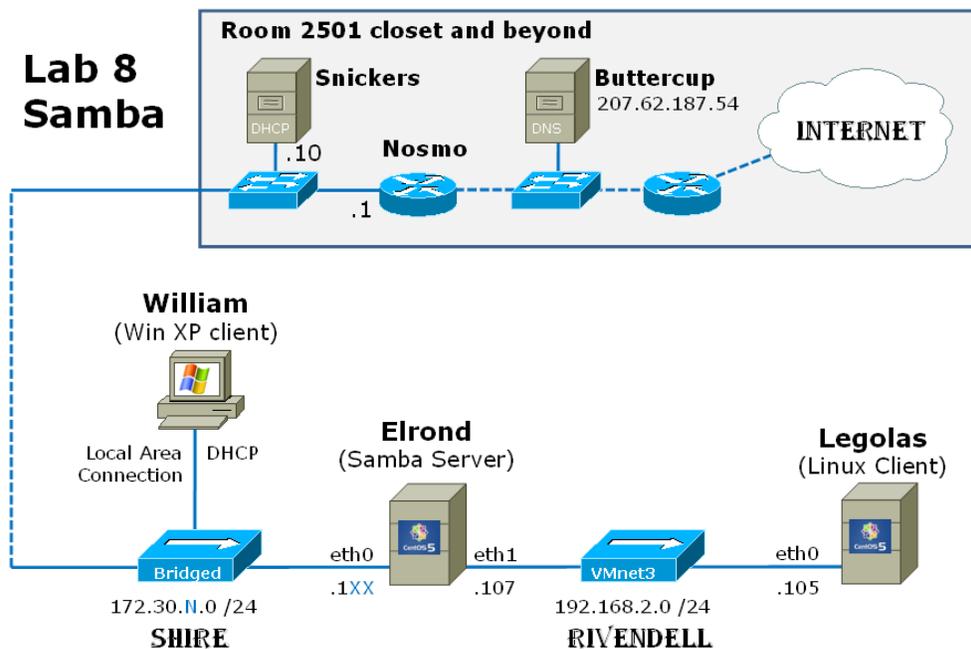


CIS 192 Linux Lab Exercise

Lab 8: Samba
Spring 2009

Lab 8: Samba

The purpose of this lab is to share files among Windows and Linux hosts on a common network. The goal is to browse directories on the Linux servers from a Windows machine. This will be accomplished using William and Legolas as clients, and Elrond as the Samba Server.



.1XX is based on your station number and the IP Table in the Appendix
N=1 for the classroom and N=4 for the CIS lab or CTC

Supplies

- VMWare Server 1.08 or higher
- 192 VMs: William (Win XP), Elrond (CentOS), and Legolas (CentOS)
- Virtual networks: VMnet3

Preconfiguration

- Original versions of all VMs.

- If you plan to do this lab at home see: <http://simms-teach.com/howtos/129-working-at-home.pdf>

Forum

Use the forum to ask for help, post tips and any lessons learned when you have finished. Forum is at: <http://simms-teach.com/forum/viewforum.php?f=18>

Background

Samba is an implementation of Windows file and print services for Linux allowing the sharing of files and printers between Windows and Linux. Samba's name is based on the protocol used by the Microsoft Windows network file system, SMB (Server Message Block).

On the Linux Samba server, the firewall will need to be configured so other systems can access the shared directories. Samba uses ports 137, 138, 139 and 445 so these ports will need to be opened.

There are several places where permissions will be to be configured. The normal UNIX file permissions need to be set (with `chmod`). Additional access controls can be defined in the Samba configuration file for each share. And if SELinux is set to enforcing mode, then shared files must be labeled with extended attributes to comply with the SELinux policy.

The commands we will be using for this lab are:

- `mount`, `umount`
- `smbclient`
- `smb`
- `testparm`

The configuration of the `smb.conf` files will require root access; the browsing of directories may be performed by a regular user.

Procedure

Setup

1. Revert William, Legolas and Elrond to their snapshots.
2. Configure Elrond and Legolas interfaces as shown in the diagram above:
 - a. Configure permanent IP addresses
 - b. Configure default routes (Elrond -> Nosmo, Legolas -> Elrond)
 - c. Configure DNS server (use 207.62.187.54)
 - d. Configure Elrond to forward packets
 - e. Modify Elrond's firewall to not filter forwarded packets:
 - i. **`iptables -D FORWARD 1`**
3. Configure William to use DHCP.
4. Configure a static route on William to the Rivendell network. To do this bring up a command line (Start > Run > "`cmd`") then:

```
route add 192.168.2.0 mask 255.255.255.0 172.30.N.1XX  
route PRINT
```
5. Determine IP address assigned to William using `ipconfig /all` from the command line.
6. Add entries to the `/etc/hosts` file on Elrond for William and Legolas
7. Add entries to the `/etc/hosts` file on Legolas for William and Elrond

8. Add entries to C:\WINDOWS\system32\drivers\etc\hosts on William for Elrond and Legolas.
9. Verify you can ping by name all systems from any system.
10. Verify Elrond and Legolas can ping an internet host, e.g. google.com.

