ALCATEL-LUCENT OMNISWITCH 10K

MODULAR LAN CHASSIS

The Alcatel-Lucent OmniSwitch® 10K Modular LAN Chassis platform is a high-capacity, high-performance modular Ethernet LAN switch that is field-proven in enterprise, service provider and data center environments. Based on the Alcatel-Lucent Operating System (AOS), which is a state-of-the-art programmable and scriptable OS designed for Software-defined Networking (SDN) deployment, the OmniSwitch 10K delivers uninterrupted network uptime with non-stop Layer 2/3 forwarding and service software upgrades. Deep packet buffers, a lossless virtual output queuing (VOQ) fabric, ready for data center convergence with key data center bridging (DCB) and T11 BB-5 integration, and extensive traffic management capabilities improve application performance and user experience. Its scalability and Layer 2/3 fabric throughput meet your bandwidth requirements for today and tomorrow.

Layer 2/3 network deployments are simplified and the network has better performance and resiliency because of the OmniSwitch 10K hardware architecture and its virtual chassis technology. The OmniSwitch 10K implementation offers Virtual Extensible LAN (VXLAN) snooping, OpenFlow, Shortest Path Bridging (SPB), DCB capabilities, Quality of Service (QoS), and Layer 2/3 switching suitable for dynamic network provisioning as well as traffic monitoring and control. It also offers user and server access automation through Edge Virtual Bridging VEPA (IEEE802.1Qbg EVB) and use of dynamic Virtual Network Profiles (vNP). Network virtualization for simplified, fully automated data center and cloud deployments is enabled over SPB (IEEE 802.1aq SPB-M) or Multiple VLAN Registration Protocol (MVRP) backbones.

The OmniSwitch 10K switch is a perfect fit for data center applications and serves as a long-term upgrade to any network because of its class-leading low-power consumption, front-to-back cooling, compact form factor, and front-accessible components.

FEATURES	BENEFITS
• High-density, non-blocking 10/40 GigE ports with large packet buffers. Includes high-density 10/100/1000 Mbit/s ports	• Maximum network performance delivers quality bandwidth for improved application and user experience. Reduces network layers as well as investment and operation costs.
Virtualized management, control and programmability • Unified virtual chassis • Comprehensive northbound RESTful API to the entire AOS feature set. The API offers access to all AOS command line interface (CLI) commands and all management information base (MIB) structures. • AOS embedded scripting capabilities supporting Python and Bash programming allows workflow optimization. • Hardware-based virtual routing and forwarding (VRF) support with VRF-lite and IPVPN capabilities.	• The OmniSwitch virtual chassis increases system redundancy and resiliency providing maximum uptime and high availability in the network. • Optimizes and simplifies Layer 2/3 network designs and reduces administration overhead while increasing network capacity with resilient multipath active-active dual homing multi-chassis support. • The RESTful interface exposes the entire AOS feature set as a programmable data structure. The API allows external controllers and applications to control and manage the switch's data plane and monitor its counters, statistics and events for automation of the network. • Provides interoperability, investment protection and flexibility.

