

```
joe@nfss:~$ sudo apt-get install nfs-kernel-server
```

```
Reading package lists... Done
```

```
Building dependency tree
```

```
Reading state information... Done
```

```
The following extra packages will be installed:
```

```
keyutils libgssglue1 libnfsidmap2 libtirpc1 nfs-common rpcbind
```

```
Suggested packages:
```

```
open-iscsi watchdog
```

```
The following NEW packages will be installed:
```

```
keyutils libgssglue1 libnfsidmap2 libtirpc1 nfs-common nfs-kernel-server  
rpcbind
```

```
0 upgraded, 7 newly installed, 0 to remove and 172 not upgraded.
```

```
Need to get 460 kB of archives.
```

```
After this operation, 2,049 kB of additional disk space will be used.
```

```
Do you want to continue? [Y/n] █
```

joe@nfss: ~

joe@nfss: ~

x

joe@web: ~

x

```
joe@nfss:~$ echo "Is it running?"
```

```
Is it running?
```

```
joe@nfss:~$
```

```
joe@nfss:~$ ps aux | egrep 'nfs|lock|rpc|portmap'
```

```
root      20    0.0  0.0    0     0 ?        S<    11:43   0:00 [kblockd]
root     2427  0.0  0.2  23424  1168 ?        Ss    13:08   0:00 rpcbind -w
statd    2660  0.0  0.2  21544  1368 ?        Ss    13:08   0:00 rpc.statd -L
root     2734  0.0  0.0    0     0 ?        S<    13:08   0:00 [rpciod]
root     2735  0.0  0.0    0     0 ?        S<    13:08   0:00 [nfsiod]
root     2744  0.0  0.0  23480   420 ?        Ss    13:08   0:00 rpc.idmapd
joe      2984  0.0  0.1   8168   888 pts/0    S+    13:09   0:00 egrep --color=auto nfs
```

```
| lock | rpc | portmap
```

```
joe@nfss:~$ █
```

```
joe@nfss:~$ echo "try to start the service"  
try to start the service  
joe@nfss:~$ █
```

```
joe@nfss:~$ sudo service nfs-kernel-server start
```

```
* Not starting NFS kernel daemon: no exports.
```

```
joe@nfss:~$ echo "we need to define what to export"
```

```
we need to define what to export
```

```
joe@nfss:~$ █
```

```
joe@nfss:/etc$ sudo vi exports
```

```
# /etc/exports: the access control list for filesystems which may be exported
#               to NFS clients.  See exports(5).
#
# Example for NFSv2 and NFSv3:
# /srv/homes      hostname1(rw,sync,no_subtree_check) hostname2(ro,sync,no_subtree_cke
ck)
#
# Example for NFSv4:
# /srv/nfs4      gss/krb5i(rw,sync,fsid=0,crossmnt,no_subtree_check)
# /srv/nfs4/homes gss/krb5i(rw,sync,no_subtree_check)
#
#/data/images will be the directory that we want to share
#144.xx.yy.zz is the host that we allow to share it
#followed by various options
/data/images 144.38.220.211(rw,sync,no_subtree_check)
```

joe@nfss: /etc

joe@nfss: /etc

x

joe@web: ~

x

```
joe@nfss:/etc$ echo "make the directory"
```

```
make the directory
```

```
joe@nfss:/etc$ █
```


joe@nfss: /etc

joe@nfss: /etc

x

joe@web: ~

x

```
joe@nfss:/etc$ sudo mkdir -p /data/images
```

```
joe@nfss:/etc$ echo "Now lets see if it will start"
```

```
Now lets see if it will start
```

```
joe@nfss:/etc$ █
```

```
joe@nfss:/etc$ sudo service nfs-kernel-server start
```

```
* Exporting directories for NFS kernel daemon...
```

```
[ OK ]
```

