

# ALCATEL-LUCENT ENTERPRISE

## OMNISWITCH 6450 SCS

### SMALL CELL GIGABIT

### ETHERNET LAN SWITCH FAMILY

The OmniSwitch™ 6450-P10S and -U24S models are gigabit fixed-configuration switches that are part of the OmniSwitch 6450 Small Cell Switch (SCS) solution. They provide 1588v2 Precision Timing Protocol (PTP) capability and up to 75 W of power over Ethernet (PoE) per port (-P10S), which is required for deploying small cell devices. These switches allow service providers to rapidly deploy cost-effective Alcatel-Lucent Metro Cell Indoor (MCI) Multi-standard Access Point (MSAP) Small Cell devices. The Alcatel-Lucent MCI MSAPs support Wi-Fi®, 3G and 4G technologies to fill in coverage holes within buildings and provide additional coverage for high-use hotspots such as hotel lobbies, railway stations, airports, and enterprise campus environments.

The OmniSwitch 6450 S family of compact Gigabit Ethernet LAN switches enables service providers to rapidly deploy a cost-effective heterogeneous wireless network of underlying indoor Multi-standard Enterprise Cells that consist of 3G W-CDMA and 4G LTE carriers and provide Wi-Fi access point functionality. The switch family is optimized to deliver Gigabit Ethernet LAN access and aggregation switch capabilities for indoor Multi-standard Enterprise Small Cell transport.

The key features supported by the OmniSwitch 6450 S family include hardware-based IEEE 1588v2 (PTP) Transparent Clock, ONF/SDN OpenFlow programmability, and 4-pair Power over Ethernet.



OmniSwitch 6450-P10S



OmniSwitch 6450-U24S

#### BENEFITS

- Meets the customers' configuration needs and offers excellent investment protection and flexibility, as well as easy deployment, operation and maintenance
- Provides outstanding performance in 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, as well as end-to-end virtual LAN (VLAN) provisioning
- Simplifies metro Ethernet network OAM for service providers

## FEATURES

### Alcatel-Lucent OmniSwitch 6450-P10S

- 10-port (8 x 10/100/1000Base-T PoE and 2 x 10/100/1000Base SFP ports) Gigabit Ethernet LAN switch
- Eight PoE ports (4 x 75 W PoE and 4 x 31 PoE ports) up to a power budget of 280 W
- Compliant with IEEE 802.3af, IEEE 802.3at and the PoE section of the Power over HD Base-T (PoH) standard
- Compliant with IEEE 1588v2 (PTP) Transparent Clock
- Support for software-defined networking (SDN) with ONF OpenFlow programmability
- Optimized dimensions with a half-rack by 1RU form factor
- Internal AC power supply
- Optional metro services feature license for service provider deployments

### Alcatel-Lucent OmniSwitch 6450-U24S

- 24-port (22 x 10/100/1000Base SFP and 2 x RJ45/combo ports) with two fixed SFP+ (10GE-ready) interfaces
- Compliant with IEEE 1588v2 (PTP) Transparent Clock
- Support for software-defined networking (SDN) with ONF OpenFlow programmability
- Optional 10 GigE uplink license option
- Internal AC or DC redundant power supplies
- Optional metro services feature license for service provider deployments

## MANAGEMENT

- AOS field-proven software with management through web interface (WebView), command line interface (CLI) and Simple Network Management Protocol (SNMP)
- Supporting programmable AOS OpenFlow for the creation of specialized services
- Ethernet operations, administration and management (OAM) 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
- Enables deployment of comprehensive and secure BYoD services in enterprise networks such as guest management, device on-boarding, device posturing, application management and dynamic change of authentication (CoA)
- 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
- 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
- Support for multimedia applications with wire-rate multicast
- Airgroup™ Network Services for Bonjour® speaking devices provides consistent experience over wireless and wired networks
- IEEE 802.3at PoE+ support for IP phones, wireless LAN (WLAN) access points and video cameras

### OmniSwitch 6450-P10S 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
OS6450-P10S	0	8	0	2	Internal AC	N/A

#### Port information:

- SFP combo port supporting 100/1000Base-X transceivers
- SFP fixed fiber interfaces support only gigabit SFP transceivers for short, long and very long distances
- All P10S ports support 1588v2 Transparent Clock.

