**Homework File: Cloud Security**

Congratulations! You have finished the cloud security portion of the course.

Your homework assignment will be 2 parts:

**Part 1**

Cloud computing has many terms and definitions that are unique to the cloud. As such, it is important to understand and remember this jargon when speaking to potential employers or peers.

In part 1 of the homework, our goal is to solidify many of the terms and concepts you have learned throughout the last 4 weeks of class.

**Instructions**

Answer the following questions in your own words:

1. What are 3 common job roles that combine security and cloud skills?
   1. Cloud Security Analyst
   2. Cloud Architect
   3. DevSecOps
2. What are the 3 biggest cloud provider platforms?
   1. AWS
   2. Azure
   3. Google Cloud
3. What are the 6 most common cloud services (and their acronyms)?
   1. Infrastructure as a Service (IaaS)
   2. Platform as a Service (PaaS)
   3. Software as a Service (SaaS)
   4. Data as a Service/Database as a Service (DaaS/DBaaS)
   5. Communications as a Service (CaaS)
   6. Anything as a Service (XaaS)
4. What is the difference between a virtual network and a physical network?
   1. A virtual network connects **virtual machines** and devices, no matter their location, using software. ... In a physical network, LANs are created to connect multiple devices to shared resources, like network storage, usually through Ethernet cables or Wi-Fi.
5. What is the point of setting your first firewall rule to block *all* traffic?
   1. This strategy provides good control over the traffic and reduces the possibility of a breach because of service misconfiguration.
6. What is the difference between physical computing components (CPU, RAM, HDD/SSD) and virtual computing components?
   1. In physical computer, all of the components are all physical. In a virtual machine, most of the components are software.
7. What is the purpose of using an encrypted ssh key to connect to a machine?
   1. It is the most secure way to configure remote access.
8. What is the difference between a container and a virtual machine?
   1. Containers are essentially lightweight VMs. These act like VMs but are smaller and use fewer resources by sharing the resources they have in common with other containers.
9. What is a provisioner? Provide 3 examples of common provisioning software.
   1. A provisioner is a software application used in IaC setups for making automated configuration changes to computers.
   2. Ansible, Puppet, and Chef.
10. What is meant by Infrastructure as Code?
    1. Infrastructure as code (IaC) is the concept of defining all of your equipment and network with code. When using virtual machines and containers, almost every server, database, workstation and other component in your infrastructure can be individually defined with code.
11. What is Continuous Integration/Continuous Deployment?
    1. **Continuous Integration/Continuous Deployment (CI/CD)** is the concept of automatically updating machines on your network whenever your IaC files change. In other words, whenever you change a machine's configuration file, CI ensures that a new version of that machine is built immediately. CD ensures that this new version is automatically deployed to your live environment.
12. What is a VPN and when should us use one?
    1. A VPN creates a direct connection between your local network and a remote network and can encrypt all network traffic between your current network or device and your remote network. Once you are connected to the VPN, you have full access to all resources on the remote network, as if you were locally connected. Many companies use VPNs to allow remote workers access to computers and servers that are otherwise only accessible from the local network.
13. What is the purpose of a load balancer?
    1. The load balancer receives any traffic that comes into the website and distributes it across multiple servers.
14. What is a resource group in Azure?
    1. A resource group is a logical grouping of all resources used for a particular setup or project. The resource group will contain the network, firewalls, virtual computers, and other resources that are needed for setup.
15. What is Region in Azure?
    1. A region is **a set of data centers deployed within a latency-defined perimeter** and connected through a dedicated regional low-latency network.

**Part 2**

**Background**

* During the last week, you created a highly available web server for XCorp's Red Team to use for testing and training.
* Your lead cloud administrator has asked for a diagram of the Network you created to keep for documentation and company records.
* Your task: Use [draw.io](https://app.diagrams.net/) to create a detailed diagram of your cloud infrastructure.

**Cloud Recap**

When you're finished completing all the activities in cloud week, you should have:

* A total of 3 VMs running DVWA.
* All 3 VMs receiving traffic from your load balancer.

**Your Goal**

When you are finished with this assignment, you should have a network diagram that shows your entire cloud setup, including your Ansible jump box and the Docker containers running on each VM.

This document can be used as part of a portfolio to demonstrate your ability.

**Instructions**

Use a free account at [draw.io](https://app.diagrams.net/) to diagram the entire cloud network you have created.

- Your diagram should show the following:

- Azure resource group

- Virtual network with IP address range

- Subnet range

- Flow of specific traffic (e.g., HTTP, SSH)

- Security group blocking traffic

- Load balancer

- All 4 VMs that you have launched

- Where Docker and Ansible are deployed

Week 12 Diagram

Diagram

Description automatically generated