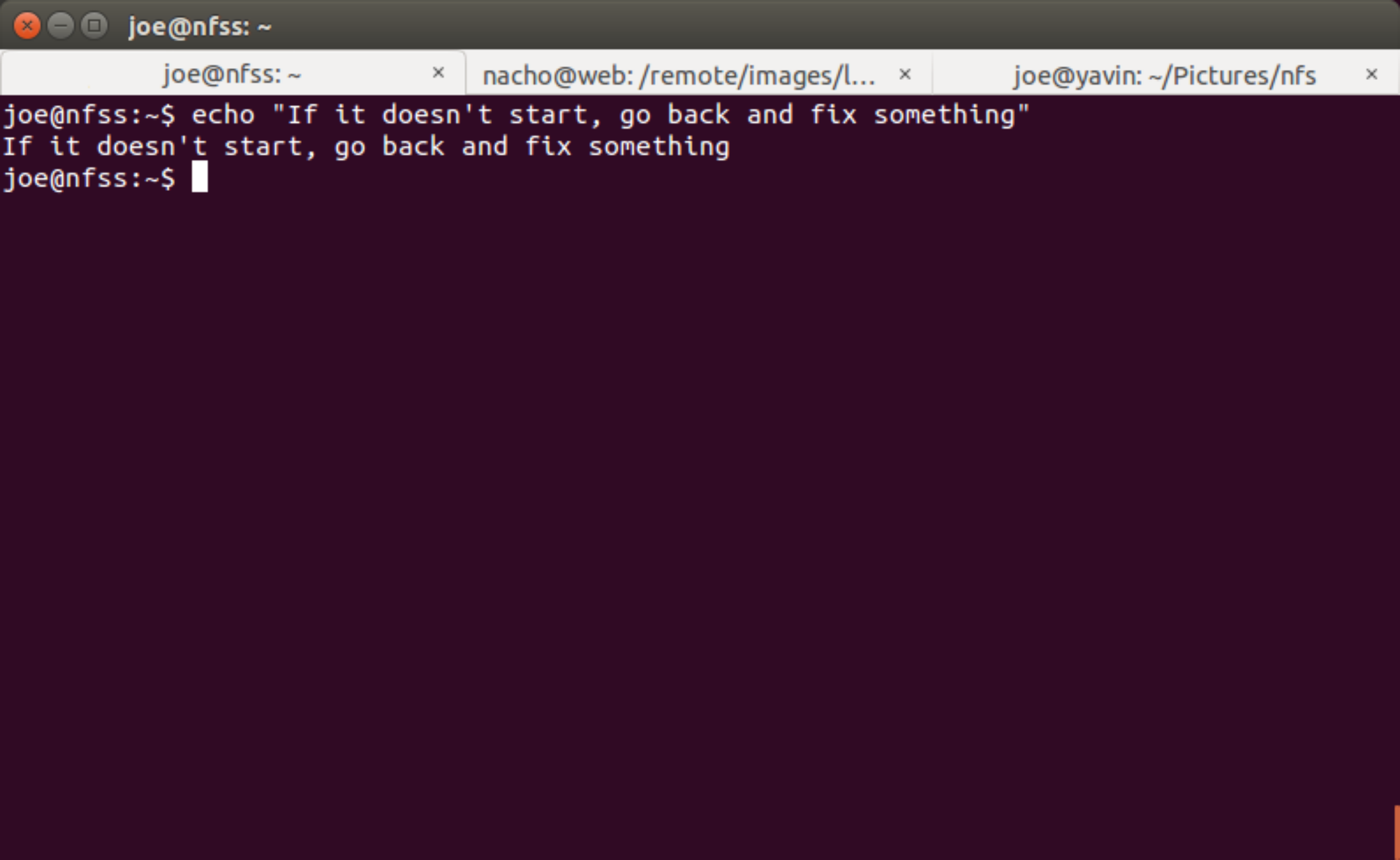
```
* Starting NFS kernel daemon
```

```
[ OK ]
```

```
joe@nfss:/etc$ echo "YAY!"
```

```
YAY!
```

```
joe@nfss:/etc$ █
```



joe@nfss: ~

joe@nfss: ~

nacho@web: /remote/images/l...

joe@yavin: ~/Pictures/nfs

```
joe@nfss:~$ echo "If it doesn't start, go back and fix something"
```

```
If it doesn't start, go back and fix something
```

