# Mount directories between machines

## Pro
- Lightweight
  - Fast transfers
  - Screams past ssh/scp
- Around forever
  - Everyone knows/has
- Robust
  - Used
    - For years
    - Often
    - By many

## Con
- Bad for public situations
  - No encryption
  - Little security
- No longer sexy
  - Support can be weird/hard
- Quirky
  - Not just NFS
The basics you have to mess with

**Server**
- `/etc/hosts`
- `/etc/exports`
- `nfsd`
- **Set ports if firewall**
  - Default: new each time
  - Setting static depends a lot on the system
- **Firewall**
  - Reliable ports or
  - Trusted interface

**Client**
- `/etc/hosts`
- `/etc/fstab`
- `nfs`
- **Mount point(s)**
- **Firewall**
  - Know server ports or
  - Trusted interface
NFS mounting instructions common to

MOST SYSTEMS
Sanity checks

root@bob|dobbs:~# rpcinfo -p

<table>
<thead>
<tr>
<th>program</th>
<th>vers</th>
<th>proto</th>
<th>port</th>
<th>service</th>
</tr>
</thead>
<tbody>
<tr>
<td>100000</td>
<td>2</td>
<td>tcp</td>
<td>111</td>
<td>portmapper</td>
</tr>
<tr>
<td>100024</td>
<td>1</td>
<td>tcp</td>
<td>866</td>
<td>status</td>
</tr>
<tr>
<td>100003</td>
<td>3</td>
<td>udp</td>
<td>2049</td>
<td>nfs</td>
</tr>
<tr>
<td>100021</td>
<td>3</td>
<td>udp</td>
<td>4045</td>
<td>nlockmgr</td>
</tr>
<tr>
<td>100011</td>
<td>2</td>
<td>tcp</td>
<td>863</td>
<td>rquotad</td>
</tr>
<tr>
<td>100005</td>
<td>3</td>
<td>tcp</td>
<td>862</td>
<td>mountd</td>
</tr>
</tbody>
</table>

(red = server only; black = both)

## Make sure nfsd is started on the server

root@bob:~# ps -ef | grep nfsd

root  4685   2  0  Oct11 ?     00:00:00 [nfsd]
root  4686   2  0  Oct11 ?     00:00:00 [nfsd]
root  4687   2  0  Oct11 ?     00:00:00 [nfsd]

... one of these for however many you started

in /etc/rc.d/rc.nfsd /etc/init.d/nfs or similar for your system

some content from: http://rlworkman.net/howtos/NFS_Firewall_HOWTO
Little things

Be sure host and client know each other (/etc/hosts)

Make mount points! (mkdir /path/to/mount/point)

Make sure there is not content already in the mount point!

Don’t put anything necessary to the client in the nfs mount!
  (like home directories, system config files)

Don’t forget to open the relevant ports on server & client
  (not doing ipchains today…)

General info:
root@bob:/etc# man nfs
root@bob:/etc# man nfsd
root@bob:/etc# man nfsstat  ## statistics on your nfs mounts
Server: give permission to export

root@bob:/etc# vi exports

/home/lachele dobbs(rw,anonuid=1000,anongid=100) alice
/programs *.woods.ccrc

### the default is read-only
##
### anonuid and anongid export write privs per those numbers
### to the anonymous user
### any user with all_squash (but only in trusted environ)
##
### wild cards match any

root@bob:/etc# exportfs -av

### for more info
root@bob:/etc# man exports
root@bob:/etc# man exportfs
Client: specify what to mount

root@dobbs:/etc# vi fstab
bob:/home/lachele /home/lachele/Bob nfs rw,user,noauto,bg,soft 0 0
### the default is read-only
##
### user = user can mount/umount – only really useful if “noauto”
##
### soft = only way to (sort of) stop apps from hanging
### most sites say don’t use (can corrupt data)
### we use, and it has usually worked
##
### see also: timeo, retrans, rsize, wsize, etc...
root@dobbs:/etc# mount /home/lachele/Bob ##(lachele can mount, too)

### for other info
root@dobbs:/etc# man nfs ### for mount options
root@dobbs:/etc# man fstab
root@dobbs:/etc# man mount
Quirky

• Disappearing server = big headache
  – “hard” option
    • Hangs and must kill processes
    • Less likely to corrupt data
  – “soft” option
    • Still might hang, but less likely
    • More likely to corrupt data

• Can’t mount a mount (chain mounting)
  – Not sure why. Just never works.

