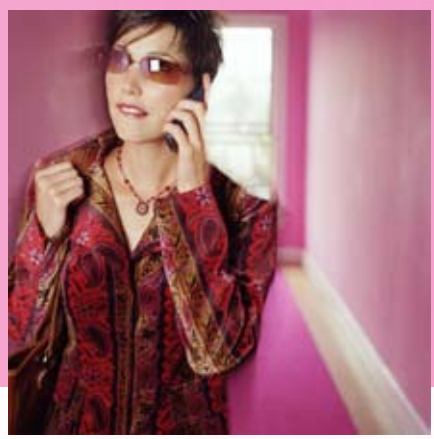
Alcatel-Lucent 1850 TSS-100

Transport Service Switch

The Alcatel-Lucent 1850 Transport Service Switch (TSS)-100, a new class of multiservice transport platform for metro-core and regional applications, supports any mix of traffic, from all-circuit to all-packet. This universal switch uniquely addresses the transition from TDM/circuit to packet transport, eliminating the problems encountered when traditional platforms face data-traffic increases. The functional versatility of the 1850 TSS-100 allows operators to support current network demands, while positioning their infrastructure for the future growth in advanced service delivery and traffic.



Transforming transport networks

To stay profitable, operators must focus on new revenue-generating services while carefully controlling their cost structures. At the same time, new bandwidth-hungry services, such as triple play and Ethernet virtual private networks (VPNs), are redefining the underlying transport-infrastructure requirements. These changes are driving the move from circuit-based transport, using TDM, to packet-based transport, using Ethernet in MANs and WANs.

Driven by end-user demand for new services, operator network capacity is growing rapidly, with these networks transporting a wide variety of traffic. Operators all need to assess how their existing metro and core networks will accommodate trends and transitions in traffic patterns.

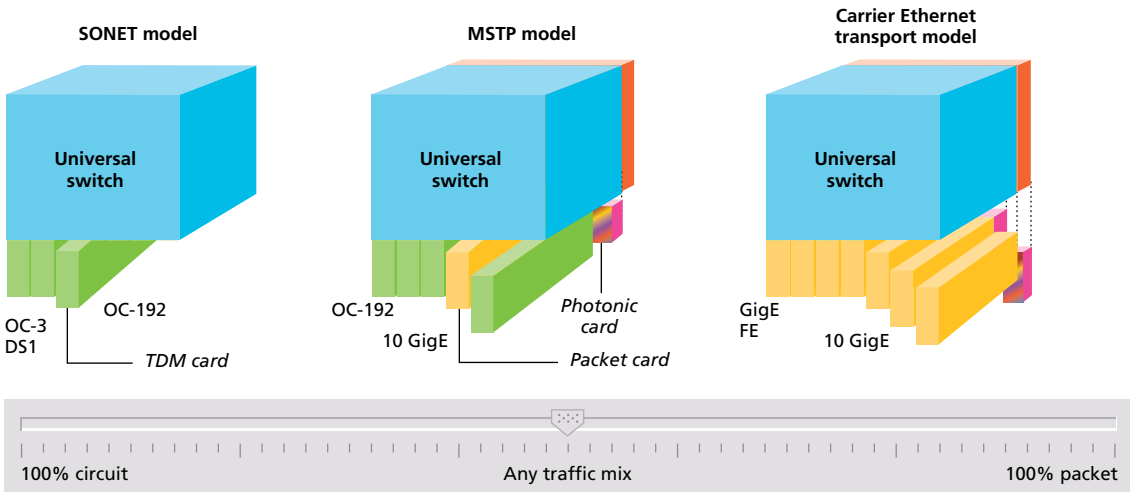
The new-services introduction is probably the most critical factor to an operator's success. The increasing demand for bandwidth to deliver new services is not reflected in comparable increases in revenue, presenting a significant business challenge. The Alcatel-Lucent 1850 TSS-100 helps operators maximize their profitability by transporting any service mix while keeping tight control on costs.

