BCD

Alcatel·Lucent Enterprise

Alcatel-Lucent OmniSwitch 6350

Gigabit Ethernet LAN switch family

The Alcatel-Lucent OmniSwitch® 6350 Stackable family is a series of fixed-configuration Gigabit Ethernet switches available as 10-, 24- and 48-port, Power-over-Ethernet (PoE) and non-PoE models to create the exact network for your small business.

The network capabilities of the OmniSwitch 6350 family include advanced security, quality of service and high availability features for your business-class data, voice and wireless technologies. These switches are simple to deploy, configure and manage.

BCD-ALE-OS6350-10
BCD-ALE-OS6350-P10

BCD-ALE-OS6350-24
BCD-ALE-OS6350-P24

BCD-ALE-OS6350-48
BCD-ALE-OS6350-P48

OmniVista 2500 NMS C

All OmniSwitch 6350 switches use the field-proven Alcatel-Lucent Operating System (AOS) to deliver highly available, secure, self-protective, easily managed, and eco-friendly networks.

The OmniSwitch 6350 family is embedded with the latest technology innovations and offers maximum investment protection.

The following type of deployments benefit from the OmniSwitch 6350 family:

- Small business network solutions

Features

- 10-port PoE and non-PoE models with two RJ-45/SFP combo port uplinks
- 24-port and 48-port, PoE and non-PoE models, with four fixed small form-factor pluggable (SFP) Gigabit uplink interfaces
- 5 G/s stacking available on 24/48 port models up to 4 units using fixed SFP ports
- Provides up to 48 ports of PoE connectivity for simplified IP phones, wireless and IP surveillance deployments over a single Ethernet cable. All 6350 models are IEEE 802.3af as well as IEEE 802.3at PoE compliant
- Provides native IPv4 and IPv6 support for routing, Access Control Lists (ACLs) and Dynamic Host Configuration Protocol (DHCP) relay
- Advanced IPv6 threat protection (DHCP snooping, router advertisement protection and source address filter protection) providing protection against a wide range of address spoofing attacks
- Simplified Voice over IP (VoIP) deployments using the advanced Auto- Quality of Service (Auto-QoS) feature that configures the IP telephony devices into the proper virtual LAN (VLAN) with the correct QoS parameters to prioritize voice traffic

Benefits

- Meets all customer configuration needs and offers excellent investment protection and flexibility with easy 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
- Field-upgradeable solution makes the network highly available and reduces OPEX
- Comprehensive security features for your small business network or campus edge at no additional cost
- Supports cost-effective installation and deployment with automated switch setup and configuration

Management

- AOS field-proven software managed through a web interface (WebView), command line interface (CLI), and Simple Network Management Protocol (SNMP)
- Supported by Alcatel-Lucent OmniVista® 2500 Network Management System (NMS)*

Security

- Flexible device and user authentication with Alcatel-Lucent Access Guardian (IEEE 802.1x/MAC)
- Advanced QoS and ACLs for traffic control, including an embedded denial of service (DoS) engine to filter out unwanted traffic attacks
- Protection of management sessions using radius, Terminal Access Controller Access-Control System Plus (TACACS+) and local database authentication as well as secure management sessions over Secure Sockets Layer (SSL), Secure Shell (SSH), and Simple Network Management Protocol version 3 (SNMPv3)
- Extensive support for user-oriented features, such as learned port security (LPS), port mapping, 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 1000Base-X optical transceivers
- Wire-rate switching and routing performance
- High availability with virtual chassis concept, redundant stacking and uplinks links, primary/secondary unit failover, hot-swappable SFP and configuration rollback

Convergence

- Enhanced VoIP and video performance with policy-based QoS
- Support for multimedia applications with wire-rate multicast to help you prepare for the future
- IEEE 802.3at PoE+ support for IP phones, wireless LAN (WLAN) access points and video cameras

OmniSwitch 6350 10-, 24- and 48-port models

All 10-port models ship with 2 RJ-45/SFP combo ports that operate at 1 Gb/s and have a 1/2 rack form factor. All 24 and 48 port models ship with four fixed SFP ports that operate at 1 Gb/s. All PoE and non-PoE models have a full-rack width, power-optimized, fixedconfiguration chassis in a 1U form factor.