FEATURES	BENEFITS
• Scalable network virtualization architecture with guaranteed service-level agreement (SLA) delivery over standard Ethernet fabric: auto-fabric IP routing for routed backbone and access provisioning, SPB for bridging and routed services, Edge Virtual Bridging (EVB), Multiple VLAN Registration Protocol (MVRP) and dynamic Virtual Network Profiles (vNP). • Zero-touch provisioning and network automation with out-of-the-box plug-and-play auto-fabric for automatic protocol and topology discovery. Protocol auto-discovery and self-provisioning works with any Ethernet device that supports standard IEEE protocols, such as 802.1aq (SPBM), 802.1ak (MVRP) and 802.3ad/802.1AX (LACP), and standard IP routing protocols.	• Out-of-the-box flexible fabric architecture designed to automate and simplify the end-to-end deployment of campus, data center and cloud-based services. • Prevents human mistakes by automating standardized and replicable configurations. • Prevents host address explosion and flooding with built-in SLA service support at low capital and operating costs and based on interoperable proven standards. • Optimizes and simplifies Layer 2/3 network designs and reduces administration overhead while increasing network capacity with resilient multipath active-active dual homing multi-chassis support. • Out-of-the-box auto-fabric to simplify installation and service provisioning. • Automated Cloud Multi-Tenancy support over vNP. • The auto-fabric operation extends beyond Layer 2 auto-provisioning to IP routing protocol provisioning and IP on-boarding.
• VXLAN snooping for dynamic real-time multi-tenant visibility and SLA policy enforcement. • Integrated overlay (VXLAN) and underlay internet working automated with the OpenStack neutron plug-in • Intelligent policy control through OpenFlow 1.3.1/1.0	• Embedded SDN integration to control virtual network profiles and policy management • Built-in dynamic and automated policy enforcement • Policy enforcement engine fully open for external control through RESTful northbound APIs for automation and integration of innovative applications and Cloud Multi-Tenancy support
• VMware-certified Alcatel-Lucent OmniVista® 2500 Virtual Machine Manager (VMM), Virtual Network Profiles (vNP) integration, VM SLA monitoring and application fingerprinting for unmanned network operation and self-adjusting SLA for application delivery • Interfaces with VMware vCenter® and Citrix™ XenServer® for discovery and inventory • VMware Vcenter integration • Single pane-of-glass for end-to-end physical and virtual networks infrastructure operations • Real-time tracking between VM and its network location • Dynamic VM performance for application performance analytics and visibility	• Unifies physical and virtual infrastructures providing network operators with a comprehensive end-to-end network view for VM inventory, VM performance, location tracking, event and log auditing and provisioning operations. Monitors applications and malware activity, adjusting the network to meet the application SLAs according to the business operational requirements. This enables error-free network administration operations and simplifies the deployment of new value-added services. • Dynamic application profiling with in-line application recognition based on signatures and auto-adjustment of the network security and quality of service treatment. Maintains the VM performance measurement of latency, throughput and jitter in the data center. • VM to underlay network correlation and single-pane visibility
• Multi-hop Fibre Channel over Ethernet (FCoE) transit switching based on T11-BB-5 with FCoE Initialization Protocol (FIP) snooping and flexible multi-queue IEEE DCB support: extends the lossless capability beyond FCoE to any traffic class in any CoS queue and for many queues simultaneously in the same port.	• Allows the administrator to have a hands-off operation using application-based dynamic Lossless configuration through Enhanced Transmission Selection (ETS) or manually engineered lossless tuned to the application needs. • Reduces data center operating cost by simplifying the convergence of high performance storage I/O and mission critical data into a single multipath infrastructure.

DETAILED PRODUCT FEATURES

Simplified manageability

- Fully programmable RESTful web services interface with XML and JSON support. The API enables access to CLI and individual MIB objects.
- Intuitive CLI in a scriptable Python and Bash environment through console, Telnet, or Secure Shell (SSH) v2 over IPv4/IPv6
- Powerful WebView Graphical Web Interface through HTTP and HTTPS over IPv4/IPv6
- Full configuration and reporting using SNMPv1/2/3 to facilitate third-party network management over IPv4/IPv6
- File upload using USB, TFTP, FTP, SFTP or SCP using IPv4/IPv6
- Multiple microcode image support with fallback recovery
- Local (on the flash) and remote server logging (Syslog) for event and command logging
- Loopback IP address support for management per service
- Management VRF support
- Policy- and port-based mirroring
- Remote port mirroring
- sFlow v5 and RMON
- Unidirectional Link Detection (UDLD) and Digital Diagnostic Monitoring (DDM)
- Dynamic Host Configuration Protocol (DHCP) relay
- IEEE 802.1AB LLDP with MED extensions
- Network Time Protocol (NTP)
- DHCPv4 and DHCPv6 server managed by Alcatel-Lucent VitalQIP® DNS/DHCP IP Address Management

