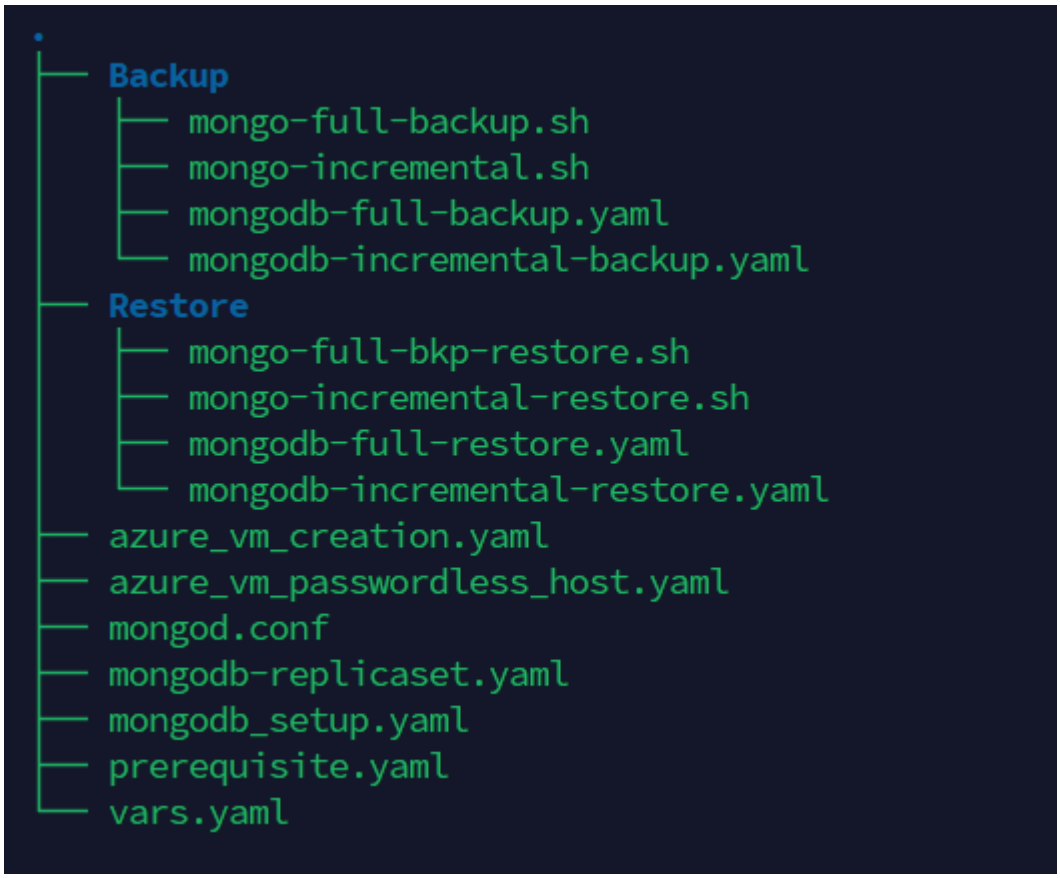
Setup a Azure VM and Mongodb Cluster with ansible

Prerequisites

1. Ansible should be installed on your control node
2. Azure should be logged in on the control plane with the command az login

Tree Structure of Files and Folders



Step 1: VM Creation with Ansible

Prerequisite: We need few parameter in order to create the VMs like VM names, Resource group, Location, user name, user password, Image size, image name and disk. That you have to mention in the variable file **vars.yaml** as shown in the below screenshot

```
master_name: mongodb-master   ##It is a VM1 and act as Master
replica1_name: mongodb-replica1  ##It is a VM2 and act as Replica 1
replica2_name: mongodb-replica2  ##It is a VM2 and act as Replica 2

resource_group: mondodb
location: eastus
ssh_user: azureuser
ssh_pass: MySecurePassword123!
vm_image_name: Canonical:0001-com-ubuntu-server-jammy:22_04-lts-gen2:latest
vm_image_size: Standard_B1s
vm_disk_size: 30 #It is in GB
```

