Virtual Machines

Install any virtualization software on your desktop/laptop.
Download Ubuntu 20.04
Check the SHA256 checksum.
Create an Ubuntu 20.04 virtual machine.

DNS

Install dig on the virtual machine
- Ensure networking capabilities of the VM so dig can get to the internet
- Use dig to query for DNS records
- Use dig to query do a reverse DNS lookup

Find the following using dig:
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1. Find the IP address of mse.isri.cmu.edu
2. Query the A, MX, and CNAME DNS records for mse.isri.cmu.edu
3. Look up and determine the TTL for each portion of the DNS hierarchy
4. Perform a reverse DNS lookup of the IPv4 address 8.8.8.8

Containers and Networking

- Install docker on the VM
- Create one dockerfile that has/runs the 'grep' command
- Create a second dockerfile that has/runs the 'cat' command
- Network the containers so they're visible to each other and the host machine
- Execute a search that takes a file and keyword that outputs the line of the file containing the keyword

TLS

- Install nginx and openssl packages
- Create self signed ssl certificates
- Apply Diffie-Hellman to the certificate
- Configure nginx with the self signed certificates
- Connect to the nginx server

SSH

Using the two ubuntu virtual machines, enable ssh from one VM to the other using SSH keys. Configure ssh to include a login banner, client alive, and whitelested users.

- Create keys for the virtual machine and relocate them to the appropriate directories on the two machines.
- Configure ssh for the requirements in the description.
- Use 'touch' to create a file on the 'server' named created.txt
- use 'ls -la' to see that the file was created and the username and group that it was created under
- 'exit' from the server box.

Jenkins:

- Use Vagrant to set up a Ubuntu virtual machine with Jenkins , Blue Ocean and SonarQube plugin.
- Use SonarQube to do a static analysis of petclinic (Either on same VM or sperate VM)
- Visualize build process with blue ocean
- Use Jenkins to build petclinic.jar
- Execute petclinic.jar and take a screen shot of the welcome screen.
- Copy petclinic.jar to your host machine for a later assignment.

Ansible

- Use Vagrant to set up a (Server 1) Ubuntu virtual machine that acts as the ansible host and Jenkins (server 2) web server where petclinic app to be deployed
- Use ansible on the Jenkins build server created in exercise 1 to deploy petclinic.jar to web server (server 2)
- Execute petclinic and display welcome screen.

Istio

- Setup istio on docker desktop
    - https://istio.io/latest/docs/setup/ (Links to an external site.)
    - https://istio.io/latest/docs/setup/platform-setup/docker/ (Links to an external site.)
- Deploy BookInfo Microservice application
    - https://istio.io/latest/docs/examples/bookinfo/ (Links to an external site.)
- Route requests dynamically to multiple version of microservices for BookInfo app.

Logstash

- Reuse assignment-2 web server where Petclinic was deployed, capture the log files generated by Petclinic in Logstash.
- Pass the formatted logs to a spreadsheet by using the .csv format output option of Logstash