XenOpt

LB9
48 10Base-T/100Base-TX/1000Base-T
4 dual speed 1GbE/10GbE SFP+ ports

Overview
The XenOpt LB9 is a high performance layer 2/3/4 Ethernet switch with 48 10Base-T/100Base-TX/1000Base-T ports and 4 dual speed 1GbE/10GbE SFP+ ports in a compact rack unit size.

Simplicity
The XenOpt LB9 can be managed through industry standard command-line Interface (CLI) which reduces the training and operating costs. A user friendly Web GUI is provided via a standard Web browser to manage. The LB9 also supports Simple Network Management Protocol (SNMP) both from standard MIB and private MIB for network administrator to easily configure, monitor, and manage remotely. With the evolution from IPv4 to IPv6, The LB9 is a IPv6 integrated management device.

High Availability
The XenOpt LB9 is designed for high availability from both hardware and software perspective. The key features include:
- o 1+1 hot-swappable power supplies
- o Out-of-band management supported
- o 802.1D, 802.1w, and 802.1s supported
- o Up to 8 ports per link aggregation group (LACP) and up to 64 groups
- o Up to 32 paths ECMP routing for load balancing and redundancy
- o Virtual Router Redundancy Protocol supported

High-Performance L2/L3 access deployments
With the compact 1U form factor, high density 48 gigabit ports and 4 dual speed1GbE/10GbE uplink ports, front to back and/or back to front airflow design, the XenOpt LB9 is ideal for enterprise campus or top-of-rack deployments. The 176Gbps switching capacity and 131Mpps forwarding rate enables high bandwidth connectivity to the aggregation or core layers and low power consumption ensures LB9 to be a powerful solution to aggregate data traffic and high-performance servers. The 4-port 10GbE density in a 1U height switch provides near 1:1 subscription ratio throughout the network. This brings the benefits to organizations to deploy highly utilized networks and avoid congestion during peak hours.

Advanced IPv4 and IPv6 routing
The XenOpt LB9 is a fully layer 2 and layer 3 routing switch that supports advanced IPv4 and IPv6 routing features such as RIP v1/v2, OSPF, ECMP, RIPng and OSPFv3. The multicast routing features for IGMP v1/v2/v3, DVMRP, PIM-DM/SM, MLD v1/v2 and PIM-DM6/SM6 are all supported in the LB9.

Product Highlight
Performance
- o 48 10Base-T/100Base-TX/1000Base-T with 4 1/10GbE dual speed SFP+ ports in 1 RU
- o 176 gigabit per second
- o 131 million packets per second

Robust hardware
- o Redundant and hot-swappable power supply
- o Out-of-band management port
- o 3+1 fans

Layer 2 features
- o 3965 configurable VLANs
- o 12K jumbo frame

Security
- o Secured STP features
- o L2/L3/L4 security
- o Storm control

Management
- o Industrial command-line interface
- o Dual images
- o Web-based GUI (HTTP/HTTPS)
- o sFlow
- o IPv6 management

Layer 3 features
- o RIP v1/v2
- o OSPF
- o ECMP
- o IGMP v1/v2/v3
- o PIM-DM/SM

IPv6 support
- o RIPng
- o OSPFv3
- o MLD v1/v2
- o PIM-DM6/SM6

Networking LB9 specifications

Physical ports
- 48 10Base-T/100Base-TX/1000Base-T ports
- 4 1GbE/10GbE dual speed SFP+ ports
- 1 RJ-45 out-of-band anagement Port (10/100/1000)
- 1 RJ-45 console port

Performance
- Switching capacity: 176Gbps
- Forwarding rate: 131Mpps
- Memory: 512MB
- Flash: 32MB
- MAC: 32K
- Packet buffer: 4MB
- Jumbo frame: 12K

L2 features
- Auto-negotiation for port speed and duplex
- Flow control: IEEE 802.3x / back-pressure
- Switching mode: store-and-forward
- Spanning Tree Protocol:
  - 802.1D, 802.1w, and 802.1s
  - Spanning Tree Fast Forwarding
  - Edge port
  - Loop guard
  - BPDU filter/guard
  - Auto Edge
  - TCN guard
  - Root guard
- VLANs
  - IEEE 802.1Q tagged based
  - Port-based (up to 4k VLANs; 3965 user configurable VLANs)
  - GVRP/GMRP
  - 802.1v protocol VLAN
  - Voice VLAN
  - MAC-based VLAN
  - IP-subnet VLAN
  - QinQ
- VTP v1/v2
- Private VLAN
- Storm control
  - Broadcast
  - Unknown multicast
  - Unknown unicast
- IGMP snooping
  - IGMP snooping v1/v2/v3
  - IGMP v1/v2 querier
  - IGMP immediate leave
- Link Aggregation
  - 802.3ad with LACP
  - Cisco EtherChannel Like
  - Unicast/Multicast traffic balance over trunking port (dst-ip, dst-mac, src-dst-ip, src-dst-mac, src-ip, src-mac)
- Link state
- Port backup

