Alcatel OmniSwitch 7000 Series
Carrier Class for the Enterprise

The OmniSwitch 7000s are intelligent, multi-layer switching platforms that provide unmatched availability and intelligence. These new platforms are part of Alcatel's next generation OmniSwitch 7000 / 8000 product family, designed for IP Communications and mission-critical environments. The OmniSwitch 7000s deliver 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 offer 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 is a product family consisting of two switching products, the OmniSwitch 7700 and 7800. The OmniSwitch 7800 is an 18 slot high-capacity, modular chassis with a fabric capacity of 128 Gbps. The OmniSwitch 7700 is a 10 slot modular chassis with a fabric capacity of 64 Gbps. They are designed for continuous operation, with two center slots dedicated to management modules in a redundant configuration and an extensive array of Ethernet interfaces and port densities. 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. Key functionalities include:

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

Carrier-Class Availability

There is a strong focus today on business continuity and the need to have carrier-class availability in enterprise networks. To ensure the highest levels of reliability, the OmniSwitch 7000s have been designed with a distributed architecture to enable carrier-class features, including full redundancy and resiliency. Carrier-class availability ensures that users have constant access to all resources and that services are available at all times.

A unique feature of the OmniSwitch 7000s 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 / fabric module failure, the system automatically switches over to the hot standby 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, that allows live upgrading without having to re-boot, downloadable bootstrap, and image rollback which allows the system 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.
**Multi-layer Security**

As organizations open up their networks for e-business and external users, a secure infrastructure needs to be architected and managed. The network must be easily accessed by users, yet incorporate extensive security that can be implemented across a global enterprise. The OmniSwitch 7000s provide with a vast arsenal of security 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, and 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 7000s feature state-of-art ASIC-based technology for intelligent, wire-speed everything, which includes switching, routing, ACLs, load balancing, and QoS. The OmniSwitch 7000s provide application-aware switching for layers 2, 3, and 4 and the most advanced classification, prioritization, and queuing schemes. The OmniSwitch 7000s classifications support industry standards including 802.1Q/p, TOS, DiffServ, and are enhanced with complementary features such as extensive QoS mappings, and QoS marking.

The OmniSwitch 7000s are particularly well adapted to server connectivity, featuring embedded server load balancing that requires no specialized hardware or software, 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.

**OneTouch Manageability**

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

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

Users are becoming increasingly mobile, and this can create challenges for administrators. The OmniSwitch 7000s feature dynamic mobility, which simplifies the task of managing remote and mobile users. This 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 7000s provide the highest flexibility and the most extensive VLAN capabilities in the industry to support mobile user environments.
**Features**

10/100/1000 Ethernet non-blocking, full-duplex

10 Gigabit Ethernet-ready platform

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, BGP4, DVMRP, PIM SM, RIP/SAP)

IP Multicast Switching (multicast isolation within VLANs)

MPLS and IPv6 support*

Dynamic mobility with extensive VLAN support

NEBS Certification*

**Chassis**

The OmniSwitch 7000 series share the same fan tray, power supplies, and interface modules to reduce maintenance and sparing costs while maximizing flexibility.

**Interface Modules**

The OmniSwitch 7000s support an extensive array of 10/100/1000 Mbps Ethernet interface modules and port densities. Designed for cost-effective, non-stop operation, the OmniSwitch 7000s interface modules are fully interchangeable.

10 Gigabit Ethernet network interface module (10GNI)*

**Gigabit network interface modules (GNI)**

2 port 1000BaseX Ethernet module with GBIC slots

GBICs supported

- SX - multi-mode fiber
- LX - single mode fiber
- LH - long reach single mode fiber
- Copper - RJ45 twisted pair

12 port 1000BaseX Ethernet module with mini-GBIC slots*

Mini-GBICs supported

- SX - multi-mode fiber
- LX - single mode fiber
- LH - long reach single mode fiber

