IBL GROUP ASSIGNMENTS

1. ANALYZING BUSINESS GOALS AND CONSTRAINTS

Review Questions

1. Why is it important to use a structured, systematic method for designing networks? What problems can occur if such methods are not used?

2. Why is it important to explore divisional and group structures of an organization when starting a network design project?

Design Scenario

You are a network consultant who has been asked to attend an initial meeting with the executive management team of ElectroMyCycle, LLC. ElectroMyCycle manufactures motorcycles. Its new electric motorcycle was just picked up by a large retail chain.

ElectroMyCycle is upgrading its manufacturing capacity and hiring new employees. Recently, ElectroMyCycle employees have started saying, "The Internet is slow." They are also experiencing problems sending email, accessing web-based applications, and printing.

In the past, when the company was small, it didn't have these problems. The operations manager outsourced computer services to a local business called Network Rogues, which installed new workstations and servers as needed, provided desktop support, and managed the switches, router, and firewall. ElectroMyCycle is now considering bringing computer services in-house and is wondering how its network should evolve as it increases production of its electric motorcycle.

Questions

1. What research will you do before your initial meeting with the executive management team?

2. What general problems does ElectroMyCycle seem to be experiencing? What network design principles may have been ignored when Network Rogues designed and operated the existing network?

3. List four major stakeholders for a new network design for ElectroMyCycle. For each stakeholder, list some design goals, constraints, and biases.

4. List five questions you will pose to the executive management team. Why will you pose those questions?

2. Analyzing Technical Goals and Tradeoffs

Review Questions

1. Discuss the term "scalability." What does it mean? Why is it an important network design goal? What are some challenges designers face when designing for scalability?

2. A network design customer has a goal of 99.80 percent uptime. How much downtime will be permitted in hours per week? How much downtime will be permitted in minutes per day and seconds per hour?

3. Assume you are in New York City in the United States and you are downloading a 100-KB web page from a server in Cape Town, South Africa. Assume that the bandwidth between the two cities is 1 Gbps. Which type of delay will be more significant, propagation delay or transmission delay? Defend your answer.

Design Scenario

Harriet's Fruit and Chocolate Company was established in 1935 in the Pacific Northwest of the United States to ship gift baskets of locally grown peaches and pears to customers in the United States. The company also makes chocolates and baked goods to include in the gift baskets. It has grown extensively over the years and is currently one of the biggest companies in the Pacific Northwest.

Recently, Harriet's descendants, who still run the company, have identified a need to immediately report when fruit is starting to ripen and should be picked and placed in cold storage. Employees in the marketing department have identified a need to access inventory data for the fruit in the orchards and in cold storage. With this data, they can design and sell gift-basket products that take advantage

of the ripe fruit. This data must also be fed into e-commerce applications so that web orders can correctly specify product availability.

In addition, the company recently hired an ambitious programmer who is anxious to use her knowledge of SAS programming, SQL, and DB2 to design reporting applications for senior management. She calls you every day with new ideas on what she could accomplish if the network were upgraded so that she could reach up-to-date data from the orchards and cold storage buildings. As the network designer for this company, you have been charged with selecting network technologies to reach the orchards and cold storage buildings. Each of the six orchards has a shack with one or two standalone PCs and a printer. The three cold storage buildings are huge warehouses that include a few standalone PCs and printers. The local telephone company has suggested that you lease fractional T1 links, but these links are expensive and possibly beyond your budget. Wireless technologies are also possible, but you have heard that fruit trees, especially full-grown trees that are tall and leafy, can absorb a wireless radio frequency (RF) signal. You have also heard that the cold storage buildings have ice hazards, making it hard to install equipment. But you will not let these challenges faze you.

Questions

1. What investigation will you do with regard to the physical infrastructure of the orchards, the orchard shacks, and the cold storage buildings?
2. Make a list of business goals for Harriet's Fruit and Chocolate Company. What are some constraints that will affect these goals?
3. Make a list of technical goals for Harriet's Fruit and Chocolate Company. What tradeoffs might you need to make to meet these goals?
4. Will a wireless solution support the low delay that will be needed to meet the needs of the applications? Defend your answer.
5. What security concerns should you bring up as you design the network upgrade?