Alcatel·Lucent
Enterprise

# Alcatel-Lucent OmniSwitch 6860

## Stackable LAN switches for mobility, IoT and network analytics

The Alcatel-Lucent OmniSwitch® 6860 is a family of advanced Stackable Gigabit and Multi-gigabit Ethernet switches offering high-performance, scalability, resiliency and security. With high-speed flexible uplinks, 200G stacking, industry leading 95W PoE, and high density 10G multi-gigabit ports ready for Wi-Fi 6, these platforms are the right choice for the next generation of enterprise switching networks.

**OS6860N-P48M**

**OS6860N-P48Z**

**OS6860N-P24M**

**OS6860N-P24Z**

**OS6860N-U28**

Alcatel-Lucent OmniSwitch 6860s are high performance and high availability switches that offer unmatched features in terms of quality of service (QoS), mobility, programmability and security for network edge deployments. The OmniSwitch 6860 family enables seamless mobility for users and devices with a high degree of integration between the wired and wireless LAN. The family includes support for next generation wireless LAN standards, Wi-Fi 6 and 802.11ac wave 2 and mix of uplink speeds up to 100G. With best-in-class 95W IEEE 802.3bt compliant support, OmniSwitch 6860 switches are ready for newest PoE and IoT devices, be it the pan-tilt-zoom camera or Wi-Fi 6 access points. The OmniSwitch 6860 family is the first in the industry to offer application monitoring and visibility for network analytics making it ready to meet the evolving business needs of enterprise networks. These switches run on the widely deployed and field-proven Alcatel-Lucent Operating System (AOS) offering programmability, industry leading network automation features and maximum investment protection.

These versatile LAN switches can be positioned:

- At the edge of mid- to large-sized converged enterprise networks
- At the aggregation layer
- In a small enterprise network core
- In the data center for GigE server connectivity and SDN applications

| Features | Benefits |
|---|---|
| • High-density Gigabit and multi-Gigabit (2.5/5/10 Gig) interface models | • With the variety of interfaces and models, the OmniSwitch 6860 family meets customer configuration needs and offers excellent investment protection and flexibility |
| • Virtual Chassis technology to create a single chassis-like entity with up to 32 x 10G/25G, 16 x 40G or 8 x 100 Gigabit uplinks and 384 multi-Gigabit ports | • Offers increased system redundancy, resiliency and high availability, while simplifying deployment, operations and management of the network |
| • Internal, hot-swappable power supplies, front-to-back cooling providing the lowest power consumption in its class | • Ensures efficient power management, thereby reducing operating expenses and lowering total cost of ownership. |
| • IEEE 802.3bt type 4 compliant PoE with up to 95W of PoE per port on select models<br>• IEEE 802.3af and 802.3at compliant PoE of 30W per port on all ports<br>• Support of high PoE (up to 75W per port) | • With its industry-leading PoE capabilities, high density of PoE ports and the best-in-class PoE budget of up to 3.4 kW, the OmniSwitch 6860 is ideal for converged campus deployments by simplifying the wiring, and reducing the time to deploy edge devices such as VoIP phones, surveillance cameras, Wi-Fi 6 access points, thin virtual desktop infrastructure (VDI) client, small cells, or even a small network switch. |
| • Application monitoring and enforcement | • Hardware driven network analytics can optimize the performance of your network and allows applying QoS policies to the individual application flows. |
| Advanced Unified Access features for converged campus network solutions in application fluent network<br>• Integrated policy with dynamic user network profiles<br>• Extensive security features for network access control (NAC), policy enforcement and attack containment<br>• SIP fluency to provision and monitor QoS treatment of SIP flows<br>• Airgroup Network Services for Bonjour and DLNA speaking devices | • Unified access and application fluent networks provide simplified network architecture with automated controls and enhanced security for both wired and wireless users. Offers enhanced management and security for reduced operational complexity costs<br>• User network profiles add intelligence to the network to automatically adapt as users move around the corporation without compromising the security<br>• With its advanced capabilities, the OmniSwitch 6860 shows outstanding performance when supporting real-time voice, data and video applications<br>• Improved user experience with the integration of services that enable employees to access the same applications and service, and have consistent experience across wired and wireless. |
| Enables deployment of comprehensive and secure BYOD services in enterprise networks:<br>• Advanced guest management capabilities<br>• Device on-boarding and automated IEEE 802.1x provisioning<br>• Device posture/health check and fingerprinting<br>• Application management | • The OmniSwitch 6860 offers flexible deployment options and enables the network for BYOD deployments and zero-touch guest management<br>• Supports dynamic change of authentication (CoA) and enforces traffic remediation or restriction for non-compliant devices<br>• Provides control and increased security over corporate data/ applications for the mixed personal and corporate environment for improved visibility and control for IT. |
| • The OmniSwitch 6860 is SDN ready.<br>• Supporting programmable Alcatel-Lucent Operating System (AOS) RESTful APIs, OpenFlow and OpenStack allow the creation of specialized services | • Opens the door for fast deployment of new network services that meet employees' needs to continuously adopt new applications that support the business<br>• The support of SDN reassures customers that their investment is ready for the future and enables interoperability with third-party solutions. |
| • Shortest path bridging (SPB-M) for bridging and routed services | • Offers a solution that fits an enterprise's needs and delivers agile value-added services, while simplifying the transformation of campus networks to meet user needs: Allows for optimal link usage, fast convergence, and ease of configuration in large L2 topologies |
| • High-availability hardware Virtual Extensible LAN (VxLAN) Virtual Tunnel<br>• End Point (VTEP) gateway for network virtualization. | • VxLAN VTEP allows overlay to underlay bridging and data center interconnecting. |
| • • MPLS (Multiprotocol label switching) | • MPLS support for virtualized environments. Enables enterprises to link together their Ethernet-based LANs from multiple sites through service provider network.<br>• The feature is supported on OS6860N.<br>• The software license required for the feature usage. |
| • Multiple VLAN Registration Protocol (MVRP) and dynamic Virtual Network Profiles (VNP)<br>• Virtual Routing and Forwarding (VRF) | • Enterprise-wide cost reduction through hardware consolidation to achieve network segmentation and security without additional hardware installation. |

## Alcatel-Lucent OmniSwitch 6860 models

The OmniSwitch 6860 family offers customers an extensive selection of fixed-configuration switches with up to 95 watts of PoE per port and power supply options that can power a wide range of next-gen Ethernet edge PoE devices, be it pan-tilt-zoom cameras or Wi-Fi 6 devices. All compliant models are in a 1RU form factor and are 19-inch rack-mountable.

There are six enhanced models in the OmniSwitch 6860 family, three advanced models and two premium models. Enhanced models have four fixed 10 Gigabit SFP+ uplink ports. Advanced models have four fixed 1/10/25 Gigabit SFP28 uplink ports whereas the premium model has a modular uplink slot that can support 4x10G, 4x25G, 2x40G & 1x100G uplinks.

For virtual chassis connections, enhanced models have two QSFP+ form-factor ports whereas premium and advanced models have two 100G QSFP28 ports. OmniSwitch 6860 enhanced PoE models support up to 60/75 watts of PoE whereas the advanced and premium PoE models support up to 95 watts of IEEE 802.3 bt compliant PoE. All OmniSwitch 6860 models have a USB port and a console port. All OmniSwitch 6860 models have an Ethernet management port (EMP) port.

