535	1024 rules per list. Max Seq # is 65535	1024 rules per list. Max Seq # is 65535

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
Maximum number of large-community ACL that can be matched in route-map	32	32	32
Maximum no of large community attributes that be received per route update (including in bound set large community)	64	64	64
<b>MPLS</b>			
Maximum MPLS labels	15K	15K	15K
Maximum Label stacking depth	3	3	3
Maximum Target LDP sessions	100	100	100
Maximum ingress/egress LSPs	Ingress = 5K, egress=5K, total=10K	Ingress=5K, egress=5K, total=10K	Ingress=5K, egress=5K, total=10K
Maximum transit LSPs	15K	8K	8K
Maximum VLLs per system (with MCT)	2600	2600	2600
Maximum VPLSs per system (with MCT)	2600	2600	2600
Maximum endpoints per VLL per system	8K	8K	8K
Maximum endpoints per VPLS per system (non MCT, MCT)	20K	20K	20K
Maximum VPLSs per system (max vpls mac table)	750K	750K	750K
Total VPLS VC labels per system	8K	8K	8K
Maximum Routes per VRF/VPN	256K	256K	256K

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
Maximum MPLS VPNs (IPv4) per system	512	512	512
Maximum MPLS VPNs (IPv6) per system	512	512	512
Maximum Adaptive LSP (ingress/egress)	5K	3K	3K
Maximum FRR instances	5K Facility or 2K 1-to-1 detour	5K Facility or 2K 1-to-1 detour	5K Facility or 2K 1-to-1 detour
Maximum number of VPLS LSP load balance	16	16	16
Maximum number of LDP ECMP path	16	16	16
RSVP LSP History support	Max 32 events per LSP at Ingress router	Max 32 events per LSP at Ingress router	Max 32 events per LSP at Ingress router
Maximum number of Auto-bandwidth templates	100	100	100
Maximum number of recorded samples per Auto-	1500	1500	1500
Single-hop LSP Accounting	5k	5K	5K
Maximum number of VPLS instance with IPv4/IPv6 VE VRF support (MCT)	2600	2600	2600
Maximum number of Bypass LSP per system	512	512	512
Maximum number of LDP session	100	100	100
Maximum number of LDP FEC	4k	4k	4k
<b>RATE LIMITING AND TRAFFIC POLICING FEATURES</b>			

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
Granularity	22kbps	22kbps	22kbps
Number of Rate-limiters/Traffic-policers Per System	1k/32k	1k/32k	1k/32k
<b>AVAILABILITY</b>			
<b>ACL</b>			
Maximum Flex ACLs across “all ports per tower”, “per linecard” and “per system”	8K ACE on 72x10G 24K ACE on 100G LC	8K ACE on 72x10G	8K ACE on 72x10G
Maximum shared IPv4 ACLs across “all ports per tower”, “per linecard” and “per system”	6K IPv4 ACE per line card.  CAM sharing - 10K IPv4 ACE per line card.	Per tower- 6K IPv4 ACE  CAM sharing - 10K IPv4 AC	Per tower- 6K IPv4 ACE  CAM sharing - 10K IPv4 AC
Maximum shared IPv6 ACLs across “all ports per tower”, “per linecard” and “per system”	6K IPv6 ACE per line card.  CAM sharing- 10K IPv6 ACE per line card.	Per tower- 6K IPv4 ACE  CAM sharing - 10K IPv4 ACE.	Per tower- 6K IPv4 ACE  CAM sharing - 10K IPv4 ACE.
Maximum shared L2 ACLs across “all ports per tower”, “per linecard” and “per system”	2K L2 ACE per line card CAM sharing – 2K L2 ACE, per line card.	Per tower – 2K L2 ACE.  CAM sharing- 2K L2 ACE.	Per tower – 2K L2 ACE.  CAM sharing- 2K L2 ACE.
Named L2 ACL statements	2k	2k	2k
Maximum number of IP receive ACLs	200	200	200
Maximum number of IPv6 receive ACLs	50	50	50



