# Alcatel-Lucent
# OMSN Product Family
# Optical Multi-Service Node

Alcatel·Lucent

## Multiservice aggregation for SDH metro networks

The Alcatel-Lucent 1660 Synchronous Multiplexer (SM), the Alcatel-Lucent 1662 Synchronous Multiplexer Compact (SMC) and the Alcatel-Lucent 1650 SMC form a family of leading multiservice provisioning platforms (MSPPs) for building next-generation, multiservice SDH metro and regional transport networks. This Alcatel-Lucent Optical Multi-Service Node (OMSN) product family integrates best-in-class transport functions, SDH cross-connect and CWDM add/drop functionality, together with carrier-class, Layer 2 packet/cell switching functions, including Ethernet, Multi-Protocol Label Switching (MPLS) and ATM. Sharing common modules and features, the Alcatel-Lucent OMSN products ensure deployment flexibility and feature support.

# Metro broadband aggregation

Today's carriers and service providers require optical solutions for metro and regional networks that are capable of providing the capacity, reliability, flexibility and scalability to efficiently address the new communication paradigm. Together with traditional TDM-based functions and carrier-transport technologies that support vast revenue streams, new packet-based services for broadband applications are expanding at an unprecedented pace and need to be cost effectively delivered over an efficient, broadband-aggregation infrastructure.

## Single solution offering carrier transport and packet switching

The Alcatel-Lucent OMSN family integrates transport and packet-switching technologies, delivering metro networking solutions that support new broadband service delivery. With these capabilities, the Alcatel-Lucent OMSN products address metro and regional applications and offer a multiservice transport platform (MSTP) to support revenues from multiple broadband services, including:

- Triple play
- Private line and Ethernet virtual private LAN service (VPLS) business services such as:
  - ¬ Mobile backhaul aggregation
  - ¬ Transport and lambda services

### Features

- Cost-effective management and transport of packet-based data applications within the existing optical infrastructure
- Enhanced connectivity in all network topologies: ring, star and mesh
- Purpose-built, highly robust carrier-transport functions with reliability features
- Fast end-to-end service provisioning, monitoring and troubleshooting
- Support for high-speed services, ranging from 2 Mb/s and Ethernet up to GE and 10 Gb/s
- Progressive integration of Internet, voice and video services in a unified and homogeneous environment
- Per-flow management of service quality and performance to support the most stringent SLA requirements

## Carrier transport

The Alcatel-Lucent OMSN products are based on a solid, yet flexible, SDH transport architecture, offering service providers several benefits:

- Offers purpose-built, highly robust carrier-transport functions with reliability features for maximum service availability, supporting zero-latency services from access to backbone in any mixture
- Delivers unmatched manageability for fast end-to-end service provisioning, monitoring and troubleshooting
- Enhances connectivity in all network topologies: ring, star and mesh
- Supports high-speed services ranging from 2 Mb/s and Ethernet up to Gigabit Ethernet (GE) and 10 Gb/s

The Alcatel-Lucent 1660 SM scales to Synchronous Transport Module (STM)-64 support for the metro/regional core, while the Alcatel-Lucent 1662 SMC and the Alcatel-Lucent 1650 SMC scale to STM-16 and STM-4, respectively, for efficient network core/edge design. The Alcatel-Lucent 1660 SM and Alcatel-Lucent 1662 SMC integrate CWDM features to extend their transport capacity by offering telecommunications service providers:

- Bandwidth multiplication for metro and regional applications
- Evolution from single-lambda to multiple-lambda services within the same node
- An ideal, cost-effective CWDM solution for optical metropolitan infrastructures

