SETUP KUBERNETES CLUSTER IN MULTI-AZ

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Prerequisite

To setup kubernetes in aws (multi-az) you need to create an IAM user and must have aws cli installed on your server and an access key and secret key with proper access permission in it and it should be configured on your ec2 instance and an s3 bucket to store the cluster configuration and an ssh-key to access your clusters instance along with this you also need to install **kops** & **kubectl** for creating and managing your cluster.

INSTALLING AWSCLI ON EC2

1. Install awscli on your ec2-instance

```
sudo apt-get install awscli
```

2. You also need to install docker on the server and login to your docker registry, for installing docker follow the link below

   https://www.digitalocean.com/community/tutorials/how-to-install-and-use-docker-on-ubuntu-16-04

   a. To login to your docker registry

```
sudo docker login docker-registry.enveu.com:5443
```

Login with username and password: docker-admin/3Zj7btENx9hb

INSTALLING KOPS AND KUBECTL

For installing KOPS

```
curl -LO https://github.com/kubernetes/kops/releases/download/$(curl -s
https://api.github.com/repos/kubernetes/kops/releases/latest | grep tag_name
'"' -f 4)/kops-linux-amd64
chmod +x kops-linux-amd64
sudo mv kops-linux-amd64 /usr/local/bin/kops
```

For installing kubectl

```
sudo apt-get update && sudo apt-get install -y apt-transport-https
curl -s https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo
apt-key add -
echo "deb https://apt.kubernetes.io/ kubernetes-xenial main" | sudo tee -a
/etc/apt/sources.list.d/kubernetes.list
sudo apt-get update
sudo apt-get install -y kubectl
```

CONFIGURING AWSCLI

Create IAM user & make a note of access key & security key and then Create S3 bucket and enable versioning.

```
aws configure

##Give access & security access key details here along with
##################the region
```

Now enter your access key and your secret key along with the region, after that you are all set to create cluster in kubernetes on AWS

CREATING SSH KEY

Now create an ssh key for creating cluster it will act as a pem file for accessing your master and nodes server and it is also essential for creating your kubernetes cluster, for creating it execute the below command:-

```
ssh-keygen -f .ssh/id_rsa
```

ENVIRONMENT VARIABLE SETUP

Environment variables setup -- Remember cluster name should ends with k8s.local and updated these two vars in .bashrc & .profile in ~ dir.

```
export KOPS_CLUSTER_NAME=<cluster name>
export KOPS_STATE_STORE=s3://s3-bucket-name
```

Cluster name should end with **.k8s.local (if you dont want to use a new domain for cluster)**

Restart .bashrc using comand:- `. ~/.bashrc`

CREATING K8S CLUSTER

If you want to use existing vpc then execute the below command, but if you do not want to use existing vpc and want to use a new one then remove the **--vpc=(vpc-id)** statement from the below command, but **remember if you do not want to use existing vpc then provide the permission for vpc to your IAM user so that it can create a new one for your cluster**

```
kops create cluster \
--node-count=(no. Of node instances ) \
--node-size=(node-instance-size) \
--master-size=(master-instance-size) \
--zones=(region-name) \
--vpc=(vpc-id)
--name=${KOPS_CLUSTER_NAME}
```

For multi az you can pass multiple zone separated by comma

Suppose you want to create your cluster in ap-south-1 region in multi az along with 3 node servers then execute below command:-

```
kops create cluster \
--node-count=3 \
--node-size=t2.micro \
--master-size=t2.micro \
--zones=ap-south-1a,ap-south-1b,ap-south-1c \
--vpc=<vpc-id>\
--name=${KOPS_CLUSTER_NAME}
```

RUN if you're okay with the configuration run the command with --yes as like below:

```
kops update cluster --name ${KOPS_CLUSTER_NAME} --yes
```

Now wait for some time untill your cluster gets stable and ready to use, to check the status of your cluster execute the below command:-

```
kops validate cluster
```

CREATING DASHBOARD (WEB UI) FOR K8S CLUSTER

The Dashboard UI is not deployed by default. To deploy it, run the following command:

```
kubectl apply -f
https://raw.githubusercontent.com/kubernetes/dashboard/v2.0.0-beta8/aio/deploy/
recommended.yaml
```

Follow the below link for more details:-
https://kubernetes.io/docs/tasks/access-application-cluster/web-ui-dashboard/

GET ADMIN PASSWORD AND TOKEN FOR ACCESSING THE DASHBOARD

To get admin user's password

```
kops get secrets kube --type secret -oplaintext
```

Enter the password that you will get by executing the above command on the browser with username as **admin**

To generate admin's token

After login as admin select token, it will ask you to enter token. For generating the token execute the below command:-

```
kops get secrets admin --type secret -oplaintext
```

SAVE THE ADMIN'S PASSWORD AND ADMIN'S TOKEN AS THEY ARE REQUIRED FOR ACCESSING YOU KUBERNETES DASHBOARD

BASIC KOPS COMMANDS THAT WILL HELP YOU IN MODIFYING YOUR CLUSTER AND NODES:-

To Delete kubernetes cluster:-

```
kops delete cluster --name=<cluster-name> --yes
```

To Edit cluster:-

```
kops edit cluster --name=(cluster-name) --yes
```

To Edit Nodes:-

```
kops edit ig --name=(cluster-name) nodes
```

To Edit Master-

```
Kops edit ig --name=(cluster-name) master
```