ALCATEL-LUCENT OMNISWITCH 6450-10
GIGABIT ETHERNET LAN SWITCH

The Alcatel-Lucent OmniSwitch™ 6450 Stackable Gigabit Ethernet LAN value switch family includes a series of 10-port models (non-PoE, Power over Ethernet [PoE], Fast and Gigabit Ethernet) for classroom, workgroup and small enterprise segments. Designed with an optimized size, low-power consumption, fan-less and fan models and a rich software feature set, the OmniSwitch 6450-10 models provide a highly available, self-protective, easily managed and eco-friendly collocation solution.

OmniSwitch 6450-P10S

OmniSwitch 6450-10L/10
OmniSwitch 6450-P10L/P10

Service providers offering managed services have the option to install the Metro services license enabling a set of Metro Ethernet features. This allows the OmniSwitch 6450-10 port models to be quickly integrated into the provider's network as advanced customer premise equipment (CPE) devices. The OS6450-P10S is especially designed for small cell access point deployments requiring higher PoE power and precision network timing.

The Alcatel-Lucent OmniSwitch 6450-10 models use the latest technologies and Alcatel-Lucent Operating System (AOS) innovations.

Solutions benefiting from the OmniSwitch 6450-10 switches are:
• Classroom and workgroup networks
• Small enterprise or branch office networks
• Commercial and residential managed services
• Service Provider networks deployments

ALCATEL-LUCENT OMNISWITCH 6450-10

The Alcatel-Lucent OmniSwitch 6450-10 offers eight user ports for smaller network environments. These models are power and acoustically optimized, with a half-rack width (8.5 in./21.59 cm), and have a fixed configuration chassis in a 1 RU form factor. All models are fan-less (except –P10S) and have an internal power supply. The –P10L/-P10 PoE models are both IEEE 802.3af/802.3at compliant with a 115 W power budget for PoE attached devices. The P10S PoE model supports IEEE 802.3af/802.3at, and is compliant the PoE section of the PoH (Power over HDBase-T over four pair) standard with a 280W power budget for PoE attached devices.

The OmniSwitch 6450-10L/P10L models have the user port speeds fixed for 10/100M operation. These models are upgradeable to gigabit speeds in the future using the OS6450-10L-UPGD license upgrade.

Table 1. OmniSwitch 6450-10 model configurations

CHASSIS	10/100 PORTS	10/100/ 1000 PORTS	GIG COMBO PORTS	SFP UPLINK (GIGABIT) SFP STACKING (5 GB/S)*	POWER SUPPLY SUPPORTED	BACKUP POWER SUPPLY SUPPORTED
Non-PoE models						
OS6450-10L	8	0	2	2	Internal AC	N/A
OS6450-10	0	8	2	2	Internal AC	N/A
PoE models						
OS6450-P10L	8	0	2	2	Internal AC	N/A
OS6450-P10	0	8	2	2	Internal AC	N/A
OS6450-P10S	0	8	0	2	Internal AC	N/A

Port information:
- RJ-45 combo port configurable to be RJ10/100/1000Base-T
- SFP combo port supporting 100/1000Base-X transceivers for short, long and very long distances
- SFP fixed fiber interfaces support only gigabit SFP transceivers or SFP stacking cable.
- All P10S ports support 1588v2 Transparent Clock and is a non-stackable switch

TECHNICAL SPECIFICATIONS

PORT	OS6450-10L	OS6450-10	OS6450-P10L	OS6450-P10	OS6450-P10S*
RJ-45 10/100 ports	8	0	8	0	0
RJ-45 10/100/1000 ports	0	8	0	8	8
RJ-45/SFP 10/100/1000 combo ports	2	2	2	2	0
SFP uplink/stacking ports	2	2	2	2	2
PoE ports	0	0	8	8	8
Maximum units stackable*	4	4	4	4	N/A
Dimensions					
Switch width	8.50 in. (21.5 cm)	8.50 in. (21.5 cm)	8.50 in. (21.5 cm)	8.50 in. (21.5 cm)	8.50 in. (21.5 cm)
Switch height	1.73 in. (4.4 cm)	1.73 in. (4.4 cm)	1.73 in. (4.4 cm)	1.73 in. (4.4 cm)	1.73 in. (4.4 cm)
Switch depth	11.5 in. (29.21 cm)	11.5 in. (29.21 cm)	11.5 in. (29.21 cm)	11.5 in. (29.21 cm)	11.5 in. (29.21 cm)
Performance (Aggregated)					
Switch capacity (with 2GigE uplinks)	5.6 Gb/s	20 Gb/s	5.6 Gb/s	20 Gb/s	20 Gb/s
Switch capacity (with 4GigE uplinks)	9.6 Gb/s	24 Gb/s	9.6 Gb/s	24 Gb/s	N/A
Max frame rate (4GigE or 2GigE uplinks)	14.28 Mp/s	35.70 Mp/s	14.28 Mp/s	35.70 Mp/s	29.76 Mp/s (2 uplinks)
Stacking capacity (2x5Gbs stacking)	10/20 Gb/s	10/20 Gb/s	10/20 Gb/s	10/20 Gb/s	N/A
Operating conditions					
Operating temperature	0°C to +45°C 32°F to +113°F	0°C to +45°C 32°F to +113°F	0°C to +45°C 32°F to +113°F	0°C to +45°C 32°F to +113°F	0°C to +45°C 32°F to +113°F
Storage temperature	-40°C to +75°C -40°F to +167°F	-40°C to +75°C -40°F to +167°F	-40°C to +75°C -40°F to +167°F	-40°C to +75°C -40°F to +167°F	-40°C to +75°C -40°F to +167°F
Humidity (operating and storage)	5% to 95%	5% to 95%	5% to 95%	5% to 95%	5% to 95%
MTBF (hours)	695,192	695,192	499,729	499,729	329,729
Power supply efficiency	85.6%	85.6%	90.1%	90.1%	88.46%
Fan-less design (Yes/No)	Yes	Yes	Yes	Yes	No (1+1 redundant)
Acoustic (dB)	Silent	Silent	Silent	Silent	<40 db(A)
System power consumption (watts/btu)** • 0% traffic • 50% traffic • 100% traffic	12.40W / 42.31 12.70W / 43.33 12.70W / 43.33	13.00W / 44.35 15.00W / 51.18 15.2W / 51.86	12.90W / 44.01 13.61W / 46.43 13.65W / 46.57	14.20W / 48.45 16.30W / 55.61 16.35W / 55.78	20.20W / 68.92 22.25W / 75.92 23.80W / 81.20
PoE power budget	N/A	N/A	115 W	115 W	280 W

PORT	OS6450-10L	OS6450-10	OS6450-P10L	OS6450-P10	OS6450-P10S*
Max PoE power/port (up to the power budget)	N/A	N/A	31W	31W	Ports 1-4: 75W (four pair)
Ports 5-8: 31W (two pair)					
PoE device heat dissipation (btu)	N/A	N/A	409	409	921

* All PoE ports support IEEE 802.3af/802.3at. PoE (four pair) ports 1-4 are compliant with the PoE portion of the Power over HD Base-T (PoH) standard with a 280W PoE power budget.