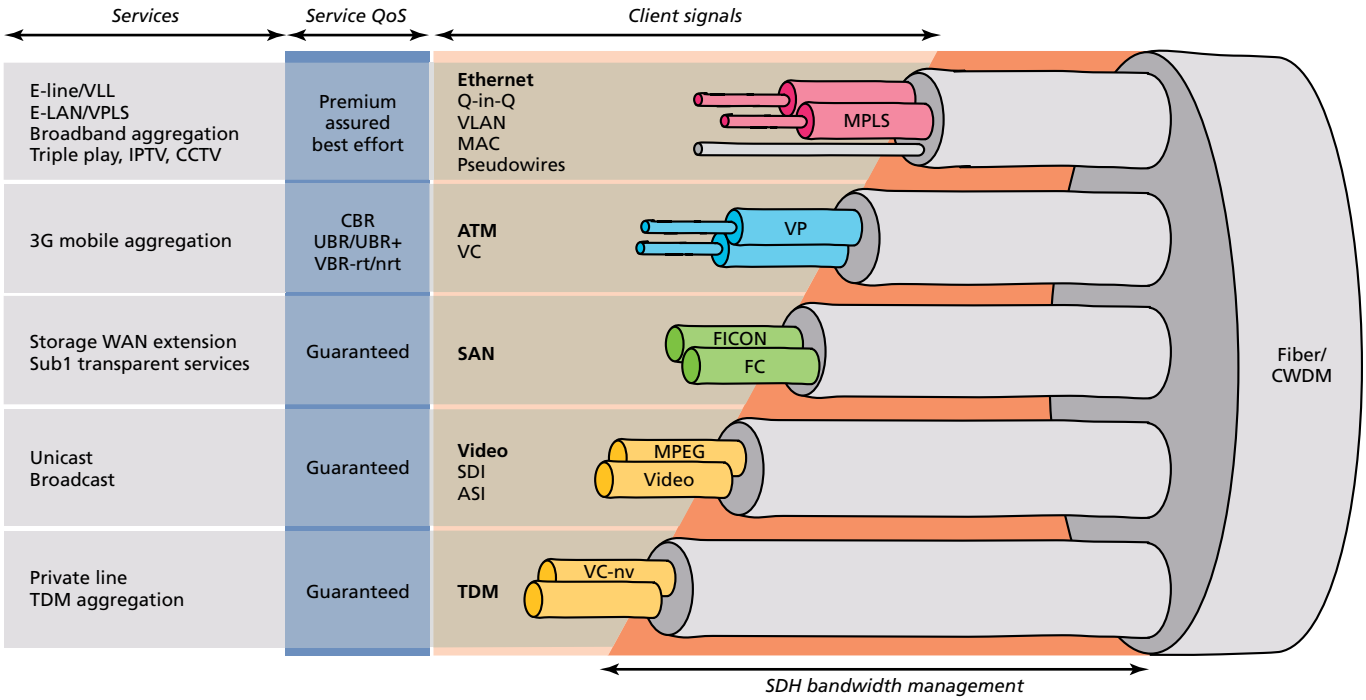
## Packet switching

The Alcatel-Lucent OMSN products share common integrated service adapter (ISA) blades that provide Layer 2 packet-switching functions, adapting the SDH transport infrastructure to the increasing demand for packet-based broadband services:

- Offers MPLS-enabled Ethernet switching functions and ATM-switching capabilities, with enterprise system connection (ESCON), fiber connection (FICON) and Fibre Channel (FC) interfaces for improved data-stream connectivity and delivery of new IP-based broadband services such as triple play, Ethernet virtual private networks (VPNs), storage networking and 3G mobile aggregation
- Cost effectively manages and transports packet-based data applications within the existing optical infrastructure, avoiding adding specific overlay data networks for metro broadband aggregation
- Creates new revenues from current and future competitive data services by enforcing and verifying service level agreements (SLAs) based on embedded Quality of Service (QoS) support (see Figure 1)

These capabilities transform the Alcatel-Lucent OMSN products into the cost-effective multitechnology nodes ideally targeted for optical metro networks where capacity, infrastructure costs, reliability and packet-based services play key roles in a user-centric broadband architecture.

