

## Alcatel-Lucent OmniSwitch 9000E

### CHASSIS LAN SWITCH

The Alcatel-Lucent OmniSwitch™ 9000E Chassis LAN Switch is a high capacity core switch that addresses large enterprise network needs for secure and highly available core switches to support voice, data and video solutions. The OmniSwitch 9000E, a complementary product line to the OmniSwitch portfolio, is also ideal for use in data centers or metro Ethernet environments since it was designed for deployments requiring high capacity, scalability and virtualization.

The switch family offers enterprises and service providers Gigabit capacity, advanced layer 3 switching, high availability through in-service software upgrades, layer-2 segregation using virtual local area networks (VLANs) and stacked VLANs as well as layer-3 segregation by multi-virtual routing and forwarding (VRF). The OmniSwitch 9000E also uses the familiar and field proven Alcatel-Lucent Operating System (AOS) providing effortless deployment and extended features to address new customer requirements. Lastly, the switch family promotes eco-sustainability by using minimal BTUs thus reducing energy bills and air-conditioning costs.



#### Key features

- Hardware based, multi-virtual routing and forwarding table support
- Uses the Alcatel-Lucent Operating System
- In service software upgrade
- Low power consumption

#### Key benefits

- Enterprise wide cost reduction through hardware consolidation
- Effortless deployment by existing customers
- Enables extended features to address new customer requirements
- 24/7 non-stop system availability – no system reboot required to implement critical software upgrades
- Promotes eco-sustainability through use of minimal BTUs and lowers air conditioning costs

## Technical specifications

### Network Interface

All modules are hot swappable and can be used in any available NI slot.

- 2-port 10GBaseX (XFP)
- 24-port 1000BaseX (SFP)
- 24-port 10/100/1000BaseT (RJ45)

### Dimensions

#### **OmniSwitch 9800**

- Height: 29.75 in (75.6 cm – 17 RU)
- Width: 17.4 in (44.2 cm)
- Depth: 17.30 in (44.0 cm)
- Weight (fully loaded chassis): <190 lbs (85 kg)

#### **OmniSwitch 9700**

- Height: 19.25 in (48.9 cm – 11 RU)
- Width: 17.4 in (44.2 cm)
- Depth: 17.30 in (44.0 cm)
- Weight (fully loaded chassis): <130 lbs (60 kg)

### Power Supply and Power Consumption

#### **600 W AC Power supply**

- Input voltage: 100-240 VAC auto-ranging
- Operating frequency: 47-63 Hz
- Maximum input current:
- 7.5A at 110 VAC; 3.65 A at 220 VAC

#### **Power consumption**

- OS9700 / OS9800 Chassis and fan trays: <80 W
- OS9700E-CMM: <45W
- OS9800E-CMM: <45W
- OS9-XNI-U2E: <40W
- OS9-GNI C24E : <55W
- OS9-GNI U24E: <59W
- PSU efficiency: > 0.75

### Environmental requirements

#### **Operating temperature:**

- 32° to 113°F (0° to 45°C)

#### **Storage temperature:**

- 14° to 158°F (-10° to 70°C)

#### **Humidity (operating and storage):**

- 10% to 90% non-condensing

#### **Heat dissipation (fully loaded with C48T and redundancy):**

- OmniSwitch 9700: < 3,000 BTU/hr, max
- OmniSwitch 9800: < 5,150 BTU/hr, max

### Emissions / Agency Approvals

- CISPR 22 Class A
- FCC Part 15 Class A
- EN 55022 Class A
- ICES-003 Class A
- AS/NZS 3548 / EN55022 Class A
- EN 61000-3-2, EN 61000-3-3
- VCCI Class A

### Immunity

- EN 55024: 1998
- EN 61000-4-2 to 61000-4-6, EN 61000-4-8, EN 61000-4-11

### Safety Agency Certifications

- UL 60950
- IEC 60950-1:2001; all national deviations
- EN 60950-1: 2001; all deviations
- CAN/CSA-C22.2 No. 60950-1-03
- NOM-019 SCFI, Mexico;
- AS/NZ TS-001 and 60950:2000, Australia
- UL-AR, Argentina
- UL-GS Mark, Germany
- EN 60825-1 Laser, EN60825-2 Laser
- CDRH Laser