Multitechnology support with the 1850 TSS-100

The 1850 TSS-100 is a multiservice transport platform that supports any mix of traffic, from all-circuit to all-packet. Its unique, technology-independent universal matrix switches packets or circuits in their native format and transports them as they are, optimizing overall network efficiency and applicability. This capability allows operators to address transitioning from TDM/circuit-based transport to packet transport with the flexible provisioning of carrier Ethernet/transport, SONET, wavelength division multiplexing (WDM) and optical transport networks (OTNs).

The 1850 TSS-100 supports current and future traffic requirements by eliminating the scalability issues encountered by traditional multiservice provisioning platform (MSPP)/multiservice transport platform (MSTP) solutions. The 1850 TSS-100 is the ideal building block for evolving transport networks, allowing operators to flexibly split increasing traffic demands among any combination of carrier transport technologies. See Figure 1.

Figure 1. Potential mix of carrier transport technologies



The universal switch

The Alcatel-Lucent 1850 TSS-100 offers operators a powerful tool for operating future-safe transport networks, with total freedom in planning network resources to support the delivery of new broadband applications such as triple play, video, mobile and Ethernet business services. It also ensures seamless interworking with the legacy transport assets that support existing revenues, while fully addressing the optical-packet transport convergence, as demanded by operators. This offers the following advantages:

- Supports any mix of Ethernet, TDM, WDM, OTN and future services with only a simple change of interface cards, eliminating the need for future switch investments as new services or protocols emerge.
- Offers a technology-independent universal switch, capable of switching packets or circuits in their native format and transporting them as they are, without costly mapping of circuits into packets or packets into circuits. The universal switch provides scalable switching capacity regardless of the traffic type.
- Delivers technology-dependent line cards, packet, circuit or wavelength, where traffic is properly processed according to its native format. The line cards provide native traffic processing.
- Eliminates, by innovatively demarking between traffic processing and traffic switching, the cost penalties traditional transport-node architectures incur with their technology-dependent processing performed in the switch (matrix). Packet and TDM traffic processing resides on the relevant line cards, allowing gradual investment to meet growing traffic requirements.

The concept of a single transport-aggregation platform is a breakthrough in operator networking. Instead of investing in several network layers to provide the required service mix, operators can now choose one platform that delivers all services. By deploying the 1850 TSS-100 as a unified transport platform supporting any mix of services, operators can:

- Simplify network operations, significantly reducing operating expenditures (OPEX) and increasing the network flexibility and scalability
- Lower the risk of capital expenditures (CAPEX) investments that may vary over time, depending on service-demand changes
- Shorten time-to-revenue for new services

Migrating to a packet transport network

Leveraging its universal, open architecture, the 1850 TSS-100 allows operators to migrate their transport networks from all-circuit to all-packet. It integrates a full set of SONET features to support traditional transport-network architectures and to interwork with a large, existing installed base of equipment.

In addition, the platform supports transport packet switching, such as packet Operations, Administration, Maintenance and Provisioning (OAM&P), and integrated G.709 Optical Transport Hierarchy (OTH) trunk cards. The 1850 TSS-100 provides a cost-effective solution for implementing resilient metro and aggregation networks. This solution uniquely transitions from TDM/circuit to packet transport by smoothly migrating toward the delivery of packet-based services, maximizing return on investment over the network lifecycle.

The 1850 TSS offers Fast Ethernet (FE) and Gigabit Ethernet (GigE) interfaces for interconnecting with customer equipment or operator access equipment, delivering carrier-class circuit and packet services. It also supports stacked unidirectional path-switched rings (UPSRs) and bidirectional line-switched rings (BLSRs), with non-blocking aggregation and TDM traffic switching, or Layer 2 Switched Ethernet. These features offer cost-effective solutions for implementing resilient metro and aggregation networks and switched Ethernet-to-Ethernet.

Combining circuit and packet interfaces and using Ethernet-based traffic management, the 1850 TSS-100 supports multiple Quality of Service (QoS) levels to provide a migration path toward the delivery of advanced packet-based services. It also ensures a smooth network evolution by enabling hybrid networks with totally flexible resource allocation between circuit and packet data services while fulfilling the roles of traditional MSPP/MSTP platforms.