12 port 10/100/1000BaseT 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**

- OmniSwitch 7700 - 64 Gbps
- OmniSwitch 7800 - 128 Gbps

**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

**Redundant, hot-swappable / hot insertable**

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

* Contact for availability
Hot-swappable / hot insertable

- Network Interface modules (NI)

Passive backplane

IP-inline power for IP phones*

-48 VDC input power*

Number of power supplies supported

- OmniSwitch 7700 – 3; two for power and one for redundancy
- OmniSwitch 7800 – 4; three for power and one for redundancy

Input voltage and current ratings

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

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
- Priority classification based upon MAC DA, IP Protocol, IP SA/DA, TCP/UDP SA/DA, port, Interface Type, VLAN, Multicast

Mapping for

- 802.1p to TOS and DiffServ
- TOS to 802.1p and DiffServ
- DiffServ to 802.1p and TOS
- Output bandwidth shaping using hardware-controlled queue scheduling based on deficit round robin
- Trusted and untrusted ports
- WRED *

Layer 3 server load balancing

- Up to 15 clusters with five servers
- Wire-rate on all network interfaces

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<table>
<thead>
<tr>
<th>OmniSwitch 7000 interface modules</th>
<th>Module Port Count</th>
<th>OmniSwitch 7800 (max)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Wire-speed Gigabit Ethernet (SX, LX, LH &amp; copper)</td>
<td>2</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>High-density Gigabit Ethernet *</td>
<td>12</td>
<td>192</td>
<td>96</td>
</tr>
<tr>
<td>High-density 10/100/1000BaseT *</td>
<td>12</td>
<td>192</td>
<td>96</td>
</tr>
<tr>
<td>Wire-speed 10/100 RJ45</td>
<td>24</td>
<td>384</td>
<td>192</td>
</tr>
<tr>
<td>Wire-speed 100BaseFX</td>
<td>12</td>
<td>192</td>
<td>96</td>
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<td>In-line power 10/100 RJ45 *</td>
<td>24</td>
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* Contact for availability
Routing Protocol Support
- RIP v1 / v2
- OSPF v1 / v2
- OSPF ECMP
- BGP4
- DVMRP
- PIM SM
- IGMP v1 / v2
- VRRP

Physical Dimensions
OmniSwitch 7800
- Width: 17.40"
- Height: 29.75"
- Depth: 14.75"
- 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: 14.75"
- 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
- OmniSwitch 7800 - 6142 BTUs
- OmniSwitch 7700 - 4095 BTUs

Storage temperature: 10 ~ 70 °C
(14 ~ 158 °F)
Operating temperature: 0 ~ 45 °C
(32 ~ 113 °F)
Humidity: 0% to 95% (Non-condensing)
Operating altitude: Sea level to 10,000 feet
(3 km)

Standards and Certifications
Standards (abridged)
- IEEE 802.1D Spanning Tree Protocol
- IEEE 802.1D-1998 Priority and Dynamic Multicast Filtering
- IEEE 802.1Q VLAN Tagging
- IEEE 802.1w
- IEEE 802.3 10BaseT Ethernet
- IEEE 802.3u 100BaseTX, 100BaseFX Fast Ethernet
- IEEE 802.3x Full-Duplex with Flow Control
- IEEE 802.3z 1000BaseX Gigabit Ethernet
- IEEE 802.3ad
- IEEE 802.3af
- RFC 768 UDP
- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 826 ARP
- RFC 854 Telnet
- RFC 925 Multi-LAN ARP/Proxy ARP
- RFC 1058 RIPv1
- RFC 1075 DVMRP
- RFC 1191 Path MTU Discovery
- RFC 1519 Classless Inter-Domain Routing (CIDR)
- RFC 1587 OSPF NSSA Option
- RFC 1757 RMON (groups 1, 2, 3, and 9)
- RFC 1765 OSPF Database Overflow
- RFC 1771 BGP4
- RFC 1812 IP router requirements
- RFC 1997 BGP Communities Attribute
- RFC 2236 IGMPv2
- RFC 2328 OSPFv2
- RFC 2338 VRRP
- RFC 2362 PIM – SM
- RFC 2370 The OSPF Opaque LSA Option*
- RFC 2385 Protection of BGP Sessions via the TCP MD-5 Signature Option
- RFC 2439 BGP Route Flap Damping
- RFC 2453 RIPv2
- RFC 2644 IP router requirements
- RFC 2715 Interoperability Rules for Multicast Routing Protocols*

