Persistent Volumes and Persistent Volume Claims

1.Exploring the available Storage Class

```
$ kubectl get sc
```

```
NAME            PROVISIONER             AGE
default         kubernetes.io/aws-ebs   19h
gp2 (default)   kubernetes.io/aws-ebs   19h
standard        kubernetes.io/aws-ebs   12h
```

2.Creating a Persistent Volume Claim

```
$ vim <your-name>-persistentvolumeclaim.yaml
```

Paste the below content and update the <your-name>-persistentvolumeclaim with your name.

```
$ curl -k https://pastebin.com/raw/7mseZ7KX > <your-name>-persistentvolumeclaim.yaml
```

```
$ kubectl create -f <your-name>-persistentvolumeclaim.yaml
```

3.Deploying a Persistent Volume

```
$ vim <your-name>-deployment.yaml
```

Paste the below content and update all the <your-name> fields with your name.

```
$ curl -k https://pastebin.com/raw/yrbvxBP4 > <your-name>-deployment.yaml
```

Now, edit the <your-name>-deployment.yaml updating the <your-name> with your name, and run the below command once done.

```
$ kubectl create -f  <your-name>-deployment.yaml
```

4.Exposing the Deployment

```
$ kubectl expose deployment <your-name>-deployment --type=NodePort --port=80
```

5.Inspecting and Using PVs

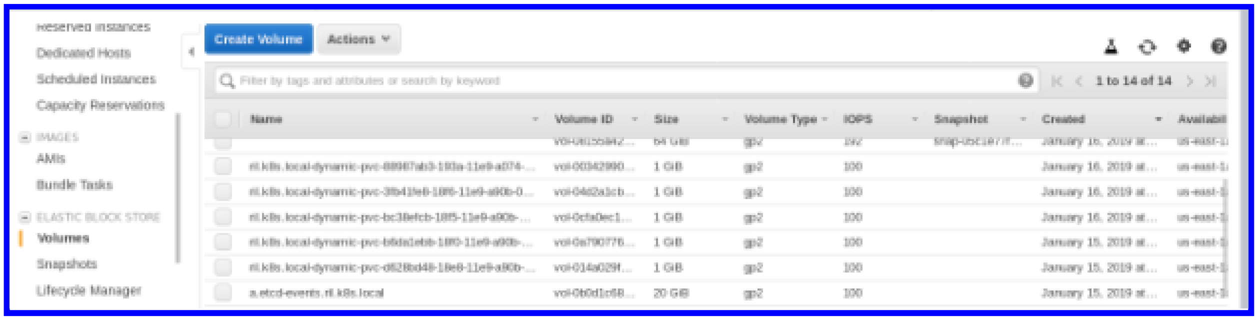
$ kubectl get pv

Output

```
NAME     CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS  CLAIM   STORAGECLASS   REASON    AGE
Pvc-751c     1Gi          RWO                    Retain             Bound      default/task-pv-claim   standard              3h
```

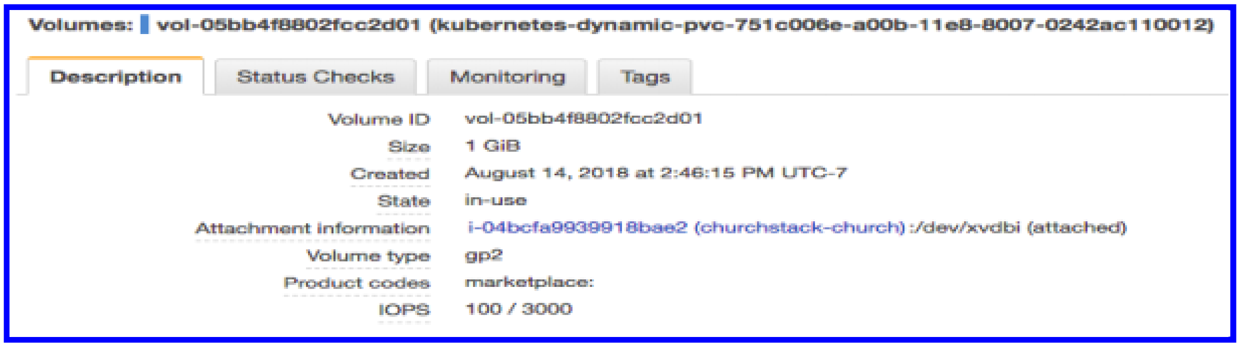
When claiming a Persistent volume on cloud provisioned (AWS) clusters, PV gets created as an EBS Volumes.

To check the details, login to the **AWS console > EC2 > ELASTIC BLOCK STORE > Volumes**



Name	Volume ID	Size	Volume Type	IOPS	Snapshot	Created	Availabil
	vol-06155a42...	64 GiB	gp2	192	snap-05c1e7f...	January 16, 2019 at...	us-east-1...
rl.k8s.local-dynamic-pvc-88987ab3-193a-11e9-a074-...	vol-00342990...	1 GiB	gp2	100		January 16, 2019 at...	us-east-1...
rl.k8s.local-dynamic-pvc-3fb41fe8-18f6-11e9-a90b-0...	vol-04d2a1cb...	1 GiB	gp2	100		January 16, 2019 at...	us-east-1...
rl.k8s.local-dynamic-pvc-bc38efcb-18f5-11e9-a90b-...	vol-0cfa0ec1...	1 GiB	gp2	100		January 16, 2019 at...	us-east-1...
rl.k8s.local-dynamic-pvc-b6da1ebb-18f0-11e9-a90b-...	vol-0a790776...	1 GiB	gp2	100		January 15, 2019 at...	us-east-1...
rl.k8s.local-dynamic-pvc-d628bd48-18e8-11e9-a90b-...	vol-014a029f...	1 GiB	gp2	100		January 15, 2019 at...	us-east-1...
a.etcd-events.rl.k8s.local	vol-0b0d1c68...	20 GiB	gp2	100		January 15, 2019 at...	us-east-1...

