Alcatel 1677 SONET Link
Next-Generation SONET Multiservice Platform
Today’s service providers are faced with a critical dilemma: How do they continue to support today’s revenue generating services, while evolving their network to support the high-speed data services of tomorrow?
Over the last decade, carriers have relied on synchronous optical network (SONET) as the foundation for support of their customers’ voice and data needs in their transport network. These carriers have invested billions of dollars in SONET network equipment, operations systems and personnel, and have aligned their business models around a SONET-based infrastructure. With the projected growth in traditional services continuing to increase, carriers must continue to deploy SONET equipment to keep pace with demand.

Pressure for revenue growth is also accelerating the demand for high-speed data offerings in many metropolitan and regional areas. Service providers need to find a solution that allows them to rapidly deploy new services—without requiring drastic changes to their network, operations, or business models.

SONET is clearly the only technology that can realistically meet the immediate needs of these carriers. However, expanding its role to economically support future service demands requires a solution that breaks through the barriers to next-generation SONET.

The Alcatel 1677 SONET Link breaks through barriers, while providing a cost-effective solution to maximize revenue from metropolitan and regional networks. The Alcatel 1677 SONET Link next-generation SONET system solves carriers’ critical issues by allowing them to scale their existing networks to meet traditional service offerings and emerging broadband services. It provides an ideal solution as it combines the functions of legacy SONET add/drop multiplexers (ADMs), the bandwidth grooming capability of wideband and broadband digital cross-connects (DCS), and the optical fiber sharing of dense wavelength division multiplexing (DWDM), while offering much greater port densities at an affordable price.
# ALCATEL 1677 SONET LINK

## FEATURES AND BENEFITS

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| Extreme scalability: wide interface range and capacity | > Supports interfaces from DS3 to OC-192, allowing a wide range of applications from a single platform  
> Terminates hundreds of rings with one network element |
| Superior port density            | > Maximizes revenue return per inch of office space                       |
| Grooming                         | > The Alcatel 1677 SONET Link consolidates underutilized trunks into full pipes for efficient transport  
> Modular design allows for optimal grooming based on application: STS, VT1.5, Transmux, or all where needed |
| Operations and Integration       | > Provides network element consolidation  
> Open architecture for integration into any OSS  
> Managed by industry standard interfaces |
| Profitability                    | > Multi-ring architecture reduces physical space requirements  
> Offers highest transport profit potential per equipment rack |
Scalability up to OC-768 with Very High Port Densities

Today's SONET equipment makes it very difficult for carriers to scale their networks to meet the ever-changing demands for increased capacity and new high bandwidth services. Upgrading the capacity of a traditional SONET ring is a very time consuming and expensive process, often requiring the carrier to replace hundreds of thousands of dollars worth of equipment. Deploying new rings is even more complex and difficult to manage, as it requires even further investment in additional central office equipment to terminate the ring and switch traffic throughout the network.

As a next-generation SONET solution, the Alcatel 1677 SONET Link eliminates scaling limitation issues and additional ring upgrade complexity. The Alcatel 1677 SONET Link provides the infrastructure for future expansion as bandwidth needs grow within metropolitan and regional networks. The ability to grow the network with an installed base of equipment provides carriers with a rapid return on their investment and saves operational and engineering expenses. Key functionality, like OC-192, allows for service providers to be ahead of their competition in rolling out next-generation services.

As a new service offering is created, service providers can increase support for hundreds of subtended rings from the same network element, and from a variety of interfaces, to support the myriad of offerings that they want to provide. Today, the Alcatel 1677 SONET Link can provide high-speed service capability, including OC-192 and Gigabit Ethernet with equipment that is ready for future expansion to OC-768 and 10 Gigabit Ethernet, enabling customers to offer a variety of services from low speed to light speed.
Grooming

The need to efficiently manage bandwidth and network resources is a critical requirement for today’s carriers. As large metropolitan and regional networks evolve to support hundreds of rings and terabytes of capacity within a region, it is imperative that carriers have the power and flexibility to switch and groom end-customer services in the most efficient way possible.

It is economically important to be able to take underutilized feeds and combine them into a small capacity trunk to realize return on investment.