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Standards and Certifications (cont)

- RFC 2796 BGP Route Reflection - An Alternative to Full Mesh IGBP
- RFC 2842 Capabilities Advertisement with BGP4
- RFC 2858 Multiprotocol Extensions for BGP*4

Certifications / Safety

**EMC Compliance:** FCC Part 15 (CFR 47) Class A/B, VCCI-V3/97.04 Class A/B, EN 50082-1 1997, IEC 1000-4-2 (EN 61000-4-2), IEC 1000-4-3 (EN 61000-4-3), IEC 1000-4-4 (EN 61000-4-4), IEC 1000-4-5 (EN 61000-4-5), IEC 1000-4-6 (EN 61000-4-6), IEC 1000-4-8 (EN 61000-4-8), IEC 1000-4-11 (EN 61000-4-11), IEC 1000-3-2, IEC 1000-3-3 (EN 60555-2)

**Safety Compliance:** UL 1950, EN 60950, CSA-0C22.2 no.950, EN 60825-1, EN 60825-2, TS 001, CE Marking, AS/NZS 3260, 21 CFR 1040, CB with all national deviations (IEC 950)

Ordering Information

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS7700-CBA</td>
<td>OmniSwitch 7700 Chassis Bundle; (OS7700-chassis, OS7700-CMM, 2 AC power supplies, fan tray)</td>
</tr>
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<td>OS7800-CBA</td>
<td>OmniSwitch 7800 Chassis Bundle; (OS7800-chassis, OS7800-CMM, 3 AC power supplies, fan tray)</td>
</tr>
<tr>
<td>OS7700-RCBA</td>
<td>OmniSwitch 7700 Redundant Chassis Bundle; (OS7700-chassis, 2 OS7700-CMM, 3 AC power supplies, fan tray)</td>
</tr>
<tr>
<td>OS7800-RCBA</td>
<td>OmniSwitch 7800 Redundant Chassis Bundle; (OS7800-chassis, 2 OS7800-CMM, 4 AC power supplies, fan tray)</td>
</tr>
<tr>
<td>OS7700-RPA</td>
<td>OmniSwitch 7700 Redundancy Package; (OS7700-CMM, 1 AC power supply)</td>
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<td>OS7700-CMM</td>
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</tr>
<tr>
<td>OS7-ENIC24</td>
<td>24 port 10/100BaseT Ethernet Module</td>
</tr>
<tr>
<td>OSGN-U12</td>
<td>12 port Fast Ethernet Module (multi-mode)</td>
</tr>
<tr>
<td>OS-GN-U12</td>
<td>Two slot Universal Gigabit Ethernet Module with 2 GBIC slots</td>
</tr>
<tr>
<td>GBCIC-LH-70</td>
<td>Long reach GBIC 70 km</td>
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<tr>
<td>GBCIC-LX</td>
<td>Single mode GBIC</td>
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<tr>
<td>GBCIC-SX</td>
<td>Multimode GBIC</td>
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<td>GBCIC-C</td>
<td>1000BaseT GBIC</td>
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<tr>
<td>OS7000-FT</td>
<td>OmniSwitch 7000 Fan Tray</td>
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<tr>
<td>OS7-PW-S6000A</td>
<td>OmniSwitch 7000 600 Watt AC Power Supply</td>
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<tr>
<td>OS7-SW-AR</td>
<td>Optional Advanced Routing Software</td>
</tr>
<tr>
<td>OS7-SW-AS</td>
<td>Optional Advanced Security Software</td>
</tr>
<tr>
<td>OS7-MANUAL</td>
<td>OmniSwitch 7000 Series User Manual (hard copy)</td>
</tr>
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