

ALCATEL-LUCENT OMNISWITCH 6850E STACKABLE LAN SWITCH

The Alcatel-Lucent OmniSwitch™ 6850E Stackable LAN Switch (SLS) family offers advanced stackable gigabit Ethernet switches for the enterprise networks. The OmniSwitch 6850E is available in 24 and 48 port configurations and provides wire-rate layer-2 and layer-3 switching simultaneously for IPv4 and IPv6. The OmniSwitch 6850E supports fine grained controls for quality of service (QoS) and for security including network access control (NAC), along with full support for 802.3at compliant power over Ethernet (PoE) and additional 10Gig ports for smooth expansion of existing installations where PoE+ or SFP+ is needed.



OS6850E-U24X



OS6-XNI-U2

These versatile LAN switches can be positioned:

- At the edge of mid- to large-sized converged enterprise networks
- At the aggregation layer
- In a small enterprise network core

They are also suitable as advanced CPEs for Ethernet access for metro and managed services.

FEATURES	BENEFITS
Versatile features and models offering: • Gigabit and 10 Gigabit interfaces • IEEE 802.3af and 802.3at compliant PoE • Optional 10GigE plug-in module delivers additional 2 10 Gigabit SFP+ ports	With the variety of interfaces and models, the OmniSwitch 6850 family meets any customer configuration need and offers excellent investment protection and flexibility, as well as ease of deployment, operation and maintenance.
Hardware-based virtual routing and forwarding (VRF) support	Enterprise-wide cost reduction through hardware consolidation to achieve network segmentation and security without additional hardware installation.
Low power consumption, full support for 802.3at PoE+ providing up to 30W of PoE per port	The OmniSwitch 6850E ensures efficient power management, reduces operating expenses and lowers total cost of ownership (TCO). Ensures that the new devices such as CCTV cameras, WLAN access points, and full featured desktop sets can be supported
Wire-rate performance for switching and routing at 10G and gigabit speeds. Advanced services are incorporated in the operating system; for example, QoS, access control lists (ACLs), L2/L3, VLAN stacking, and IPv6.	Outstanding performance when supporting real-time voice, data, and video applications for converged scalable networks
Redundancy at all levels including power supplies, software and hot-swappable Small Form Factor Pluggable (SFP) modules	A field-upgradeable solution that makes the network highly available and reduces operating expenses
Extensive security features for network access control (NAC), policy enforcement and attack containment.	Fully secures the network at the edge, at no additional cost.
Enhanced Unified Access features for converged campus network solutions • SIP Fluency to provision & monitor QOS treatment of SIP flows • Airgroup™ Network Services for Bonjour speaking devices • Integrated Policy with User Network Profile • Citrix VDI fluency enables differentiated services for VDI flows	Unified Access and Application fluent Networks provide resilient architecture with automated controls, enhanced security and simplified management for both wired and wireless users resulting in reduced operational complexity & lesser cost. User Network Profiles add intelligence to the network to automatically adapt as users move around the enterprise network. Integration of services enable employees to access same applications and service across wired and wireless access and thus gives a consistent, seamless user experience.

FEATURES	BENEFITS
Enables deployment of advanced, secure BYOD services in enterprise networks*: • Advanced zero-touch guest management capabilities • Device on-boarding and automated 802.1x provisioning • Device posture/health check, and fingerprinting, • Application management Ready for Metro Ethernet access: VLAN stacking, multicast switching, Dynamic Host Configuration Protocol (DHCP) snooping/option 82, ITU-T Y.1731, IEEE 802.1ag, IEEE 802.3ah and MAC-Forced Forwarding	OS6850E offers flexible deployment options for BYOD services which does not require a forklift upgrade and protects customer investment. Automatic on-boarding and 802.1x provisioning of user devices helps in IT operation simplification and increased wired LAN security. Provides improved control and security over corporate data/applications for mixed personal and corporate environment. Simplifies Metro Ethernet network OA&M for service providers

*with ClearPass

ALCATEL-LUCENT OMNISWITCH 6850E MODELS

The OmniSwitch 6850E family offers customers an extensive selection of gigabit fixed-configuration switches with up to four 10GigE uplinks, PoE and power supply options that accommodate most needs. All models are in a 1RU form factor and have two 10GBase-CX4 ports that can be used either for stacking or as a connector to a plug-in module for two additional 10 Gigabit SFP+ ports.