** Power consumption measured with 64 byte packets at varied % traffic conditions on all port, including the stacking ports

Indicators
System LEDs
- System (OK) (chassis HW/SW status)
- PWR (primary power supply status)
- PRI (virtual chassis primary)
- BPS (backup power status)
- STK (stacking indicator for 10 port models)

Per-port LEDs
- 10/100/1000: PoE, link/activity
- SFP: Link/activity
- Stacking: Link/activity

Compliance and certifications
Commercial
EMI/EMC
- FCC CRF Title 47 Subpart B (Class A limits. Note: Class A with UTP cables)
- VCCI (Class A limits. Note: Class A with UTP cables)
- AS/NZS 3548 (Class A limits. Note: Class A with UTP cables)
- CE-Mark: Marking for European countries (Class A limits. Note: Class A with UTP cables)
- CE-Mark
  ¬ 2006/95/EC: Low voltage Directive
  ¬ 2004/108/EC: EMC-Directive
  ¬ 2011/65/EU: RoHS-Directive
- EN 55022: 2010 (EMI and EMC requirement))
- EN 61000-3-3: 2008
- EN 61000-3-2: 2006+A1:2009+A2 (Limits for harmonic current emissions)
- EN 55024: 2010 (ITE Immunity characteristics)
  ¬ EN 61000-4-2: 2008
  ¬ EN 61000-4-3: 2010
  ¬ EN 61000-4-4: 2011
  ¬ EN 61000-4-5: 2005
  ¬ EN 61000-4-6: 2008
  ¬ EN 61000-4-8: 2009
  ¬ EN 61000-4-11: 2004
- IEEE802.3: Hi-Pot Test (2250 V DC on all Ethernet ports)
- EN 50581: 2012 Standard for technical documentation for RoHS recast

Safety agency certifications
- CB Scheme: Certification per IEC 60950/ EN 60950 with all different country deviations, IEC 60950-1:2005: 2nd Edition
  ¬ UL 60950 United States
  ¬ IEC 60950-1:2006; all national deviations
  ¬ EN 60950-1: 2nd Edition+A11: 2009+A1: 2010+A12: 2011 (Electric/ Health & Safety) all national deviations
  ¬ 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
- IEC 60825-1 Laser, IEC 60825-2 Laser
- CDRH Laser

DETAILED PRODUCT FETAURES
Simplified management
Configuration management interfaces
- Intuitive Alcatel-Lucent command-line interface (CLI) with familiar interface reducing training costs
- Easy-to-use, point-and-click web-based element manager (WebView) with built-in help for easy configuration
- Integration with Alcatel-Lucent OmniVista for network management
- Full configuration and reporting using SNMPv1/2/3 across all OmniSwitch families to facilitate third-party Network Management System (NMS) integration
- Remote Telnet management or Secure Shell access using SSHv2
- File upload using USB, TFTP, FTP, SFTP, or SCP for faster configuration
- Human-readable ASCII-based configuration files for offline editing and bulk configuration
- Managed by Alcatel-Lucent 5620 Service Aware Manager

Monitoring and troubleshooting
- Local (on the flash) and remote server logging: Syslog and command log
- Port-based mirroring for troubleshooting and lawful interception supporting four sessions with multiple sources-to-one destination
- Policy-based mirroring – allows selection of the type of traffic to mirror by using quality of service (QoS) policies
- Remote port mirroring that facilitates passing mirrored traffic through the network to a remotely connected device
- Port monitoring feature that allows capture of Ethernet packets to a file, or for on-screen display 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
- Digital Diagnostic Monitoring (DDM): Real-time diagnostics of fiber connections for early detection of optical signal deterioration
- Time Domain Reflectometry (TDR): For locating breaks or other discontinuity in copper cables

Network configuration
- Auto remote configuration download feature
- 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/Dynamic Host Configuration Protocol (DHCP) client allows auto-config of switch IP information for simplified deployment
- DHCP relay to forward client requests to a DHCP server
- Alcatel-Lucent Mapping Adjacency Protocol (AMAP) for building topology maps

- IEEE 802.1AB Link Layer Discovery Protocol (LLDP) with MED extensions for automated device discovery
- Multiple VLAN Registration Protocol (MVRP) for IEEE 802.1Q-compliant. VLAN pruning and dynamic VLAN creation
- Auto QoS for switch management traffic as well as traffic from Alcatel-Lucent IP phones
- IEEE 1588v2 Precision Timing Protocol (PTP) via end-to-end Transparent Clock (TC) for network-wide time synchronized applications: – "S" models only
- Network Time Protocol (NTP) for network-wide time synchronization
- Stackable to 4 units

Resiliency and high availability
- Rapid Ring Spanning Tree Protocol (RRSTP) optimized for ring topology to provide less than 100 ms convergence time
- IEEE 802.1s Multiple Spanning Tree Protocol: Encompasses IEEE 802.1D STP and IEEE 802.1w Rapid Spanning Tree Protocol
- 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 is supported
- Dual-home link (DHL) support for sub second link protection without STP
- Virtual Router Redundancy Protocol (VRRP) to provide highly available routed environments
- Broadcast and multicast storm control to avoid degradation in overall system performance
- Unidirectional Link Detection (UDLD): Detects and disables unidirectional links on fiber optic interfaces
- Layer 2 port loopback detection for preventing customer loops on Ethernet access ports
- Redundant and hot-swappable power supplies, transceivers modules offering uninterruptable service
- Dual image and dual configuration files storage provides backup

Advanced security
Access control
- AOS Access Guardian framework for comprehensive user policy- based Network Access Control (NAC)
- Autosensing 802.1X multi-client, multi-VLAN
- MAC-based authentication for non-802.1x hosts

- Web-based authentication (Captive Portal) – a customizable web portal residing on the switch that can be used for authenticating supplicants as well as non-supplicants
- Group mobility rules and "guest" VLAN support
- The host integrity check (HIC) agent on each switch makes it a HIC enforcer and facilitates endpoint device control for company policy compliance.
- Supports dynamic Change of Authentication (CoA) and enforces traffic remediation or restriction for non-compliant devices.
- User Network Profile (UNP) – simplify NAC management and control by dynamically providing pre-defined policy configuration to authenticated clients – VLAN, ACL, BW, HIC
- SSH for secure CLI session with public key infrastructure (PKI) support
- Centralized RADIUS and Lightweight Directory Access Protocol (LDAP) user authentication
- Private VLAN feature for user traffic segregation

Containment, monitoring and quarantine
- Alcatel-Lucent Quarantine Manager and quarantine VLAN (not supported)
- 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 Spoof protection
- TACACS+ client allows for authentication authorization and accounting with a remote TACACS+ server
- Dynamic Address Resolution Protocol (ARP) protection and ARP poisoning detection
- Access control lists to filter out unwanted traffic including denial of service attacks; flow-based filtering in hardware (L1-L4)
- Bridge Protocol Data Unit (BPDU) blocking – automatically shuts down user ports if a STP BPDU packet is seen to prevent topology loops
- STP Root Guard – prevents edge devices from becoming Spanning Tree Protocol root node

Converged networks
PoE
- The PoE models support Alcatel-Lucent IP phones and WLAN access points, as well as any IEEE 802.3af or IEEE 802.3at compliant end device.

- The P10S PoE model supports IEEE 802.3af, IEEE 802.3at and is compliant the PoE section of the PoH (Power over HDBase-T) standard
- Configurable per port PoE priority and max power for power allocation
- Dynamic PoE allocation delivers only the power needed by the Powered Devices (PD) up to the total power budget for most efficient power consumption.

