

ExtremeXOS Supported Protocols and Standards (cont.)

	X435	X440-G2	X450-G2	X460-G2	X465	X480	X590	X620	X670	X670-G2	X690	X695	X770	X870
Power Over Ethernet (PoE) (cont.)														
IEEE 802.az Energy Efficient Ethernet (EEE)	•	•	•	•	•	-	-	-	•	-	-	-	-	-
Fast PoE	•	-	-	-	•	-	-	-	-	-	-	-	-	-
Perpetual PoE	•	-	-	-	•	-	-	-	-	-	-	-	-	-
Security, Switch, and Network Protection														
Role Based Policy	•	•	•	•	•	-	•	•	-	•	•	•	•	•
Multi-User, Multi-method authentication and policy	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Secure Shell (SSH-2), Secure Copy (SCP-2), and SFTP client/server with encryption/authentication	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SNMPv3 user based security, with encryption/ authentication	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 1492 TACACS+	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2865 RADIUS Authentication	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2866 RADIUS Accounting	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 3579 RADIUS EAP support for 802.1x	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 3580 IEEE 802.1x RADIUS Guidelines, Dynamic VLAN assignment via RADIUS tunnel attributes	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RADIUS Per-command Authentication	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RADIUS Server Load Balancing	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Access Profiles on All Routing Protocols	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Access Policies for Telnet/ SSH-2/SCP-2	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Network Login – 802.1x, Web and MAC-based mechanisms	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IEEE 802.1x – 2004 Port-Based Network Access Control for Network Login	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 4668 RADIUS Authentication Client MIB for IPv6	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 4670 RADIUS Accounting Client MIB for IPv6	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Multiple supplicants with multiple VLANs for Network Login (all modes)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Fallback to local authentication database (MAC and Web-based methods)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Guest VLAN for 802.1x	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 1866 HTML – used for Web-based Network Login and ExtremeXOS Chalet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SSL/TLS transport – used for Web-based Network Login and ExtremeXOS Chalet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
MAC Security – Lockdown and Limit	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IEEE 802.1AE MACsec Link Encryption	-	• ¹⁹	• ¹⁹	• ^{19, 20}	•	-	• ¹⁹	• ¹⁹	-	• ¹⁹	• ¹⁹	• ¹⁹	-	-
IP Security – RFC 3046 DHCP Option 82 with port and VLAN ID	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IP Security – Trusted DHCP Server	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Layer 2/3/4 Access Control Lists (ACLs)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2267 Network Ingress Filtering	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RPF (Unicast Reverse Path Forwarding) Control via ACLs	•	•	•	•	•	•	•	•	•	•	•	•	•	•

³ X480 with conversion cable to SummitStack256

¹⁶ Supported on QSFP+ ports only—X670V with VIMG4X and X670-G2-48x-4q

ExtremeXOS Supported Protocols and Standards (cont.)

	X435	X440-G2	X450-G2	X460-G2	X465	X480	X590	X620	X670	X670-G2	X690	X695	X770	X870
Security, Switch, and Network Protection (cont.)														
Wire-speed ACLs	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Rate Limiting/Shaping by ACLs	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IP Broadcast Forwarding Control	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ICMP and IP-Option Response Control	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SYN attack protection	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPU DoS Protection with traffi rate-limiting to management CPU	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Security, Router Protection														
IP Security - DHCP enforcement via Disable ARP Learning	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IP Security - Gratuitous ARP Protection	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IP Security - DHCP Secured ARP/ARP Validation	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Routing protocol MD5 authentication	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CLEAR-Flow, threshold- based alerts and actions	-	•	•	•	•	•	•	•	•	•	•	•	•	•
Identity Manager	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IPv4 Host Services														
RFC 1122 Requirements for internal hosts - Communication Layers	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 768 User Datagram Protocol (UDP)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 791 Internet Protocol (IP)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 792 Internet Control Message Protocol (ICMP)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 793 Transmission Control Protocol (TCP)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 826 Address Resolution Protocol (ARP)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 894 IP over Ethernet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 3021 Using 31-Bit Prefixes on IPv4 Point-to-Point Links	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 1027 Proxy ARP	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2068 HTTP server	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IGMP v1/v2 Snooping with Configurable Router Registration Forwarding	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IGMP v3 Snooping with Configurable Router Registration Forwarding	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IGMP Filters	•	•	•	•	•	•	•	•	•	•	•	•	•	•
PIM Snooping	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Static IGMP Membership	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Multicast VLAN Registration (MVR)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Static Unicast Routes	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Static Multicast Routes	-	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 1112 IGMP v1	•	•	•	•	•	•	•	•	•	•	•	•	•	•

¹⁹ MACsec encryption supported using the external LRM/MACsec Adapter; also requires a MACsec Feature Pack license.

