



OmniSwitch 7000 Series

Carrier Class for the Enterprise

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The OmniSwitch 7000 series, consisting of the OmniSwitch 7700 and 7800, are intelligent, multi-layer switching platforms that provide unmatched availability and intelligence. These new platforms are part of Alcatel's next generation OmniSwitch 6600/7000/8000 product family, designed for IP Communications and mission-critical environments. The OmniSwitch 7000 series delivers carrier-class features and performance with simplified management for a wide range of enterprise environments. These new switching platforms are optimized for voice and data integration and provide non-blocking multi-Gigabit Ethernet capacity, multi-layer security, carrier-class availability, and intelligent switching and routing services – all at wire speed.

The OmniSwitch 7000 series offers an extensive set of features making them ideal for a variety of network environments such as:

- Enterprise core and edge applications
- LAN aggregation/distribution
- IP telephony/LAN wiring closets
- Gigabit Ethernet MANs

OmniSwitch 7700 and 7800

The OmniSwitch 7000 series product family consists of two switching products: the OmniSwitch 7700 and 7800. The OmniSwitch 7700 is a 10 slot, modular chassis that supports an aggregate switch port capacity of 192 full duplex Gigabit Ethernet. The OmniSwitch 7800 is an 18 slot, high capacity modular chassis that supports an aggregate switch port capacity of 384 full duplex Gigabit Ethernet. These platforms are built from the ground up for IP Communications and converged environments, featuring advanced QoS capabilities, and in-line power distribution for IP phones. They are designed for continuous operation, with two center slots dedicated to chassis management modules (CMM), with the OmniSwitch 7700 providing a CMM fabric capacity of 64 Gbps, and the OmniSwitch 7800 providing a CMM fabric capacity of 128 Gbps. They are available in redundant configurations with an extensive array of Ethernet interfaces and port densities.

Key functionality includes:

- Smart continuous switching
- Multi-layer security
- Dynamic mobility
- Wire-speed intelligent switching/routing
- Wire-speed server load balancing
- In-line power distribution

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Carrier-Class Availability

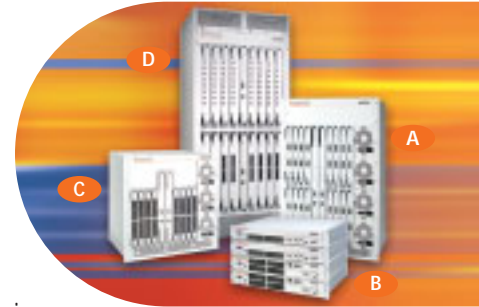
Today's successful business needs to have a network that can deliver continuous operation and provide carrier class availability to support the demands of IP Communications and mission-critical applications. Carrier-class availability ensures that users have access to resources and services at all times. To ensure availability, the OmniSwitch 7000s have been designed with a distributed architecture enabling carrier-class features, including full redundancy and resiliency.

A unique feature of the OmniSwitch 7000 series is *smart continuous switching*, which provides continuous operation in the event of a failure. With smart continuous switching, all source learning, Spanning Tree functions, and established routes are distributed throughout the network interface modules instead of a central engine. In the event of a management module failure, the system automatically switches over to the hot standby module with no loss of connections or fabric capacity. Existing L2/L3 traffic, including voice conversations, will continue seamlessly without interruption. Plus, Alcatel's OmniSwitch 7000s are capable of creating new connections during this failover – an industry first.

Network resiliency is a critical part of network availability and the OmniSwitch 7000s provide extensive support including advanced routing redundancy protocols, load sharing, and mechanisms for fast reconfiguration of links between switches, servers, and other network devices. The OmniSwitch 7000s provide fully redundant and resilient system components to ensure continuous operation. This includes:

- **Redundant chassis subsystems**
- **Hot swappable modules**
- **Load-sharing components**
- **"Hitless loading" of optional software, such as advanced routing, without re-booting**
- **Downloadable bootstrap**
- **Image rollback to automatically re-load previous configurations and software versions**

Alcatel's OmniSwitch 7000s are leading the industry, delivering carrier-class availability and functionality – all at an enterprise price.