### IEEE Standards

- IEEE 802.1ad (VLAN Stacking)
- 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 NAC)
- IEEE 802.3i (10BaseT)
- IEEE 802.3u (Fast Ethernet)
- IEEE 802.3x (Flow Control)
- IEEE 802.3z (Gigabit Ethernet)
- IEEE 802.3ab (1000BaseT)
- IEEE 802.3ac (VLAN Tagging)
- IEEE 802.3ad (Link Aggregation)
- IEEE 802.3af (Power-over-Ethernet)

### IETF Standards

#### **Manageability**

- RFC 854/855 Telnet and Telnet options
- RFC 1215 Convention for SNMP Traps
- RFC 2616 /2854 HTTP and HTML
- RFC 2096 IP MIB
- RFC 1212/2737 MIB and MIB-II
- RFC 1643/2665 Ethernet MIB
- RFC 2668/3636 IEEE 802.3 MAU MIB
- RFC 1573/2233/2863 Private Interface MIB
- RFC 1155/2578-2580 SMI v1 and SMI v2
- RFC 1157/2271 SNMP
- RFC 1213/2011-2013 SNMP v2 MIB
- RFC 1901-1908/3416-3418 SNMP v2c
- RFC 2570-2576/3411-3415 SNMP v3
- RFC 2667 IP Tunneling MIB
- RFC 2674 VLAN MIB

#### **Security**

- RFC 2104 HMAC Message Authentication
- RFC 1321 MD5
- RFC 2284 PPP EAP
- RFC 2139/2866/2867/2620 RADIUS

#### **Accounting and client MIB**

- RFC 2138/2865/2868/3575/2618 RADIUS

#### **Authentication and client MIB**

- RFC 2869/2869bis RADIUS Extension
- RFC 2228 sFTP
- RFC 959/2640 FTP

### IP and routing

#### **BGP**

- RFC 1771-1774/2842/2918/3392/4271 BGP v4
- RFC 1269/1657 BGP v3 and v4 MIB
- RFC 3065 BGP AS Confederations
- RFC 2385 BGP MD5 Signature
- RFC 2042 BGP New Attribute
- RFC 2439 BGP Route Flap Damping
- RFC 2796 BGP Route Reflection
- RFC 1965 BGP AS Confederations
- RFC 1997/1998 BGP Communities Attribute
- RFC 1966 BGP Route Reflection
- RFC 1403/1745 BGP/OSPF Interaction

#### **OSPF**

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

#### **RIP**

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

#### **IP multicast**

- RFC 1112 IGMP v1
- RFC 2236/2933 IGMP v2 and MIB
- RFC 3376 IGMPv3
- RFC 1075 DVMRP
- RFC 2934 PIM MIB for IPv4
- RFC 2362 PIM-SM
- RFC 2365 Multicast
- RFC 2715/2932 Multicast Routing MIB

#### **IPv6**

- RFC 2292/2373/2374/2460/2462 IPv6
- RFC 2464/2553/3493/3513 IPv6
- RFC 3542/3587/4213/4291 IPv6
- RFC 2461 NDP
- RFC 2463/2466/4443 ICMP v6 and MIB
- RFC 1886/3596 DNS for IPv6
- RFC 2452/2454 IPv6 TCP/UDP MIB
- RFC 2740 OSPF for IPv6
- RFC 2545/2858 MP Extensions for BGP-4
- RFC 2893/3056 IPv6 Tunneling

#### **Quality of service**

- RFC 896 Congestion control
- RFC 3635 Pause Control
- RFC 1122 Internet Hosts
- RFC 2474/2475/2597/3168/3246 DiffServ

#### **Others**

- RFC 3176 sFlow
- RFC 826/903 ARP and Reverse ARP
- RFC 925/1027 Multi LAN ARP / Proxy ARP
- RFC 951 Bootp
- RFC 1493 Bridge MIB
- RFC 919/922 Broadcasting internet datagram

- RFC 1518/1519 CIDR
- RFC 1541/1542/2131/3396/3442 DHCP
- RFC 2132 DHCP Options
- RFC 2131/3046 DHCP/BootP Relay
- RFC 792 ICMP
- RFC 791/894/1024/1349 IP and IP / Ethernet
- RFC 2251 LDAP v3
- RFC 1305/2030 NTP v3 and Simple NTP
- RFC 1191 Path MTU Discovery
- RFC 3060 Policy Core
- RFC 1151 RDP
- RFC 1757/2819 RMON and MIB
- RFC 950 Subnetting
- RFC 793/1156 TCP/IP and MIB
- RFC 768 UDP
- RFC 2338/3768/2787 VRRP and MIB
- RFC 1256 ICMP Router Discovery