Table 1. OmniSwitch 6850E modules

Models	10/100/1000 RJ-45	Gigabit SFP	NUMBER OF PORTS		
			10Gig uplinks (stacked)	10Gig uplinks (stand-alone)	802.3af/802.3at PoE ports
OS6850E-24	24	4*		2	x
OS6850E-24X	24	4*	2	4	x
OS6850E-48	48	4*		2	x
OS6850E-48X	48	2*	2	4	x
OS6850E-U24X	2*	24	2	4	x
PoE models					
OS6850E-P24	24	4*		2	24
OS6850E-P24X	24	4*	2	4	24
OS6850E-P48	48	4*		2	48
OS6850E-P48X	48	2*	2	4	48

*these are combo ports

Combo ports are ports individually configurable to be 10/100/1000Base-T or 1000Base-X, which support SFP transceivers for short, long and very long distances.

POWER SUPPLIES

All OmniSwitch 6850E models support redundant, hot-swappable AC, DC or PoE power supplies. The primary and the backup power supply units are modular, allowing for easier maintenance and replacement. There is no interruption of service when a new power supply is installed or an old one replaced

Table 2. OmniSwitch 6850E power supplies

NON-POE PS MODELS	DESCRIPTION	DIMENSIONS (W x D x H)	WEIGHT
OS6850E-BP-D	Modular 120W -48-V DC power supply. Provides system power to one non-PoE device.	16 x 17.5 x 4.4 cm (6.3 x 6.9 x 1.73 in.)	2.09 lb (0.95 kg)
OS6850E-BP	Modular 126W AC power supply. Provides system power to one non-PoE device	16 x17.5 x 4.4 cm (6.3 x 6.9 x 1.73 in.)	2.45 lb (1.11 kg)
Power Supplies for PoE models			
OS6850E-BPP	Modular 360W AC power supply. Provides system and up to 240 W of PoE power.	16 x 17.5 x 4.4 cm (6.3 x 6.9 x 1.73 in.)	3.22 lb (1.46 kg)
OS6850E-BPPH	Modular 510W AC power supply. Provides system and up to 390 W of PoE power.	32 x 17.5 x 4.4 cm (12.6 x 6.9 x 1.73 in.)	5.71 lb (2.59 kg)
OS6850E-BPPX	Modular 900W AC power supply. Provides system and up to 780 W of PoE power.	32 x 17.5 x 4.4 cm (12.6 x 6.9 x 1.73 in.)	6.02lb (2.73 kg)
Power supply shelf	Comes with every bundle and holds one 510W AC or two 360W AC, 126W AC, or 120W DC power supplies	35.3 x 21 x 4.4 cm (13.9 x 8.3 x 1.73 in.)	1.26 lb (0.57 kg)

Any power supply can be remotely connected with a cable that enables rack mounting with the mounting ears provided with the unit. This feature allows for space-sensitive installations requiring reduced depth, for example, in a wall-mounted cabinet.

In addition to the primary and backup power supplies the OS6850E family supports the OmniSwitch Backup power shelf (BPS). With flexible configuration and advanced management capabilities the BPS is a powerful and cost effective way to protect against primary power supply failure while reducing the closet space used. The OmniSwitch BPS supplies redundant power for system power as well as power over Ethernet (PoE) for OmniSwitch 6850E devices only. It can actively backup up to eight devices attached in either full backup or single power supply backup mode. **

** - see OmniSwitch BPS datasheet for additional information

TECHNICAL SPECIFICATIONS

Physical dimensions

- Chassis size without PS and shelf:
 - Width: 44.0 cm (17.32 in.)
 - Depth: 27.0 cm (10.63 in.)
 - Height: 4.4 cm (1.73 in.)
- Total size including PS and shelf:
 - Width: 48.2 cm (19.00 in.)
 - Depth: 44.6 cm (17.56 in.)
 - Height: 4.4 cm (1.73 in.)

Indicators

- Per-port LEDs
 - RJ-45: PoE, link/activity
 - SFP: link/activity
 - SFP+: link/activity
- System LEDs
 - Switch ID (indicates the stack ID of the unit in the stack)
 - PRI (virtual chassis primary)

- System (OK) (chassis HW/SW status)
- PWR (primary power supply status)
- BPS (backup power status)

Acoustic levels

Under 48 dB for all models, measured with a single power supply at room temperature

Environmental requirements

- Operating temperature: 0°C to +45°C (+32°F to +113°F)
- Storage temperature: -10°C to +70°C (+14°F to +158°F)
- Humidity (operating and storage): 5% to 95% non-condensing
Cyclic temperature and humidity tests of -5°C to +55°C, 5% to 90% Relative Humidity (RH) for the duration of ~185 hours as per GR-63-CORE

Table 3. OmniSwitch 6850E power consumption, heat dissipation, MTBF and weights

PRODUCT	MTBF (HOURS)	POWER CONSUMPTION (WATTS)*	HEAT DISSIPATION (BTU/HOUR)**	WEIGHTS (CHASSIS ONLY)
PoE models				
OS6850E-P24	186206	84	287	3.88
OS6850E-P24X	178085	94	321	3.91
OS6850E-P48	168662	150	512	4.2
OS6850E-P48X	161769	152	519	4.21
Non-PoE models				
OS6850E-24	272970	58	198	3.79
OS6850E-24X	270735	66	225	3.81
OS6850E-48	253153	91	311	3.95
OS6850E-48X	242611	102	348	3.97
OS6850E-U24X	290159	56	191	3.77

* Calculated maximum power consumption. The power consumed by the power device attached to the PoE port is not included.

