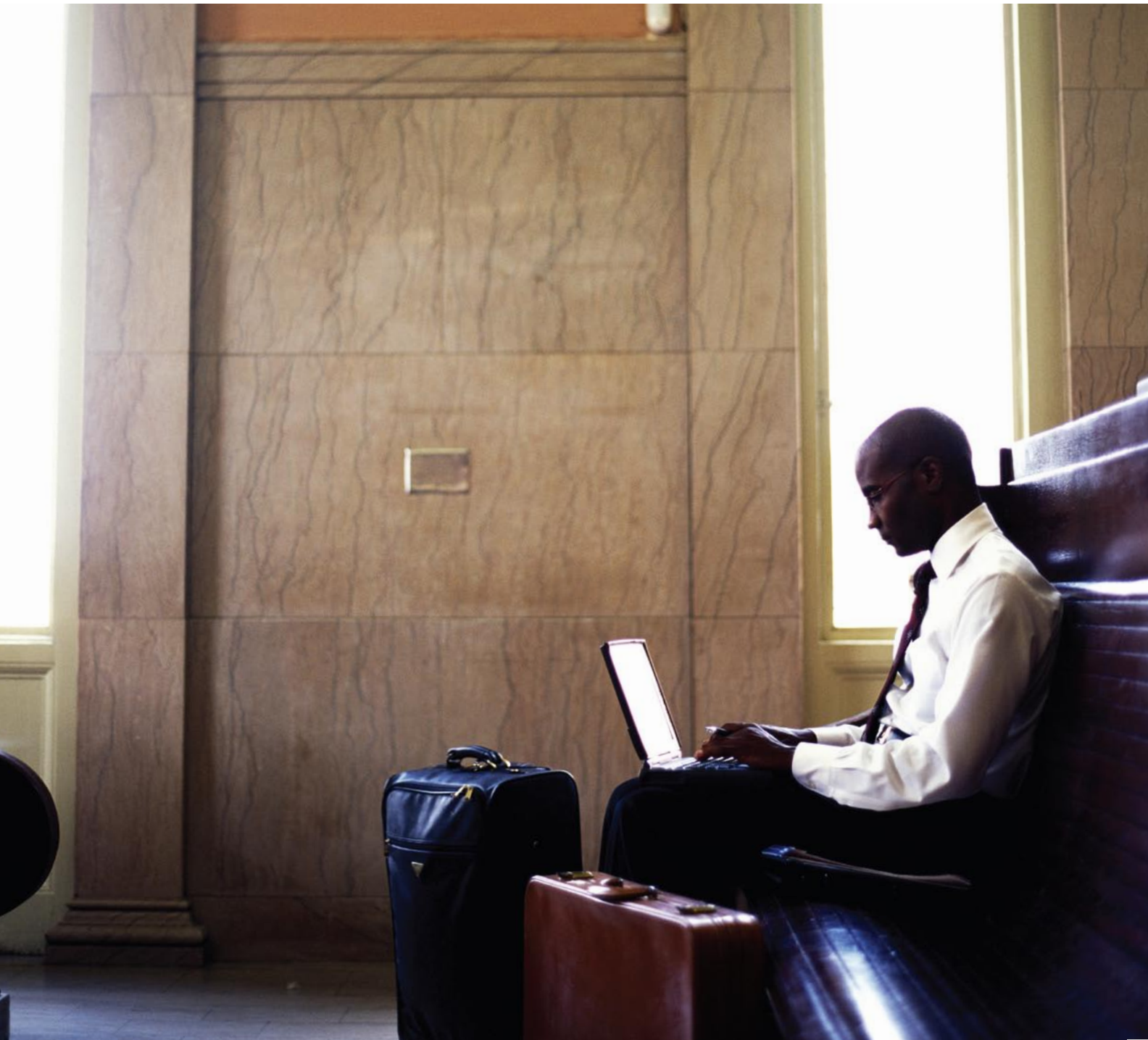# Alcatel-Lucent
1850 TSS-3
Transport Service Switch

