Emerging WAN Technologies (Instructor Version)

Instructor Note: Red font color or Gray highlights indicate text that appears in the instructor copy only.

Objective

Troubleshoot WAN issues that affect internetwork communications in a small- to medium-sized business network.

Instructor Notes:

- This activity allows students to consider other options for WAN connectivity. They are mentioned in the curriculum and allow students to explore the emerging network WAN communications options available to today's small- to medium-sized business networks.
- Students may work individually or in small groups to complete this activity.

Scenario

As the network administrator, in your small- to medium-sized business, you have already moved from leased-line WAN to Frame Relay connectivity for WAN network communication. You are responsible to keep current with all future network upgrades.

To stay current with emerging and developing technologies, you find that there are some alternate options available for WAN connectivity. Some of these include:

- Frame Relay
- Broadband DSL
- Broadband cable modem
- GigaMAN
- VPN
- MPLS

Because you want to offer the best quality, lowest-cost WAN network service to your company, you decide to research, at least, two emerging and developing technologies. It is your intent to gather information about these two alternate WAN options to intelligently discuss the future goals of your network with your business manager and other network administrators.

Resources

- Internet access to the World Wide Web
- Presentation software

Directions

Step 1: Choose two of the following emerging and developing WAN technologies:

a. Frame Relay

b. Broadband DSL

c. Broadband cable modem

d. GigaMAN

e. VPN

f. MPLS

Step 2: **Create a matrix to record information about the two WAN technologies you chose. At a minimum, include:**

    a. A short description of the technology

    b. Physical requirements to set up the technology

        1) Cabling requirements

        2) Network devices necessary to operate the WAN technology

        3) Who provides the network devices necessary to operate the WAN technology

    c. Benefits of this type of WAN technology

    d. Disadvantages to implementing or changing to this form of WAN technology

    e. Costs associated with this type of technology

Step 3: **Create a five-slide presentation for future use with discussions with your business manager or other network administrators.**

Instructor Example Solution Matrix

Information based on these sites:

[Understanding the Gigaman Service](#)
[To LAN or not to LAN](#)

GigaMAN WAN Technology	
Description	Point-to-Point WAN technology using Ethernet to fiber-optic switched connections. This is currently limited to metro areas, but is considering to expand over larger and larger geographic distances. Uses Gigabit Ethernet switches connected to fiber-optic switches and routers (Telco-dependent). AT&T developed this technology and is currently known as one of the main service providers for GigaMAN WAN connections.
Physical Requirements	If the small- to medium-sized business currently uses Gigabit Ethernet connectivity on its switches, the Telco will help provide connectivity to the company switches. No additional equipment would need to be purchased.
Benefits	Bandwidth availability increased (some research suggests that one line offers over 26 times the speed of a T1 line) Provides a secure WAN technology (leased, Point-to-Point with three variations on how data is delivered over fiber-optic connections). Capable of sending or receiving large files due to

	increased bandwidth availability (1 Gb/s; some sources currently list GigaMAN bandwidth capabilities at 10 Gb/s). Due to its branch-to-region operation, this type of technology is well-suited to companies with many branches, such as with educational systems.
Disadvantages	Currently limited to regional and branch use, as service providers are working to expand the distance limitations. Under current standards, GigaMAN is able to run up to 180 miles, end-to-end with the use of repeaters.
Associated Costs	Increased Point-to-Point leasing associated costs, depending on bandwidth usage and Telco plan, but this is relative considering the trade-off of more bandwidth and security options availability.

Identify elements of the model that map to IT-related content:

- WAN technologies
- Circuit-switched WANs
- Packet-switched WANs
- Leased-line connections
- Point-to-Point connections