** Under full traffic load

Interface and speeds

- 24 and 48 ports 10/100/1000, 24 ports 100/1000Base-X
- Modular 2x 10Gig SFP+ uplinks
- Wire rate at layer 2 and layer 3 on all ports
- Switching throughput numbers per models (with the optional uplinks):
 - OS6850E-48/-P48 (48 GigE ports + 2 x 10G): 101.2 Mp/s
 - OS6850-48X/-P48X (48 GigE ports + 4 x 10G): 131 Mp/s
 - OS6850-24/-P24 (24 GigE ports + 2 x 10G): 65.5 Mp/s
 - OS6850-24X/-P24X (24 GigE ports + 4 x 10G): 95.3 Mp/s
 - OS6850-U24X (24 GigE ports + 4 x 10G): 95.3 Mp/s
- Stacking capacity (full duplex/aggregated): 20/40 Gbps
- Jumbo Frame size: 9216 bytes (for 1/10 Gbps)

COMPLIANCE AND CERTIFICATIONS

Commercial EMI/EMC

- FCC CRF Title 47 Subpart B (Class A)
- VCCI (Class A)
- AS/NZS 3548 (Class A)
- CE marking for European countries (Class A)
- EN 55022:2006+A1:2007 (EMI & EMC)
- EN 61000-3-2:2006
- EN 61000-3-3:1995 +A2:2005
- EN 55024:1998 +A1:2001 +A2:2003 (Immunity)
 - EN 61000-4-2: 2001
 - EN 61000-4-3:2002
 - EN 61000-4-4:2004
 - EN 61000-4-5:2001
 - EN 61000-4-6:2004
 - EN 61000-4-8:2001
 - EN 61000-4-11:2004
- IEEE802.3: Hi-Pot Test (2250 V DC on all Ethernet ports)

Safety agency certifications

- US UL 60950
- IEC 60950-1:2006+A11:2009 Electric/Health and Safety
- CAN/CSA-C22.2 No. 60950-1-03
- NOM-019 SCFI, Mexico
- AS/NZ TS-001 and 60950:2000, Australia
- UL-AR, Argentina
- UL-GS Mark, Germany

- EN 60825-1 Laser: 1993+A1:1997+A2:2001
 - EN 60825-2 Laser:2004
 - CDRH Laser
 - IEC 60950-1/EN 60950 with all country deviations. IEC 60950-1:2005 , Second Edition
 - GR-1089-CORE, Issue 6**
 - GR-63-CORE, Issue 4**
- * Note: Class A with UTP cables.
** Applicable for Non-PoE models

The OS6850E family is compliant with Restriction on Hazardous Substances(RoHS) and Waste Electrical and Electronic Equipment (WEEE) directives.

DETAILED PRODUCT FEATURES

Simplified manageability

Management interfaces

- Intuitive, familiar Alcatel-Lucent operating system (AOS) which is modular by design and common to all OmniSwitch families, reduces training costs and TCO
- Easy to use, point-and-click, web-based element manager (WebView) with built-in help for easy configuration
- Integrated with Alcatel-Lucent OmniVista™ products for network management
- Full configuration and reporting using SNMPv1/2/3 across all OmniSwitch families to facilitate third-party network management system integration
- Remote switch access using Telnet or Secure Shell (SSHv2)
- File upload using USB, TFTP, FTP, SFTP, or SCP for faster configuration
- Human-readable ASCII-based configuration files for off-line editing, bulk configuration and out-of-the-box auto-provisioning

Monitoring and troubleshooting

- Local (on the flash) and remote server logging: Syslog and command log
- Port based mirroring for troubleshooting and lawful interception; supports four sessions with multiple sources-to-one destination
- Policy based mirroring allows selection of the type of traffic to mirror by using QoS policies
- Remote port mirroring facilitates passing mirrored traffic through the network to a remotely connected device
- Port monitoring feature allows capture of Ethernet packets to a file to assist in troubleshooting
- sFlow v5 and RMON for advanced monitoring and reporting capabilities for statistics, history, alarms and events

- IP tools: ping and trace route
- ITU-T Y.1731 and IEEE 802.1ag Ethernet OA&M: Connectivity Fault Management and performance measurements (layer-2 ping and link trace)
- IEEE 802.3ah Ethernet in the First Mile (EFM) for link monitoring , remote fault detection, and loopback control (layer-1 ping)
- Dying Gasp support via SNMP and syslog messages;
- Unidirectional Link Detection (UDLD) detects and disables unidirectional links on fiber optic interfaces.
- Digital Diagnostic Monitoring (DDM): Real-time diagnostics of fiber connections for early detection of optical signal deterioration
- Link Monitoring: link flap detection and link error counts to identify bad connections and automatically make adjustments to use the links that are good
- Time Domain Reflectometry (TDR): used for locating break or other discontinuity in copper cables.

