Alcatel 1696 Metro Span
Metropolitan DWDM System
In metropolitan areas, the need for higher bandwidth and value-added services is becoming increasingly critical. Service providers must find flexible and powerful solutions that can adapt to a broad set of customer requirements. By introducing solutions with DWDM technology into metropolitan and enterprise networks, service providers can build a powerful transmission platform, future proof their networks, and create a core-to-edge optical network. The Alcatel 1696 Metro Span is just that type of solution.
The 1696 Metro Span is a versatile metropolitan DWDM platform that supports a broad range of data rates that are easily customized for both non-amplified systems of intra-city networks and amplified systems used in large metropolitan networks. Compact and scalable, the 1696 Metro Span can be installed in variety of environments, from a central office to a basement closet. Its 10.6 inch deep rack is standard and can house a fully equipped 32 protected or 64 unprotected channel high density system.

From an enterprise standpoint, access to such bandwidth will come in the form of demands for as little as a single optical channel. The Alcatel 1696 Metro Span Compact is a smaller version of the 1696 Metro Span for just this type of lower bandwidth site. It can be initially configured with as little as a single channel with room for future growth to as many as eight channels. At only five inches high, the 1696 Metro Span Compact can easily fit into the top of a closet or a standard telecom rack.

Product Features Overview

Provides Optical Protection
> The Alcatel 1696 Metro Span employs unidirectional path-switched ring (UPSR) technology, best suited for today’s robust networks.
> With its 8 x 8 cross point matrix, the 1696 Metro Span gives the network manager the power to configure the best optical protection scheme required.

Flexible and Scalable Architecture
> Designed with a compact and high-density architecture, the Alcatel 1696 Metro Span creates a single, cost effective solution that can accommodate multiple services, traffic levels and data rates.
> The 1696 Metro Span supports up to 32 protected or 64 unprotected channels at 100 Mbps to 10 Gbps.
> Multi-wavelength tunable transponders are standard and help lower the costs associated with spare modules.

Optical Amplification
> With its +17 dBm output, the 1696 Metro Span offers the most advanced optical amplification available today.
Ensures Optimum Performance of Multi-Services

> Using its Universal 3R multi-rate transponder, the 1696 Metro Span handles bit rates from 100 Mbps to 2.5 Gbps.
> The 1696 Metro Span is equipped with a 10 Gbps optical channel transponder.
> With 4 x Any TDM Modules, the Alcatel 1696 Metro Span concentrates up to four low bit rate client signals into one single 2.5 Gbps optical channel, which provides cost-efficient transport for low bit rate traffic by reducing the number of required optical channels.

Performance Monitoring Capabilities

> Housekeeping access is provided in both directions (eight inputs and eight outputs).
> Based on B1 in SONET frames, the 1696 Metro Span is an effective solution for digital performance monitoring.
> The 1696 Metro Span can be equipped with a 1510 nm supervisory channel.
> Operators can remotely setup end-user’s bit rate.
> Bit error rate can be monitored on all transported services.
The Alcatel 1696 Metro Span employs UPSR technology. It provides two independent paths, one westbound and one eastbound for two-fiber ring applications. The 1696 Metro Span uses redundant fiber optic transmission facilities in a pair configuration. One fiber is dedicated to transmitting in one direction, and a second fiber transmits in the other direction. Using this configuration, if a failure occurs on the primary ring, the second ring takes over and the transmission continues on to its destination.

With its 8x8 cross point matrix on the transponders, the network manager can select the protection scheme best suited to match the service requirements of the customer. Each transponder is equipped with an electrical matrix that the network manager can control remotely. The network manager can configure the transponder for O/E/O regeneration, drop and continue, or local or remote loop back. This matrix also provides flexibility to the hub and OADM nodes. The network manager can configure the matrix so that the transponder can add and drop traffic at one node, reconfigure the same transponder to provide a pass through connection, and later move the add and drop capability to another node.
When transmitting over long spans of optical cable, amplification becomes critical. The cable is not always purely transparent and attenuation ensues. Using O/E/O regeneration or modulation to boost the laser beam can limit the bandwidth due to limitations at the electrical stage of amplification.

The 1696 Metro Span provides for a +17 dBm optical output. With this unique feature, the laser beam conversion to an electrical signal is eliminated. Instead, erbium gas, excited by an external energy source, increases the intensity of the laser transmission passing through the amplifier. Therefore, without electrical conversion, bandwidth remains at the super-high optical level before and after amplification.
Deployment flexibility is important for today’s networks, but to avoid obsolescence, scalability of service is also crucial. Providing customers an expanded range of choices gives service providers a needed advantage in the marketplace. That advantage can be reinforced through thoughtful and controlled expansion of the network.

The Alcatel 1696 Metro Span is designed to meet the requirements of metropolitan networks with its compact and high-density architecture. It provides a single, cost effective, managed platform that supports multiple services, traffic levels and data rates. It is scalable up to 32 protected or 64 unprotected channels at 100 Mbps to 10 Gbps, and can be installed in virtually any network environment from a central office to a basement closet.

