

Lesson Module Status

- Slides
- Whiteboard with 1st minute quiz

- Flashcards
- Web Calendar summary
- Web book pages
- Commands
- Howtos

- Samba lab tested
- Lab template in depot

- Backup slides, Confer links, handouts on flash drive
- 9V backup battery for microphone

Course history and credits

Jim Griffin



- Jim created the original version of this course
- Jim's site: <http://cabrillo.edu/~jgriffin/>

Rick Graziani



- Thanks to Rick Graziani for the use of some of his great network slides
- Rick's site: <http://cabrillo.edu/~rgraziani/>



Instructor: **Rich Simms**

Dial-in: **888-450-4821**

Passcode: **761867**



Solomon



Sean C.



Chris



Corey



Bryan



Sean F.



Tony



David



Donna



Dave



Evan



Gabriel



Elia



Tajvia



Carlos



Adam



Ben



Laura

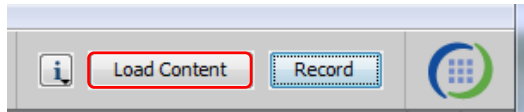


VMs for tonight

William, Elrond

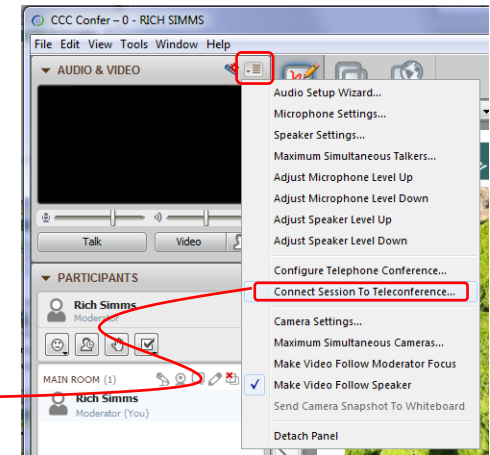
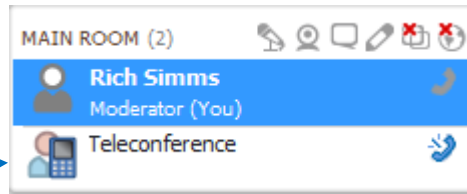


[] Preload White Board with *cis*lesson??*-WB*



[] Connect session to Teleconference

Session now connected to teleconference



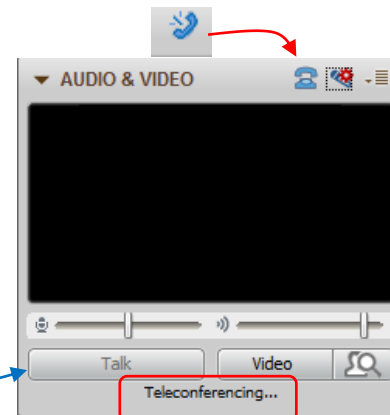
[] Is recording on?



Red dot means recording

[] Use teleconferencing, not mic

Should be greyed out





- [] Video (webcam) optional
- [] layout and share apps

The screenshot displays a Windows desktop environment during a video conference. On the left, the 'CCC Confer' application window is visible, showing a video feed of Rich Simms and a list of participants. The main desktop area contains several open applications:

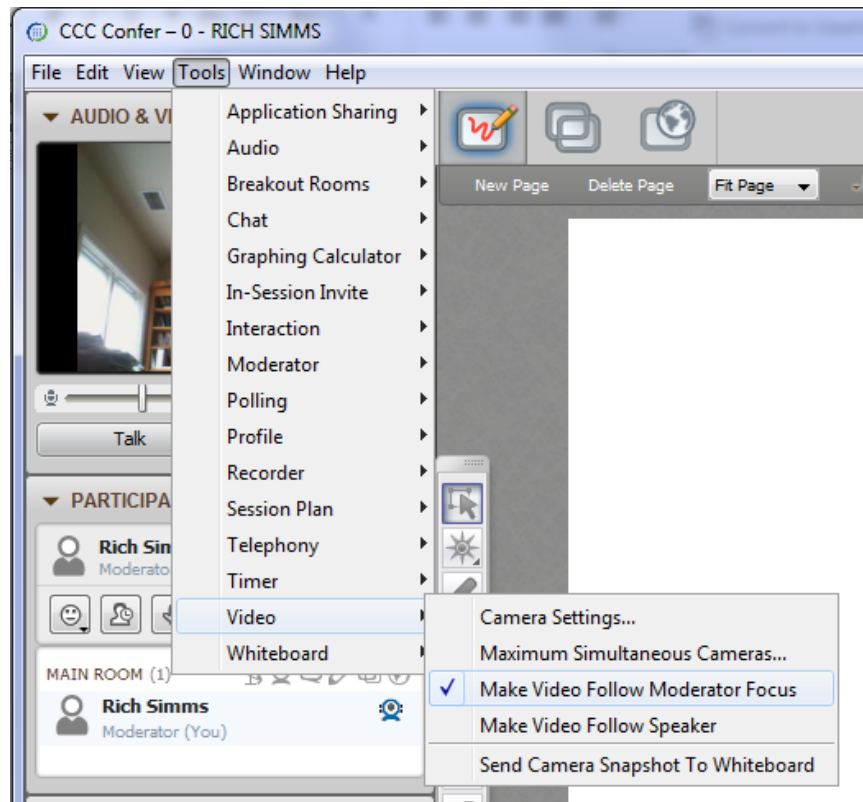
- foxit for slides:** A Foxit Reader window displaying a PDF document titled 'cis90lesson07.pdf'. A red box labeled 'foxit for slides' points to the document content.
- chrome:** A Google Chrome browser window displaying a webpage from 'simms-teach.com/docs/cis90/cis-90-TEST-1-Fall-12.pdf'. A red box labeled 'chrome' points to the browser window.
- putty:** A terminal window showing a shell session for 'simben90@oslab:~'. The terminal output includes login prompts, password attempts, and directory listings. A red box labeled 'putty' points to the terminal window.
- vSphere Client:** A vCenter - vSphere Client window showing the 'CIS 192' virtual machine inventory. A red box labeled 'vSphere Client' points to the vSphere Client window.

Red lines connect the labels 'foxit for slides', 'chrome', and 'vSphere Client' to their respective application windows. The terminal window shows the following output:

```
simben90@oslab:~  
login as: simben90  
simben90@oslab.cabrillo.edu's password:  
Access denied  
simben90@oslab.cabrillo.edu's password:  
Last login: Mon Oct 8 18:58:43 2012 from  
d.com  
  
Current directory  
source  
destination  
  
What command copies th  
  
Terminal type? [xterm]  
Terminal type is xterm.  
/home/cis90/simben $
```



- [] Video (webcam) optional
- [] Follow moderator
- [] Double-click on postage stamps



Universal Fix for CCC Confer:

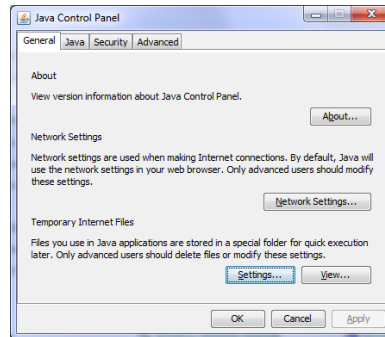
- 1) Shrink (500 MB) and delete Java cache
- 2) Uninstall and reinstall latest Java runtime



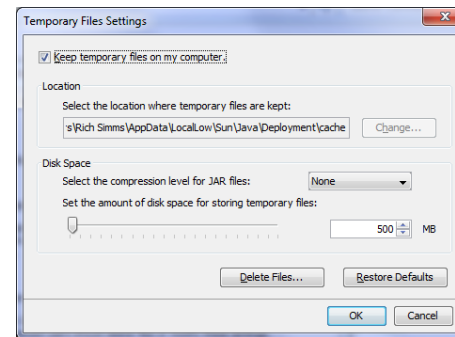
Control Panel (small icons)



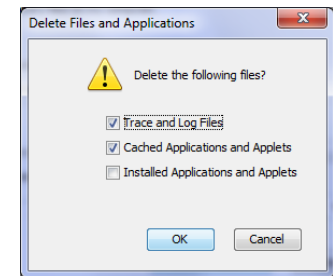
General Tab > Settings...



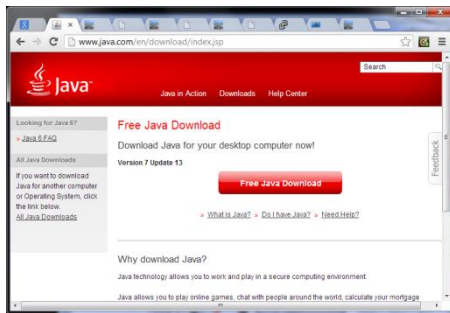
500MB cache size



Delete these



Google Java download



First Minute Quiz

Please answer these questions **in the order** shown:

Use CCC Confer White Board

**For credit email answers to:
risimms@cabrillo.edu
within the first few minutes of class**

Samba

Objectives

- Use SAMBA to browse directories on the Linux servers from a Windows machine.

Agenda

- Quiz
- Questions on previous material
- Housekeeping
- Monitor Script - Sean Callahan
- Basic Windows Skills - IPs, /etc/hosts
- Warmup - William and Elrond configuration
- Samba
- Windows Shares (viewing, monitoring, browsing)
- Share browsing and access - from Windows
- Share browsing and access - from Linux
- Installing Samba
- SWAT
- Lab 8
- Wrap



Questions



Questions

Lesson material?

Labs?

How this course works?

Chinese
Proverb

他問一個問題，五分鐘是個傻子，他不問一個問題仍然是一個傻瓜永遠。

He who asks a question is a fool for five minutes; he who does not ask a question remains a fool forever.

Housekeeping

- No labs due today
- Extra credit labs available:
 - X1 Permanent NIC configuration (30 points)
 - X2 PPP (30 points)
 - X3 NFS (30 points)
- Guest student presentation tonight on a monitoring script

Final Exam

- Timed test
- Open book, notes and computer
- You will be provided with a pristine exam pod
- There will be a number of tasks to implement
 - Some mandatory
 - Some optional
 - Some extra credit
 - Task specifications available one week in advance
- 60 points - the more tasks completed, the more points earned

--	6/4	<p>Final Exam for CIS 192</p> <p>Time</p> <ul style="list-style-type: none"> • 5:30PM - 8:20PM in Room 2501 <p>Materials</p> <ul style="list-style-type: none"> • Presentation slides (download) • Test (download) 	<p><u>5 posts</u></p> <p>Extra Credit Labs</p>
----	-----	--	--

- Preparing for the final exam
 - Know where to locate information quickly
 - Make a network map & crib sheet
 - "Muscle memory" for basic commands
 - Practice makes perfect

Extra Credit

- Note you can earn up to 90 points of extra credit (labs, typos, HowTos, etc.)
- 3 extra credit labs
- HowTos
 - Up to 20 points extra credit for a publishable HowTo document (will be published on the class website)
 - 10 points additional if you do a class presentation
 - Topics must be pre-approved with instructor

Grades Web Page

<http://simms-teach.com/cis192grades.php>

Code Name	Grading Choice	Quizzes & Tests										Forum				Labs										Final	Extra Credit	Total	Grade			
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	T1	T2	T3	F1	F2	F3	F4	L1	L2	L3	L4	L5	L6	L7					L8	L9	L10
Max Points		3	3	3	3	3	3	3	3	3	3	30	30	30	20	20	20	20	30	30	30	30	30	30	30	30	30	30	60	90	560	
Atagiri	Grade	2		3	3							25			20				30	30	23	30	30							11		
Billo	Grade	3	3	3	3	3						29			20				29	29	29	30	24							19		
Bennett	Prob	1	1	1	1	1						1			1				1	1	1	1	1	1	1	1	1	1	1	1		
Dwain																																
Flora																																
Erond																																
Faham																																
Fredo																																
Gwen																																
Jareth																																
Layla																																
Isagui																																
Phyllis																																
Samwise																																
Samwise	Grade	3	3		3	3						29			20				30	30	30	30	30						1			
Strider	Grade	3	3	2		3						19			20				29	30		21	30						7			
Therese	Grade	3	3	3	3	3						25			20				20	20	27	30	29						9			
Trebeard	P/NP																															

Please check your:

- Grading Choice
- Quiz points
- Forum points
- Test points
- Lab points
- Extra Credit points



Send me an email if you want to change this

*Don't know your secret LOR code name?
... then email me your student survey to get it!*



Help with labs



Like some help with labs?

