6G7Z1004 Advanced Computer Networks and Operating Systems

Complete the following exercises[i]

Case Project 7-1

Wilke Environmental Group, a large organization that provides environmental services such as water quality monitoring and geological surveys to businesses and government agencies across the nation, seeks your help in designing its corporate WAN. (It plans to completely replace its legacy hodgepodge of connections and services.) Headquartered in Baton Rouge, Louisiana, the firm also has large, regional offices in Seattle, Phoenix, and Boston. These offices need a way to exchange e-mail and large files. Most of the firm's 500 engineers and technical specialists spend at least half their time on the road and while mobile, they need to upload data to their regional offices. At other times, they work from home and need fast and reliable connections to their regional offices. The IT manager makes it clear that the environmental services business is booming and so you should not necessarily seek economical solutions. Describe at least two suitable WAN technologies for each of Wilke's three connectivity situations: office-to-office, mobile user-to-office, and hometo-office. Which options do you recommend above all and why?

Case Project 7-2

Wilke's IT manager appreciates how clearly you explained each WAN connectivity option. Then she adds another requirement for the connections that link employees who work from the road and at home: security. Because the firm works on government contracts, it must follow strict privacy regulations to protect the data it gathers and reports. The IT manager is concerned that using a telephone line to dial into a remote access server, for example, leaves the data vulnerable to snooping. She also wonders how secure home-based broadband connections really are. What can you tell her about ensuring secure connections from home and mobile users? For each situation, which protocols are preferred over others?

Case Project 7-3

Wilke's IT staff has decided to implement nearly everything you recommended for its WAN, including a SONET ring connecting all the regional offices, broadband DSL connections for every employee who works from home, and dial-VPN capabilities for workers on the road. Before the firm solicits bids for equipment and carrier services, the IT director asks you to sketch a network diagram, with each type of WAN link labeled, including the media it will use. She also request that you list the types of equipment that is necessary to complete each connection at an office, home, and mobile computer.

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[i] Tamara Dean, Network+ Guide to Networks, 7th Edition, Chapter 7, 2012.