**Figure 1. Creating new revenues through the Alcatel-Lucent OMSN broadband service management**



# Multiservice applications

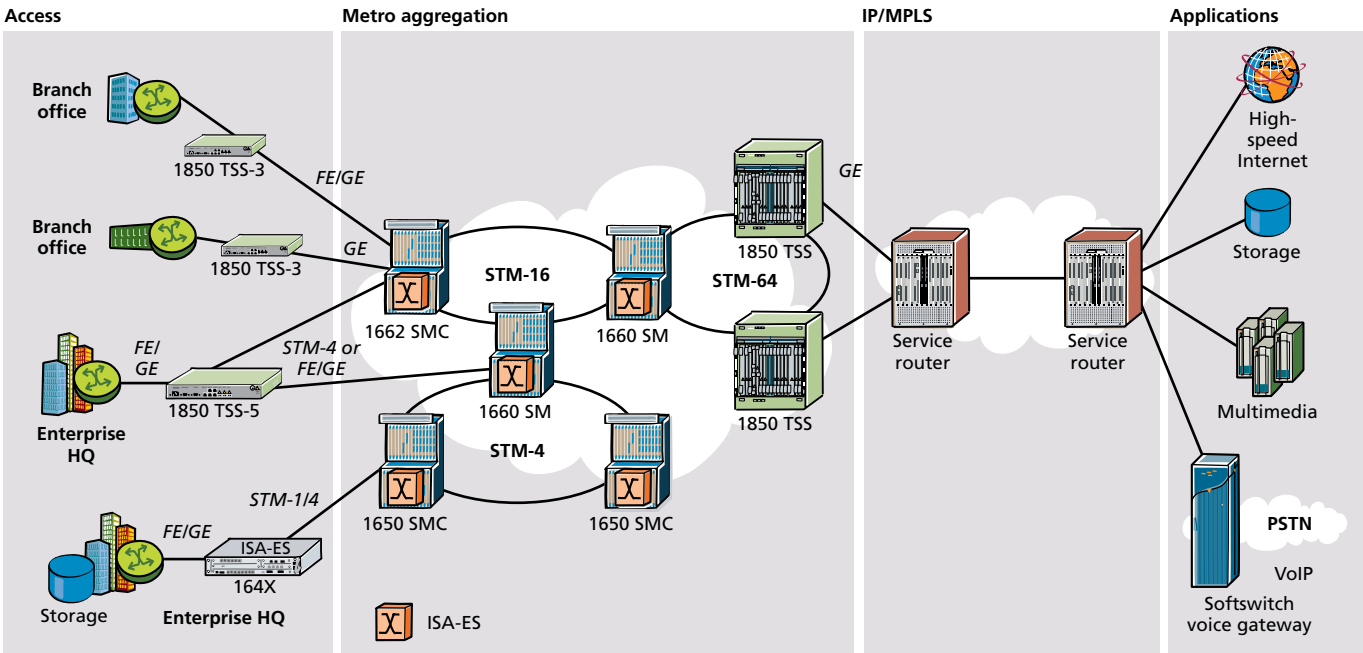
Today flexibility also means the ability to support broadband data services and multimedia applications in the network. The Alcatel-Lucent OMSN products offer service providers the ability to deliver several different types of multiprotocol services for the best balance between new broadband data services and high-margin traditional-voice and leased-line services.

Alcatel-Lucent OMSN products, equipped with ISA plug-in blades that perform Ethernet, ATM or video switching functions, enable new network applications such as 3G mobile aggregation, VPLS and triple play services, with strict QoS and SLA controls. The extensive range of ISA packet-based engines allows operators and service providers to cope with current and future broadband traffic needs over transport networks by enabling multiple-layer convergence in a single node. ISA plug-ins can be placed in new or previously installed Alcatel-Lucent OMSN devices when and where needed. These blades improve bandwidth management and reduce both transport infrastructure costs and time-to-market for introducing new broadband data services in the network, ultimately reducing both capital expenditures (CAPEX) and operating expenditures (OPEX).

## Ethernet VPNs and triple play services

The growth, penetration and profitability potential of carrier-class Ethernet services are deeply significant to service providers offering metro and wide-area Ethernet services over an extensive variety of technologies.

**Figure 2. Revenue-generating Ethernet VPN Services**



When the ubiquity of the optical-network platforms deployed today is considered, optical technologies represent one of the most compelling opportunities for service providers to leverage their installed base and deliver new revenue-generating services (see Figure 2).

Alcatel-Lucent OMSN products can be deployed with traditional MSPPs from the Alcatel-Lucent portfolio and emerging packet optical transport devices in the Alcatel-Lucent 1850 Transport Service Switch (TSS) portfolio.

ISA-Ethernet Switch (ISA-ES) modules enable new, highly-available Layer 2 Ethernet service delivery in the metro network through their MPLS-enabled Ethernet.

With the ISA-ES equipped Alcatel-Lucent OMSN nodes, service providers can enhance their service offerings with Metro Ethernet Forum (MEF)-certified Ethernet services for business and residential customers.

