

Practical 8

Configuring NFS

NFS Server and Client Configuration

1) On Server, verify the package of NFS whether installed as shown below.

```
[root@localhost ~]# rpm -q nfs-utils
nfs-utils-1.3.0-0.48.el7.x86_64
```

2) Verify IP address of the linux machine to be setup as NFS Server.

```
[root@localhost ~]# ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.0.100 netmask 255.0.0.0 broadcast 10.255.255.255
    inet6 fe80::20c:29ff:feaf:d3cb prefixlen 64 scopeid 0x20<link>
    ether 00:0c:29:af:d3:cb txqueuelen 1000 (Ethernet)
    RX packets 8362 bytes 572086 (558.6 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 273 bytes 34460 (33.6 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

3) On server, make a directory to be exported, create few files into it and give it full permission as follows.

```
[root@localhost ~]# mkdir /data
[root@localhost ~]# touch /data/{1.txt,2.txt}
[root@localhost ~]# mkdir /alpha
[root@localhost ~]# touch /alpha/{3.txt,4.txt}

[root@localhost ~]# chmod -R 777 /alpha
[root@localhost ~]#
```

4) On server, open the configuration file of NFS, vi /etc/exports.

```
[root@localhost ~]# vi /etc/exports
[root@localhost ~]#
```

And write the following lines in it.

```
/data
/alpha (rw,sync,root_squash)
```

Press **esc :wq** to save and exit from vi editor.

/data directory is a read-only by default and /alpha is read write with root squash. Hence root user of client will be considered as anonymous user on nfs server and will be identified nsfnobody user.

5) Restart nfs service, check status and disable firewall.

```
[root@localhost ~]# systemctl restart nfs
[root@localhost ~]# systemctl status nfs
● nfs-server.service - NFS server and services
   Loaded: loaded (/usr/lib/systemd/system/nfs-server.service; disabled; vendor preset: disabled)
   Active: active (exited) since Sun 2024-09-22 11:26:24 IST; 3s ago
     Process: 13835 ExecStopPost=/usr/sbin/exportfs -f (code=exited, status=0/SUCCESS)
     Process: 13833 ExecStopPost=/usr/sbin/exportfs -au (code=exited, status=0/SUCCESS)
     Process: 13830 ExecStop=/usr/sbin/rpc.nfsd 0 (code=exited, status=0/SUCCESS)
     Process: 13852 ExecStart=/usr/sbin/rpc.nfsd $RPCNFSDARGS (code=exited, status=0/SUCCESS)
     Process: 13847 ExecStartPre=/bin/sh -c /bin/kill -HUP `cat /run/gssproxy.pid` (code=exited, status=0/SUCCESS)
     Process: 13846 ExecStartPre=/usr/sbin/exportfs -r (code=exited, status=0/SUCCESS)
   Main PID: 13852 (code=exited, status=0/SUCCESS)
   CGroup: /system.slice/nfs-server.service

Sep 22 11:26:23 localhost.localdomain systemd[1]: Starting NFS server and ser...
Sep 22 11:26:23 localhost.localdomain exportfs[13846]: exportfs: No options f...
Sep 22 11:26:23 localhost.localdomain exportfs[13846]: exportfs: No host name...
Sep 22 11:26:24 localhost.localdomain systemd[1]: Started NFS server and serv...
Hint: Some lines were ellipsized, use -l to show in full.
[root@localhost ~]# systemctl stop firewalld
```

6) On client, check IP address.

```
[root@localhost ~]# ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
    inet 10.0.0.51 netmask 255.0.0.0  broadcast 10.255.255.255
    inet6 fe80::20c:29ff:fe06:60f7 prefixlen 64  scopeid 0x20<link>
    ether 00:0c:29:06:60:f7 txqueuelen 1000  (Ethernet)
    RX packets 3218  bytes 2121170 (2.0 MiB)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 415  bytes 37367 (36.4 KiB)
    TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0
```

7) On a client, showmount command shows you all shared directories in given IP address. (SERVER)

```
[root@localhost ~]# showmount -e 10.0.0.100
Export list for 10.0.0.100:
/alpha(rw,sync,root_squash) *
/data *
```

8) On Client, create two local directories and mount the server exported directory on it as shown:

```
[root@localhost ~]# mkdir localdir1
[root@localhost ~]# mkdir localdir2
[root@localhost ~]# mount -t nfs 10.0.0.100:/data localdir1
[root@localhost ~]# mount -t nfs 10.0.0.100:/alpha localdir2
```

Here nfs is a file system type. Exported directories from server 10.0.0.100 are to be mounted on local directories.

9) On listing, it show up the content of server export directory.

```
[root@localhost ~]# cd localdir1
[root@localhost localdir1]# ls
1.txt 2.txt
[root@localhost localdir1]# touch 3.txt
touch: cannot touch '3.txt': Read-only file system
```

We have mounted read-only directory /data on localdir1. Hence client is not able to create a file in it.

```
[root@localhost localdir1]# cd /root/localdir2
[root@localhost localdir2]# ls
3.txt 4.txt
[root@localhost localdir2]# touch new.txt
[root@localhost localdir2]# ls
3.txt 4.txt new.txt
```

/alpha is read write directory which is mounted on localdir2; hence client is able to create files. We have created new.txt file from root user on client.

You can check this on server.

```
[root@localhost ~]# ls -lh /alpha
total 0
-rwxrwxrwx. 1 root      root      0 Sep 22 10:54 3.txt
-rwxrwxrwx. 1 root      root      0 Sep 22 10:54 4.txt
-rw-r--r--. 1 nfsnobody nfsnobody 0 Sep 22 11:38 new.txt
[root@localhost ~]#
```

Because of root squash, client root user is anonymous user 'nfsnobody' for nfs server.

10) Now try this with no root squash. On server, add one parameter in /etc/exports file.

```
[root@localhost ~]# vi /etc/exports
```

```
/data
/alpha (rw,sync,no_root_squash)
```

Press **esc :wq** to save and exit from vi editor.

On client, create one empty file demo.txt in localdir2.

```
[root@localhost localdir2]#
[root@localhost localdir2]# touch demo.txt
[root@localhost localdir2]# ls
3.txt 4.txt demo.txt
[root@localhost localdir2]#
```

```
[root@localhost ~]# ls -lh /alpha
total 0
-rwxrwxrwx. 1 root root 0 Sep 22 10:54 3.txt
-rwxrwxrwx. 1 root root 0 Sep 22 10:54 4.txt
-rw-r--r--. 1 root root 0 Sep 22 11:46 demo.txt
[root@localhost ~]#
```

Because of no root squash, client root user is identified as root user on nfs server.