MPLS Quick Overview

Today many companies run divergent networks (voice, data, and video) which are reaching the end of their lives and becoming expensive to maintain. Over the past few years, business requirements for bandwidth and security have steadily increased due to the addition of new business applications and the proliferation of useful IP-based protocols.
MPLS solves this fundamental problem by…

1. **Collapsing Applications and Technologies as a converged service.**
   Many companies still run separate voice, data, and internet networks, MPLS allows for these networks to collapse onto one physical infrastructure with the benefit being less access lines for the customer while creating more efficient control on bandwidth utilization.
2. **Prioritizing Business Applications during peak traffic times.**
   MPLS ensures traffic that needs stable, reliable bandwidth, such as streaming video or Voice over Internet Protocol (VoIP) telephony, receives the highest priority and routing on the network while lower bandwidth requirements, such as email and web traffic, receive a lower priority. MPLS guaranteed throughput levels ensure applications Q-o-S needs so that there is no obvious difference to the user.
3. **Efficient and quick Disaster recovery.**
   MPLS meshed architecture allows companies to mirror sites at other locations that can provide backup services in the event a main site goes down. MPLS meshed architecture allows remote sites to communicate with the backup site without the need to reconfigure Customer Edge devices as re-routing is automatically done by MPLS.
4. **Simplified connection between sites due to meshed architecture and managed I-A-D services.**
   In the traditional frame relay environment, PVC's are required to be configured in each edge router, as the number of sites increase the number of PVC's, this increase exponentially to the point that large sites become difficult to manage the PVC routing table. Since all routing tables are maintain by the carrier, the customer is alleviated the headaches of managing routing tables, thus allowing the customer to implement, change, or add a MPLS network quickly and efficiently.
5. **Versatile Last Mile Technology Support making cost efficient connections for satellite sites.**
   Many legacy technologies were developed for certain last mile links such as T1's and T3's. MPLS was designed from the start to operate with a multitude of last mile links and thus can be used not only on T1's, T3's, but xDSL, wireless, coaxial cable, Fiber, and other connectivity options. This allows customers to implement a MPLS network that fits their needs by using cost effective connections that makes sense for the customer not the provider.
6. **Need to Collapse Applications & Technologies (Converged Services)**
   In the past users would run separate networks for their voice and data needs, this is costly and increases the management needs and requirements of these networks. MPLS has the ability to combine voice, data, and video onto one network since it provides a Class of Service for applications based on the user's needs and requirements.
7. **Want to use Existing Bandwidth more efficiently.**
   MPLS is able to divert communication traffic according to critical and non-critical categories, resulting in more efficient allocation and management of network resources.

Top MPLS Benefits

The promise of MPLS is the benefits it will bring to the current and future Internet architecture. Some of the top MPLS benefits are summarized in the following:

1 Scalability With the ever-increasing demand for more bandwidth from users and applications, this dictates the need for increased access requirements from "last-mile" technologies such as DS1, DS3, xDSL, wireless, and fiber, MPLS is a scalable technology that allows the use of last-mile loops in the most effective manner.

2. New applications with the ever-increasing demand for new IP-based applications such as Q-o-S, dynamic path restoration, and VPNs, MPLS will leverage the Internet services of data, voice, and video to deliver robust and cost-effective solutions. MPLS is also flexible enough to provide support for new applications as they arise.

3. Standards-based MPLS is a standards-based IETF specification developed by the MPLS working group. MPLS interoperates as part of the TCP-IP protocol suite with various signaling and label distribution protocols, SNMP management, and other standard IETF protocols.

4. Complements customer installed routing base MPLS complements the customers existing routing and builds on what is already there; no "forklift" replacement of existing router infrastructure is required. MPLS uses a number of label distribution and signaling techniques and protocols. MPLS works with conventional routing algorithms such as the Border Gateway Protocol (BGP) and Open Shortest Path First (OSPF).

5. Complements installed switching base MPLS works with ATM and IP/ATM overlay networks, Frame Relay, Ethernet, Sonet, and others. Elegant, efficient, and extensible design, MPLS separates the control and forwarding functions. It offers an elegant evolutionary path to include new innovations and technology directions. MPLS is an extensible solution that can work with numerous delivery technologies and applications.

6. New Internet services MPLS is the enabling technology that will accommodate new advances in Internet services such as data, voice, and video. Pivotal role in optical networking MPLS will be the "glue" for the new optical world. MPLS progresses beyond ATM's limitations, but includes ATM's best features. MPLS fits well with next-generation high-speed routers, core backbone switches, and other new devices. MPLS will end the need for overlay networks as optical networks are deployed.

7. Reliability - MPLS offers fast circuit re-route for telecommunications-like robustness akin to the Automatic Protection Switching (APS) feature found in Sonet. MPLS is designed to handle many failure scenarios for both node and link failure types. Top vendor and provider support MPLS is backed and being implemented by the top vendors in the network industry. It is enjoying initial success from customers and service providers at many levels.

Summary
By the end of 2006, Multi-Protocol Label Switching (MPLS) Internet Protocol virtual private networks (IP VPNs) will be the clear WAN solution of choice (managed and unmanaged) in the North American business community, and the dominant alternative to established private line and frame relay networks especially those at the end of contract cycle.