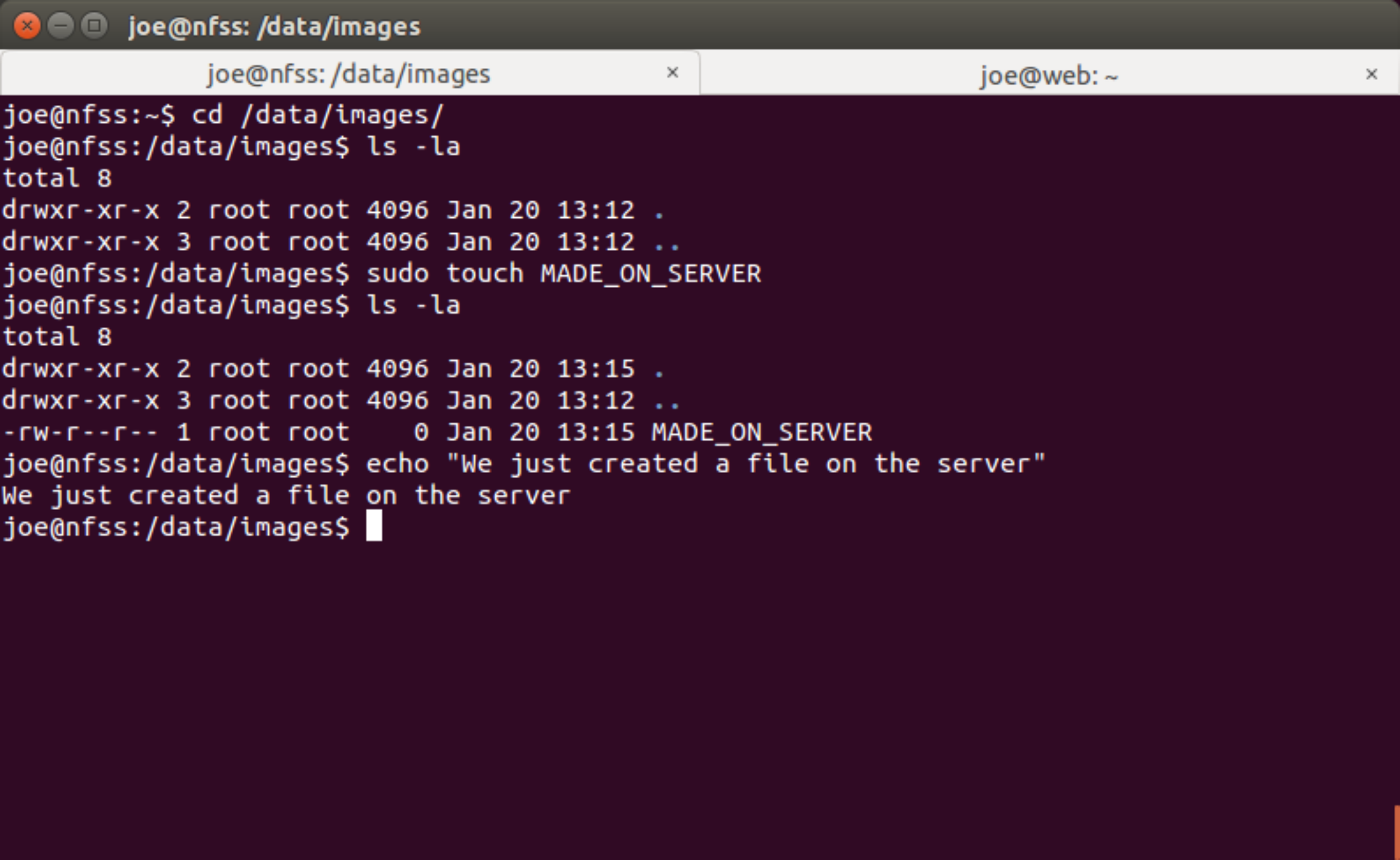
```
joe@nfss:~$
```

```
joe@nfss:/var/lib/nfs$ cd
```

```
joe@nfss:~$ cat /var/lib/nfs/etab
```

```
/data/images 144.38.220.211(rw, sync, wdelay, hide, nocrossmnt, secure, root_squash, no_all_squash, no_subtree_check, secure_locks, acl, anonuid=65534, anongid=65534, sec=sys, rw, root_squash, no_all_squash)
```

```
joe@nfss:~$ █
```



joe@nfss: /data/images

joe@nfss: /data/images

joe@web: ~

```
joe@nfss:~$ cd /data/images/
```

```
joe@nfss:/data/images$ ls -la
```

```
total 8
```

```
drwxr-xr-x 2 root root 4096 Jan 20 13:12 .
```

```
drwxr-xr-x 3 root root 4096 Jan 20 13:12 ..
```

```
joe@nfss:/data/images$ sudo touch MADE_ON_SERVER
```

```
joe@nfss:/data/images$ ls -la
```

```
total 8
```

```
drwxr-xr-x 2 root root 4096 Jan 20 13:15 .
```

```
drwxr-xr-x 3 root root 4096 Jan 20 13:12 ..
```

```
-rw-r--r-- 1 root root 0 Jan 20 13:15 MADE_ON_SERVER
```

```
joe@nfss:/data/images$ echo "We just created a file on the server"
```

```
We just created a file on the server
```

```
joe@nfss:/data/images$
```

```
joe@web:~$ echo "we are now on the client"
```