²⁰ MACsec encryption supported natively on X460-G2-24t-24ht-10GE4 and X460-G2-24p-24hp-10GE4 models; requires a MACsec Feature Pack License.

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IPv4 Host Services (cont.)														
RFC 2236 IGMP v2	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 3376 IGMP v3	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2933 IGMP MIB	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 1812 Requirements for IP Version 4 Routers	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 1519 An architecture for IP Address allocation with CIDR	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 1256 IPv4 ICMP Router Discovery (IRDP)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 1058 RIP v1	-	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2453 RIP v2	-	•	•	•	•	•	•	•	•	•	•	•	•	•
Static ECMP	-	-	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2096 IPv4 Forwarding Table MIB	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 1724 RIPv2 MIB	-	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2338 Virtual Router Redundancy Protocol	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 3768 VRRPv2	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 2787 VRRP MIB	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 2328 OSPF v2 (Edge-mode)	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
OSPF ECMP	-	-	AE	AE	•	•	•	AE	•	•	•	•	•	•
OSPF MD5 Authentication	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 1587 OSPF NSSA Option	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 1765 OSPF Database Overflow	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 2370 OSPF Opaque LSA Option	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 3623 OSPF Graceful Restart	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 1850 OSPFv2 MIB	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 2362 Protocol Independent Multicast – Sparse Mode PIM-SM (Edge- mode)	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 2934 Protocol Independent Multicast MIB	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 3569, draft-ietf-ssm- arch-06.txt PIM-SSM PIM Source Specific Multicast	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
draft-ietf-pim-mib-v2-o1.txt	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
Mrinfo, the multicast router information tool based on Appendix-B of draft-ietf- idmr-dvmrp-v3-11	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
PIM ECMP Load Splitting	-	AE	AE	•	•	•	•	AE	•	•	•	•	•	•
PIM-SM	-	AE	AE	•	•	•	•	AE	•	•	•	•	•	•
RFC 3587, Global Unicast Address Format	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Ping over IPv6 transport	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Traceroute over IPv6 transport	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2460, Internet Protocol, Version 6 (IPv6) Specification	•	•	•	•	•	•	•	•	•	•	•	•	•	•

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IPv4 Host Services (cont.)														
RFC 5095, Internet Protocol, Version 6 (IPv6) Specification	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 4861, Neighbor Discovery for IP Version 6, (IPv6)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2463, Internet Control Message Protocol (ICMPv6) for the IPv6 Specification	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2464, Transmission of IPv6 Packets over Ethernet Networks	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2465, IPv6 MIB, General Group and Textual Conventions	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2466, MIB for ICMPv6	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 4293, Management Information Base for the Internet Protocol (partial)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2462, IPv6 Stateless Address Auto configuration - Host Requirements	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 1981, Path MTU Discovery for IPv6, August 1996 - Host Requirements	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 3513, Internet Protocol Version 6 (IPv6) Addressing Architecture	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 3484, Default Address Selection for IPv6	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Telnet server over IPv6 transport	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SSH-2 server over IPv6 transport	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 4193, Unique Local IPv6 Unicast Addresses	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 5722, Handling of Overlapping IPv6	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IPv6 Interworking and Migration														
RFC 2893, Configured Tunnels	-	-	AE	AE	•	•	•	-	•	•	•	•	•	•
RFC 3056, 6to4	-	-	AE	AE	•	•	•	-	•	•	•	•	•	•
IPv6 Router Services														
RFC 2462, IPv6 Stateless Address Auto Configuration - Router Requirements	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 1981, Path MTU Discovery for IPv6, August 1996 - Router Requirements	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2710, IPv6 Multicast Listener Discovery v1 (MLDv1) Protocol	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 3810, IPv6 Multicast Listener Discovery v2 (MLDv2) Protocol	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 4291, IP Version 6 Addressing Architecture	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 4862, IPv6 Stateless Address Autoconfiguration	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 4443, Internet Control Message Protocol (ICMPv6) for the Internet Protocol Version 6 (IPv6) Specification	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 4541, Considerations for Internet Group Management Protocol (IGMP) and Multicast Listener Discovery (MLD) Snooping Switches	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Static Unicast routes for IPv6	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 6164, Using 127-Bit IPv6 Prefixes on Inter-Router Links	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2080, RIPng	-	•	•	•	•	•	•	•	•	•	•	•	•	•

ExtremeXOS Supported Protocols and Standards (cont.)