Network configuration

- Auto-negotiating 10/100/1000 ports automatically configure port speed and duplex setting
- Auto MDI/MDIX automatically configures transmit and receive signals to support straight through and crossover cabling
- BOOTP/DHCP client with option 60 allows auto-configuration of the switch for simplified deployment
- DHCP v4/v6 relay to forward client requests to a DHCP server
- Alcatel-Lucent Mapping Adjacency Protocol (AMAP) for building topology maps
- IEEE 802.1AB LLDP with MED extensions for automated device discovery and IP phone provisioning
- Multiple VLAN Registration Protocol (MVRP) and GARP VLAN Registration Protocol (GVRP) for 802.1Q/1ak-compliant VLAN pruning and dynamic VLAN creation
- Auto QoS for switch management and IP phone traffic
- Network Time Protocol (NTP) for network-wide time synchronization
- Dynamic Virtual Network Profiles (vNP) for automating virtual machine/ device attachment to the network with guaranteed SLA

Resiliency and high availability

- ITU-T G.8032 v2 Ethernet Ring Protection (ERP) designed for loop protection and fast convergence times (sub 50 ms) in ring topologies
- Ring Rapid Spanning Tree Protocol (RRSTP) optimized for ring topology to provide less than 100-ms convergence time
- IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) encompasses IEEE 802.1D Spanning Tree Protocol (STP) and IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
- Per-VLAN spanning tree (PVST+) and Alcatel-Lucent 1x1 STP mode
- IEEE 802.3ad Link Aggregation Control Protocol (LACP) and static LAG groups across modules
- Dual-home link support for sub-second link protection without STP
- Virtual Router Redundancy Protocol (VRRP) to provide highly available routed environments
- Bidirectional Forwarding Detection (BFD) for fast failure detection and reduced re-convergence times in a routed environment.
- Broadcast, unknown unicast and multicast storm control to avoid degradation in overall system performance
- Redundant and hot-swappable power supplies, transceivers modules offering uninterruptible service
- Dual image and dual configuration files storage provides backup
- In Service Software Upgrade (ISSU)
- Stacking capability for virtual chassis redundancy. Up to 10-km fault-tolerant remote stacking supported.
- Split Stack Protection: Auto detection and recovery of stacks splitting into sub-stacks due to one or more stacking-link or stack element failure.
- WCCPv2 for transparent traffic flow redirection and better bandwidth utilization

Advanced security

Access control

- AOS Access Guardian framework for comprehensive user-policy-based NAC
- Autosensing 802.1X multi-client, multi-VLAN support
- MAC-based authentication for non-802.1x hosts
- Web based authentication (captive portal): A customizable web portal residing on the switch

- IEEE 802.1X and MAC-based authentication, with group mobility and “guest” VLAN support
- Host integrity check (HIC) agent on each switch makes it an HIC enforcer and facilitates endpoint device control for company policy compliance; quarantine and remediation are supported as required.
- User Network Profile (UNP) simplifies NAC by dynamically providing pre-defined policy configuration to authenticated clients – VLAN, ACL, BW, HIC
- SSHv2 for secure CLI session with public key infrastructure (PKI) support
- TACACS+ client allows for authentication authorization and accounting (AAA) with a remote TACACS+ server
- Centralized RADIUS and Lightweight Directory Access Protocol (LDAP) user authentication
- Microsoft Active Directory authentication snooping (Kerberos)
- Bring Your Own Device (BYOD) – Enables deployment of advanced, secure BYOD services in enterprise networks*: on-boarding of Guest, IT / non-IT issued and silent devices; Restriction / Remediation of traffic from non-compliant devices. Uses RADIUS CoA to dynamically enforce User Network Profiles based on Authentication, Profiling, Posture check of devices.

