

# NFS SETUP

## Redhat subscription:

```
[root@nfs ~]# subscription-manager register --username=manojkumar@techzert.com --password=M@n0j83249 --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.ftmchh
[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)
Red Hat Enterprise Linux 8 for x86_64 - AppStream (RPMs)
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 490 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 gasproxy; then systemctl reload gasproxy ; fi (code=exited, status=0/SUCCESS)  
     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 ~]# wget https://mirror.openshift.com/pub/openshift-v4/x86_64/clients/ocp/stable/openshift-client-linux.tar.gz
--2021-10-28 15:05:57-- https://mirror.openshift.com/pub/openshift-v4/x86_64/clients/ocp/stable/openshift-client-linux.tar.gz
Resolving mirror.openshift.com (mirror.openshift.com)... 54.172.173.155, 54.172.163.83
Connecting to mirror.openshift.com (mirror.openshift.com)|54.172.173.155|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 49412492 (47M) [application/x-gzip]
Saving to: 'openshift-client-linux.tar.gz'

openshift-client-linux.tar.gz      100%[=====>] 47.12M  1.17MB/s   in 31s

2021-10-28 15:06:29 (1.52 MB/s) - 'openshift-client-linux.tar.gz' saved [49412492/49412492]

[root@nfs ~]# tar -zxvf openshift-client-linux.tar.gz
README.md
oc
kubectl
[root@nfs ~]# mv kubectl /usr/local/bin/
[root@nfs ~]# ls
anaconda-ks.cfg  Documents  initial-setup-ks.cfg  oc  Pictures  README.md  Videos
Desktop          Downloads  Music                openshift-client-linux.tar.gz  Public  Templates
[root@nfs ~]# ./oc version
Client Version: 4.9.0
```

```
[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 ~]#
```



Red Hat OpenShift Container Platform

Project: nfs

### Volumes

Name	Mount Path	SubPath	Type	Permissions	Utilized By
nfs-client-root	/persistentvolumes	No subpath	NFS (/nfsshare/nfs-sc 192.168.19.212)	Read/Write	nfs-client-provisioner

### Conditions

Type	Status	Updated	Reason	Message
Progressing	True	2 minutes ago	NewReplicaSet Created	Created new replica set "nfs-client-provisioner-5d4858c57c"
Available	False	2 minutes ago	MinimumReplicas Unavailable	Deployment does not have minimum availability.
ReplicaFailure	True	2 minutes ago	FailedCreate	pods "nfs-client-provisioner-5d4858c57c" is forbidden: unable to validate against any security context constraint: [spec.volumes[0]: Invalid value: "nfs": nfs volumes are not allowed to be used]

Activate Windows  
Go to Settings to activate Windows.

```
./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 ~]#
```

Red Hat OpenShift Container Platform

Project: nfs

Deployments > Deployment Details

### nfs-client-provisioner

Details YAML Replica Sets Pods Environment Events

```

135   app: nfs-client-provisioner
136   spec:
137     restartPolicy: Always
138     serviceAccountName: nfs-client-provisioner
139     schedulerName: default-scheduler
140     terminationGracePeriodSeconds: 30
141     securityContext: {}
142     containers:
143     - name: nfs-client-provisioner
144       image: 'k8s.gcr.io/sig-storage/nfs-subdir-external-provisioner:v4.0.2'
145       env:
146       - name: PROVISIONER_NAME
147         value: nfs-storage

```


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

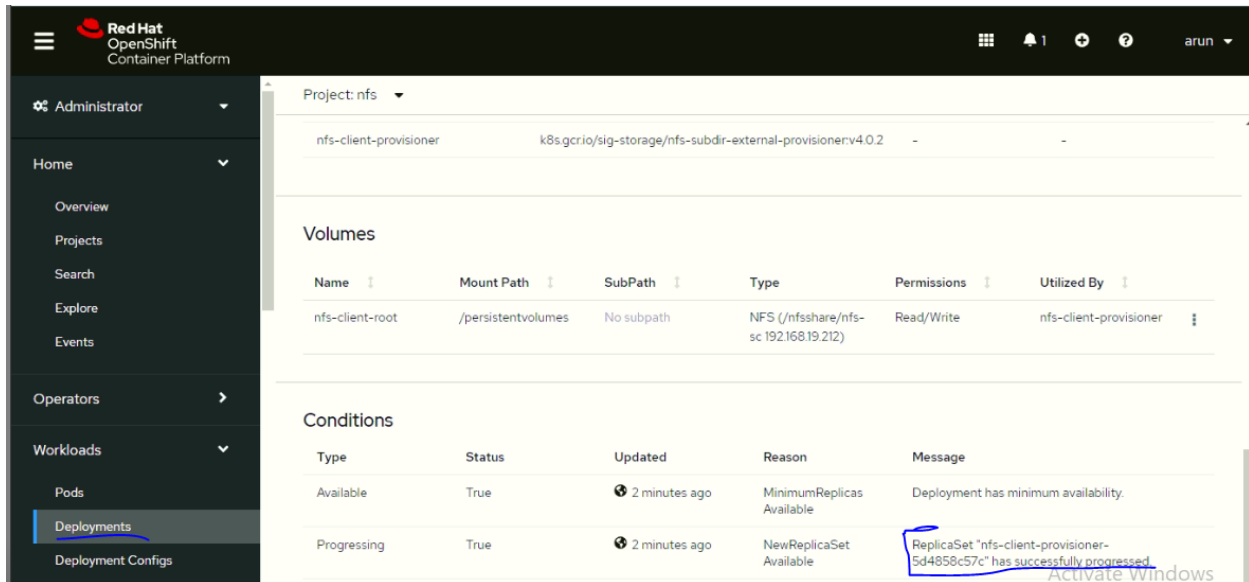
Project: nfs ▼

### Deployment Details



<b>Name</b>	nfs-client-provisioner	<b>Update Strategy</b>	Recreate
<b>Namespace</b>	<span>NS</span> nfs	<b>Progress Deadline Seconds</b>	600 seconds
<b>Labels</b>	app=nfs-client-provisioner	<b>Min Ready Seconds</b>	Not Configured

[Edit](#) 



```
[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

The screenshot shows the Red Hat OpenShift Container Platform console. The left sidebar has a menu with 'Workloads' expanded and 'Deployments' selected. The main panel shows the 'nfs-client-provisioner' deployment details for the 'nfs' project. The 'Details' tab is active, showing a deployment with 1 pod. The 'Update Strategy' is set to 'Recreate'.

Project: nfs

Deployments > Deployment Details

### nfs-client-provisioner

Details | YAML | Replica Sets | Pods | Environment | Events

#### Deployment Details

1 pod

Name	Update Strategy
nfs-client-provisioner	Recreate

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 Running state)

The screenshot shows the Red Hat OpenShift Container Platform console. The left sidebar has a menu with 'Workloads' expanded and 'Pods' selected. The main panel shows the 'ubuntu-test-nfs' pod details for the 'default' project. The pod is in a 'Pending' state. The 'Details' tab is active, showing memory usage, CPU usage, and filesystem information.

Project: default

Pods > Pod Details

### ubuntu-test-nfs Pending

Details | YAML | Environment | Logs | Events | Terminal

#### Pod Details

Memory Usage	CPU Usage	Filesystem
No datapoints found.	No datapoints found.	No datapoints found.