QoS
- Priority queues: Eight hardware-based queues per port for flexible QoS management
- Traffic prioritization: Flow-based QoS with internal and external (that is, remarking) prioritization
- Bandwidth management: Flow-based bandwidth management, ingress rate limiting; egress rate shaping per port
- Queue management: Configurable scheduling algorithm – Strict Priority (SQP), Weighted Round Robin (WRR) and Deficit Round Robin (DRR)
- Congestion avoidance: Support for End-to-End Head of Line (E2E-HOL) Blocking Protection
- Auto QoS for switch management traffic as well as traffic from Alcatel-Lucent IP phones
- Three color marker – single/dual rate – policing with commit BW, excess BW, burst size

Layer 2, Layer 3 routing and multicast
Layer 2 switching
- Up to 16,000 MACs
- Up to 4000 VLANs
- Up to 2K Access Control Lists (ACLs)
- Latency: <4 µs

IPv4 and IPv6
- Static routing for IPv4 and IPv6
- RIP v1 and v2 for IPv4, RIPng for IPv6
- Up to 256 IPv4/128 IPv6 static and RIP routes
- Up to 128 IPv4 and 16 IPv6 interfaces
- Up to 1k Arp entries

Multicast
- IGMPv1/v2/v3 snooping to optimize multicast traffic
- Multicast Listener Discovery (MLD) v1/v2 snooping
- Up to 1000 multicast groups/stack
- IP Multicast VLAN (IPMVLAN) for optimized multicast replication at the edge saving network core resources

Network protocols
- DHCP relay (including generic UDP relay)
- ARP
- DHCP relay
- DHCP relay to forward client requests to a DHCP server
- Generic User Datagram Protocol (UDP) relay per VLAN
- DHCP Option 82 – configurable relay agent information

Metro Ethernet access (features available through Metro license upgrade)
- Ethernet services support per IEEE 802.1ad Provider Bridge
  - ¬ Transparent LAN Services with Service VLAN (SVLAN) and Customer VLAN (CVLAN) concept
  - ¬ Ethernet network-to-network interface (NNI) and user network interface (UNI) services
  - ¬ Service Access Point (SAP) profile identification
  - ¬ CVLAN to SVLAN translation and mapping
- IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (L2 ping and link trace)
- Ethernet OAM compliant with IEEE 802.3ah
- ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies
- Private VLAN feature for user traffic segregation
- Service Assurance Agent (SAA) for proactively measuring network health, reliability and performance. Four SAA tests including L2-MAC, IP, ETH-LB and ETH-DMM depending on your network requirements
- Customer Provider Edge (CPE) test head traffic generator and analyzer tool used in the metro Ethernet network to validate customer Service Level Agreements (SLA)
- IPMVLAN for optimized multicast replication at the edge saving network core resources
- Layer 2 Multicast VLAN Replication (MVR) – allows users from different multicast VLANs to subscribe to a multicast group from an upstream trunk interface
- Three color marker – single/dual rate – policing with commit BW, excess BW, burst size
- TR-101 Point-to-Point Protocol over Ethernet (PPPoE) Intermediate Agent allowing for the PPPoE network access method

- MAC-forced forwarding support according to RFC 4562
- L2CP – Layer 2 Control Protocol for tunneling a customer's L2CP frames, using a well known address, on a given UNI for the EPL and EVPL services
- Dying Gasp using SNMP and Ethernet OAM delivery
- Metro Ethernet Forum CE 2.0 Certified
- Managed by Alcatel-Lucent 5620 Service Aware Manager

Supported standards
IEEE standards
- IEEE 802.1D (STP)
- IEEE 802.1p (CoS)
- IEEE 802.1Q (VLANs)
- IEEE 802.1ad (Provider Bridge)
- Q-in-Q (VLAN stacking)
- IEEE 802.1ag (Connectivity Fault Management)
- IEEE 802.1s (MSTP)
- IEEE 802.1w (RSTP)
- IEEE 802.1X (Port-based Network Access Protocol)
- 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 802.3af (Power over Ethernet)
- IEEE 802.3at (Power over Ethernet)
- IEEE 802.ah (Ethernet first mile)
- IEEE 1588v2 Precision Timing Protocol (PTP) "S" models only
  - ¬ End-to-end Transparent Clock (TC)
  - ¬ IPv4 Unicast address or Ethernet Multicast Encapsulation

ITU-T standards
- ITU-T G.8032: Draft (June 2007) Ethernet Ring Protection
- ITU-T Y.1731 OA&M fault and performance management

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

IP Multicast
- RFC 1112 IGMP v1
- RFC 2236/2933 IGMP v2 and MIB
- RFC 2365 Multicast
- RFC 3376 IGMPv3 for IPv6

IPv6
- RFC 1886 DNS for IPv6
- RFC 2292/2373/2374/2460/2462
- RFC 2461 NDP
- RFC 2463/2466 ICMP v6 and MIB
- RFC 2452/2454 IPv6 TCP/UDP MIB
- RFC 2464/2553/2893/3493/3513
- RFC 3056 IPv6 Tunneling
- RFC 3542/3587 IPv6
- RFC 4007 IPv6 Scoped Address Architecture
- RFC 4193 Unique Local IPv6 Unicast Addresses Manageability
- RFC 1350 TFTP Protocol
- RFC 854/855 Telnet and Telnet options
- 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 1573/2233/2863 Private Interface MIB
- RFC 1643/2665 Ethernet MIB
- RFC 1901-1908/3416-3418 SNMP v2c
- RFC 2096 IP MIB
- RFC 2570-2576/3411-3415 SNMP v3
- RFC 3414 User-based security model
- RFC 2616/2854 HTTP and HTML
- RFC 2667 IP Tunneling MIB
- RFC 2668/3636 IEEE 802.3 MAU MIB
- RFC 2674 VLAN MIB
- RFC 4251 Secure Shell Protocol architecture
- RFC 4252 The Secure Shell (SSH) Authentication Protocol
- RFC 959/2640 FTP

Security
- RFC 1321 MD5
- RFC 2104 HMAC Message Authentication
- RFC 2138/2865/2868/3575/2618 RADIUS Authentication and Client MIB
- RFC 2139/2866/2867/2620 RADIUS Accounting and Client MIB
- RFC 2228 step
- RFC 2284 PPP EAP
- RFC 2869/3579 Radius Extension

Quality of service
- RFC 896 Congestion control
- RFC 1122 Internet Hosts
- RFC 2474/2475/2597/3168/3246 DiffServ
- RFC 3635 Pause Control
- RFC 2697 srTCM
- RFC 2698 trTCM

Others
- RFC 791/894/1024/1349 IP and IP/Ethernet
- RFC 792 ICMP

- RFC 768 UDP
- 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 Sub-netting
- RFC 951 BootP
- RFC 1151 RDP
- RFC 1191 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 DHCP/BootP Relay
- RFC 2132 DHCP Options
- RFC 2251 LDAP v3
- RFC 3060 Policy Core
- RFC 3176 sFlow
- RFC 3021 Using 31-bit prefixes

OMNISWITCH 6450-10 MODELS ORDERING

PART NUMBER	DESCRIPTION
OS6450-10L	Fast Ethernet chassis in a 1 RU form factor with eight 10/100Base-T, two 10/100/1000 RJ-45/SFP combo and two fixed SFP uplink/stacking ports
OS6450-10	Gigabit Ethernet chassis in a 1 RU form factor with eight 10/100/1000Base-T, two 10/100/1000 RJ-45/SFP combo and two fixed SFP uplink/stacking ports
OS6450-P10L	Fast Ethernet chassis in a 1 RU form factor with eight PoE 10/100Base-T, two 10/100/1000 RJ-45/SFP combo and two fixed SFP uplink/stacking ports
OS6450-P10	Gigabit Ethernet chassis in a 1 RU form factor with eight PoE 10/100/1000Base-T, two 10/100/1000 RJ-45/SFP combo and two fixed SFP uplink/stacking ports
OS6450-P10S	Gigabit Ethernet chassis in a 1 RU form factor with eight PoE 10/100/1000Base-T and two fixed gigabit SFP uplink ports. Supports IEEE 802.3af, IEEE 802.3at and 4x75W PoE (four pair) ports compliant with the Power over HD Base-T (PoH) standard with a 280W PoE power budget. Supports 1588v2 precision timing protocol.

