■ **Analyze requirements:** In this phase, the network analyst interviews users and technical personnel to gain an understanding of the business and technical goals for a new or enhanced system. The task of characterizing the existing network, including the

logical and physical topology and network performance, follows. The last step in this phase is to analyze current and future network traffic, including traffic flow and load, protocol behavior, and quality of service (QoS) requirements.

■ **Develop the logical design:** This phase deals with a logical topology for the new or enhanced network, network layer addressing, naming, and switching and routing protocols.

Logical design also includes security planning, network management design, and the initial investigation into which service providers can meet WAN and remote access requirements.

■ **Develop the physical design:** During the physical design phase, specific technologies and products that realize the logical design are selected. Also, the investigation into service providers, which began during the logical design phase, must be completed during this phase.

■ **Test, optimize, and document the design:** The final steps in top-down network design are to write and implement a test plan, build a prototype or pilot, optimize the network design, and document your work with a network design proposal.

**Case Study #2 Enterprise: National Bank National Network]**: National bank with head offices in the big cities (NY, LA, Dallas, Minneapolis, ...) and several small buildings in major cities in each state. Bank machines all around each city. Total 10000 employees in different cities (1000 in each major city and 100 in each small city around the nation) and over 1,000,000 bank accounts (i.e. users). Employees use a special software to access user accounts, with different levels of access, in addition to the typical servers, mail, web, file servers. Security is crucial in order to secure client accounts.

Work Key:

* David
* Chenghong
* Sahithi
* Hyndavi

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Location | # of Buildings | # of Floors per Building | Number of Employees | Bank Accounts | Other Notes |
| New York City, NY | 20 | 4 | 1000 | 300000 | **Main Office Location** |
| Los Angeles, CA | 17 | 4 | 1000 | 200000 | **Big City Location** |
| Dallas, TX | 15 | 4 | 1000 | 150000 | **Big City Location** |
| Minneapolis, MN | 14 | 4 | 1000 | 100000 | **Big City Location** |
| Hartford, CT | 10 | 3 | 1000 | 30000 | **Big City Location** |
| Wallingford, CT | 2 | 2 | 100 | 10000 | Small City Location |
| Nashville, TN | 6 | 3 | 1000 | 30000 | **Big City Location** |
| Washington, D.C. | 8 | 3 | 1000 | 30000 | **Big City Location** |
| Seattle, WA | 10 | 3 | 1000 | 30000 | **Big City Location** |
| Denver, CO | 9 | 3 | 1000 | 30000 | **Big City Location** |
| Tulsa, OK | 2 | 2 | 100 | 10000 | Small City Location |
| Jackson, MS | 3 | 3 | 100 | 10000 | Small City Location |
| Shreveport, LA | 3 | 3 | 100 | 10000 | Small City Location |
| Mesa, AZ | 4 | 2 | 100 | 10000 | Small City Location |
| Provo, UT | 3 | 2 | 100 | 10000 | Small City Location |
| Salem, OR | 2 | 3 | 100 | 10000 | Small City Location |
| Ann Arbor, MI | 3 | 2 | 100 | 10000 | Small City Location |
| Leesburg, FL | 2 | 3 | 100 | 10000 | Small City Location |
| Boise, ID | 2 | 3 | 100 | 10000 | Small City Location |

Types of Servers for the Enterprise:

1. Application

2. Fax

3. E-mail

4. Web

5. Print

6. Database

7. File

8. AAA