**Setting Up an NFS Server and Client on CentOS 7.2**

**This tutorial exists for these OS versions**

* **CentOS 7.2**
* [CentOS 6.3](https://www.howtoforge.com/setting-up-an-nfs-server-and-client-on-centos-6.3)
* [CentOS 5.5](https://www.howtoforge.com/setting-up-an-nfs-server-and-client-on-centos-5.5)

**On this page**

1. [1 Preliminary Note](https://www.howtoforge.com/tutorial/setting-up-an-nfs-server-and-client-on-centos-7/#-preliminary-note)
2. [2 Configure the Firewall](https://www.howtoforge.com/tutorial/setting-up-an-nfs-server-and-client-on-centos-7/#-configure-the-firewall)
3. [3 Installing NFS](https://www.howtoforge.com/tutorial/setting-up-an-nfs-server-and-client-on-centos-7/#-installing-nfs)
4. [4 Exporting Directories on the Server](https://www.howtoforge.com/tutorial/setting-up-an-nfs-server-and-client-on-centos-7/#-exporting-directories-on-the-server)
5. [5 Mounting the NFS Shares on the Client](https://www.howtoforge.com/tutorial/setting-up-an-nfs-server-and-client-on-centos-7/#-mounting-the-nfs-shares-on-the-client)
6. [6 Testing](https://www.howtoforge.com/tutorial/setting-up-an-nfs-server-and-client-on-centos-7/#-testing)
7. [7 Mounting NFS Shares at Boot Time](https://www.howtoforge.com/tutorial/setting-up-an-nfs-server-and-client-on-centos-7/#-mounting-nfs-shares-at-boot-time)
8. [8 Links](https://www.howtoforge.com/tutorial/setting-up-an-nfs-server-and-client-on-centos-7/#-links)

**1 Preliminary Note**

I'm using two CentOS systems here:

* NFS Server: *server.example.com*, IP address: *192.168.1.100*
* NFS Client: *client.example.com*, IP address: *192.168.1.101*

**2 Configure the Firewall**

I recommend having a firewall installed. If you do not have firewalld installed yet and want to use a firewall, then install it with these commands:

*yum -y install firewalld*

start the firewall and enable it to be started at boot time.

*systemctl start firewalld.service  
systemctl enable firewalld.service*

Next, open the SSH and NFS ports to ensure that you will be able to connect to the server by SSH for admin purposes and by NFS from our NFS client.

*firewall-cmd --permanent --zone=public --add-service=ssh  
firewall-cmd --permanent --zone=public --add-service=nfs  
firewall-cmd --reload*

**3 Installing NFS**

**server:**

On the NFS server we run:

*yum -y install nfs-utils*

Then enable and start the nfs server service.

*systemctl enable nfs-server.service  
systemctl start nfs-server.service*

**client:**

On the client, we can install NFS as follows (this is actually the same as on the server):

*yum install nfs-utils*

**4 Exporting Directories on the Server**

**server:**

I'd like to make the directories */home* and */var/nfs* accessible to the client; therefore we must "export" them on the server.

When a client accesses an NFS share, this normally happens as the user *nfsnobody*. Usually the */home* directory isn't owned by *nfsnobody* (and I don't recommend to change its ownership to *nfsnobody*!), and because we want to read and **write** on */home*, we tell NFS that accesses should be made as root (if our */home* share was read-only, this wouldn't be necessary). The */var/nfs* directory doesn't exist, so we can create it and change its ownership to the user and group nfsnobody.

*mkdir /var/nfs  
chown nfsnobody:nfsnobody /var/nfs  
chmod 755 /var/nfs*

Now we must modify */etc/exports* where we "export" our NFS shares. We specify */home* and */var/nfs* as NFS shares and tell NFS to make accesses to */home* as root (to learn more about */etc/exports*, its format and available options, take a look at

*man 5 exports*

)

*nano /etc/exports*

/home 192.168.1.101(rw,sync,no\_root\_squash,no\_subtree\_check)

/var/nfs 192.168.1.101(rw,sync,no\_subtree\_check)

(The *no\_root\_squash* option makes that */home* will be accessed as root.)

Whenever we modify */etc/exports*, we must run:

*exportfs -a*

afterwards, to make the changes effective.