Offering user-centric broadband services

The 1850 TSS-100 universal-transport platform allows for next generation services:

- *Ethernet business services* – Ethernet-line (E-line) and Ethernet-LAN (E-LAN)
- *Triple play* – large-scale Ethernet aggregation
- *Mobile backhaul* – Ethernet and TDM native support for mobile second-generation mobile system/third-generation mobile system/Worldwide Interoperability for Microwave Access (2G/ 3G/WiMAX)
- *Carrier-to-carrier services* – packet/TDM/lambda (λ)
- *Mission-critical services* – Government, research, TV broadcasters, energy, utilities and transportation

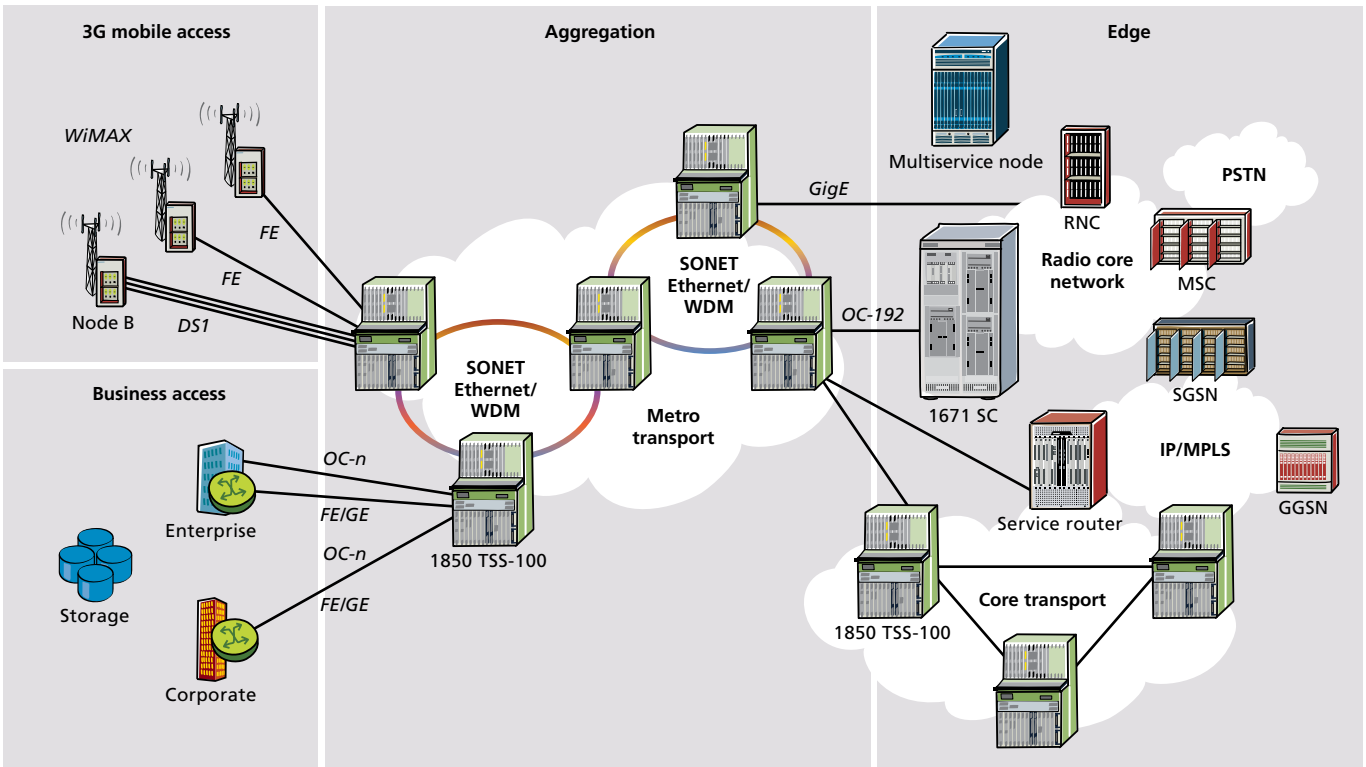
Triple play over optical

Introducing triple-play services establishes new broadband-aggregation infrastructure requirements for both scalability and the speed of service rollout. To meet these goals, many operators are introducing Ethernet into their broadband-access infrastructures. This allows network operators to progressively integrate their triple-play services into a unified and homogeneous environment.