I'm in the CIS Lab Monday afternoons

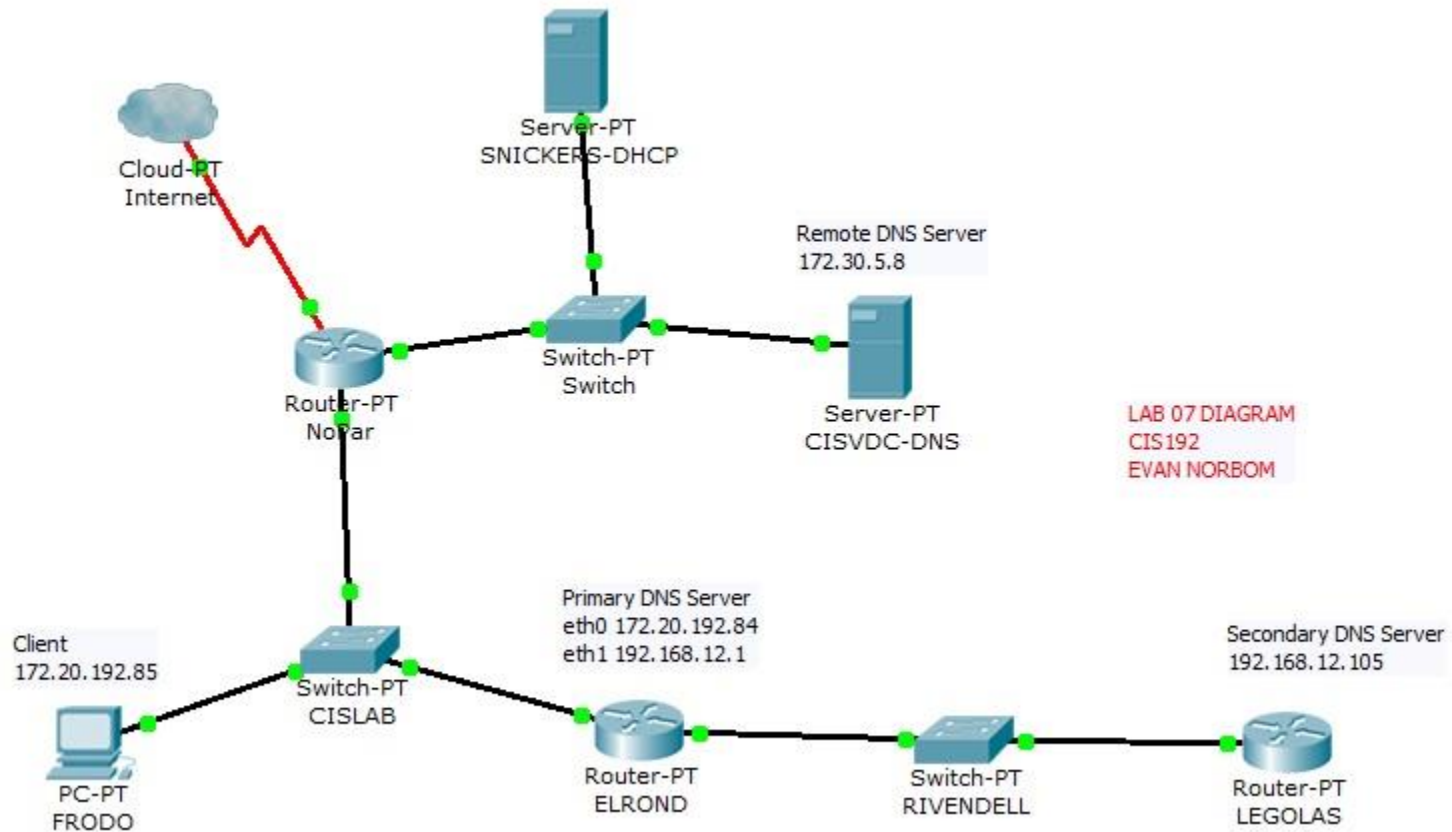
- See schedule at <http://webhawks.org/~cislabs/>

or see me during office hours

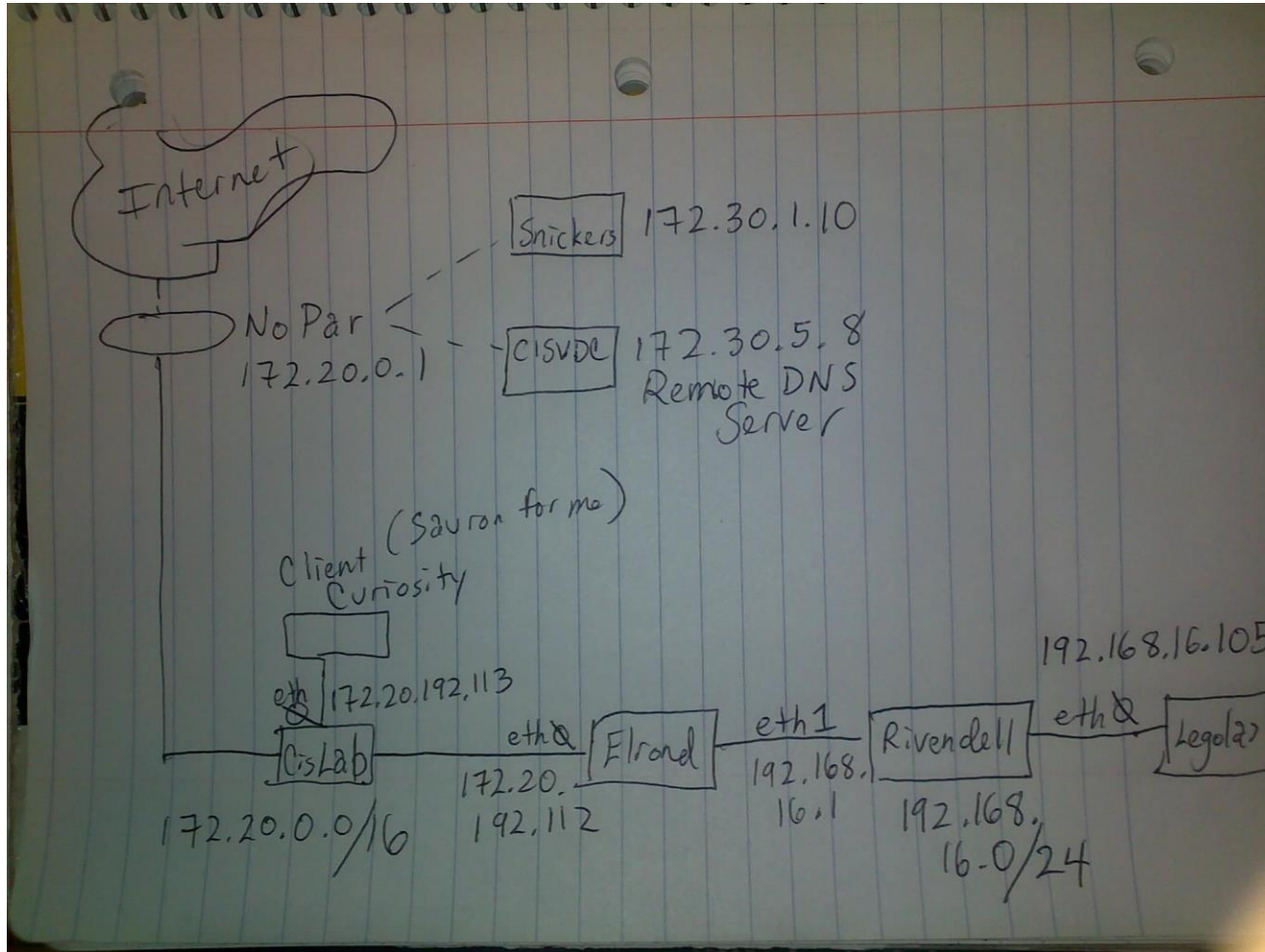
or contact me to arrange another time online