### Warranty

1 year on hardware, 90 days on software  
Additional and optional support available

### Layer-2 Switching

#### VLAN

- Port based, IEEE 802.1Q VLANs
- Advanced VLAN Classification: MAC, protocol, IP subnet
- IEEE 802.1ad VLAN Stacking (a.k.a. QinQ)

#### Spanning tree

- IEEE 802.1D Spanning Tree Protocol (STP) – 1998 / 2004 edition
- IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) – 2001 edition
- IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) – 2002 / 2005 edition
- Support of single and multiple instances for STP and RSTP
- BPDU Watch Guard, Root Guard
- PVST+

#### Link aggregation

- Support for static aggregate (a.k.a., OmniChannel)
- Support for dynamic aggregate (IEEE 802.3ad)

#### Auto-negotiation

- Speed (10, 100 and 1000 Mbps) and duplex mode (half or full)
- Auto MDIX on 10/100/1000 port (for straight through or crossover cables)

#### Traffic control

- IEEE 802.3x

#### DHCP

- DHCP Relay, Option 82 and Snooping (including port-MAC-IP binding)

### Layer-3 Routing (IPv4)

#### IP routing

- Static routing, RIP (v1, v2), OSPF (v2) and BGP (v4, including graceful restart)
- Multiple-VRF
- Graceful Restart extensions for OSPF and BGP
- GRE Tunneling

#### Multicast

- IGMP (v1, v2 and v3) and IGMP snooping
- PIM-SM, PIM-DM and DVMRP

#### Network protocol

- Generic UDP relay (including DHCP Relay)
- TCP/IP stack
- ARP

#### Resilience

- VRRP (v2)

### Layer-3 Routing (IPv6)

#### IP routing

- Static routing, RIP (ng), OSPF (v3) and Multiprotocol Extensions for BGP
- Graceful Restart extensions for OSPF and BGP

#### Multicast

- MLD snooping
- PIM-SM, PIM-DM<sup>1</sup>

#### Network protocol

- Generic UDP relay (including DHCP Relay)
- TCP/IP stack
- NDP

#### Resilience

- VRRP (v3)

### Convergence

#### Priority queues

- Eight hardware based queues per port

#### Traffic prioritization

- Flow-based QoS in hardware (L1-L4)
- Internal and external (a.k.a., remarking) prioritization
- Auto-QoS for Alcatel-Lucent IP phones & NMS

#### Traffic redirection/mirroring

- Policy-based routing (redirection)
- Policy-based mirroring
- Server load balancing (including health monitoring of servers)

#### Bandwidth management

- Flow based bandwidth management, ingress policing / egress shaping
- Port-based egress shaping

### Convergence

#### Queue management

- Configurable de-queuing algorithm
- Strict Priority
- Weighted Round Robin
- Deficient Round Robin

### Security

#### Traffic filtering

- Traffic Anomaly Detection
- Flow-based filtering in hardware (L1-L4)

#### User authentication

- IEEE 802.1X, with Group Mobility and Guest VLAN support
- MAC Based Authentication for non 802.1X host
- Authenticated VLAN (web and telnet based authentication)

### Switch protocol security

- MD5 for RIPv2, OSPFv2 and SNMPv3
- SSHv2 for secure CLI session (including Secure Copy)
- SSL for secure HTTP session

### Switch management

- Local authentication database
- Remote authentication RADIUS, TACACS+, LDAP and ACE servers

### Management

#### Configuration mode

- Command Line Interface
- Telnet/SSH for remote CLI access
- Web-base (HTTP / HTTPS)
- SNMP v1/v2c/v3 for complete NMS integration

#### Management access type

- Serial console port for local and remote (modem dial up) access (RJ45)
- Out-of-band Ethernet access (10/100/1000 RJ45)
- In-band Ethernet access

#### System maintenance

- In service software upgrade
- Port mirroring (one-to-one, many-to-one)
- RMON (Remote Monitoring): statistics, history, alarm and events
- sFlowTM
- Local and remote logging (Syslog)
- Detailed statistics / alarm/debug information per process
- Ethernet OAM (802.1ag)
- IP OAM (ICMP Ping and Traceroute)
- NTP (Network Time Protocol)
- Internal flash (Compact Flash) to feature:
- working directory
- certified directory

#### System file transfer

- Xmodem
- FTP (File Transfer Protocol)

### Service and support

#### Default warranty

- 1 year on hardware, 90 days on software

#### Support basic

- One year – 7x24 phone. Includes e-service web access, software releases and repair and return of hardware to be completed in 10 business days from receipt.