	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
<b>MULTI-CHASSIS TRUNKING (vLAG support)</b>			
Number of vPorts – (# of VLANs) times (# of ports)	200K	100K	100K
Number of VLANs for logical port (single port or LAG)	225	225	225
Maximum MCT Clients	233	40	72 (24 10G ports and 48 25G breakout ports)
Maximum of VLANs for ICL	Not applicable with SLX MCT design	Not applicable with SLX MCT design	Not applicable with SLX MCT design
Maximum number of L2 / unified bridging instances (VPLS/EVPN, L2, VXLAN) with MCT and BUM RL	8K	4k	4k
Maximum number endpoint in MCT for L2/bridging (VPLS, EVPN, L2, VXLAN)	Breakdown for each endpoint types *100K AC LIFs for SLX9850 *8K PW instances total 8K total VNI (including 4K for vlan and 4K for BD) *100K for all types of services.	Breakdown for each endpoint types *80K AC LIFs for SLX9540 *8K PW instances total *8K total VNI (including 4K for vlan and 4K for BD) *100K for all types of services.	Breakdown for each endpoint types *80K AC LIFs for SLX9640 *8K PW instances total *8K total VNI (including 4K for vlan and 4K for BD) *100K for all types of services.
Maximum number of MAC addr for MCT	180K	180K	180K
<b>SOFTWARE DEFINED NETWORKING/OpenFlow</b>			

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
Maximum number of Flows per system	40K	4K	4K
Maximum number of L2 Mode Flows	40K	4K	4K
Maximum number of L3 Mode Flows	40K	4K	4K
Maximum number of L23 Mode Flows	40k	4K	4K
Maximum number of Flows with multi-point modification	2k	2k	2k
Maximum number of L2, L3, L23 Mode Flows with Flow statistic	40k	4k	4k
Max number of controller connections	3	3	3
Maximum Flows with Wildcard match	3000	3k	3k
Maximum Protected Vlans per Hybrid Port	40	40	40
Maximum Protected Vlans per system	2000	2k	2k
<b>VXLAN /IP Fabric</b>			
<b>NVA (See Feature Tab)</b>			
<b>Statistics</b>			
<b>OAM</b>			
BFD min timer	200msec (32 sessions multihop)	200msec (36 sessions multihop)	200msec (36 sessions multihop)
802.1ag sessions	4000	4000	4000

		<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
Y.1731 SLM/DM sessions		100	100	100
<b>EVPN-VXLAN Scaling (IP Fabric)</b>				
VxLAN Tunnel (e.g. ToR, DCI, hybrid cloud)		512	512	512
L2 VNI (Bridge Domains)		4K	4K	4K
L3 VNI		512	512	512
Maximum # VRF		512	512	512
<b>Layer 2</b>	Maximum # of VLANs	4K	4K	4K
	Maximum # of Bridge Domains	4K	4K	4K
	Maximum # of MAC entries	168K	168K	168K
	Maximum # of ARP entries	168K	168K	168K
	Maximum # of L2 VXLAN Tunnels within DC	NS	NS	NS
	Maximum # VNI	8K	8K	8K
<b>Layer 3</b>	Maximum # of BGP peers (IPv4+IPv6)	256 (V4 only)	256 (V4 only)	256 (V4 only)
	Maximum # of VE	4K	4k	4k
	Maximum # of VRF	512	512	512
<b>MVRP</b>				

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
Maximum no. of dynamic VLANs advertised over MVRP (with/without MCT)	2K	2K	
Maximum no. of MACs on DUT on 2K dynamic VLANs (with/without MCT)	250K	250K	
<b>Endpoint Tracking</b>			
Maximum number of Dynamic Vlan creation	2k	2k	
Maximum number MACs authenticated per port/Port channel/CCEP Port	2k	2k	
Maximum number MACs authenticated per system	8k	8k	
Maximum sFlow sample rate configuration per device or per LC	3 different sample rate per LC	3 different sample rate per device	3 different sample rate per device
Maximum sFlow datagrams lifted to Collector (L2/L3/MPLS/VPLS/VLL)	10k pkts per sec	10k pkts per sec	10k pkts per sec
Maximum sFlow collectors	5	5	5
<b>SNMP</b>			
Maximum communities	256	256	256
Maximum contexts	256	256	256
Maximum community maps	256	256	256
Maximum SNMP v3 users	10	10	10

	<b>ExtremeRouting SLX-9850</b>	<b>ExtremeSwitching SLX-9540</b>	<b>ExtremeSwitching SLX-9640</b>
Maximum groups	10	10	10
Maximum views	10	10	10
Maximum v1/v2c trap hosts	12	12	12
Maximum v3 trap hosts	6	6	6