Once you will mention all the variables then you can run the playbook **azure_vm_creation.yaml** for creating the virtual machines on the Azure cloud with the below command:

ansible-playbook azure_vm_creation.yaml

Step 2: Password less Authentication and Host entries

Prerequisites:

1. SSH-Key should be available on the Control plane
   Create an ssh key with the command ssh-keygen –t rsa
   Once it will be created you can check the key **id_rsa.pub** on the path **~/.ssh** and add that path you have to add in the variable file **vars.yaml** as shown in the below screenshot.

```
ssh_pub_key_path: ~/.ssh/id_rsa.pub
```

After successfully completed the step1, you can note down the IP's of all the VMs and mention in the variable file **vars.yaml** as shown in the below screenshot

```
master_ip: 172.177.46.94
replica1_ip: 172.210.167.75
replica2_ip: 172.177.47.3
```

Once you will mention all the variables then you can run the playbook **azure_vm_passwordless_host.yaml** for adding the Host entries (Master, Replica1 and replica2) in the control plane so that our ansible server can also communicate with the hostnames.

ansible-playbook azure_vm_passwordless_host.yaml

The above command will add the host entries in the control plane server and you can verify with the below command:

cat /etc/hosts

In the output, you will see the all three VMs IP and their name as shown in the below screenshot:

```
127.0.0.1 localhost
4.247.137.221 logstashkibana-vm
# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
ff02::3 ip6-allhosts
172.177.46.94 mongodb-master
172.210.167.75 mongodb-replica1
172.177.47.3 mongodb-replica2
```

For the password less authentication, you can take the SSH without passing the credentials from the control plane. You can verify with the below command:

ssh azureuser@mongodb-master
ssh azureuser@mongodb-replica1
ssh azureuser@mongodb-replica2

Step 3: Setup MongoDB on all 3 nodes

In Step 3, we will install MongoDB on the Master, Replica1, and Replica2 nodes using the following Ansible playbook:

ansible-playbook mongodb_setup.yaml

Step 4: Setup up Replica set Controller

In Step 4, we will set up the Replica Set Controller on the Master, which will serve as the primary database, and add Replica1 and Replica2 as secondary nodes.

ansible-playbook mongodb-replicaset.yaml

With this step, we will setup the MongoDB cluster successfully.

Step 5: Backup (Full and Incremental)

Prerequisites:

1. Install Azure CLI and AZCopy on all the three nodes.

   You can run the Ansible playbook prerequisite.yaml with below command in order to install the Azure CLI and AZCopy on all the three nodes:
   ansible-playbook prerequisite.yaml

2. Azure should be logged in on the Master VM(Mongodb-master)

   As we will take the backup from the Master VM and then push into the Azure Blob Storage/container. For that, we need connectivity of Master VM with the Azure. You can run the below command from the Control plane.

   ssh azureuser@mongodb-master
   sudo az login
   exit

3. Azure Storage account and the container should be available, where we will push the backups.

4. Replace the **AZURE_STORAGE_URL, SAS_TOKEN** and **MONGODB_HOST** with the one that you have in the file **Backup/mongo-full-backup.sh**. In the MONGODB_HOST, replace the **mongodb-master** with the name of the master VM that you have created in the step 2

```
MONGODB_HOST="my-demo-replset/mongodb-master:27017"
MONGODB_USER="mongo-admin"
MONGODB_PASS="mongo-pass"
MONGODB_AUTH_DB="admin"

# Azure Storage Configuration
AZURE_STORAGE_URL="https://mongodbbackuptesting.blob.core.windows.net/mongodbbkp"
SAS_TOKEN="se=2099-12-31T23%3A59%3A59Z&sp=racwdl&spr=https&sv=2022-11-02&sr=c&sig=gTUG8z3%2BnWroBfgTsd0SOQeKxQTbn6Yx2rYVxEEaAUg%3D"
TIMESTAMP=$(date +"%F_%T")
```