The 1850 TSS-100 can efficiently provide distributed broadband service aggregation and transport toward the broadband service routers. It is a unified transport platform, offering flexible support when transitioning from legacy transport to Ethernet. The unified aggregation platform supports any multiservice business model and protects infrastructure investments.

When distributing video, it is important to broadcast these services from the last possible point in the network to avoid duplicating service costs inside the network. With a dedicated Ethernet network or a multiservice network, the multicast can be done efficiently at either the TDM or Ethernet level. The 1850 TSS-100 can use a combination of distributed Layer 2 and TDM Switching, depending on the option that suits the provider's requirements and minimizes costs (see Figure 2).

Figure 2. Triple play over optical



Supporting business services

Enterprises are increasing their use of high-bandwidth applications and they are more frequently interconnecting LANs and data centers within a metro area. To address this market, operators need scalable, carrier-class solutions that offer operators guaranteed QoS levels, support for differentiated SLAs and customer separation. Operators can build either dedicated Ethernet networks or multiservice networks able to provide other services through the same networking platform. The 1850 TSS-100 supports both of these models.

Wireless network traffic is increasing significantly with growth in subscriber usage and the introduction of new, wireless data services, such as video telephony, music, Internet surfing and live television, along with video-on-demand (VoD). Price-based competition makes profitable growth a challenge. Nevertheless, operators are forced to invest in new infrastructure to serve their customers' needs. Should they expand with TDM technology for more capacity now and worry about strategically evolving to 3G and all-IP later, or can they expand innovatively, making the network better now, while anticipating future requirements?

The 1850 TSS-100 helps operators introduce new business services, either by leveraging the installed base, or by introducing a single platform to replace multiple traditional systems. In both instances, providing a fully flexible and reliable transport platform that meets today's growth requirements for both Ethernet- and TDM-based traffic opens the door for a strategic move toward an IP-based infrastructure.

Network management

Operators need to focus on the service, rather than the technology, where it is used, how the network scales and how complex it is. By migrating from a technology-based network management model to a service-oriented one, the complexity of managing services is greatly reduced. Alcatel-Lucent offers two management platforms for operators, depending on their network requirements and planned evolution: the Alcatel-Lucent 1350 Open Media Suite (OMS) and the Alcatel-Lucent 1340 Integrated Network Controller (INC).

The 1350 OMS management suite eliminates the need to deploy multitechnology element and network management systems, reducing CAPEX and OPEX. It offers a highly modular architecture to properly match operator requirements. It also:

- Simplifies presentation of a multitechnology network to the user
- Delivers future-safe, scalable platform that can be extended as the network and its services grow
- Offers single point-of-alarm collection, with all network management information available on a single platform with a single login procedure

The 1340 INC is a leading-edge, single-platform network management system for both Alcatel-Lucent transport networks and multivendor environments. Capable of supporting next-generation and legacy equipment, the 1340 INC makes the transport network transparent to operators through a simplified view from a single Graphical User Interface (GUI). It also:

- Provides end-to-end circuit, fault and performance management
- Extensively reports data, including card inventory, usage, utilization and historical reports
- Simplifies operations with a single GUI for SONET, Ethernet, MSPP, ATM/Frame Relay, data circuit synchronous (DCS) and optical devices

Versatility and scalability

Support current network demands, while positioning your infrastructure for future growth and advanced service delivery. The 1850 TSS-100 facilitates the transport of packets and circuits, as well as multiservice aggregation to optimize network efficiency and eliminate inefficient mapping. A powerful cross-layer network management simplifies operations and reduces the total cost of ownership. Allowing flexible provisioning of Ethernet/MPLS, SONET/SDH and dense wavelength division multiplexing (DWDM)/OTN, the 1850 TSS-100 avoids the blocking problems encountered by traditional MSPP/MSTP solutions.

Recognized world leader in optical networking

Alcatel-Lucent delivers end-to-end communications solutions to operators, 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 operators and 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.