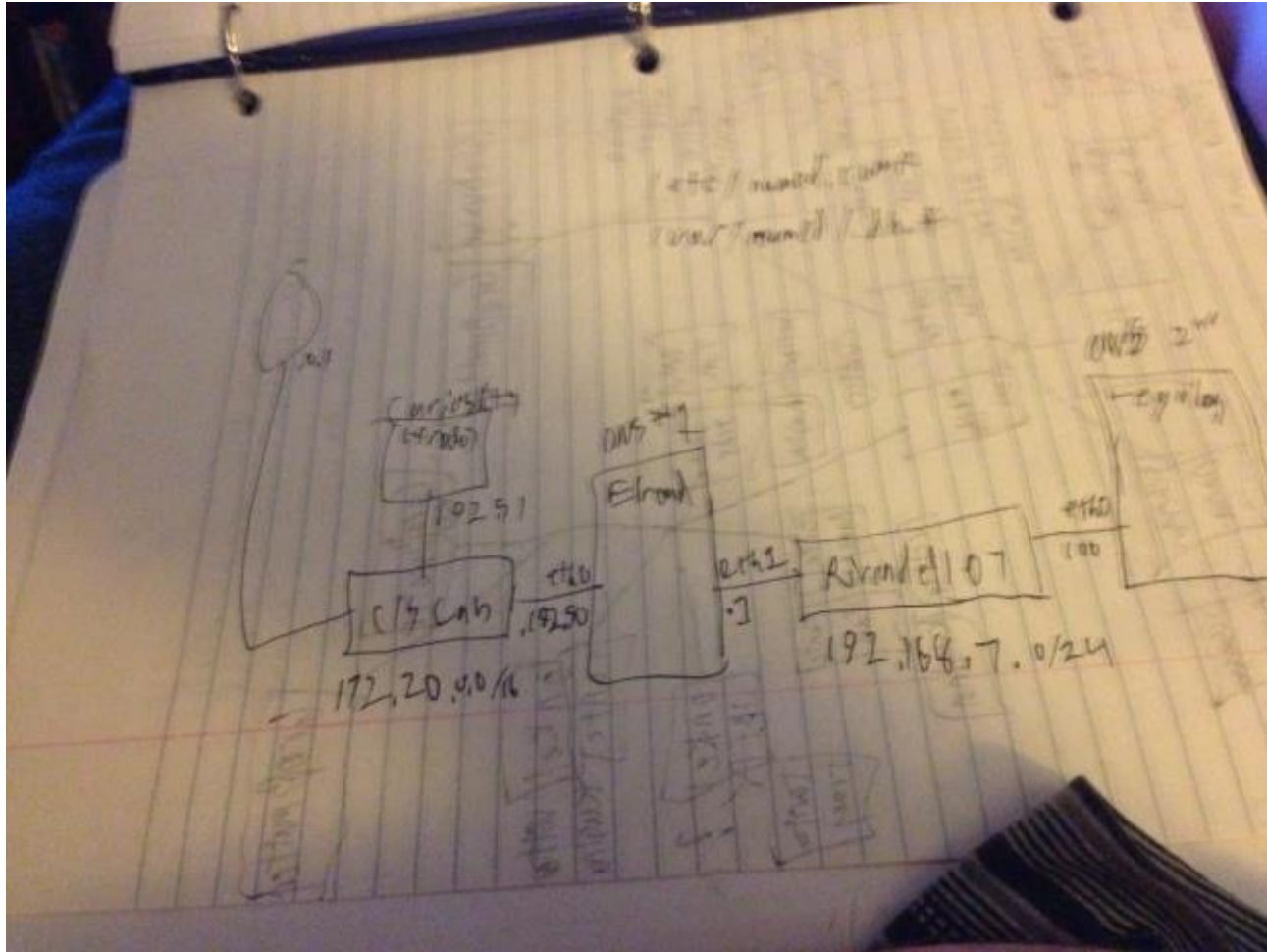


Lab 7 Gallery

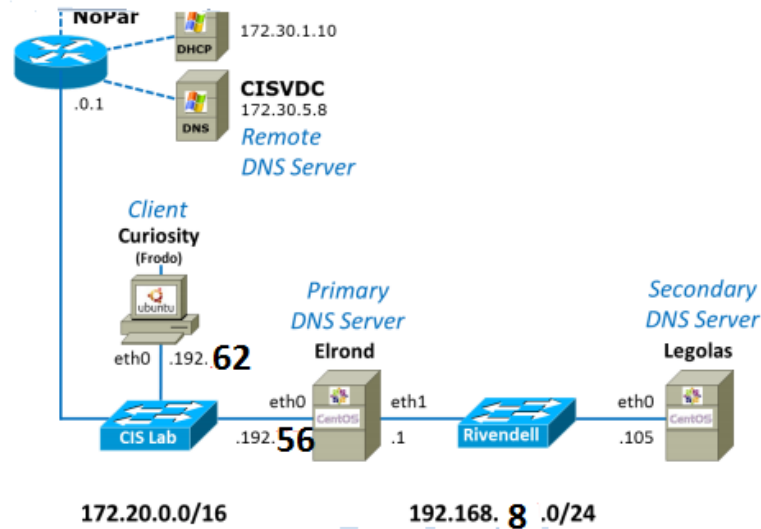


LAB 07 DIAGRAM
CIS192
EVAN NORBOM





Lab 7



/etc/named.conf

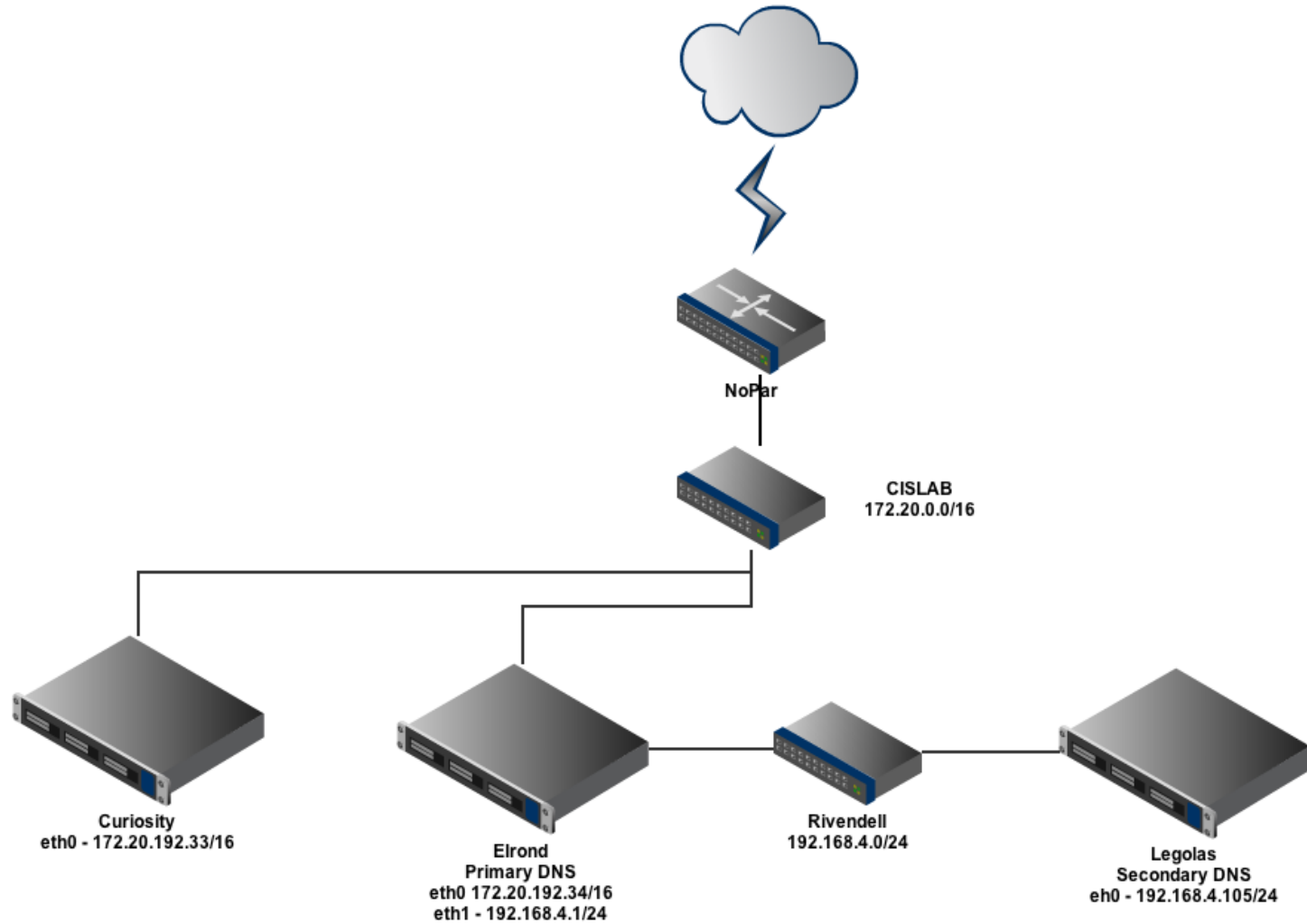
```
zone "rivendell" IN {
type master;
file "db.rivendell";
allow-update { none; };
};
zone " 8 .168.192.in-
addr.arpa" IN {
type master;
file "db. 8 .168.192";
allow-update { none; };
```

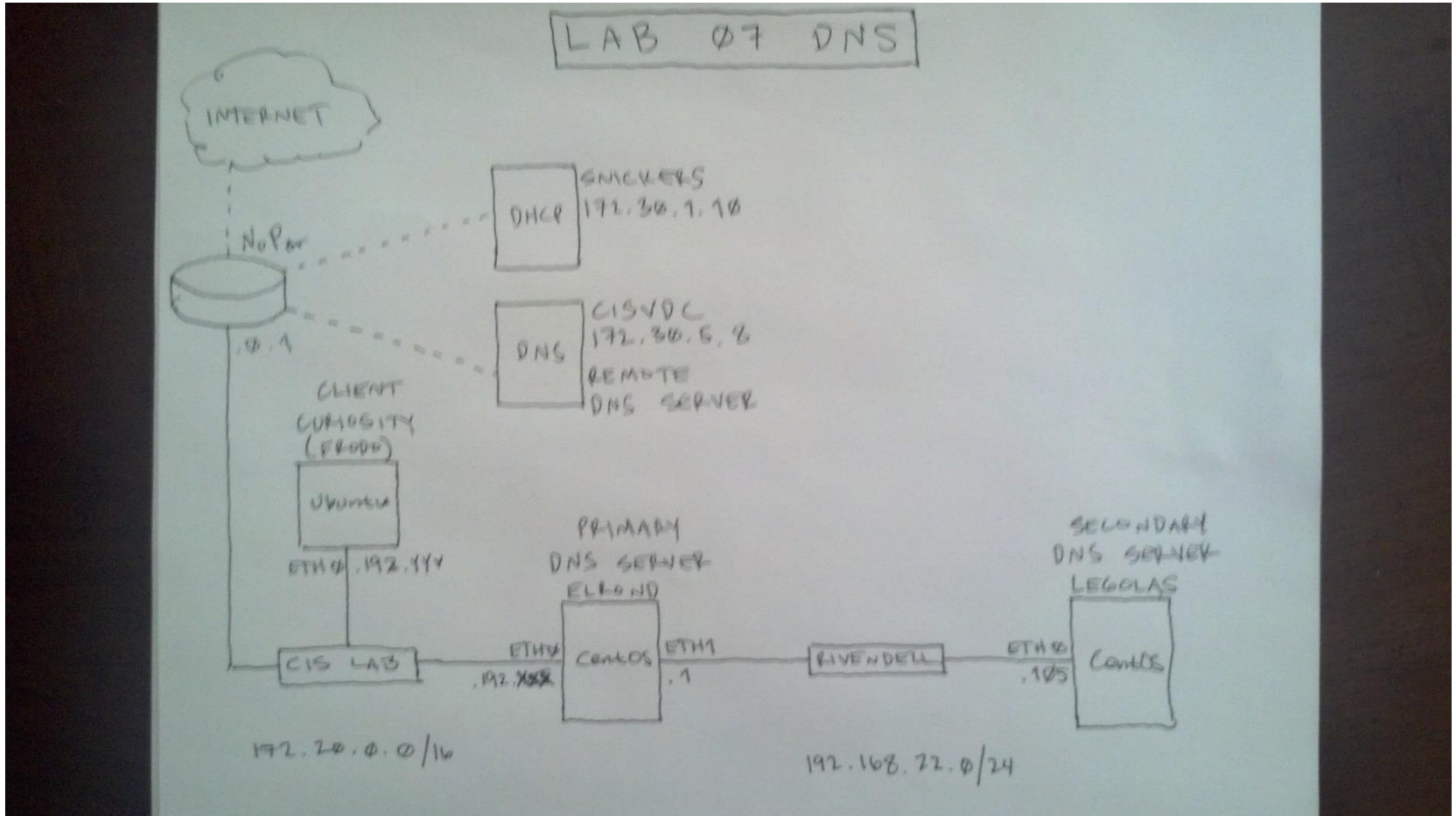
```
iptables -I INPUT 4 -p udp -m udp --dport 53 -j
ACCEPT
```

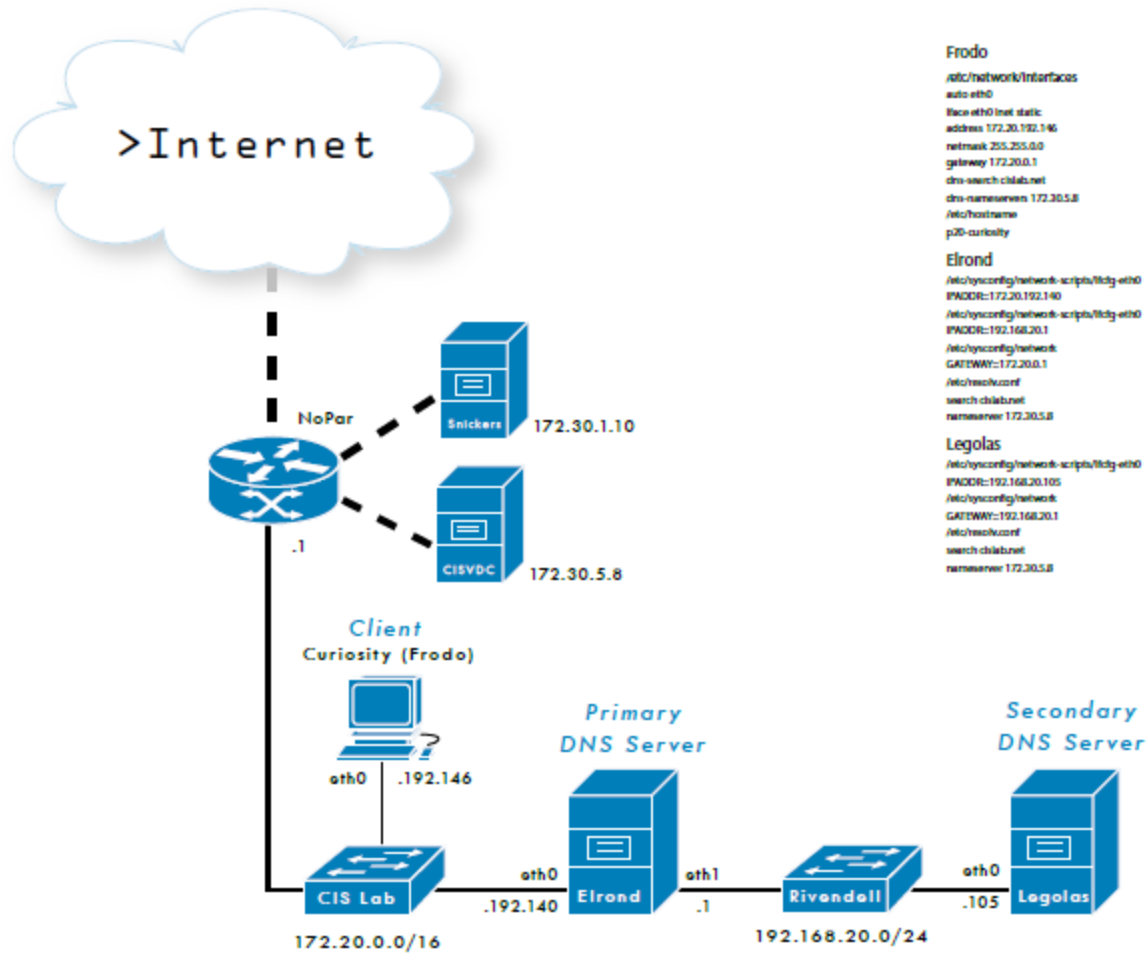
```
iptables -I INPUT 4 -s 192.168. 8 .0/24 -p tcp -
m tcp --dport 53 -j ACCEPT
```