Resiliency and high availability

- Unified management, control and fabric-mesh 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), 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)
- Redundant and hot-swappable power supplies
- Redundant fans
- Hot-swappable fan tray
- Hot-swappable expansion modules
- Built-in CPU protection against malicious attacks

Data center networking

- Dynamic Virtual Network Profiles (vNP)
- IEEE 802.1Qbg Edge Virtual Bridging (EVB)
- IEEE 802.1Qbb Priority Flow Control (PFC)
- IEEE 802.1Qaz Enhanced Transmission Selection (ETS)
- IEEE 802.1Qaz Data Center Bridging Capabilities Exchange Protocol (DCBX)
- IEEE 802.1 Converged Enhanced Ethernet (CEE) 1.01
- IEEE 802.1aq Shortest Path Bridging (SPB-M)
- IETF RFC 7348 Virtual Extensible LAN (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 compatible with Grizzly or later

Converged storage I/O

- Multi-hop FCoE transit switching with FIP snooping
- End-to-end FCoE Converged Network Adapter (can) switching T11-BB-6
- FIP snooping

Advanced security

Access control

- Autosensing IEEE 802.1X multi-client, multi-VLAN support, support for bridging and SPBM/VXLAN services
- MAC-based authentication for non-IEEE 802.1X hosts
- 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 Snooping, DHCP IP and Address Resolution Protocol (ARP) spoof protection
- ARP poisoning detection
- IP Source Filtering as a protective and effective mechanism against ARP attacks

Quality of Service (QoS)

- Priority queues: Eight hardware-based queues per port
- 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
- Lossless Virtual Output Queuing (VOQ) with configurable scheduling algorithms
- DiffServ architecture
- Congestion avoidance: Support for end-to-end head-of-line (E2E-HOL) blocking prevention, IEEE 802.1Qbb Priority-based Flow Control (PFC) and IEEE 802.3x Flow Control (FC)

IPv4 routing

- Multiple Virtual Routing and Forwarding (VRF)
- Static routing with route labeling
- 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
- Distributed ARP learning

IPv6 routing

- Multiple Virtual Routing and Forwarding (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 (VRRPv3)
- Neighbor Discovery Protocol (NDP)
- Policy-based routing and server load balancing
- DHCPv6 server

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
- (S,G) and (*,G) forwarding

Advanced Layer 2 services

- Ethernet services support using IEEE 802.1ad Provider Bridges (also known as Q-in-Q or VLAN stacking)
- Fabric virtualization services IEEE802.1aq SPB-M and VXLAN
  - ¬ Ethernet Virtual Connection (EVC) support for transparent LAN services, such as E-LAN, E-Line and E-Tree
  - ¬ Multipoint Ethernet VPN (EVPN) over I-SID service virtualization or Q-in-Q tunnels or Visual Networking Index (VNI)
  - ¬ Ethernet network-to-network interface (NNI) and user network interface (UNI)
  - ¬ Service Access Point (SAP)
  - ¬ Service VLAN (SVLAN) and Customer VLAN (CVLAN) support
  - ¬ VLAN translation and mapping including CVLAN to SVLAN
  - ¬ C-tag to S-tag priority mapping
- Port mapping
- DHCP Option 82: Configurable relay agent information
- Multicast VLAN Registration Protocol (MVRP)
- HA-VLAN for L2 clusters such as MS-NLB and active-active Firewall clusters
- Jumbo frame support
- Bridge Protocol Data Unit (BPDU) blocking
- STP Root Guard

TECHNICAL SPECIFICATIONS

Product specifications and measurements

Per-port LEDs

- Ethernet/FC: link/activity
- EMP: link/activity
- Per-port multi-color beacon support in OS6900-Q32

