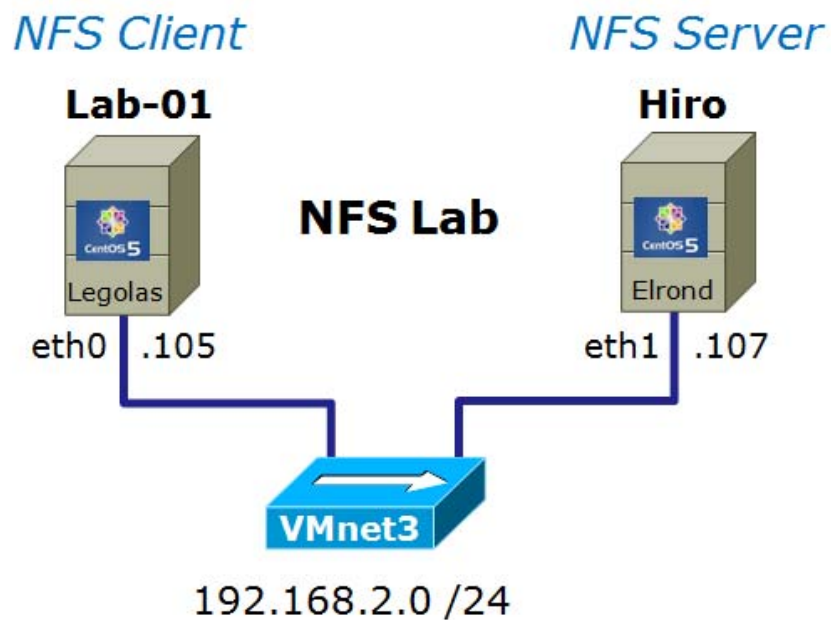


## CIS 192 Linux Lab Exercise

### Lab X3: Network File System Spring 2010

#### Lab X3: Network File System (Extra Credit Lab)

The purpose of this lab is to share files among hosts on a common network. NFS allows the sharing of files among UNIX/Linux hosts; the goal of this lab is to use NFS to share a directory of files on one machine with the other hosts on the same network.



#### Supplies

- VMWare Server 1.08 or higher
- 192 VMs shown above

#### Preconfiguration

- Original versions of all VMs. Note, this will set the network configurations back to down or DHCP settings.

## Forum

Use the forum to ask and answer questions, collaborate, and report any equipment issues. Post tips and any lessons learned when you have finished. Forum is at:  
<http://opus.cabrillo.edu/forum/viewforum.php?f=5>

## Background

This lab requires a minimum of two Linux machines. There is a cis192 user account and password on each machine. A new guest account will be added to each system.

The following packages must be installed to perform this lab:

- portmap
- nfs-utils

The commands we will be using for this lab are:

- mount, umount
- nfs
- exportfs
- showmount

The configuration of the export file will require root access; use the two Rivendell computers: Elrond and Legolas.

## Procedure

This lab uses the Elrond and Legolas VMs. The Elrond VM will be configured with the hostname Hiro and the Legolas VM will be configured with the hostname Lab-01. These VM's already have the required NFS and port mapper packages installed.

## Setup

1. Revert Elrond and Legolas to their snapshots and cable them as shown above.
2. Check that both nfs-utils and portmap packages are installed:
  - a. **rpm -qa | grep nfs-utils**
  - b. **rpm -qa | grep portmap**
  - c. or use **rpm -q nfs-utils portmap**
3. Configure the Legolas VM using permanent settings according to the diagram above:
  - a. Configure eth0 with the static IP address
  - b. Configure eth1 to be down
  - c. Change hostname to lab-01.rivendell
  - d. Update /etc/hosts with new hostname and add hiro
4. Configure the Elrond VM using permanent settings according to the diagram above:
  - a. Configure eth0 to be down
  - b. Configure eth1 with the static IP address
  - c. Change hostname to hiro.rivendell
  - d. Update /etc/hosts with new hostname and add lab-01
5. Use ping to check connectivity between Hiro and Lab-01

## Part I

We will configure the Elrond VM to be an NFS server named Hiro. Hiro's system exports file will be configured to export the /home/cis192 and /home/guest directories.