## QoS for Ethernet

As well as mapping Ethernet customer flows onto SDH network resources through standardized mechanisms, the ISA-ES series cards introduce wire-speed classification, policing and scheduling capabilities on a carrier-class Ethernet switching blade. These capabilities provide a cost-effective solution for building multiservice aggregation infrastructures that are scalable, reliable and capable of per-service SLA/QoS support with:

- Scalable service delivery based on virtual local area network (VLAN), Q-in-Q or MPLS technologies, extended by efficient SDH bandwidth-management capabilities
- Sub-50 ms service resilience based on SDH
- Per-flow and per-service SLA guarantees offer accurate bandwidth profiles according to different customers' applications, to create a measurable, differentiated Ethernet service portfolio and increase service profitability by ensuring QoS-specified Ethernet service delivery in any network condition, including faults and congestion.

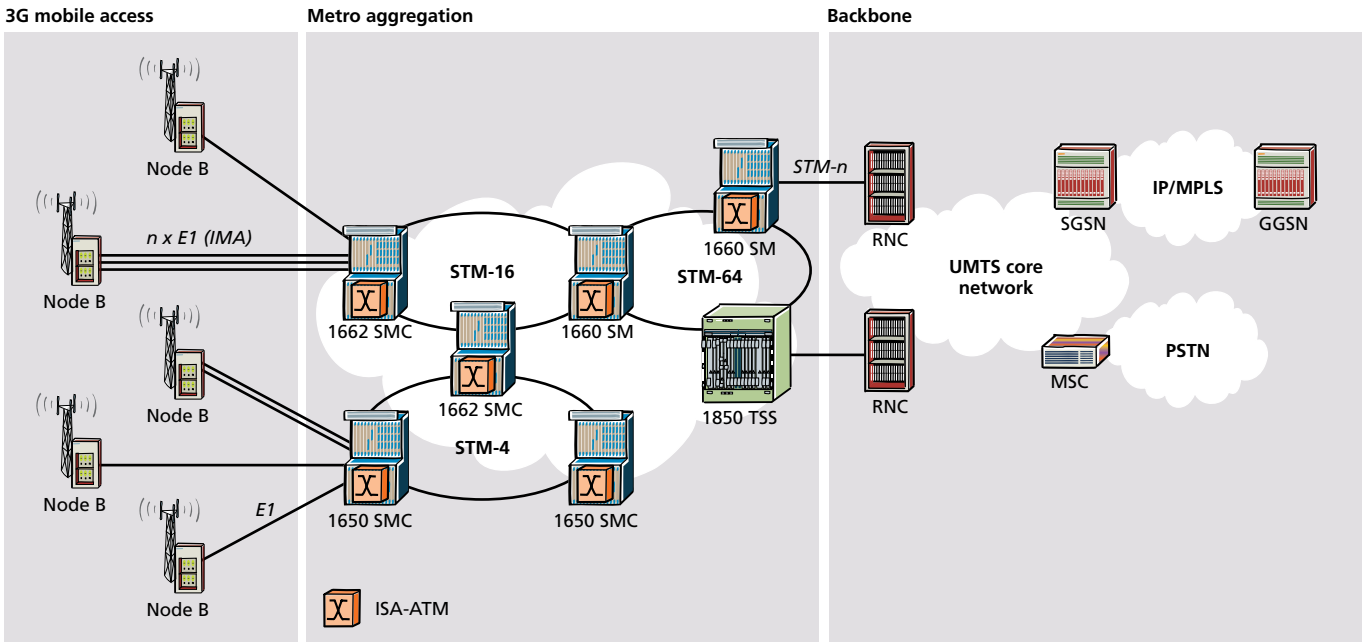
The ISA-ES blades allow service providers to deliver more than just Ethernet connectivity service over the optical metro infrastructure. These modules enable service providers to climb up the value chain and offer the new revenue-generating services that both business and residential users are demanding.

## ATM backhauling and 3G mobile aggregation

Broadband-data applications require transport-network architectures capable of processing data traffic flows at native level. The 3G mobile-aggregation application is a key example of how service providers can benefit from the ATM switching integrated into the Alcatel-Lucent OMSN products (see Figure 3).