System LEDs

- OK: green/yellow
- PS1: green/yellow
- PS2: green/yellow
- PWR Save: green

COMPLIANCE AND CERTIFICATIONS

EMI/EMC - Commercial

- FCC 47 CFR Part 15 Class A
- ICES-003 Class A
- CE marking for European countries (Class A)
- EMC Directive 89/336/EEC
- EN55022:1998:2006 Class A
- EN55024 :1998:A1: 2001+A2:2003
- EN61000-3-2
- EN61000-3-3
- EN61000-4-2
- EN61000-4-3
- EN61000-4-4
- EN61000-4-5
- EN61000-4-6
- EN61000-4-8
- EN61000-4-11
- CISPR22:1997 Class A
- VCCI (Class A)
- AS/NZS 3548 (Class A)
- IEEE 802.3 Hipot requirement and 1.5 kV surge on data port for copper interfaces

Safety agency certifications

- US UL 60950
- IEC 60950-1:2001; all national deviations
- EN 60950-1: 2001; all deviations
- CAN/CSA-C22.2 No. 60950-1-03
- AS/NZ TS-001 and 60950:2000; Australia
- UL-AR; Argentina
- UL-GS Mark; Germany
- GOST; Russian Federation
- EN 60825-1 Laser
- EN 60825-2 Laser
- CDRH Laser

SUPPORTED STANDARDS

IEEE standards

- IEEE 802.1D STP
- IEEE 802.1p CoS
- IEEE 802.1Q VLANs
- IEEE 802.1ad Provider Bridges Q-in-Q/ VLAN stacking
- IEEE 802.1ak (MVRP)
- IEEE 802.1aq (SPB)
- IEEE 802.1Qaz ETS/DCBX
- IEEE 802.1 CEE 1.01
- IEEE 802.1Qbb PFC
- IEEE 802.1s MSTP
- IEEE 802.1w RSTP
- IEEE 802.1X Port-based Network Access Control (PNAC).
- IEEE 802.3x Flow Control
- IEEE 802.3u Fast Ethernet
- IEEE 802.3z 1 GigE
- IEEE 802.3ab 1 GBase-T
- IEEE 802.3ac VLAN Tagging
- IEEE 802.3ad/802.1AX Link Aggregation
- IEEE 802.3ae 10 GigE
- IEEE 802.3an 10 GBase-T
- IEEE 802.3ba 40 GigE

ITU-T recommendations

- ITU-T G.8032/Y.1344 2010: Ethernet Ring Protection (ERPv2)

IETF RFCs

IPv4

- RFC 2003 IP/IP Tunneling
- RFC 2784 GRE Tunneling
- RFC 2131 - Dynamic Host Configuration Protocol (DHCPv4)

OSPF

- RFC 1765 OSPF Database Overflow
- RFC 1850/2328 OSPF v2 and MIB
- RFC 2154 OSPF MD5 Signature
- RFC 2370/5250 OSPF Opaque LSA
- RFC 3101 OSPF NSSA Option
- RFC 3623 OSPF Graceful Restart
- RFC 2740 OSPFv3 for IPv6

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 1771-1774/2842/2918/4271 BGP
- RFC 1965 BGP AS Confederations
- RFC 1966 BGP Route Reflection
- RFC 1997/1998/4360 BGP Communities Attribute
- RFC 2042 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 Capabilities Advertisement with BGP-4
- RFC 5396/5668/6793 BGP 4-Octet and Textual Representation of ASN

IS-IS

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

IP Multicast

- RFC 1075/draft-ietf-idmr-dvmrp-v3-11.txt DVMRP
- 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 4087 IP Tunnel MIB
- RFC 4541 Considerations for IGMP and MLD Snooping Switches
- RFC 4601/5059 PIM-SM
- RFC 5015 BiDIR PIM
- RFC 5060 Protocol Independent Multicast MIB
- RFC 5240 PIM Bootstrap Router MIB
- RFC 5132 Multicast Routing MIB

IPv6

- RFC 1981 Path MTU Discovery
- RFC 2460 IPv6 Specification
- 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 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 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 Autoconfiguration
- 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 2570-2576/3411-3415 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 4122 A Universally Unique IDentifier (UUID) URN Namespace
- RFC 4234 Augmented BNF for Syntax Specifications: ABNF
- RFC 4251/4418 Secure Shell Protocol Architecture with UMAC Message Authentication
- RFC 4252/4253 The Secure Shell (SSH) Authentication Protocol and Transport Layer Protocol
- RFC 4627 JavaScript Object Notation (JSON)
- RFC 6585 Additional HTTP Status Codes