License options	All models above support the below license options.
OS6450-10L-UPGD	Software license enabling gigabit speeds on the RJ-45 ports of OS6450-10L and OS6450-P10L chassis to operate at gigabit speed
OS6450-SW-ME	OS6450 software license enables the Metro software features outlined in the Metro Ethernet access section of this data sheet.
Mounting options	Order optional 19" rack mounting kit separately
OS6450-RM-19-L	Simple L-bracket for mounting a single OS6450-10 model switch in a 19-in. rack
OS6450-DUAL-MNT	Two universal mounting and sliding brackets accessory kit. Hardware to mount two 6450-10 units in a 19-in. rack
Gigabit transceivers	
SFP-GIG-LH70	1000Base-LH transceiver with an LC interface for single mode fiber over 1550 nm wavelength. Typical reach of 70 km
SFP-GIG-LH40	1000Base-LH transceiver with an LC interface for single mode fiber over 1310 nm wavelength. Typical reach of 40 km
SFP-GIG-LX	1000Base-LX transceiver with an LC interface for single mode fiber over 1310 nm wavelength. Typical reach of 10 km
SFP-GIG-SX	1000Base-SX transceiver with an LC interface for multimode fiber over 850 nm wavelength. Typical reach of 300 m
SFP-GIG-BX-D	1000Base-BX bidirectional transceiver with an LC type interface for use over single mode fiber optic on a single strand link up to 10 km point to point. Transmits 1490 nm and receives 1310 nm optical signal
SFP-GIG-BX-U	1000Base-BX bidirectional transceiver with an LC type interface for use over single mode fiber optic on a single strand link up to 10 km point to point. Transmits 1310 nm and receives 1490 nm optical signal
100 Megabit transceivers	
SFP-100-MM	100Base-FX transceiver with an LC interface for multimode fiber optic cable
SFP-100-SM15	100Base-FX transceiver with an LC type interface for single mode fiber optic cable up to 15 km
SFP-100-SM40	100Base-FX transceiver with an LC type interface for single mode fiber optic cable up to 40 km
SFP-100-BX-U	100Base-BX bidirectional transceiver with an SC type interface for use over single mode fiber optic on a single strand link up to 20 km point to point, where the client (ONU) transmits 1310 nm and receives 1550 nm optical signal
SFP-100-BX-D	100Base-BX bidirectional transceiver with an SC type interface for use over single mode fiber optic on a single strand link up to 20 km point to point, where the client (OLT) transmits 1550 nm and receives 1310 nm optical signal

Alcatel·Lucent

Enterprise

ALCATEL-LUCENT OMNISWITCH 6450
STACKABLE GIGABIT ETHERNET LAN SWITCH FAMILY

The Alcatel-Lucent OmniSwitch™ 6450 Stackable Fast Ethernet and Gigabit Ethernet LAN value switch family offers versatile, 24/48-port fixed configuration switches with optional upgrade paths for 10 Gigabit Ethernet (GigE) stacking, 10 GigE uplinks and metro Ethernet services.

Offering a design optimized for flexibility and scalability as well as low power consumption, the OmniSwitch 6450 is an outstanding edge solution. It uses the field-proven Alcatel-Lucent Operating System (AOS) to deliver highly available, secure, self-protective, easily managed and eco-friendly networks.

OS6450-24L/P24L
OS6450-24/P24

OS6450-48L/P48L
OS6450-48/P48

OS6450-U24

The Alcatel-Lucent OmniSwitch 6450 family is embedded with the latest technology innovations, and offers maximum investment protection.

Deployments benefiting from the OmniSwitch 6450 family are:
- Edge of small-to-mid-sized networks
- Branch office enterprise and campus workgroups
- Residential and commercially managed services applications

FEATURES

- 24-port and 48-port, Power over Ethernet (PoE), non-PoE and 24-port fiber models with two fixed small form factor pluggable (SFP+) 10-G-ready interfaces
- Scalability from 24 to 384 Fast Ethernet and gigabit ports and 16 10 GigE ports
- Optional SFP+ stacking module
- Optional 10 GigE uplink license option
- Optional metro services feature license for service provider deployments
- Support for IEEE 802.3af as well as IEEE 802.3at-compliant PoE
- Internal AC or DC redundant power supplies

MANAGEMENT

- AOS field-proven software with management through web interface (WebView), command line interface (CLI), and Simple Network Management Protocol (SNMP)

- Ethernet operations, administration and management (OA&M) support for service configuration and monitoring
- Support by Alcatel-Lucent OmniVista™ 2500 Network Management System (NMS)
- Alcatel-Lucent 5620 Service Aware Manager (SAM) applications for service providers

SECURITY

- Flexible device and user authentication with Alcatel-Lucent Access Guardian (IEEE 802.1x/MAC/captive portal) with Host Integrity Check (HIC) enforcement
- Advanced Quality of Service (QoS) and Access Control Lists (ACLs) for traffic control, including an embedded denial of service (DoS) engine to filter out unwanted traffic attacks
- Extensive support of user-oriented features such as learned port security (LPS), port mapping, Dynamic Host Configuration Protocol (DHCP) binding tables and User Network Profile (UNP)

PERFORMANCE AND REDUNDANCY

- Advanced layer-2+ features with basic layer-3 routing for both IPv4 and IPv6
- Triple speed (10/100/1000) user interfaces and fiber interfaces (SFPs) supporting 100Base X or 1000Base-X optical transceivers
- 10 G uplinks with license installed

Alcatel·Lucent
Enterprise

- Wire-rate switching and routing performance
- High availability with virtual chassis concept, redundant stacking links, primary/secondary unit failover, hot-swappable power options and configuration rollback

CONVERGENCE

- Enhanced Voice over IP (VoIP) and video performance with policy-based QoS
- Future-ready support for multimedia applications with wire-rate multicast
- IEEE 802.3at PoE+ support for IP phones, wireless LAN (WLAN) access points and video cameras)

BENEFITS

- Meets any customer configuration need and offers excellent investment protection and flexibility, as well as ease of deployment, operation and maintenance
- Provides outstanding performance when supporting real-time voice, data and video applications for converged scalable networks
- Ensures efficient power management, reduces operating expenses (OPEX) and lowers total cost of ownership (TCO) through low power consumption and dynamic PoE allocation, which delivers only the power needed by the attached device

- A field-upgradeable solution that makes the network highly available and reduces OPEX
- Fully secures the network at the edge at no additional cost
- Enterprise-wide cost reduction through hardware consolidation to achieve network segmentation and security without additional hardware installation
- Supports cost-effective installation and deployment with automated switch setup and configuration and end-to-end virtual LAN (VLAN) provisioning
- Simplifies metro Ethernet network OA&M for service providers

ALCATEL-LUCENT OMNISWITCH 6450 24- AND 48-PORT MODELS

All models ship with two fixed SFP+ ports that operate at 1 Gb/s by default. Operation at 10 Gb/s requires the installation of the OS6450-SW-PERF license. These models also offer a two-port expansion slot for additional gigabit uplinks or 10 Gb/s stacking modules. Both PoE and non-PoE models are full rack width, power optimized, fixed configuration chassis in a 1U form factor.

