MPLS and Next-Generation Networks

Foundations for NGN and Enterprise Virtualization

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Layer 3 and Layer 2 VPN Comparison

Layer 3 VPNs	Layer 2 VPNs
• Provider devices forward customer packets based on Layer 3 information (for example, IP).	• Provider devices forward customer packets based on Layer 2 information.
• **SP Involvement in Routing**	• **Tunnels, Circuits, LSPs, MAC Address**
• MPLS/BGP VPNs (RFC 2547), GRE, Virtual Router Approaches	• Pseudo-Wire Concept

Figure 3-28 *Layer 3 and Layer 2 VPN Comparison*

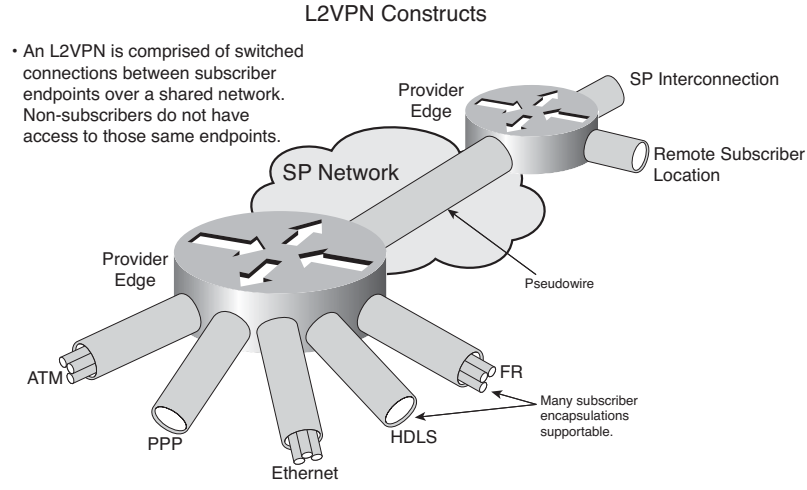

Figure 3-29 *L2VPN Constructs*

Layer 2 VPNS are further discussed in Chapter 4.

Summary

MPLS technology is fundamentally a service enabler for Layer 3 VPNs and provides for support of CoS and QoS guarantees along with traffic engineering, DiffServ-TE, and fast reroute that are required to manage tight SLAs for such services as voice, video, and data. Multicast VPNs can support enhanced services for push applications, such as streaming, IPTV, videoconferencing, and e-learning. As IP commences to dominate the majority of public network traffic and the requirement for bandwidth increases the need to reduce management, service providers definitely require configuration and provisioning in the network.

With GMPLS, the IP routing tables of an optical LSR enable you to activate a lambda of dense wave divisional multiplexing (DWDM) immediately, according to the needs of the network. It therefore becomes possible to establish connections in a dynamic fashion for rapid provisioning through the SDH/Sonet, optical, or packet network layers.

GMPLS could be used to support bandwidth-intensive applications, such as GRiD, which is emerging in the industry amongst auto, financial, and pharmaceutical vertical segments. Thus, MPLS technology is flexible and can be used to develop and implement services serving current and future market needs.

We have technically deconstructed Layer 3 VPNs as these apply to MPLS and have described the functionality of traffic engineering and differentiated services essential for the deployment of services that require tight SLAs, such as voice and videoconferencing.

We have further provided an overview of Layer 2 VPNs that can be implemented over an MPLS core. Layer 2 service interworking as part of an evolving convergence strategy can facilitate the migration of legacy Layer 2–based services over an MPLS infrastructure. Finally, we have provided a building block of the MPLS service architecture essential to highlighting its value-added proposition, particularly toward developing service provider NGNs for implementing LAN/WAN virtualization within enterprise organizations.

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PART 3

MPL SERVICES AND COMPONENTS

CHAPTER 4

LAYER 2 VPNS