

LAYER 2 VPNS: ETHERNET MANS AND WANS

Ethernet in its newest variant is extending the traditional Local Area Network (LAN) into the Metropolitan Area Network (MAN) and Wide Area Network (WAN). Many organizations wish to use Virtual Private Networks but are unclear as to the pros and cons of each. Should they use Layer 3 IP VPNs, or MPLS or stick with their traditional Layer 2 ATM or Frame Relay VPNs? Or should they consider new Ethernet-based Layer 2 VPNs. This course begins by considering VPN alternatives and then dives into the technical minutiae of Ethernet-based VPNs.

Audience:

This ALS course is designed for enterprise, carrier and service provider personnel who must understand the differences between the traditional Ethernet version and the new high speed versions being implemented in the MAN and WAN. This course would also be suitable for entry to mid level product designers as well as technical marketing managers and support engineers.

Prerequisites:

A basic understanding of Ethernet-based Local Area Network operations and the OSI or IETF layered protocol models and their implementation.

Objectives:

At the conclusion of this course the student will be able to:

- Describe the primary Virtual Private Network (VPN) approaches
- Clarify the pros and cons of different VPN systems
- Design VPNs based upon 10Gbps Ethernet
- Support the product and service selection or sales process
- Choose proper configuration options for 10Gbps Ethernet systems
- Explain the operation of 10Gbps Ethernet VPNs in detail

LAYER 2 VPNS: ETHERNET MANS AND WANS

COURSE OUTLINE

Day 1

1. Virtual Private Networks

- Definitions and Examples
- Layer 1/2 and Layer 3 Services
- Ethernet, ATM, Frame Relay and IP VPNs
- The Role of MPLS/gMPLS

2. Ethernet Flavors and Applications

- LAN
- 10BaseT
- 100BaseT
- 1000BaseT
- 10 Gigabit Ethernet
- MAN/WAN
- 1000BaseT
- 10 Gigabit Ethernet

3. 10 Gigabit Ethernet Architecture and Overview

- Architecture
- Physical Layer
- MAC Layer
- 10Gigabit Ethernet in LAN, MAN & WAN
- Pros and Cons

4. 10 Gigabit Ethernet Products and Services

- Products
- Services

5. Ethernet VPN Case Studies

- Small-Medium Enterprise Metropolitan Area Network
- Medium-Large Enterprise Ethernet Wide Area VPN
- ISP/NSP Ethernet Wide Area VPN

Day 1 Review

Day 2

6. 10 Gigabit Ethernet Protocols & Processes

- Physical Layer Architecture
- Physical Layer
- Data Rates & Pacing Mechanism
- MDI (Medium Dependent Interface)
- PMD (Physical Medium Dependent)
- PMA (Physical Medium Attachment)
- PCS (Physical Coding Sublayer)
- 10GMII (10-Gigabit Media Independent Interface)
- Reconciliation Sublayer
- Medium Access Control (MAC)
- MAC Frame Format

7. Coding Techniques

- 8B/10B
- PAM-5
- Forward Error Correction (FEC)

Day 2 Review