Table 1. Available OmniSwitch 6450 models
24/48 port models

CHASSIS	10/100 RJ-45 PORTS	10/100/1000 RJ45 PORTS	SFP+ GIGABIT UPLINK SFP+ 10 GIGABIT UPLINK**	10 GBPS SFP+ STACKING EXPANSION MODULE PORTS	PRIMARY POWER	BACKUP POWER
Non-PoE models						
OS6450-24L	24	0*	2	2	Internal AC	Internal AC/DC
OS6450-48L	24	0*	2	2	Internal AC	Internal AC/DC
OS6450-24	0	24	2	2	Internal AC	Internal AC/DC
OS6450-48	0	48	2	2	Internal AC	Internal AC/DC
PoE models						
OS6450-P24L	24	0*	2	2	Internal AC	External AC
OS6450-P48L	24	0*	2	2	Internal AC	External AC
OS6450-P24	0	24	2	2	Internal AC	External AC
OS6450-P48	0	48	2	2	Internal AC	External AC

* User port speeds upgradeable to gigabit speeds with license upgrade
** Requires OS6450-SW-PERF license to enable 10 G uplink capability.
• OmniSwitch 6450-P24L/P24 and OmniSwitch 6450-P48L/P48 models comply with both IEEE 802.3af/at standards.

CHASSIS	10/100/1000 SFP PORTS	10/100/1000 COMBO PORTS	SFP+ GiGABIT UPLINK SFP+ 10 GIGABIT UPLINK**	10 GBPS SFP+ STACKING EXPANSION MODULE PORTS	PRIMARY POWER	BACKUP POWER
Fiber models						
OS6450-U24	22	2	2	2	Internal AC	Internal AC\DC

** Requires OS6450-SW-PERF license to enable 10 G uplink capability.
• Combo ports are ports individually configurable to be 10/100/1000Base-T or 100/1000Base-X, which support SFP transceivers for short, long and very long distances.
• SFP ports support 100/1000 Base-X SFP transceivers

Expansion port models

EXPANSION MODULE	GIGABIT RJ45 PORTS	GIGABIT SFP PORTS	10 Gb/s SFP+ ***
OS6450-XNI-U2	0	0	2
OS6450-GNI-U2	0	2	0
OS6450-GNI-C2	2	0	0

*** Only stacking mode supported

DETAILED PRODUCT FEATURES

Simplified management

Configuration management interfaces

- Intuitive Alcatel-Lucent CLI with familiar interface, reducing training costs
- Easy-to-use, point-and-click web based element manager (WebView) with built-in help for easy configuration
- Integration with Alcatel-Lucent OmniVista 2500 for network management
- Full configuration and reporting using SNMPv1/2/3 across all OmniSwitch families to facilitate third-party NMS integration
- Remote Telnet management or Secure Shell access using SSHv2
- File upload using USB, TFTP, FTP, SFTP, or SCP for faster configuration
- Human-readable ASCII-based config files for off-line editing and bulk configuration
- Managed by Alcatel-Lucent 5620 Service Aware Manager

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 that facilitates passing mirrored traffic through the network to a remotely connected device
- Port monitoring feature that allows capture of Ethernet packets to a file, or to an on-screen display 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
- Digital Diagnostic Monitoring (DDM): Real-time diagnostics of fiber connections for early detection of optical signal deterioration
- Time Domain Reflectometry (TDR): For locating breaks or other discontinuity in copper cables

Network configuration

- Remote auto-configuration download feature
- 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 allows auto-configuration of switch IP information for simplified deployment
- DHCP relay to forward client requests to a DHCP server
- Alcatel-Lucent Mapping Adjacency Protocol (AMAP) for building topology maps
- IEEE 802.1AB Link Layer Discovery Protocol (LLDP) with MED extensions for automated device discovery
- GARP VLAN Registration Protocol (GVRP) for IEEE 802.1Q-compliant VLAN pruning and dynamic VLAN creation
- Auto QoS for switch management traffic as well as traffic from Alcatel-Lucent IP phones
- Network Time Protocol (NTP) for network-wide time synchronization
- Stackable to eight units

Resiliency and high availability

- Ring Rapid Spanning Tree (RRSTP) optimized for ring topology to provide less than 100 ms convergence time
- IEEE 802.1s Multiple Spanning Tree Protocol: Encompasses IEEE 802.1D STP and IEEE 802.1w Rapid Spanning Tree Protocol
- 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 are supported
- Dual-home link (DHL) support for sub-second link protection without STP
- Virtual Router Redundancy Protocol (VRRP) to provide highly available routed environments
- Broadcast and multicast storm control to avoid degradation in overall system performance
- Unidirectional Link Detection (UDLD): Detects and disables unidirectional links on fiber optic interfaces
- Layer-2 port loopback detection for preventing customer loops on Ethernet access ports
- Redundant and hot-swappable power supplies, transceiver modules offering uninterruptable service
- Dual image and dual configuration file storage provide backup

Advanced security

Access control

- AOS Access Guardian framework for comprehensive user-policy-based network access control (NAC)*

- Autosensing IEEE 802.1X multi-client, multi-VLAN MAC-based authentication for non-802.1X hosts
- Web-based authentication (Captive Portal) - A customizable web portal residing on the switch that can be used for authenticating supplicants as well as non-supplicants
- Group mobility rules 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) - Simplify NAC management and control by dynamically providing predefined policy configuration to authenticated clients – VLAN, ACL, BW, HIC
- SSH for secure CLI session with public key infrastructure (PKI) support
- Centralized Remote Access Dial-In User Service (RADIUS) and LDAP user authentication
- Private VLAN feature for user traffic segregation

Containment, monitoring and quarantine

- DHCP Snooping, DHCP IP spoof protection
- Terminal Access Controller Access Control System Plus (TACACS+) client allows for authentication, authorization and accounting with a remote TACACS+ server
- Dynamic ARP protection and ARP poisoning detection
- ACLs to filter out unwanted traffic including DoS attacks; flow-based filtering in hardware (L1 to L4)
- BPDU blocking - Automatically shuts down user ports if an STP BPDU packet is seen to prevent topology loops
- STP Root Guard - Prevents edge devices from becoming Spanning Tree Protocol root node

Converged networks

PoE

- PoE models support Alcatel-Lucent IP phones and WLAN access points, as well as any IEEE 802.3af or IEEE 802.3at-compliant end device
- Configurable per-port PoE priority and max power for power allocation
- Dynamic PoE allocation: Delivers only the power needed by the powered devices (PD) up to the total power budget for most efficient power consumption