**Table 1. OmniSwitch 6860 Gigabit switch configurations**

| | | | | PoE budget | |
|---|---|---|---|---|---|
| **Gigabit models** | **Gigabit copper and fiber ports** | **Uplinks** | **Supported power supplies** | **With 1 PS** | **With 2 PS** |
| **Enhanced models** | | | | | |
| OS6860E-24 | 24 RJ45 | 4 x 1/10G SFP+, MACsec | OS6860-BP, OS6860-BP-D | N/A | N/A |
| OS6860E-P24 | 24 (20 PoE+, 4 x 60W PoE), MACsec | 4 x 1/10G SFP+, MACsec | OS6860-BP-PH | 450 W | 900W |
| OS6860E-48 | 48 RJ45 | 4 x 1/10G SFP+, MACsec | OS6860-BP, OS6860-BP-D | N/A | N/A |
| OS6860E-P48 | 48 (44 PoE+, 4 x 60W PoE) | 4 x 1/10G SFP+, MACsec | OS6860-BP-PX | 750W | 1500W |
| **Advanced models** | | | | | |
| OS6860N-U28 | 24 x 100/1000 BaseX, SFP, MACsec | 4 x 1/10G SFP+, MACsec, 4 x 1/10/25G SFP28, MACsec | OS6860-BP, OS6860-BP-D | N/A | N/A |

**Table 2. OmniSwitch 6860 multi-gigabit switch configurations**

| | | | | PoE budget | |
|---|---|---|---|---|---|
| **Gigabit models** | **Gigabit copper and fiber ports** | **Uplinks** | **Supported power supplies** | **With 1 PS** | **With 2 PS** |
| **Enhanced model** | | | | | |
| OS6860N-P24Z | 12 x 10/100/1000M 60W 802.3bt PoE; 12 x 100M/1G/2.5G/5G 95W 802.3bt PoE | 4 x 1/10/25G SFP28, MACsec | OS6860N-BPPH | 415W | 960W |
| | | | OS6860N-BPPX | 750W | 1545W |
| OS6860E-P24Z8 | 16 x 10/100/1000 PoE+, MACsec; 4 x 100/1G/2.5G, 75W PoE | 4 x 1/10G SFP+, MACsec | OS6860-BPPH | 450W | 900W |
| | | | OS6860-BPPX | 750W | 1500W |
| **Advanced model** | | | | | |
| OS6860N-P48Z | 36 x 10/100/1000 60W PoE; 12 x 100/1G/2.5G/5G, 95W PoE | 4 x 1/10/25G SFP28, MACsec | OS6860N-BPPH | 360W | 900W |
| | | | OS6860N-BPPX | 660W | 1500W |

| Premium model | | | | | |
|---|---|---|---|---|---|
| OS6860N-P48M | 36 x 100/1G/2.5G 95W PoE;<br>12 x 100/1G/2.5G/5G/10G,<br>95W bt PoE, MACsec | Modular | OS6860N-BPPH | 300W | 845W |
| | | | OS6860N-BPPX | 590W | 1425W |
| | | | OS6860N-BPXL | 665W<br>@115 VAC | 1570W<br>@115 VAC |
| | | | | 1570W @230<br>VAC | 3390W<br>@230 VAC |
| | | | | **PoE budget** | |
| **Gigabit models** | **Gigabit copper and fiber ports** | **Uplinks** | **Supported power supplies** | **With 1 PS** | **With 2 PS** |
| OS6860N-P24M | 24 x 100M/1G/2.5G/5G/10G 95W PoE, MACsec | Modular | OS6860N-BPPH | 385W | 935W |
| | | | | 680W | 1515W |
| | | | | 750W<br>@115VAC | 1660W<br>@115VAC |
| | | | | 1660W<br>@230VAC | 2280W<br>@230VAC |

**Table 3. OmniSwitch 6860 product specifications**

| Criteria | Enhanced models (OS6860E) | Advanced and premium models (OS6860N) |
|---|---|---|
| USB port | 1 | 1 |
| Out-of-band EMP port | 1 | 1 |
| RS-232 port | 1 | 1 |
| Console port (micro-USB) | 1 | 1 |
| Fans | POE models: 1<br>Non-PoE model: 0 | 3 |
| Altitude | 13,000 ft | 13,000 ft |
| 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 85°C (-40°F to 185°F) | -40°C to 85°C (-40°F to 185°F) |
| Humidity (operating and storage) | 5% to 95% non-condensing | 5% to 95% non-condensing |
| Air flow | Front-to-back | Front-to-back |
| Dimensions (H x W x D) | 4.4 cm x 44 cm x 35 cm<br>1.73 in x 17.32 in x 13.78 in | **OS6860N-P48M / OS6860N-P48Z:**<br>4.4 cm x 44 cm x 44 cm<br>1.73 in x 17.32 in x 17.32 in<br>**OS6860N-U28:**<br>4.4 cm x 44 cm x 35 cm<br>1.73 in x 17.32 in x 13.78 in |
| Port LEDs | Single LED per port<br>• Non-PoE ports - green: link/activity<br>• PoE ports - amber: link/activity | • RJ45 ports: two LEDs per port<br>¬ PoE LED: amber: link/activity.<br>Off: No PoE<br>¬ Speed LED: Solid: link, Blinking: activity<br>Blue: 10G speed<br>Magenta: 5G speed<br>Green: 2.5G speed<br>Amber: 100M/1G speed<br>Off: Link down<br>• Fiber ports: one LED per port<br>¬ Solid green: link. Blinking green: activity |

| Criteria | Enhanced models (OS6860E) | Advanced and premium models (OS6860N) |
|---|---|---|
| System LEDs | • OK1: green/yellow operational status of the switch<br>• OK2: green/yellow operational status of the external CPU. Not present in OS6860N<br>• VC: green/yellow master or slave role in VC configuration<br>• PS: green/yellow combined status for the primary and/or backup power supplies<br>• BPS: green/yellow status of the power coming from the Backup Power Shelf. Not present in OS6860N<br>• GRN: power saving mode<br>• 7-segment LED display for Virtual Chassis ID | • OK1: green/yellow operational status of the switch<br>• OK2: green/yellow operational status of the external CPU. Not present in OS6860N<br>• VC: green/yellow master or slave role in VC configuration<br>• PS: green/yellow combined status for the primary and/or backup power supplies<br>• GRN: power saving mode<br>• 7-segment LED display for Virtual Chassis ID |

## OmniSwitch 6860N uplink modules

The premium models on OS6860N support optional modules for uplinks. These modules are not included in the default shipping bundle and should be purchased separately.

**OS68-XNI-U4**

**OS68-QNI-U2**

**OS68-VNI-U4**

**OS68-CNI-U1***

**Table 4. OmniSwitch 6860 uplink modules configuration**

| Uplink module | Description |
|---|---|
| OS68-XNI-U4 | 4 x 1G/10G SFP+, 256-bit MACsec capable ports |
| OS68-VNI-U4 | 4 x 1/10/25G SFP28, 256-bit MACsec capable ports |
| OS68-QNI-U2 | 2 x 10/40G QSFP+, 256-bit MACsec capable ports |
| OS68-CNI-U1 | 1 x 25/100G QSFP28 256-bit MACsec capable port |

**Table 5. OmniSwitch 6860 performance specifications**

| Criteria | Enhanced models (OS6860E) | Advanced and premium modes (OS6860N) |
|---|---|---|
| Max raw fabric capacity (Aggregated) | 24-port Gigabit models: 224 Gb/s<br>48-port Gigabit models: 264 Gb/s<br>24-port multi-gigabit model: 264 Gb/s | OS6860N-48-port models: 1,120 Gb/s<br>OS6860N-P24M: 1,120 Gb/s<br>OS6860N-U28 : 960 Gb/s<br>OS6860N-P24Z: 960 Gb/s |
| Switching capacity (Aggregated) | 24-port Gigabit copper models: 208 Gb/s<br>48-port Gigabit models: 256 Gb/s<br>24-port multi-gigabit model: 232 Gb/s<br>24-port Gigabit fiber model: 216 Gb/s | OS6860N-P48M: 1,020 Gb/s<br>OS6860N-P48Z: 792 Gb/s<br>OS6860N-U28: 728 Gb/s<br>OS6860N-P24M: 1,080 Gb/s<br>OS6860N-P24Z: 744 Gb/s |
| Throughput | 24-port Gigabit copper models: 154.9 Mpps<br>48-port Gigabit models: 190.6 Mpps<br>24-port multi-gigabit model: 172.6 Mpps<br>24-port Gigabit fiber model: 160.9 Mpps | OS6860N-P48M: 758.9 Mpps<br>OS6860N-P48Z: 589.3 Mpps<br>OS6860N-U28 : 541.7 Mpps<br>OS6860N-P24M: 803.5 Mpps<br>OS6860N-P24Z: 553.6 Mpps |
| File system flash | 2 GB | 16 GB |
| DRAM | 2 GB | 4 GB |
| VLANs | 4,000 | 4,000 |
| MAC addresses | 48 K | 64 K |
| Max IPv4 routes | 64 K | 144 K |

| Criteria | Enhanced models (OS6860E) | Advanced and premium modes (OS6860N) |
|---|---|---|
| Max IPv6 routes | 6 K | 72 K |
| Jumbo frames | 9216 bytes | 9216 bytes |
| VFL ports capacity | 42 GB/s or 84 GB/s aggregate | 200 Gb/s or 400 Gb/s aggregate |
| Maximum number of units in a virtual chassis | 8 | 8 |
| DAC cables for VC | OS6860-CBL-40<br>OS6860-CBL-100<br>OS6860-CBL-300 | OS6860-CBL-40<br>OS6860-CBL-100<br>OS6860-CBL-300<br>QSFP-100G-C1M<br>QSFP-100G-C3M<br>QSFP-100G-C5M |