Part 1

Samba client software on Elrond will be used to access file shares on William, the Windows XP system. The smbclient command will be used to list shares and retrieve files. The mount command will be used to mount a remote Windows file share on the local Linux file tree.

1. On William, the Windows XP system on the Shire network,
 - a. Login as cis192.
 - b. Examine the contents and permissions of the folders, depot and depot192, off the C:\ drive.
 - c. To view permissions, right click on a folder, select Properties, Sharing tab, Permissions button
 - d. Verify the permissions on the depot share are Everyone: Read.
 - e. Verify the permissions on the depot192 share are cis191: none and cis192: Full Control, Change, Read.
 - f. To monitor access to shares right click on My Computer icon (labeled William) and select Manage to run the MMC (MS Management Console). In the MMC left panel, expand (click on the +) Shared Folders. Then click on Shares, Sessions or Open Files to view share status.
 - g. Keep the MMC window open and monitor it as you connect to shares from Elrond
2. On Elrond, the CentOS Linux system,
 - a. Login as **root**
 - b. use **rpm -qa | grep samba** and check that the samba-client and samba-common packages have been installed.
 - c. List the public shares on William with:
smbclient -L william
 Just hit Enter when prompted for a password.
 - d. Mount the depot share:
mount //william/depot /mnt
 Just hit enter when prompted for a password which is not needed.
 - i. Use **more** command to view files on share.
 - ii. On William, use the MMC to view share status. It may be necessary to click the little refresh icon under View to get current information.
 - iii. Use **umount /mnt** to close the session.
 - e. Try to mount the depot192 share as user cis191 using:
mount -o username=cis191 //william/depot192 /mnt
 (enter the correct password)
 - i. This should fail given the user cis191 has no access permissions
 - f. Now mount the depot192 share as user cis192 using:
mount -o username=cis192 //william/depot192 /mnt
 (enter the correct password)
 - i. Verify you can read the files in the share
 - ii. Verify you can add new files to the share
 - iii. Use **umount /mnt** to close the session
 - g. The smbclient command can also be used in an ftp-like manner to transfer files. Use the following to start a session and copy some files:

smbclient -U cis192 //william/depot192

Type the following commands at the smb: \> prompt:

- i. **help**
- ii. **ls**
- iii. **dir**
- iv. **mget *.txt**
- v. **quit**

Part 2

Install and configure Elrond as a Samba server. The configuration will include making shares, poking holes in the firewall and allowing files to be accessed under the default SELinux policy. The shares will be accessed from the Windows PC (William).

1. Install the server portion of Samba on Elrond
yum install samba
2. Verify that samba has been installed:
rpm -qa samba | grep samba
What version of samba are you running?
3. Make two directories to be shared:
 - a. **echo "We can do anything we want if we stick to it long enough." - Helen Keller > /tmp/hk.txt**
 - b. **cd /var**
 - c. **mkdir -p shares/depot shares/depot192**
 - d. **cd shares**
 - e. **cp /tmp/hk.txt depot/**
 - f. **cp /tmp/hk.txt depot192/**
 - g. **chmod 755 ***
 - h. **chown -R cis192:users ***
4. Add a cis191 user:
 - a. **useradd -c "CIS 191" -g users cis191**
5. Add passwords to the Samba password database
 - a. **smbpasswd -a cis191**
 - b. **smbpasswd -a cis192**
6. Edit /etc/samba/smb.conf file using your favorite editor.
 - a. In the Globals section, make the following changes:
 - i. **workgroup = WORKGROUP**
 - ii. **server string = Cool Samba Server**
 - b. Comment out the **[homes]** and **[printers]** shares at the end of smb.conf
 - c. Add to the bottom of the smb.conf file the following shares:

```
[depot]
comment = Public files on Elrond
path = /var/shares/depot
read only = yes
guest ok = yes

[depot192]
comment = CIS 192 files on Elrond
path = /var/shares/depot192
valid users = cis192
read only = yes
guest ok = yes
```

