NFS SETUP

Redhat subscription:

```
[root@nfs ~]# subscription-manager register --username=manojkumar@techzert.com --password=M@nOj83249 --auto-attach
Registering to: subscription.rhsm.redhat.com:443/subscription
The system has been registered with ID: 46fef297-ec5a-42d9-999e-47b6f3635d62
The registered system name is: nfs.ftmchk
[root@nfs ~]#
```

Configuring the Registry:

Installing NFS Server:

dnf/yum install nfs-utils -y

```
[root@nfs ~]# yum install nfs-utils -y
Updating Subscription Management repositories.
Red Hat Enterprise Linux 8 for x86_64 - BaseOS (RPMs)                    4.9 MB/s |  37 MB     00:07
Red Hat Enterprise Linux 8 for x86_64 - AppStream (RPMs)                 4.7 MB/s |  33 MB     00:06
Last metadata expiration check: 0:00:01 ago on Thursday 28 October 2021 03:15:49 PM IST.
Package nfs-utils-1:2.3.3-41.el8.x86_64 is already installed.
Dependencies resolved.
================================================================================================================================
 Package                 Architecture          Version                          Repository                               Size
================================================================================================================================
Upgrading:
 nfs-utils               x86_64                1:2.3.3-41.el8_4.2               rhel-8-for-x86_64-baseos-rpms            498 k

Transaction Summary
================================================================================================================================
```

Check available disk space and its location:

df –h

```
[root@nfs ~]# df -h
Filesystem                 Size  Used Avail Use% Mounted on
devtmpfs                    16G     0   16G   0% /dev
tmpfs                       16G     0   16G   0% /dev/shm
tmpfs                       16G  9.4M   16G   1% /run
tmpfs                       16G     0   16G   0% /sys/fs/cgroup
/dev/mapper/rhel_nfs-root  700G   11G  690G   2% /
/dev/sda2                   20G  374M   20G   2% /boot
/dev/mapper/rhel_nfs-home   30G  247M   30G   1% /home
/dev/mapper/rhel_nfs-var   150G  1.4G  149G   1% /var
/dev/mapper/rhel_nfs-tmp    30G  247M   30G   1% /tmp
/dev/sda1                   10G  5.8M   10G   1% /boot/efi
tmpfs                      3.2G  4.6M  3.2G   1% /run/user/0
[root@nfs ~]#
```

Create the Share

```
mkdir -p /nfsshare/registry
mkdir –p /nfsshare/nfs-sc
chmod -R 777 /nfsshare
chown -R nobody:nobody /nfsshare
```

NFS server IP:

```
[root@nfs ~]# ip r
default via 192.168.18.5 dev ens192 proto dhcp metric 100
192.168.18.0/23 dev ens192 proto kernel scope link src 192.168.19.212 metric 100
192.168.122.0/24 dev virbr0 proto kernel scope link src 192.168.122.1 linkdown
```

Export the NFS Share

```
echo "/nfsshare/nfs-sc
192.168.18.0/23(rw,sync,no_root_squash,no_subtree_check,no_wdelay)" > /etc/exports

echo "/nfsshare/registry
192.168.18.0/23(rw,sync,root_squash,no_subtree_check,no_wdelay)" >> /etc/exports

exportfs –rv
```

```
[root@nfs ~]# mkdir -p /nfsshare/registry
[root@nfs ~]# mkdir -p /nfsshare/nfs-sc
[root@nfs ~]# chmod -R 777 /nfsshare
[root@nfs ~]# echo "/nfsshare/nfs-sc  192.168.18.0/23(rw,sync,no_root_squash,no_subtree_check,no_wdelay)" > /etc/exports
[root@nfs ~]# echo "/nfsshare/registry 192.168.18.0/23(rw,sync,root_squash,no_subtree_check,no_wdelay)" >> /etc/exports
[root@nfs ~]# cat /etc/exports
/nfsshare/nfs-sc  192.168.18.0/23(rw,sync,no_root_squash,no_subtree_check,no_wdelay)
/nfsshare/registry 192.168.18.0/23(rw,sync,root_squash,no_subtree_check,no_wdelay)
[root@nfs ~]# exportfs -rv
exporting 192.168.18.0/23:/nfsshare/registry
exporting 192.168.18.0/23:/nfsshare/nfs-sc
```