## Power supplies

All OmniSwitch 6860 models support 1+1 redundant, hot-swappable, load-sharing power supplies. The primary and backup power supply units are internal but removable to allow for easier maintenance and replacement. The OmniSwitch 6860 family also supports power load-sharing for PoE between the primary and backup power supplies. OmniSwitch 6860 enhanced models provide up to 1500 watts of PoE per switch, whereas the Advance/Premium models can provide up to 3400W of PoE per switch. There is no interruption of service when a new power supply is installed or an existing one replaced.

**Table 6.1. OmniSwitch 6860 power supplies**

| PS models | OS6860-BP | OS6860-BP-D | OS6860-BP-PH | OS6860-BP-PX |
|---|---|---|---|---|
| Description | Modular AC power supply. Provides system power to one OS6860E/N non-PoE switch | Modular DC power supply. Provides system power to one OS6860E/N non-PoE switch | Modular 600-W AC PoE power supply. Provides system and PoE power to one 24-port OS6860E PoE switch | Modular 920-W AC PoE power supply. Provides system and PoE power to one 48-port OS6860E PoE or one OS6860E-P24Z 8 switch |
| Dimensions (H x W x L) | 3.9 cm x 5.05 cm x 18.5 cm (1.54 in x 1.99 in x 7.28 in) | 3.9 cm x 5.05 cm x 18.5 cm (1.54 in x 1.99 in x 7.28 in) | 4.0 cm x 7.3 cm x 18.5 cm (1.57 in x 2.87 in x 7.28 in) | 4.0 cm x 7.3 cm x 18.5 cm (1.57 in x 2.87 in x 7.28 in) |
| Weight | .7 kg (1.11 lb) | .88 kg (1.94 lb) | 1.04 kg (2 lb) | 1.05 kg ( 2.32 lb) |
| Max with 1 PSU | N/A | N/A | 450W | 750W |
| Max with 2 PSUs | N/A | N/A | 900W | 1500W |
| Input voltage/ current | 90 V to 136 VAC/3 A<br>180 V to 264 VAC/1.5 A | -36 V to-72 V DC/ 1.8 A to 6 A | 90 V to 136 VAC/8.5 A<br>180 V to 264 VAC/4.25 A | 90 V to 136 VAC/13 A<br>180 V to 264 VAC/6.5 A |
| Max output power/current | 150W/12.5 A | 150W/12.5 A | 600W/11 A | 920W/16.88 A |
| Fans | 1 | 1 | 1 | 1 |

OmniSwitch 6860N PoE models use a different set of power supplies than the OmniSwitch 6860E PoE models. PoE power supplies cannot be used interchangeably between OS6860N and OS6860E models. OS6860N-BPXL power supply can only be used on premium switch models and requires input voltage of 200-240VAC for 2000W output. At 100-120VAC the output is 1000W.

**Table 6.2. OmniSwitch 6860N power supplies**

| PS models | OS6860N-BPXL | OS6860N-BPPX | OS6860N-BPPH |
|---|---|---|---|
| Description | Modular 2000W AC PoE power supply. Provides system and PoE power to one OS6860N-P48M or OS6860N-P24M switch | Modular 920W AC PoE power supply. Provides system and PoE power to one OS6860N PoE switch | Modular 600W AC PoE power supply. Provides system and PoE power to one OS6860N PoE switch |
| Dimensions (H x W x L) | 4.0 cm x 7.3 cm x 18.5 cm (1.57 in x 2.87 in x 7.28 in) | 4.0 cm x 7.3 cm x 18.5 cm (1.57 in x 2.87 in x 7.28 in) | 4.0 cm x 7.3 cm x 18.5 cm (1.57 in x 2.87 in x 7.28 in) |
| Weight | 1.37 kg (3.02 lb) | 1.05 kg (2.32 lb) | 1.04 kg (2 lb) |
| Max PoE budget with 1 PSU | 1570W @200-240 VAC<br>665W @100-120 VAC | 750W | 450W |
| Max PoE budget with 2 PSUs | 3390W @200-240 VAC<br>1570W @100-120 VAC | 1500W of PoE | 900W |
| Input voltage/ current | 100 V to 120 VAC/13.0 A<br>200 V to 240 VAC/13.0 A | 90 V to 132 VAC/12.0 A<br>180 V to 264 VAC/6.0 A | 90 V to 132 VAC/8.0 A<br>180 V to 264 VAC/4.0 A |
| Max output power/current | 1000W/18.35 A<br>2000W/36.7 A | 920W/16.88 A | 600W/11A |
| Fans | 1 | 1 | 1 |

# Detailed product features

## Simplified manageability and configuration

- Intuitive CLI in a scriptable BASH environment via console, Telnet or Secure Shell (SSH) v2 over IPv4/IPv6
- Powerful WebView Graphical Web Interface via HTTP and HTTPS over IPv4/IPv6
- Network Automation and Programmability Abstraction Layer with Multivendor (NAPALM) support
- Fully programmable RESTful web services interface with XML and JSON support. API enables access to CLI and individual mib objects
- Integrated with Alcatel-Lucent OmniVista® products for network management
- File upload using USB, TFTP, FTP, SFTP or SCP using IPv4/IPv6
- Human-readable ASCII-based configuration files for off-line editing, bulk configuration and out-of-the-box auto-provisioning
- Fully programmable OpenFlow 1.3.1 and 1.0 agent for control of native OpenFlow and hybrid ports
- Non-volatile memory for start-up configuration
- Multiple microcode image support with fallback recovery
- Dynamic Host Configuration Protocol (DHCP) relay for IPv4/IPv6
- IEEE 802.1AB Link Layer Discover Protocol (LLDP) with Media Endpoint Discover (MED) extensions
- Network Time Protocol (NTP)
- DHCPv4 and DHCPv6 server managed by Alcatel-Lucent VitalQIP® DNS/DHCP IP Address Management
- Access to the AOS console via USB Adapter with Bluetooth technology provides wireless management access to the OmiSwitch 6860, eliminating the use of console cables

## Cloud ready with Alcatel-Lucent OmniVista Cirrus

- OmniVista® Cirrus offers a secure, resilient and scalable cloud-based network management. It offers hassle free network deployment and easy service roll-out with advanced analytics for smarter decision making. It provides IT friendly Unified Access with secure authentication and policy enforcement for users and devices.

