

Preparing For Enterprise MPLS

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Yes, MPLS is a standard, but that doesn't mean all carriers are going to deliver it the same way—or that all enterprises are equally suited for it.

As enterprise organizations come under increasing pressure to support strategic business requirements for enhanced application performance, and as new infrastructure platforms are introduced, the need for an application-aware and dynamic infrastructure has increased.

Multi-Protocol Label Switching (MPLS) provides an answer, but it's a challenge to build the business case to migrate to an MPLS service: How does one differentiate between technology, service and industry myths, conceptions and realities? What are the relevant differentiators between managed and unmanaged network-based MPLS-VPNs offered by carriers for replacement of traditional VPN services such as frame relay and ATM?

Let's review typical business objectives and expectations for an enterprise considering a migration to a network-based MPLS-VPN:

■ **Potential reduction to cost of telecommunication services:** Equant, AT&T, InfoNet and British Telecom (BT) are among the carriers currently offering competitive MPLS services. They're pursuing a large client base transitioning from, or integrating with, traditional frame relay and ATM backbone services, and they have forecasted future profit from a value-add services portfolio—e.g., Internet access, IP-video bridging services, etc.—delivered to customers via their MPLS cloud.

A promising story, but buyers beware. Although most of the carriers offer similar pricing models, the service purchased can vary. Technical details such as class of service, bandwidth allocation per class, in/out-of-profile traffic treatment, traffic marking, community of interest, Committed Data Rate (CDR), Total Data Rate (TDR) and others, make all the difference and could greatly affect the service cost.

While from a technology perspective, MPLS is ready for prime time as an enterprise backbone (although ratification of IETF MPLS standards is still in play), from a commercial perspective, the direction blurs; most providers are still building or enhancing their service offerings and training their sales and Tier-I/II technical forces on its functionality. At the end of the day, the most challenging aspect of MPLS strategy development is how to achieve an “apples-to-apples” comparison between MPLS service provider offerings and current enterprise backbone services (e.g. frame relay). Such a comparison will determine if the cost savings are real. Further, despite their promises, it is essential to truly understand the providers' technical service offerings.

■ **Financial benefit from an “any-to-any” network that uses a “distance-independent” pricing model:** MPLS was designed to provide any-to-any, full mesh connectivity within a defined community of interest. The providers' MPLS-enabled routers make forwarding decisions based upon short labels, thereby avoiding the complex “look-ups” used in conventional routing. This concept of “point-to-cloud” access is similar to Internet connectivity—as you connect to the Internet, you need not concern yourself about physical connectivity to each website you visit. The connectivity is many to many.

This point-to-cloud, any-to-any access concept can lift the burden from the enterprise for design and cost of partially- or fully-meshed networks. This in turn will trigger a shift in strategy and mindset as an enterprise transitions from a “circuit-based culture”—i.e., emphasis on provisioning WAN circuits based on locality of applications and capacity planning for connectivity of the downstream locations—to a “services-based culture”—i.e., network designers focus on prioritising business applications, the integration of new/additional services (e.g., video bridging, IP-telephony, extranets, etc.). In short, network design will be more about encouraging any-to-any access to value-add services than on circuit connectivity.

■ **Gain a roadmap for mission/business-critical applications such as SAP, JD Edwards, PeopleSoft, Oracle Financial, MDS, etc., as well as for convergence to video- and voice-over-IP**

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technologies: Enterprises should be able to classify their applications based on business priority, strategic value and technical characteristics. The priorities would then translate into a class of service provided by the MPLS carrier.

This would enable network managers to manage predictability of the traffic/performance and to provide varying service levels to different applications. They'd also be able to introduce applications such as IP-video to run over the MPLS network, while lower-cost and lower-priority classes of service can be used for non-business critical applications/traffic, such as Internet traffic, which comprises about 40 percent of enterprise wide-area network traffic.

But all this flexibility and customization implies a mature set of Service Level Agreement/Objectives (SLA/SLOs). As the carriers provide class of service and application service differentiators, SLAs will become more important and probably more complicated than they are today. For example, SLO per class of service will be based on a broader set of performance-based quality parameters—e.g., delay, packet loss, jitter and availability—than the more limited per-circuit SLOs (mainly delay and availability) for today's frame relay services.

Today, however, there aren't adequately mature SLAs/SLOs for carrier-provided MPLS services. That means that an enterprise will go through a comprehensive process to negotiate and validate the SLA/SLO, ensure that it matches the service and understand the mechanism that the carrier uses to report the metrics. Service Level Management (SLM) tools and processes that enable enterprises to monitor service contract agreements with their service providers and verify that defined network performance levels are being fulfilled are becoming a "must-have" for this new environment.

■ **Provide an easy path for deployment of future business tools and applications over the network:** One of the key issues in deploying an MPLS class-of-service environment is determining the set of applications and/or users that will be given preferential access to network resources. The administrative criteria for regulating access to resources constitute the quality-of-service (QOS) policies.

This movement toward policy-based networking, with specialized performance monitoring and control of application access to network resources, could lead to a foundation for enterprise chargeback, where IT services costs are allocated to individual business units based on the application access and resource reservation into particular class of service. Policy-based networking also creates the opportunity for an enterprise to develop different communities of interests (e.g. business

partners—extranet) allowing for enhanced productivity and easier access to specific enterprise resources.

Conclusion

While the technology supporting MPLS is interesting and innovative, technology alone won't determine whether it succeeds in replacing frame Relay or ATM clouds for enterprise backbones. Clearly, each enterprise contemplating a migration to MPLS will have to do their homework—clearly define business and technical goals, the importance of differential services for the applications running over their network and the organization's readiness for significant change to the network culture. Among the items to be considered are:

- Can the current WAN infrastructure support the performance requirements of business-critical application(s)?
- What are the emerging requirements for support of advanced, real-time applications such as voice and video?
- Can business applications be prioritized without extensive investment?

■ What are the tradeoffs—costs/benefits—of being able to decrease the time to provision circuit size (e.g. add more contracted bandwidth to the current circuits), simplify WAN connectivity and consolidation, and ease external partner connectivity?

- Do the providers' SLAs/SLOs translate into internal SLAs for business units?

Migrating to MPLS also requires a thorough understanding of the providers' technical service offerings. The good news is that today's MPLS service offerings from, for example, AT&T, Equant, BT and Infonet, have the potential to reduce WAN infrastructure costs.

But all MPLS offerings are *not* created equal, and the differences go beyond price structure and service coverage. Enterprises need to quickly learn and understand how a carrier's underlying MPLS network build-out relates to their legacy infrastructures, if at all. Among the key areas that need to be evaluated and validated include are how Layers 2 and 3 are being handled via the carrier's implementation of MPLS, traffic engineering, contracted bandwidth, bursting capabilities, number of classes of service, bandwidth allocation/restriction per class of service, SLA/SLO per class of service and SLA reporting□

**MPLS has a good story,
but buyers beware**

Companies Mentioned In This Article

AT&T (www.att.com)
British Telecom (www.bt.com)
Equant (www.equant.com)
InfoNet (www.infonet.com)