Individual Clout Computing Questions

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Demonstration Videos:

https://drive.google.com/drive/folders/1vEnwTgwCnBo0c7Cr74J7qRTwsACSMa0K?usp=sharing

1. **What are docker images, container, and registry**

    - Docker images are comparable to the classes that docker containers run. A registry is akin to storage or a large collection/composition of data, but a container is similar to virtual machines in that it allows you to run real-time photos or apps without requiring a guest operating system. Docker images are kept in these repositories.

2. **List the Docker commands used in the video with a brief description for each command and option.**

    i) Docker version - displays the current version and status of Docker in the terminal.
    ii) Docker images Is a list of all available Docker images.
    iii) Docker build -t hello-world:1.0 (SIMILAR for 2.0, 3.0, etc.) - builds a docker file with the tag 1 and the hello-world image name supplied.
    iv) Docker run -r hello-world:1.0(SIMILAR for 2.0, 3.0, etc.) - This application will be executed using the image name and tag supplied using the docker run command.
    v) Docker ps - displays a list of containers that are presently operating.
    vi) Docker ps a – all containers whether running or stopped
    vii) Docker logs <container id> - take a look at what's going on in the container

3. **At the end of the video, there are two running containers, what commands can be used to stop and delete those two containers?**

    - Docker <container id> - rm will remove/delete container
    - Docker kill <container id> - halts containers from running

4. **What's a multi-container Docker application?**

    - A container that holds a lot of containers A Docker application consists of a collection of containers that may interact with one another. In the Docker system, each of these containers has a distinct role.

5. **How are these containers communicated together?**

    - Because everyone is accountable for performing a specific function for the system - containers operate independently, however "networking" can be used to connect them and share data or information (send/receive).

6. **What command can be used to stop the Docker application and delete its images?**

    - docker image -rmi <image id>

7. **List the new docker commands used in the video with a brief description for each command and option.**

    - Docker run --name app -d my-web-app:1.0: The program is executed in detached mode when the name option for the container is used.
    - Docker rm -f/-rm app: "-f" halts the container and "rm" terminates it.
    - Docker network ls: displays all of the containers' networks in Docker.
    - Docker run --name app -d my-web-app:1.0: The name option for the container is used to execute the program in detached mode.
    - Docker network create app-network: Creates a container-to-container communication network.
    - Docker compose-up: Starts the application by bringing in both containers.
    - Docker pull mysql: Obtains the mysql image for use as a source.

8. **List all used GCP shell commands and their description in your report.**

    - Docker cp index.html:/usr/share/nginx/html/: the html file that will be used to convert the side into the container id
    - Docker run -p 8080:80 nginx:latest: Simply runs a docker container on port 8080 as the host.
    - Docker cp index.html<container id> :/usr/share/nginx/html/: the html file that will be used to convert the side into the container id
    - Docker tag cad/web:version1 us.gcr.io/youtube-demo-255723/cad-site:version1: allows specifications of tag and name of container
    - Docker push us.gcr.io/youtube-demo-255723/cad-site:version1: Push the following
    - Gcloud config set project youtube-demo-255723: Configures the project name to it's default
    - Gcloud config set compute/zone us-central1-a: Allows to set us a time regarding timezone for gke cluster prior to beginning developments
    - Gcloud container clusters create gk-cluster --num-nodes=1: Produces gk cluster for respective containers
    - Gcloud container clusters get-credentials gk-cluster: Allows credentials to be passed through gk cluster
    - Kubectl create deployment web-server --image=us.gcr.io/youtube-demo-255723/cad-site:version1: opens web server through image
    - Kubectl expose deployment hello-server --type LoadBalancer --port 80 -target-port 8080: Gives exposure to deployed server by giving user ports

- Kubectl get pods: shows running ports
- Kubectl get service hello-server: shows server “hello-server”

9. What is Kubernetes’ pod, service, node, and deployment?

- Pod: In Kubernetes, pods are the most basic and smallest deployable objects that can host many containers. They're effectively operating single instances of cluster processes.
- Service: A service in Docker is a generic representation of a cluster or collection of pods.
- Deployment: Command that informs Kubernetes how to create/change pod instances

10. **What’s meant by replicas?**

- A replica is when many pod instances are executed in a process to maintain the number of pods consistent. This ensures that users may continue to use the program even if a pod fails or becomes unavailable.

11. What are the types of Kubernetes’ services? What is the purpose of each?

- loadBalancer: Exposes the service
- externalName: map service by having the CNAME return value
- nudePort: The service will be exposed from the port by the IP of each node (that is static)
- clusterIP: Services within clusters can be shown.