## Monitoring and troubleshooting

- Local (on the flash) and remote server logging (Syslog): event and command logging
- IP tools: ping and trace route
- Dying Gasp support via SNMP and syslog messages
- Loopback IP address support for management per service
- Management virtual routing and forwarding (VRF) support
- Policy- and port-based mirroring
- Remote port mirroring
- sFlow v5 and Remote Monitoring (RMON)
- Unidirectional Link Detection (UDLD), Digital Diagnostic Monitoring (DDM), and Time Domain Reflectometry (TDR)

## Resiliency and high availability

- Unified management, control and virtual chassis technology
- Virtual Chassis 1+N redundant supervisor manager
- Virtual Chassis In-Service Software Upgrade (ISSU)
- Smart continuous switching technology
- ITU-T G.8032/Y1344 2010: Ethernet Ring Protection
- IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) encompasses IEEE 802.1D Spanning Tree Protocol (STP) and IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
- Per-VLAN spanning tree (PVST+) and 1x1 STP mode
- IEEE 802.3ad/802.1AX Link Aggregation Control Protocol (LACP) and static LAG groups across modules
- Virtual Router Redundancy Protocol (VRRP) with tracking capabilities

- IEEE protocol auto-discovery
- Bidirectional Forwarding Detection (BFD) for fast failure detection and reduced re-convergence times in a routed environment
- Redundant and hot-swappable power supplies
- Built-in CPU protection against malicious attacks
- Split Virtual Chassis protection: Auto-detection and recovery of Virtual Chassis splitting due to one or more VFL or stack element failures

## Advanced security

### Access control

- Alcatel-Lucent Access Guardian framework for comprehensive user-policy-based NAC
- Autosensing IEEE 802.1X multi-client, multi-VLAN support for bridging and SPBM/VxLAN/MPLS services
- MAC-based authentication for non-IEEE 802.1X hosts
- Web based authentication (captive portal): a customizable web portal residing on the switch
- User Network Profile (UNP) simplifies NAC by dynamically providing pre-defined policy configuration to authenticated clients — VLAN, ACL, BW
- Secure Shell (SSH) with public key infrastructure (PKI) support
- Terminal Access Controller Access-Control System Plus (TACACS+) client
- Centralized Remote Access Dial-In User Service (RADIUS) and Lightweight Directory Access Protocol (LDAP) administrator authentication
- Centralized RADIUS for device authentication and network access control authorization
- Learned Port Security (LPS) or MAC address lockdown
- Access Control Lists (ACLs); flow-based filtering in hardware (Layer 1 to Layer 4)
- DHCP v4 and v6 Snooping, DHCP IP and Address Resolution Protocol (ARP) spoof protection
- DHCPv6 guard and DHCPv6 Client guard
- ARP poisoning detection
- IP v4 and v6 Source Filtering as a protective and effective mechanism against ARP attacks
- Bring Your Own Device (BYOD) provides on-boarding of Guest, IT/non-IT issued and silent devices. Restriction/Remediation of traffic from non-compliant devices. Uses RADIUS CoA to dynamically enforce User Network Profiles based on Authentication, Profiling, Posture check of devices.
- Role-based authentication for routed domains

### Switch software security

- AOS secured diversified code solution is available on OmniSwitch 6860, hardening it at both the software source code and binary executable levels to enhance overall network security.
- AOS secured diversified code protects networks from intrinsic vulnerabilities, code exploits, embedded malware, and potential back doors that could compromise mission critical operations.
- AOS secured diversified code is a proactive, defense approach toward network security that continuously defines and implements value-add capabilities to address both current and future threats.

## QoS

- Priority queues: Eight hardware-based queues per port for flexible QoS management
- Traffic prioritization: Flow-based QoS
- Flow-based traffic policing and bandwidth management
- 32-bit IPv4/128-bit IPv6 non-contiguous mask classification
- Egress traffic shaping
- DiffServ architecture
- Congestion avoidance: Support for end- to-end head-of-line (E2E-HOL) blocking prevention, and IEEE 802.3x Flow Control (FC)

## Layer-3 routing and multicast

### IPv4 routing

- Multiple VRF
- Static routing
- Routing Information Protocol (RIP) v1 and v2
- Open Shortest Path First (OSPF) v2 with Graceful Restart
- Intermediate System to Intermediate System (IS-IS) with Graceful Restart
- Border Gateway Protocol (BGP) v4 with Graceful Restart
- Generic Routing Encapsulation (GRE) and IP/IP tunneling
- Virtual Router Redundancy Protocol (VRRPv2)
- DHCP relay (including generic UDP relay)
- Address Resolution Protocol (ARP)
- Policy-based routing and server load balancing
- DHCPv4 server

### IPv6 routing

- Multiple VRF
- Internet Control Message Protocol version 6 (ICMPv6)
- Static routing
- Routing Information Protocol Next Generation (RIPng)
- Open Shortest Path First (OSPF) v3 with Graceful Restart
- Intermediate System to Intermediate System (IS-IS) with Graceful Restart
- Multi-Topology IS-IS
- BGP v4 multiprotocol extensions for IPv6 routing (MP-BGP)
- Graceful Restart extensions for OSPF and BGP
- Virtual Router Redundancy Protocol version 3 (VRRPv3)
- Neighbor Discovery Protocol (NDP)
- Policy-based routing and server load balancing
- DHCPv6 server
- DHCPv6 relay & UDPv6 relay

### IPv4/IPv6 multicast

- Internet Group Management Protocol (IGMP) v1/v2/v3 snooping
- Protocol Independent Multicast–Sparse-Mode (PIM-SM), Source Specific Multicast (PIM-SSM)
- Protocol Independent Multicast–Dense-Mode (PIM-DM), Bidirectional Protocol Independent Multicast (PIM-BiDir)
- Distance Vector Multicast Routing Protocol (DVMRP)
- Multicast Listener Discovery (MLD) v1/v2 snooping
- PIM to DVMRP gateway support

### Multiprotocol Label Switching

- VPLS (Virtual Private LAN Service)
- LDP-based signaling of LSP
- BGP-based signaling of LSP
- MPLS L2VPN VPWS with LDP
- BGP Route Reflector for VPLS NLRI
- MPLS OAM: LDP ping and traceroute
- VNP for VPLS services
- IGMP for VPLS services

- LPS for VPLS services
- DHCP snooping for VPLS services
- Graceful restart

### Fluent network for voice, video and data

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

### Advanced Layer-2 services

- Ethernet services support using IEEE 802.1ad Provider Bridges (also known as Q-in-Q or VLAN stacking)
- Ethernet OAM (802.1ag): Connectivity Fault Management (L2 ping & Link trace)
- Ethernet in First mile: Link OAM (802.3ah)
- Fabric virtualization services IEEE 802.1aq Shortest Path Bridging (SPB-M) and VxLAN
- In-band management for SPB-M
- Ethernet network-to-network interface (NNI) and user network interface (UNI)
- Service Access Point (SAP) profile identification
- Service VLAN (SVLAN) and Customer VLAN (CVLAN) support
- VLAN translation and mapping including CVLAN to SVLAN
- Port mapping
- DHCP Option 82: Configurable relay agent information
- Multiple VLAN Registration Protocol (MVRP)
- HA-VLAN for Layer 2 clusters such as MS-NLB and active-active Firewall clusters
- Jumbo frame support
- Bridge Protocol Data Unit (BPDU) blocking
- STP Root Guard

### Data center networking

- Dynamic Virtual Network Profiles (vNP)
- IEEE 802.1aq Shortest Path bridging (SPB-M)
- RFC 7348 Virtual eXtensible Local Area Network (VxLAN)

### Software Defined Networking (SDN)

- Programmable AOS RESTful API
- Fully programmable OpenFlow 1.3.1 and 1.0 agent for control of native OpenFlow and hybrid ports
- OpenStack networking plug-in
- Software-controlled VxLAN hardware VTEP gateway

## Supported standards

### IEEE standards

- IEEE 802.1D STP
- IEEE 802.1p CoS
- IEEE 802.1Q VLANs
- IEEE 802.1ab (LLDP)
- IEEE 802.1ag (OA&M)
- IEEE 802.1ad Provider Bridges Q-in-Q/VLAN stacking
- IEEE 802.1ak (Multiple VLAN Registration Protocol (MVRP)
- IEEE 802.1aq Shortest Path Bridging (SPB)
- IEEE 802.1s MSTP
- IEEE 802.3i 10BASE-T
- IEEE 802.1w RSTP
- IEEE 802.3x Flow Control
- IEEE 802.3z Gigabit Ethernet
- IEEE 802.3ab 1000Base-T
- IEEE 802.3ac VLAN Tagging
- IEEE 802.3ad/802.1AX Link Aggregation
- IEEE 802.3ae 10 GigE
- IEEE 802.3af Power over Ethernet
- IEEE 802.3at PoE Plus
- IEEE 802.3az Energy Efficient Ethernet (EEE)
- IEEE 802.3bz 2.5/5 GigE
- IEEE 802.3ba 40GBASE-X
- IEEE 802.1x-2004
- IEEE 802.1ae MAC Security
- IEEE 1588-2008 (PTP)*