- A OmniSwitch 7800**
- B OmniSwitch 6600 series**
- C OmniSwitch 7700**
- D OmniSwitch 8800**



Multi-layer Security

Enterprises are becoming borderless as they open their networks to e-business and external users. This requires the network to provide easy user access yet have extensive security that can be managed across a global enterprise. The OmniSwitch 7000 series provides multi-layer security with a vast arsenal of features that can be implemented at the edge, the core, and throughout the network.

These include:

- User authentication
- VLANs
- Access control lists (ACLs)
- Authenticated switch access
- Encryption
- NAT/PAT
- Denial of service protection

Multi-layer security enables the building of sophisticated hardware and software-based solutions that can be integrated with policy-based management and other technologies such as smart cards, PKI, and biometrics for enhanced security implementations. For secure management there are many features integrated into the architecture including authenticated user access, SNMPv3 and SSL for encrypted sessions, and partitioned management for multi-tiered access and granular network administration.

Distributed Intelligence

Distributed intelligence ensures that users and applications get the priority and performance they need with ease-of-use management that extends across the enterprise. The OmniSwitch 7000 series features state-of-the-art ASIC-based technology for intelligent, wire-speed everything including switching, routing, ACLs, load balancing, and QoS. The switches provide application-aware switching for layers 2, 3, and 4 and the most advanced classification, prioritization, and queuing schemes. They also support industry classification standards including 802.1Q/p, TOS, and DiffServ, and are enhanced with complementary features such as extensive QoS mappings, and re-tagging of prioritization.

The OmniSwitch 7000s are well adapted to server connectivity offering embedded server load balancing (no specialized hardware or software is required) and operates at wire-speed. This flexibility makes them a perfect fit in small or medium core applications where server connectivity and backbone functions are collapsed.

Alcatel OmniSwitch 7000 Series



OneTouch Manageability

OmniVista, the Alcatel voice and data network management platform, features **OneTouch manageability** allowing network managers to quickly configure and manage the switches in their network. For example, OneTouch QoS, a feature of Alcatel's policy management software PolicyView, allows network managers to quickly assign QoS priorities to network traffic based on the characteristics of different applications. With "one-click," every Alcatel switch in the network is automatically configured.

The OmniSwitch 7000s also offer service-level and policy-based configurations with support for LDAP directories enabling flexible integration with existing platforms and allowing extended offerings. RMON support is also included with a choice of interfaces for administrators – a command line interface (CLI), SNMP, a fully editable text-based configuration file, and standard Web-browser interface.

Dynamic Mobility

Users are becoming increasingly mobile creating challenges for administrators. The OmniSwitch 7000s feature **dynamic mobility**, which simplifies the task of managing remote and mobile users. Dynamic mobility allows users to move anywhere in the network without having to reconfigure each time. Users can change locations, connect to a new network port, and have access to all their resources without administrator intervention. Dynamic mobility can be fully integrated with authentication to provide **secure mobility** across an entire network. The OmniSwitch 7000 series provides the industry's most extensive VLAN capabilities enabling flexible support for mobile user environments.

Features

- 10/100/1000 Ethernet non-blocking, full duplex
- In-line power for IP phones and end devices
- Carrier-class availability with smart continuous switching
- Multi-layer security (ACLs, authenticated services, DoS protection, and SSL)
- Authenticated VLANs and authentication services
- Enhanced ACLs
- NAT and PAT
- Distributed intelligence
- Wire-speed everything
- Application-aware (L2/L3/L4 QoS classification)
- Embedded wire-speed server load balancing
- IP/IPX routing (RIP v1/v2, OSPF, BGP-4, DVMRP, PIM- SM, RIP/SAP)
- IP Multicast Switching (multicast isolation within VLANs)
- MPLS and IPv6 support*
- Dynamic mobility with extensive VLAN support

*Contact for availability



Chassis

The OmniSwitch 7000 series shares the same fan tray, power supplies, and interface modules reducing maintenance and sparring costs while maximizing flexibility.

Interface Modules

The OmniSwitch 7000 series supports an extensive array of 10/100 Mbps, Gigabit, and interface modules and port densities. The interface modules are fully interchangeable and are designed for cost-effective, continuous operation.