5. Replace the **AZURE_STORAGE_URL, SAS_TOKEN** and **MONGO_URI** with the one that you have in the file **Backup/mongo-incremental.sh**. In the **MONGO_URI**, replace the **mongodb-master** with the name of the master VM that you have created in the step 2

```
# MongoDB connection details
MONGO_URI="mongodb://mongo-admin:mongo-pass@mongodb-master:27017/?replicaSet=my-demo-replset"
AUTH_DB="admin"

# Azure Blob Storage configuration
AZURE_STORAGE_URL="https://mongodbbackuptesting.blob.core.windows.net/mongodbbkp"
SAS_TOKEN="se=2099-12-31T23%3A59%3A59Z&sp=racwdl&spr=https&sv=2022-11-02&sr=c&sig=gTUG8z3%2BnWroBfgTsd0SOQeKxQTbn6Yx2rYVxEEaAUg%3D"
```

Full Backup:

For taking the Full backup, you can run the ansible playbook mongodb-full-backup.yaml with below command:
ansible-playbook mongodb-full-backup.yaml

Once it's done, You can check the Azure storage container where you will see the full backup with the Date and time inside the folder **full**

Incremental Backup:

For taking the Incremental backup, you can run the ansible playbook mongodb-incremental-backup.yaml with below command:

ansible-playbook mongodb-incremental-backup.yaml

Once it's done, You can check the Azure storage container where you will see the incremental backup with the Date and time inside the folder **Incremental**

Step 6: Restore (Full and Incremental) Backup

Prerequisites:

1. Replace the **AZURE_STORAGE_URL, SAS_TOKEN** and **MONGODB_HOST** with the one that you have in the file **Backup/ mongo-full-bkp-restore.sh**. In the MONGODB_HOST, replace the **mongodb-master** with the name of the master VM that you have created in the step 2

```
# Configuration
AZURE_STORAGE_URL="https://mongodbbackuptesting.blob.core.windows.net/mongodbbkp"
SAS_TOKEN="se=2099-12-31T23%3A59%3A59Z&sp=racwdl&spr=https&sv=2022-11-02&sr=c&sig=gTUG8z3%2BnWroBfgTsd0SOQeKxQTbn6Yx2rYVxEEaAUg%3
RESTORE_DIR="/home/ubuntu/mongorestore/full"
MONGODB_HOST="my-demo-replset/mongodb-master:27017"
MONGODB_USER="mongo-admin"
MONGODB_PASS="mongo-pass"
MONGODB_AUTH_DB="admin"
```

2. Replace the **AZURE_STORAGE_URL, SAS_TOKEN** and **MONGO_URI** with the one that you have in the file **Backup/mongo-incremental-restore.sh**. In the **MONGO_URI**, replace the **mongodb-master** with the name of the master VM that you have created in the step 2

```
# MongoDB connection details
MONGO_URI="mongodb://mongo-admin:mongo-pass@mongodb-master:27017/?replicaSet=my-demo-replset"
SAS_TOKEN="se=2099-12-31T23%3A59%3A59Z&sp=racwdl&spr=https&sv=2022-11-02&sr=c&sig=gTUG8z3%2BnWroBfgTsd0SOQeKxQTbn6Yx2rYVxEEaAUg%3D"
AZURE_STORAGE_URL="https://mongodbbackuptesting.blob.core.windows.net/mongodbbkp"
```

Full Backup Restore:

For restoring the Full backup, you can run the ansible playbook mongodb-full-restore.yaml with below command:
ansible-playbook mongodb-full-restore.yaml

Note: It will restore the latest backup.

Once it's done, You can check the database and check the data as you wanted to restore.

Incremental Backup Restore:

For restoring the Incremental backup, you can run the ansible playbook mongodb-incremental-restore.yaml with below command:

ansible-playbook mongodb-incremental-restore.yaml

Note: It will restore the latest backup.

Once it’s done, You can check the database and check the data as you wanted to restore.