NETWORK DESIGN TEAM
(325)

REGIONAL – 2017

**Judges/Graders: Please double check and verify
all scores and answer keys!**

Description:

Analyze existing and planned business environments and develop a strategy for the implementation of a network infrastructure that addresses the business needs of the scenario provided. At state and national level, teams will be presented with an additional element to the scenario that requires revision of their final presentation.

Topic:

Elite Quick Freight, Inc. is a commercial shipping company that operates in the United States, specializing in transporting oversized items and hazardous materials. Currently, the company has a fleet of approximately 200 trucks of various capabilities, strategically placed throughout the nation at ten different locations. As a family-owned company, Elite Quick Freight, Inc. is known for its exceptional customer service, sound business ethics, and workplace quality. Elite Quick Freight, Inc. is now becoming a major player among large shipping companies, especially when specialized freight services, such as oversized or hazardous item transport, are required.

By following traditional business practices, and running the company in a consistent manner, Elite Quick Freight, Inc. has fallen victim to a lacking technology infrastructure. In order to "catch-up" with the latest in technology, Elite Quick Freight, Inc. is seeking proposals for a company network redesign. The company is looking to upgrade all desktop, laptop, and tablet devices, redesign and upgrade the network infrastructure, deploy a fleet management software/hardware system, and create a small data center at their main location that will host all needed applications and data. Due to budget constraints and the need for testing, the company is only looking to deploy the new network design to four of their locations, and the rest will follow in a secondary deployment. Below, you can find a detailed description of each location, and its current infrastructure, if any exists.

Headquarters (Birmingham, Alabama):

The main office of Elite Quick Freight, Inc. is in Birmingham, Alabama, in a large remodeled warehouse outside the city limits. The warehouse is sectioned off into a climate-controlled office space and a warehouse area where trucks load and unload freight. In the climate controlled area, there are ten office spaces, and one executive suite containing two office spaces. The company has decided to merge two of the office spaces into a larger room to house a small data center, as they are also interested in relocating a small number of staff members to a secondary location. Elite Quick Freight, Inc. has asked for a complete design of their data center, including a description of recommended items such as: server racks, server types/brands/models, a core switch, power distribution, cooling, battery backup, secondary power backup, and anything else that might be needed. A server rack already exists in a small closet that contains the security camera server, intra-office communication server, file-share server, and a legacy email server. These existing systems will need to be migrated to the new data center, and the email server will need to be updated to match current industry standards. After the migration of existing systems, the company has requested the following functionalities. The software and/or servers, physical or virtual, need to provide such functionalities: a directory system that provides LDAP (lightweight directory access protocol), a centrally managed hypervisor for virtual machines and appliances, a web server for intra-organizational web applications, and a more robust file sharing/collaboration system. Due to a recent wave of "new hires," in this office location, Elite Quick Freight, Inc. recently went through a less intensive network redesign in this office, and are happy with the current network infrastructure. All that is required is integration with the new data center, and reorganization of the current subnets/VLANs (virtual local area networks) in order to properly segment the network for the following areas: secure communication between servers, office communication, office wireless communication, and visitor wireless communication. It is also required that the servers be protected by a firewall.

South Central Region (San Antonio, TX):

In order to tap the large commercial market available in Texas, Elite Quick Freight, Inc. decided to place their first auxiliary shipping warehouse in San Antonio, TX. This location provides service to the whole state of Texas, as well as select locations in the states of New Mexico, Oklahoma, Arkansas, and Louisiana. Similar in structure to the Birmingham headquarters, this location has a climate controlled office area and a warehouse area used for shipping. However, at this location, there are only four offices. A recent boom in business in this office's region has prompted Elite Quick Freight, Inc. to hire an additional five office employees. Two of the existing offices will be combined into a larger room that will be setup with four cubicles. The other two offices will remain the same, and an additional area will be walled off in the warehouse, configured with climate control, and setup with three cubicles.

The current network infrastructure at this location is considered minimal to non-existent. At most, the infrastructure can be considered a SOHO (small office, home office) network, with a single off-the-shelf wireless all-in-one router/switch/AP (access point). Elite Quick Freight, Inc. is requesting a list of equipment needed for this office to create an appropriate network to connect ten desktop workstations and thirty wireless devices, as well as a method to create a secure connection to the headquarters in Birmingham. Network segmentation for this office will need to match the following areas: office communication, office wireless communication, visitor wireless communication.

Midwestern Region (Cedar Rapids, Iowa):

Providing service to the Midwestern U.S., the Cedar Rapids office is an important location for Elite Quick Freight, Inc. This location has, in similar fashion to the other locations, a climate controlled office space and a warehouse area. This office is smaller in comparison to the other office locations. A single medium sized area with four cubicles, a small walled-off area for the office manager, and a break room for all employees, make up the climate controlled area.

The network infrastructure for this area will need to be kept simple, and does not require segmentation (subnets/VLANs). The infrastructure must be able to support at least eight desktop workstations and 20 wireless devices. A fast connection to the headquarters is required, and it must be secure, due to the probability of confidential data transmission.