A versatile network termination unit

The Alcatel-Lucent 1850 Transport Service Switch (TSS-3) is a carrier-grade network termination unit (NTU). Providing a rich mix of connectivity and network services options, it is available in a one-rack unit size, mountable in a wall, rack, cabinet or table-top setting. Customer-side Ethernet or Gigabit Ethernet (GigE) interfaces can be aggregated and transported through copper or fiber using native Ethernet or Ethernet over Plesiochronous Digital Hierarchy (PDH). With its rich management and QoS features, the Alcatel-Lucent 1850 TSS-3 forms a strong foundation for offering end-to-end Ethernet services.

Key benefits

- Off-the-shelf, optimized configurations
- Transmits Ethernet over any physical uplink
- Fast rollout of carrier Ethernet services
- An end-to-end, feature-rich solution
- Intelligent Ethernet service demarcation
- Leading-edge services over Ethernet

Versatility, to meet customer needs

Customers are using IP-based applications and services at an ever-increasing rate, compelling service providers to converge network infrastructure into an integrated framework capable of supporting very high bandwidth, packet-based services. This infrastructure must also be capable of broaching the first and last mile.

The Alcatel-Lucent 1850 TSS-3 meets this need by offering Ethernet access using fiber or copper. The 1850 TSS-3 is a member of the Alcatel-Lucent 1850 Transport Service Switch portfolio, a family of products that is helping businesses move gradually from an all-circuit environment to an all-packet environment, in incremental and affordable steps.

With worldwide appeal, the 1850 TSS-3 is a future-safe, carrier-class Ethernet switch and NTU. The device's versatility is demonstrated by its network-side capability of transporting first and last mile (or further) aggregated traffic using fiber or copper.

Alternatively, the 1850 TSS-3 can be configured as a connection between the customer-side LAN and the service-provider WAN, offering rate-limiting and other cost-optimizing functionalities. The use of small form-factor pluggable (SFP) modules for fiber connections offers cost-effective and scalable functionality common to the entire 1850 TSS family.

Multiple applications

Potential applications for the 1850 TSS-3 include:
- Ethernet demarcation
- Ethernet service aggregation
- Ethernet over PDH (EoPDH)
- Ethernet extension

In Figure 1, the 1850 TSS-3 is in the Ethernet-demarcation role, with the demarcation point shown as a dotted line, representing the point where traffic crosses from the customer-owned equipment to the service-provider-owned customer premises equipment (CPE). At the demarcation point, the 1850 TSS-3 accepts the traffic stream on the customer side and transports this traffic to one or more network elements in a carrier Ethernet network. This application offers fault diagnostics and monitoring, traffic rate limiting and virtual LAN (VLAN) stacking (capability of offering multiple, discrete VLANs over a single connection).

Figure 1. Ethernet demarcation

WDM – Wavelength Division Multiplexing
MSPP – Multiservice Provisioning Platform
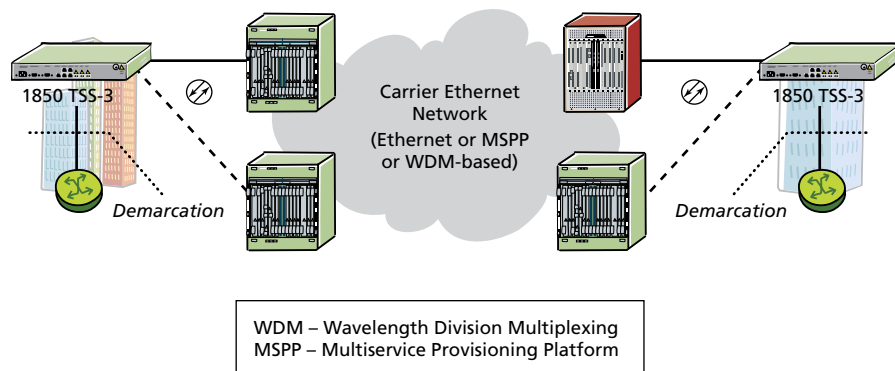
In Figure 2, the 1850 TSS-3 is in an Ethernet service-aggregation configuration, in this case acting as a carrier-class Ethernet switch, accepting multiple inputs from the customer side and aggregating them for onward transmission on the network side. Network-side redundancy can be provided by Rapid Spanning Tree Protocol or Ethernet dual homing, two methods for providing automatic backup paths.