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
- RFC 2284 PPP EAP
- RFC 2869/2869bis RADIUS Extension
- RFC 4301 Security Architecture for IP
- RFC 1826/1827/4303/4305 Encapsulating Payload (ESP) and crypto algorithms

QoS

- 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 ARP
- RFC 919/922 Broadcasting Internet Datagram
- RFC 925/1027 Multi-LAN ARP/Proxy ARP
- RFC 950 Subnetting
- RFC 951 BOOTP
- RFC 1151 RDP
- RFC 1191 Path MTU Discovery
- RFC 1256 ICMP Router Discovery
- RFC 1305/2030 NTP v3 and Simple NTP
- RFC 1493 Bridge MIB
- RFC 1518/1519 CIDR
- RFC 1541/1542/2131/3396/3442 DHCP
- RFC 1757/2819 RMON and MIB
- RFC 2131/3046 DHCP/BootP Relay
- RFC 2132 DHCP Options
- RFC 2251 LDAP v3
- RFC 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"

Software Defined Networking (SDN)

- OpenFlow Switch Specification, Version 1.3.1
- OpenFlow Switch Specification, Version 1.0.0
- RFC 7348 Virtual eXtensible Local Area Network (VXLAN)

Table 1. Chassis model

OMNISWITCH 10K	
Fan tray slots	12, 8 NI slots, 2 half-slots for CMM/CFM
Management module slots (CMM)	2
Fabric module slots (CFM)	2
Network interface slots (NI)	8
Current switching capacity per NI (b/s or pps)	640 Gb/s / 480 Mb/s
Raw switching capacity per slot (b/s or p/s)	1280 Gb/s / 960 Mp/s
Power supply (AC/DC) slots	4
Height (19-in. and 23-in. rack mount)	16U
Dimensions (HxWxD)	71.2 x 44.2 x 58.5 cm (28 x 17.4 x 23 in.)
Weight (loaded)	89.8 kg (198 lb)
ENVIRONMENT	
Operating temperature	0°C to 45°C (32°F to 113°F)
Storage temperature	-10°C to 70°C (14°F to 158°F)
Operating and storage humidity	10% to 90% (non-condensing)
Heat dissipation (fully loaded - worst case)	14 572 BTU/h

Table 2. Network interface characteristics

MODEL NUMBERS	CPU	MEMORY	PORT COUNT	INTERFACE TYPE	L2 TABLE	L3 TABLE IPV4/IPV6	POLICY TABLE	MPLS*/SPBM SUPPORT	DCB SUPPORT
OS10K-CMM	1.5 GHz dual-core	4 GB SDRAM, 2 GB CF	3	USB, Console, 10/100/1000Base-Tx	N/A	N/A	N/A	N/A	N/A
OS10K-CFM	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A
OS10K-GNI-C48E	1.2 GHz dual-core	1.2 GB packet buffer	48	10/100/1000Base-Tx	256K*	512K/256K	4K	Yes	No
OS10K-GNI-U48E	1.2 GHz dual-core	1.2 GB packet buffer	48	SFP	256K*	512K/256K	2K	Yes	No
OS10K-XNI-U32S	1.2 GHz dual-core	4.8 GB packet buffer	32	SFP+, SFP 1GigE	32K	512K/256K	2K	No	No
OS10K-XNI-U32E	1.2 GHz dual-core	4.8 GB packet buffer	32	SFP+, SFP 1GigE	128K	512K/256K	2K	Yes	Yes
OS10K-XNI-U16E	1.2 GHz dual-core	2.4 GB packet buffer	16	SFP+, SFP 1GigE	128K	512K/256K	2K	Yes	Yes
OS10K-XNI-U16L	1.2 GHz dual-core	2.4 GB packet buffer	16	SFP+, SFP 1GigE	128K	512K/256K	2K	Yes	Yes
OS10K-QNI-U4E	1.2 GHz dual-core	2.4 GB packet buffer	4	QSFP+	128K	512K/256K	2K	Yes	Yes
OS10K-QNI-U8E	1.2 GHz dual-core	4.8 GB packet buffer	8	QSFP+	128K	512K/256K	2K	Yes	Yes