* Requires Clearpass

Containment, monitoring and quarantine

- Support for Alcatel-Lucent OmniVista 2500 Quarantine Manager and quarantine VLAN
- Learned Port Security (LPS) or MAC address lockdown secures the network access on user or trunk ports based on MAC address
- DHCP Snooping, DHCP IP and Address Resolution Protocol (ARP) spoof protection
- Embedded traffic anomaly detection (TAD) monitors traffic patterns typical for worm-like viruses and either shuts down the port or reports to the management system
- ARP poisoning detection
- IP Source Filtering as a protective and effective mechanism against ARP attacks.
- ACLs to filter out unwanted traffic including denial of service (DOS) attacks; flow-based filtering in hardware (layer 1 to layer 4)
- Support of Microsoft® Network Access Protection (NAP)

- Bridge Protocol Data Unit (BPDU) blocking automatically shuts down user ports to prevent topology loops if an STP BPDU packet is seen
- STP Root Guard prevents edge devices from becoming STP root nodes
- LLDP Security mechanism for rogue device detection and restriction

Converged networks

PoE

- Dynamic PoE allocation delivers only the power needed by the attached device up to the total power budget for most efficient power consumption
- PoE models support Alcatel-Lucent IP phones and WLAN access points, as well as any IEEE 802.3af-compliant end device
- Configurable per-port PoE priority and max power for power allocation
- Negotiation for Additional PoE Power using LLDP Power-via-MDI TLV

QoS

- Priority queues: Eight hardware-based queues per port for flexible QoS management
- Traffic prioritization: Flow-based QoS with internal and external prioritization (also known as re-marking)
- Bandwidth management: Flow based bandwidth management, ingress rate limiting; egress rate shaping per port
- Queue management: Configurable scheduling algorithms: Strict Priority Queuing (SPQ), Weighted Round Robin (WRR) and Deficit Round Robin (DRR)
- Congestion avoidance: Support for End-to-end Head-of-Line (E2E-HOL) blocking prevention and flow control
- LLDP network polices for dynamic designation of VLAN-ID and layer-2/layer-3 priority for IP phones
- Auto-QoS for switch management traffic as well as traffic from Alcatel-Lucent IP phones
- Differentiated Services for Virtual Desktop Interface (VDI) flows. One-touch QoS support for Citrix VDI

Fluent network for Voice, Video and Data

- Session Initiation Protocol (SIP) detection, session monitoring and tracking
- Provides real time conversation quality information contained in the SIP packets concerning packet loss, delay, jitter, MOS score, R-Factor in real time
- SIP profile for QoS, priority tuning for end-to-end processing
- Multicast DNS Relay: Bonjour protocol Support for wired Airgroup™

Layer-3 routing and multicast

IPv4 routing

- Multiple VRF for network segmentation and Inter-VRF route leaking
- Static routing, Routing Information Protocol (RIP) v1 and v2
- Open Shortest Path First (OSPF) v2, Intermediate System-to-Intermediate System (IS-IS), Border Gateway Protocol (BGP) v4
- Generic Routing Encapsulation (GRE) and IP/IP tunneling
- Graceful restart extensions for OSPF and BGP
- VRRP v2
- DHCP relay (including generic UDP relay)
- ARP

IPv6 routing

- Static routing
- Routing Information Protocol Next Generation (RIPng)
- OSPF v3
- BGP v4 (with extensions to IPv6 routing)
- Graceful restart extensions for OSPF and BGP
- IS-IS v6
- Multi Topology Routing in IS-IS (M-ISIS)
- VRRP v3
- Neighbor Discovery Protocol (NDP)
- DHCP relay for IPv6

IPv4/IPv6 multicast

- Internet Group Management Protocol (IGMP) v1/v2/v3 snooping for optimized multicast traffic
- Protocol Independent Multicast – Sparse Mode (PIM-SM)/Protocol Independent Multicast – Dense Mode (PIM-DM)
- Distance Vector Multicast Routing Protocol (DVMRP)• Multicast Listener Discovery (MLD) v1/v2 snooping for optimized multicast traffic

Metro Ethernet access

- Ethernet services support per IEEE 802.1ad Provider Bridges (also known as Q-in-Q or VLAN stacking):
 - Service VLAN (SVLAN) and Customer VLAN (CVLAN) transparent LAN services
 - Ethernet network-to-network interface (NNI) and user network interface (UNI) services
 - Service Access Point (SAP) profile identification
 - CVLAN to SVLAN translation and mapping

- Ethernet OA&M compliant with ITU Y.1731 and IEEE 802.1ag version 8.1 for connectivity fault and performance management and IEEE 802.3ah EFM for link OA&M
- Service Assurance Agent (SAA) for SLA compliance validation
- Customer provider edge (CPE) test head traffic generator and analyzer tool used in the metro Ethernet network to validate customer Service Level Agreements (SLA)
- TR-101 PPPoE Intermediate Agent allowing for the PPPoE network access method
- MAC-Forced Forwarding support according to RFC 4562
- Private VLAN feature for user traffic segregation
- DHCP Option 82: Configurable relay agent information
- IP Multicast VLAN (IPMVLAN) for optimized multicast replication at the edge saving network core resources
- Optimized Ethernet access services delivery
 - Network bandwidth protection against overload of video traffic
 - Multicast streams isolation from multiple content providers over the same interface
- MEF 9 and 14 certified
- Managed by Alcatel-Lucent 5620 Service Aware Manager