	X435	X440-G2	X450-G2	X460-G2	X465	X480	X590	X620	X670	X670-G2	X690	X695	X770	X870
IPv6 Router Services (cont.)														
RFC 2740 OSPF v3 for IPv6 (Edge-mode)	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
RFC 5187,OSPFv3 Graceful Restart	-	AE	AE	AE	•	-	•	AE	-	AE	•	•	AE	•
RFC 5340, OSPFv3, OSPF for IPv6	-	AE	AE	AE	•	-	•	AE	-	AE	•	•	AE	•
Static ECMP	-	-	•	•	•	•	•	•	•	•	•	•	•	•
RFC 5798 Virtual Router Redundancy Protocol (VRRP) Version 3 for IPv4 and IPv6	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
draft-ietf-vrrp-unified- mib-08.txt - Definitions of Managed Objects for VRRPv3	-	AE	AE	AE	•	•	•	AE	•	•	•	•	•	•
Core Protocols For Layer 2, IPv4 and IPv6														
EAPS multiple rings	-	-	AE	AE	•	•	•	AE	•	•	•	•	•	•
EAPsv2 Shared ports	-	-	AE	AE	•	C	AE	AE	C	•	•	•	•	•
PIM-DM Draft IETF PIM Dense Mode draft-ietf-idmr-pim-dm-05.txt, draft-ietf- pim-dm-new-v2-04.txt	-	-	C	C	C	C	C	-	C	C	C	C	C	C
Draft-ietf-idr-bgp4- mibv2-02.txt - Enhanced BGP-4 MIB	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 4724 Graceful Restart Mechanism for BGP	-	-	C	C	C	C	C	-	C	C	C	C	C	C
IOS 10589 OSI IS-IS Intra- Domain Routing Protocol (RFC 1142)	-	-	C	C	C	C	C	-	C	C	C	C	C	C
Draft-ietf-isis-ipv6-06 Routing IPv6 with IS-IS	-	-	C	C	C	C	C	-	C	C	C	C	C	C
Draft-ietf-isis-restart-02 Restart Signaling for IS-IS	-	-	C	C	C	C	C	-	C	C	C	C	C	C
Draft-ietf-isis-wg-multi- topology-11 Multi Topology (MT) Routing in IS-IS	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 1195 Use of OSI IS-IS for Routing in TCP/IP and Dual Environments (TCP/IP transport only)	-	-	C	C	C	C	C	-	C	C	C	C	C	C
Draft-ietf-isis-ipv6-06 Routing IPv6 with IS-IS	-	-	C	C	C	C	C	-	C	C	C	C	C	C
Draft-ietf-isis-restart-02 Restart Signaling for IS-IS	-	-	C	C	C	C	C	-	C	C	C	C	C	C
Draft-ietf-isis-wg-multi- topology-11 Multi Topology (MT) Routing in IS-IS	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 1195 Use of OSI IS-IS for Routing in TCP/IP and Dual Environments (TCP/IP transport only)	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 1745 BGP4/IDRP for IP-OSPF Interaction	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 1997 BGP Communities Attribute	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 2439 BGP Route Flap Damping	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 2545 Use of BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 2740 OSPFv3, OSPF for IPv6	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 2763 Dynamic Hostname Exchange Mechanism for IS-IS	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 2858 Multiprotocol Extensions for BGP-4 (Obsoletes RFC 2283)	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 2918 Route Refresh Capability for BGP-4	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 2966 Domain-wide Prefix Distribution with Two-Level IS-IS	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 2973 IS-IS Mesh Groups	-	-	C	C	C	C	C	-	C	C	C	C	C	C