### ITU-T recommendations

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

### IETF RFCs

#### IPv4

- RFC 2003 IP/IP Tunneling
- RFC 2131 Dynamic Host Configuration Protocol (DHCPv4)
- RFC 2784 GRE Tunneling
- RFC 4022/2452 MIB for IPv4 TCP
- RFC 4087 IP Tunnel MIB
- RFC 4113/2454 MIB for IPv4 UDP
- RFC 4292/4293 IPv4 MIBs

#### OSPF

- RFC 1765 OSPF Database Overflow
- RFC 1850/2328 OSPF v2 and MIB
- RFC 2154 OSPF MD5 Signature
- RFC 2370/3630 OSPF Opaque LSA
- RFC 2740/5340 OSPFv3 for IPv6
- RFC 3101 OSPF NSSA Option
- RFC 3623/5187 OSPF Graceful Restart
- RFC 5838 MIB for OSPFv3
- RFC 4552 Authentication for OSPFv3

#### RIP

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

#### BGP

- RFC 1269/1657/4273 BGP v3 and v4 MIB
- RFC 1403/1745 BGP/OSPF Interaction
- RFC 1771-1774/2842/2918/ 3392/4271 BGP v4
- RFC 1965 BGP AS Confederations
- RFC 1966 BGP Route Reflection
- RFC 1997/1998/4360 BGP Communities Attribute
- RFC 2042/5396 BGP New Attribute
- RFC 2385 BGP MD5 Signature
- RFC 2439 BGP Route Flap Damping
- RFC 2545 BGP-4 Multiprotocol Extensions for IPv6 Routing
- RFC 2858/4760 Multiprotocol Extensions for BGP-4
- RFC 3065 BGP AS Confederations
- RFC 4456 BGP Route Reflection
- RFC 4486 Subcodes for BGP Cease Notification
- RFC 4724 Graceful Restart for BGP
- RFC 3392/5492/5668/6793 BGP 4-Octet ASN
- RFC 5082 Generalized TTL Security Mechanism (GTSM)

#### IS-IS

- RFC 1142/1195/3719/3787/5308 IS-IS v4
- RFC 2763/2966/3567/3373

* Supported on selected models

Adjacencies and route management
- RFC 5120 M-ISIS: Multi Topology IS-IS
- RFC 5306 Graceful Restart
- RFC 5309/draft-ietf-isis-igp-p2p-over-lan Point to point over LAN
- RFC 6329 IS-IS Extensions Supporting IEEE 802.1aq SPB
- RFC 5304 IS-IS Cryptographic Authentication
- RFC 5310 IS-IS Generic Cryptographic Authentication

### MPLS
- RFC 3031 MPLS Architecture
- RFC 4761 VPLS using BGP Signaling
- RFC 4762 VPLS using LDP Signaling
- RFC 5036 LDP Specification
- RFC 3478 Graceful Restart
- RFC 3815 Definitions of Managed Objects for MPLS and LDP

### IP Multicast
- RFC 1075/draft-ietf-idmr-dvmrp-v3-11.txt DVMRP
- RFC 2362/4601/5059 PIM-SM
- RFC 2365 Multicast
- RFC 2710/3019/3810/MLD v2 for IPv6
- RFC 2715 PIM and DVMRP interoperability
- RFC 2933 IGMP MIB
- RFC 3376 IGMPv3 (includes IGMP v2/v1)
- RFC 3569 Source-Specific Multicast (SSM)
- RFC 3973 Protocol Independent Multicast- Dense Mode (PIM-DM)
- RFC 4541 Considerations for IGMP and MLD Snooping Switches
- RFC 5015 BiDIR PIM
- RFC 5060 Protocol Independent Multicast MIB
- RFC 5132 Multicast Routing MIB
- RFC 5240 PIM Bootstrap Router MIB

### IPv6
- RFC 1981 Path MTU Discovery
- RFC 2460 IPv6 Specification
- RFC 2461 NDP
- RFC 2464 IPv6 over Ethernet
- RFC 2465 MIB for IPv6: Textual Conventions (TC) and General Group
- RFC 2466 MIB for IPv6: ICMPv6 Group
- RFC 2711 Router Alert Option
- RFC 3056 6to4 Tunnels
- RFC 3315 Dynamic Host Configuration Protocol for IPv6 (DHCPv6)
- RFC 3484 Default Address Selection
- RFC 3493/2553 Basic Socket API
- RFC 3542/2292 Advanced Sockets API
- RFC 3587/2374 Global Unicast Address Format
- RFC 3595 TC for IPv6 Flow Label
- RFC 3596/1886 DNS for IPv6
- RFC 4007 Scoped Address
- RFC 4022/2452 MIB for IPv6 TCP
- RFC 4087 IP Tunnel MIB
- RFC 4113/2454 MIB for IPv6 UDP
- RFC 4193 Unique Local Addresses
- RFC 4213/2893 Transition Mechanisms
- RFC 4291/3513/2373 Addressing Architecture (uni/any/multicast)
- RFC 4292/4293 IPv6 MIBs
- RFC 4301/2401 Security Architecture
- RFC 4302/2402 IP Authentication Header
- RFC 4303/2406 IP Encapsulating Security Payload (ESP)
- RFC 4308 Cryptographic Suites for IPSec
- RFC 4443/2463 ICMPv6
- RFC 4861/2461 Neighbor Discovery
- RFC 4862/2462 Stateless Address Auto-configuration
- RFC 5095 Deprecation of Type 0 Routing Headers in IPv6

### Manageability
- RFC 854/855 Telnet and Telnet options
- RFC 959/2640 FTP
- RFC 1350 TFTP Protocol
- 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 1867 Form-based File Upload in HTML
- RFC 1901-1908/3416-3418 SNMP v2c
- RFC 2096 IP MIB
- RFC 2131 DHCP Server/Client
- RFC 2388 Returning Values from Forms: multipart/form-data
- RFC 2396 Uniform Resource Identifiers (URI): Generic Syntax
- RFC 2570-2576/3410-3415/3584 SNMP v3
- RFC 2616 /2854 HTTP and HTML
- RFC 2667 IP Tunneling MIB
- RFC 2668/3636 IEEE 802.3 MAU MIB
- RFC 2674 VLAN MIB
- RFC 3023 XML Media Types
- RFC 3414 User-based Security Model
- RFC 3826 (AES) Cipher Algorithm in the SNMP User-based Security Model
- RFC 4122 A Universally Unique IDentifier (UUID) URN Namespace
- RFC 4234 Augmented BNF for Syntax Specifications: ABNF
- RFC 4251 Secure Shell Protocol Architecture
- RFC 4252 The Secure Shell (SSH) Authentication Protocol
- RFC 4253 SSH Transport Layer Protocol
- RFC 4254 SSH Connection Protocol
- RFC 4627 JavaScript Object Notation (JSON)
- RFC 5424 The Syslog protocol
- RFC 6585 Additional HTTP Status Codes

### Security
- RFC 1321 MD5
- RFC 1826/1827/4303/4305 Encapsulating Payload (ESP) and crypto algorithms
- RFC 2104 HMAC Message Authentication
- RFC 2138/2865/2868/3575/2618 RADIUS Authentication and Client MIB
- RFC 3576 Dynamic Authorization Extensions to RADIUS
- RFC 2139/2866/2867/2620 RADIUS Accounting and Client MIB
- RFC 2228 FTP Security Extensions
- RFC 2284 PPP EAP
- RFC 2869/2869bis RADIUS Extension
- RFC 3162 RADIUS and IPv6
- RFC 4301 Security Architecture for IP
- RFC 5517 Private VLAN

### QoS
- RFC 896 Congestion Control
- RFC 1122 Internet Hosts
- RFC 2474/2475/2597/3168/3246
- DiffServ
- RFC 2697 srTCM
- RFC 2698 trTCM
- RFC 3635 Pause Control

