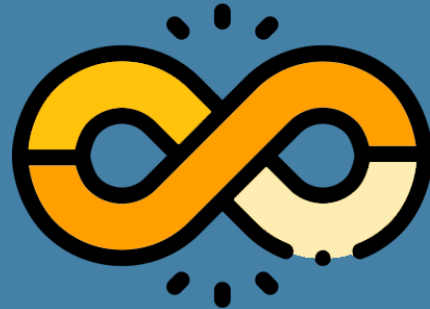


DevOps -
Infrastructure &
Configuration
Management



DevOps

Infrastructure & Configuration Management

April 2022

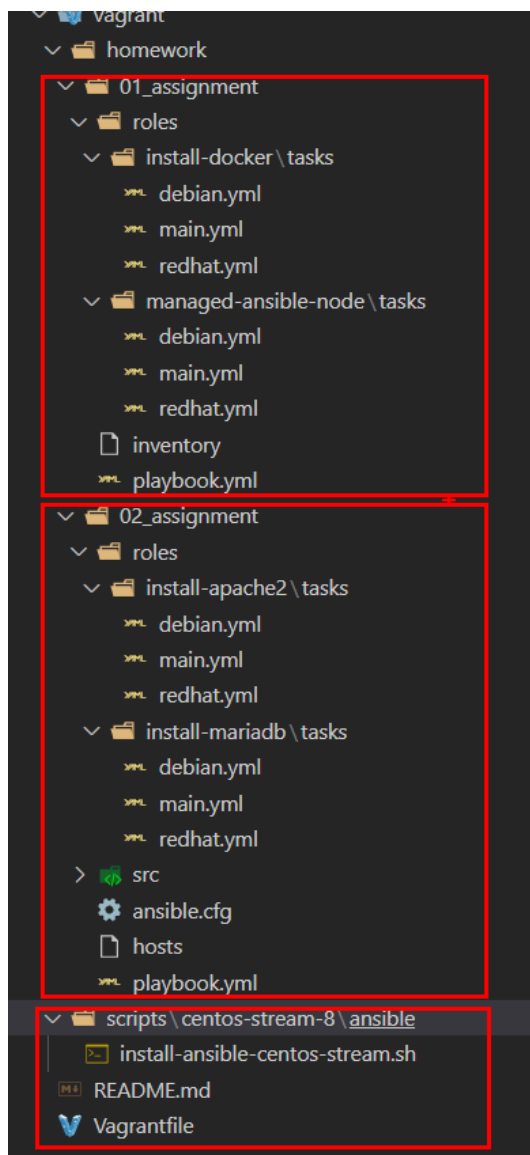
Configuration Management with Ansible
Home Work

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Assignment

You must execute the following set of tasks:

1. With the help of **Ansible** and **Vagrant** create **Docker** host and run a **nginx** container in it.
2. With the help of **Ansible** and **Vagrant** create a two-host setup:
 - One of the hosts should be based on **Debian/Ubuntu** and the other one – on **CentOS**
 - Both hosts should see each other in terms of network communication. Their names should be **web** and **db**
 - One of the hosts should play the role of **WEB** server with web solution of your choice and **PHP** installed and the other one – **DB** server with **MySQL/MariaDB** installed
 - On the **WEB** host deploy the content of the **web** folder in **M2-Homework-Challenge-Ansible (files).zip** archive and on the other – the content of the **db** folder from the same archive



Solution Structure

- Vagrant
 - Four VM's setup file
 - Scripts folder – contains ansible installation script
 - Vagrant folder – shared across all VM's, contains assignments solutions
- Vagrant/homework/01_assignment
 - Solution for the first assignment. Contains ansible-playbook, roles for docker, and ansible managed node setups.
- Vagrant/homework/02_assignment
 - Solution for the second assignment. Contains ansible-playbook, roles for apache2 and MariaDB setup
 - Src/ – contains application code

Solution Setup

- Enter solution directory (where Vagrant file is placed).
 - Execute – vagrant up
 - When VM's are up, execute- vagrant ssh ansible

Ansible ssh communication setup

- cd /vagrant/homework/
- mkdir .ssh
- ssh-keygen -q -f .ssh/id_rsa -N '' -t rsa -m PEM
- ssh-copy-id -i .ssh/id_rsa.pub vagrant@192.168.150.101
- ssh-copy-id -i .ssh/id_rsa.pub vagrant@192.168.150.102
- ssh-copy-id -i .ssh/id_rsa.pub [vagrant@192.168.150.103](#)

```
[vagrant@ansible ~]$ cd /vagrant/homework/
[vagrant@ansible homework]$ mkdir .ssh
[vagrant@ansible homework]$ ssh-keygen -q -f .ssh/id_rsa -N '' -t rsa -m PEM
[vagrant@ansible homework]$ ssh-copy-id -i .ssh/id_rsa.pub vagrant@192.168.150.101
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: ".ssh/id_rsa.pub"
The authenticity of host '192.168.150.101 (192.168.150.101)' can't be established.
ECDSA key fingerprint is SHA256:Y5CneH0c1VvptQtN1ImA9LzaY1nCRoYRS0XpQui+pd4.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install
vagrant@192.168.150.101's password:

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'vagrant@192.168.150.101'"
and check to make sure that only the key(s) you wanted were added.

[vagrant@ansible homework]$ ssh-copy-id -i .ssh/id_rsa.pub vagrant@192.168.150.102
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: ".ssh/id_rsa.pub"
The authenticity of host '192.168.150.102 (192.168.150.102)' can't be established.
ECDSA key fingerprint is SHA256:7iJ3nMHok0dHOULuoabIaKg1ddmSp4wBJ0qsA2eiqwQ.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install
vagrant@192.168.150.102's password:

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'vagrant@192.168.150.102'"
and check to make sure that only the key(s) you wanted were added.

[vagrant@ansible homework]$ ssh-copy-id -i .ssh/id_rsa.pub vagrant@192.168.150.103
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: ".ssh/id_rsa.pub"
The authenticity of host '192.168.150.103 (192.168.150.103)' can't be established.
ECDSA key fingerprint is SHA256:Y5CneH0c1VvptQtN1ImA9LzaY1nCRoYRS0XpQui+pd4.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install
vagrant@192.168.150.103's password:

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'vagrant@192.168.150.103'"
and check to make sure that only the key(s) you wanted were added.
```