Set Firewall rules:

```
firewall-cmd --zone=internal --add-service mountd --permanent
firewall-cmd --zone=internal --add-service rpc-bind --permanent
firewall-cmd --zone=internal --add-service nfs --permanent
firewall-cmd –-reload
```

Enable and start the NFS related services

```
systemctl enable nfs-server rpcbind
systemctl start  nfs-server rpcbind nfs-mountd
```

```
[root@nfs ~]# systemctl status nfs-server
● nfs-server.service - NFS server and services
   Loaded: loaded (/usr/lib/systemd/system/nfs-server.service; enabled; vendor preset: disabled)
  Drop-In: /run/systemd/generator/nfs-server.service.d
           └─order-with-mounts.conf
   Active: active (exited) since Thu 2021-10-28 15:25:04 IST; 16s ago
  Process: 56420 ExecStart=/bin/sh -c if systemctl -q is-active gssproxy; then systemctl reload gssproxy ; fi (code=exited, status=0/SUCCE
  Process: 56407 ExecStart=/usr/sbin/rpc.nfsd (code=exited, status=0/SUCCESS)
  Process: 56405 ExecStartPre=/usr/sbin/exportfs -r (code=exited, status=0/SUCCESS)
 Main PID: 56420 (code=exited, status=0/SUCCESS)

Oct 28 15:25:03 nfs.ftmchk systemd[1]: Starting NFS server and services...
Oct 28 15:25:04 nfs.ftmchk systemd[1]: Started NFS server and services.
```

```
[root@nfs ~]#  systemctl status rpcbind
● rpcbind.service - RPC Bind
   Loaded: loaded (/usr/lib/systemd/system/rpcbind.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2021-10-27 15:20:14 IST; 24h ago
     Docs: man:rpcbind(8)
 Main PID: 1113 (rpcbind)
    Tasks: 1 (limit: 204156)
   Memory: 1.9M
   CGroup: /system.slice/rpcbind.service
           └─1113 /usr/bin/rpcbind -w -f

Oct 27 15:20:14 nfs.ftmchk systemd[1]: Starting RPC Bind...
Oct 27 15:20:14 nfs.ftmchk systemd[1]: Started RPC Bind.
[root@nfs ~]#
[root@nfs ~]# systemctl status nfs-mountd
● nfs-mountd.service - NFS Mount Daemon
   Loaded: loaded (/usr/lib/systemd/system/nfs-mountd.service; static; vendor preset: disabled)
   Active: active (running) since Thu 2021-10-28 15:25:03 IST; 1min 36s ago
  Process: 56402 ExecStart=/usr/sbin/rpc.mountd (code=exited, status=0/SUCCESS)
 Main PID: 56404 (rpc.mountd)
    Tasks: 1 (limit: 204156)
   Memory: 12.9M
   CGroup: /system.slice/nfs-mountd.service
           └─56404 /usr/sbin/rpc.mountd

Oct 28 15:25:03 nfs.ftmchk systemd[1]: Starting NFS Mount Daemon...
Oct 28 15:25:03 nfs.ftmchk rpc.mountd[56404]: Version 2.3.3 starting
Oct 28 15:25:03 nfs.ftmchk systemd[1]: Started NFS Mount Daemon.
[root@nfs ~]#
```

```
[root@nfs ~]# showmount -e
Export list for nfs.ftmchk:
/nfsshare/registry 192.168.18.0/23
/nfsshare/nfs-sc   192.168.18.0/23
[root@nfs ~]#
```

Download the yaml from Github

https://github.com/kubernetes-sigs/nfs-subdir-external-provisioner

Update the entries in the RBAC.yaml
- change the namespace **default** to **nfs**
:%s/default/nfs/g

Update the entries in the Deploy.yaml
- change the namespace **default** to **nfs**
:%s/default/nfs/g

Update the below entries
spec:
    serviceAccountName: nfs-client-provisioner
    containers:
      - name: nfs-client-provisioner
        image: k8s.gcr.io/sig-storage/nfs-subdir-external-provisioner:v4.0.2
        volumeMounts:
          - name: nfs-client-root
            mountPath: /persistentvolumes

```
        env:
          - name: PROVISIONER_NAME
            value: nfs-storage
          - name: NFS_SERVER
            value: 192.168.19.212
          - name: NFS_PATH
            value: /nfsshare/nfs-sc
      volumes:
        - name: nfs-client-root
          nfs:
            server: 192.168.19.212
            path: /nfsshare/nfs-sc
```