QoS

- Priority queues: Eight hardware-based queues per port for flexible QoS management
- Traffic prioritization: Flow-based QoS with internal and external (a.k.a., remarking) prioritization
- 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 Protection
- Auto QoS for switch management traffic as well as traffic from Alcatel-Lucent IP phones
- Three-color marker: Single/Dual Rate – policing with commit BW, excess BW, burst size

Layer-2, Layer-3 Routing and Multicast

Layer-2 switching

- Up to 16,000 MACs
- Up to 4000 VLANs
- Up to 2000 ACLs
- Latency: < 4 µs
- Max Frame: 9216 bytes (jumbo)

IPv4 and IPv6

- Static routing for IPv4 and IPv6
- RIP v1 and v2 for IPv4; RIPng for IPv6
- Up to 256 IPv4 and 128 IPv6 static and RIP routes
- Up to 128 IPv4 and 16 IPv6 interfaces

Multicast

- IGMPv1/v2/v3 snooping to optimize multicast traffic
- Multicast Listener Discovery (MLD) v1/v2 snooping
- Up to 1000 multicast groups per stack
- IP Multicast VLAN (IPMVLAN) for optimized multicast replication at the edge, saving network core resources

Network protocols

- DHCP relay (including generic UDP relay)
- ARP
- Dynamic Host Configuration Protocol (DHCP) relay
- DHCP relay to forward client requests to a DHCP server
- Generic User Datagram Protocol (UDP) relay per VLAN
- DHCP Option 82 – configurable relay agent information

Metro Ethernet access (features available through Metro license upgrade)

- Ethernet services support per IEEE 802.1ad Provider Bridge
  - ¬ Transparent LAN Services with Service VLAN (SVLAN) and Customer VLAN (CVLAN) concept
  - ¬ Ethernet network-to-network interface (NNI) and user network interface (UNI) services
  - ¬ Service Access Point (SAP) profile identification
  - ¬ CVLAN to SVLAN translation and mapping
- IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (L2 ping and link trace)
- Ethernet OAM compliant with IEEE 802.3ah

- ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies
- Private VLAN feature for user traffic segregation
- Service Assurance Agent (SAA) for proactively measuring network health, reliability and performance. Four SAA tests including L2-MAC, IP, ETH-LB and ETH-DMM depending on network requirements
- Customer provider edge (CPE) test head traffic generator and analyzer tool used in the metro Ethernet network to validate customer Service Level Agreements (SLAs)
- IPMVLAN for optimized multicast replication at the edge, saving network core resources
- Layer-2 Multicast VLAN Replication (MVR): Allows users from different multicast VLANs to subscribe to a multicast group from an upstream trunk interface
- Three color marker: Single/Dual Rate – Policing with commit BW, excess BW, burst size
- TR-101 PPPoE Intermediate Agent allowing for the PPPoE network access method
- MAC-Forced forwarding support according to RFC 4562
- Layer-2 Control Protocol (L2CP) for tunneling a customer's L2CP frames, via well known address, on a given UNI for Ethernet Private Line (EPL) and Ethernet Virtual Private Line (EVPL) services
- Dying Gasp via SNMP and Ethernet OAM delivery
- MEF 9 and 14 certified
- Managed by Alcatel-Lucent 5620 SAM

TECHNICAL SPECIFICATION

24/48 port models

PORT	OS6450-24L	OS6450-P24L	OS6450-48L	OS6450-P48L	OS6450-U24
RJ-45 10/100 ports	24	24	48	48	0
PORT	**OS6450-24**	**OS6450-P24**	**OS6450-48**	**OS6450-P48**	**OS6450-U24**
RJ-45 10/100/1000 ports	24	24	48	48	0
PERFORMANCE (Gigabit models)					
Switch capacity with 2x10 G ports and 2x10 G stacking	128 Gb/s	128 Gb/s	176 Gb/s	176 Gb/s	128 Gb/s
Switch capacity with 2x10 G ports and 2x10 G stacking	95.3 Mp/s	95.3 Mp/s	131.0 Mp/s	131.0 Mp/s	95.3 Mp/s
Stacking capacity (aggregated)	40 Gb/s	40 Gb/s	40 Gb/s	40 Gb/s	40 Gb/s
PORT	**OS6450-24L** **OS6450-24**	**OS6450-P24L** **OS6450-P24**	**OS6450-48L** **OS6450-48**	**OS6450-P48L** **OS6450-P48**	**OS6450-U24**
RJ-45/SFP 10/100/1000 combo ports	0	0	0	0	2
SFP 100/1000 ports	0	0	0	0	22
SFP+ Gigabit/10 Gigabit uplink ports	2	2	2	2	2
Ports per expansion module	2	2	2	2	2
PoE ports	0	24	0	48	0
Max 24/48-port models in a stack	8	8	8	8	8
DIMENSIONS					
Width	44.0 cm (17.32 in)	44.0 cm (17.32 in)	44.0 cm (17.32 in)	44.0 cm (17.32 in)	44.0 cm (17.32 in)
Height	4.4 cm (1.73 in)	4.4 cm (1.73 in)	4.4 cm (1.73 in)	4.4 cm (1.73 in)	4.4 cm (1.73 in)
Depth	31.24 cm (12.3 in)	31.24 cm (12.3 in)	39.1 cm (15.4 in)	39.1 cm (15.4 in)	31.24 cm (12.3 in)
Weight	4.08 kg (9.0 lb)	5.05 kg (11.0 lb)	5.44 kg (12.0 lb)	6.8 kg (15.0 lb)	4.08 kg (9.0 lb)
OPERATING CONDITIONS					
Operating temperature	0°C to +45°C 32°F to +113°F	0°C to +45°C 32°F to +113°F	0°C to +45°C 32°F to +113°F	0°C to +45°C 32°F to +113°F	0°C to +45°C 32°F to +113°F
Storage temperature	-40°C to +75°C -40°F to +167°F	-40°C to +75°C -40°F to +167°F	-40°C to +75°C -40°F to +167°F	-40°C to +75°C -40°F to +167°F	-40°C to +75°C -40°F to +167°F
Humidity (operating and storage)	5% - 95%	5% - 95%	5% - 95%	5% - 95%	5% - 95%
Fan (variable speed)*	Fanless	3 fan	3 fan	4 fan	2 fan
Acoustic (dB)	0 db (A)	<40db (A)	<40db (A)	<40db (A)	<40db (A)
MTBF (hours)	894,251	231,542	337,583	135,087	364,214
System power consumption (watts)**	35.67	37.89	64.68	66.54	56.26
System heat dissipation (BTU)	122	129	221	227	192
PoE power budget (watts)	N/A	390	N/A	780	N/A
PoE device heat dissipation (BTU)	N/A	1332	N/A	2663	N/A
Power supply efficiency	86.99%	88.75%	85.72%	81.25%	85.71%

* Acoustic levels measured with a single power supply at room temperature
** Power consumption measured under fully loaded traffic conditions

OmniSwitch 6450 backup supplies and specifications

The OmniSwitch 6450 24/24L/48/48L/U24-port models offer a 1RU internal backup supply configuration where the redundant supply is installed in a power supply bay at the back of the unit.

The OmniSwitch 6450 P24/48-port models offer a 2RU external backup supply configuration where the redundant supply/tray combination mounts above the switch and uses a remote cable for the switch/supply connection. All parts and accessories are included with the backup supply kit.