The AWS console shows a volume has been provisioned having a matching name with type gp2 and a 1GiB size.



Volumes: vol-05bb4f8802fcc2d01 (kubernetes-dynamic-pvc-751c006e-a00b-11e8-8007-0242ac110012)

Volume ID	vol-05bb4f8802fcc2d01
Size	1 GiB
Created	August 14, 2018 at 2:46:15 PM UTC-7
State	in-use
Attachment information	i-04bcfa9939918bae2 (churchstack-church):/dev/xvdbi (attached)
Volume type	gp2
Product codes	marketplace:
IOPS	100 / 3000

6.Inspecting and Using PVCs

```
$ kubectl get pvc   ## to get the list of PVCs created.
$ kubectl describe pvc <pvc-name> # to describe the pvc details.
```

7.Accessing the Application

Check the Node details where the POD has been deployed

```
$ kubectl get pod -o wide | grep <your-name>
```

```
NAME                          READY   STATUS    RESTARTS   AGE   IP                NODE
arshad-5fdff48b48-7r4pg          1/1     Running   0         2m    100.96.4.43
ip-172-20-55-125.ec2.internal
arshad-5fdff48b48-gg7j4          1/1     Running   0         2m    100.96.4.44
ip-172-20-55-125.ec2.internal
rajni-deployment-d667            1/1     Running   0         3h    100.96.4.13
ip-172-20-55-125.ec2.internal
```

ip-172-20-55-125.ec2.internal is the Worker node where the app has been deployed

To get the NodePort

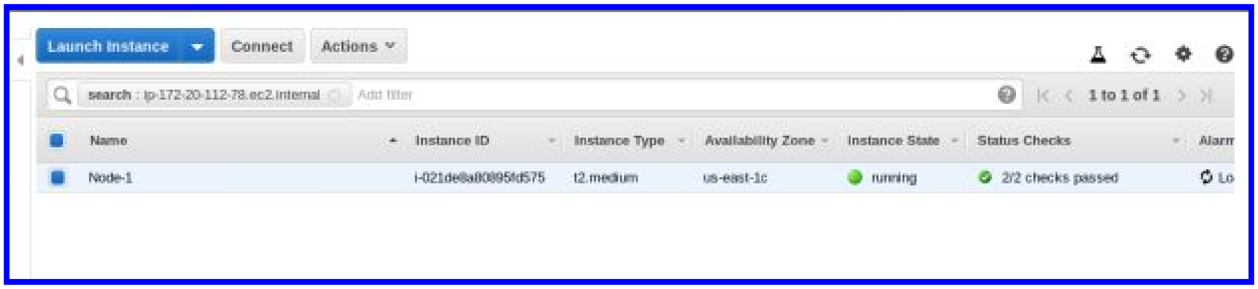
```
$ kubectl get svc | grep <your-name>
```

Example

```
kubectl get svc | grep aa
asyed-deployment          NodePort      100.64.248.219   <none>
80:30114/TCP
asyed-deployemt2          NodePort      100.71.18.29     <none>
80:31526/TCP
```

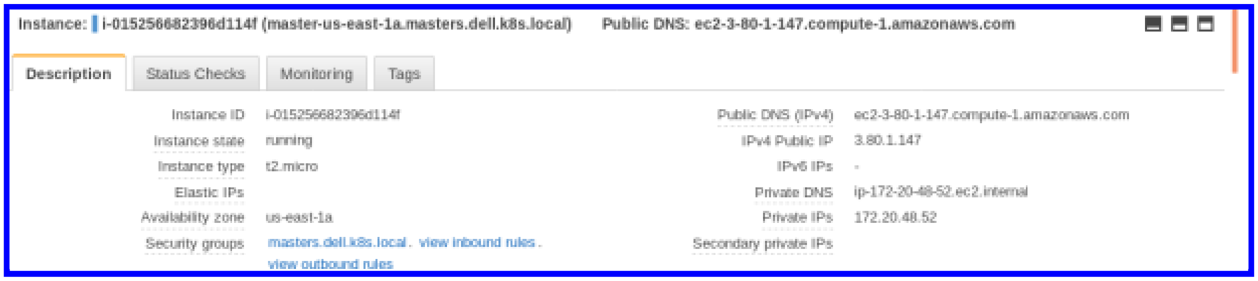
As shown above
30114 is the nodeport for asyed-deployment and **31526** is the nodeport for the asyed-deployment2

Login to the **AWS Console** and Search for the Interal-IP <**ip-172-20-55-125.ec2.internal**> on which the Deployment has been exposed and Copy the **Public IP** of that NODE



Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm
Node-1	i-021de8a80895fd575	t2.medium	us-east-1c	● running	✓ 2/2 checks passed	Lo

Goto the descriptions and copy the public IP of the Node


Instance: i-015256682396d114f (master-us-east-1a.masters.dell.k8s.local) Public DNS: ec2-3-80-1-147.compute-1.amazonaws.com

Instance ID	i-015256682396d114f	Public DNS (IPv4)	ec2-3-80-1-147.compute-1.amazonaws.com
Instance state	running	IPv4 Public IP	3.80.1.147
Instance type	t2.micro	IPv6 IPs	-
Elastic IPs		Private DNS	ip-172-20-48-52.ec2.internal
Availability zone	us-east-1a	Private IPs	172.20.48.52
Security groups	masters.dell.k8s.local . view inbound rules . view outbound rules	Secondary private IPs	

Access the application as shown below
http://<node-public-ip>:NodePort

Example
http://18.208.206.161:32587/