**ENEL 443 Design Project**

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**Introduction**

In this project, we are required to design a network across US and Canada for a sole company. We are to assume that the network has no current existing network infrastructure in all the locations. The cities that we are required to develop infrastructure are Vancouver, Los Angeles, London, Montreal, Toronto and Boston. Each city will have their own number of hosts that we will need to consider before implementing our design. We must also take into consideration the reliability, efficiency, cost and security for our design to ensure it’s the most efficient.

1. Network layout
   1. Requirements and specifications

Specific network requirements are generally given by the client to determine what is valued most. General requirements that should be considered are things such as; scalability, reliability, security, performance, manageability, and cost-effectiveness. Scalability is better described as long-term ability to incorporate growth and expansion. If a network is only able to handle the set number of hosts and nothing more, then this can raise issues in terms of instances when there are hosts that go over the set cap. Reliability is a requirement that should be incorporated to ensure that network services are always available to consumers. Security in its simplest form is to prevent any unverified access to the network to minimize breaches and threats. Performance should be valued in the network as well since it needs enough bandwidth and must reduce latency to ensure the services on the network are able to run efficiently. Manageability is when the network itself is easy to maintain and provides tools that can allow for easy troubleshooting even for individuals not very savvy with the technical aspects of the network. Lastly, for cost-effectiveness the network should be capable of balancing the performance as well as the reliability with the cost. This is done in order to ensure that the network can handle the required load and slightly more in case of instances where the cap is gone over. Furthermore, the company must be able to maintain the network over time with a reasonable cost.

* 1. In-depth layout and topologies for layers