Data center networking

- Dynamic Virtual Network Profiles (vNP)
- Alcatel-Lucent OmniVista™ 2500 Virtual Machine Manager (VMM) and Virtual Network Profiles (vNP) integration

SUPPORTED STANDARDS

IEEE standards

- IEEE 802.1D (STP)
- IEEE 802.1p (CoS)
- IEEE 802.1Q VLANs
- IEEE 802.1ad Provider Bridges (Q-in-Q/VLAN stacking)
- IEEE 802.1ag (Connectivity Fault Management)
- IEEE 802.1ak (Multiple VLAN Registration Protocol)
- IEEE 802.1s MSTP
- IEEE 802.1w RSTP
- IEEE 802.1X Port Based Network Access Control

- IEEE 802.3i 10Base-T
- IEEE 802.3u Fast Ethernet
- IEEE 802.3x (Flow Control)
- IEEE 802.3z Gigabit Ethernet
- IEEE 802.3ab 1000Base-T
- IEEE 802.3ac VLAN Tagging
- IEEE 802.3ad (Link Aggregation)
- IEEE 802.3ae 10G Ethernet
- IEEE 802.3af Power over Ethernet
- IEEE 802.3at PoE Plus

ITU-T standards

- ITU-T G.8032: Draft (June 2008) Ethernet Ring Protection
- ITU-T Y.1731 OA&M fault and performance management

IETF standards

IPv4

- RFC 2003 IP/IP Tunneling
- RFC 2784 GRE Tunneling

OSPF

- RFC 1253/1850/2328 OSPF v2 and MIB
- RFC 1587/3101 OSPF NSSA Option
- RFC 1765 OSPF Database Overflow
- RFC 2154 OSPF MD5 Signature
- RFC 2370/3630 OSPF Opaque LSA
- RFC 3623 OSPF Graceful Restart

RIP

- RFC 1058 RIP v1
- RFC 1722/1723/1724 /2453 RIP v2 and MIB
- RFC 1812/2644 IPv4 Router Requirements
- RFC 2080 RIPng for IPv6

BGP

- RFC 1269/1657 BGP v3 & v4 MIB
- RFC 1403/1745 BGP/OSPF Interaction
- RFC 1771-1774/2842/2918/3392 BGP v4
- RFC 1965 BGP AS Confederations
- RFC 1966 BGP Route Reflection
- RFC 1997/1998 BGP Communities Attribute
- RFC 2042 BGP New Attribute
- RFC 2385 BGP MD5 Signature
- RFC 2439 BGP Route Flap Damping
- RFC 2545 BGP-4 Multiprotocol Extensions for IPv6 Inter-Domain Routing
- RFC 2796 BGP Route Reflection
- RFC 2858 Multiprotocol Extensions for BGP-4
- RFC 3065 BGP AS Confederations

IS-IS

- RFC 1142 OSI IS-IS for Intra-domain Routing Protocol
- RFC 1195 OSI IS-IS for Routing
- RFC 2763 Dynamic Host Name
- RFC 2966 Route Leaking
- RFC 3719 Interoperable Networks
- RFC 3787 Interoperable IP Networks using IS-IS
- RFC 5308 Routing IPv6 with IS-IS
- RFC 5120 Multi Topology Routing in IS-IS

IP multicast

- RFC 1075 DVMRP
- RFC 1112 IGMP v1
- RFC 2236/2933 IGMP v2 and MIB
- RFC 2362/4601 PIM-SM
- RFC 2365 Multicast
- RFC 2710 – Multicast Listener Discovery for IPv6
- RFC 2715/2932 Multicast Routing MIB
- RFC 2934 PIM MIB for IPv4
- RFC 3376 IGMPv3
- RFC 4541 Considerations for IGMP and MLD snooping
- RFC 5060 Protocol Independent Multicast MIB
- RFC 5132 IP Multicast MIB
- RFC 5240 PIM Bootstrap Router MIB

IPv6

- RFC 1886/3596 DNS for IPv6
- RFC 2292/2553/3493/3542 IPv6 Sockets
- RFC 2373/2374/3513/3587/4291 IPv6 Addressing
- RFC 2460//2462/2464 Core IPv6
- RFC 2461 NDP
- RFC 2463/2466/4443 ICMP v6 and MIB
- RFC 2452/2454 IPv6 TCP/UDP MIB
- RFC 2893/4213 IPv6 Transition Mechanisms
- RFC 3056 IPv6 Tunneling
- RFC 3542/3587 IPv6
- RFC 3595 TC for Flow Label