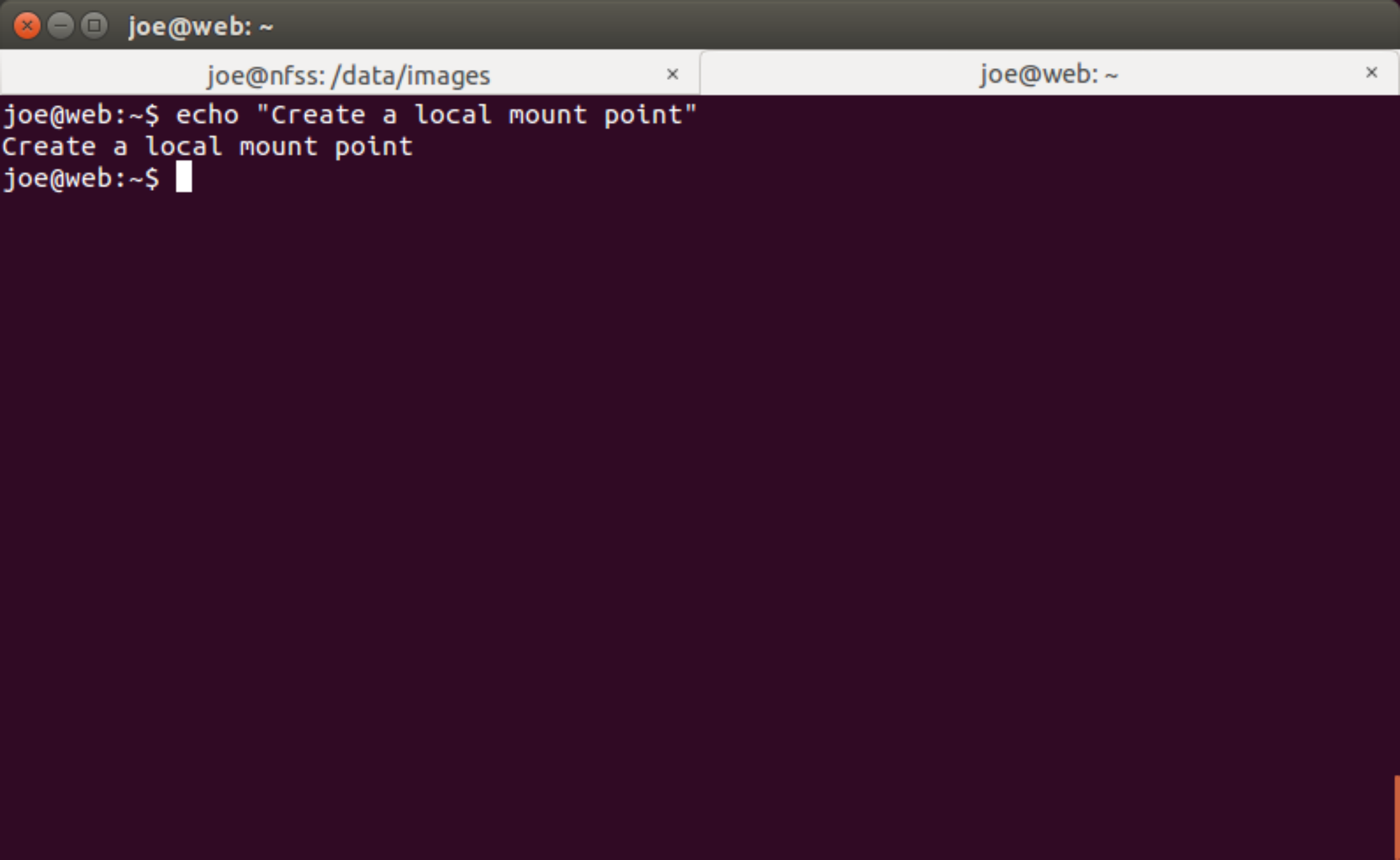
```
we are now on the client
```

```
joe@web:~$ echo "Install the client nfs utilities"
```

```
Install the client nfs utilities
```

```
joe@web:~$ sudo apt-get install nfs-common
```

```
joe@web: ~  
joe@nfss: /data/images x  
joe@web: ~ x  
joe@web:~$ ps aux | egrep 'rpc|nfs'  
root      4258  0.0  0.2 23424 1168 ?        Ss   13:16   0:00 rpcbind -w  
statd    4491  0.0  0.2 21544 1364 ?        Ss   13:16   0:00 rpc.statd -L  
root      4564  0.0  0.0      0      0 ?        S<   13:16   0:00 [rpciod]  
root      4565  0.0  0.0      0      0 ?        S<   13:16   0:00 [nfsiod]  
root      4582  0.0  0.0 23480  416 ?        Ss   13:16   0:00 rpc.idmapd  
joe       4604  0.0  0.1  8164  888 pts/1    S+   13:17   0:00 egrep --color=auto rpc  
|nfs  
joe@web:~$
```