Chassis	10/100/1000 RJ45 ports	Gigabit RJ456/ SFP combo	SFP uplink/ stacking ports	Primary power	Backup power
Non-PoE models					
OS6350-10	10	2	0	Internal AC	N/A
OS6350-24	24	0	4	Internal AC	N/A
OS6350-48	48	0	4	Internal AC	N/A
PoE models					
OS6350-P10	10	2	0	Internal AC	N/A
OS6350-P24	24	0	4	Internal AC	N/A
OS6350-P48	48	0	4	Internal AC	N/A

Note: Minimum AOS 6.7.1R04 is reqiured for stacking capability

Detailed product features

Management

Configuration management interfaces

- Intuitive CLI with a 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 configuration files for offline editing and bulk configuration

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 that allows selecting the type of traffic to mirror using 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 to an on-screen display to assist in troubleshooting
- sFlow v5 and Remote Network Monitoring (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
- Auto-negotiating: 10/100/1000 ports automatically configure port speed and duplex setting
- Automatic medium dependent interface/medium-dependent interface crossover (Auto-MDI/MDI-X) configuring to transmit and receive signals to support straightthrough and crossover cabling

- Bootstrap protocol (BOOTP)/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 Media Endpoint Device (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 and traffic from Alcatel-Lucent IP phones
- Network Time Protocol (NTP) for networkwide time synchronization
- Stackable to four units

Resiliency and high availability

- 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: Encompasses IEEE 802.1D Spanning Tree Protocol (STP) and IEEE 802.1w Rapid Spanning Tree Protocol
- Per-VLAN spanning tree (PVST) and 1x1 STP mode
- Support for IEEE 802.3ad Link Aggregation Control Protocol (LACP) and static Link Aggregation Groups (LAGs) across modules
- 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
- Hot-swappable transceiver modules offering uninterruptable service
- Dual-image and dual-configuration file storage provide backup

Advanced security

Access control

- Access Guardian framework in the AOS for comprehensive user-policy-based network access control (NAC)
- Auto-sensing IEEE 802.1X multi-client, multi-VLAN MAC-based authentication for non-802.1X hosts
- Group mobility rules and guest VLAN support
- User network profile (UNP): Simplifying NAC management and control by dynamically providing predefined policy configuration to authenticated clients (VLAN, ACL, BW)
- 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

Containment, monitoring and quarantine

- DHCP snooping, DHCP IP spoof protection
- TACACS+ client allowing authentication, authorization and accounting with a remote TACACS+ server
- Dynamic Address Resolution Protocol (ARP) protection and ARP poisoning detection
- ACLs for filtering out unwanted traffic including DoS attacks; flow-based filtering in hardware (L1 to L4)
- Bridge Protocol Data Unit (BPDU) blocking: Automatically shutting down user ports if an STP BPDU packet is seen to prevent topology loops
- STP Root Guard: Preventing edge devices from becoming Spanning Tree Protocol root nodes

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 devices
- Configurable per-port PoE priority and max power for power allocation
- Dynamic PoE allocation: Delivering only the amount of 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 algorithms, including Strict Priority Queuing (SPQ), Weighted Round Robin (WRR) and Deficit Round Robin (DRR)
- Congestion avoidance: Support for Endto- End Head-Of-Line (E2E-HOL) blocking protection
- Auto QoS for switch management traffic and traffic from Alcatel-Lucent IP phones
- Three-color marker: Single/dual rate policing with commit bandwidth (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 1,000 ingress rules
- Up to 128 egress rules
- Latency: < 4 µs
- Max Frame: 9,216 bytes (jumbo)

IPv4 and IPv6

- Static routing (IPv4 and IPv6)
- Up to 8 IPv4 and 4 IPv6 interfaces
- Up to 8 IPv4 and 4 IPv6 static routes
- Up to 256 ARP entries

Multicast

- IGMPv1/v2/v3 snooping for optimized multicast traffic
- Multicast Listener Discovery (MLD) v1/v2 snooping
- Up to 1000 multicast groups
- IP Multicast VLAN (IPMVLAN) supported

Network protocols

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

Technical specifications

Port	OS6350-10	OS6350-P10
RJ-45 10/100/1000 ports	8	8
RJ-45/SFP 10/100/1000 combo ports	2	2
PoE ports	0	8
Dimensions	OS6350-10	OS6350-P10
Switch width	21.5 cm (8.50 in)	21.5 cm (8.50 in)
Switch height	4.4 cm (1.73 in)	4.4 cm (1.73 in)
Switch depth	28 cm (11 in)	28 cm (11 in)
Performance (aggregated)	OS6350-10	OS6350-P10
Switch capacity (with 2GigE uplinks)	20 Gb/s	20 Gb/s
Max frame rate (2GigE uplinks)	14.88 Mp/s	14.88 Mp/s
Operating conditions	OS6350-10	OS6350-P10
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% – 95%	5% – 95%
MTBF (hours)	694,151	547,284
Power supply efficiency	89.7%	85.6%
Fanless design (Yes/No)	Yes	Yes
Acoustic (dB)	0	0
System power consumption (watts/BTU)	OS6350-10	OS6350-P10
100% traffic	15.00 W/51.18	15.2 W/51.86
PoE power budget	N/A	120W
Max PoE power/port (up to the power budget)	N/A	31 W

