NW255 Internetworking II
Final Project Handout

The Acme Corporation has grown and now has 665 staff members. In addition, Acme has added a sales force. Acme employees now work in the marketing, engineering, documentation, human resources, and sales departments. Acme offices are in Cincinnati (150 employees), San Diego (150 employees), Tokyo (150 employees), Bilbao (150 employees), London (20 employees), Mexico City (15 employees), Milwaukee (10 employees), Chicago (10 employees), and Madison (10 employees). The documentation and engineering departments are primarily located in Cincinnati, San Diego, Tokyo, and Bilbao, although there are some writers and engineers in the other locations as well. The marketing, sales, and human resource departments are in all six locations, but their central offices are in Cincinnati.

Prepare a detailed Active Directory plan for the Acme Corporation, a proposal to be presented to the Acme management team. Your plan will consist of the following:

- a written document of sufficient length to fully cover your material and support your design decisions
- a Visio diagram illustrating the plan you've designed
- a 3-4 paragraph Executive Summary of your report providing an overview of your design as well as a top-level explanation of why you made your choices

Explain the logical components of your Active Directory design: the domains, organizational units, trees, forests, and trusts. Explain why you made your choices and how your design recommendations are based on the specifics of the company growth. For example, should organizational units be organized by department or by office location? How do employees communicate across domain boundaries? How do members of a department found in different locations (such as the human resources department) communicate with headquarters and with each other in other sites? Give specific examples.

Describe how you would modify the DNS strategy that you chose earlier for the Acme Corporation, and explain why you are making these changes. Describe your new namespace strategy and use of DNS zones. Describe how the namespace strategy is affected by the company growth, such as by the addition of offices in foreign countries. Explain how you'd optimize DNS performance. Explain your reasoning for your design choices.

Determine the frequency of Active Directory replication and explain why you made this determination. Identify ways to monitor and troubleshoot replication that are specific to this company's needs. In addition, describe the AD schema you'll use as well as how it can be extended for future Acme growth. There is private/leased line connectivity between major sites.

Describe how you would use Active Directory group policy to apply settings or deploy software to client computers. What kinds of software would you want to distribute to Acme sites, domains, or OUs?

Explain how you would optimize the location of Active Directory files, as well as how you'd work with application directory partitions to optimize the Active Directory. Which problems would this address?

As with the network plan you designed for the midterm, each of the Acme sites has one physical connection to the public Internet, and each physical connection is given a fixed IP address by the network service provider. Each site deploys a Windows machine at this fixed IP address. These machines, in turn, connect to their local area networks, thereby facilitating Internet connectivity so that all Acme machines can communicate with each other.

Explain the physical components of your Active Directory: the domain controllers, sites, bridge head servers, and site links. How do the changes in the company affect your design decisions?

Now that Acme Corporation has expanded, explain how you would change the IP network for the Acme Corporation, describing the connectivity each department and location is using. Explain how you would implement Internet Connection Firewall (ICF), Internet Connection Sharing (ICS), and Network Address Translation (NAT) for specific Acme locations. Be sure to include all three technologies in your design and be sure to explain why you have implemented a specific technology for a particular location.

You should continue to assume that all Acme inter-office traffic is sensitive, and, therefore, should be secured via IPSec as it transits over the public Internet. You do not need to secure traffic between machines on the same LAN.

Acme's business requirements specify the following data be transferred:

> Human resources data goes from Cincinnati to the other offices via email. Because this data must be strongly authenticated as coming from a particular person, the VP of HR will send the traffic over secure email. This email should use public key cryptography for its security and obtain certificates from a Certificate Server.
> The engineering department needs to transmit large files every day from the offices in Cincinnati, San Diego, Tokyo, and Bilbao. Don't worry about how the files are transferred, e.g., via FTP, SSH, HTTP, etc. The important point is that firewall configuration should enable traffic between these sites and restrict potentially malicious non-Acme traffic originating from the public Internet.
> The Mexico City and London offices have fewer employees than the other Acme offices and do not generally need to transmit large files to other offices.

Explain how your design decisions are influenced by the kind of data that comes across per department and location.

Describe the procedure you'll use for backing up the Active Directory database. How will you determine which files to back up? Describe how you would protect network resources using security based on Active Directory.

Finally, describe any changes you'd make to the DHCP server configuration and explain why.