- RFC 4007 IPv6 Scoped Address Architecture
- RFC 4193 Unique Local IPv6 Unicast Addresses
- **Manageability**
- RFC 854/855 Telnet and Telnet options
- RFC 959/2640 FTP
- RFC 1155/2578-2580 SMI v1 and SMI v2
- RFC 1157/2271 SNMP
- RFC 1212/2737 MIB and MIB-II
- RFC 1213/2011-2013 SNMP v2 MIB
- RFC 1215 Convention for SNMP Traps
- RFC 1350 TFTP Protocol
- RFC 1573/2233/2863 Private Interface MIB
- RFC 1643/2665 Ethernet MIB
- RFC 1901-1908/3416-3418 SNMP v2c
- RFC 2096 IP MIB
- RFC 2131 DHCP server/client
- RFC 2570-2576/3411-3415 SNMP v3
- RFC 2616 /2854 HTTP and HTML
- RFC 2667 IP Tunneling MIB
- RFC 2668/3636 IEEE 802.3 MAU MIB
- RFC 2674 VLAN MIB
- RFC 3414 User based Security model
- RFC 4251 Secure Shell Protocol architecture
- RFC 4252 The Secure Shell (SSH) Authentication Protocol
- RFC 4878 OA&M Functions on Ethernet-Like Interfaces

Security

- RFC 1321 MD5
- RFC 2104 HMAC Message Authentication
- RFC 2138/2618/2865/2868/3575/2618 RADIUS Authentication and Client MIB
- RFC 2139/2866/2867/2620 RADIUS Accounting and Client MIB
- RFC 2228 FTP Security Extensions
- RFC 2267 Network Ingress Filtering
- RFC 2284 PPP EAP
- RFC 2869 RADIUS Extension

- RFC 3579 RADIUS for EAP
- RFC 3576 Dynamic Authorization Extensions to RADIUS

QoS

- RFC 896 Congestion Control
- RFC 1122 Internet Hosts
- RFC 2474/2475/2597/3168/3246

DiffServ

- RFC 2697 srTCM
- RFC 2698 trTCM
- RFC 3635 Pause Control

Others

- RFC 768 UDP
- RFC 791/894/1024/1349 IP and IP/Ethernet
- RFC 792 ICMP
- RFC 793/1156 TCP/IP and MIB
- RFC 826/903 ARP and Reverse ARP
- RFC 919/922 Broadcasting internet datagram
- RFC 925/1027 Multi LAN ARP/Proxy ARP
- RFC 950 Subnetting
- RFC 951 BOOTP
- RFC 1151 RDP
- RFC 1191/1981 Path MTU Discovery
- RFC 1256 ICMP Router Discovery
- RFC 1305/2030 NTP v3 and Simple NTP
- RFC 1493 Bridge MIB
- RFC 1518/1519 CIDR
- RFC 1541/1542/2131/3396/3442 DHCP
- RFC 1757/2819 RMON and MIB
- RFC 2131/3046/3315/4649/6221 DHCP/BootP Relay
- RFC 2132 DHCP Options
- RFC 2251 LDAP v3
- RFC 2338/3768/2787 VRRP and MIB
- RFC 3021 Using 31-bit prefixes
- RFC 3060 Policy Core
- RFC 3176 sFlow
- RFC 4562 MAC-Forced Forwarding
- RFC 5880, 5881, 5882 BFD