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Core Protocols For Layer 2, IPv4 and IPv6 (cont.)														
RFC 3107 Carrying Label Information in BGP-4	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 3373 Three-way Handshake for IS-IS Point-to-Point Adjacencies	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 5492 Capabilities Advertisement with BGP-4	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 3446 Anycast RP using PIM and MSDP	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 3618 Multicast Source Discovery Protocol (MSDP)	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 3784 IS-IS Extensions for Traffic Engineering (wide metrics only)	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 4271 A Border Gateway Protocol 4 (BGP-4) (Obsoletes RFC 1771)	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 4273 Definitions of Managed Objects for the Fourth Version of the Border Gateway Protocol (BGP-4) using SMLv2	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 4360 BGP Extended Communities Attribute	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 4456 BGP Route Reflection: An alternative to full mesh internal BGP (Obsoletes RFC 1966)	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 4486 Subcodes for BGP Cease Notification message	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 4760 Multiprotocol extensions for BGP-4	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 6793 BGP Support for Four-octet AS Number Space	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 5065 Autonomous System Confederations for BGP	-	-	C	C	C	C	C	-	C	C	C	C	C	C
RFC 5396 Textual Representation of Autonomous System (AS) Attributes	-	-	C	C	C	C	C	-	C	C	C	C	C	C
Quality of Service (QoS) and VLAN Services														
IEEE 802.1D – 1998 (802.1p) Packet Priority	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2474 DiffServ Precedence, including 8 queues/port	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2598 DiffServ Expedited Forwarding (EF)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2597 DiffServ Assured Forwarding (AF)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RFC 2475 DiffServ Core and Edge Router Functions	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Weighted Random Early Detection (WRED)	-	-	-	•	•	•	•	•	•	•	•	•	•	•
VLAN Services: VLANS, VMANS														
IEEE 802.1Q VLAN Tagging	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IEEE 802.1v: VLAN classification by Protocol and Port	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IEEE 802.3ad Static Load sharing configuration and LACP based dynamic configuration	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Port-based VLANs	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Protocol-based VLANs	•	•	•	•	•	•	•	•	•	•	•	•	•	•
MAC-based VLANs	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Multiple STP domains per VLAN	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Upstream Forwarding Only/Disable Flooding	•	•	•	•	•	•	•	•	•	•	•	•	•	•
VLAN Translation	•	•	•	•	•	•	•	•	•	•	•	•	•	•

ExtremeXOS Supported Protocols and Standards (cont.)

	X435	X440-G2	X450-G2	X460-G2	X465	X480	X590	X620	X670	X670-G2	X690	X695	X770	X870
VLAN Services: VLANS, VMANS (cont.)														
IEEE 802.1ad Provider Bridge Network, virtual MANs (vMANs)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
vMAN Ethertype Translation/Secondary vMAN Ethertype	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Multicast Support for PVLAN	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Multicast Support for VLAN Aggregation	•	•	•	•	•	•	•	•	•	•	•	•	•	•
VLAN Aggregation	•	•	AE	•	•	•	•	•	•	•	•	•	•	•
VLAN Bridging	•	•	•	•	•	•	•	•	•	•	•	•	•	•
IEEE 802.1AK MVRP and MRP	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Multi-Protocol Label Switching (MPLS) and VPN Services														
RFC 2961 RSVP Refresh Overhead Reduction Extensions	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 3031 Multiprotocol Label Switching Architecture	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 3032 MPLS Label Stack Encoding	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 5036 Label Distribution Protocol (LDP)	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 3209 RSVP-TE: Extensions to RSVP for LSP Tunnels	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 3630 Traffic Engineering Extensions to OSPFv2	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 3811 Definitions of Textual Conventions (TCs) for Multiprotocol Label Switching (MPLS) Management	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 3812 Multiprotocol Label Switching (MPLS) Traffic Engineering (TE) Management Information Base (MIB)	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 3813 Multiprotocol Label Switching (MPLS) Label Switching Router (LSR) MIB	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP ⁴	MP
RFC 3815 Definition of Managed Objects for the Multiprotocol Label Switching (MPLS), Label Distribution Protocol (LDP)	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP ⁴	MP
RFC 4090 Fast Re-route Extensions to RSVP-TE for LSP (Detour Paths)	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP ⁴	MP
RFC 4379 Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures (LSP Ping)	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP ⁴	MP
draft-ietf-bfd-base-09.txt Bidirectional Forwarding Detection	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP ⁴	MP
Layer 2 VPNs														
RFC 4447 Pseudowire Setup and Maintenance using the Label Distribution Protocol (LDP)	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 4448 Encapsulation Methods for Transport of Ethernet over MPLS Networks	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 4762 Virtual Private LAN Services (VPLS) using Label Distribution Protocol (LDP) Signaling	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 5085 Pseudowire Virtual Circuit Connectivity Verification (VCCV)	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 5542 Definitions of Textual Conventions for Pseudowire (PW) Management	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 5601 Pseudowire Management Information Base (MIB)	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP

ExtremeXOS Supported Protocols and Standards (cont.)

