K8SC

INSTALL AWS CLI:

```
curl "https://awscli.amazonaws.com/awscli-exe-linux-x86_64.zip" -o "awscliv2.zip"

unzip awscliv2.zip

sudo ./aws/install

yum install vim wget -y

vim .bashrc

export PATH=$PATH:/usr/local/bin/

source .bashrc

aws --version
```

```
curl -LO "https://dl.k8s.io/release/$(curl -L -s
https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"
```

```
wget https://github.com/kubernetes/kops/releases/download/v1.24.1/kops-linux-amd64
```

```
wget https://github.com/kubernetes/kops/releases/download/v1.21.1/kops-linux-amd64

m

chmod +x kops-linux-amd64 kubectl

mv kops-linux-amd64 /usr/local/bin/kops

mv kubectl /usr/local/bin/kubectl

aws --version

kubectl version

kops
```

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Console -- > uername -- > security credentials -- > Access key -- > Downloads

```
aws configure
```

```
aws s3api create-bucket --bucket bhavuk.k8s.local --region us-east-1
aws s3api put-bucket-versioning --bucket bhavuk.k8s.local --region us-east-1 --versioning-configuration Status=Enabled
```

```
export KOPS_STATE_STORE=s3://bhavuk.k8s.local
```

```
ssh-keygen
```

```
kops create secret sshpublickey admin -i ~/.ssh/id_rsa.pub --name bhavuk.k8s.local --state s3://bhavuk.k8s.local
```

```
kops create cluster --name bhavuk.k8s.local --zones us-east-1a --master-size t2.medium --node-size t2.micro
# no use: kops edit cluster --name bhavuk.k8s.local
```

```
kops update cluster --name bhavuk.k8s.local --yes --admin
```

```
kubectl get nodes
```

```
kops validate cluster --name bhavuk.k8s.local
```

initially it will fail then later use same command after sometime it will be ready

```
kubectl get nodes
```

EXTRA IF FAILS:

```
kops export kubecfg
```

PODS:

pods is the smallest unit of deployment to don in Kubernetes.

K8s cant manager containers directly

if u add some metadata to your running container then its a pod

within a pod we can have multiple containers.

but mostly we have one container in one pod only very few cases we have multiple containers in a pod

if u have a wokernode of 2 gb of ram then u can get 2 pods of 1 gb ram

REPLICASET:

it is nothing but Group of pods

if one pod crashes then by using replicaset another pod is recreated automatically.

DEPLOYMENT:

It has features of Replicaset and some other extra features

++

kubectl config view   : To show config settings

kubectl config get-context :

++

.kube dir: used to interact with one node to another node

here we can find the dir inside this dir there is a config for a particular user to authenticate kubeapi server. It is also on master node as well by using this we can interact with Kube API.

We can do all activites from the main node created initially to created the cluster.

We are going to create a few resources so for that we can use my predefined templates.

Yum install git docker -y (if u don't install docker also u can do things on pod level not on container level)

Git clone https://github.com/rhavukm/k8s.git

Cd k8s

Pods :

pods is the smallest unit of deployment to don in Kubernetes.

We can create any resources in 2 ways

1: by running the commands (ex: kubectl run nginx - -image nginx:alpine)

Kubectl get pods : for pods list

Kubectl get pods -o wide : for additional info

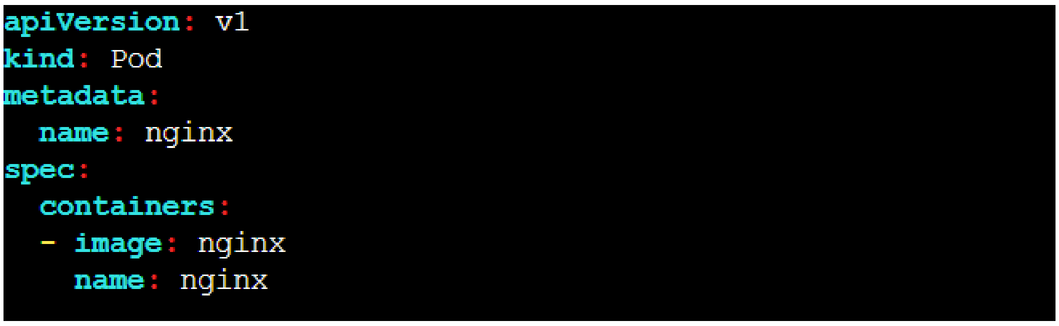
If you want to schedule a pod on particular node in that case we need to create own scheduler.

We use default scheduler it will decide on which node the pod is created.

The above method is not recommended in real time.