### OmniSwitch 6450-U24S model configurations

CHASSIS	10/100/1000 SFP PORTS	10/100/1000 COMBO PORTS	SFP+ GIGABIT UPLINK SFP+ 10 GIGABIT UPLINK**	10 GB/S SFP+ STACKING EXPANSION MODULE PORTS	PRIMARY POWER	BACKUP POWER
OS6450-U24S	22	2	2	2	Internal AC	Internal AC/DC

#### Port information:

- \*\* Requires OS6450-SW-PERF license to enable 10 G uplink capability.
- Combo ports are individually configurable to be 10/100/1000Base-T or 100/1000Base-X based SFP transceivers.
- SFP+ ports support 1000 Base-X SFP or 10GBase-X transceivers for short, long and very long distances
- All ports support 1588v2 Transparent Clock except expansion module ports (standalone configuration only)

## TECHNICAL SPECIFICATIONS

PORT	OS6450-P10S	OS6450-U24S
RJ-45 10/100/1000 ports	8	22
RJ-45/SFP 10/100/1000 combo ports	0	2
SFP uplink	2	2*
PoE ports	8	N/A
Maximum units stackable	N/A	8
DIMENSIONS		
Switch width	8.50 in (21.5 cm)	17.32 in (44.0 cm)
Switch height	1.73 in (4.4 cm)	1.73 in (4.4 cm)
Switch depth	11.5 in (29.21 cm)	12.3 in (31.24 cm)
Weight	6.06 lb (2.75 kg)	9.0 lb (4.08 kg)
PERFORMANCE (AGGREGATED) P10S: 2 X GE UPLINKS, U24S: 2 X 10 GE UPLINKS, NO STACKING		
Switch capacity	20 Gb/s	88 Gb/s
Max. frame rate	29.76 Mp/s	131 Mp/s
OPERATING CONDITIONS		
Operating temperature	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
Humidity (operating and storage)	5% to 95%	5% to 95%
MTBF (hours)	123,944	364,214
Power supply efficiency	88.46%	85.71%
Number of fans	2 (1+1 redundant)	2
Acoustic (dB)	< 40 dB(A)	< 40 dB(A)
System power consumption/dissipation (watts/Btu)**		
• 0% traffic	20.20 W / 68.92	51.5 W / 175.72
• 50% traffic	22.25 W / 75.92	55.75 W / 190.22
• 100% traffic	23.80 W / 81.20	62.9 W / 214.62
PoE power budget	280 W	N/A
Max PoE power/port (up to the power budget)	Ports 1 to 4: 75 W (four pair) Ports 5 to 8: 31 W (two pair)	N/A
PoE devices heat dissipation (Btu)	921	N/A

\* Default 1 G speed. Requires OS6450-SW-PERF license to enable 10 G uplink capability.

\*\* Power consumption measured with 64 byte packets at varied traffic conditions on all ports

BACKUP POWER SUPPLY MODEL		
SPECIFICATION	OS6450-BP	OS6450-BP-D
Style	Framed	Framed
Internal/external	Internal	Internal
Input voltage	90-220 V AC	36-72 V DC
Output voltage	12V DC	12V DC
Wattage	90 W	90 W
PoE power budget	N/A	N/A
Power supply efficiency	85%	85%
Weight	2.45 lb (1.11 kg)	2.45 lb (1.11 kg)
Total RU with BPS	1 RU	1 RU

## 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 U24S 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
  - EC: Low Voltage Directive
  - EC: EMC Directive
  - EU: RoHS Directive
- EN 55022: EMI and EMC requirement
- EN 61000-3-3
- EN 61000-3-2: Limits for harmonic current emissions
- EN 55024: ITE Immunity characteristics
  - EN 61000-4-2
  - EN 61000-4-3
  - EN 61000-4-4
  - EN 61000-4-5
  - EN 61000-4-6
  - EN 61000-4-8
  - EN 61000-4-11
- IEEE802.3: Hi-Pot Test (2250 V DC on all Ethernet ports)
- EN 50581: 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
  - UL 60950: United States
  - IEC 60950-1: all national deviations
  - EN 60950-1 Electric/Health & Safety: all national deviations
  - CAN/CSA-C22.2 No. 60950-1-03
  - NOM-019 SCFI: Mexico
  - AS/NZ TS-001 and 60950: Australia