**5 Mounting the NFS Shares on the Client**

**client:**

First we create the directories where we want to mount the NFS shares, e.g.:

*mkdir -p /mnt/nfs/home  
mkdir -p /mnt/nfs/var/nfs*

Afterwards, we can mount them as follows:

*mount 192.168.1.100:/home /mnt/nfs/home  
mount 192.168.1.100:/var/nfs /mnt/nfs/var/nfs*

You should now see the two NFS shares in the outputs of

*df -h*

*[root@client ~]# df -h  
Filesystem Size Used Avail Use% Mounted on  
/dev/mapper/centos-root 28G 1.7G 26G 7% /  
devtmpfs 909M 0 909M 0% /dev  
tmpfs 919M 0 919M 0% /dev/shm  
tmpfs 919M 8.6M 910M 1% /run  
tmpfs 919M 0 919M 0% /sys/fs/cgroup  
/dev/sda1 497M 208M 290M 42% /boot  
tmpfs 184M 0 184M 0% /run/user/0  
192.168.1.100:/home 28G 1.2G 27G 5% /mnt/nfs/home  
192.168.1.100:/var/nfs 28G 1.2G 27G 5% /mnt/nfs/var/nfs*

and

*mount*

*[root@client ~]# mount  
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime,seclabel)  
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)  
devtmpfs on /dev type devtmpfs (rw,nosuid,seclabel,size=930320k,nr\_inodes=232580,mode=755)  
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)  
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev,seclabel)  
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,seclabel,gid=5,mode=620,ptmxmode=000)  
tmpfs on /run type tmpfs (rw,nosuid,nodev,seclabel,mode=755)  
tmpfs on /sys/fs/cgroup type tmpfs (ro,nosuid,nodev,noexec,seclabel,mode=755)  
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,release\_agent=/usr/lib/systemd/systemd-cgroups-agent,name=systemd)  
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)  
cgroup on /sys/fs/cgroup/perf\_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf\_event)  
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb)  
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices)  
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer)  
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset)  
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpuacct,cpu)  
cgroup on /sys/fs/cgroup/net\_cls type cgroup (rw,nosuid,nodev,noexec,relatime,net\_cls)  
cgroup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relatime,blkio)  
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory)  
configfs on /sys/kernel/config type configfs (rw,relatime)  
/dev/mapper/centos-root on / type xfs (rw,relatime,seclabel,attr2,inode64,noquota)  
selinuxfs on /sys/fs/selinux type selinuxfs (rw,relatime)  
systemd-1 on /proc/sys/fs/binfmt\_misc type autofs (rw,relatime,fd=25,pgrp=1,timeout=300,minproto=5,maxproto=5,direct)  
mqueue on /dev/mqueue type mqueue (rw,relatime,seclabel)  
debugfs on /sys/kernel/debug type debugfs (rw,relatime)  
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime,seclabel)  
sunrpc on /var/lib/nfs/rpc\_pipefs type rpc\_pipefs (rw,relatime)  
nfsd on /proc/fs/nfsd type nfsd (rw,relatime)  
/dev/sda1 on /boot type xfs (rw,relatime,seclabel,attr2,inode64,noquota)  
tmpfs on /run/user/0 type tmpfs (rw,nosuid,nodev,relatime,seclabel,size=188060k,mode=700)  
192.168.1.100:/home on /mnt/nfs/home type nfs4 (rw,relatime,vers=4.0,rsize=262144,wsize=262144,namlen=255,hard,proto=tcp,port=0,timeo=600,retrans=2,sec=sys,clientaddr=192.168.1.101,local\_lock=none,addr=192.168.1.100)  
192.168.1.100:/var/nfs on /mnt/nfs/var/nfs type nfs4 (rw,relatime,vers=4.0,rsize=262144,wsize=262144,namlen=255,hard,proto=tcp,port=0,timeo=600,retrans=2,sec=sys,clientaddr=192.168.1.101,local\_lock=none,addr=192.168.1.100)*

**6 Testing**

On the client, you can now try to create test files on the NFS shares:

**client:**

*touch /mnt/nfs/home/test.txt  
touch /mnt/nfs/var/nfs/test.txt*

Now go to the server and check if you can see both test files:

**server:Advertisement**

*ls -l /home/*

*[root@server1 ~]# ls -l /home/  
total 0  
drwx------. 2 administrator administrator 59 Jun 21 16:13 administrator  
-rw-r--r--. 1 root root 0 Jun 29 13:07 test.txt*

*ls -l /var/nfs*

*[root@server1 ~]# ls -l /var/nfs  
total 0  
-rw-r--r--. 1 nfsnobody nfsnobody 0 Jun 29 13:07 test.txt*

(Please note the different ownerships of the test files: the */home* NFS share gets accessed as root, therefore */home/test.txt* is owned by root; the */var/nfs* share gets accessed as *nobody/65534*, therefore */var/nfs/test.txt* is owned by *65534*.)

