Network Foundations Summative Assessment

**Assignment 1**

**To complete this case study, you will need to read the paper at this link: Chesapeake Netcraftsmen**

**You will also need to do some additional internet research to fully answer all the questions below. Your answers should be written in your own words, from your own understanding, and not copied from any source.**

**You will need to write a minimum of one a paragraph to fully answer each of the questions below, and many of the questions will require more than one paragraph.**

**Case Study Questions:**

**This white paper was published by Chesapeake Netcraftsmen. Research the Netcraftsmen company and briefly describe the kinds of IT services this company provides.**

**In the year 2022, NetCraftsmen's new webpage is:** [**https://netcraftsmen.com/**](https://netcraftsmen.com/)**. The hyper link provided in the published White Paper, is no longer valid, the web page returns a 404. I was able to find NetCraftsmen in Maryland with the same phone number, Headquarters now located at: 7134 Columbia Gateway Dr Ste 100, Columbia, Maryland, 21046, United States. Paul Mauritz, President & CEO leads this $19 Million LLC. For over 20 years they have sucessfully Locked out CyberCrimals from accessing Data Blocks from highly regulated Government Facillities, Financial Institutions, and many more Sectors here in the U.S. They are for hire. You can pay for their services monthly for Ongoing management of your Network or a fixed fee for Consultations and Floor Plans. NetCraftsmen will analyze your Security Breaches and Create a solution with your current Hardware or you can upgrade your Hardware if nessacary. They also offer a Cloud Solution for your Data Centers and Networks. NetCraftsmen will Secure your Infrastructure while allowing Availability to your Cohorts.**

**Explain in your words what the authors of the white paper define as “Medical Grade Networks”. Your discussion should include an explanation of some specific network design challenges that health care networks present.**

**The Network Hub for Healthcare Facilities can span down the street, where the pharmacy is located to across the Globe and to design a Secure Network which is accessible is very Challenging. The security to protect this Data from CyberThreats must be created from the purest materials. NetCraftsmen has experience in this area and has outline a design for other CyberSecurity Professionals called “Medical Grade Networks”. This design is rooted in the hierarchical, three-layer model: core, distribution, and access layers. NetCraftsMen doesn't stop at the Core layer. To access the Servers you need to jump throught Virtual Servers after the Core Layer.**

**Describe the Cisco hierarchical three-layer model, including the purpose of each layer and some advantages provided by a network design that uses this model.**

**The three-layer model developed by Cisco are the Access Layer, Distribution Layer and the Core Layer.**

**The Access Layer consists of the workstations locally that requests and updates Data on a server. This layer usually incorporates Layer 2 switches and access points, these devices locks down the port numbers to the MAC address of the workstation and provide connectivity between workstations and local servers. You can manage and implement port security at this layer. If the MAC adress doesn't match the port number the connection is denied.**

**The Distribution Layer serves as the communication point between the access layer and the core. Its primary functions are to provide routing, filtering, and WAN access and to determine how packets can access the core. This layer determines the fastest way that network service requests are accessed – for example, how a file request is forwarded to a server – and, if necessary, forwards the request to the core layer. This layer usually consists of routers and multilayer switches.**

**The Core Layer is the backbone of the network, this layer is responsible for transporting large amounts of traffic quickly. The core layer provides interconnectivity between distribution layer devices it usually consists of high speed devices, like high end routers and switches that have a switching Capacity of 6.4 Terabits per seconds with redundant links.**

**Which ISO Model layer provides end-to-end connectivity in this network design, and what networking devices are required?**

**In this Network Design the ISO Model layer that provides end-to-end connectivity is called the Routing Layer. When a device is set up to have multiple paths to reach a destination, the device can be programmed to always select one path by preferring it over others. This selection process is termed as Routing. Routing is done by special network devices called routers or it can be done by means of software processes.**

**Explain why the devices identified in Question 4 are used for end-to-end connectivity rather than OSI Model Layer 2 switches. What problem can extensive use of Layer 2 switches create in a large network?**

**Routers are used for end-to-end connectivity rather than OSI Layer 2 switches because Routers gives us the ability to secure different networks and pass Traffic to and from them. Layer 2 Switches only passes traffic from one Host to another Host and only if they are connected to the same switch. Layer 2 switches also known as bridges cannot break up broadcast domains, which can cause performance issues and limits the size of your network. Broadcast and multicasts can cause major problems as the network grows.**

**Why are multiple virtual networks used in the network solution described in the white paper rather than separate physical networks?**

**Chesapeake NetCraftsMen uses multiple virtual networks to aid in the delivery of Requested Data and to keep the Networks isolated if a breach does occurred. NetCrafstmen calls their virtual networks, VNOs, Virtual Network Overlays.Once the network infrastructure has been established the Virtual Network Overlays are applied to it. Once applied, the networks are seperated and built to support the different branches in the Health care facility, which includes the guests wifi. VNOs provides the Secure Isolation that Physical networks provides without the same downtime if the network needs to be repaired.**

**What is the purpose of QoS? How does network support for the services provided in a health care environment map to the QoS priority chart on page 3 of the white paper?**

**Quality of Service is designed to Prioritze Application requests. QoS is also flexible and will be taliored to the type of buisness. In the example of a Health care environment QoS gives Routing and Switching Protocols the highest priority to troubleshoot and improve the transfer of Data. Communications is second on the priority list, this includes Voice Over Internet Protocol phone systems. Thrid Highest Priority to get throught the network Firewall rules are any Life-Critical devices or Instruments monitroring the vitals of a patients, this includes Emergency Life and Fire equipments.**

**Describe the security needs found specifically in health care environments. Explain how the solutions proposed in the white paper meet these needs.**

**Protected health information (PHI) is among an individual’s most sensitive and private data. CyberCrimals want your PHIs, they can get rich from it. Health care Providers has Urgent Care scattered in mulitple buildings and spanning down the block, across town and surrounding Counties. The scattered entity now has a weak link in the Network and has gain the attention of cybercrimals. To combat this NetCraftsMen has implemented a solution to stop the threat. They propose to combine these separate networks into one physical infrastructure, implementing the “Medical Grade Networks”. A design that secures the Main Server Layer behind redundant Virtual Servers called The Distrubition Layer , These two Layers are protected by The Core, Distribution, and Access Layers. The Virtual Servers distribute and prioritize Network Traffic Making Data Avaiable when authorized requests are recevied.**

**Based on information available on the netcraftsmen.com website, briefly describe a solution that this company has provided to help a health care company cope with new needs due to the Covid-19 pandemic. Your answer should describe the problems that the pandemic created and an overview of the solution.**

**When was COVID-19 officially declared a pandemic?**

**The World Health Organization (WHO) on March 11, 2020, declared the novel coronavirus (COVID-19) outbreak a global pandemic. The Nation had to contain it, Healthcare Providers had to test and care for everyone while educating about qurentine to thoes infected. Makeshift Testing Triage centers were erected where Hospitals were too far away. The Personal Data collected from these centers had to be compiled and cataloged for a Real time analysis of infected areas across the Nation. All that Data also needed to be Locked down and secured. NetCraftsMen helped the Mid-Atlantic Healthcare chip away the unknown. Mobile “Medical Grade Networks” were created, Twenty Seven in total. The Pandemic cause slow to non-existence supply chain issues. The hardware and technology NetCraftsMen used had to be readily available and whatever was on hand. Each mobile network units were deployed within two weeks and replicated in the same amount of time.**