The multiservice capability of the Alcatel-Lucent OMSN nodes equipped with the ISA-ATM blades offers mobile service providers a cost-effective solution for 3G mobile aggregation in the UMTS terrestrial radio access network. ISA-ATM switching blades can consolidate ATM traffic collected from different Node B access devices onto shared SDH virtual container (VC) resources in STM-n rings, and switch the ATM traffic into the network with QoS support for all traffic classes. Traffic-policing, shaping and congestion-control management features allow a complete range of ATM traffic contracts. For increased service manageability, ATM OA&M capabilities provide end-to-end fault management and performance monitoring.

**Figure 3. Cost-effective 3G mobile aggregation**



## Video broadcasting

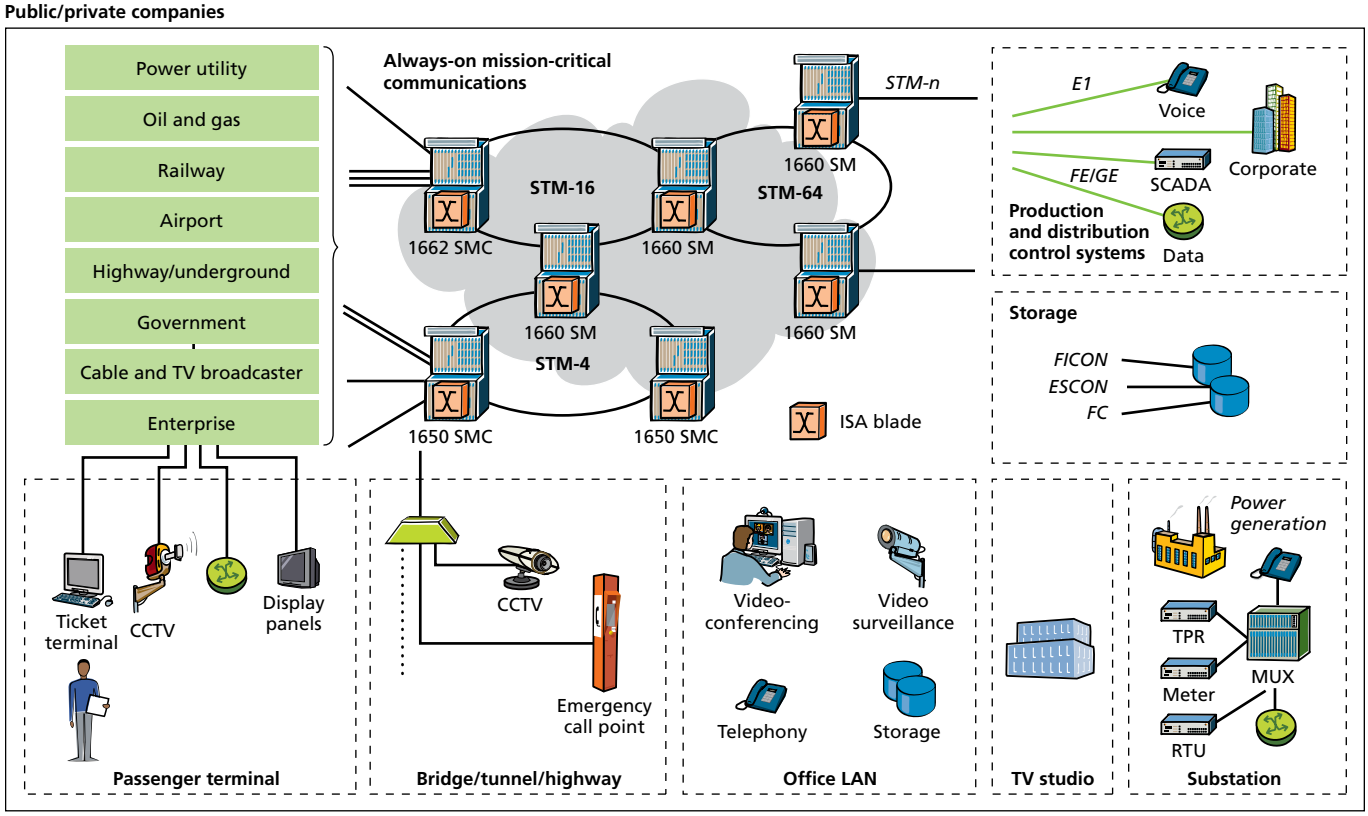
Using the Digital Video Broadcasting-Asynchronous Serial Interface (DVB-ASI) blade, the Alcatel-Lucent OMSN products enable broadcasting companies to transport DVB-compliant signals over the same unique, reliable optical infrastructure. In the past, video transmission across wide metropolitan areas required a costly overlay network separate from voice and data networks due to a lack of digital-video interface standards designed for WAN transport. The deployment of the DVB-ASI, together with the packet-adaptation capability offered by the frame mapped generic frame procedure (GFP-F), allow packet-based transmission of compressed video signals, including DVB-S, DVB-H, DVB-T and DVB-C over the Alcatel-Lucent OMSN product family (see Figure 4).