QoS
- Queues per port: 8 queues
- QoS queue management using Weighted Round Robin (WRR), Strict Priority (SP) and hybrid (WRR+SP)
- COS: 802.1p, IP Precedence, and DSCP
- DiffServ
- Port rate limit

Security
- Static and dynamic port security (MAC-based)
- 802.1x: port-based, MAC-based, auto VLAN assignment, guest VLAN, unauthenticated VLAN
- ACL: L2/L3/L4
- IPv6 ACL: L3/L4
- RADIUS: authentication and accounting (up to 32 servers)
- TACACS+: authentication (up to 5 servers)
- HTTPS (AES 128-cbc, 3ES-cbc, Blowfish-cbc)
- SH v1.5/v2.0 (AES 128-cbc, 3ES-cbc, Blowfish-cbc)
- User name and password: local authentication and remote authentication via RADIUS/TACACS+
- Denial of Service control
- Management IP filtering (SNMP/Web/Telnet/SSH)
- MAC filtering
- IP Source Guard
- Dynamic ARP inspection (DAI)
- DHCP snooping

Management
- Industrial command-line interface
- CLI filtering
- Telnet/SSH
- HTTP/HTTPs
- Software download/upload: TFTP/Xmodem/FTP
- Configuration download/upload: TFTP/Xmodem/FTP
- Dual image backup supported
- SNMP v1/v2c/v3
- RMON 1, 2, 3 and 9
- BOOTP: client/relay
- DHCP: client/relay/option 82
- Event/error log: local flash and remote server via system log (RFC3164)
- DNS: client/relay
- SNTP
- LLDP (802.1ab, Link Layer DiscoveryProtocol)
- CDP (Cisco Discovery Protocol) version 2
- Port mirroring: one to one and many to one
- sFlow (RFC3176)
- IPv6 management:
  - IPv4/IPv6 Dual Stack
  - ICMPv6
  - ICMPv6 redirect
  - IPv6 Path MTU Discovery
  - IPv6 Neighbor Discovery
  - stateless auto-configuration
  - manual configuration
  - DHCPv6 (client)
- SNMP/HTTP/SSH/Telnet over IPv6
- IPv6 DNS resolver
- IPv6 RADIUS/TACACS+ support
- IPv6 Syslog support
- IPv6 SNTP
- IPv6 TFTP
- IPv6 Ping

Layer 3 features
- CIDR
- ARP (static: 128 and dynamic 3968)
- Proxy ARP
- Local proxy ARP
- IRDP
- Static route
- Unicast Routing: RIP v1/v2, OSPF
- ECMP
- BGP4
- Multichasis LAG (MLAG)
- Multicast Routing: IGMP v1/v2/v3, DVMRP, PIM-DM/-SM
- GMP proxy
- VRRP

IPv6 Layer 3 features
- Static route
- Unicast Routing: RIPng and OSPFv3
- Multicast Routing: MLD v1/v2, PIM-DM6/-SM6

Mechanical
- Dimension (HxWxD): 42.8x435x393.7 mm
- Weight: 7.15kg (NET)

Environmental specifications
- Operating temperature: 0~45□C
- Operating humidity: 90% maximum relative humidity

Safety
- UL 60950-1 (2nd Ed.)
- CSA C22.2 60950-1-07 (2nd Ed.)
- IEC 60950-1 (2005)
- EN 60950-1 (2006)

EMC
- FCC 47CFR, Part 15 Class A
- ICES-003 Class A
- EN 55022 Class A
- CISPR 22 Class A
- EN 55024
- EN 61000-3-2
- EN 61000-3-3
- EN 300 386 (2008)
- VCCI Class A
- CCC

Environmental
- Reduction of Hazardous Substances (RoHS) 6

Warranty
- Limited lifetime warranty

Ordering information[1]

