

Faculty of Engineering and Applied Science

SOFE 4790U Distributed Systems

Lab 1: Intro to K8S

**Group 19**

Individual Report

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## Objectives

1. Get familiar with Docker images and containers.

2. Learns various Kubernetes tools.

3. Learn how to use Google Cloud Platform (GCP).

4. Compose YAML files to deploy cloud applications.

## Procedure

## Lab Discussion

1. Summarize what you have learned about Docker and Kubernetes including the used terminologies and their descriptions.

Docker is a tool which is used to automate the deployment of applications in lightweight containers, so that the application can work as intended in different environments. The container is a software package that consists of all the libraries and dependencies required to run the application. Om order to easily share and create these containers, a Docker Image file can be used to serve as a template with instructions. These image file can be then shared to other users to ensure the working environment to run the application is the same.

Kubernetes is a portable, extensible platform to help manage containerized workloads and services. Kubernetes manages containers in various nodes/clusters, while offering scalability. With this management and scalability, Kubernetes can make a cluster that allows the app to run on multiple nodes, allowing for load balancing.

1. What are the advantages and disadvantages of using docker images against using virtual machines.

Docker Images ensures the software environment is the same across various computers. In virtual machines, there is the dependency of having the same guest OS installed on all systems, and then having to install all the necessary packages and run time dependencies. With the use of a Docker Image, the blueprint required to run the application is already given, so all dependencies and libraries can be installed, including their version number.

## Lab Design

1. MongoDB is anther type of databases. It’s required to deploy it using GKE using a YAML file. If you used any Kubernetes tool in your deployment that is not included in the lab you should describe it and why you used it.

## References:

[1]

Simplilearn, “What Is Docker? | What Is Docker And How It Works? | Docker Tutorial For Beginners | Simplilearn,” *YouTube*. Sep. 14, 2018. Accessed: Sep. 15, 2022. [YouTube Video]. Available: https://www.youtube.com/watch?v=rOTqprHv1YE

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Google Cloud Tech, “What is Kubernetes?,” *YouTube*. Nov. 07, 2020. Accessed: Sep. 15, 2022. [YouTube Video]. Available: <https://www.youtube.com/watch?v=cC46cg5FFAM>

[3]

“What is Kubernetes?,” *Redhat.com*, 2022. https://www.redhat.com/en/topics/containers/what-is-kubernetes (accessed Sep. 15, 2022).

[4]

“Weaveworks,” *Weave.works*, 2015. https://www.weave.works/blog/a-practical-guide-to-choosing-between-docker-containers-and-vms (accessed Sep. 15, 2022).

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