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**Department of Computing Sciences and Mathematics**

**College of Art, Science, and Technology**

**ITEC 205: Cloud Fundamentals**

**Homework Assignment 2: Cloud Networking and Storage**

**Questions:**

1. How is the DoD model for the TCP/IP protocol suite differs from the 5-Layers Internet model?

The two models differ with the DoD model having the bottom layer of network access that contains any physical need such as the ethernet cables as well as the data needs like WI-FI while the 5-layers model starts with a physical layer which is only the hardware needed to move from the physical device into the computer itself and then the data layer which is only for data. The next layer is the internet which is similar to the network layer within the 5-layers model but instead connects to different posts like connecting the system to the cloud. The host-to-host layer is the connection between you and the cloud you are trying to reach which is similar to the transport layer in the 5-layers model. Then we reach the application layer which is similar to the application layer in the 5-layers. The main difference is the steps it takes to go from hardware to the destination.

1. Mentions 4 ways to connect to the cloud. What are the possible capabilities (i.e., what we can do when using this technology?) and limitations associated with each method when accessing the cloud.

The first way to connect to the cloud is by using HTTPS with the web browser. You can use this to connect to safely with its built-in safety features and can be done with any device. The drawback is that you have to have an internet connection to be able to reach the cloud. The second connection is with the remote desktop protocol to create a virtual instance which means there is no added hardware and no waste of physical resources. It has the drawback of needing a good system that can handle running a virtual machine and can take a bit of time when doing tasks on this instance. The third way to connect is the use of the secure shell (SSH) should you require a Linux instance. The upside is that it runs as a text command within the command prompt but you have to know that command line to be able to run it. The fourth way is by using a virtual private network as you can connect to the it remotely as if you were there. The downside with VPNs is that people think that VPNs are safer than they really are as even with having your signal bounce around if someone wanted to, they could hack you.

1. What is the difference between traditional networking model and SDN model?

The main difference between traditional and the SDN model is that SDN takes and separates its forwarding into two sections one being the network packets and the other being the logical decision-making process.

1. Why we need load balancing in cloud computing? What are the two common configurations for load balancing? Provide an example where we can use each of them.

Load balancing is important in cloud computing because of the amount of requests that are sent to the servers. Load balancing helps balance the workload to keep everything running smoothly and quickly. The first load balancing model is the cross-region which has servers that run in different regions who will run their regions requests and pick up the requests where the region’s server may be too busy. An example of this would be a big business such as Nintendo who sells and runs products all over and originate in Japan but has offices in America. They not only have their site and the traffic it gets to make sure is balanced but it also has the Nintendo live features on its devices, so it needs to be able to have servers for the different areas its based in to help keep everything balanced. The other model is content-based which will split up the requests based on product. An example of this would be Microsoft creating servers specific to its different areas such as a server for pc, one for games, and another for console as these each have different requests that center around its topic.

1. What is the role of the firewall in cloud computing?

The firewall is used to protect the network against threats. Cloud computing has sensitive data that it can store so a network-based firewall with one for public side and another for internet would help protect it.

1. What is Cloud-defined Storage and how it differs from the on-premises storage systems?

Cloud-defined storage lets data be stored inside of external storage so it can be accessed by outside of the area it is stored. On-premises storage means that the data is stored internally and is accessed locally. Cloud storage also separates the physical data it stores from the logical control overdrive configuration where on-premises does not.

1. What are the different types of cloud-defined storage systems? Provide an example where type is used.

The different types of cloud-defined storage systems are object storage, file storage, and block storage. Object storage is used for unstructured data so if a company wanted to store a lot of photos they would use this storage type. The file storage is a directory created to store structured data such as folders. An example is that for each class I have made a folder so once I finish the class, I move it into another folder called completed classes that stores the class folders I have made. Block storage is used for files by splitting them into chunks of data of equal size with its own unique identifiers with the best example for this being databases.

1. What is CDN and how it differs from SDN?

CDN or content delivery networks are used for load balancing mostly with web servers so they can speed up access to the resources within the web with locations set up around the world. SDN has more of a focus on the network itself and CDN focuses on the content that is being delivered.