- d. Save and exit the file.
7. Run the **testparm** command to verify and test the syntax of the smb.conf file. Ensure that no errors are displayed with reference to the file. (Ignore any error messages regarding long share names.) Press Enter to display the dump of the shares, when prompted by the testparm command.
8. You must now start the smb service:
 - service smb start**
 - You should see two daemons successfully start: smb and nmb
9. On William, view workgroup computers by:
 - a. Open My Network Places (desktop icon)
 - b. Click View workgroup computers on left panel
 - c. You should now see a Cool Samba Server (Elrond) icon
 - d. Try and open it ... it will fail with an access error message. Why?
10. On Elrond, open up the firewall for file sharing (ports 137/udp, 138/udp, 139/tcp, and 445/tcp):
 - Option I (Use GUI based Security Level and Firewall Tool)
 - a. startx
 - b. System > Administration > Security Level and Firewall
 - c. Check Samba and click Apply then OK buttons
 - or Option II (insert iptables rules)


```
iptables -I RH-Firewall-1-INPUT 9 -p udp -m state --state NEW -m udp --dport 137 -j ACCEPT
iptables -I RH-Firewall-1-INPUT 9 -p udp -m state --state NEW -m udp --dport 138 -j ACCEPT
iptables -I RH-Firewall-1-INPUT 9 -p tcp -m state --state NEW -m tcp --dport 139 -j ACCEPT
iptables -I RH-Firewall-1-INPUT 9 -p tcp -m state --state NEW -m tcp --dport 445 -j ACCEPT
```
11. On William, see if you can now open the Cool Samba Server (Elrond) icon.
 - a. It should succeed and display the depot share and Printers and Faxes share.
 - b. Try to open the depot share ... it will fail with an access error message. Why?
12. On Elrond, show then change the SELinux context for /depot from default_t to samba_share_t:
 - a. **cd /var/shares**
 - b. **ls -lRZ**
 - c. **chcon -R -t samba_share_t ***
 - d. **ls -lRZ**
13. On William, you should now be able to open the depot share and view the hk.txt file. Congratulations ... you have just made your first Samba server!
14. If your need to close connections on William use:
 - a. **net use * /delete**
15. Close the windows you opened on William to access the Samba server and lets look at quicker way to access the same share:
 - a. **Start > Run**
 - b. Type **//elrond/depot**
 - c. Click **OK** button

Part 3

Access the Samba shares on Elrond from another Linux system (Legolas)

1. On Legolas:
 - a. Use **smbclient -L elrond** to see shares on Elrond (don't enter a password, just hit Enter)
 - b. Now try **smbclient -L elrond -U cis192%** (should not get prompted for a password now)

- c. Now mount the **depot192** share as **user cis192** using:
 - i. **mount -o username=cis192 //elrond/depot192 /mnt**
 - ii. Enter the correct password
 - iii. Verify you can read the files in the share
 - iv. Use **umount /mnt** to close the session
- d. The smbclient command can also be used in an ftp-like manner to transfer files. Use the following to start a session and copy some files:


```
smbclient -U cis192 //elrond/depot192
```

 Type the following commands at the smb: \> prompt:
 - i. **help**
 - ii. **ls**
 - iii. **dir**
 - iv. **mget *.txt**
 - v. **quit**

To turn in

Your *lab08* 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*
- Elrond's smb.conf file
- Elrond's **smbclient -L william** output
- Elrond's **cat /etc/sysconfig/iptables** output to show samba ports open
- Elrond's **ls -lRZ /var/shares** output to show SELinux Samba contexts
- Legolas' **smbclient -U CIS192 //elrond/depot192** and **ls** subcommand output
- 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 lab08 cis192@opus.cabrillo.edu:lab08.*lastname*

Grading rubric (30 points)

- 4 points for correct submittal, professional appearance and quality
- 5 points for Elrond's smb.conf file
- 4 points for Elrond's smbclient -L william output
- 4 points for Elrond's cat /etc/sysconfig/iptables output
- 4 points for Elrond's ls -lRZ /var/shares output
- 4 points for Legolas' smbclient -U CIS192 //elrond/depot192 and ls subcommand output
- 5 points for complete and concise command summary

Appendix - Static IP address table by station number:

Station	IP	Static 1	Static 2
CIS-Lab-01	172.30.4.101	172.30.4.121	172.30.4.122
CIS-Lab-02	172.30.4.102	172.30.4.123	172.30.4.124
CIS-Lab-03	172.30.4.103	172.30.4.125	172.30.4.126
CIS-Lab-04	172.30.4.104	172.30.4.127	172.30.4.128
CIS-Lab-05	172.30.4.105	172.30.4.129	172.30.4.130
CIS-Lab-06	172.30.4.106	172.30.4.131	172.30.4.132
CIS-Lab-07	172.30.4.107	172.30.4.133	172.30.4.134
CIS-Lab-08	172.30.4.108	172.30.4.135	172.30.4.136
CIS-Lab-09	172.30.4.109	172.30.4.137	172.30.4.138
CIS-Lab-10	172.30.4.110	172.30.4.139	172.30.4.140
CIS-Lab-11	172.30.4.111	172.30.4.141	172.30.4.142
CIS-Lab-12	172.30.4.112	172.30.4.143	172.30.4.144
Pod 1		172.30.4.113	172.30.4.145
Pod 2		172.30.4.114	172.30.4.146
Pod 3		172.30.4.115	172.30.4.147
Pod 4		172.30.4.116	172.30.4.148

If you are working at home and using the Nosmo VM, then set Elrond's IP address to 172.30.4.107