Western Region (Fresno, California):

The western region office provides service to the entire state of California, and select areas in bordering states. This office is quite large, and is actually separate from the region's shipping warehouse. While the warehouse is located outside of the city's urban center, the office is located in the middle of the city, in a two story office building. The first floor of the office building belongs to an accounting firm, and the second floor is occupied by Elite Quick Freight, Inc. Two large rooms separated into eight cubicles each, a lounge area, a receptionist area, three offices, and a one office executive suite makeup the office space. You may notice that this office is quite larger than the headquarters, and the company has considered in the past to make it the main location. The company has ultimately decided that having two key locations has been beneficial to business operations, especially when situated in two disparate geographic regions.

Due to the importance of the office, it has been recommended by the company to create a "hot" disaster recovery data center in this location that will act as a backup for the headquarters. A plan for executing this will need to be included in the final design for the network infrastructure. In addition, this location will require a complete network upgrade. The current infrastructure consists of an outdated wireless access point, a defunct file server, two 32 port 10/100 switches that need to be upgraded, a legacy router that exists at the network perimeter, and deteriorating CAT 5 cabling. Keep in mind that this office space is on the second floor when deciding on appropriate network cabling, and that this infrastructure description does not include the 15 desktop workstations and 20 wireless devices that require network access.

A file server at this location is not needed, and can be retired in the network redesign. To replace the file server, a fast connection will need to be created between this location and the Birmingham data center. The connection will be used extensively, and at times, more so than normal internet traffic. Take this requirement into account when recommending connection methods. To provide security and virtual organization within the office, network segmenting will be needed in this office. It is recommended that the network segmenting match the following: wired office communication and wireless office communication. A visitor's network will not be provided at this location.

Customer's needs:

Birmingham Office:
- Provide a reasonable proposal for the new data center, taking the following needs into account:
    - server racks, physical organization, and cooling
    - server types/brands/models
    - core switch and networking needs
    - power distribution and backup
    - software application requirements specified in above document
- Network segmentation (subnets/VLAN)
- Security requirements

San Antonio Office:
- Redesign of the network infrastructure from SOHO (small office/home office) to a business-class network
- Equipment to provide connectivity to at least ten desktop workstations and thirty wireless devices
- Fast and secure connection to headquarters

Cedar Rapids Office:
- Intra-office connectivity
- Fast and secure connection to headquarters

Fresno Office:
- Complete upgrade of the listed network devices
- Fast and secure wireless connectivity
- Fast and secure connection to headquarters
- "hot" disaster recovery site for the Birmingham office

Judges Notes:

1. Network design should be in line with industry standards and reasonably priced
2. Network architecture should provide fast, secure, and efficient connections between the headquarters and other offices
3. The datacenter design is a key component of this scenario. It should be emphasized above other requirements in the document. Below are some points to check for in the proposal:
    1. Physical organization and setup of the datacenter is discussed
    2. The servers needed in the datacenter are detailed
    3. Network requirements such as devices are listed
    4. Thorough research has been put into all facets surrounding the datacenter design
4. The network in the Midwestern region is described as being very minimal. Proposals should keep this network design as simple as possible. There should be a clear contrast between the Fresno office and the Cedar Rapids office, in terms of complexity.
5. Security of connections is detailed in the proposal

JUDGING PROCEDURE

- Teams will be introduced by team number. **Contestants may continue to wear their name badges.**
- As a team of judges, formulate two to three questions to ask at the conclusion of the presentation. Be sure to ask the same questions of each team.
- No more than three (3) minutes for set-up.
- No more than ten (10) minutes for the presentation.
- No more than five (10) minutes for judges' questions.
- Excuse teams upon completion of judges' questions.
- **There can be no ties in the top ten (10) teams.** It is the responsibility of the judges to break any ties.
- Administrator will fill out ranking sheet prior to dismissing the judges.
- If more than one (1) section is necessary, finalists will be determined by selecting an equal number from each section.
- Give administrator all Judges' Rating Sheets, Judge Evaluation Sheets and contest materials.
- No audience is allowed in the contest room.

Please double-check and verify all scores!

Julie Smith *(Sender's Name)*   (Header: Sender's Last Name & Page #) Smith 1

   (DS)

Roger Meyer *(Recipient's Name)*

(DS)

Marketing Department *(Name of Recipient's Department or Job Title)*

(DS)

8 October 20___ *(use current date in military style (as shown)*

   (DS)

<div style="text-align:center">

Report Format
(DS)

</div>

> **Report**
> (MLA Style)
> Top Margin 1"
> Side Margins 1"
> Spacing of Body: DS

> *NOTE*: The title is typed in Title Case (not all caps) and is not bold.

    Whether written for personal or business use, a report should present a message that is well

organized, stated simply, and clear in meaning. A report that does not meet these criteria reflects a lack

of planning and preparation.

Planning a Report

    Three steps should be taken in planning a report. Selecting the topic is not merely the first step,

but also the most important one. It is vital that you choose a topic in which you have sufficient interest

to do the necessary related reading and research (LePoole 197).

Preparing the Report

    The following three steps should be utilized in preparing the report:

1. Look for data and authoritative statements.

2. Prepare a rough draft of the report, organizing the data into a series of related paragraphs. A

    sentence that follows enumerated items within the same paragraph should begin at the left margin.

3. Read the rough draft carefully.

    Whether the report is typed or printed, it should be neat and arranged in proper format. A

neat report presented in an orderly style makes an immediate positive impression on the reader.

> **Report—Second Page and Subsequent Pages**
> *(Right margin header—Sender's Last Name and Page #)* Smith 2