In order to reduce the number of spare transponders, the 1696 Metro Span uses tunable transponders. All the transponders are tuneable over two wavelengths.

1969 Metro Span 32 channel architecture
Enterprise Scaling

Compatibility with metro-core DWDM networks
While offering reduced footprint and deployment costs over the Alcatel 1696 Metro Span for enterprise applications, the 1696 Metro Span Compact remains fully compatible with the former. With identical channel plan and tunable transponders between both platforms, they can be mixed and matched on a single ring as dictated by capacity demand. A common supervisory channel maintains performance monitoring and management capabilities throughout the network. This mix and match flexibility reduces the need for excess spares in inventory, which equates to lower costs for the service provider. Furthermore, compatible channel plans eliminate the need for costly O/E/O conversion, which would otherwise be necessary to adapt wavelengths being handed off between the two systems.

Addressing new customers and revenues
Enterprise demands originating at a significant distance from a metro DWDM ring pose a special challenge. Rather than denying service due to distance limitations, the 1696 Metro Span Compact can be used as a remote CPE platform. Transponders and 4xAny TDM modules will reside in the Metro Span Compact, sending signals directly to a 1696 Metro Span node where they will be add/dropped from a larger network. A further reduction to deployment cost can be obtained by eliminating the mux/demux or OADM hardware from the CPE. Using remote transponders and TDM modules at a CPE site also helps reduce the amount of equipment installed in the central office or co-location space, saving valuable rack space.
Unlike long haul networks, where the services are consolidated at a SDH/SONET homogeneous bit rate (mainly 2.5 Gbps or 10 Gbps), the metro arena encounters protocols that differ by several orders of magnitude. The Alcatel 1696 Metro Span efficiently puts them all under a single umbrella, providing not only flexible connectivity on demand, but also a common environment for edge-to-edge management and maintenance.

With its universal 3R multi-rate transponder, the 1696 Metro Span is capable of accepting a broad range of data rates, from 100 Mbps to 2.5 Gbps. It carries SONET wavelengths such as OC-3, OC-12 and OC-48, in addition to signals like ATM, IP, ESCON, GbE, FDDI, DV, FE, FICON and fiber channel (FC). This feature reduces the cost per managed channel, and lets service providers offer a complete array of services managed over the same optical channel. The matrix creates the maximum level of flexibility inside the metro network and allows true optical networking—strengthening transmission efficiency and improving protection capabilities. With the Alcatel 1696 Metro Span, service providers use a single, cost optimized, managed platform, which accommodates multiple types of services and protocols.

Complementary to the multi-rate transponder, a 10 Gbps transponder supports services such as OC-192 and 10 GbE WAN. The 10 Gbps transponder presents the same great features as the multi-rate transponder, such as tunable lasers and an on-board 8x8 cross-point matrix.

The Alcatel 1696 Metro Span features a dedicated 4 x Any TDM module that multiplexes up to 4 low bit rate client signals into one single 2.5 Gbps optical channel. This concentration provides cost-efficient transport for low bit rate traffic by reducing the number of required optical channels. This distinctive feature of the 1696 Metro Span does not use a proprietary TDM multiplexing scheme. Rather, it delivers a fully compliant SONET frame. For example, a concentrated 2.5 Gbps signal from the Alcatel 1696 Metro Span can be directly and cost-efficiently connected to a SONET ADM or digital cross-connect without requiring prior de-concentration.
Service provisioning and management can be a costly expenditure. Alcatel understands the importance of highly efficient management systems and is the world’s leading supplier of integrated management systems for optical transport networks. The 1696 Metro Span is designed with superior performance monitoring capabilities that allow service providers to implement tailored protection schemes based on quality of service and bit rate requirements. For example, it can monitor the quality of signals, transmitted through the network, using a 4 x Any TDM concentrator—based on B1 monitoring of transported SONET frames when using a multi-clock transponder. Also, the transponder’s bit rate can be tuned via remote command.

The Alcatel 1696 Metro Span can monitor and provision the entire DWDM path of the carried signal and provides housekeeping access in both directions (eight inputs and eight outputs). For service providers who require it, the system can be equipped with a 1510 nm supervisory channel.
The Alcatel 1696 Metro Span offers service providers a single platform with maximum bandwidth potential and superior service capabilities. With its robust feature set, it can handle multiple data rates and service requirements with ease and has the flexibility and scalability needed to meet the requirements of today’s metro traffic environment. The Alcatel 1696 Metro Span is an ideal edge-to-edge optical network solution, satisfying the needs of today’s bandwidth hungry and service dynamic market.

Look to Alcatel for all your networking needs. We have a long-standing reputation and the experience with building end-to-end carrier class solutions for use on land, undersea, and across the globe. Call us today at 1-800-ALCATEL or 1-800-252-2835, or visit us on line at www.alcatel.com.