The Alcatel 1677 SONET Link is able to groom traffic by taking circuits from multiple interfaces and switching them onto one pipe for transport across the network. The Alcatel 1677 SONET Link supports STS-1 grooming in order to make the most efficient use of the carrier’s network infrastructure. Additionally, an optional modular VT1.5 switching capability provides fine-grain bandwidth management. Also available is a trans-multiplexing card to allow for full-featured wideband grooming within a modest sized, single platform. Carriers may deploy this capability as needed, providing enhanced grooming efficiency. The Alcatel 1677 SONET Link is the only product on the market that combines this level of grooming capability with an STS-1 switching fabric that scales beyond 320 Gbps per system.

Operations and Integration

Over the last decade, the relative cost of operating and managing a network has quickly outgrown the cost of the network elements themselves. As carriers roll out new network equipment, it is an absolute necessity that this equipment be integrated into a service provider’s back office environment under their operational support systems (OSS) that provide provisioning, monitoring, and management of multiple vendors network elements. It is important that the network management architecture provide
standard open interfaces to allow other third party vendors to pick up support for the product to provide comprehensive management, like end-to-end provisioning and monitoring across multiple network elements. Carriers simply cannot afford to deploy equipment from vendors that require a proprietary, single vendor network management system.

The Alcatel 1677 SONET Link was designed with the goal of being deployed in a carrier-class environment and included development for open interfaces for the purpose of OSS integration. The 1677 SONET Link supports interworking standards such as OSI/TARP to allow for integration with other vendors’ systems. Upon deployment of the Alcatel 1677 SONET Link, service providers can easily transition to managing a new element and will rapidly roll out services for revenue generation, while keeping their costs static.

Figure 1: Bandwidth grooming with VT SSC card
Profitability

All the capabilities and features in the world are useless in a next-generation system if they do not allow for improved profitability. For a solution to be viable, it must dramatically reduce the provider’s costs, while increasing their service revenues.

The Alcatel 1677 SONET Link provides many operational and capital benefits. For example, the multi-ring feature allows numerous users and circuits to be supported on one network element, eliminating the need for multiple network elements. This reduction in equipment results in immediate savings of capital expenditure and ongoing savings of operational expenses.

In addition to the valuable protection and restoration capabilities of SONET, the 1677 SONET Link offers carriers an opportunity to deliver Gigabit Ethernet services through the TDM network. The 1677’s Gigabit Ethernet interface makes use of leading edge technology that allows for transport of data services over the existing SONET infrastructure. This service allows for new revenue at an extremely attractive deployment cost.

Figure 2: Bandwidth management in rings

> Multiple rings at different rates may be subtended to size network to customer demand
> USPR, BLSR, 1+1 linear supported
The Platform for Next-Generation Service Delivery

SONET is clearly the technology of choice for carriers who need to maintain their existing revenue base from traditional services, but how will it evolve to support the next-generation data services that will be crucial to a carrier’s long term success?

The Alcatel 1677 SONET Link is the first SONET-based optical transmission system that is designed for Gigabit Ethernet and OC-192 with expansion capabilities for 10 Gigabit Ethernet and OC-768 transport.

Alcatel is one of the first vendors to support “virtual concatenation,” an emerging standard that allows carriers to map Ethernet directly onto a SONET network. Virtual concatenation enables carriers to offer low-cost Ethernet services, while maintaining all the benefits of SONET networking and without requiring drastic changes to the network infrastructure or operational systems.

The multi-ring termination and bandwidth grooming capabilities of the Alcatel 1677 SONET Link fit the emerging optical network model that distributes bandwidth management to the edge of the network in contrast to the traditional centralized model.
Positioned for Today and Tomorrow
The Alcatel 1677 SONET Link is a dynamic product that provides a SONET-based infrastructure to support today’s traditional offerings and can be seamlessly assimilated into a service provider’s existing network architecture. In addition, the Alcatel 1677 SONET Link provides the functions needed to deliver next-generation deployment of emerging and profitable end-user services.

Find out how you can deliver a higher level of power and profitability to your metropolitan and regional networks. Call Alcatel today at 1-800-ALCATEL, or visit us on the web at www.alcatel.com, for additional information on this next-generation service delivery platform.