service named restart

rndc reload





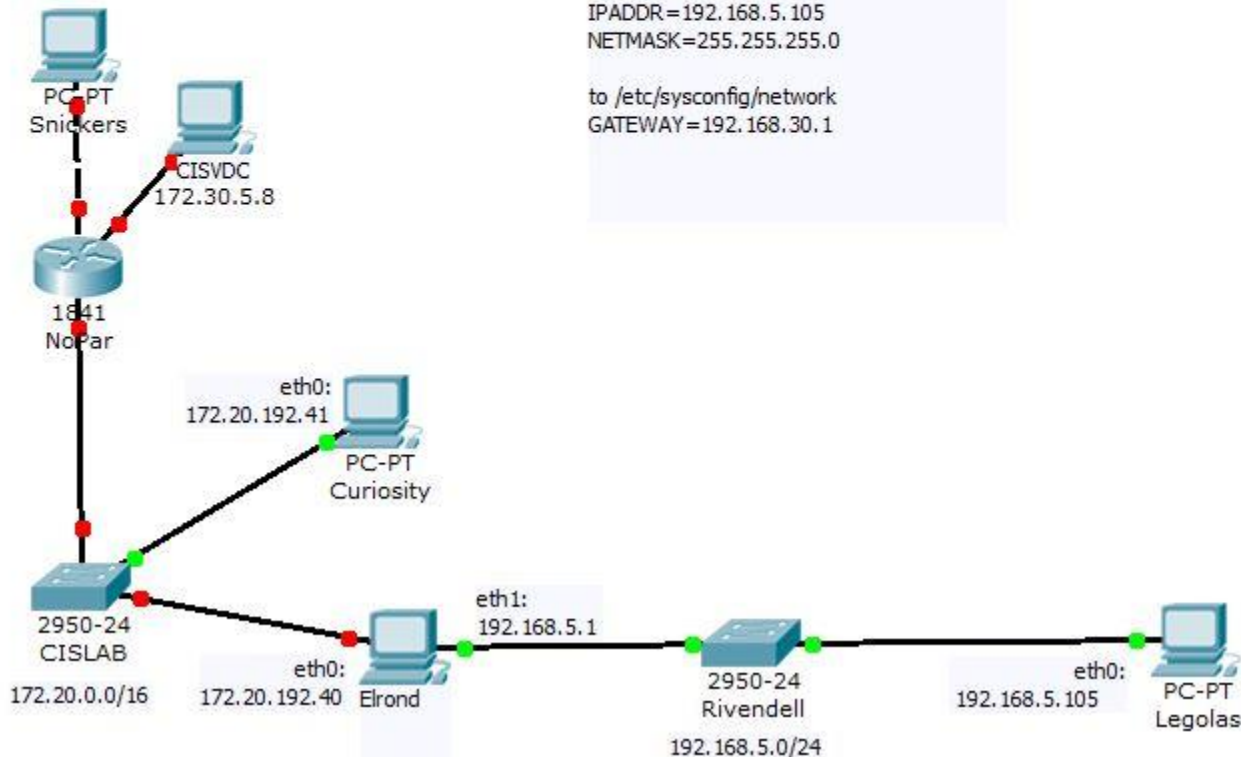


```

Frodo
/etc/network/interfaces
auto eth0
iface eth0 inet static
address 172.30.192.146
netmask 255.255.0.0
gateway 172.20.0.1
dns-search chlab.net
dns-nameserver 172.30.5.8
/etc/hostname
p00-curiosity

Elrond
/etc/sysconfig/network-scripts/ldg-eth0
IPADDR:172.20.192.140
/etc/sysconfig/network-scripts/ldg-eth0
IPADDR:192.168.20.1
/etc/sysconfig/network
GATEWAY:172.20.0.1
/etc/resolv.conf
search chlab.net
nameserver 172.30.5.8

Legolas
/etc/sysconfig/network-scripts/ldg-eth0
IPADDR:192.168.20.105
/etc/sysconfig/network
GATEWAY:192.168.20.1
/etc/resolv.conf
search chlab.net
nameserver 172.30.5.8
    
```



```

LEGOLAS
-----
to /etc/sysconfig/network-scripts/ifcfg-eth0
DEVICE="eth0"
BOOTPROTO="static"
NM_CONTROLLED="no"
ONBOOT="yes"
TYPE="Ethernet"
IPADDR=192.168.5.105
NETMASK=255.255.255.0

to /etc/sysconfig/network
GATEWAY=192.168.30.1
    
```

```

FRODO
-----
to /etc/network/interfaces

iface eth0 inet static
address 172.20.192.41
netmask 255.255.0.0
network 172.20.192.0
broadcast 172.20.192.255
gateway 172.20.0.1

dns-search cislab.net
dns-nameservers 172.30.5.8
    
```

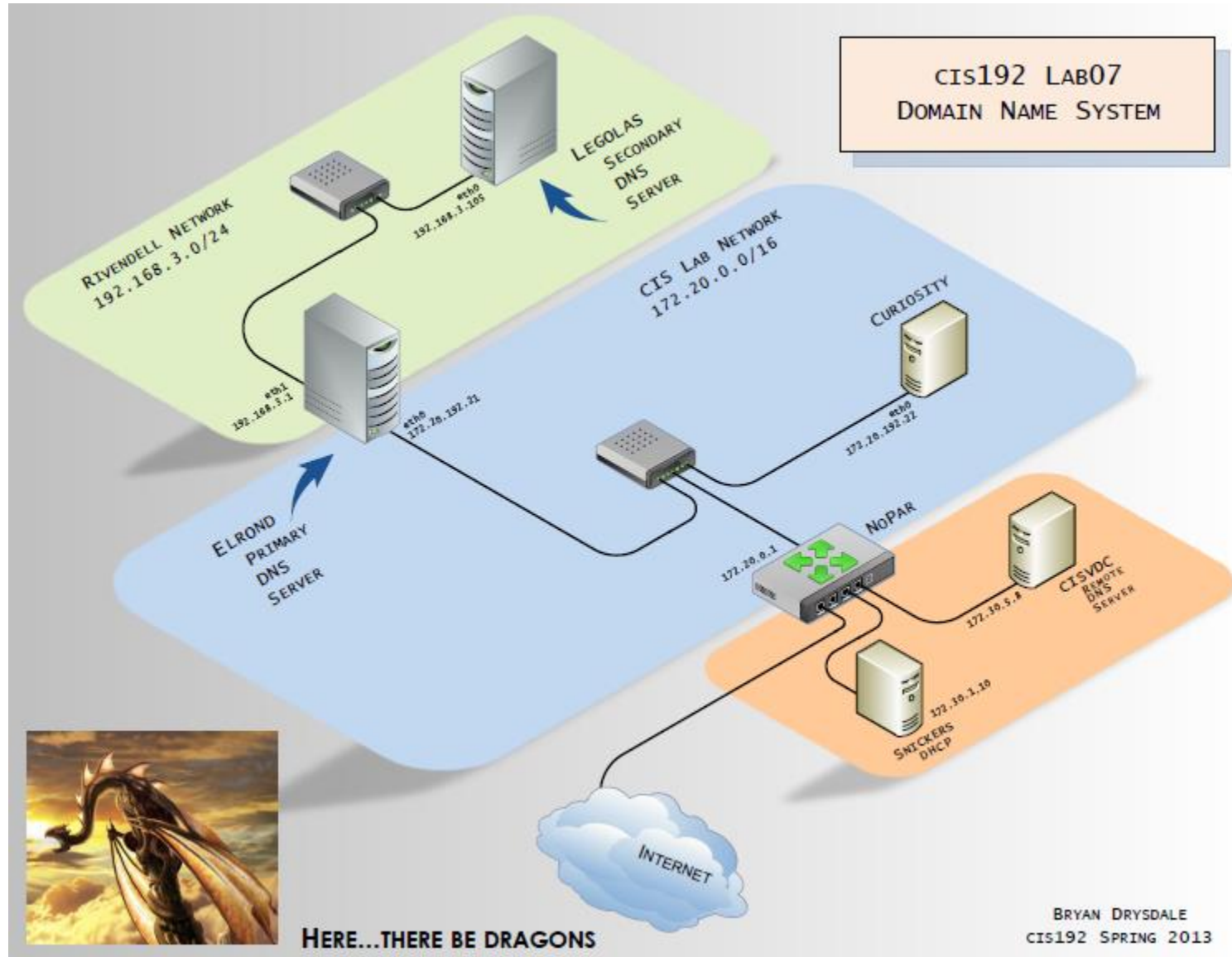
```

ELROND
-----
to /etc/sysconfig/network-scripts/ifcfg-eth0
DEVICE="eth0"
BOOTPROTO="static"
NM_CONTROLLED="no"
ONBOOT="yes"
TYPE="Ethernet"
IPADDR=172.20.192.40
NETMASK=255.255.0.0

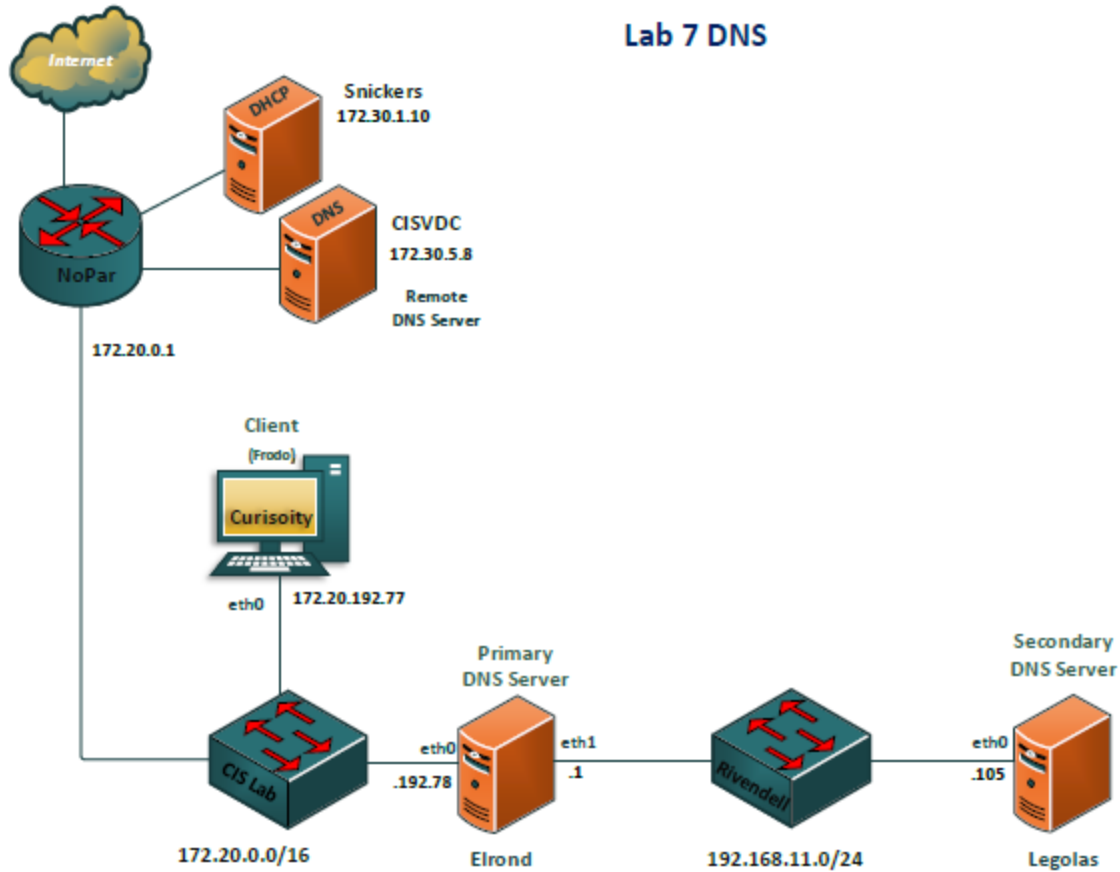
to /etc/sysconfig/network-scripts/ifcfg-eth1
DEVICE="eth1"
BOOTPROTO="static"
NM_CONTROLLED="no"
ONBOOT="yes"
TYPE="Ethernet"
IPADDR=192.168.5.1
NETMASK=255.255.255.0

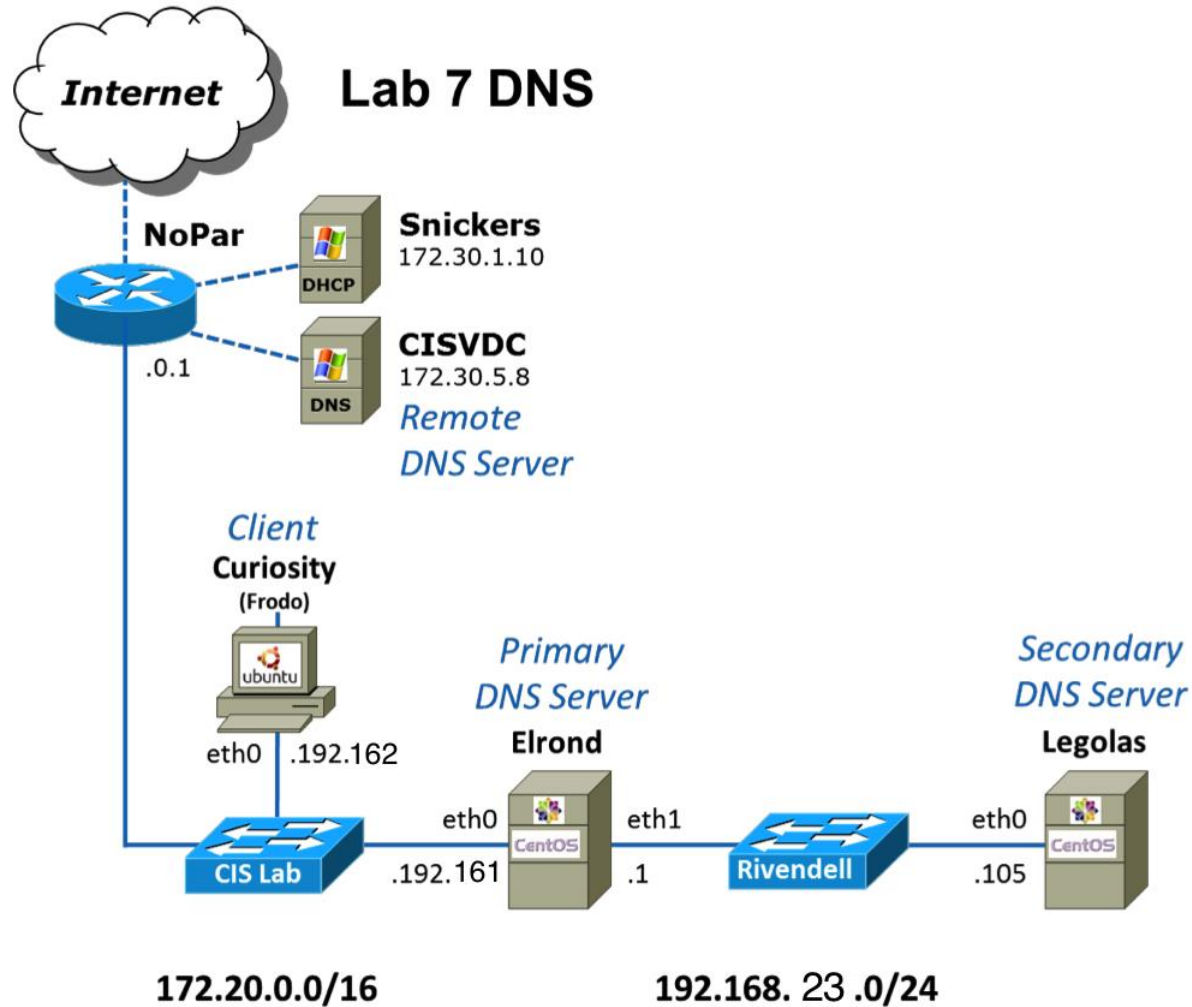
to /etc/sysconfig/network
GATEWAY=172.20.0.1
    
```

