Networking

Name _____ **Networking Final Take Home Exam**

Please complete five of the following nine questions. Each question is worth 20 points for a total 200 points.

1. If you were to implement a switching network architecture for a financial firm where the speed, bandwidth and low latency switching are of utmost importance, what switching method would you use. Please provide a detailed explanation why you would choose this particular method and what importance it may hold in the overall design and implementation.

2. A company adheres to open standards when implementing any and all new technology. They have a need to redesign their internal network routing architecture. The company has locations worldwide. What routing protocol would you choose to implement at this company? Please provide a detailed explanation why you would choose this particular routing protocol for this company and the importance it would have in the overall design and implementation of the network.

3. A Tier 2 service provider is peering with two upstream Tier 1 service providers. This Tier 2 service provider is also peering with their customers. What protocol is being used between the Tier 2 and Tier 2 service providers and the Tier 2 service provider and its customers? Without going into detail with regard to specific IP Addressing, provide the diagram for this network topology using the appropriate terminology and make sure to specify the peering relationship in terms of the specified protocol.

4. You are provided a network address of 204.5.6.0/24. Utilize the most efficient ip addressing design for a network with the following criteria:
    a. There are five locations.
    b. Location1 is connected to Location2 via a WAN connection.
    c. Location2 is connected to Location3 via a WAN connection.
    d. Location1 is connected to Location4 via a WAN connection.
    e. Location1 has two network segments on the same layer2 physical hardware.
    f. Segment1a in Location1 has a maximum of 40 devices.
    g. Segment1b in Location1 has a maximum of 50 devices.
    h. Location2 has a maximum of 20 devices on its LAN.
    i. Location3 has a maximum of 10 devices on its LAN.
    j. Location4 has a maximum of 50 devices on its LAN.

5. A cloud-based service provider currently has 40 physical firewall appliances providing its customers security policies. They have a strong virtual infrastructure for their storage and computing environment. What technology could this cloud-based service provider use to provide a more efficient computing environment for its customers that would utilize fewer resources and potentially provide more functionality? What additional functionality would this environment provide, if any?

6. A hospital network is currently undergoing high latency through one particular segment of their network. When the radiology department of the hospital has a patient that requires an X-ray to be captured and sent directly to the server in the hospital's data center, it takes an extremely long time to complete the image transfer from the X-ray machine to the server causing high latency in that portion of the network. What technology could be used to mitigate this problem? Explain your reasoning why you chose this particular technology and what improvements would occur from its implementation.

7. In a medium-size business network there is a DHCP server in the data center. The network consists of large redundant and fault tolerant layer2 architecture. When a client boots, there DHCP request times out. What might be occurring within the network that is causing this problem? How would you resolve this problem?

8. A company utilizes a central point of control to change its network configurations via open standards. They have 50 switches across their campus network all being managed from this central point of control. What technology is this referred as? What underlying protocol is used? What functionality can this standard provide?

9. An enterprise network consists of two core multilayer switches. What technology and protocol(s) could be implemented to provide a redundancy and fault tolerance if one core multilayer switch fails? Describe the protocol(s). Design a topology using Cisco Packet Tracer and implement this protocol. Provide a screenshot of the topology and your configuration files and include your .pkt file with your final exam submission.

When you have completed five questions above, please submit this to ilearn in the assignments section. This document should be posted in .doc or .docx format in addition to any other documents, designs or simulation files.