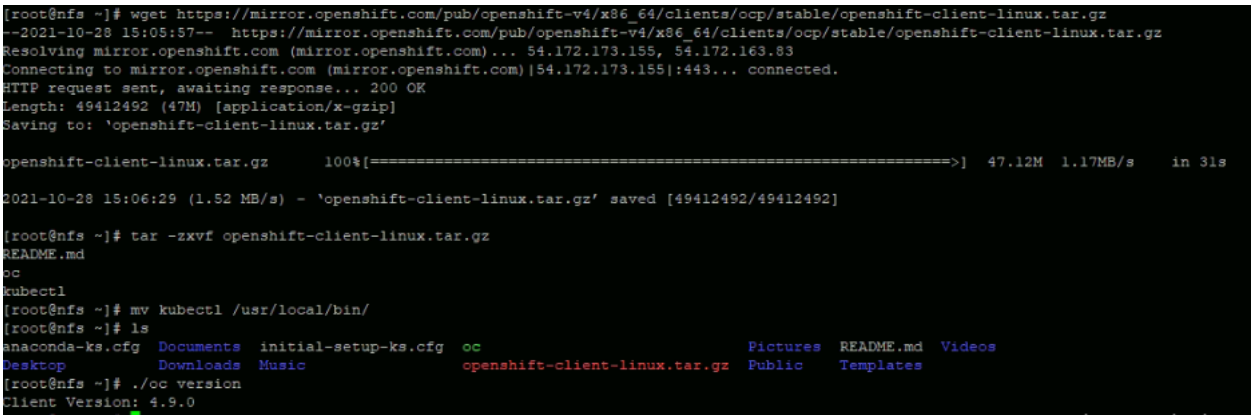
Please find the attached deploy.yaml file

deploy.yaml.txt

Update the entries in the class.yaml

```
apiVersion: storage.k8s.io/v1
kind: StorageClass
metadata:
  name: managed-nfs-storage
provisioner: nfs-storage
parameters:
  archiveOnDelete: "false"
```

Download oc client tool on the NFS VM



```
[root@nfs ~]# export KUBECONFIG=~/Downloads/kubeconfig
[root@nfs ~]# ./oc get nodes
NAME                          STATUS   ROLES    AGE   VERSION
mstr01.ftmchk.techzert.work   Ready    master   22h   v1.19.0+e49167a
mstr02.ftmchk.techzert.work   Ready    master   22h   v1.19.0+e49167a
mstr03.ftmchk.techzert.work   Ready    master   22h   v1.19.0+e49167a
wrkr01.ftmchk.techzert.work   Ready    worker   22h   v1.19.0+e49167a
wrkr02.ftmchk.techzert.work   Ready    worker   22h   v1.19.0+e49167a
wrkr03.ftmchk.techzert.work   Ready    worker   22h   v1.19.0+e49167a
wrkr04.ftmchk.techzert.work   Ready    worker   22h   v1.19.0+e49167a
[root@nfs ~]#
```

Copy all the three yaml files to NFS server(/root/)
Make sure that all the yaml files are updated, before you run the yaml

Create the name space nfs

```
[root@nfs ~]# ./oc create ns nfs
namespace/nfs created
[root@nfs ~]#
```