**7 Mounting NFS Shares at Boot Time**

Instead of mounting the NFS shares manually on the client, you could modify */etc/fstab* so that the NFS shares get mounted automatically when the client boots.

**client:**

Open */etc/fstab* and append the following lines:

*nano /etc/fstab*

[...]

192.168.1.100:/home /mnt/nfs/home nfs rw,sync,hard,intr 0 0

192.168.1.100:/var/nfs /mnt/nfs/var/nfs nfs rw,sync,hard,intr 0 0

Instead of *rw,sync,hard,intr* you can use different mount options. To learn more about available options, take a look at

*man nfs*

To test if your modified */etc/fstab* is working, reboot the client:

*reboot*

After the reboot, you should find the two NFS shares in the outputs of

*df -h*

*[root@client ~]# df -h  
Filesystem Size Used Avail Use% Mounted on  
/dev/mapper/centos-root 28G 1.7G 26G 7% /  
devtmpfs 909M 0 909M 0% /dev  
tmpfs 919M 0 919M 0% /dev/shm  
tmpfs 919M 8.6M 910M 1% /run  
tmpfs 919M 0 919M 0% /sys/fs/cgroup  
/dev/sda1 497M 208M 290M 42% /boot  
tmpfs 184M 0 184M 0% /run/user/0  
192.168.1.100:/home 28G 1.2G 27G 5% /mnt/nfs/home  
192.168.1.100:/var/nfs 28G 1.2G 27G 5% /mnt/nfs/var/nfs*

and

*mount*

*[root@client ~]# mount  
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime,seclabel)  
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)  
devtmpfs on /dev type devtmpfs (rw,nosuid,seclabel,size=930320k,nr\_inodes=232580,mode=755)  
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)  
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev,seclabel)  
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,seclabel,gid=5,mode=620,ptmxmode=000)  
tmpfs on /run type tmpfs (rw,nosuid,nodev,seclabel,mode=755)  
tmpfs on /sys/fs/cgroup type tmpfs (ro,nosuid,nodev,noexec,seclabel,mode=755)  
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,release\_agent=/usr/lib/systemd/systemd-cgroups-agent,name=systemd)  
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)  
cgroup on /sys/fs/cgroup/perf\_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf\_event)  
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb)  
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices)  
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer)  
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset)  
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpuacct,cpu)  
cgroup on /sys/fs/cgroup/net\_cls type cgroup (rw,nosuid,nodev,noexec,relatime,net\_cls)  
cgroup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relatime,blkio)  
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory)  
configfs on /sys/kernel/config type configfs (rw,relatime)  
/dev/mapper/centos-root on / type xfs (rw,relatime,seclabel,attr2,inode64,noquota)  
selinuxfs on /sys/fs/selinux type selinuxfs (rw,relatime)  
systemd-1 on /proc/sys/fs/binfmt\_misc type autofs (rw,relatime,fd=25,pgrp=1,timeout=300,minproto=5,maxproto=5,direct)  
mqueue on /dev/mqueue type mqueue (rw,relatime,seclabel)  
debugfs on /sys/kernel/debug type debugfs (rw,relatime)  
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime,seclabel)  
sunrpc on /var/lib/nfs/rpc\_pipefs type rpc\_pipefs (rw,relatime)  
nfsd on /proc/fs/nfsd type nfsd (rw,relatime)  
/dev/sda1 on /boot type xfs (rw,relatime,seclabel,attr2,inode64,noquota)  
tmpfs on /run/user/0 type tmpfs (rw,nosuid,nodev,relatime,seclabel,size=188060k,mode=700)  
192.168.1.100:/home on /mnt/nfs/home type nfs4 (rw,relatime,vers=4.0,rsize=262144,wsize=262144,namlen=255,hard,proto=tcp,port=0,timeo=600,retrans=2,sec=sys,clientaddr=192.168.1.101,local\_lock=none,addr=192.168.1.100)  
192.168.1.100:/var/nfs on /mnt/nfs/var/nfs type nfs4 (rw,relatime,vers=4.0,rsize=262144,wsize=262144,namlen=255,hard,proto=tcp,port=0,timeo=600,retrans=2,sec=sys,clientaddr=192.168.1.101,local\_lock=none,addr=192.168.1.100)*