**Network Admin and Design Project**

**Business Case**

One of the firms is considering to expand its current operations. A possible bottleneck identified to hinder business operations in the proposed expansion plan is the current telecommunications infrastructure. This project is about designing a new voice and data infrastructure to facilitate the planned expansion.

Background on the firm’s network: The firm is headquartered in San Francisco where they occupy the first and third floor of a large, but somewhat antiquated building. Each floor of the building measures 1000 ft. by 1500 ft. They currently have 200 outdated Pentium-based PC’s located on the third floor to meet the needs of the accounting, billing, and phone sales departments. The first floor contains 75 Pentium-based computers and 25 Apple PowerMacs used by management, receptionist, and walk-in sales staff. They currently have a 10Base2 network that is used to connect some, but not all, of the existing systems.

You as a senior network administrator assess that the remaining systems could not be networked due to the 10Base2 architecture. Keeping the immediate expansion proposal in mind, (say) you plan to add more branch offices in Los Angeles, San Diego, and Sacramento. Currently there are three small branch offices one each in Los Angeles, San Diego, and Sacramento. These offices generally have 20 to 25 Pentium or Apple-based computers. However, the computers in these locations are not currently networked. The immediate expansion plans, if approved by the shareholders, include opening a second office in Los Angeles, two offices in San Diego and three offices in Sacramento. These offices will be similar to the existing small offices operated in the respective cities. The goal set for the new telecommunications network includes having all of the existing and proposed offices connected together in a seamless, secure manner. All of the computers in all of the offices should be connected.

**Deliverables:**

1. As a senior network administrator, would you suggest to design and implement a new network from scratch, or would you rather upgrade the existing network by continuing to build on the existing network? Support your answer with detailed explanation and justification.
2. What network architecture would you suggest to implement as part of the proposed expansion plan? (E.g. I see the network as consisting of two primary parts, the networks within each facility and the network that connects all branch offices together). Suggest your network architecture accordingly.
3. Please provide diagrams for each of the office locations that illustrate how these networks will look after the new infrastructure rollout. You may use Visio, Word, or similar software to draw the diagrams.
4. I will require a detailed cost proposal for both the installation and first year’s operating cost associated with the entire proposed infrastructure. You will need to consider all equipment and wiring costs, the cost for the proposed services from the phone companies and provide the source for your costing information (Excluding labor costs).
5. Currently all offices use IPv4 protocol. Discuss the feasibility of implementing an IPv6 protocol along with the new infrastructure. Whether you choose to implement IPv6 or not, discuss the business ramifications of implementing IPv6 at this time.
6. Describe how security will be maintained for data, particularly for data being transmitted remotely between offices.
7. List the most applicable wireless security protocols that you plan to implement in your network design for the proposed expansion project. Discuss how you will implement a network that will allow secure wireless communications between computers and other resources, including Internet access.
8. Research and discuss steps for configuring wireless access points and wireless network adapter with various security features (including WPS, WEP, WPA2, etc.) The steps may correspond to either GUI or command line, or a mix of both.

**Submission Requirements:**

* Format: Microsoft Word
* Font: Arial, 12-Point, Double-Space
* Citation Style: APA
* Length: Minimum of 12 pages.