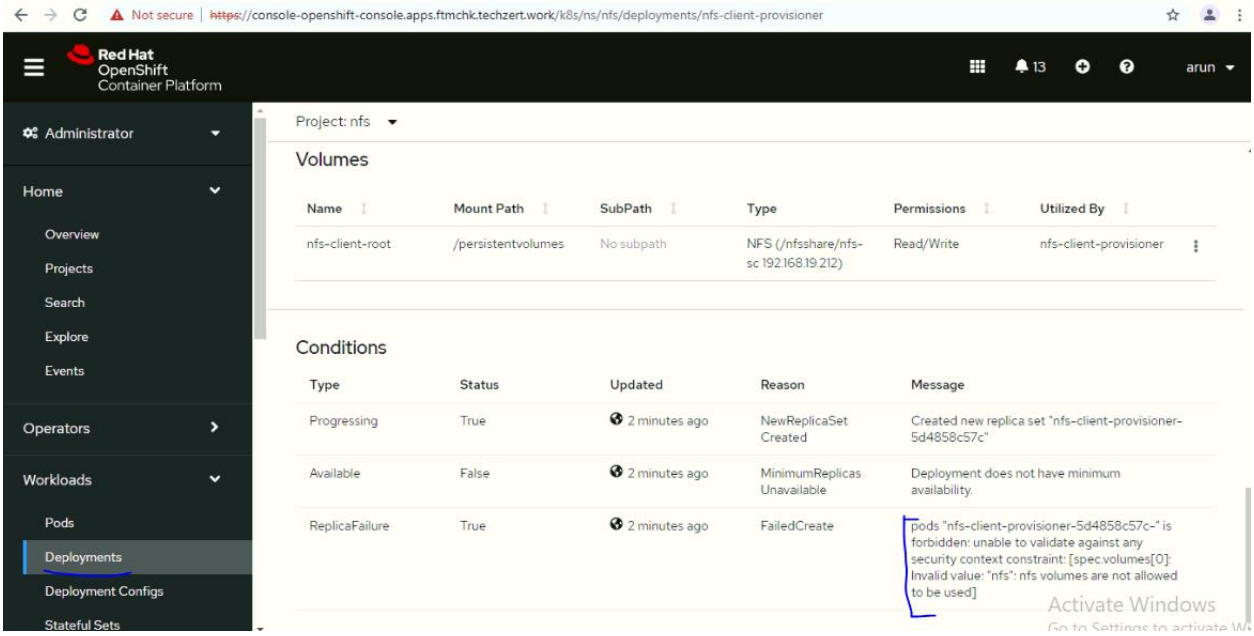
```
-rw-r--r--. 1 root root      1071 Oct 28 13:38 deployment.yaml
-rw-r--r--. 1 root root      1948 Oct 28 15:10 rbac.yaml
-rw-r--r--. 1 root root       230 Oct 28 15:10 class.yaml
```

Run the RBAC.yaml

```
[root@nfs ~]# ./oc delete -f rbac.yaml
serviceaccount "nfs-client-provisioner" deleted
clusterrole.rbac.authorization.k8s.io "nfs-client-provisioner-runner" deleted
clusterrolebinding.rbac.authorization.k8s.io "run-nfs-client-provisioner" deleted
role.rbac.authorization.k8s.io "leader-locking-nfs-client-provisioner" deleted
rolebinding.rbac.authorization.k8s.io "leader-locking-nfs-client-provisioner" deleted
[root@nfs ~]#
[root@nfs ~]#
[root@nfs ~]#
[root@nfs ~]# ./oc create -f rbac.yaml
serviceaccount/nfs-client-provisioner created
clusterrole.rbac.authorization.k8s.io/nfs-client-provisioner-runner created
clusterrolebinding.rbac.authorization.k8s.io/run-nfs-client-provisioner created
role.rbac.authorization.k8s.io/leader-locking-nfs-client-provisioner created
rolebinding.rbac.authorization.k8s.io/leader-locking-nfs-client-provisioner created
[root@nfs ~]#
```

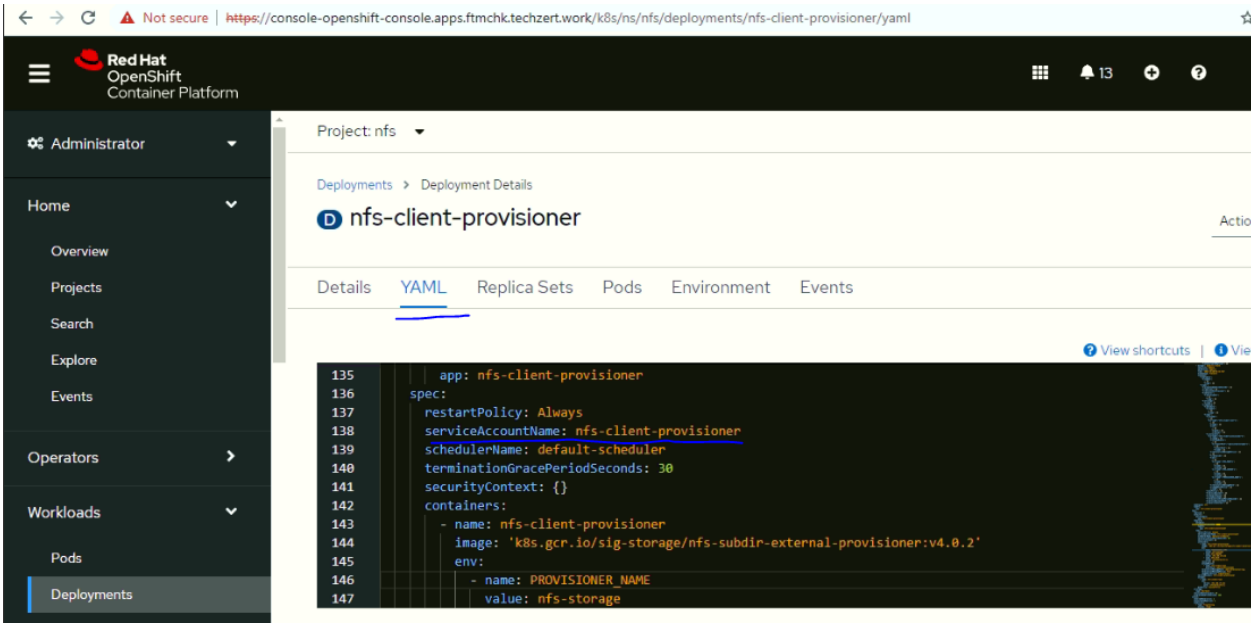
Run the Deployment.yaml and class.yaml

```
[root@nfs ~]# ./oc create -f deployment.yaml
deployment.apps/nfs-client-provisioner created
[root@nfs ~]#
[root@nfs ~]# ./oc create -f class.yaml
storageclass.storage.k8s.io/managed-nfs-storage created
[root@nfs ~]#
```