## Storage area networks

Enterprises worldwide rely on complex information-technology computer structures to store and maintain their mission-critical data and applications. In this scenario, storage area networks (SANs) are the telecommunications industry's solution for improving the availability, resiliency, performance, modularity and geographical distribution of storage systems, offering corporations superior capacity and connectivity for their vital information systems.

The Alcatel-Lucent 1660 SM and Alcatel-Lucent 1662 SMC address SAN applications in metro environments. Their wavelength division multiplexing (WDM) features, together with the native interfacing capabilities of the 4 x any modules for specific storage applications, including ESCON, FICON and FC, make them a flexible solution for interconnecting local networks to a centralized storage network, reducing the data-management costs.

**Figure 4. Alcatel-Lucent OMSN reliably supports mission-critical communications**



## Reliable, carrier-class product family

Their resiliency features also make the Alcatel-Lucent OMSN products ideal for a multiservice transport-node solution. In terms of hardware, maximum reliability is achieved by a 1 + 1 hot standby protection mechanism for all common parts and electrical tributary ports. Matrix, control and synchronization functions are duplicated. Power-supply protection is inherent, because the DC/DC conversion function is distributed on each card.

For traffic protection, single and dual-ended linear multiplex section protection (MSP) and Subnetwork Connection Protocol (SNCP) protection, with the drop-and-continue function, are provided for improved traffic availability. The Alcatel-Lucent 1660 SM and Alcatel-Lucent 1662 SMC also support up to 2 x 2 fiber STM-64 or STM-16 multiplex section-shared protection rings (MSPRINGs) respectively. Collapsed single- and dual-node interconnections support cost-effective closure and interconnection of multiple rings.

The Alcatel-Lucent OMSN family consolidates the extensive experience gathered by Alcatel-Lucent in optical networks through hundreds of thousands of installations worldwide.

## Improving operations

The Alcatel-Lucent 1660 SM, Alcatel-Lucent 1662 SMC and Alcatel-Lucent 1650 SMC share most of their replaceable units, including common parts and traffic cards. This flexibility allows carriers to minimize the impact of spare holding and personnel training, immediately reducing investments and network-operation costs. Moreover, the absence of processors on most traffic boards allows reuse of available in-stock cards and ensures quick and easy in-service upgrades.

### Benefits

- Offers maximum service availability, supporting zero-latency services from access to backbone in any mixture
- Streamlines operations and significantly improves CAPEX and OPEX, without affecting existing services
- Avoids specific overlay data networks for metro broadband aggregation
- Creates new revenues from current and future competitive data services
- Improves bandwidth use, providing space for more revenue-generating services

## End-to-end service manageability

The Alcatel-Lucent OMSN products are managed end-to-end by the proven, carrier-class Alcatel-Lucent 1350 Optical Management System (OMS). The Alcatel-Lucent 1350 OMS manages both the transport and packet functions featured in the Alcatel-Lucent 1660 SM, Alcatel-Lucent 1662 SMC and Alcatel-Lucent 1650 SMC, including service provisioning, monitoring and troubleshooting, from fixed-QoS TDM services to differentiated-QoS Ethernet VPN and triple play services.

## Recognized world leader in optical networking

Alcatel-Lucent delivers end-to-end communications solutions to service providers and enterprises anywhere in the world. Leveraging its network equipment as well as services, Alcatel-Lucent facilitates its customers' service offerings and revenue streams. As the recognized world leader in optical networking, Alcatel-Lucent is in a unique position to help service providers navigate through current market conditions. Alcatel-Lucent, with its global reach and scale, combined with local presence in over 130 countries, makes use of a deep understanding of global market dynamics, as well as the ability to anticipate local requirements. Visit us at *www.Alcatel-Lucent.com*.

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