	X435	X440-G2	X450-G2	X460-G2	X465	X480	X590	X620	X670	X670-G2	X690	X695	X770	X870
Layer 2 VPNs (cont.)														
RFC 5602 Pseudowire over MPLS PSN MIB	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 5603 Ethernet Pseudowire MIB	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
draft-ietf-l2vpn-vpls- mib-02.txt Virtual Private LAN Services (VPLS) MIB	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
Pseudowire LSP Loadsharing	-	-	-	MP	MP	-	MP	-	MP	MP	MP	-	MP	MP
RFC 5602 Pseudowire over MPLS PSN MIB	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
RFC 5603 Ethernet Pseudowire MIB	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
draft-ietf-l2vpn-vpls- mib-02.txt Virtual Private LAN Services (VPLS) MIB	-	-	-	MP	MP	MP	MP	-	MP	MP	MP	-	MP	MP
Pseudowire LSP Loadsharing	-	-	-	MP	MP	-	MP	-	MP	MP	MP	-	MP	MP
Layer 3 VPNs														
RFC 4364 BGP/MPLS IP Virtual Private Networks (VPNs)	-	-	-	MP ⁸	MP ⁸	MP ⁸	MP ⁸	-	MP ⁸	MP ⁸	MP ⁸	-	MP ⁸	MP ⁸
RFC 4382 MPLS/BGP Layer 3 Virtual Private Network (VPN) MIB	-	-	-	MP ⁹	MP ⁹	MP ⁹	MP ⁹	-	MP ⁹	MP ⁹	MP ⁹	-	MP ⁹	MP ⁹
Timing Protocol														
Network Time Protocol	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ITU-T G.8262 / G.8264 Synchronous Ethernet	-	-	-	• ¹⁵	-	-	-	-	-	-	-	-	-	-
IEEE 1588v2 Precision Time Protocol (Slave/Ordinary clock)	-	-	-	NT ¹³	-	-	-	-	-	NT	-	-	NT	-
IEEE 1588v2 Precision Time Protocol (Boundary and Transparent clock)	-	-	-	NT	-	-	-	-	-	NT	-	-	NT	-
Data Center														
RFC 7348 - Virtual eXtensible Local Area Network (VXLAN)	-	-	-	-	•	-	•	-	-	•	•	•	•	•
Direct Attach (IEEE 802 VEPA)	•	DA	DA	DA	•	DA	•	DA	DA	DA	•	•	DA	•
Priority Flow Control (IEEE 802.1Qbb)	-	-	-	•	•	-	•	•	• ¹¹	•	•	•	•	•
Data Center Bridging eXchange (DCBX) (IEEE P802.1Qaz/D2.3)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
XNV (ExtremeXOS Network Virtualization)	-	•	-	•	•	•	•	•	•	•	•	•	•	•
RestConf API	•	•	•	•	•	-	•	•	•	-	•	•	•	•

⁸ Full except for section 9 and 10

⁹ Full except for 1 table: mplsL3VpnVrfSecTable

¹³ Requires X460-G2-TM-CLK module

¹⁵ Supported on the first 8 copper ports of the t and p switch models. Supported on all x switch models and VIM-2t and VIM-2x

⁴ In non-SummitStack configuration only

EXOS Release	Supported Platforms
16.X Release	<ul style="list-style-type: none"> • ExtremeSwitching X450-G2, X460-G2, X480, X670, X670-G2, X770 fixed series switches • ExtremeSwitching X8 and 8800 modular series switching
21.X Release	<ul style="list-style-type: none"> • ExtremeSwitching X440-G2, X450-G2, X460-G2, X620, X670-G2, and X770 fixed series switches
22.X Release	<ul style="list-style-type: none"> • ExtremeSwitching X440-G2, X450-G2, X460-G2, X590, X620, X670-G2, X690, X770, and X870 fixed series switches • Extended Edge Switching V400 Port Extender switches
30.X Release	<ul style="list-style-type: none"> • ExtremeSwitching X435, X440-G2, X450-G2, X465, X590 X460-G2, X620, X670-G2, X690, X695, and X870 fixed series switches • Extended Edge Switching V300 and V400 Port Extender switches

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