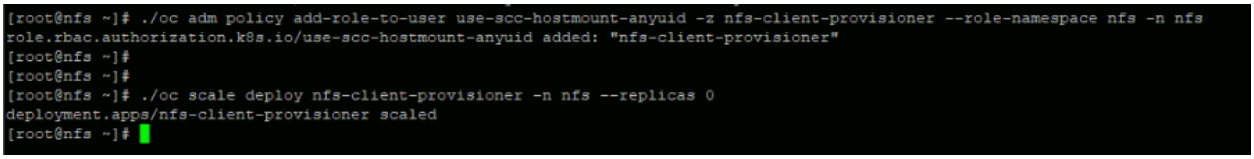
./oc create role use-scc-hostmount-anyuid --verb=use --resource=scc --resource-name=hostmount-anyuid -n nfs

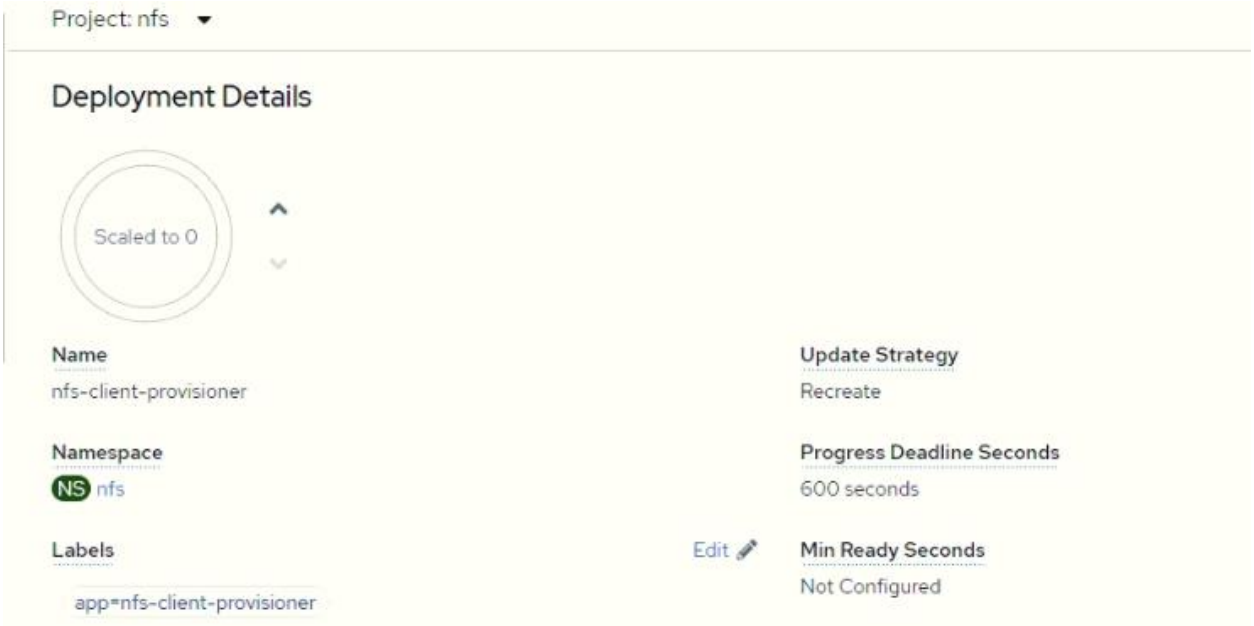
```
[root@nfs ~]# ./oc create role use-scc-hostmount-anyuid --verb=use --resource=scc --resource-name=hostmount-anyuid -n nfs
role.rbac.authorization.k8s.io/use-scc-hostmount-anyuid created
[root@nfs ~]#
[root@nfs ~]# ./oc get roles -n nfs
NAME                                   CREATED AT
leader-locking-nfs-client-provisioner  2021-10-28T10:10:55Z
use-scc-hostmount-anyuid               2021-10-28T10:18:02Z
[root@nfs ~]#
```