Gigabit network interface modules (GNI)

Two port 1000BaseX Ethernet module with GBIC slots

GBICs supported

- SX – 1000BaseSX over multimode fiber
- LX – 1000BaseLX over single mode fiber
- LH – 1000BaseLH Long reach over single mode fiber up to a maximum distance of 70 km
- Copper – 1000BaseT GBIC for Cat5/Cat5e copper

12 port 1000BaseX Ethernet module with Mini-GBIC slots

Mini-GBICs supported

- SX – 1000BaseSX over multimode fiber
- LX – 1000BaseLX over single mode fiber
- LH – 1000BaseLH Long reach over single mode fiber up to a maximum distance of 70 km

12 port 10/100/1000 BaseT Ethernet module

Ethernet NI modules (ENI)

- 24 port 10/100 Ethernet module
- 12 port 100BaseFX multi-mode Ethernet module
- 24 port 10/100 in-line powered Ethernet module

Technical Summary

Switch Architecture

Fabric capacity of CMM

OmniSwitch 7700: 64 Gbps

OmniSwitch 7800: 128 Gbps

Aggregate switch port capacity

OmniSwitch 7700: 192 full duplex Gigabit Ethernet

OmniSwitch 7800: 384 full duplex Gigabit Ethernet

Number of slots

OmniSwitch 7700: 10; two for management/fabric and eight for interface modules

OmniSwitch 7800: 18; two for management/fabric and 16 for interface modules

NEBS Certification

Redundant, hot-swappable/hot insertable

- Chassis Management Module (CMM)
- Fan tray
- Power supplies
- Switching fabric

Hot-swappable/hot insertable

- Network Interface modules (NI)

Passive backplane

IP-inline power for IP phones

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OmniSwitch 7000 interface modules	Module Port Count	OmniSwitch 7800 (max)	OmniSwitch 7700 (max)
Gigabit Ethernet (SX, LX, LH & copper)	2	32	16
High-density Gigabit Ethernet with Mini-GBIC (SX, LX, LH)	12	192	96
High-density 10/100/1000BaseT	12	192	96
10/100 RJ-45	24	384	192
100BaseFM	12	192	96
In-line power 10/100 RJ-45	24	384	192

Number of power supplies supported

OmniSwitch 7700: up to three; two required for power; one optional for N+1 resiliency

OmniSwitch 7800: up to four; three required for power; one optional for N+1 resiliency

Input voltage and current ratings

- 90-265 VAC input voltage (auto-ranging)
- 8 amps at 110 VAC
- 4 amps at 220 VAC
- 47-63 Hz
- -48 VDC input power

System Features

- Distributed L2/L3/L4 services and processing
- Provides non-blocking store-and-forward switching fabric
- Wire-speed layer 2
- Wire-speed layer 3 IP and IPX
- Wire-speed ACL (Access Control Lists)
- Multicast multi-layer switching

Hardware Features

- 10/100/1000 Ethernet auto-sensing and auto-negotiation
- Port mirroring with reverse-path data
- 802.3ad and Alcatel's OmniChannel port aggregation with port failure recovery and load balancing based on MAC addresses
 - Up to 32 aggregates per switch
 - Up to 16 links per aggregate
- Per-port flood limiting
- Provides hardware support for IP multicast switching

VLAN Support

- Up to 4,096 802.1Q tag value support
- Configuration per port, MAC address, layer 3-based, port binding, protocol type, and custom
- Authenticated and policy-based VLANs
- Hardware support for 802.1p-tagged frames, including "hybrid" and "transparent" ports



Advanced QoS Features

- Hardware priority queuing with four priority levels per port
- 2,048 queues per interface module
- Setting of 802.1p, IP TOS, and/or DiffServ control points on output
- Classification based upon MAC DA, IP Protocol, IP SA/DA, TCP/UDP SA/DA, destination slot/interface, destination interface type, destination VLAN, multicast
- Output bandwidth shaping using hardware-controlled queue scheduling based on deficit round robin
- Trusted and untrusted ports
- WRED *