- UL-AR: Argentina
- UL-GS Mark: Germany
- IEC 60825-1 Laser, IEC 60825-2 Laser
- CDRH Laser

## DETAILED PRODUCT FEATURES

### 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 destinations
- Policy-based mirroring that allows selecting 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 capturing 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
- Auto-negotiating 10/100/1000 ports automatically configure port speed and duplex setting
- Auto MDI/MDIX configuring transmit and receive signals to support straight through and crossover cabling
- BOOTP/Dynamic Host Configuration Protocol (DHCP) client that allows auto-configuring switch IP information for simplified deployment
- DHCP relay for forwarding 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 virtual LAN (VLAN) pruning and dynamic VLAN creation
- Auto QoS for switch management traffic and traffic from Alcatel-Lucent IP phones
- IEEE 1588v2 Precision Timing Protocol (PTP) through end-to-end Transparent Clock (TC) for network-wide time-synchronized applications: "S" models only
- Network Time Protocol (NTP) for network-wide time synchronization

### 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
- Support for IEEE 802.3ad Link Aggregation Control Protocol (LACP) and static LAG groups across modules
- Dual-home link (DHL) support for sub-second link protection without STP
- Virtual Router Redundancy Protocol (VRRP) providing highly available routed environments
- Broadcast and multicast storm control to avoid degradation in overall system performance
- Unidirectional Link Detection (UDLD) for detecting and disabling 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 uninterruptible 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)
- Auto-sensing 802.1X multi-client and 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, which makes it a HIC enforcer and facilitates endpoint device control for company policy compliance
- Support for dynamic Change of Authentication (CoA) and enforcing traffic remediation or restriction for non-compliant devices
- 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 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
- Terminal Access Controller Access Control System Plus (TACACS+) client allowing authentication, authorization and accounting with a remote TACACS+ server
- Dynamic Address Resolution Protocol (ARP) protection and ARP poisoning detection
- Access control lists filtering out unwanted traffic including denial of service attacks; flow-based filtering in hardware (L1-to L4)

- Bridge Protocol Data Unit (BPDU) blocking: Automatically shutting 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 nodes

## 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 devices.
- 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 delivering 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 (remarking) prioritization
- Bandwidth management: Flow-based bandwidth management, ingress rate limiting; egress rate shaping per port
- Queue management: Configurable scheduling algorithm, including 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 and 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 for optimized 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 for forwarding 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 (< 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 (SLAs)
- IPMVLAN for optimized multicast replication at the edge saving network core resources
- Layer-2 Multicast VLAN Replication (MVR) that 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 and 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
- Layer 2 Control Protocol (L2CP) for tunneling a customer's L2CP frames, using a well-known address, on a given UNI for the Ethernet Private Line (EPL) and Ethernet Virtual Private Line (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): OS6450 "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 Subnetting
- 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



## ORDERING INFORMATION

PART NUMBER	DESCRIPTION
OS6450-P10S	8 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 IEEE 1588v2 precision timing protocol.
OS6450-U24S	Gigabit Ethernet chassis in a 1 RU 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. Supports IEEE 1588v2 precision timing protocol.
<b>LICENSE OPTIONS: ALL MODELS ABOVE SUPPORT THE BELOW LICENSE OPTIONS.</b>	
OS6450-SW-ME	OS6450 software license enables the Metro software features outlined in the Metro Ethernet access section of this data sheet.
<b>MOUNTING OPTIONS: ORDER OPTIONAL 19-IN RACK MOUNTING KIT SEPARATELY</b>	
OS6450-RM-19-L	Simple L-bracket for mounting a single OS6450-P10S model switch in a 19-in. rack
OS6450-DUAL-MNT	Two universal mounting and sliding brackets accessory kit. Hardware to mount two 6450-P10S units in a 19-in. rack
<b>GIGABIT TRANSCEIVERS</b>	
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
<b>10 GIGABIT TRANSCEIVERS</b>	
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 (62.5 μm)
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
<b>POWER SUPPLY</b>	
OS6450-BP	90 W 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-D	90 W 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.