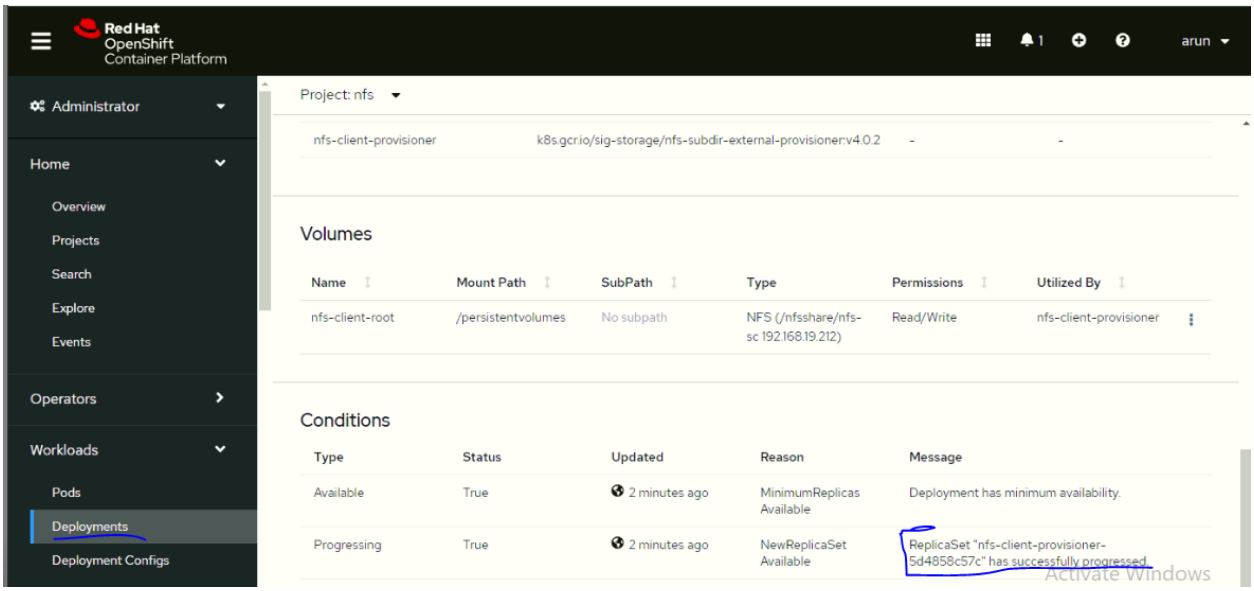


```
[root@nfs ~]# ./oc adm policy add-role-to-user use-scc-hostmount-anyuid -z nfs-client-provisioner --role-namespace nfs -n nfs
role.rbac.authorization.k8s.io/use-scc-hostmount-anyuid added: "nfs-client-provisioner"

[root@nfs ~]#
[root@nfs ~]# ./oc scale deploy nfs-client-provisioner -n nfs --replicas 0
deployment.apps/nfs-client-provisioner scaled
[root@nfs ~]#
```







[root@nfs ~]# ./oc scale deploy nfs-client-provisioner -n nfs --replicas 1
deployment.apps/nfs-client-provisioner scaled
[root@nfs ~]#