ORDERING INFORMATION

Table 4. OmniSwitch 6850E ordering information

OS6850E NON-POE BUNDLES	
OS6850E24 OS6850E24D	OS6850E-24: Gigabit Ethernet L3 fixed configuration chassis with 20 RJ-45 10/100/1000 BaseT ports, 4 combo ports, and two 10GigE CX-4 ports. The CX-4 ports can be used as stacking ports or as connectors for the OS6-XNI-U2. A 126-W AC or 120-W DC power supply respectively is included in the bundle.
OS6850E24X OS6850E24XD	OS6850E-24X: Gigabit Ethernet L3 fixed configuration chassis with 20 RJ-45 10/100/1000 BaseT ports, 4 combo ports, 2 SFP+ 10GigE ports, and two 10GigE CX-4 ports. The CX-4 ports can be used as stacking ports or as connectors for the OS6-XNI-U2. A 126-W AC or 120-W DC power supply respectively is included in the bundle.
OS6850E48 OS6850E48D	OS6850E-48: Gigabit Ethernet L3 fixed configuration chassis with 44 RJ-45 10/100/1000 BaseT ports, 4 combo ports, and two 10GigE CX-4 ports. The CX-4 ports can be used as stacking ports or as connectors for the OS6-XNI-U2. A 126-W AC or 120-W DC power supply respectively is included in the bundle.
OS6850E48X OS6850E48XD	OS6850E-48X: Gigabit Ethernet L3 fixed configuration chassis with 46 RJ-45 10/100/1000 BaseT ports, 2 combo ports, 2 SFP+ 10GigE ports, and two 10GigE CX-4 ports. The CX-4 ports can be used as stacking ports or as connectors for the OS6-XNI-U2. A 126-W AC or 120-W DC power supply respectively is included in the bundle.
OS6850EU24X OS6850EU24XD	OS6850E-U24X: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 22 SFP GigE ports, 2 combo ports, 2 SFP+ 10GigE ports, and two 10GigE CX-4 ports. The CX-4 ports can be used as stacking ports or as connectors for the OS6-XNI-U2. A 126-W AC or 120-W DC power supply respectively is included in the bundle.
OS6850E PoE bundles	
OS6850EP24 OS6850EP24H	OS6850E-P24: Gigabit Ethernet L3 fixed configuration chassis with 20 RJ-45 10/100/1000 BaseT PoE ports, 4 combo, and two 10GigE CX-4 ports. The CX-4 ports can be used as stacking ports or as connectors for the OS6-XNI-U2. A 360-W AC or 510-W AC power supply respectively is included in the bundle.
OS6850E NON-POE BUNDLES	
OS6850EP24X OS6850EP24XH	OS6850E-P24X: Gigabit Ethernet L3 fixed configuration chassis with 20 RJ-45 10/100/1000 BaseT PoE ports, 4 combo ports, 2 SFP+ 10GigE ports, and two 10GigE CX-4 ports. The CX-4 ports can be used as stacking ports or as connectors for the OS6-XNI-U2.. A 360W AC or 510W AC power supply respectively is included in the bundle.
OS6850EP48 OS6850EP48H	OS6850E-P48: Gigabit Ethernet L3 fixed configuration chassis with 44 RJ-45 10/100/1000 BaseT PoE ports, 4 combo ports, and two 10GigE CX-4 ports. The CX-4 ports can be used as stacking ports or as connectors for the OS6-XNI-U2. A 360W AC or 900W AC power supply respectively is included in the bundle.
OS6850EP48X OS6850EP48XH	OS6850E-P48X: Gigabit Ethernet L3 fixed configuration chassis with 46 RJ-45 10/100/1000 BaseT PoE ports, 2 combo ports (10/100/1000 BaseT or 1000 BaseX), 2 SFP+ 10GigE ports, and two 10GigE CX-4 ports. The CX-4 ports can be used as stacking ports or as connectors for the OS6-XNI-U2.. A 360W AC or 900W AC power supply respectively is included in the bundle.
OS6850E Power Supplies	
OS6850E-BP-D	Modular 120W DC backup power supply. Provides backup power to one non-PoE switch. Ships with chassis connection cable.
OS6850E-BP	Modular 126W AC backup power supply. Provides backup power to one non-PoE switch. Ships with chassis connection cable and country specific power cord.
OS6850E-BPP	Modular 360W AC backup power supply. Provides backup system and up to 240W of PoE power. Ships with chassis connection cable and country specific power cord.
OS6850E-BPPH	Modular 510W AC backup power supply. Provides backup system and up to 390W of PoE power. Ships with chassis connection cable, country specific power cord, power shelf and rack mounts.
OS6850E-BPPX	Modular 900W AC backup power supply. Provides backup system and up to 780W of PoE power. Ships with chassis connection cable, country specific power cord, power shelf and rack mounts.
Backup Power Shelf (BPS)	
OS-BPS	The OmniSwitch backup power shelf (BPS). Protects against primary power supply and AC circuit failure. Actively backs up to 8 devices. It has total of 5 power supply bays to accommodate up to three PoE power supplies (OS-BPS-P) and two 450W system power supplies (OS-BPS-S). By default the OS-BPS comes with one 450W AC power supply
OS-BPS-S	Modular 450W AC power supply for OmniSwitch BPS. Provides a backup for system power only

OS-BPS-P	Modular Power Over Ethernet (PoE) AC power supply for OmniSwitch BPS. It provides up to 1200W @110V/2000W @220V of PoE power. Must be installed along with OS-BPS-S system power supply.
Plug-in Modules	
OS6-XNI-U2	OS6850E Optional 10GigE plug-in module. Supports 2 SFP+ 10GigE ports. Inserts in the stacking cages and connects to the CX-4 ports at the rear of the OS6850E chassis.
OS6850E Software	
OS6850E-SW-AR	OS6850E Advanced Routing software. Includes support for IPv4 Routing protocols OSPFv2, BGPv4, PIM-SM/DM and DVMRP and support for IPv6 Routing protocol OSPFv3. Must be purchased separately

SERVICE AND SUPPORT

Warranty

Limited lifetime hardware warranty: Limited to the original owner, and will be provided for up to 5 years after the product's End-of-Sales announcement.