*Hardware capacity, future software support

ORDERING INFORMATION

Chassis and power supply

MODEL NUMBER	DESCRIPTION
OSX-HA-CBA	OS10K-HA-CBA is a high availability bundle. The bundle includes 64 ports of 10G, 8 ports of 40G and 4 QSFPs together with Advanced and DC licenses for two (CB) chassis included. The bundle components include: 2 quantities of OS10K8-CB-A, 2 quantities of OS10K-XNI-U32E, 2 quantities of OS10K-QNI-U4E, 2 quantities of OS10K-SW-A, 2 quantities of OS10K-SW-DC and 4 quantities of QSFP-40G-S. Note: Refer to part OS10K8-CB-A bundle for detailed baseline BOM.
OSX-XG-CBA	OS10K-XG-CBA is a 10G bundle with 64 ports of 10G and 16 10G SFP-SRs included. The bundle includes: 1 qty of OS10K8-CB-A, 2 quantities of OS10K-XNI-U32E, 1 quantity of OS10K-SW-A, 1 quantity of OS10K-SW-DC and 16 quantities of SFP-10G-SR. Note: Refer to part OS10K8-CB-A bundle for detailed base bundle BOM.
OS10K8-CB-A	OS10K base bundle with AC power and SSL (DES, 3DES, RC2, RC4). Base bundle includes 1 x OS10K Chassis, 2 x Fan Trays, 2 x OS10K-PS-25A power supplies, 1 x OS10K-CMM chassis management module, 1 x OS10K-CFM chassis fabric module and fully featured AOS software w/ advanced IP routing SW (IPv4/IPv6). Includes power cord.
OS10K8-CB-D	OS10K base bundle with DC power and SSL (DES, 3DES, RC2, RC4). Base bundle includes 1 x OS10K Chassis, 2 x Fan Trays, 2 x OS10K-PS-24D power supplies, 1 x OS10K-CMM chassis management module, 1 x OS10K-CFM chassis fabric module and fully featured AOS software w/ advanced IP routing SW (IPv4/IPv6).
OS10K8-RCB-A	OS10K redundant bundle with AC power and SSL (DES, 3DES, RC2, RC4). Redundant bundle includes 1 x OS10K Chassis, 2 x Fan Trays, 4 x OS10K-PS-25A power supplies, 2 x OS10K-CMM chassis management module, 2 x OS10K-CFM chassis fabric module and fully featured AOS software w/ advanced IP routing SW (IPv4/IPv6). Includes power cord.
OS10K8-RCB-D	OS10K base bundle with DC power and SSL (DES, 3DES, RC2, RC4). Base bundle includes 1 x OS10K Chassis, 2 x Fan Trays, 3 x OS10K-PS-24D power supplies, 2 x OS10K-CMM chassis management module, 2 x OS10K-CFM chassis fabric module and fully featured AOS software w/ advanced IP routing SW (IPv4/IPv6).

MODEL NUMBER	DESCRIPTION
OS10K-FAN-TRAY	OS10K fan tray. Spare.
OS10K-PS-25A-XX	OS10K AC power supply. Provides up to 2.5 kW of power, auto-ranging 110VAC-240VAC. -XX country power cord designator
OS10K-PS-24D	OS10K DC power supply. Provides up to 2.4 kW of power. 36v-72v DC input power.