Figure 2. Ethernet service aggregation
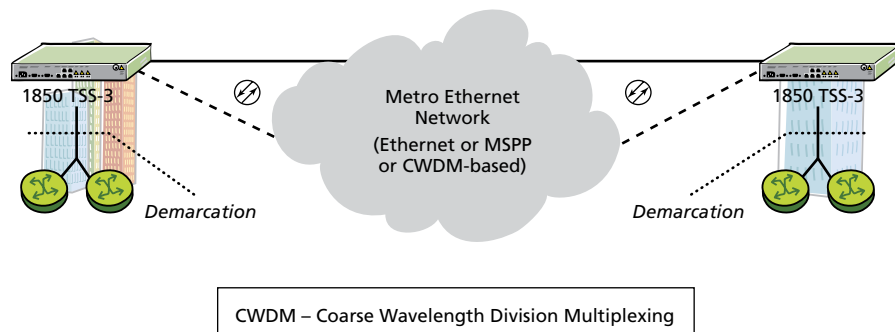

CWDM – Coarse Wavelength Division Multiplexing

Figure 3 shows the 1850 TSS-3 in an EoPDH configuration, installed with CPE in a standard building or at a cellular tower. In each case, there is a pre-existing copper connection capable of carrying an E1/DS1 channel or an E3/DS3 channel connected to a legacy synchronous optical network (SONET)/SDH network.

By inserting the 1850 TSS-3 into the copper connection, EoPDH is established. Ethernet packets are mapped to the PDH lines using a standards-compliant mapping mechanism, VCAT/GFP, with redundancy provided by PDH 1+1 protection. If several E1/DS1 or E3/DS3 lines are available, they can be bonded together to create a higher-bandwidth uplink.

Figure 3. Ethernet over PDH
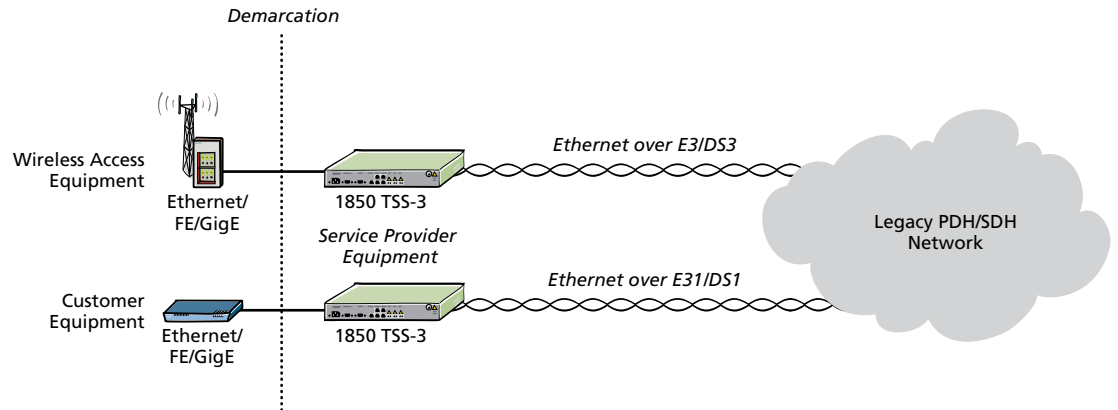
In Figure 4, the 1850 TSS-3 is in the Ethernet extension configuration. In this configuration, electrically-based FE or GigE is converted to optical Ethernet for transmission over longer distances than are possible with copper lines. Transmission complies with the Ethernet in the first mile (EFM) standard, bringing the service provider's Ethernet domain right up to the customer's building or cell site.