QoS mapping and prioritization re-tagging for:

- 802.1p to 802.1p, TOS and DiffServ
- TOS to TOS, 802.1p and DiffServ
- DiffServ to DiffServ, 802.1p and TOS

Layer 3 Server Load Balancing

- Supports any combination of servers in a cluster with a maximum of 15 clusters and up to 75 total servers per system
- Wire rate on all network interfaces

Routing Protocol Support

- RIP v1/v2
- OSPF v1/v2
- OSPF ECMP
- BGP-4
- DVMRP
- PIM-SM
- IGMP v1/v2
- VRRP

Physical Dimensions

OmniSwitch 7800

Width: 17.40"

Height: 29.75"

Depth: 17.30"

Weight: 80 lbs or 188 lbs fully loaded

Total slots: 18

Can be rack mounted in 19" and 23" racks

OmniSwitch 7700

Width: 17.40"

Height: 19.25"

Depth: 17.30"

Weight: 55 lbs or 128 lbs fully loaded

Total slots: 10

Can be rack mounted in 19" and 23" racks

Operating Environment

Total heat dissipation at maximum configuration

OmniSwitch 7800: 4,513 BTUs

OmniSwitch 7700: 2,534 BTUs

Storage temperature: 14 ~ 158 °F (-10 ~ 70 °C)

Operating temperature: 32 ~ 113 °F (0 ~ 45 °C)

Humidity: 0% to 95% (Non-condensing)

Operating altitude: Sea level to 10,000 feet (3 km)

*Contact for availability

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Standards and Certifications

Standards (abridged)

IEEE 802.1D Spanning Tree Protocol	RFC 1587 OSPF NSSA Option
IEEE 802.1D-1998 Priority and Dynamic Multicast Filtering	RFC 1757 RMON (groups 1, 2, 3, and 9)
IEEE 802.1p	RFC 1765 OSPF Database Overflow
IEEE 802.1Q VLAN Tagging	RFC 1771 BGP-4
IEEE 802.1w	RFC 1812 IP router requirements
IEEE 802.3 10BaseT Ethernet	RFC 1997 BGP Communities Attribute
IEEE 802.3u 100BaseTX, 100BaseFX Fast Ethernet	RFC 2236 IGMPv2
IEEE 802.3x Full-Duplex with Flow Control	RFC 2328 OSPFv2
IEEE 802.3z 1000BaseX Gigabit Ethernet	RFC 2338 VRRP
IEEE 802.3ad Link Aggregation	RFC 2362 PIM – SM
IEEE 802.3ae 10 Gigabit Ethernet standard	RFC 2370 The OSPF Opaque LSA Option*
RFC 768 UDP	RFC 2385 Protection of BGP Sessions via the TCP MD-5 Signature Option
RFC 791 IP	RFC 2439 BGP Route Flap Damping
RFC 792 ICMP	RFC 2453 RIPv2
RFC 793 TCP	RFC 2644 IP router requirements
RFC 826 ARP	RFC 2715 Interoperability Rules for Multicast Routing Protocols*
RFC 854 Telnet	RFC 2796 BGP Route Reflection - An Alternative to Full Mesh IBGP
RFC 925 Multi-LAN ARP/Proxy ARP	RFC 2842 Capabilities Advertisement with BGP-4
RFC 1058 RIPv1	RFC 2918 Route Refresh Capability for BGP-4
RFC 1075 DVMRPv2	RFC 3065 Autonomous System Confederations for BGP
RFC 1191 Path MTU Discovery	
RFC 1519 Classless Inter-Domain Routing (CIDR)	

*Contact for availability



Certifications/Safety

EMC Compliance: EN55024: 1998; EN55022 Class A/B; FCC Part 15, Subpart B, Class A/B; VCCI-V3/97.04 Class A/B; 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; AS/NZS 3548, Class A/B; CE Marking per EMC Directive

Safety Compliance: 21 CFR 1040; AS/NZS 3260; CB with all national deviations (IEC 950); CE Marking per Low Voltage Directive; CSA-C22.2 no.60950; TS 001; UL 60950; EN60825-1; EN60825-2; TUV GS Mark (EN60950); UL-AR: Argentina Certification