joe@web: ~

joe@nfss: /data/images

x

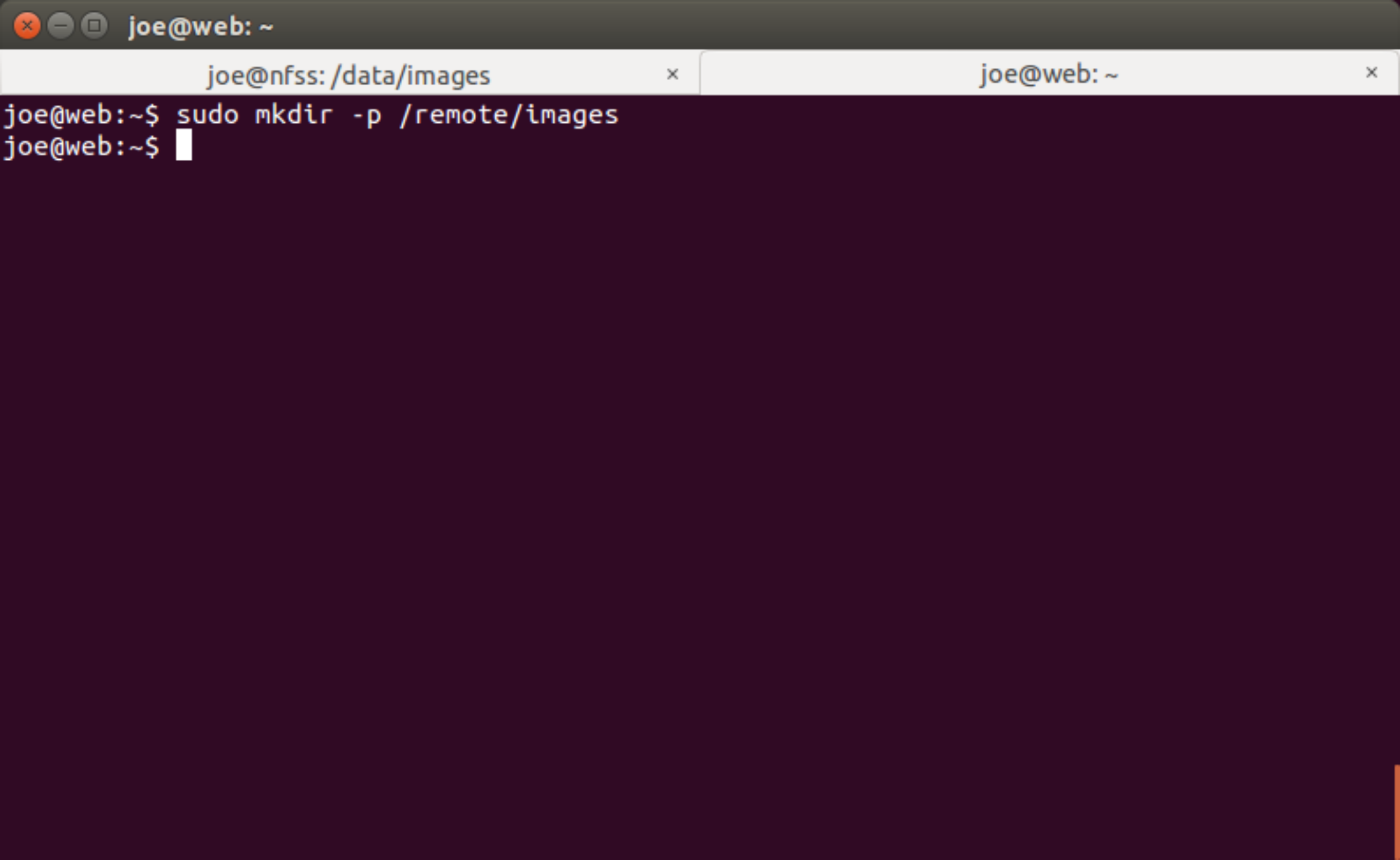
joe@web: ~

x

```
joe@web:~$ echo "Create a local mount point"
```

```
Create a local mount point
```

```
joe@web:~$ █
```



joe@web: ~

joe@nfss: /data/images

joe@web: ~

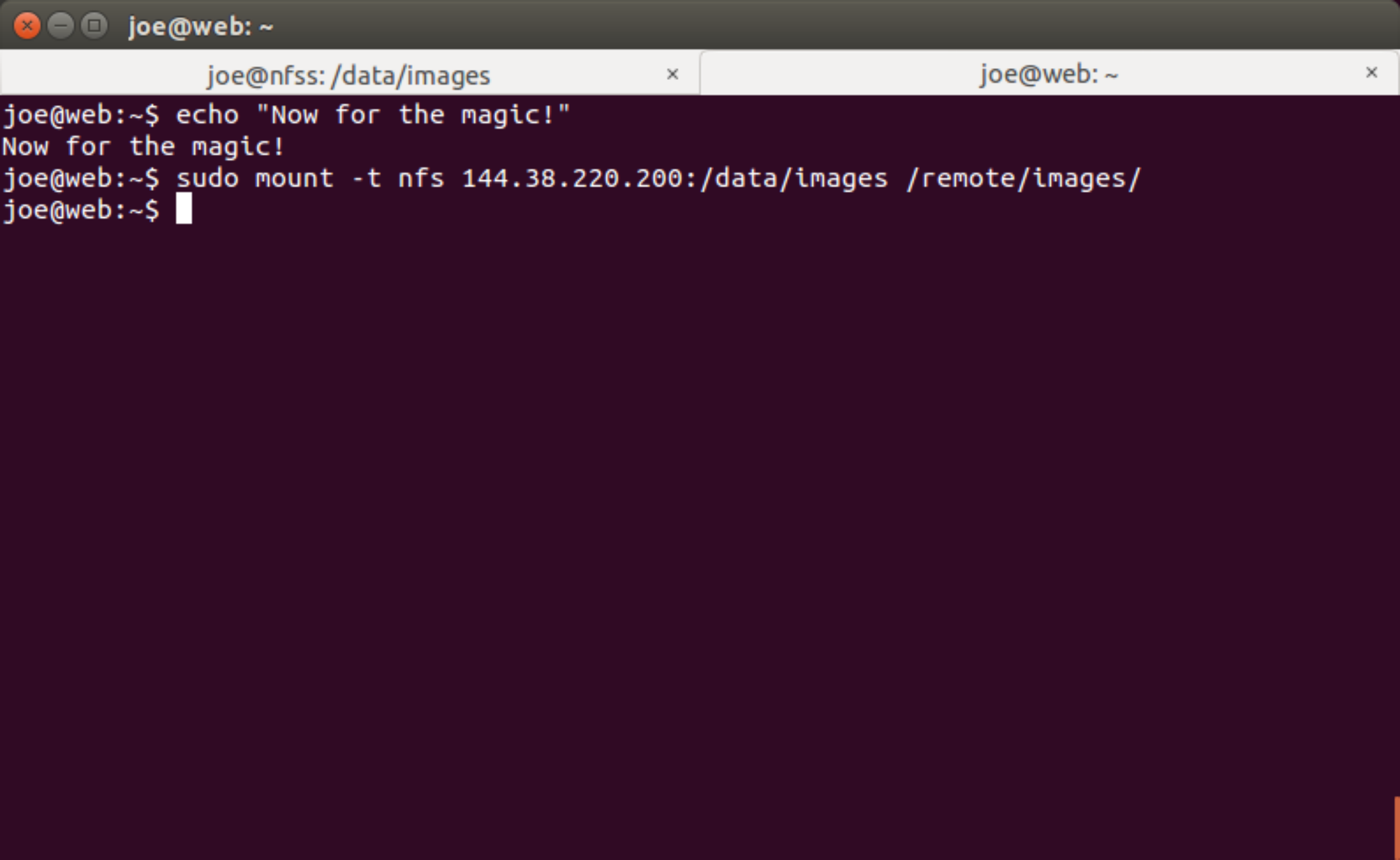
```
joe@web:~$ sudo mkdir -p /remote/images
```

```
joe@web:~$
```

```
joe@web:~$ df -h
```