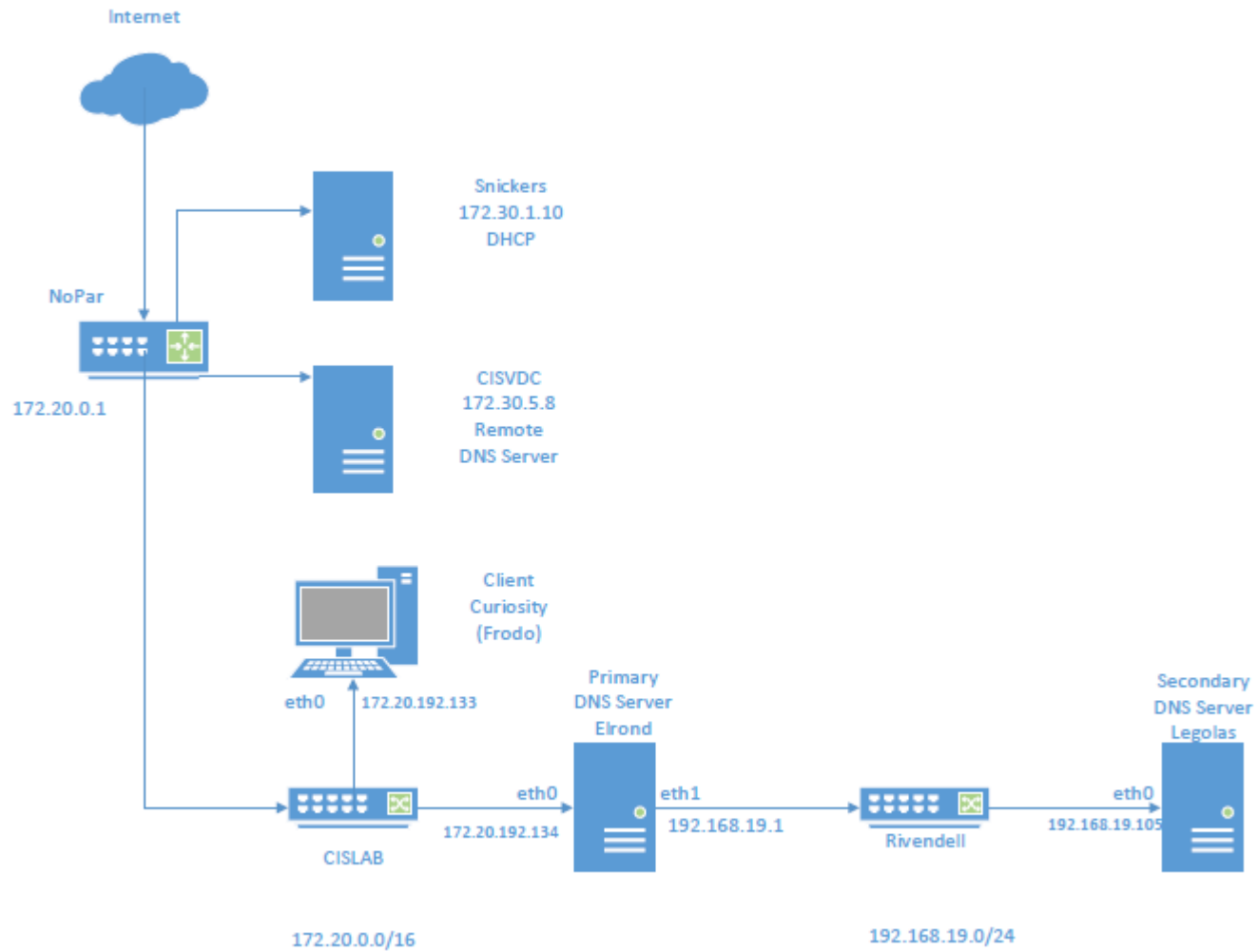

CIS192 LAB07 DOMAIN NAME SYSTEM



Lab 7 DNS









Student Presentation

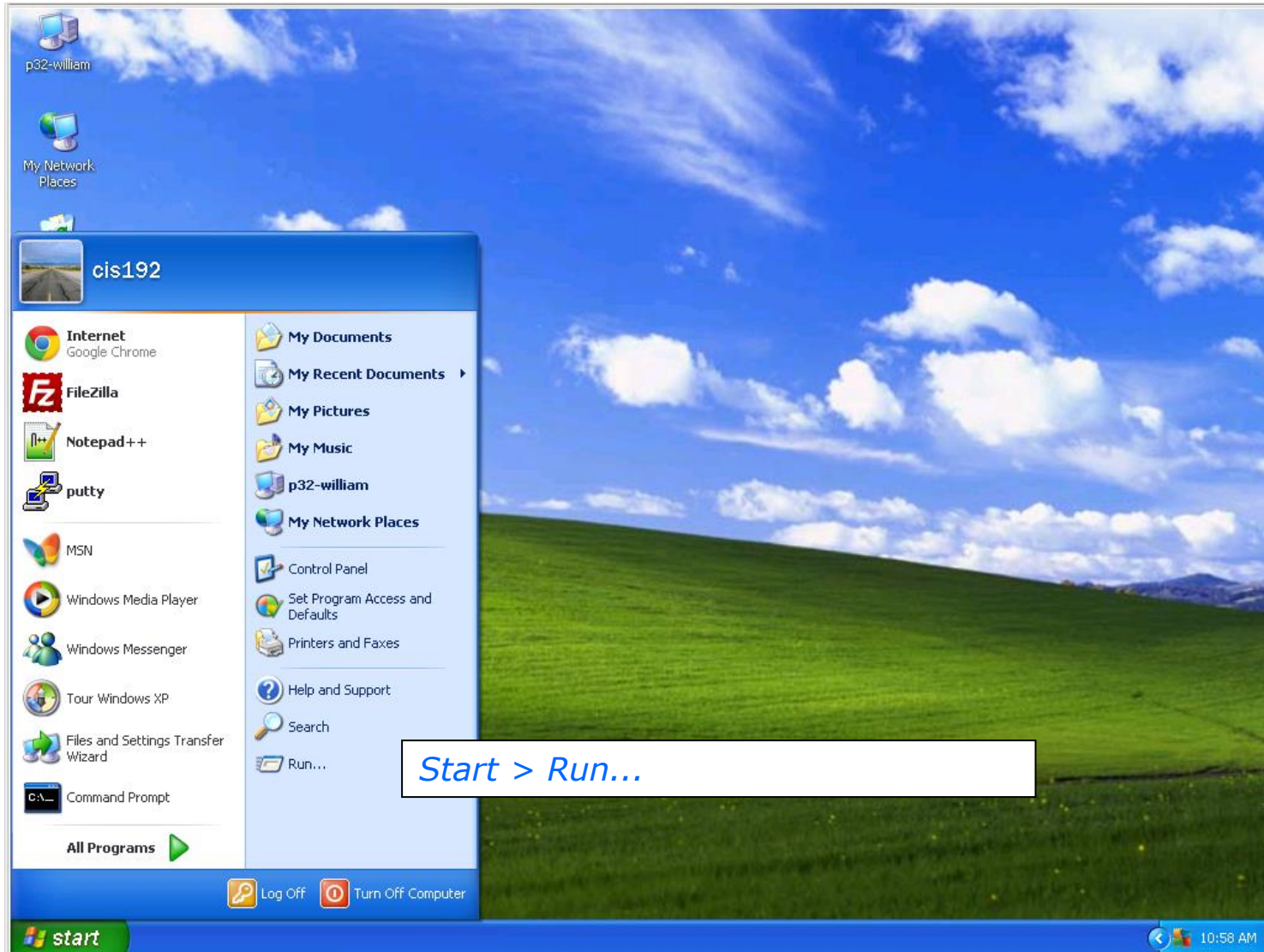
Student
Presentation

Monitor Script

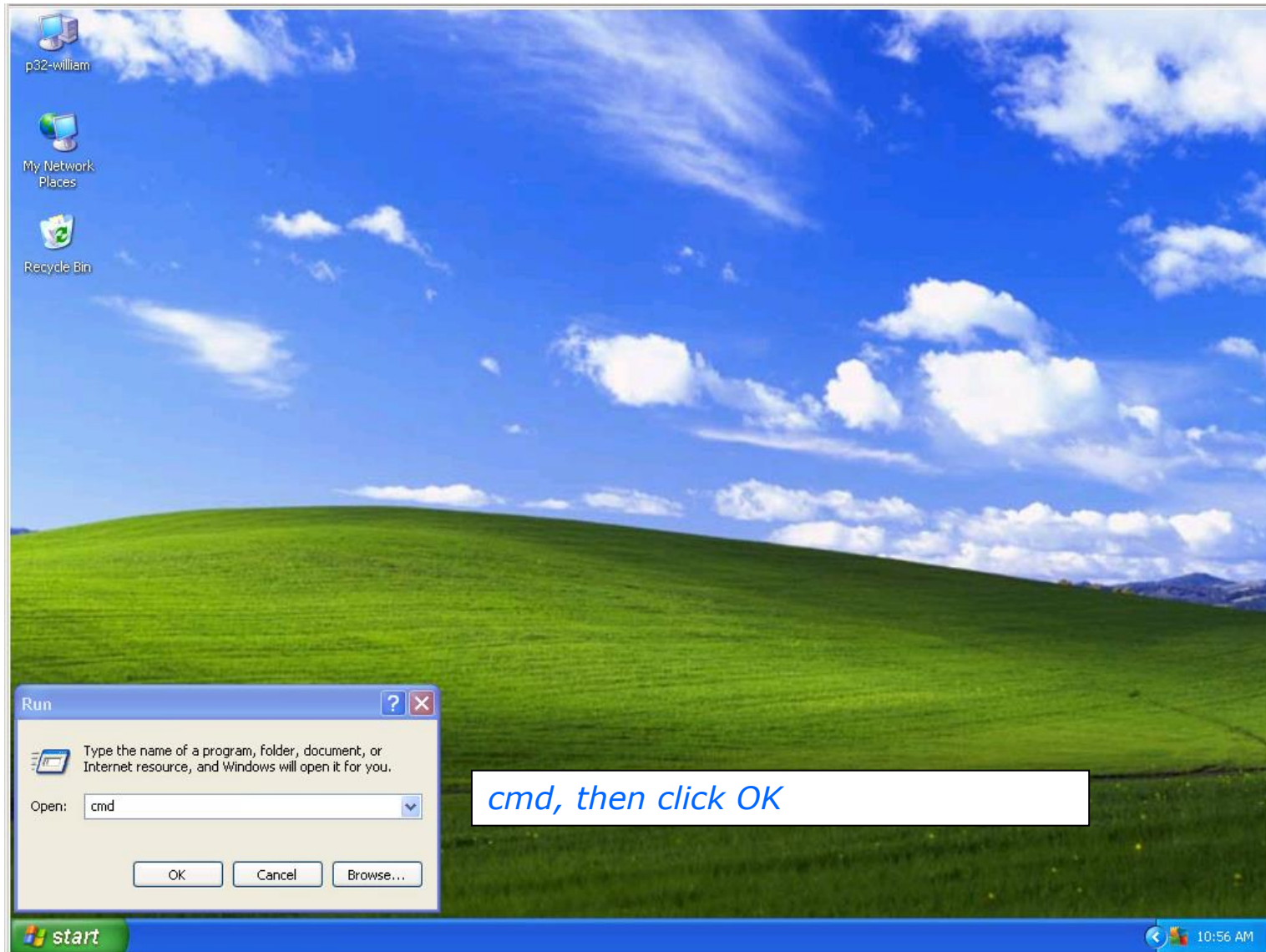
-Sean Callahan

Windows Skills IP addresses

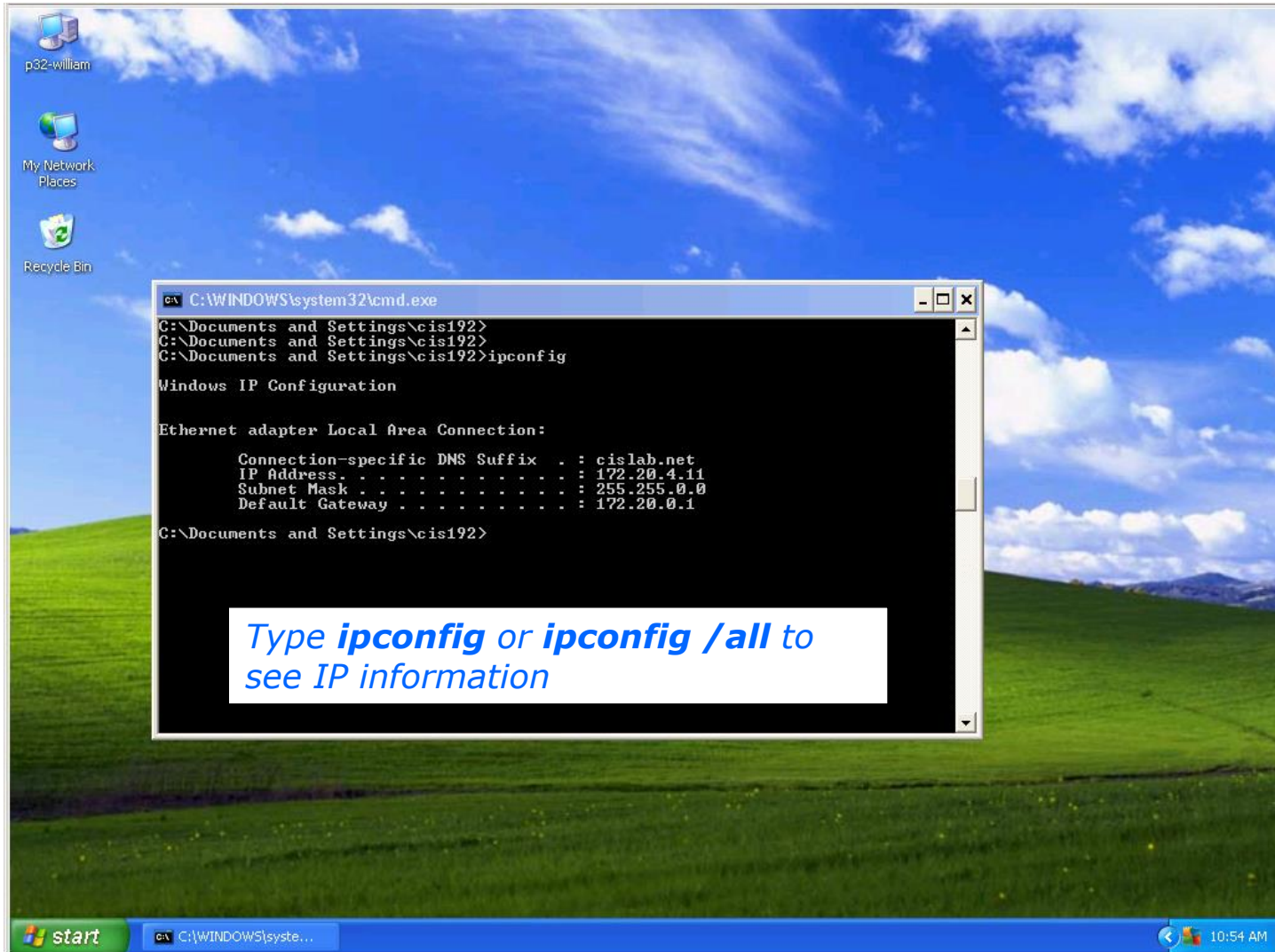
Windows - Show the IP Address



Windows - Show the IP Address



Windows - *Show the IP Address*



The screenshot shows a Windows XP desktop with a blue sky and green hills background. On the left side, there are icons for 'p32-william', 'My Network Places', and 'Recycle Bin'. A command prompt window is open in the center, displaying the following text:

```
C:\WINDOWS\system32\cmd.exe
C:\Documents and Settings\cis192>
C:\Documents and Settings\cis192>
C:\Documents and Settings\cis192>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

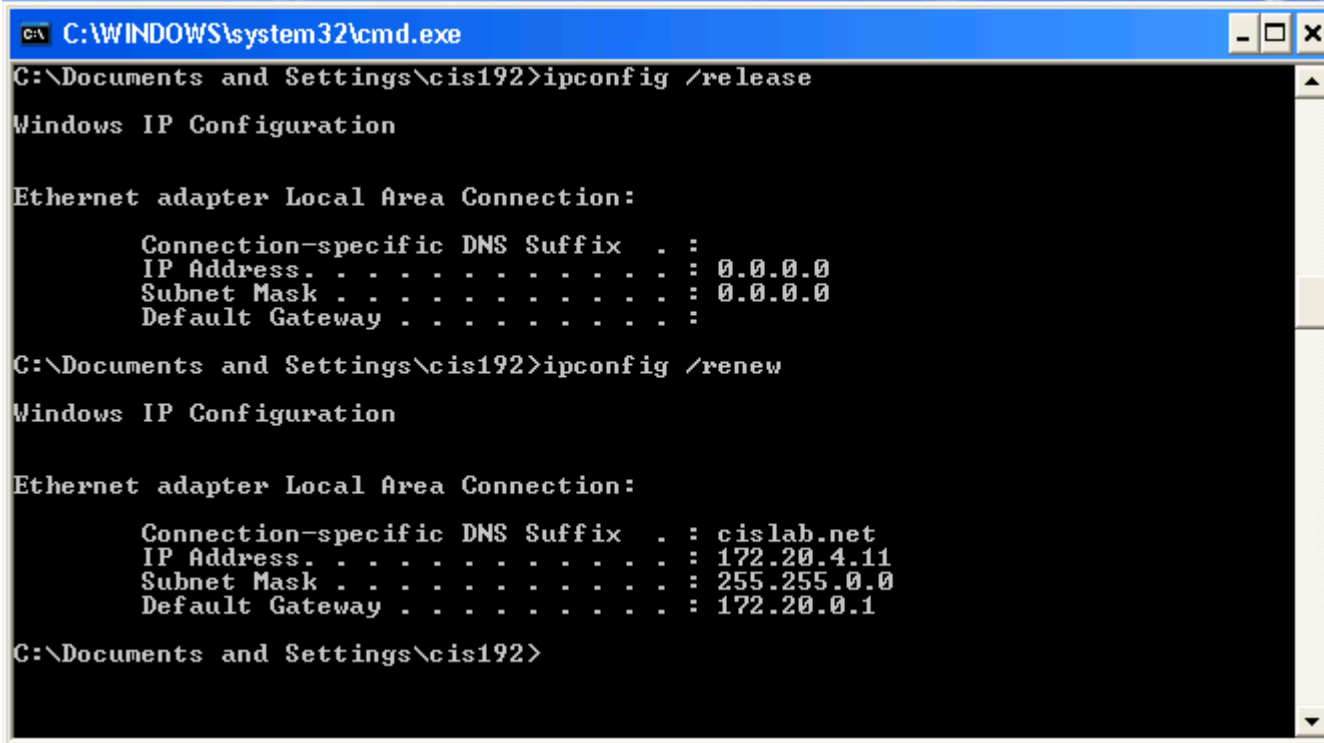
    Connection-specific DNS Suffix  . : cislabs.net
    IP Address. . . . .               : 172.20.4.11
    Subnet Mask . . . . .            : 255.255.0.0
    Default Gateway . . . . .        : 172.20.0.1

C:\Documents and Settings\cis192>
```

Below the command prompt window, there is a white text box with blue text that reads: *Type **ipconfig** or **ipconfig /all** to see IP information*

The taskbar at the bottom shows the 'start' button, a taskbar button for 'C:\WINDOWS\sysste...', and the system tray with the time '10:54 AM'.

Windows - Show the IP Address



```
C:\WINDOWS\system32\cmd.exe
C:\Documents and Settings\cis192>ipconfig /release

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . .               : 0.0.0.0
    Subnet Mask . . . . .            : 0.0.0.0
    Default Gateway . . . . .        : 

C:\Documents and Settings\cis192>ipconfig /renew

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : cislabs.net
    IP Address. . . . .              : 172.20.4.11
    Subnet Mask . . . . .            : 255.255.0.0
    Default Gateway . . . . .        : 172.20.0.1

C:\Documents and Settings\cis192>
```

Use ***ipconfig /release*** to release the current IP addresses obtained using DHCP

Use ***ipconfig /renew*** to obtain a new IP address via DHCP

Windows - IP Addresses

To show IP address: **ipconfig**