Ordering Information

Model Number	Description
OS7700-CB-A	OmniSwitch 7700 Chassis Bundle; (OS7700-chassis, OS7700-CMM, 2 AC power supplies, fan tray)
OS7700-CB-D	OmniSwitch 7700 Chassis Bundle; (OS7700-chassis, OS7700-CMM, 2 DC power supplies, fan tray)
OS7800-CB-A	OmniSwitch 7800 Chassis Bundle; (OS7800-chassis, OS7800-CMM, 3 AC power supplies, fan tray)
OS7800-CB-D	OmniSwitch 7800 Chassis Bundle; (OS7800-chassis, OS7800-CMM, 3 DC power supplies, fan tray)
OS7700-RCB-A	OmniSwitch 7700 Redundant Chassis Bundle; (OS7700-chassis, 2 OS7700-CMM, 3 AC power supplies, fan tray)
OS7700-RCB-D	OmniSwitch 7700 Redundant Chassis Bundle; (OS7700-chassis, 2 OS7700-CMM, 3 DC power supplies, fan tray)
OS7800-RCB-A	OmniSwitch 7800 Redundant Chassis Bundle; (OS7800-chassis, 2 OS7800-CMM, 4 AC power supplies, fan tray)
OS7800-RCB-D	OmniSwitch 7800 Redundant Chassis Bundle; (OS7800-chassis, 2 OS7800-CMM, 4 DC power supplies, fan tray)
OS7700-RP-A	OmniSwitch 7700 Redundancy Package; (OS7700-CMM, 1 AC power supply)
OS7700-RP-D	OmniSwitch 7700 Redundancy Package; (OS7700-CMM, 1 DC power supply)
OS7800-RP-A	OmniSwitch 7800 Redundancy Package; (OS7800-CMM, 1 AC power supply)
OS7800-RP-D	OmniSwitch 7800 Redundancy Package; (OS7800-CMM, 1 DC power supply)
OS7700-CMM	OmniSwitch 7700 Management and Fabric Module
OS7800-CMM	OmniSwitch 7800 Management and Fabric Module

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Ordering Information (continued)

Model Number	Description
OS7-ENI-C24	24 port 10/100BaseT Ethernet Module
OS7-ENI-P24	24 port 802.3af compliant Power Over LAN Ethernet Module
OS7-ENI-FM12	12 port Fast Ethernet Module (multi-mode)
OS7-GNI-U2	Two slot Universal Gigabit Ethernet Module with 2 GBIC slots
OS7-GNI-U12	12 slot Universal Gigabit Ethernet Module with 12 Mini-GBIC slots
OS7-GNI-C12	12 port 10/100/1000BaseT Ethernet Module
GBIC-LH-70	1000BaseLH GBIC for single mode fiber up to a maximum distance of 70 kms – SC connector
GBIC-LX	1000BaseLX GBIC for single mode fiber – SC connector
GBIC-SX	1000BaseSX GBIC for multi-mode fiber – SC connector
GBIC-C	1000BaseTX GBIC for Cat5 copper – RJ-45 connector
MiniGBIC-SX	1000BaseSX Mini-GBIC (SFP MSA) for multi-mode fiber – LC connector
MiniGBIC-LX	1000BaseLX Mini-GBIC (SFP MSA) for single mode fiber – LC connector
MiniGBIC-LH-70	1000BaseLH Mini-GBIC (SFP MSA) for single mode fiber up to a maximum distance of 70 kms – LC connector
OS7000-FT	OmniSwitch 7000 Fan Tray
OS7-PS-0600A	OmniSwitch 7000 600 Watt AC Power Supply – 85-270 VAC input voltage; auto-sensing
OS7-PS-0600D	OmniSwitch 7000 600 Watt DC Power Supply - 48VDC input voltage
OS7-IPS-600A	Power Over LAN power Supply
OS7-IP-SHELF	Power Over LAN Power shelf, to house Power Over LAN power supplies
OS7-SW-AR	Optional Advanced Routing Software
OS7-SW-AS	Optional Advanced Security Software

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