Figure 4. Ethernet extension
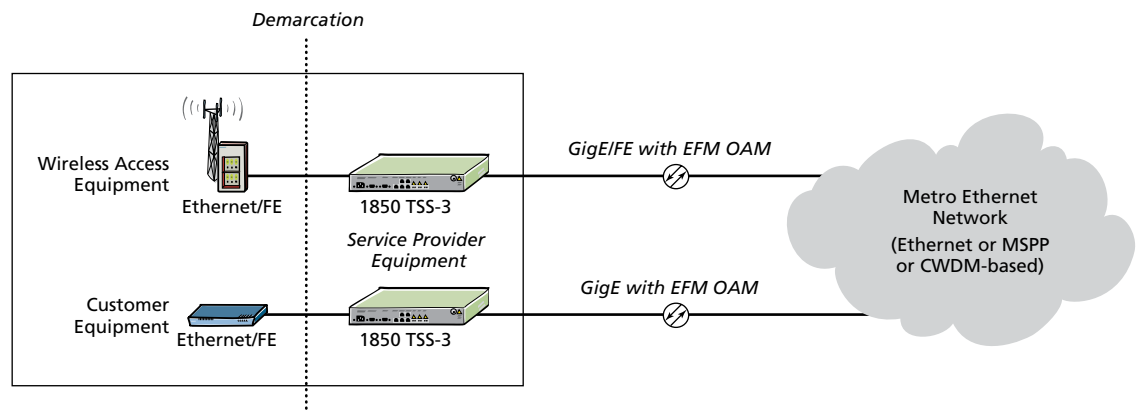
Ethernet service management

The 1850 TSS-3 goes beyond simple media conversion and physical presence, providing a rich mix of connectivity and network services, offering diagnostics, service monitoring, protection, quality of service (QoS), rate limiting and VLAN stacking for Metro Ethernet Forum (MEF)-compliant Ethernet services.

Available in a number of standard configurations, the 1850 TSS-3 offers a flexible mix of copper and optical Ethernet on the customer side, and supports optical Ethernet and EoPDH on the network side.

In addition, the 1850 TSS-3 supports wire-speed Ethernet switching, network redundancy on Ethernet and PDH uplinks, and standards-based operations, administration and maintenance (OAM). Hardware-based Ethernet OAM provides precise QoS measurements for superior SLA support.

With multiple off-the-shelf configurations and applications, the Alcatel-Lucent 1850 TSS-3 offers new-service revenue streams at a very competitive price. It comes with rich functionality, including discovery and auto-negotiation of OAM, link monitoring and remote fault indication.

The 1850 TSS-3 acts as a fully non-blocking Ethernet switch, including rate-control and control-protocol processing rules. It also offers Ethernet QoS, as defined by the service provider, at the CPE demarcation point. Service differentiation becomes possible and time-sensitive traffic is given precedence. Finally, a variety of redundancy schemes are available, depending upon the application chosen. All this makes the Alcatel-Lucent 1850 TSS-3 a leading CPE device.

Key features

- Versatile mix of Fast Ethernet (FE) and GigE interfaces
- Available Ethernet over PDH (EoPDH) network interfaces
- Traffic classification, rate control and prioritization
- VLAN tagging and stacking
- Uplink redundancy
- Hardware-based Ethernet service OAM (ITU-T Y.1731)
- Ethernet in the First Mile (EFM, IEEE 802.3ah) and Connectivity Fault Management (CFM, IEEE 802.1ag)
- Compact, standalone or rack mounted
- Standard configurations simplify deployment

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 networks 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, leverages a deep understanding of global market dynamics, as well as the ability to anticipate local requirements.