**CMIT 495 Current Trends and Projects in Computer Networks and Security**

*Week 2 – Cloud Computing*

1. **Log in to your newly created AWS account and take a screenshot of the AWS Management Console (Dashboard) and paste it below question 1. The screenshot should include the username you created during the setup phase.**
2. **Launch a Windows Virtual Machine (VM). Provide a detailed overview of the steps required to install the Microsoft Windows operating system (OS) on the VM. The steps may be listed in the form of bullet points or a summary with complete sentences. Use as much space as required. Finally, take a screenshot of the desktop and paste it with your response below this question.**
3. **Using what you learned from Project 1, provision and launch a new AWS EC2 Ubuntu Linux Server and connect to it via the SSH protocol. Note any challenges or opportunities associated with this provisioning.**
4. **Using AWS, *create a network file system* with Amazon Elastic File Systems (EFS) and attach it to the running Ubuntu Server instance. You may use the** [**AWS**](https://docs.aws.amazon.com/efs/latest/ug/how-it-works.html) ***web page* for step-by-step instructions and understand how the EFS works. Take a screenshot of the result and embed it below. Specifically, take a screenshot to verify *that your file system has been successfully mounted*, along with the results from *creating a test file in your new file system. This will be done by running a simple dd command to generate a 1GiB file in your new directory.* Finally, describe the value of a network file system.**
5. **Using the AWS platform, create an S3 bucket and upload any file to the S3 bucket. Take a screenshot showing the file was uploaded to the S3 bucket and paste it below. If necessary, use the AWS webpage above for step-by-step instructions.**
6. **The CTO will be reviewing this document. You have shown how easy it is to provision a Microsoft OS using the AWS platform. The CTO chose AWS because it offered a free account. She will now expect a recommendation from you on what cloud service to use for the organization’s PaaS (e.g., the infrastructure, OS, runtime, etc.) needs. There is no need for a private cloud, so the public option will work just fine. Describe the difference between the Google Cloud platform, Amazon AWS platform, and Microsoft Azure platform. Provide a recommendation for the CTO as to which service provider you would recommend and why. Be explicit and detailed in your recommendation.**
7. **The CTO approved your comparative analysis between the cloud service providers (i.e. Amazon, Google, and Microsoft). She has decided to proceed with an** [**Amazon Virtual Private Cloud (Amazon VPC)**](https://docs.aws.amazon.com/vpc/latest/userguide/what-is-amazon-vpc.html)**. The Amazon VPC en**a**bles one to launch AWS resources into a virtual network, which is similar to a traditional network that can be operated in an on-premises data center. Keep in mind that networking, storage, and security associated with a VPC are as important as the overall scalable infrastructure of AWS.**
   1. **To begin, the CEO would like you to provide the network settings needed to provision two (2) subnets for the VPC as shown in the table below:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Subnet** | **End-User** | **CIDR** | **Network** | **Broadcast** | **Mask** |
| **A** | **Developers** | **146.38.70.105/20** | *Click or tap here to enter text.* | *Click or tap here to enter text.* | *Click or tap here to enter text.* |
| **B** | **Marketing** | **172.31.0.0 /16** | *Click or tap here to enter text.* | *Click or tap here to enter text.* | *Click or tap here to enter text.* |

* 1. **Based on your understanding, list the network address, broadcast address, and subnet mask for subnet A and subnet B in the table above. Perform the necessary calculations and explain how you arrived at your answer.**

**To better help you understand IP addressing, IP subnetting, and IP address summarization, review the following AWS documentation prior to answering the questions in this section:**

* [**VPCs and subnets**](https://docs.aws.amazon.com/vpc/latest/userguide/VPC_Subnets.html)
* [**CIDR and Peering for VPC and AWS Control Tower**](https://docs.aws.amazon.com/controltower/latest/userguide/vpc-ct-cidr.html)
* [**Subnet CIDR reservations**](https://docs.aws.amazon.com/vpc/latest/userguide/subnet-cidr-reservation.html)

**Note:**

**The key benefit of an Amazon VPC (or a virtual private network) is that the internal network devices are not openly accessible via the Internet and can only be accessed from within a secure network. Thus, it keeps the proprietary applications and data protected.**

**Classless Internet Domain Routing (CIDR) notation: CIDR was introduced as a means to primarily improve address space utilization as a result of the rapid growth of the Internet and growth of the IP routing tables held in the Internet routers. Represented by an IP prefix, CIDR moves away from the traditional IP classes (e.g., Class A, Class B, Class C, etc.). Subnetting a network address space using CCIDR leads to an effective IP address space only for the number of hosts needed without wasting IP addresses.**

1. **Please note the following carefully. Confirm that you have stopped and terminated your Microsoft Windows virtual machine, deleted your file system from the Amazon EFS console, deleted the contents of your Amazon S3 bucket, and deleted your Amazon S3 bucket. To confirm, simply type your name below.**

***Click or tap here to enter your name.***