	BACKUP POWER SUPPLY MODEL			
SPECIFICATION	OS6450-BP	OS6450-BP-PH	OS6450-BP-PX	OS6450-BP-D
Style	Framed	Framed	Framed	Framed
Internal/external	Internal	External	External	Internal
Input voltage	90-220V AC	90-220V AC	90-220V AC	36-72V DC
Output voltage	12V DC	12V DC/54V DC	12V DC/54.5V DC	12V DC
Wattage	90W	530W	900W	90W
PoE power budget	N/A	390W	780W	N/A
Power supply efficiency	85%	85%	80%	85%
Weight	1.11 kg (2.45 lb)	2.59 kg (5.75 lb)	2.73 kg (6.02 lb)	1.11 kg (2.45 lb)
Total RU with BPS	1 RU	2 RU	2 RU	1 RU
Supply dimension	N\A	32 cm x 17.5 cm x 4.4cm (12.6 in x6.9 in x 1.73 in)	2 cm x 17.5 cm x 4.4cm (12.6 in x 6.9 in x 1.73 in)	N\A
Shelf dimension	N\A	35.3 cm x 21 cm x 4.4cm (13.9 in x 8.3 in x 1.73 in)	35.3 cm x 21 cm x 4.4cm (13.9in x 8.3 in x 1.73 in)	N\A
Models supported	OS6450-24/24L/48/48L/U24	OS6450-P24/P24L	OS6450-P48/P48L	OS6450-24/24L/48/48L/U24

INDICATORS

System LEDs

- System (OK) (chassis HW/SW status)
- PWR (primary power supply status)
- PRI (virtual chassis primary)
- BPS (backup power status)
- LED segment display indicates the stack ID of the unit in the stack: 1 to 8 (24/48 port models)

Per-port LEDs

- 10/100/1000: PoE, link/activity
- SFP: Link/activity
- Stacking: Link/activity

Compliance and certifications

Commercial

- EMI/EMC
- FCC CRF Title 47 Subpart B (Class A limits. Note: Class A with UTP cables)
- VCCI (Class A limits. Note: Class A with UTP cables)
- AS/NZS 3548 (Class A limits. Note: Class A with UTP cables)
- CE marking for European countries (Class A limits. Note: Class A with UTP cables)
- EN 55022: 2006 (Emission Standard)
- EN 61000-3-3: 1995
- EN 61000-3-2: 2006

- EN 55024: 1998 (Immunity standards)
  - ¬ EN 61000-4-2: 1995+A1: 1998
  - ¬ EN 61000-4-3: 1996+A1: 1998
  - ¬ EN 61000-4-4: 1995
  - ¬ EN 61000-4-5: 1995
  - ¬ EN 61000-4-6: 1996
  - ¬ EN 61000-4-8: 1994
  - ¬ EN 61000-4-11: 1994
- IEEE802.3: Hi-Pot Test (2250 V DC on all Ethernet ports)

Safety agency certifications

- UL 60950 United States
- IEC 60950-1:2001; all national deviations
- EN 60950-1: 2001; all deviations
- 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, EN 60825-2 Laser
- CDRH Laser

Supported standards

IEEE standards

- IEEE 802.1D (STP)
- IEEE 802.1p (CoS)
- IEEE 802.1Q (VLANs)

- IEEE 802.1ad (Provider Bridge)
- Q-in-Q (VLAN stacking)
- IEEE 802.1ag (Connectivity Fault Management)
- IEEE 802.1s (MSTP)
- IEEE 802.1w (RSTP)
- IEEE 802.1X (Port Based Network Access Protocol)
- 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 (10 Gigabit Ethernet)
- IEEE 802.3af (Power-over-Ethernet)
- IEEE 802.3at (Power-over-Ethernet)
- IEEE 802.ah (Ethernet first mile)
- IEEE 802.3az (Energy Efficient Ethernet)

ITU-T recommendations

- ITU-T Y.1731 OA&M fault and performance management
- TU-T G.8032/Y.1344 2010: Ethernet Ring Protection (ERPv2)

IETF RFCs

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

IP Multicast
- RFC 1112 IGMP v1
- RFC 2236/2933 IGMP v2 and MIB
- RFC 2365 Multicast
- RFC 3376 IGMPv3 for IPv6

IPv6
- RFC 1886 DNS for IPv6
- RFC 2292/2373/2374/2460/2462
- RFC 2461 NDP
- RFC 2463/2466 ICMP v6 and MIB
- RFC 2452/2454 IPv6 TCP/UDP MIB
- RFC 2464/2553/2893/3493/3513
- RFC 3056 IPv6 Tunneling
- RFC 3542/3587 IPv6
- 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
- RFC3414 User-based Security Model
- RFC 2616 /2854 HTTP and HTML
- RFC 2667 IP Tunneling MIB
- RFC 2668/3636 IEEE 802.3 MAU MIB
- RFC 2674 VLAN MIB
- RFC 2818 HTTPS over SSL
- RFC 4251 Secure Shell Protocol Architecture
- RFC 4252 The Secure Shell (SSH v2) Authentication Protocol

Security
- RFC 1321 MD5
- RFC 2104 HMAC Message Authentication
- RFC 2138/2865/2868/3575/2618 RADIUS Authentication and Client MIB
- RFC 2139/2866/2867/2620 RADIUS Accounting and Client MIB
- RFC 2228 FTP Security Extensions step
- RFC 2284 PPP EAP
- RFC 2869/3579 Radius Extension

Quality of service
- RFC 896 Congestion control
- RFC 1122 Internet Hosts

- RFC 2474/2475/2597/3168/3246 DiffServ
- RFC 3635 Pause Control
- RFC 2697 srTCM
- RFC 2698 trTCM

Others
- RFC 791/894/1024/1349 IP and IP/Ethernet
- RFC 792 ICMP
- RFC 768 UDP
- 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 Sub-netting
- RFC 951 BOOTP
- RFC 1151 RDP
- RFC 1191 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 DHCP/BOOTP Relay
- RFC 2132 DHCP Options
- RFC 2251 LDAP v3
- RFC 3060 Policy Core
- RFC 3176 sFlow
- RFC 3021 Using 31-bit Prefixes

OMNISWITCH 6450 ORDERING

MODEL NUMBER	DESCRIPTION
OS6450-24L	Fast Ethernet chassis in a 1U form factor with 24 10/100 Base-T ports, 2 fixed SFP+ (1G/10G*) ports and one expansion slot for optional stacking or uplink modules.
OS6450-P24L	Fast Ethernet chassis in a 1U form factor with 24 PoE 10/100 Base-T ports, 2 fixed SFP+ (1G/10G*) ports and one expansion slot for optional stacking or uplink modules.
OS6450-48L	Fast Ethernet chassis in a 1U form factor with 48 10/100 Base-T ports, 2 fixed SFP+ (1G/10G*) ports and one expansion slot for optional stacking or uplink modules.
OS6450-P48L	Fast Ethernet chassis in a 1U form factor with 48 PoE 10/100 Base-T ports, 2 fixed SFP+ (1G/10G*) ports and one expansion slot for optional stacking or uplink modules.
OS6450-24	Gigabit Ethernet chassis in a 1U form factor with 24 10/100/1000 Base-T ports, 2 fixed SFP+ (1G/10G*) ports and one expansion slot for optional stacking or uplink modules.
OS6450-P24	Gigabit Ethernet chassis in a 1U form factor with 24 PoE 10/100/1000 Base-T ports, 2 fixed SFP+ (1G/10G*) ports and one expansion slot for optional stacking or uplink modules.
OS6450-48	Gigabit Ethernet chassis in a 1U form factor with 48 10/100/1000 Base-T ports, 2 fixed SFP+ (1G/10G*) ports and one expansion slot for optional stacking or uplink modules.
OS6450-P48	Gigabit Ethernet chassis in a 1U form factor with 48 PoE 10/100/1000 Base-T ports, 2 fixed SFP+ (1G/10G*) ports and one expansion slot for optional stacking or uplink modules.
OS6450-U24	Gigabit Ethernet chassis in a 1U form factor with 22 100/1000 Base-X SFP ports, 2 combo ports configurable to be 10/100/1000 Base-T or 100/1000 Base-X, 2 fixed SFP+ (1G/10G*) ports and one expansion slot for optional stacking or uplink modules.
The above model numbers contain	All models above include an internal AC power supply with a country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and RJ-45 to DB-9 adapter. Ethernet SFP optical transceivers, stacking module and cables may be ordered separately.