```
C:\Documents and Settings\cis192>ipconfig
```

```
Windows IP Configuration
```

```
Ethernet adapter Local Area Connection:
```

```
    Connection-specific DNS Suffix  . : cislabs.net
    IP Address. . . . .               : 172.20.4.11
    Subnet Mask . . . . .             : 255.255.0.0
    Default Gateway . . . . .         : 172.20.0.1
```

```
C:\Documents and Settings\cis192>
```

Windows - IP Addresses

To show IP address and more: **ipconfig /all**

```
C:\Documents and Settings\cis192>ipconfig /all
```

```
Windows IP Configuration
```

```
Host Name . . . . . : p32-william
Primary Dns Suffix . . . . . :
Node Type . . . . . : Unknown
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : cislabs.net
```

```
Ethernet adapter Local Area Connection:
```

```
Connection-specific DNS Suffix . : cislabs.net
Description . . . . . : VMware Accelerated AMD PCNet Adapter

Physical Address. . . . . : 00-50-56-BD-E1-7F
Dhcp Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
IP Address. . . . . : 172.20.4.11
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . : 172.20.0.1
DHCP Server . . . . . : 172.30.1.10
DNS Servers . . . . . : 172.30.5.8
                        10.240.1.2
Lease Obtained. . . . . : Monday, April 29, 2013 6:43:18 AM
Lease Expires . . . . . : Sunday, May 05, 2013 6:43:18 AM
```

Windows - IP Addresses

To release an IP address (back to DHCP): **ipconfig /release**

```
C:\Documents and Settings\cis192>ipconfig /release

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . :
    IP Address. . . . .                : 0.0.0.0
    Subnet Mask . . . . .              : 0.0.0.0
    Default Gateway . . . . .          :

C:\Documents and Settings\cis192>
```

Windows - IP Addresses

To obtain an IP address (from DHCP): **ipconfig /renew**

```
C:\Documents and Settings\cis192>ipconfig /renew

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : cislabs.net
    IP Address. . . . .                : 172.20.4.11
    Subnet Mask . . . . .              : 255.255.0.0
    Default Gateway . . . . .          : 172.20.0.1

C:\Documents and Settings\cis192>
```

William



LAN1 DHCP

- Start > Run... > cmd (click OK)
- Type **ipconfig**
- Type **ipconfig /all**
- Record William's IP address to use later