Port	OS6350-24	OS6350-P24	OS6350-48	OS6350-P48
RJ-45 10/100/1000 ports	24	24	48	48
Performance (Gigabit models)	OS6350-24	OS6350-P24	OS6350-48	OS6350-P48
Switch capacity with 4xGb/suplinks	56 Gb/s	56 Gb/s	104 Gb/s	104 Gb/s
Switch frame rate with 4xGb/s uplinks	41.66 Mp/s	41.66 Mp/s	77.38 Mp/s	77.38 Mp/s
Port	OS6350-24	OS6350-P24	OS6350-48	OS6350-P48
Gigabit SFP ports	4	4	4	4
Gigabit/5Gb/s Stacking Ports	2/2	2/2	2/2	2/2
PoE ports	0	24	0	48
Dimensions	OS6350-24	OS6350-P24	OS6350-48	OS6350-P48
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)
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)
Depth	25.2 cm (9.92 in)	25.2 cm (9.92 in)	25.2 cm (9.92 in)	38.6 cm (15.2 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)
Operating conditions	OS6350-24	OS6350-P24	OS6350-48	OS6350-P48
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
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

Port	OS6350-24	OS6350-P24	OS6350-48	OS6350-P48
Humidity (operating and storage)	5% – 95%	5% – 95%	5% – 95%	5% – 95%
Fan (variable speed)*	Fanless	3 fans	1 fan	4 fans
Acoustic (dB) at 27°C	0 dB (A)	< 32 dB (A)	< 30 dB (A)	< 40dB (A)
Mean Time Between Failures (MTBF) at 25°C (hours)	1,250,292	421,866	774,351	448,312
System power consumption (W)**	24 W	30 W	50 W	58 W

* Acoustic levels measured with the primary power supply at room temperature

** Power consumption measured with 64-byte packets at varied traffic conditions on all ports, including the 1 Gigabit Ethernet uplinks

OmniSwitch 6350 power supply specifications

The OmniSwitch 6350 24/P24/48/P48 port models offer an internal supply configuration. A backup power supply option is not available on the OmniSwitch 6350 family of products.

Specification	OS6350-24	OS6350-P24	OS6350-48	OS6350-P48
Internal/external	Internal	Internal	Internal	Internal
Nominal Input voltage	90-220 V AC	90-220 V AC	90-220 V AC	90-220 V AC
Output voltage	12V DC	12V DC/54V DC	12V DC	12V DC/53V DC
Wattage	30 W	525 W	60 W	900 W
PoE power budget	N/A	380 W	N/A	780 W
PoE device heat dissipation (BTU)	N/A	1296	N/A	2661
Power supply efficiency	85%	85%	87%	85%

Indicators

System LEDs

System (OK1) (chassis HW/SW status) PWR (primary power supply status) PRI (chassis primary)

Per-port LEDs

- 10/100/1000: PoE, link/activity
- SFP: 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
  - ¬ Low voltage Directive
  - ¬ EMC Directive
  - ¬ RoHS Directive
- EN 55022 (EMI and EMC requirement)
- EN 61000-3-3
- EN 61000-3-2 (Limits for harmonic current emissions)
- EN 55024: 2010 (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
  - ¬ UL 60950, United States
  - ¬ IEC 60950-1, all national deviations
  - ¬ EN 60950-1 (Eletric/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

Supported standards

- IEEE 802.1D (STP)
- IEEE 802.1p (CoS)
- IEEE 802.1Q (VLANs)
- 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 802.3az (Energy Efficient Ethernet)

IETF RFCs

IP Multicast

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

IPv6

- RFC 1981 Path MTU discovery
- RFC 1886 DNS for IPv6
- RFC 2292/2373/2374/2460/2462
- RFC 4861/2461 Neighbor discovery protocol
- RFC 4862/2462 IPv6 stateless address auto-configuration
- RFC 4443/2463/2466 ICMP v6 and MIB
- RFC 2452/2454 IPv6 TCP/UDP MIB
- RFC 2464/2553/2893/3493/3513
- RFC 3056 IPv6 Tunneling
- RFC 3484 Default Address Selection for IPv6
- RFC 3542/3587 IPv6 API support
- RFC 3595 Textual Conventions for IPv6 Flow Label
- RFC 4291/3315 – Dynamic Host Configuration Protocol for IPv6 (DHCPv6)
- RFC 4007 IPv6 Scoped Address Architecture
- RFC 4193 Unique Local IPv6 Unicast Addresses
- RFC 4291/3315 – Dynamic Host Configuration Protocol for IPv6 (DHCPv6)
- RFC 4649 – Dynamic Host Configuration Protocol for IPv6 (DHCPv6) Relay agent Remote-ID option
- RFC 6105 – Router Advertisement Guard
- RFC 6221 – Lightweight DHCPv6 Relay Agent

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

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