| Filesystem | Size | Used | Avail | Use% | Mounted on |
|------------|------|------|-------|------|----------------|
| /dev/sda1 | 12G | 1.3G | 9.4G | 12% | / |
| none | 4.0K | 0 | 4.0K | 0% | /sys/fs/cgroup |
| udev | 235M | 4.0K | 235M | 1% | /dev |
| tmpfs | 50M | 380K | 49M | 1% | /run |
| none | 5.0M | 0 | 5.0M | 0% | /run/lock |
| none | 246M | 0 | 246M | 0% | /run/shm |
| none | 100M | 0 | 100M | 0% | /run/user |

```
joe@web:~$ █
```



joe@web: ~

joe@nfss: /data/images

x

joe@web: ~

x

```
joe@web:~$ echo "Now for the magic!"
```

```
Now for the magic!
```

```
joe@web:~$ sudo mount -t nfs 144.38.220.200:/data/images /remote/images/
```

```
joe@web:~$
```

```
joe@web:~$ df -h
```

| Filesystem | Size | Used | Avail | Use% | Mounted on |
|-----------------------------|------|------|-------|------|----------------|
| /dev/sda1 | 12G | 1.3G | 9.4G | 12% | / |
| none | 4.0K | 0 | 4.0K | 0% | /sys/fs/cgroup |
| udev | 235M | 4.0K | 235M | 1% | /dev |
| tmpfs | 50M | 380K | 49M | 1% | /run |
| none | 5.0M | 0 | 5.0M | 0% | /run/lock |
| none | 246M | 0 | 246M | 0% | /run/shm |
| none | 100M | 0 | 100M | 0% | /run/user |
| 144.38.220.200:/data/images | 12G | 1.3G | 9.4G | 12% | /remote/images |

```
joe@web:~$
```

```
joe@web:~$ cd /remote/images/
```

```
joe@web:/remote/images$ ls -l
```

```
total 0
```

```
-rw-r--r-- 1 root root 0 Jan 20 13:15 MADE_ON_SERVER
```

```
joe@web:/remote/images$
```

```
joe@web:/remote/images$ ls
```

```
MADE_ON_SERVER
```

```
joe@web:/remote/images$ sudo touch MADE_FROM_CLIENT
```

```
touch: cannot touch 'MADE_FROM_CLIENT': Permission denied
```

```
joe@web:/remote/images$ echo "OUCH!"
```

```
OUCH!
```

```
joe@web:/remote/images$ echo "Why can't we write to the shared dir?"
```

```
Why can't we write to the shared dir?
```

```
joe@web:/remote/images$ █
```

```
joe@web:/remote/images$ echo "We are writing as root, and root does not have privileges  
on the remote server. They are squashed."
```

```
We are writing as root, and root does not have privileges on the remote server. They ar  
e squashed.
```

```
joe@web:/remote/images$ █
```



```
joe@nfss:/data/images$ echo "Back on server"
```

```
Back on server
```

```
joe@nfss:/data/images$ sudo vi /etc/exports
```

```
# /etc/exports: the access control list for filesystems which may be exported
#                to NFS clients.  See exports(5).
#
# Example for NFSv2 and NFSv3:
# /srv/homes      hostname1(rw,sync,no_subtree_check) hostname2(ro,sync,no_subtree_cke
ck)
#
# Example for NFSv4:
# /srv/nfs4      gss/krb5i(rw,sync,fsid=0,crossmnt,no_subtree_check)
# /srv/nfs4/homes gss/krb5i(rw,sync,no_subtree_check)
#
#/data/images will be the directory that we want to share
#144.xx.yy.zz is the host that we allow to share it
#followed by various options
/data/images 144.38.220.211(rw,sync,no_subtree_check,no_root_squash)
```

```
~
~
~
~
~
~
~
~
~
~
~
```

```
joe@nfss:/data/images$ sudo service nfs-kernel-server reload
```

```
* Re-exporting directories for NFS kernel daemon...
```

```
[ OK ]
```

```
joe@nfss:/data/images$
```

```
joe@web:/remote/images$ echo "Back on client"
```

```
Back on client
```

```
joe@web:/remote/images$ █
```

```
joe@web:/remote/images$ sudo touch MADE_FROM_CLIENT
```

```
joe@web:/remote/images$ ls -la
```

```
total 8
```

```
drwxr-xr-x 2 root root 4096 Jan 20 13:24 .
```

```
drwxr-xr-x 3 root root 4096 Jan 20 13:18 ..
```

```
-rw-r--r-- 1 root root 0 Jan 20 13:24 MADE_FROM_CLIENT
```

```
-rw-r--r-- 1 root root 0 Jan 20 13:15 MADE_ON_SERVER
```

```
joe@web:/remote/images$ echo "YAY"
```

```
YAY
```

```
joe@web:/remote/images$ █
```