### Others

- RFC 791/894/1024/1349 IP and IP/Ethernet
- RFC 792 ICMP
- RFC 768 UDP
- RFC 793/1156 TCP/IP and MIB
- RFC 2581 TCP Congestion Control
- RFC 826 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 1305/2030/5905 NTP v4 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 4502 RMON MIB v2
- RFC 2131/3046 DHCP/BootP Relay
- RFC 2132 DHCP Options
- RFC 2251 LDAP v3
- RFC 2338/3768/2787 VRRP and MIB
- RFC 3021 Using 31-bit Prefixes
- RFC 3060 Policy Core
- RFC 3176 sFlow
- IETF draft "IP/IPVPN services with IEEE 802.1aq SPB networks"
- RFC 4562 MAC-Forced Forwarding
- RFC 7348 Virtual extensible Local Area Network (VxLAN)

## OmniSwitch 6860 specifications

**Table 7. Power consumption, MTBF, Acoustics and weight**

| Switch module | Power consumption (idle) | Power consumption (full load) | Heat dissipation | Acoustic noise (dB) @ 25°C | MTBF | Weight (chassis and fan) | Weight (fully populated) |
|---|---|---|---|---|---|---|---|
| OS6860E-24 | 38.9W | 48W | 163.8 BTU/h | 45.8 | 353,806 h | 4.58 kg (10.1 lb) | 5.26 kg (11.6 lb) |
| OS6860E-48 | 44.1W | 60W | 204.7 BTU/h | 45.8 | 336,101 h | 4.81 kg (10.6 lb) | 5.49 kg (12.1 lb) |
| OS6860E-P24 | 65W | 76.1W | 259.7 BTU/h | 42 | 126,601 h | 4.81 kg (10.6 lb) | 6.26 kg (13.8 lb) |
| OS6860E-P24Z8 | 87W | 91.6W | 312.7 BTU/h | 45.9 | 198,869 h | 4.81 kg (10.6 lb) | 6.26 kg (13.8 lb) |
| OS6860E-P48 | 72.9W | 93.2W | 318 BTU/h | 43.5 | 121,442 h | 5.03 kg (11.1 lb) | 6.49 kg (14.3 lb) |
| OS6860N-U28 | 69W | 141W | 481.1 BTU/h | 52 | 222,502 h | 4.50 kg (9.92 lb) | 4.99 kg (11.0 lb) |

* Power consumption measured at the 120 V AC outlet. Full load power consumption measured with 2 x 600W power supplies for 24 port, 2 x 920W power supplies for 48 port and 1 x 150W AC Power supply for U28 model. Power consumption does not include PoE power. Heat dissipation is calculated for power consumption at full load.
1 watt ≈ 3.41214 BTU/h

** Fully populated chassis includes two power supplies, mounting brackets and no transceivers

*** MTBF is measured 25 °C ambient temperature with one AC power supply, as per Telcordia SR-332 issue 4 standard

**Table 8. Power consumption, MTBF, Acoustics and weight**

| Switch module | Power consumption (idle) | Power consumption (full load) | Heat dissipation | Acoustic noise (dB) @ 25°C | MTBF | Weight (chassis and fan) | Weight (fully populated) |
|---|---|---|---|---|---|---|---|
| OS6860N-P24Z | 101.4W | 141.2W | 481.8 BTU/h | 50.6 | 257,250 h | 5.94 kg (13.1 lb) | 7.6 kg (16.75 lb) |
| OS6860N-P24M | 121W | 171.7W | 585.9 BTU/h | 48.9 | 225,081 h | 6.38 kg (14.05 lb) | 8.24 kg (18.15 lb) |
| OS6860N-P48Z | 122.6W | 146W | 498.2 BTU/h | 49.6 | 233,756 h | 6.04 kg (13.32 lb) | 7.76 kg (17.11 lb) |
| OS6860N-P48M | 166.8W | 260.5W | 888.9 BTU/h | 49.2 | 216,393 h | 6.35 kg (13.99 lb) | 8.28 kg (18.25 lb) |

* Power consumption measured at the 120 V AC outlet. Full load power consumption measured with 2 x 600W power supplies for 24 port, 2 x 920W power supplies
1 watt ≈ 3.41214 BTU/h
** Acoustic level measured per ISO7779. Mic is positioned 1 meter in front of the device. The device with two OS6860N-BPPX is running at 50% of total PoE load.
*** MTBF is measured 25 °C ambient temperature with one AC power supply, as per Telcordia SR-332 issue 4 standard
**** Fully populated chassis includes two power supplies, mounting brackets and no transceivers

**Table 9. OmniSwitch 6860 compliance and certifications**

| Compliance type | Certification |
|---|---|
| Commercial EMI/EMC | • 47 CRF FCC Part 15: 2015 Subpart B (Class A)<br>• ICES–003:2012 Issue 5, Class A ANSI C63.4-2009<br>• VCCI (Class A, with UTP Cables)<br>• AS/NZS 3548 (Class A) – C-Tick CE marking for European countries (Class A, with UTP Cables)<br>• CE Emission<br>¬ EN 55032 (EMI & EMC)<br>¬ EN 55024 (Immunity)/EN 55035<br>¬ EN 50581 (RoHS Recast)<br>¬ EN 61000-3-2<br>¬ EN 61000-3-3<br>¬ EN 61000-4-2<br>¬ EN 61000-4-3<br>¬ EN 61000-4-4<br>¬ EN 61000-4-5<br>¬ EN 61000-4-6<br>¬ EN 61000-4-8<br>¬ EN 61000-4-11<br>• IEEE 802.3: Hi-Pot Test (2250 V DC on all Ethernet ports) |
| Safety | • IEC 62368-1<br>• UL 60950-1, 2nd Edition<br>• IEC 60950-1/EN 60950-1, all national deviations<br>• UL 62368-1/IEC 62368-1<br>• EN 60825-1 Laser<br>• EN 60825-2 Laser<br>• CDRH Laser<br>• CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition<br>• NOM-019 SCFI, Mexico<br>• CAN/CSA 62368-1<br>• AS/NZ TS-001 and 60950:2000, Australia<br>• UL-AR, Argentina<br>• AS/NZ 62368-1<br>• UL-GS Mark, Germany<br>• CU, EAC, Russia<br>• CCC, China<br>• ANATEL, Brazil<br>• BSMI, Taiwan<br>• KCC, Korea<br>• RoHS & WEEE directives compliant<br>• C Mark, Morocco<br>• TEC, India |
| Federal | • FIPS 140-2<br>• Common Criteria EAL2<br>• Common Criteria NDcPP<br>• Joint Interoperability Test Command (JITC)<br>• Trade Agreements Act (TAA) |

