DAAD Summer School 2019

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Tools & Concepts for Cloud Deployments

Exercise 6: Container Orchestration 1

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Section 1

Exercise 6: Container Orchestration 1

Overview

Welcome to exercise 6. This time we will have the following lessons:

1. Container Orchestration with Docker Swarm
2. Container Orchestration with Rancher

Lessons learned

- How to install and use Docker Swarm
- How to install and use Rancher
- What are core features of Container Orchestrators
- How to deploy and use a private Docker Registry

Section 2

Answers to questions

Lesson 1: Container Orchestration with Docker Swarm

Questions: Docker Swarm

In the Swarm terminology, what are services, tasks, and containers?

A service is a declarative description of a task, executed by a container. Several (replicated) tasks may serve as a service, while the task uses a container to run software to fulfil it's purpose.

Where in our Cloud Stack do you place Docker Swarm?

The virtual machines have to be created externally. Docker engines have to be assigned to a Swarm cluster. Swarm automates from Containers on upwards.

Cloud Stack	Example	Deployment Tool
Application Component	Mediawiki	Dockerfile/Bash
Containers	Docker	Docker Swarm

Lesson 2: Container Orchestration with Rancher

Questions: Rancher

Where in our Cloud Stack do you place Rancher?

Rancher offers the full cloud stack: from allocating resources to container placement and triggers application deployment via Docker.

Cloud Stack	Example	Deployment Tool
Application Component	Mediawiki	Dockerfile/Bash
Containers	Docker	Rancher
Virtual Resource	Instance m1.small	Rancher
Cloud Platform	OpenStack	-

Yet, Rancher does not automate the resource allocation depending on demands (e.g. http requests per second, or cpu load). This feature has has to be added separately.

Section 3

Solution for practical part

Docker Swarm

Docker Swarm works without additional software, since it is integrated in Docker. Yet it does not automate the creation of nodes when all available nodes are fully packed with containers. Scaling and updating containers works within seconds. Loadbalancing is partially replaced by Swarm's networking: services are accessible from any of the joined nodes.

Rancher

Rancher starts virtual machines in bwcloud, and adds them as hosts to Rancher.