For that we use yaml file

2: by using a yaml manifest file



```yaml
apiVersion: v1
kind: Pod
metadata:
  name: nginx
spec:
  containers:
  - image: nginx
    name: nginx
```

Api: version of Api for creating a pod

Kind : type of service

Name: name of the pod

Spec: specification

Image: the image you want to give to container

kubectl create -f pod-nginx.yaml : command to create a pod from file

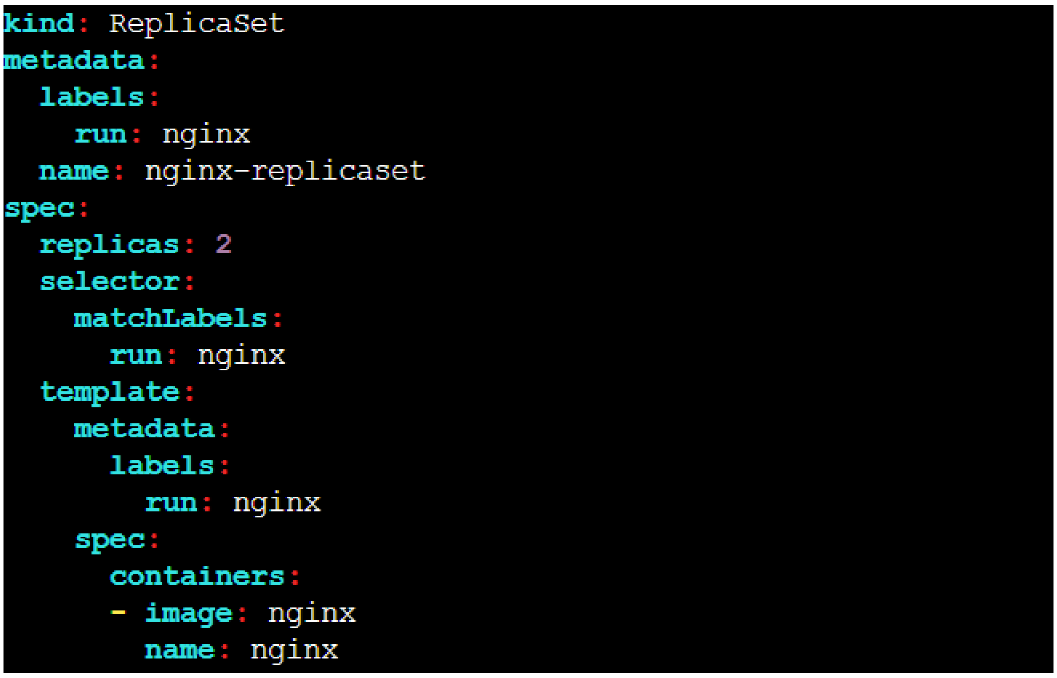
The main dis advantage is if we delete that pod we are not able to access

So if we work on the realtime production then we need to use replicaset.

REPLICASET:

it is nothing but Group of pods

if one pod crashes then by using replicaset another pod is recreated automatically.


```yaml
kind: ReplicaSet
metadata:
  labels:
    run: nginx
  name: nginx-replicaset
spec:
  replicas: 2
  selector:
    matchLabels:
      run: nginx
  template:
    metadata:
      labels:
        run: nginx
    spec:
      containers:
      - image: nginx
        name: nginx
```

Labels : mandatory to create RS (if u have 100 pods in a cluster we can inform which pods we need to take care by using labels) if u labeled some pods a raham then all the pods with label raham will be managed

Replicas: Number of pod copies we need to create

Matchelabel: the label we want to match with pods

Template: This is the template of pod.