## Ordering information

| Part number | Description |
|---|---|
| **OmniSwitch 6860 enhanced models** | |
| OS6860E-24-## | OS6860E-24: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 24 RJ-45 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports, USB, and two VFL/stacking ports. The bundle includes one AC power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB- to-USB console adapter. |
| OS6860E-24D | OS6860E-24: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 24 RJ-45 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports, USB, and two VFL/stacking ports. The bundle includes one DC power supply, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter. |
| OS6860E-P24-## | OS6860E-P24: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 24 RJ-45 10/100/1000 Base-T PoE+ ports, four of them provide 60 W, four fixed SFP+ (1G/10G) ports, USB, EMP, and two VFL/stacking ports. Includes a built-in co-processor for Enhanced network services. The bundle includes one 600-W AC PoE power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter. |
| OS6860E-P24Z8## | OS6860E-P24Z8: Multi-Gigabit L3 fixed configuration chassis in a 1U form factor chassis with 16 PoE+ 10/100/1000 RJ45, 8 multi-gigabit HPoE (75W PoE ), 4-fixed SFP+ (1G/10G) ports, USB, EMP, and two VFL/ stacking ports. Includes a built-in co-processor for Enhanced network services. The bundle includes one 600W AC PoE power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter. |
| OS6860E-48-## | OS6860E-48: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 48 RJ-45 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports, USB, EMP, and two VFL/stacking ports. Includes a built-in co-processor for Enhanced network services. The bundle includes one AC power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter. |
| OS6860E-48D | OS6860E-48: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 48 RJ-45 10/100/1000 Base-T ports, four fixed SFP+ (1G/10G) ports, USB, EMP, and two VFL/stacking ports. Includes a built-in co-processor for Enhanced network services. The bundle includes one DC power supply, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter. |
| OS6860E-P48-## | OS6860E-P48: Gigabit Ethernet L3 fixed configuration chassis in a 1U form factor with 48 RJ-45 10/100/1000 Base-T PoE+ ports, four of them provide 60 W, four fixed SFP+ (1G/10G) ports, USB, EMP, and two VFL/stacking ports. Includes a built-in co-processor for Enhanced network services. The bundle includes one 920-W AC PoE power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter. |
| **OmniSwitch 6860 power supplies** | |
| OS6860-BP-D | OS6860-BP modular 150-W DC backup power supply. Provides backup power to one non-PoE OS6860N switch |
| OS6860-BP-## | OS6860-BP modular 150-W AC backup power supply. Provides backup power to one non-PoE OS6860E or OS6860N switch |
| OS6860-BP-PH-## | OS6860-BP-PH modular 600-W AC PoE backup power supply. Provides system and PoE backup power to one 24-port PoE OS6860E switch |
| OS6860-BP-PX-## | OS6860-BP-PX modular 920-W AC PoE backup power supply. Provides system and PoE backup power to one 48-port PoE OS6860E or OS6860E-P24Z8 switch |
| **OmniSwitch 6860 advanced models** | |
| OS6860N-P48Z-## | OS6860N-P48Z: Fixed-configuration chassis in a 1U form factor with 36x10/100/1000 Base-T 60W IEEE 802.3 bt PoE ports, 12x100/1000/2500/5000 mbps multi-gigabit 95W 802.3 bt PoE ports, four SFP28 (1G/ 10G/25G) MACsec ports and 2x 100G QSFP28 Virtual Chassis link ports. All PoE ports are IEEE 802.3bt compliant. All SFP28 25G ports are 256-bit are MACsec capable. Bundle includes one 920W AC power supply, country-specific power cord, user manuals, access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter |
| OS6860NPH48Z-## | OS6860N-P48Z: Multi-GigE L3 1 RU chassis with 36x10/100/1000 BaseT 60W PoE, 12x100M/1G/2.5G/5G 95W bt PoE, four SFP28 (1G/10G/25G) and 2x100G QSFP28 virtual chassis ports. All PoE ports are IEEE 802.3bt compliant. All SFP28 ports are 256-bit MACsec capable. Bundle includes 600W AC power supply, country-specific power cord, user manuals, access card, 19" rack-mount kit and a micro-USB-to-USB console cable |

| Part number | Description |
|---|---|
| OS6860N-P24Z-## | OS6860N-P24Z: Fixed-configuration chassis in a 1U form factor with 12x10/100/1000 Base-T 60W PoE ports, 12x100M/1G/2.5G/5G multi-gigabit 95W PoE ports, four SFP28 (1G/10G/25G) MACsec ports and 2x 100G QSFP28 Virtual Chassis link ports. All PoE ports are IEEE 802.3bt compliant. All SFP28 25G ports are 256 bit MACsec capable. Bundle includes one 920W AC power supply, country-specific power cord, user manuals, access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter |
| OS6860N-U28-## | OS6860N-U28: Fixed-configuration chassis in a 1U form factor with 24x100/1000 Base-X SFP ports, 4x 1G/10G SFP+ ports, four SFP28 (1G/10G/25G) ports and 2 x 100G QSFP28 Virtual Chassis link ports. All ports are MACsec capable. The bundle includes one system AC power supply, country-specific power cord, user manuals, access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter |
| OS6860N-U28-D | OS6860N-U28-D: Fixed-configuration chassis in a 1U form factor with 24x100/1000 Base-X SFP ports, 4x 1G/10G SFP+ ports, four SFP28 (1G/10G/25G) ports and 2 x 100G QSFP28 Virtual Chassis link ports. All ports are 256-bit MACsec capable. The bundle includes one system DC power supply, user manuals, access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter |
| **OmniSwitch 6860 Premium models** | |
| OS6860N-P48M-## | OS6860N-P48M: Fixed-configuration chassis in a 1U form factor with 36x100/1000/2500 mbps multi-gigabit 95W bt PoE ports, 12x100/1000/2500/5000/10000 Mb/s multi-gigabit 95W bt PoE MACsec ports, 2x100G QSFP28 Virtual Chassis link ports with an uplink module expansion slot. All PoE ports are IEEE 802.3bt compliant. The bundle includes one 920W AC power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter |
| OS6860NPH48M-## | OS6860N-P48M: Fixed-configuration chassis in a 1U form factor with 36x100M/1G/2.5G multi-gigabit 95W PoE ports, 12x100M/1G/2.5G/5G/10G multi-gigabit 95W PoE, 256-bit MACsec capable ports and 2x100G QSFP28 Virtual Chassis link ports with an uplink module expansion slot. All PoE ports are IEEE 802.3bt compliant. The bundle includes one 600W AC power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter. |
| OS6860NPX48M-## | OS6860N-P48M: Fixed-configuration chassis in a 1U form factor with 36x100M/1G/2.5G multi-gigabit 95W PoE ports, 12x100M/1G/2.5G/5G/10G multi-gigabit 95W PoE, 256-bit MACsec capable ports and 2x100G QSFP28 Virtual Chassis link ports with an uplink module expansion slot. All PoE ports are IEEE 802.3bt compliant. The bundleincludes one 2000W AC power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter. |
| OS6860N-P24M-## | OS6860N-P24M: Fixed-configuration chassis in a 1U form factor with 24x100M/1G/2.5G/5G/10G multi-gigabit 95W PoE ports and 2x100G QSFP28 Virtual Chassis link ports with an uplink module expansion slot. All ports are IEEE 802.3bt compliant and support 256-bit MACsec. The bundle includes one 920W AC power supply, country-specific power cord, user manuals access card, hardware for mounting in a 19" rack and a micro-USB-to-USB console adapter. |
| **OmniSwitch 6860N uplink modules** | |
| OS68-XNI-U4 | OS68-XNI-U4: One uplink module for OS6860N-P24M/P48M with 4x1/10G SFP+ ports. All ports are 256-bit MACsec capable |
| OS68-VNI-U4 | OS68-VNI-U4: One uplink module for OS6860N-P24M/P48M with 4x 1/10/25G SFP28 ports. All ports are 256-bit MACsec capable |
| OS68-QNI-U2 | OS68-QNI-U2: One uplink module for OS6860N-P24M/P48M with 2x10/40G QSFP+ ports. All ports are 256-bit MACsec capable |
| OS68-CNI-U1 | OS68-CNI-U1: One uplink module for OS6860N premium models with 1x25/100G QSFP28, 256-bit MACsec capable port. |
| **OmniSwitch 6860N power supplies** | |
| OS6860N-BPPH-xx | OS6860N-BPPH modular 600W AC PoE backup power supply. Provides system and PoE backup power to one OS6860N PoE switch |
| OS6860N-BPPX-xx | OS6860N-BPPX modular 920W AC PoE backup power supply. Provides system and PoE backup power to one OS6860N PoE switch |
| OS6860N-BPXL-xx | OS6860N-BPXL modular 2000W AC PoE power supply. Provides system and PoE power to one OS6860N-P48M or OS6860N-P24M switch |