⌵ ⌵ ⌵ joe@web: /remote/images

joe@nfss: /data/images

×

joe@web: /remote/images

×

```
joe@web:/remote/images$ echo "How do we unmount that directory?"
```

```
How do we unmount that directory?
```

```
joe@web:/remote/images$ █
```

```
joe@web:/remote/images$ echo "How do we unmount that directory?"
```

```
How do we unmount that directory?
```

```
joe@web:/remote/images$ sudo umount /remote/images
```

```
umount.nfs: /remote/images: device is busy
```

```
umount.nfs: /remote/images: device is busy
```

```
joe@web:/remote/images$ echo "Why is device busy?"
```

```
Why is device busy?
```

```
joe@web:/remote/images$
```

```
joe@web:/remote/images$
```

```
joe@web:/remote/images$
```

```
joe@web:/remote/images$ echo "Because we are IN that directory!"
```

```
Because we are IN that directory!
```

```
joe@web:/remote/images$ █
```

```
joe@web: ~  
joe@nfss: /data/images x  
joe@web: ~ x  
joe@web:~$ sudo umount /remote/images  
joe@web:~$ echo "YAY"  
YAY  
joe@web:~$ df -h  
Filesystem      Size  Used Avail Use% Mounted on  
/dev/sda1       12G   1.3G   9.4G  12% /  
none            4.0K    0   4.0K   0% /sys/fs/cgroup  
udev           235M   4.0K  235M   1% /dev  
tmpfs          50M   380K   49M   1% /run  
none           5.0M    0   5.0M   0% /run/lock  
none          246M    0  246M   0% /run/shm  
none          100M    0  100M   0% /run/user  
joe@web:~$ █
```



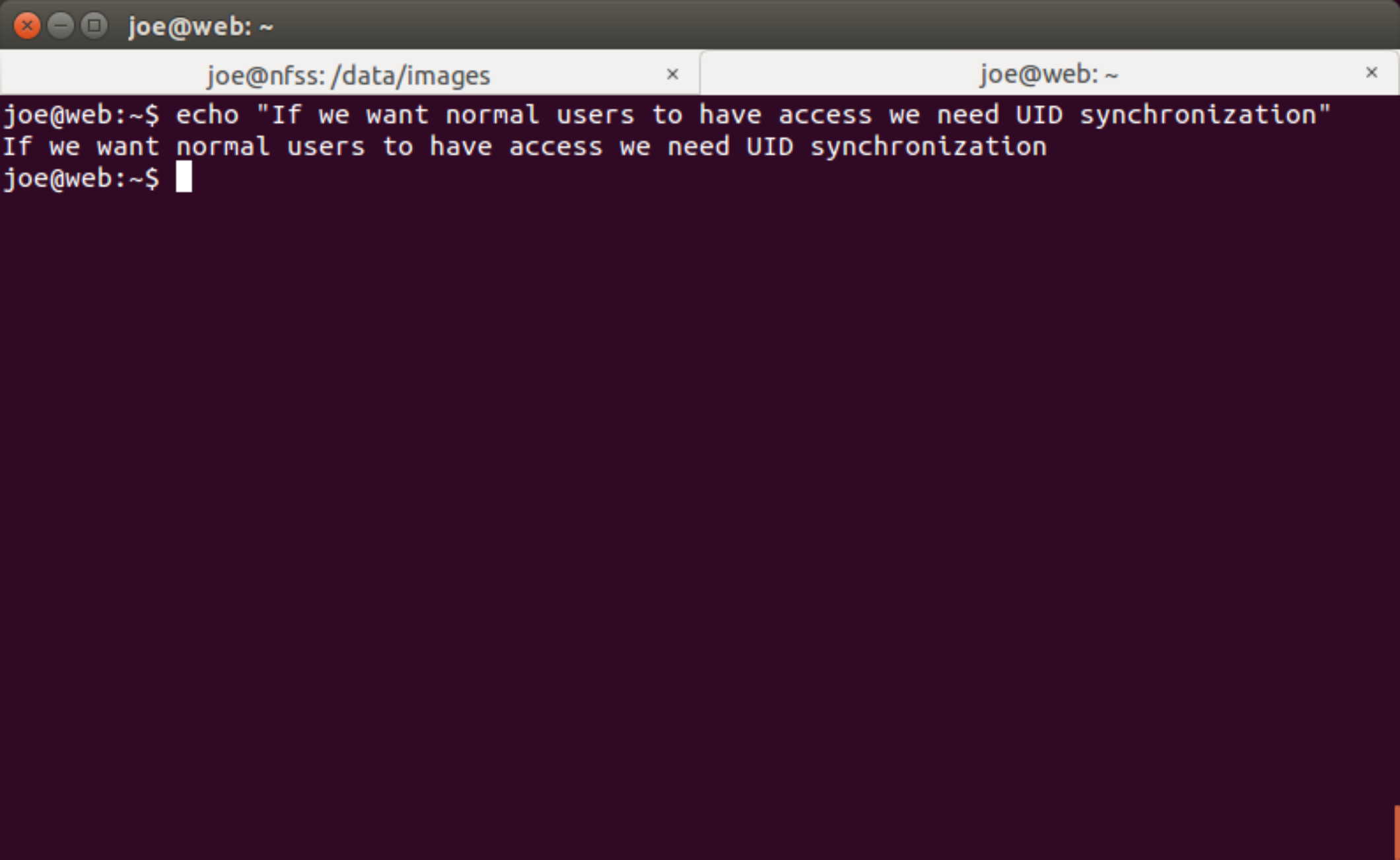
```
joe@web:~$ echo "Now, make it persistent everytime we boot"
```

```
Now, make it persistent everytime we boot
```

```
joe@web:~$ █
```

```
joe@web: ~
joe@nfss: /data/images x
joe@web: ~ x
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point> <type> <options> <dump> <pass>
# / was on /dev/sda1 during installation
UUID=16c336d9-038e-40a8-a65f-737585b4ab8c / ext4 errors=remount-ro 0
1
# swap was on /dev/sda5 during installation
UUID=500baf4a-4ec1-4900-b4d5-e1e1a700e0f1 none swap sw 0
0
/dev/fd0 /media/floppy0 auto rw,user,noauto,exec,utf8 0 0
144.38.220.200:/data/images /remote/images nfs bg,rw,tcp 0 0
~
~
~
~
~
~
~
~
~
~
13,60 All
```

```
joe@web: ~  
joe@nfss: /data/images x  
joe@web: ~ x  
joe@web:~$ sudo mount /remote/images/  
joe@web:~$ df -h  
Filesystem      Size  Used Avail Use% Mounted on  
/dev/sda1       12G   1.3G   9.4G  12% /  
none            4.0K     0   4.0K   0% /sys/fs/cgroup  
udev           235M   4.0K  235M   1% /dev  
tmpfs          50M   380K   49M   1% /run  
none           5.0M     0   5.0M   0% /run/lock  
none          246M     0  246M   0% /run/shm  
none          100M     0  100M   0% /run/user  
144.38.220.200:/data/images 12G   1.3G   9.4G  12% /remote/images  
joe@web:~$
```



