

Build and deployment using docker, jenkins and ansible

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- Faculty of Chemistry and Chemical Engineering (UBB)
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 1. Usability Dynamics as DevOps since 2014
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 3. RedCapCloud since 2017 as DevOps

- Docker
 - ✓ What is Docker
 - ✓ How does it work?
 - ✓ Dockerfile
 - ✓ Docker Networking
 - ✓ Docker Networking Type
- Jenkins
 - ✓ What is Jenkins
- Ansible

Docker

What is Docker

- Is a way of running multiple software applications on the same machine. Each of which is running in an isolated environment called “Container”
- It eliminates the annoying problem of “running on my machine”. Software is packaged in the container and can be run on any machine running docker engine.
- A container is a closed environment for the software. It bundles all the files and libraries the software needs to run correctly

How does it work?

- Docker is using images to spawn containers. Multiple containers can use the same image
- Images are indexed and stored in an online repository <http://hub.docker.com>
- Docker solves the problem of not being able to upgrade the system because the applications needs a specific version of libraries

Dockerfile

- Docker uses Dockerfile to create images
- Building an image is an incremental process. You might download an OS image and in top of it you will install the libraries you need for your application
- You can add new packages, change configuration files. Create new users/groups even copy or link files from your host to the container

Docker Networking

- Docker is not a virtual machine therefore it would be using the host machines network interface
- When a container is created a private loopback interface is available for the container for internal communication. It is totally isolated from outside traffic
- There is also created a bridge interface called docker0 that is responsible to handle the traffic to and from the container
- docker0 interface acts as a router. It can be used for inter container communication also to communicate with the host
- Docker provides three type of networking: closed, bridged and open

Docker Networking Type

- Closed - the container will not be accessible from outside network.
- Bridged - the container will be talking via the docker0 interface all traffic will be NAT-ed from the container to the host
- Open - the container is using the host network interface.

Demo

Jenkins

What is Jenkins

- Jenkins offers a simple way to setup continuous integrations and continuous delivery/deployment for almost any combinations of languages and source code repositories
- Alternatives: TravisCi, CircleCi, Bamboo, Codeship, Gitlab, Buddy

Demo

Ansible

What is configuration Management

- A way to install and configure servers/applications ensuring that you will have the same results.

What is Ansible

- Is a configuration management tool like: cfengine, chef, puppet, salt
- They are do the same thing at a different level of complexity.
- Advantages of ansible:
 - ✓ Agentless
 - ✓ It is using python for scripting
 - ✓ working via SSH

Ansible Inventory File

- By default ansible is using `/etc/ansible/hosts`
- Contains the machines hostname, IP addresses or a mix of them
- Hosts can be added either in groups for easier reference or as standalone entries
- If you have a number of hosts for which you can choose a numbered naming pattern like (node1, node2 ... node6), they can be added in one line like `node[1-6]`

Ansible Playbooks

- Are using YAML format. Stands for Ain't Markup Language. It is used the same as JSON to serialize data in an easy format that is readable by both humans and machines.
- Data is stored in Key/value pairs.
- Arrays (called dictionaries) of data are represented by placing a dash (-) before each item at the same indentation level
- Quoting values are optional, but it is mandatory if you are using special characters
- YAML does not allow you to use tabs for indentations

DEMO

THE END

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- <https://github.com/zozo6015/StarTech-md.git>
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