• 32-bit and 64-bit
  – Some 64-bit programs have trouble with 32-bit mounts
  – Currently seems a kernel or fs issue
Server and client setup for system configurations similar to SLACKWARE
### Server: `/etc/services`

<table>
<thead>
<tr>
<th>Service</th>
<th>Protocol</th>
<th>Port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sunrpc</td>
<td>tcp</td>
<td>111</td>
<td>SUN Remote Procedure Call</td>
</tr>
<tr>
<td>sunrpc</td>
<td>udp</td>
<td>111</td>
<td>SUN Remote Procedure Call</td>
</tr>
<tr>
<td>mountd</td>
<td>tcp</td>
<td>862</td>
<td>NFS mountd</td>
</tr>
<tr>
<td>mountd</td>
<td>udp</td>
<td>862</td>
<td>NFS mountd</td>
</tr>
<tr>
<td>rquotad</td>
<td>udp</td>
<td>863</td>
<td>NFS rquotad</td>
</tr>
<tr>
<td>rquotad</td>
<td>tcp</td>
<td>863</td>
<td>NFS rquotad</td>
</tr>
<tr>
<td>status</td>
<td>udp</td>
<td>865</td>
<td>NFS status (listen/send)</td>
</tr>
<tr>
<td>status</td>
<td>tcp</td>
<td>865</td>
<td>NFS status (listen/send)</td>
</tr>
<tr>
<td>status</td>
<td>udp</td>
<td>866</td>
<td>NFS status (send/listen)</td>
</tr>
<tr>
<td>status</td>
<td>tcp</td>
<td>866</td>
<td>NFS status (send/listen)</td>
</tr>
<tr>
<td>nfsd</td>
<td>tcp</td>
<td>2049</td>
<td>NFS server daemon</td>
</tr>
<tr>
<td>nfsd</td>
<td>udp</td>
<td>2049</td>
<td>NFS server daemon</td>
</tr>
<tr>
<td>lockd</td>
<td>udp</td>
<td>4045</td>
<td>NFS lock daemon/manager</td>
</tr>
<tr>
<td>lockd</td>
<td>tcp</td>
<td>4045</td>
<td>NFS lock daemon/manager</td>
</tr>
</tbody>
</table>

(listen/send reversed on reciprocal server)

Lots of content from: http://rlworkman.net/howtos/NFS_Firewall_HOWTO
Server setup: /etc/sysctl.conf

Slackware 13.1 and later:

```
root@bob:/etc# vi sysctl.conf
fs.nfs.nlm_udpport=4045
fs.nfs.nlm_tcpport=4045
```

Earlier versions:

```
root@bob:/etc/modprobe.d# vi lockd.conf
options lockd nlm_udpport=4045 nlm_tcpport=4045
```

lots of content from: http://rlworkman.net/howtos/NFS_Firewall_HOWTO
Server setup: /etc/rc.d/rc.nfSD

root@bob:/etc/rc.d# chmod +x rc.nfSD
root@bob:/etc/rc.d# vi rc.nfSD

# set quota daemon to port 863
if [ -x /usr/sbin/rpc.rquotad ];
  then echo " /usr/sbin/rpc.rquotad -p 863"
  /usr/sbin/rpc.rquotad -p 863
fi

# set mount daemon to port 861
if [ -x /usr/sbin/rpc.mountd ];
  then echo " /usr/sbin/rpc.mountd -p 861"
  /usr/sbin/rpc.mountd -p 861
fi

lots of content from: http://rlworkman.net/howtos/NFS_Firewall_HOWTO
Server and client setup: /etc/rc.d/rc.rpc

root@bob|dobbs:/etc/rc.d# chmod +x rc.rpc
root@bob|dobbs:/etc/rc.d# vi rc.rpc # bits might be in rc.nfsd

if [ -x /sbin/rpc.portmap -a -x /sbin/rpc.statd ]; then
    # portmap daemon chroot to /var/empty ...increases security
    if ! ps axc | grep -q rpc.portmap ; then
        echo "Starting RPC portmapper: /sbin/rpc.portmap -t /var/empty"
        /sbin/rpc.portmap -t /var/empty
    fi

    # status daemon listen on port 865 and talk on port 866
    if ! ps axc | grep -q rpc.statd ; then
        echo "Starting Net. Stat. Mon.: /sbin/rpc.statd -p 865 -o 866"
        /sbin/rpc.statd -p 865 -o 866 # server
        echo "Starting Net. Stat. Mon.: /sbin/rpc.statd -p 866 -o 865"
        /sbin/rpc.statd -p 866 -o 865 # client
    fi
fi

lots of content from: http://rlworkman.net/howtos/NFS_Firewall_HOWTO
(don’t forget to open firewall ports and)

reboot...
Server and client setup for system configurations similar to RED HAT
Server

## Only need this to set static ports for a firewall

```
root@cap:/etc/sysconfig# vi nfs ## can change ports – use unique
    RQUOTAD_PORT=1073
    LOCKD_TCP_PORT=35793
    LOCKD_UDPPORT=35999
    MOUNTD_PORT=1095
    STATD_PORT=1072
    STATD_OUTGOING_PORT=2620
```

```
root@cap:~# chkconfig portmap on  ## usually already started
root@cap:~# chkconfig --list portmap  ## command to check
```

```
root@cap:~# chkconfig nfs on
root@cap:~# reboot
```

content from Google searches and mucking about on my own
Client

should just work...
(but don’t forget to open firewall ports)

content from Google searches and mucking about on my own