1. On Elrond/Hiro, create a new user named guest:  
**useradd -c "guest user" guest  
passwd guest**
2. Change directory to /home.
3. Verify that the cis192 and guest subdirectories have permissions of 700.
4. Since NFS uses port numbers not usually allowed by firewalls, turn off iptables with **service iptables stop** command and disable the firewall.
5. Edit the /etc/exports file so that it includes the following line:  
/home/cis192 192.168.2.0/255.255.255.0(ro,no\_root\_squash,sync)  
Note: that there are no spaces in the second half of the above entry.
6. Add a second line for the /home/guest directory, but do not include the no\_root\_squash parameter, and allow access to all users:  
/home/guest \*(rw,sync)
7. Save your changes to this file and start the NFS daemon:  
**service nfs start**
8. You should see four OK messages as the NFS services start. Do you know which daemons these represent?  
The NFS server will export the directories listed in the exports file. If you change this file, you will have to either restart the NFS services or run the **exportfs** command:  
**exportfs -rv**

## Part II

Hiro (the Elrond VM) is now an NFS server. The Legolas VM will be configured as a NFS client named Lab-01. On Lab-01 we can mount one of the exported remote drive partitions on Hiro (the Elrond VM).

1. On Lab-01 (the Legolas VM), create a new user named guest:  
**useradd -c "guest user " guest  
passwd guest**
2. On Lab-01, issue the following command:  
**showmount -e hiro**  
Do you see the directories you exported?
3. Now on Lab-01, mount the remote /home/cis192 directory on Hiro to the local /mnt directory:  
**mount -t nfs hiro:/home/cis192 /mnt**  
(Question: Is the -t nfs option above needed?)
4. Log in as cis192 on Lab-01, and see if you can access the files in the /mnt directory. If the cis192 account UIDs are the same, you should have access to these files. Can you view the text files? Can you create a new file? Why or why not?
5. As cis192, enter the mount command with no arguments to see the remote file system.
6. As root, create an empty directory to serve as a mount point for the /home/guest directory of your server, and mount it.

- NFS mount points are commonly put under the / directory for easy access.
7. Log in as guest, and see if you can create a file in the mounted directory?
  8. As root, can you remove the file you just created?  
Can you change directory to the mount point? Why or why not?
  9. Use the showmount command as root to see all current mount points:  
**showmount -a hiro**  
**showmount -e hiro**  
Use **ls -ld** on both directories you used as mount points to see ownership and permissions.
  10. NFS mounts can be unmounted using the umount command.  
Note: the umount command will fail if any users are in or accessing files in the mounted directories.
  11. Unmount both remote directories.

## To turn in

Your *lab0X3* **text** file should contain the following sections.

- Standard boilerplate information:  
CIS 192 Lab *XX*  
*Name*  
*Date*  
TBA hours: *X.X*  
Station number: CIS-Lab-*XX*
- On hiro: /etc/exports
- On lab-01: **mount** command output (show both mounts)
- On lab-01: **showmount -a hiro** output (show both mounts)
- On lab-01: **showmount -e hiro** output (show both exports)
- On lab-01: **ls -ld** output on both directories used as mount points
- Example command summary

The command summary should be a concise set of documented examples that can be used as a resource for repeated operations in future labs.

Check your work for completeness then submit as many times as you wish up until the due date deadline. Remember, **late work is not accepted**, so start early, plan ahead for things to go wrong and use the forum to ask questions.

**[p]scp lab0X3 cis192@opus.cabrillo.edu:labX3.logname**

## Grading rubric (30 points)

- 5 points for correct submittal, professional appearance and quality
- 5 points for correct /etc/exports file
- 5 points for correct mount output.
- 5 points for correct showmount output
- 5 points for correct ls -ld output.
- 5 points for complete and concise command summary