| Part number | Description |
|---|---|
| **OmniSwitch 6860 software** | |
| OS-SW-MACSEC | Site license to enable MACsec on OS6860 models. One license per customer at no cost. |
| OS6860N-MPLS-1 | Software license to enable MPLS on one node of OS6860N switch. A node can be a stand-alone switch or a virtual chassis of switches located on a single site. |
| OS6860N-MPLS-4 | Software license to enable MPLS support on four nodes of OS6860N switch. A node can be a stand-alone switch or a virtual chassis. All nodes to be co-located on a single site. |
| **OmniSwitch 6860 accessories** | |
| OS6860-CBL-40 | OS6860 direct attached copper cable (40 cm, QSFP+) for Virtual Chassis connections |
| OS6860-CBL-100 | OS6860 direct attached copper cable (1m, QSFP+) for Virtual Chassis connections |
| OS6860-CBL-300 | OS6860 direct attached copper cable (3m, QSFP+) for Virtual Chassis connections |
| QSFP-40G-AOC20M | 40 Gigabit QSFP+ direct attached active optical cable. 20 m for Virtual Chassis connections |
| QSFP-40G-SR | Four channel 40 Gigabit QSFP+. Supports link lengths of up to 100m for Virtual Chassis connections |
| QSFP-4X10G-SR | 40 Gb to 4 x 10 Gb Multifiber Push-On (MPO) fiber splitter transceiver for Virtual Chassis connections |
| **1G transceivers** | |
| SFP-GIG-T | 1000Base-T Gigabit Ethernet Transceiver (SFP MSA). SFP works at 1000 Mb/s speed and full-duplex mode |
| SFP-GIG-SX | 1000Base-SX Gigabit Ethernet optical transceiver (SFP MSA) |
| SFP-GIG-LX | 1000Base-LX Gigabit Ethernet optical transceiver (SFP MSA) |
| SFP-GIG-LH40 | 1000Base-LH Gigabit Ethernet optical transceiver (SFP MSA). Typical reach of 40 km on 9/125 µm SMF |
| SFP-GIG-LH70 | 1000Base-LH Gigabit Ethernet optical transceiver (SFP MSA). Typical reach of 70 km on 9/125 µm SMF |
| SFP-DUAL-MM-N | Dual Speed 100Base-FX or 1000Base-X Ethernet optical transceiver (SFP MSA). Supports multimode fiber over 1310nm wavelength (nominal) with an LC connector. Typical reach of 550m at Gigabit speed and 2km at 100 Mb/t speed |
| SFP-GIG-EXTND | Extended 1000Base-SX Gigabit Ethernet optical transceiver(SFP MSA). Multimode fiber over 850nm wavelength (nominal) LC connector. Reach of up to 2 km on 62.5/125 m MMF and 50/125 m MMF. |
| SFP-GIG-BX-D | 1000Base-BX SFP bi-directional transceiver with an LC interface. Works on single mode fiber optic on a single strand link up to 10 km. Transmits 1490 nm and receives 1310 nm optical signal. |
| SFP-GIG-BX-U | 1000Base-BX SFP bi-directional transceiver with an LC interface. Works on single mode fiber optic on a single strand link up to 10 km. Transmits 1310 nm and receives 1490 nm optical signal. |
| SFP-GIG-BX-D%% | 1000Base-BX SFP bi-directional transceiver with an LC interface. Works on single mode fiber optic on a single strand link. %% denotes length in KM. Available lengths are 20 & 40 Km. Transmits 1490 nm and receives 1310 nm optical signal. |
| SFP-GIG-BX-U%% | 1000Base-BX SFP bi-directional transceiver with an LC interface. Works on single mode fiber optic on a single strand link. %% denotes length in KM. Available lengths 20 & 40 Km.. Transmits 1310 nm and receives 1490 nm optical signal. |
| **10G 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 monomode fiber over 1310 nm wavelength (nominal) with an LC connector. Typical reach of 10 km |
| SFP-10G-ZR | 10 Gigabit optical transceiver (SFP+). Supports data transmission at 1550 nm over up to 80km single mode fiber. LC connector type. |
| SFP-10G-ER | 10 Gigabit optical transceiver (SFP+). Supports monomode 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) |

| Part number | Description |
|---|---|
| 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 |
| SFP-10G-GIG-LR | Dual-speed SFP+ optical transceiver. Supports monomode fiber over 1310 nm wavelength (nominal) with an LC connector. Typical reach of 10 Km. Supports 1000BASE-LX and 10GBASE-LR |
| SFP-10G-T | 10 Gigabit copper transceiver (SFP+). 10GBase-T 10 Gigabit ethernet Transceiver (SFP MSA) - Supports category 6a/7 cabling copper cabling up to 30m. This transceiver supports 10Gbs full-duplex mode only. |
| **SFP+ Direct attached cables** | |
| SFP-10G-C1M | 10 Gigabit direct attached copper cable (1 m, SFP+) |
| SFP-10G-C3M | 10 Gigabit direct attached copper cable (3 m, SFP+) |
| SFP-10G-C7M | 10 Gigabit direct attached copper cable (7 m, SFP+) |
| **25G transceivers** | |
| SFP-25G-CLR | 25 Gigabit optical transceiver (SFP28). Supports link lengths of 2Km over singlemode fiber cables. Single MPO |
| SFP-25G-LR | 25 Gigabit optical transceiver (SFP28). Supports link lengths of 10Km over singlemode fiber cables. Single MPO |
| SFP-25G-ESR | 25 Gigabit optical transceiver (SFP28). Supports multimode fiber over 850nm wavelength nominal with an LC connector. Typical reach of 300m on OM4 MMF |
| SFP-25G-SR | 25 Gigabit optical transceiver (SFP28). Supports link lengths of 70m on OM3 and 100m on OM4 multimode fiber cables. Single MPO |
| **25G SFP28 direct attached cables** | |
| SFP-25G-A20M | 25 Gigabit SFP28 direct attached active optical cable. 20 m. |
| SFP-25G-C1M | 25 Gigabit direct attached copper cable 1m, SFP28) |
| SFP-25G-C3M | 25 Gigabit direct attached copper cable 3m, SFP28) |
| SFP-25G-C5M | 25 Gigabit direct attached copper cable 7m, SFP28) |
| **40G transceivers** | |
| QSFP-40G-SR | Four channel 40 Gigabit optical transceiver QSFP+). Supports link lengths of 100m and 150m respectively on OM3 and OM4 multimode fiber cables. Single MPO receptacle |
| QSFP-40G-LR | Four channel 40 Gigabit optical transceiver QSFP+). Supports single mode fiber over 1310nm wavelength. Typical reach 10 km. Duplex LC receptacles |
| QSFP-40G-SR-BD | Dual channel 40 Gigabit optical transceiver QSFP+). Supports multimode fiber over 850nm wavelength nominal) with duplex LC connector. Supports link lengths up to 100 meters on OM3 MMF or 150 meters on OM4 MMF |
| **40G QSFP+ direct attached cables** | |
| QSFP-40G-AOC20M | 40 Gigabit QSFP+ direct attached active optical cable. 20 m. |
| QSFP-40G-C1M | 40 Gigabit direct attached copper cable 1m, QSFP+ |
| QSFP-40G-C3M | 40 Gigabit direct attached copper cable 3m, QSFP+ |
| QSFP-40G-C40CM | 40 Gigabit direct attached copper cable 40 cm, QSFP+ |
| QSFP-40G-C7M | 40 Gigabit direct attached copper cable 7m, QSFP+ |
| **100G transceivers** | |
| QSFP-100G-LR4 | 100 Gigabit optical transceiver QSFP28). Supports link lengths of 10Km over singlemode fiber cables. Single MPO |
| QSFP-100G-SR4 | 100 Gigabit optical transceiver QSFP28). Supports link lengths of 70m on OM3 and 100m on OM4 multimode fiber cables. Single MPO |
| QSFP-100G-CLR4 | 100 Gigabit optical transceiver QSFP28). Supports link lengths of 2Km over singlemode fiber cables. Single MPO |
| QSFP-100G-CWDM4 | 100 Gigabit optical transceiver QSFP28). Supports link lengths of 2Km over singlemode fiber cables. Single MPO. CWDM4 |

| Part number | Description |
|---|---|
| **100G direct attach cables** | |
| QSFP-100G-A20M | 100 Gigabit QSFP28 direct attached active optical cable. 20 m. |
| QSFP-100G-C1M | 100 Gigabit direct attached copper cable 1m, QSFP28 |
| QSFP-100G-C3M | 100 Gigabit direct attached copper cable 3m, QSFP28 |
| QSFP-100G-C5M | 100 Gigabit direct attached copper cable 5m, QSFP28 |

Please replace the "##" in the part number with the country-specific power cord (for example, OS6860E-24-US OS6860N-P24M-US will come with a power cord for the USA). 11 different power cord options are available. Please consult the price list for all power cord options offered.

## Warranty

The OmniSwitch 6860 family comes with a Hardware Limited Lifetime Warranty.

## Services and support

For more information about our Professional services, Support services, and Managed services, please go to https://www.al-enterprise.com/en/services.

Please visit our website to learn more:
https://www.al-enterprise.com/en/products/switches/omniswitch-6860



Alcatel·Lucent Enterprise