joe@web: ~

joe@nfss: /data/images

joe@web: ~

```
joe@web:~$ echo "If we want normal users to have access we need UID synchronization"
If we want normal users to have access we need UID synchronization
joe@web:~$
```

```
joe@nfss: /data/images x      joe@web: ~ x
joe@nfss:/data/images$ sudo addgroup --gid 2000 nacho
Adding group `nacho' (GID 2000) ...
Done.
joe@nfss:/data/images$ sudo adduser --uid 2000 --gid 2000 nacho
Adding user `nacho' ...
Adding new user `nacho' (2000) with group `nacho' ...
Creating home directory `/home/nacho' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for nacho
Enter the new value, or press ENTER for the default
    Full Name []:
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] Y
joe@nfss:/data/images$
```

```
joe@web: ~  
joe@nfss: /data/images x  
joe@web: ~$ echo "Repeat on client system"  
Repeat on client system  
joe@web: ~$ sudo addgroup --gid 2000 nacho  
Adding group `nacho' (GID 2000) ...  
Done.  
joe@web: ~$ sudo adduser --uid 2000 --gid 2000 nacho  
Adding user `nacho' ...  
Adding new user `nacho' (2000) with group `nacho' ...  
Creating home directory `/home/nacho' ...  
Copying files from `/etc/skel' ...  
Enter new UNIX password:  
Retype new UNIX password:  
passwd: password updated successfully  
Changing the user information for nacho  
Enter the new value, or press ENTER for the default  
Full Name []:  
Room Number []:  
Work Phone []:  
Home Phone []:  
Other []:  
Is the information correct? [Y/n] Y  
joe@web: ~$
```


nacho@web: /remote/images/lucha

joe@nfss: /data/images

nacho@web: /remote/images/lucha

```
joe@web:~$ sudo su - nacho
nacho@web:~$ cd /remote/images/
nacho@web:/remote/images$ ls
lucha  MADE_FROM_CLIENT  MADE_ON_SERVER
nacho@web:/remote/images$ cd lucha/
nacho@web:/remote/images/lucha$ touch eskeleto.jpg
nacho@web:/remote/images/lucha$ ls -la
total 8
drwxr-xr-x 2 nacho nacho 4096 Jan 20 13:32 .
drwxr-xr-x 3 root  root  4096 Jan 20 13:30 ..
-rw-rw-r-- 1 nacho nacho    0 Jan 20 13:32 eskeleto.jpg
nacho@web:/remote/images/lucha$ █
```