Windows
Skills
/etc/hosts

Windows - Modifying /etc/hosts

Start



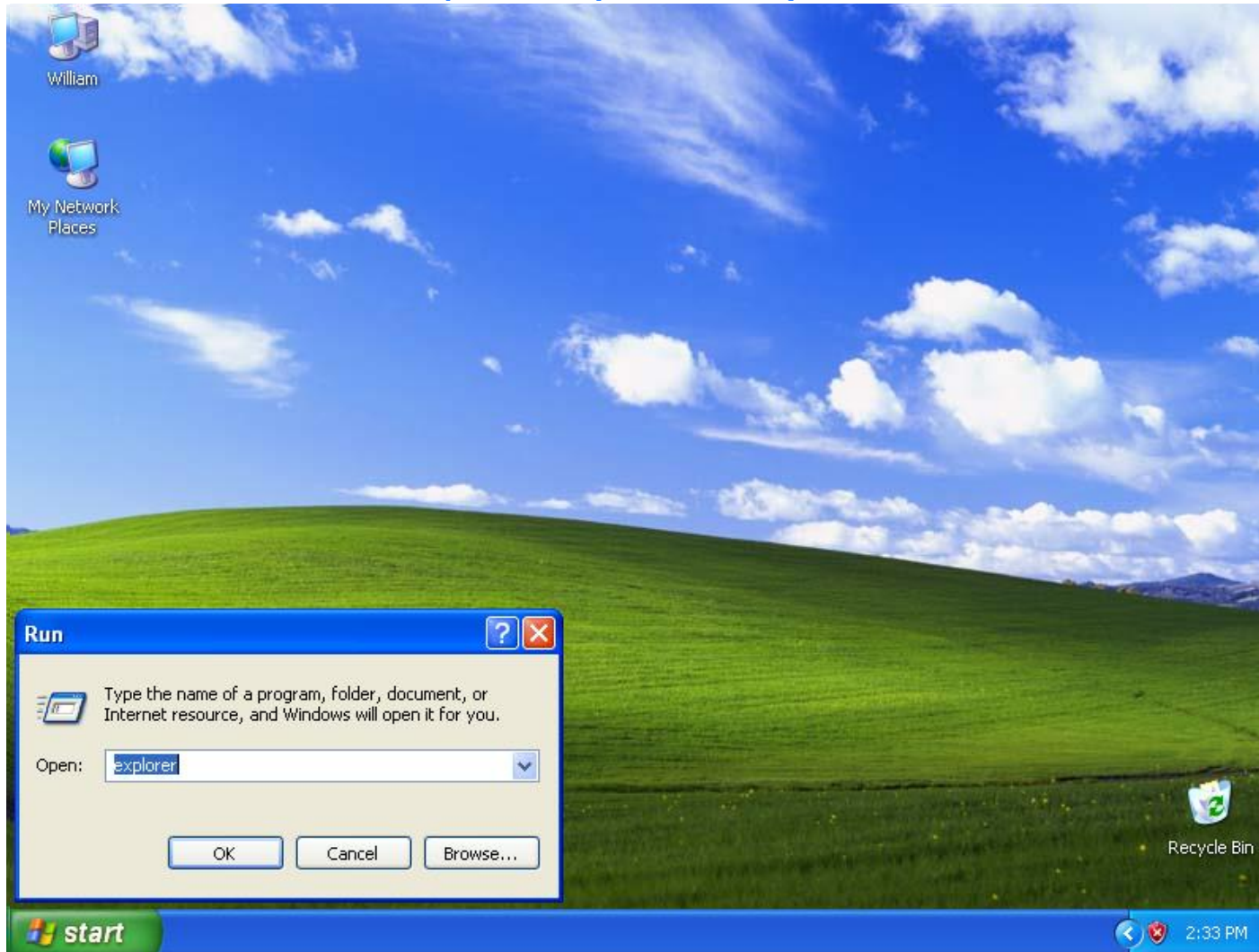
Windows - Modifying /etc/hosts

Start > Run...



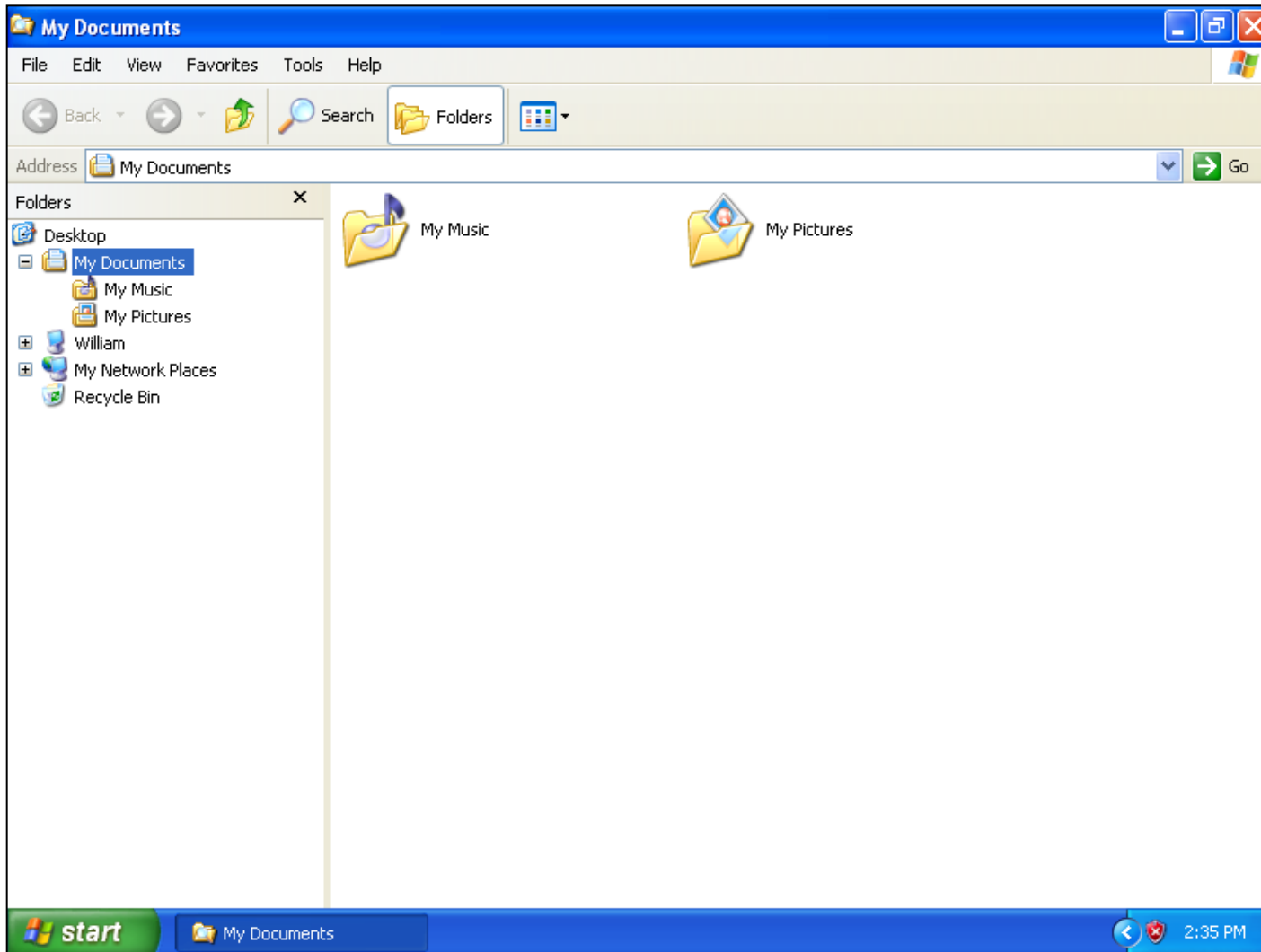
Windows - *Modifying /etc/hosts*

Start > Run... > explorer (Click OK)



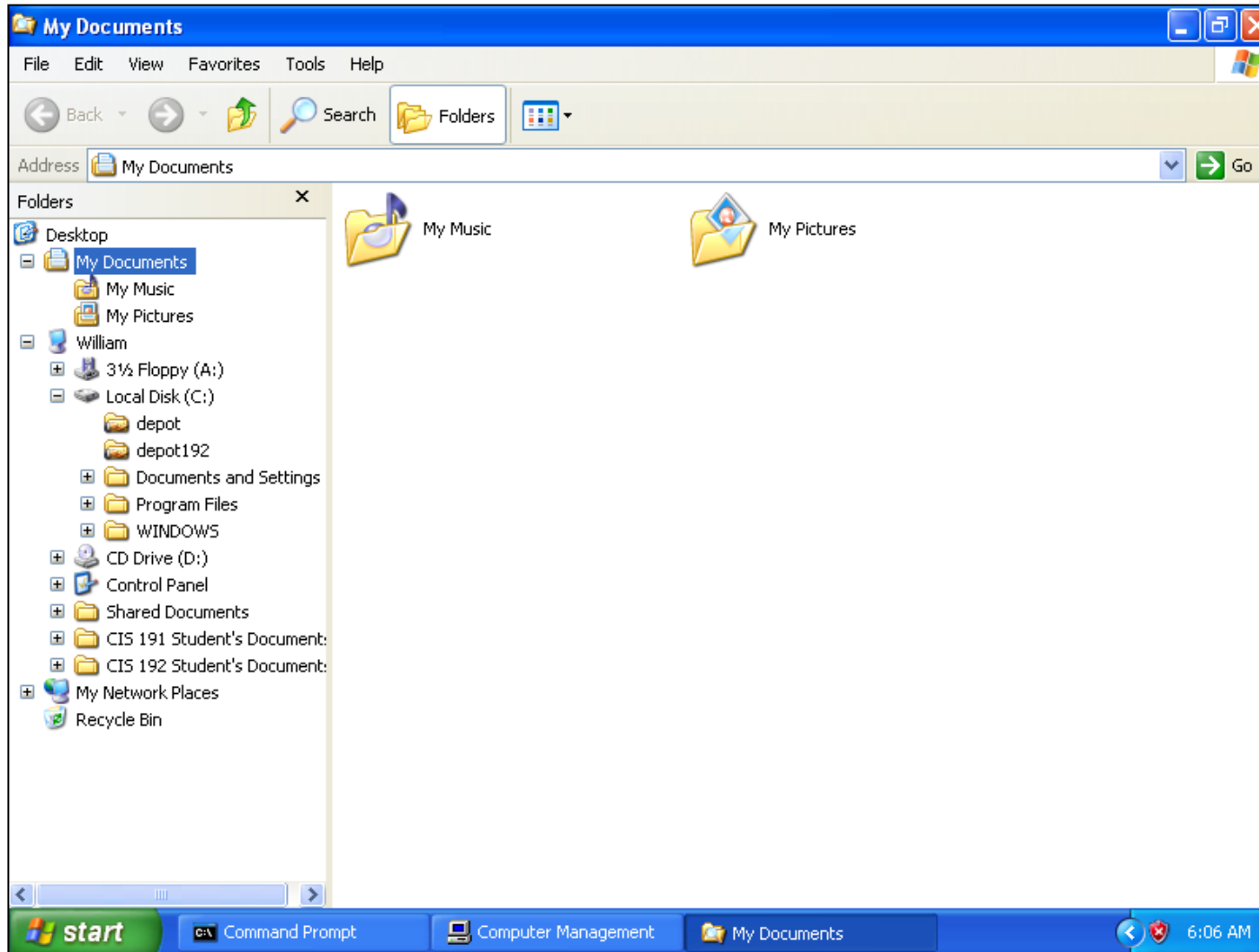
Windows - Modifying /etc/hosts

Expand William (MY Computer) on left panel



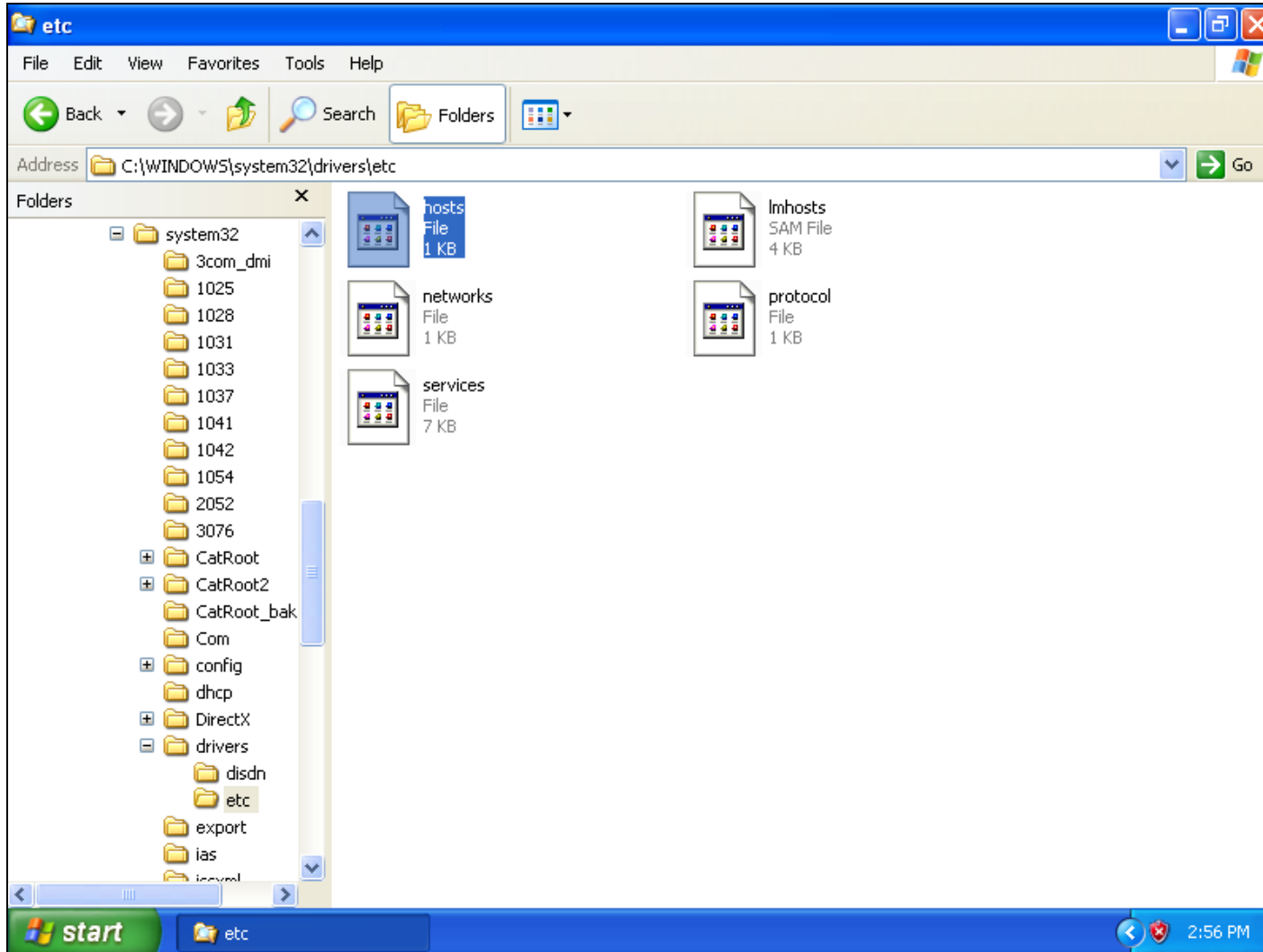
Windows - *Modifying /etc/hosts*

Navigate to C:\WINDOWS\system32\drivers\etc\hosts



Windows - Modifying /etc/hosts

Navigate to C:\WINDOWS\system32\drivers\etc\hosts



Windows - Modifying /etc/hosts

Edit C:\WINDOWS\system32\drivers\etc\hosts

The screenshot shows a Windows Explorer window titled 'etc' with the address bar set to 'C:\WINDOWS\system32\drivers\etc'. The file 'hosts' (1 KB) is selected. A Notepad window titled 'hosts - Notepad' is open, displaying the following text:

```

File Edit Format View Help
# Copyright (c) 1993-1999 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host
# name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#       102.54.94.97       rhino.acme.com           # source server
#       38.25.63.10      x.acme.com               # x client host

127.0.0.1       localhost
172.30.4.107    elrond
192.168.2.105   legolas
    
```

The Windows taskbar at the bottom shows the Start button, the 'etc' folder icon, the 'hosts - Notepad' application icon, and the system tray with the time '2:48 PM'.