#### Support plus

- One year – 7x24 phone. Includes e-service web access, software releases and advanced shipment for next business day arrival of replacement hardware.

(1) Contact your local Alcatel-Lucent representative for availability

## Ordering information

### Bundles

| PART NUMBER   | DESCRIPTION                                                                  |
|---------------|------------------------------------------------------------------------------|
| OS9700E-CB-A  | OS9700 base bundle, to include OS9700 chassis, fan tray, 1 CMM, 2 PSUs       |
| OS9700E-RCB-A | OS9700 redundant bundle, to include OS9700 chassis, fan tray, 2 CMM, 3 PSUs  |
| OS9800E-CB-A  | OS9800 base bundle, to include OS9800 chassis, fan tray, 1 CMM, 3 PSUs       |
| OS9800E-RCB-A | OS9800 redundant bundle, to include OS9800 chassis, fan tray, 2 CMMs, 4 PSUs |

### Chassis and power supplies

| PART NUMBER    | DESCRIPTION                                                                     |
|----------------|---------------------------------------------------------------------------------|
| OS9600-CHASSIS | OS9600 chassis and fan tray                                                     |
| OS9700-CHASSIS | OS9700 chassis and fan tray                                                     |
| OS9800-CHASSIS | OS9800 chassis and fan tray                                                     |
| OS9-PS-0600A   | 600W AC PSU (100-240V) for OS9000                                               |
| OS9-PS-0600D   | 600W DC PSU (48V) for OS9000                                                    |
| OS9-IP-SHELF   | External PoE rack for the OS9000 chassis. Rack to include 1 PSU (OS9-IPS-0600A) |
| OS9-IPS-0600A  | 600W AC power-over-Ethernet PSU (100-240V) for use with OS9-IPSHELF only        |
| OS9-IPS-0390A  | 390W AC power-over-Ethernet PSU (100-240V) for standalone use <sup>3</sup>      |
| OS9-IPS-0230A  | 240W AC power-over-Ethernet PSU (100-240V) for standalone use <sup>3</sup>      |

### Management and fabric modules

| PART NUMBER | DESCRIPTION                                           |
|-------------|-------------------------------------------------------|
| OS9700E-CMM | Chassis Management Module for the OS9700 <sup>4</sup> |
| OS9800E-CMM | Chassis Management Module for the OS9800              |

### Network interface cards

| PART NUMBER          | DESCRIPTION             |
|----------------------|-------------------------|
| OS9-XNI-U2E 2-port   | 10GigE XFP              |
| OS9-GNI-U24E 24-port | GigE SFP                |
| OS9-GNI-C24E 24-port | GigE (10/100/1000) RJ45 |

### Chassis and power supplies

| PART NUMBER     | DESCRIPTION                                                                            |
|-----------------|----------------------------------------------------------------------------------------|
| XFP-10G-SR      | 10 Gigabit Ethernet optical transceiver (XFP MSA – up to 300m)                         |
| XFP-10G-LR      | 10 Gigabit Ethernet optical transceiver (XFP MSA – up to 10km)                         |
| XFP-10G-ER40    | 10 Gigabit Ethernet optical transceiver (XFP MSA – up to 40km)                         |
| XFP-10G-ZR80    | 10 Gigabit Ethernet optical transceiver (XFP MSA – up to 80km)                         |
| SFP-GIG-SX      | Gigabit Ethernet optical transceiver (SFP MSA – up to 550m)                            |
| SFP-GIG-LX      | Gigabit Ethernet optical transceiver (SFP MSA – up to 10km)                            |
| SFP-GIG-LH40    | Gigabit Ethernet optical transceiver (SFP MSA – up to 40km)                            |
| SFP-GIG-LH70    | Gigabit Ethernet optical transceiver (SFP MSA – up to 70km)                            |
| SFP-GIG-xxCWD60 | Gigabit Ethernet CWDM optical transceiver (SFP MSA – up to 60km – 8 wavelengths)       |
| SFP-GIG-EXTND   | Gigabit Ethernet optical transceiver (SFP MSA – Gigabit extender up to 2km)            |
| SFP-DUAL-MM     | Dual Speed (100FX – 1000LX) optical transceiver (SFP MSA – up to 2km (FX) / 550m (LX)) |
| SFP-DUAL-SM10   | Dual Speed (100FX – 1000LX) optical transceiver (SFP MSA – up to 10km (FX and LX))     |

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