CIS 192 Linux Lab Exercise

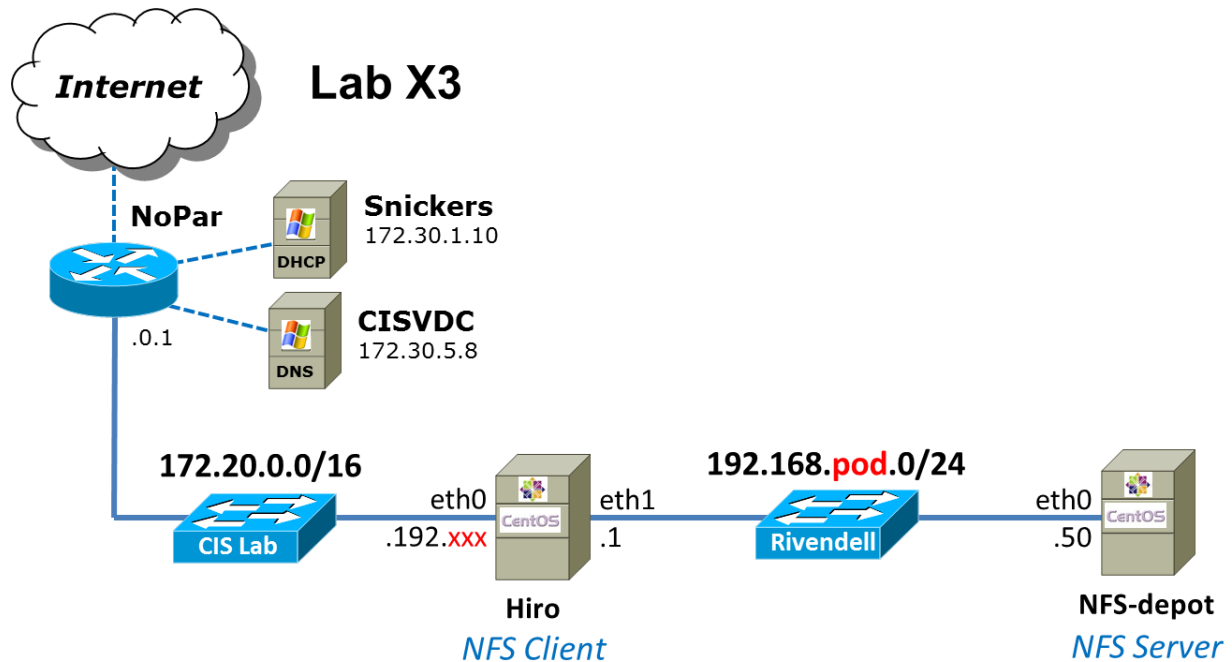Lab X3: Network File System
Spring 2013

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

- Any two CIS 192 CentOS VMs
- Rivendell virtual network

Preparation
- Make a network map and add any crib notes to your map or into a separate document.
- Select two CentOS VMs in your pod to be your NFS client and server.

- On Opus, make a copy of the labX3 report template file in /home/cis192/depot in your home directory. Edit the header of this file with your own information and record all the information requested.

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://oslab.cabrillo.edu/forum/

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

Setup

- ☐ [Optional] Revert the CentOS VMs to their Pristine snapshots
- ☐ Cable and permanently configure the interfaces as shown above.
- ☐ Permanently change the hostnames to Hiro-pod and NFS-depot-pod.
- ☐ Permanently configure cisvdc as the nameserver on both systems.
- ☐ Permanently configure Hiro to be a gateway router:
    - o Open the FORWARD chain in iptables.
    - o Enable packet forwarding in */etc/sysctl.conf*.
    - o Provide NAT service for Rivendell hosts using either MASQUERADE or SNAT.
- ☐ Check that the nfs-utils package is installed on both VMs:
    - **rpm -qa | grep nfs-utils**
- ☐ Add the new hostnames to /etc/hosts on both systems so they can ping each other by name.
- ☐ Use ping to check connectivity between both VMs.

