

NETWORK DESIGN TEAM (325)

REGIONAL – 2014

TOTAL POINTS _____ (530)

Failure to adhere to any of the following rules will result in disqualification:

- 1. Contestant must hand in this test booklet and all printouts. Failure to do so will result in disqualification.**
- 2. No equipment, supplies, or materials other than those specified for this event are allowed in the testing area. No previous BPA tests and/or sample tests or facsimile (handwritten, photocopied, or keyed) are allowed in the testing area.**
- 3. Electronic devices will be monitored according to ACT standards.**

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Description

The team will analyze existing and planned business environments and develop a strategy for the implementation of a network infrastructure that addresses the need(s) of the defined business environment based on 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 Technologies is a contractor for the United States government and large enterprises that provides technical, business, and engineering consulting. Elite Technologies is known for their quality of work as well as the high level of professionalism found in their employees. Being a firm that provides services to the United States government and large companies with various trade secrets, security is high priority when it comes to data retention and transmission. In accordance with government policies, Elite Technologies employees must attain certain levels of security clearance in order to perform their duties and view certain data. In recent years, the firm's number of contracts has increased greatly, and as such they are looking for ways to improve their level of service. Elite Technologies is looking for ways to improve upon their current network infrastructure without compromising security or efficiency.

One of the reasons Elite Technologies has decided to do a redesign of their current network infrastructure is that several locations are being added outside the region where they are currently headquartered. The firm's current headquarters is located in Houston, Texas, a satellite office exists in Washington, D.C., and offices are being created in San Francisco, California and Chicago, Illinois.

Headquarters: Houston, Texas

Elite Technologies occupies a large three-story building outside of downtown Houston. The first floor contains the following departments: reception, human resources, business strategy, business management, and accounting. The second floor houses the IT department and datacenter, and is the most secure of the three. The third floor contains the executive offices and several conference rooms, each equipped with video conferencing equipment.

The first floor contains approximately 41 workstations: 2 of the workstations are assigned to reception, 10 are assigned to human resources, 6 are assigned to business strategy, 8 are assigned to financial management, and 15 are assigned to accounting. All workstations on the first floor are connected to an intermediate distribution frame (IDF) that contains a patch panel and a 48 port 10/100/1000 Mbps switch with a 10 Gbps uplink. From this switch, a 10 gigabit multi-mode fiber line runs up to the master distribution frame (MDF) in the second floor datacenter.

The datacenter on the second floor contains 50 medium-density racks, a majority of which contain virtual server hosts. A large storage area network (SAN) provides storage for the virtual servers hosted on the virtual hosts and tapes are created weekly for backups.

The third floor contains approximately 10 workstations and all are connected to a 10/100/1000 Mbps, along with the two video conference rooms, which is then routed down to the datacenter on the second floor.

Satellite Office: Washington, D.C.

The Washington DC office contains the following departments: information security, litigation and contracts, and government relations. This office currently operates separately from the Houston, TX office as employees at this office do not need access to virtual servers or storage located at the headquarters.

Approximately 50 workstations are connected to the network at all times and a file server provides centralized storage for all departments. The only data that are sent from the headquarters are reports used by information security for auditing. Currently, data is sent through a proprietary encrypted protocol, but the company feels that the connection is too slow and the encryption scheme is outdated.

New Office: San Francisco, California

The soon to be completed offices in San Francisco will be located on the 8th story of a large building in downtown. The San Francisco office will be home to employees that conduct business with other companies along the West Coast, an area home to many leading enterprises and start-ups in technology. This office will be the future home of business relations and any employees working on contracts within the area, as such, several of the offices will not be home to a single employee, but will be occupied by whoever is working on a contract job in the Bay Area at that time.

Approximately 50 desktop clients will be on-site at all times in the office and a number of laptops belonging to the employees must be able to connect wirelessly to the Internet. This office must be able to have a fast connection to the headquarters in Houston in order to access the virtual servers and storage in the datacenter.

New Office: Chicago, Illinois

The Chicago office will serve strictly as a base of operations for all contracts in the American Midwest. This office will have approximately 20 on-site desktop clients and will need to provide wireless access to all employees. The number of employees staffing the office at any one point varies according to the current number of contracts in the area and network load can vary between 5-8 clients and 25-30 clients. A fast connection must exist from this office to the headquarters.

Customer's needs:

- Provide a fast, secure, and efficient network design for the two new offices and a method for connection to the main office.
- Provide a solution for the segmentation of the network in the main office as all machines are currently connected to the same network.
- Recommend an effective design for the subnetting of the entire network.
- Devise a solution for a faster and more secure method of communication between the Washington office and the main office.
- Provide a solution for a secondary Internet connection as well as a recommendation for a DR (disaster recovery) site and the connections required, as Houston is an area vulnerable to large storms and destructive hurricanes.
- Suggest a strategy for improving the current security of the network as well as security in the new offices.
- Design a strategy for effective communication of all employees. Note that because the company provides consulting and work is done based on a contract, many employees work remotely on laptops with encrypted hard drives.