Management and switching fabric modules

MODEL NUMBER	DESCRIPTION
OS10K-CMM	OS10K Chassis Management Module with SSL (DES, 3DES, RC2, RC4). The OS10K-CMM Chassis Management Module includes a processor module, a fabric module, and AOS software with advanced IP routing SW (IPv4/IPv6).
OS10K-CFM	OS10K Chassis Fabric Module. OS10K-CFM provides additional switch capacity and increased fabric redundancy.

Network interface cards

MODEL NUMBER	DESCRIPTION
GIGABIT MODULES	
OS10K-GNI-C48E	OS10K Gigabit network interface card offers 48 wire rate RJ-45 1000Base-T ports. This Enhanced network interface card is MPLS ready, and provides large table support for L2, L3, and ACL policies.
OS10K-GNI-U48E	OS10K Gigabit network interface card offers 48 unpopulated wire rate 1000BaseX SFP ports. This Enhanced network interface card is MPLS ready, and provides large table support for L2, L3, and ACL policies.
10 GIGABIT MODULES	
OS10K-XNI-U16E	OS10K network interface card includes 16 unpopulated 10G SFP+ ports. This Standard interface card does not support MPLS or the large tables for L2, L3, and ACL policies.
OS10K-XNI-U16L	OS10K network interface card includes 8 unpopulated 10G SFP+ ports and 8 unpopulated 1G SFP+ ports. 1G ports can be updated to 10G through license upgrade. Supports standard tables for L2, L3 and ACL policies.
OS10K-XNI-U32E	OS10K network interface card includes 32 unpopulated 10G SFP+ ports. Supports standard tables for L2, L3 and ACL policies.
OS10K-XNI-U32S	OS10K network interface card includes 32 unpopulated 10G SFP+ ports. Supports standard tables for L2, L3 and ACL policies.
40 GIGABIT ETHERNET MODULES	
OS10K-QNI-U4E	OS10K network interface card includes 4 unpopulated 40G QSFP+ ports. Supports standard tables for L2, L3 and ACL policies.
OS10K-QNI-U8E	OS10K network interface card includes 8 unpopulated 40G QSFP+ ports. Supports standard tables for L2, L3 and ACL policies.
SOFTWARE LICENSE	
OS10K-U16L-UPG	Software Upgrade to provide 10Gb on 8 ports of 1Gb.
OS10K-SW-DC	Data Center Software for support of DCBX, FCoE and EVB on OS10K. One license required per chassis.
OS10K-SW-A	Advanced Software for support of SPB and Virtual Chassis on OS10K. One license required per chassis.
GE 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.
10 GE 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-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 (62.5µm).
SFP-10G-GIG-SR	Dual-speed SFP+ optical transceiver. Supports multimode fiber over 850nm wavelength (nominal) with an LC connector. Supports 1000BaseSX and 10GBASE-SR.
SFP-10G-24DWD80	10 Gigabit DWDM optical tranceiver (SFP+ MSA), 1558.17 nm/Channel 24 (100GHz ITU Grid), 80 km, LC Connector.
SFP-10G-ZR	10 Gigabit industrial optical transceiver (SFP+). Supports data transmission at 1550nm over up to 80km single mode fiber.

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+).
40 GE TRANSCEIVERS	
QSFP-40G-SR	Four channel 40 Gigabit optical transceiver (QSFP+). Supports link lengths of 100 m and 150 m, respectively, on OM3 and OM4 multimode fiber cables.
QSFP-40G-LR	Four channel 40 Gigabit optical transceiver (QSFP+). Supports single mode fiber over 1310nm wavelength. Typical reach of 10 km.
QSFP+ DIRECT ATTACHED CABLES	
QSFP-40G-C1M	40 Gigabit direct attached copper cable (1 m, QSFP+).
QSFP-40G-C3M	40 Gigabit direct attached copper cable (3 m, QSFP+).
QSFP-40G-C7M	40 Gigabit direct attached copper cable (7 m, QSFP+).

Contact your Alcatel-Lucent Enterprise reseller for additional information on country-specific power cords and a complete list of our SFP+ and SFP transceivers.

Service and support

Warranty

Limited warranty to the original owner of one year on hardware and 90 days on software.

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