Part 1
Add a new user to NFS-depot and populate it with some sample files for testing.
- ☐ On NFS-depot, create a new user named guest:
    - **useradd -c "guest user" guest**
    - **passwd guest**
- ☐ Verify that the *cis192* and *guest* home directories have permissions of 700.
    - **ls -l /home**

□ Login as cis192 and create two sample files in the cis192 home directory:
  echo Sample text > claire
  echo Sample text > niki
□ Login as guest and create two sample files in the guest home directory:
  echo Sample text > noah
  echo Sample text > sylar

Part II

We will configure NFS-depot to be an NFS server. It will export the */home/cis192* and */home/guest* directories.

□ Lock down the ports used by NFS so we can configure a firewall for those ports. To do this, edit */etc/sysconfig/nfs* and uncomment the following lines:
  #RQUOTAD_PORT=875
  #LOCKD_TCPPORT=32803
  #LOCKD_UDPPORT=32769
  #MOUNTD_PORT=892
  #STATD_PORT=662
  #STATD_OUTGOING_PORT=2020
□ Open the following ports in the firewall for new connections:
  port 111 TCP/UDP
  port 2049 TCP
  port 875 TCP/UDP
  port 32803 TCP
  port 32769 UDP
  port 892 TCP/UDP
  port 662 TCP/UDP
□ Edit the */etc/exports* file so that it includes the following line:
  /home/cis192   192.168.pod.0/255.255.255.0(ro,no_root_squash,sync)
 Note: that there are no spaces in the second half of the above entry.
□ 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)
□ Save your changes to this file and start the NFS daemon:
 service nfs start
□ You should see four OK messages as the NFS services start. Do you know which daemons these represent?
□ Confirm rpc is using the ports you selected:
 rpcinfo -p
□ 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
□ Always start nfs at system start:
 chkconfig nfs on

Part III

NFS-depot is now an NFS server. Hiro will be configured as a NFS client. In this part we will mount the remote directory belonging to the guest user.

☐ On Hiro, create a new user named guest:
  useradd -c "guest user " guest
  passwd guest
☐ On Hiro, issue the following command:
  showmount -e NFS-depot
☐ Do you see the directories you exported?
☐ Now on Lab-01, mount the remote */home/cis192* directory on NFS-depot to the local /mnt directory:
  mount -t nfs NFS-depot:/home/cis192 /mnt
  (Question: Is the -t nfs option above needed?)
☐ Log in as cis192 on Hiro, 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?
☐ As cis192, enter the mount command with no arguments to see the remote file system.

Part IV
In this part we will mount the remote directory belonging to the guest user.

☐ As root, create an empty directory, */nfsmnt*, to serve as a mount point for the */home/guest* directory of your NFS server, and mount it.
  (NFS mount points are commonly put under the / directory for easy access.)
☐ Log in as guest, and see if you can create a file in the mounted directory?
☐ As root, can you remove the file you just created?
  Can you change directory to the mount point? Why or why not?
☐ Use **ls -ld** on both directories you used as mount points to see ownership and permissions.
☐ Now would be a good time to collect outputs for your lab report (see below).
☐ NFS mounts can be unmounted using the umount command.
  o Note: the umount command will fail if any users are in or accessing files in the mounted directories.
☐ Unmount both remote directories.

To turn in

Record the following in your labX3 file.

• On NFS-depot: */etc/exports*
• On NFS-deport: */etc/sysconfig/iptables*
• On NFS-deport: */etc/sysconfig/nfs*
• On Hiro: **showmount -e NFS-depot** output (show both exports)
• On Hiro: **mount** command output (show both mounts)
• On Hiro: as cis192, **ls -l** output on */mnt*
• On Hiro: as guest, **ls -l** output on */nfsmnt*

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.

> **cp labX3 /home/rsimms/turnin/cis192/labX3.$LOGNAME**
> Email your network map to **risimms@cabrillo.edu**

Grading rubric (30 points)

    4 points for network map/crib sheet
    4 points for correct /etc/exports file on nfs-depot
    4 points for a correct /etc/sysconfig/iptables on nfs-depot
    4 points for a correct /etc/sysconfig/nfs on nfs-depot
    4 points for correct showmount output on hiro
    4 points for correct mount output on hiro
    3 points for correct /mnt long listing as cis192 on hiro
    3 points for correct /nfsmnt long listing as guest on hiro