LICENSE OPTIONS	ALL MODELS ABOVE SUPPORT THE BELOW LICENSE OPTIONS
OS6450-SW-PERF	OS6450 Performance software license for enables 10 gigabit speeds on the two fixed SFP+ ports of the 24- or 48-port models.
OS6450-SW-ME	OS6450 Software license enables the Metro Software features outlined in the Metro Ethernet Access section of this data sheet.
OS6450-24L-UPGD	Software license enabling gigabit speeds on the RJ-45 user ports of OS6450-24L and OS6450-P24L.
OS6450-48L-UPGD	Software license enabling gigabit speeds on the RJ-45 user ports of OS6450-48L and OS6450-P48L.

EXPANSION MODULE	
OS6450-XNI-U2	Optional 10 Gigabit SFP+ stacking module. Supports two SFP+ 10 Gigabit ports. Inserts into the OS6450 expansion slot at the rear of the OS6450 chassis. Order stacking cables separately. Uplink mode not supported.
OS6450-GNI-U2	Optional SFP Gigabit uplink module. Supports two SFP Gigabit ports. Inserts in the OS6450 expansion slot at the rear of the OS6450 chassis. Order SFPs separately.
OS6450-GNI-C2	Optional RJ-45 Gigabit uplink module. Supports two RJ-45 Gigabit ports. Inserts in the 6450 expansion slot at the rear of the OS6450 chassis.

POWER SUPPLY	
OS6450-BP	90 W power AC backup power supply. Provides backup power to one non-PoE switch. Inserts into the backup power supply bay at the rear of the chassis. Ships with country-specific power cord.
OS6450-BP-PH	550 W AC backup power supply. Provides backup PoE power (390 W) to one 24-port PoE switch. Ships with remote power connection cable, country-specific power cord, power shelf and rack mounts for a 2RU configuration.
OS6450-BP-PX	900 W AC backup power supply. Provides backup PoE power (780 W) to one 48-port PoE switch. Ships with remote power connection cable, country-specific power cord, power shelf and rack mounts for a 2RU configuration.
OS6450-BP-D	90 W power DC backup power supply. Provides backup power to one non-PoE switch. Inserts into the backup power supply bay at the rear of the chassis.

CABLES	
OS6450S-CBL-60	OS6450 60 cm long SFP+ direct stacking cable for OS6450 24- and 48-port models
OS6450S-CBL-1M	OS6450 100 cm long SFP+ direct stacking cable for OS6450 24- and 48-port models

GIGABIT TRANSCEIVERS	
SFP-10G-SR	10 Gigabit optical transceiver (SFP+). Supports multimode fiber over 850 nm wavelength (nominal) with an LC connector. Typical reach of 300 m
SFP-10G-LR	10 Gigabit optical transceiver (SFP+). Supports single mode fiber over 1310 nm wavelength (nominal) with an LC connector. Typical reach of 10 km
SFP-10G-ER	10 Gigabit optical transceiver (SFP+). Supports single mode fiber over 1550 nm wavelength (nominal) with an LC connector. Typical reach of 40 km
SFP-10G-LRM	10 Gigabit optical transceiver (SFP+). Supports multimode fiber over 1310 nm wavelength (nominal) with an LC connector. Typical reach of 220 m on FDDI-grade (62.5µm)
SFP-10G-GIG-SR	Dual-speed SFP+ optical transceiver. Supports multimode fiber over 850 nm wavelength (nominal) with an LC connector. Supports 1000Base-SX and 10GBase-SR speeds

GIGABIT TRANSCEIVERS	
SFP-GIG-LH70	1000Base-LH transceiver with an LC interface for single mode fiber over 1550 nm wavelength. Typical reach of 70 km
SFP-GIG-LH40	1000Base-LH transceiver with an LC interface for single mode fiber over 1310 nm wavelength. Typical reach of 40 km
SFP-GIG-LX	1000Base-LX transceiver with an LC interface for single mode fiber over 1310 nm wavelength. Typical reach of 10 km
SFP-GIG-SX	1000Base-SX transceiver with an LC interface for multimode fiber over 850 nm wavelength. Typical reach of 300 m
SFP-DUAL-BX-D	1000Base-BX10-D transceiver with an LC type interface for use over single mode fiber on a single strand link up to 10 km. Operates at 100/1000 Mb speed, transmits 1500 nm and receives 1310 nm optical signal
SFP-DUAL-BX-U	1000Base-BX10-U transceiver with an LC type interface for use over single mode fiber on a single strand link up to 10 km. Operates at 100/1000 Mb speed, transmits 1310 nm and receives 1550 nm optical signal.
SFP-GIG-BX-D	1000Base-BX bidirectional transceiver with an LC type interface for use over single mode fiber on a single strand link up to 10 km point to point. Transmits 1490 nm and receives 1310 nm optical signal
SFP-GIG-BX-U	1000Base-BX bidirectional transceiver with an LC type interface for use over single mode fiber on a single strand link up to 10 km point to point. Transmits 1310 nm and receives 1490 nm optical signal
SFP-GIG-BX-D20	1000Base-BX bidirectional transceiver with an LC type interface for use over single mode fiber on a single strand link up to 20 km point to point. Transmits 1490 nm and receives 1310 nm optical signal
SFP-GIG-BX-U20	1000Base-BX bidirectional transceiver with an LC type interface for use over single mode fiber on a single strand link up to 20 km point to point. Transmits 1310 nm and receives 1490 nm optical signal
SFP-GIG-EXTND	1000Base-SX transceiver with an LC interface for single mode fiber over 850 nm wavelength. Typical reach of 2 km over

100 Megabit transceivers	
SFP-100-MM	100Base-FX transceiver with an LC interface for multimode fiber optic cable
SFP-100-SM15	100Base-FX transceiver with an LC type interface for single mode fiber optic cable up to 15 km
SFP-100-SM40	100Base-FX transceiver with an LC type interface for single mode fiber optic cable up to 40 km
SFP-100-BX-U	100Base-BX bi-directional transceiver with an SC type interface for use over single mode fiber optic on a single strand link up to 20KM point-to-point, where the client (ONU) transmits 1310nm and receives 1550nm optical signal.
SFP-100-BX-D	100Base-BX bi-directional transceiver with an SC type interface for use over single mode fiber optic on a single strand link up to 20KM point-to-point, where the client (OLT) transmits 1550nm and receives 1310nm optical signal.

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