kubectl create -f replicaset-nginx.yaml

kubectl get replicaset -o wide

kubectl get all

Now delete a pod and do list now it will be created automatically

Kubectl delete po nginx-replicaset-f2zkq

Kubectl get all or Kubectl get rs

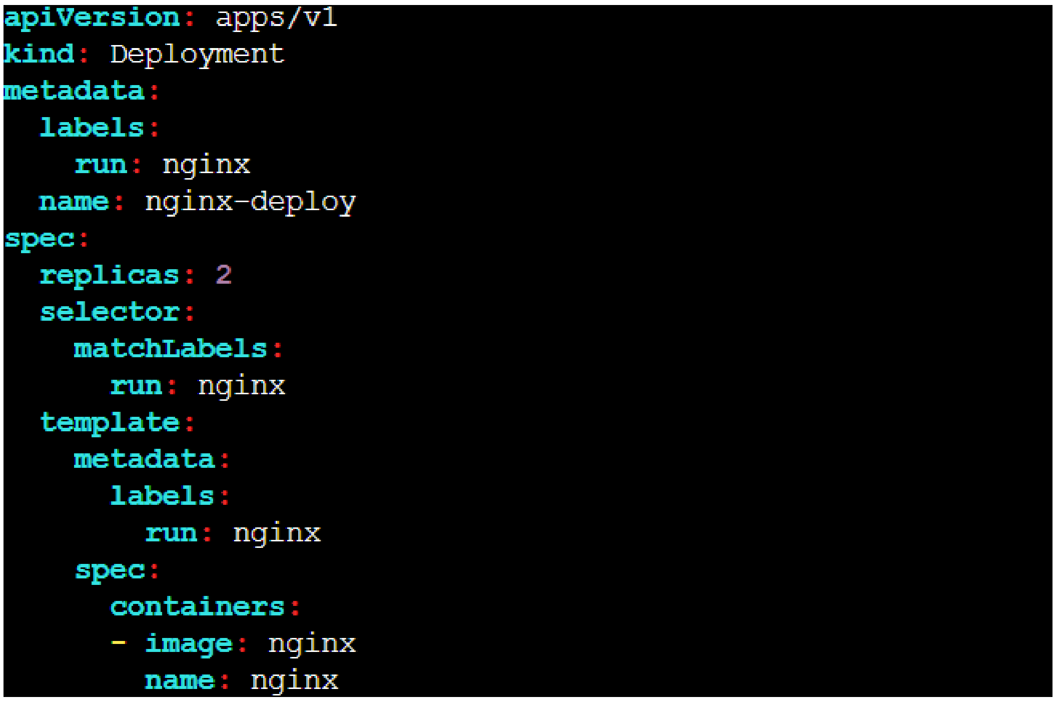
kubectl describe pod/nginx-replicaset-g9vcw : to see additional info

this command is used to see the events where we can see error log

kubectl delete rs nginx-replicaset : to delte replicaset so no pods will create now automatically

DEPLOYMENT:

It has features of Replicaset and some other extra features like updating and rollbacking to a particular version we want without downtime*.



```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  labels:
    run: nginx
  name: nginx-deploy
spec:
  replicas: 2
  selector:
    matchLabels:
      run: nginx
  template:
    metadata:
      labels:
        run: nginx
    spec:
      containers:
      - image: nginx
        name: nginx
```

kubectl create -f deployment-nginx.yaml

deployment created replicaset and replicaset create pod

here application will reside on pod to manage and update& manage that pod we used deployment

kubectl delete rs nginx-deploy-7dc4b48974

kubectl get rs : now u will get replicasets automatically because it is managed by deployment

NAMESPACE:

It is a way to filter out the stuff for different users in a single machine.

Kubectl get ns : we can list name spaces by default it is four

Default : if we don't specify any namespace the n default is used.

Kubectl get all -n default

Kube-node-lease: It is used for the lease objects associated with each node that improves the performance of the node heartbeats as the cluster scales.

Kube-public: To create any object that is publicly available to users.

Kube-system: Kubernetes uses this for creating its own objects.

kubectl get all -n kube-system

kubectl create ns raham

kubectl get ns

kubectl config set-context $(kubectl config current-context) --namespace=raham to change the resources from to desired name space

kubectl get all

Now lets create a new pod and lets see on which name space it will go

kubectl create -f pod-nginx.yaml

kubectl describe pod nginx | grep -i namespace

if you are cluster admin we can get different namespaces for different users then you can create different namespaces for different users.

GETTING INSIDE CLUSTER USING SSH:

kops create secret sshpublickey admin -i ~/.ssh/id_rsa.pub --name bhavuk.k8s.local --state s3://bhavuk.k8s.local

we need to update the cluster now

kops update cluster rahammc.k8s.local –yes

kops rolling-update cluster : optional

now we have attached a key to connect to my master node

to access we need to use

check from 50: minutes on part-2

kops get cluster

kops delete cluster --name=rahammc.k8s.local --yes specific k8s version:

```
kops edit cluster --name bhavuk.k8s.local #edit the Kubernetes version & save and exit
```

```
kops update cluster --name bhavuk.k8s.local --yes --admin
kops validate cluster --name bhavuk.k8s.local
```

latest k8s version:

```
kops upgrade cluster --name bhavuk.k8s.local --yes
kops update cluster --name bhavuk.k8s.local --yes --admin
kops validate cluster --name bhavuk.k8s.local
```

delete k8s cluster:

```
kops delete cluster --name bhavuk.k8s.local --yes
```

https://github.com/bhavukm/k8s

```
git clone https://github.com/bhavukm/k8s
```

To SSH to Master and Worker Nodes in KOPS:

```
kops update cluster bhavuk.k8s.local --yes
kops rolling-update cluster
```