Assignment 01

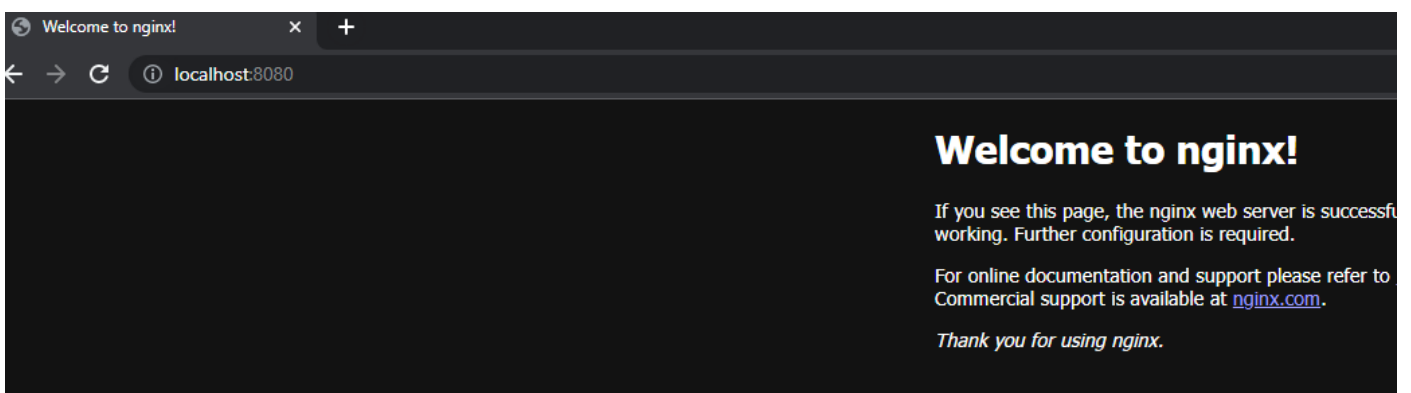
- cd 01_assignment/
- ansible-playbook -i inventory playbook.yml

The playbook uses root privileges to install python dependencies to all hosts. Then all hosts are installed with docker and nginx container is started on port 80

```
---
- hosts: all
  name: Create Docker Host
  become: true
  roles:
    - managed-ansible-node
    - install-docker
- hosts: all
  name: Start NGINX Container
  become: true
  tasks:
    - name: Create NGINX Docker Container
      docker_container:
        name: con_nginx
        image: nginx
        ports:
          - "80:80"
        state: started
        detach: yes
```

```
PLAY RECAP *****
docker1 : ok=9  changed=7  unreachable=0  failed=0  skipped=6  rescued=0  ignored=0
```

- <http://localhost:8080>



Assignment 02

```
- cd 02_assignment/
```

```
- ansible-playbook -i hosts playbook.yml
```

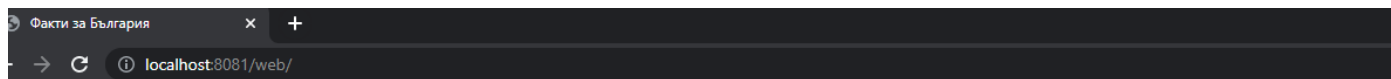
The Playbook consist two plays. First play is the db environment. As root ansible installs mariadb, then adds entries to hosts file. Final tasks is to insert data to mysql.

Second play is the web. As root ansible installs apache2 web server, then adds entries to hosts file. Final task is to copy source file to server dest. Folder.

```
---
- hosts: db
  name: Database Play
  become: true
  roles:
    - install-mariadb
  tasks:
    - name: Update Hosts
      shell: "{{item}}"
      with_items:
        - echo "192.168.150.102 web.do2.homework web" >> /etc/hosts
        - echo "192.168.150.103 db.do2.homework db" >> /etc/hosts
    - name: "Create and load the database"
      shell: mysql -u root < /vagrant/homework/02_assignment/src/db/db_setup.sql
- hosts: web
  name: Web Play
  become: true
  roles:
    - install-apache2
  tasks:
    - name: Update Hosts
      shell: "{{item}}"
      with_items:
        - echo "192.168.150.102 web.do2.homework web" >> /etc/hosts
        - echo "192.168.150.103 db.do2.homework db" >> /etc/hosts
    - name: "Copy Source Files"
      copy:
        src: /vagrant/homework/02_assignment/src/web
        dest: /var/www/html/
```

```
PLAY RECAP *****
db1      : ok=6    changed=5    unreachable=0    failed=0    skipped=2    rescued=0    ignored=0
web1     : ok=5    changed=4    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

- <http://localhost:80801/web>



Факти за България



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Население 7 101 859
Столица София

Големи градове

София	1236047
Пловдив	343424
Варна	335177
Бургас	202766
Русе	144936
Стара Загора	136781
Плевен	98467
Сливен	87322
Добрич	85402
Шумен	76967