HW-4 Ansible

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Abstract

this project demonstrates the deployment of a MongoDB sharded cluster. The project requires two host machines, either physical or vm. One will be assigned the Ansible Controller, the other will be assigned the managed host. Initially each host needs only the basic operating system, a single network interface, and an installation of OpenSSH.

1 Set Up

1.1 2 Hosts

1. Create 2 host machines (vm's) using ubuntu live server 20.04
2. Assign one to be the Ansible Control Host and the other to be the Managed Host
3. Assign static IP's to both, make sure they're on the same network.

```
demo control node: user=sammy, pwd=password, ip=192.168.1.80
demo managed node: user=ansible, pwd=ansible, ip=192.168.1.81
```

Listing 1: demo hosts

4. Initially both hosts only need a bare minimum install, basic Ubuntu + OpenSSH, no other apps.
5. Log into the Control Node and do the following steps:
6. Install ansible (see hw4 docs)
7. establish a password based ssh connection from the control host to the managed host
8. confirm user has sudoer (i.e. run ' sudo -i')
9. log out back to control node

1.2 Passwordless SSH access

Ansible is an agentless aproach to management, as such the Ansible software will only be installed on the control node. There is no client or agent necessary to install on the managed node. The only requirement on the mangaed node is that we have a user installed with sudo rights and that we have the password for this user.

After establishing an initial password connection between the two hosts, an SSH key pair will be produced an shared so that the remainder of the installation automation can be done in a password-less manner.

1. Create SSH Key pairs on the Control Node

```
    $ ssh-keygen

```

Listing 2: ssh 1

2. Push the public SSH key of the control node to the managed node

```
$ ssh-copy-id -i ansible@192.168.1.81 (provide passwords when requested)
```

Listing 3: ssh 2

3. Attempt to SSH connect from control node to managed node without password

1.3 Install Ansible on Control Node

We can leave the managed host alone with it's bare bones OS installation, but it is necessary to install Ansible on the control node in order to run the playbook. After installing Ansible, an edit will have to be made in order to make it aware of the target host(s)

1. Install Ansible via APT
2. Edit the '/etc/ansible/hosts' file and add the following..

```
 [shards]
192.168.1.81
```

Listing 4: ansible host config

3. Test Anible's connection to the target host

```
ansible shards -m ping -u ansible
```

Listing 5: test connection

2 Execution

2.1 Ansible Playbook Execution

Once the two hosts are prepared, a .zip file containing an ansible playbook and it' dependencies will be downloaded and extracted to a folder on the control node. Through the use of an ansible playbook the control node will make the following changes to the managed node:

1. Install the apt package manager
2. check for update
3. Install Docker
4. Use Docker to install 3 MongoDB containers
5. Organize the containers as (1) primary and (2) secondary shard nodes
6. copy to the managed host a team.txt text file of users to add

The playbook will need to be executed with the necessary sudo user permissions to complete the steps above. The following command will do so:

```
ansible-playbook playbook.yml -l shards -u ansible -kK -v
```

Listing 6: run the playbook

2.1.1 Validation

After the playbook has successfully run, which may require more than one run, we will ssh into the managed host and query any created docker containers to confirm they match what was intended. Once connected to the managed node, run the following command

```
1     sudo docker ps -a
2
```

Listing 7: run the playbook

Finally, while in the managed host, switch to root and confirm that inside the directory /root/ is the text file teams.txt