PN	Description
Switches	
X1LB9BZZ0000	Switch, 1U, 48G+4x10G SFP+, (standard L2/L3 FW), dual PSU, Air Flow Direction Front to Back
X1LB9BZZ0001	Switch, 1U, 48G+4x10G SFP+, (standard L2/L3 FW), dual PSU, Air Flow Direction Back to Front
X1LB9BZZ0STQ	Switch, 1U, 48G+4x10G SFP+, (HW only), dual PSU, Air Flow Direction Front to Back
X1LB9BZZ0STR	Switch, 1U, 48G+4x10G SFP+, (HW only), dual PSU, Air Flow Direction Back to Front
X1LB9BZZ0STQC	Switch, 1U, 48G+4x10G SFP+, (Cumulus FW[2]), dual PSU, Air Flow Direction Front to Back
X1LB9BZZ0STRC	Switch, 1U, 48G+4x10G SFP+, (Cumulus FW[2]), dual PSU, Air Flow Direction Back to Front
Cables 10 G	
XCD-SFSFNgg	Cable, 10GbE, Direct attach, Copper, SFP+ to SFP+, length: gg = {01 - 1m; 02 - 2m; 03 - 3m; 04 - 4m; 05 - 5m}
XCE-SFSFNgg	Cable, 10GbE, Direct attach, Optic, SFP+ to SFP+, length: gg = {01 - 1m; 02 - 2m; 03 - 3m; 04 - 4m; 05 - 5m; 06 - 6m; 07 - 7m; 10 - 10m; 20 - 20m; 50 - 50m; C1 - 100m}
Pluggables	
XSM311-02LY	SFP, multimode, 1310nm, 1Gbps, 2km, LC, with DDMI (0 ± 70OC)
XSM851-M5LY	SFP, multimode, 850nm, 1Gbps, 500m, LC, with DDMI (0 ± 70OC)
XSSdd1-ffLh	SFP, singlemode, dd = {31 - 1310nm; 55 - 1550nm}, 1Gbps,ff = {20 - 20km; 40 - 40km; 80 - 80km; C0 - 120km; G0 - 160km; I0 - 180km; K0 - 200km} , LC, h = {N - no DDMI; Y - DDMI (0 ± 70OC)}
XSBdd1-ffgh	SFP, bidirectional, dd = {27 - 1270nm; 29 - 1290nm; … ; 61 - 1610nm}, 1Gbps, ff = {20 - 20km; 40 - 40km; 80 - 80km; C0 - 120km}, g = {L - LC, S - SC}, h = {N - no DDMI; Y - DDMI (0 ± 70OC)}
XSCdd1-ffLh	SFP, CWDM, 1Gbps, dd = {lower WL: 27 - 1270nm; … 45 - 1450nm / upper WL: 47 - 1470nm; … ; 61 - 1610nm}, ff = {40 - 40km; 80 - 80km; C0 - 120km; G0 - 160km; I0 - 180km; K0 - 200km}, LC, h = {N - no DDMI; Y - DDMI (0 ± 70OC)}
XSDdd1-ffLY	SFP, DWDM C-BAND, dd = {17 - 61 ITU grid channel}, 1Gbps, ff = {80 - 80km; C0 - 120km}, LC, with DDMI (0 ± 70OC)
XTM85A-M3LY	SFP+, multimode, 850nm, 10Gbps, 300m (OM3), LC, with DDMI (0 ± 70OC)
XTS31A-ffLY	SFP+, singlemode, 1310nm, 10Gbps, ff = {02 - 2km; 10 - 10km; 20 - 20km; 40 - 40km}, LC, with DDMI (0 ± 70OC)
XTS55A-ffLY	SFP+, singlemode, 1550nm, 10Gbps, ff = {40 - 40km; 80 - 80km; A0 - 100km}, LC, with DDMI (0 ± 70OC)
XTBddA-ffLY	SFP+, bidirectional, dd = {27 - 1270nm; 32 - 1330nm; }, 10Gbps, ff = {10 - 10km; 20 - 20km; 40 - 40km; 60 - 60km}, LC, with DDMI (0 ± 70OC)

XTCddA-ffLY	SFP+, CWDM, dd = {27 - 1270nm; 29 - 1290nm; … ; 61 - 1610nm}, 10Gbps, ff = {10 - 10km; 40 - 40km; 80 - 70/80km}, LC, with DDMI (0 ± 70OC)
XTDddA--ffLY	SFP+, DWDM C-BAND, dd = {17 - 61 ITU grid channel}, 10Gbps, ff = {40 - 40km; 80 - 80km*}, LC, with DDMI (0 ± 70OC)
XTDTCA--ffLY	SFP+, DWDM C-BAND, Tunable,10Gbps, ff = {40 - 40km; 80 - 80km}, LC, with DDMI (0 ± 70OC)
XTLTLA--ffLY	SFP+, DWDM L-BAND, Tunable, 10Gbps, ff = {40 - 40km; 80 - 80km}, LC, with DDMI (0 ± 70OC)
Services	
Spare Power Supply Unit	
SW&FW	

Notes:

[1] For accurate order specification please contact Xenopt reseller before placing an order. The content of this document is subject to change without notice. Xenopt does not guarantee errorless or outdated information.

[2] For accurate Cumulus FW ordering part number please refer to http://www.cumulusnetworks.com/, or contact Xenopt Reseller.

To find out more, please contact:

www.xenopt.com