Wait for few minutes, until the pod is scaled to 1

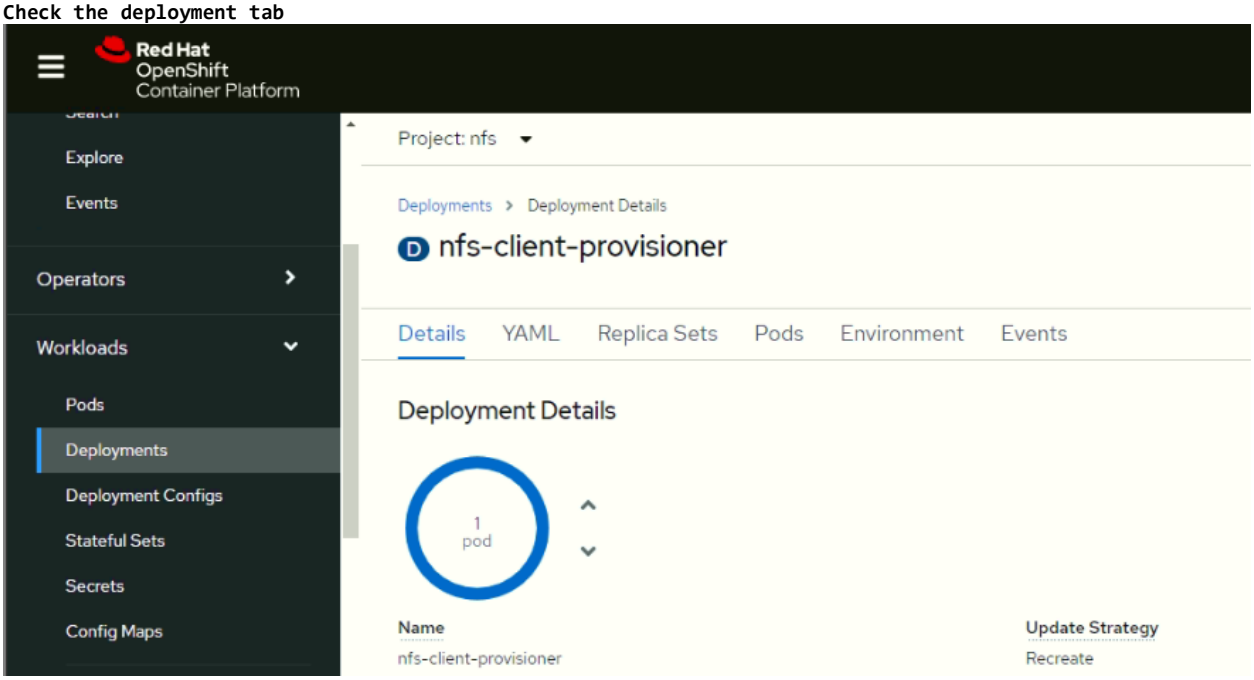
Click on Pods→Events tab
Scaling Error:
nfs-client-provisioner-5d4858c57c-ddnbk
NamespaceNSnfs
less than a minute ago
Generated from kubelet on wrkr01.ftmchk.techzert.work
10 times in the last 25 minutes
Unable to attach or mount volumes: unmounted volumes=[nfs-client-root], unattached volumes=[nfs-client-root nfs-client-provisioner-token-gc2zg]: timed out waiting for the condition
PodPnfs-client-provisioner-5d4858c57c-ddnbk

NamespaceNSnfs
2 minutes ago
Generated from kubelet on wrkr01.ftmchk.techzert.work
4 times in the last 10 minutes
(combined from similar events): MountVolume.SetUp failed for volume "nfs-client-root" : mount failed: exit status 32 Mounting command: systemd-run Mounting arguments: --description=Kubernetes transient mount for /var/lib/kubelet/pods/2d3db105-f205-4daa-8328-f6be936de402/volumes/kubernetes.io~nfs/nfs-client-root --scope -- mount -t nfs 192.168.19.212:/nfsshare/nfs-sc /var/lib/kubelet/pods/2d3db105-f205-4daa-8328-f6be936de402/volumes/kubernetes.io~nfs/nfs-client-root Output: Running scope as unit: run-r1bbdf243f61a461faaba84c920b17751.scope mount.nfs: No route to host
PodPnfs-client-provisioner-5d4858c57c-ddnbk

Solution:

```
[root@nfs ~]# systemctl stop firewalld.service
[root@nfs ~]# systemctl status firewalld.service
```

Check the deployment tab



Run the test-sc.yaml

```
[root@nfs ~]# ./oc create -f test-sc.yaml
persistentvolumeclaim/test-nfs-provisioner created
pod/ubuntu-test-nfs created
[root@nfs ~]#
```

Change the project to default, Click on Pod (Pending to Ruuning state)