William

Copyright (c) 1993-1999 Microsoft Corp.

#

This is a sample HOSTS file used by Microsoft TCP/IP for Windows.

#

This file contains the mappings of IP addresses to host names. Each
entry should be kept on an individual line. The IP address should
be placed in the first column followed by the corresponding host name.
The IP address and the host name should be separated by at least one
space.

#

Additionally, comments (such as these) may be inserted on individual
lines or following the machine name denoted by a '#' symbol.

#

For example:

#

```
#      102.54.94.97      rhino.acme.com      # source server
```

```
#      38.25.63.10      x.acme.com          # x client host
```

```
127.0.0.1      localhost
```

```
172.20.192.xxx elrond pNN-elrond
```

Student	Port	CIS Lab Network 172.20.192.0/24		Virtual Switches		
		Start	End	Shive	Rivendell	Mordor
Ahmed	1	172.20.192.7	172.20.192.13	Shive-01	Rivendell-01	Mordor-01
Berji	2	172.20.192.14	172.20.192.20	Shive-02	Rivendell-02	Mordor-02
Bryan	3	172.20.192.21	172.20.192.27	Shive-03	Rivendell-03	Mordor-03
Carlos	4	172.20.192.28	172.20.192.34	Shive-04	Rivendell-04	Mordor-04
Chris	5	172.20.192.35	172.20.192.41	Shive-05	Rivendell-05	Mordor-05
Corey	6	172.20.192.42	172.20.192.48	Shive-06	Rivendell-06	Mordor-06
David H.	7	172.20.192.49	172.20.192.55	Shive-07	Rivendell-07	Mordor-07
Dave	8	172.20.192.56	172.20.192.62	Shive-08	Rivendell-08	Mordor-08
Donna	9	172.20.192.63	172.20.192.69	Shive-09	Rivendell-09	Mordor-09
Duke	10	172.20.192.70	172.20.192.76	Shive-10	Rivendell-10	Mordor-10
Elia	11	172.20.192.77	172.20.192.83	Shive-11	Rivendell-11	Mordor-11
Evan	12	172.20.192.84	172.20.192.90	Shive-12	Rivendell-12	Mordor-12
Gabriel	13	172.20.192.91	172.20.192.97	Shive-13	Rivendell-13	Mordor-13
Harmer	14	172.20.192.98	172.20.192.104	Shive-14	Rivendell-14	Mordor-14
Sean C.	15	172.20.192.105	172.20.192.111	Shive-15	Rivendell-15	Mordor-15
Sean F.	16	172.20.192.112	172.20.192.118	Shive-16	Rivendell-16	Mordor-16
Schannon	17	172.20.192.119	172.20.192.125	Shive-17	Rivendell-17	Mordor-17
Stephanie	18	172.20.192.126	172.20.192.132	Shive-18	Rivendell-18	Mordor-18
Tajvia	19	172.20.192.133	172.20.192.139	Shive-19	Rivendell-19	Mordor-19
Tony	20	172.20.192.140	172.20.192.146	Shive-20	Rivendell-20	Mordor-20
Adam	21	172.20.192.147	172.20.192.153	Shive-21	Rivendell-21	Mordor-21
Ben	22	172.20.192.154	172.20.192.160	Shive-22	Rivendell-22	Mordor-22
Laura	23	172.20.192.161	172.20.192.167	Shive-23	Rivendell-23	Mordor-23

- Lookup up the static IP address (based on your station number) to use Elrond with:

<http://simms-teach.com/docs/cis192/Pod-Assignments-192-sp13.pdf>

- Add Elrond to C:\WINDOWS\system32\drivers\etc\hosts on William.

Windows Skills Static Routes

Windows - Static Routes

Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\cis192>route ?

Manipulates network routing tables.

```
ROUTE [-f] [-p] [command [destination]
[MASK netmask] [gateway] [METRIC metric] [IF interface]
```

< *snipped* >

Examples:

```
> route PRINT
> route ADD 157.0.0.0 MASK 255.0.0.0 157.55.80.1 METRIC 3 IF 2
      destination^      ^mask      ^gateway      metric^      ^
                                   Interface^
If IF is not given, it tries to find the best interface for a given
gateway.
> route PRINT
> route PRINT 157*      .... Only prints those matching 157*
> route CHANGE 157.0.0.0 MASK 255.0.0.0 157.55.80.5 METRIC 2 IF 2

CHANGE is used to modify gateway and/or metric only.
> route PRINT
> route DELETE 157.0.0.0
> route PRINT
```

With Windows there is an example showing how to make a static route in the online help

< *snipped* >

Windows - Static Routes

To show routing table use: **route PRINT**

```
C:\>route PRINT
=====
Interface List
0x1 ..... MS TCP Loopback interface
0x2 ...08 00 27 d2 e9 40 ..... AMD PCNET Family PCI Ethernet Adapter - Packet S
cheduler Miniport
=====
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
0.0.0.0                    0.0.0.0          172.30.1.1      172.30.1.168     20
127.0.0.0                  255.0.0.0        127.0.0.1       127.0.0.1        1
172.30.1.0                 255.255.255.0   172.30.1.168   172.30.1.168     20
172.30.1.168              255.255.255.255 127.0.0.1       127.0.0.1        20
172.30.255.255            255.255.255.255 172.30.1.168   172.30.1.168     20
224.0.0.0                 240.0.0.0        172.30.1.168   172.30.1.168     20
255.255.255.255          255.255.255.255 172.30.1.168   172.30.1.168     1
Default Gateway:          172.30.1.1
=====
Persistent Routes:
None

C:\>
```


Windows - Static Routes

To add a route use: **route add address mask gateway**

```
C:\Documents and Settings\cis192>route add 192.168.32.0 mask 255.255.255.0 172.20.192.224
```

```
C:\Documents and Settings\cis192>route PRINT
```

```
=====
```

Interface List

```
0x1 ..... MS TCP Loopback interface
```

```
0x2 ...00 50 56 bd e1 7f ..... AMD PCNET Family PCI Ethernet Adapter - Packet Scheduler
```

```
Miniport
```

```
=====
```

```
=====
```

Active Routes:

Network	Destination	Netmask	Gateway	Interface	Metric
	0.0.0.0	0.0.0.0	172.20.0.1	172.20.4.11	10
	127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1
	172.20.0.0	255.255.0.0	172.20.4.11	172.20.4.11	10
	172.20.4.11	255.255.255.255	127.0.0.1	127.0.0.1	10
	172.20.255.255	255.255.255.255	172.20.4.11	172.20.4.11	10
	192.168.32.0	255.255.255.0	172.20.192.224	172.20.4.11	1
	224.0.0.0	240.0.0.0	172.20.4.11	172.20.4.11	10
	255.255.255.255	255.255.255.255	172.20.4.11	172.20.4.11	1

```
Default Gateway: 172.20.0.1
```

```
=====
```

Persistent Routes:

```
None
```

```
C:\Documents and Settings\cis192>
```

Windows - Static Routes

To delete a route use: **route delete address mask gateway**

```
C:\Documents and Settings\cis192>route delete 192.168.32.0 mask 255.255.255.0 172.20.192.224
```

```
C:\Documents and Settings\cis192>route PRINT
```

```
=====
Interface List
0x1 ..... MS TCP Loopback interface
0x2 ...00 50 56 bd e1 7f ..... AMD PCNET Family PCI Ethernet Adapter - Packet S
cheduler Miniport
=====
```

Active Routes:

Network	Destination	Netmask	Gateway	Interface	Metric
	0.0.0.0	0.0.0.0	172.20.0.1	172.20.4.11	10
	127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1
	172.20.0.0	255.255.0.0	172.20.4.11	172.20.4.11	10
	172.20.4.11	255.255.255.255	127.0.0.1	127.0.0.1	10
	172.20.255.255	255.255.255.255	172.20.4.11	172.20.4.11	10
	224.0.0.0	240.0.0.0	172.20.4.11	172.20.4.11	10
	255.255.255.255	255.255.255.255	172.20.4.11	172.20.4.11	1
Default Gateway:		172.20.0.1			

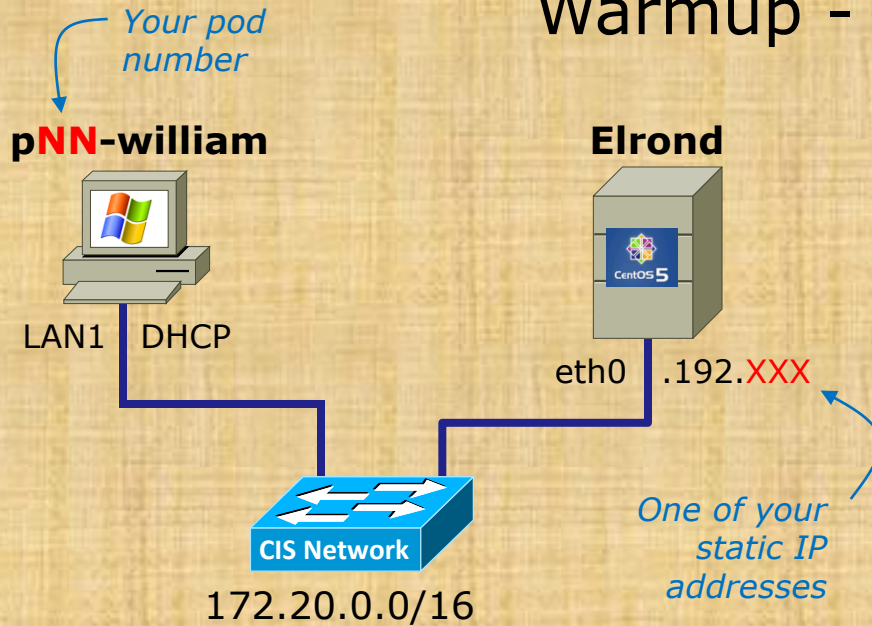
Persistent Routes:

None

```
C:\Documents and Settings\cis192>
```

Warmup

Warmup - Partial Lab 8 Prep



- Cable and configure as shown
- Configure /etc/hosts on Elrond with William's IP address
- Test:
 - On Elrond: **ping pNN-william**
 - On Elrond: **ping google.com**
 - On William: **ping elrond**

```
# cat /etc/sysconfig/network-scripts/ifcfg-eth0
DEVICE="eth0"
BOOTPROTO="static"
NM_CONTROLLED="no"
ONBOOT="yes"
TYPE="Ethernet"
IPADDR=172.20.192.XXX
NETMASK=255.255.0.0
```

```
# cat /etc/sysconfig/network-scripts/ifcfg-eth1
DEVICE=eth1
ONBOOT=no
BOOTPROTO=none
```

```
# cat /etc/sysconfig/network
NETWORKING=yes
HOSTNAME=pNN-elrond.rivendell
GATEWAY=172.20.0.1
```

```
# cat /etc/resolv.conf
search cislabs.net
nameserver 172.30.5.8
```

```
# cat /etc/hosts
127.0.0.1    localhost <snipped >
::1         localhost <snipped >
```

```
172.20.4.11 pNN-william william
192.168.32.105 legolas
```

```
# service network restart
```

Use ssh to enable using a better terminal for completing the lab

```

p32-elrond on vmserver3.cislab.net
File View VM
[root@p32-elrond ~]# who
root    tty1      2013-04-28 22:08
cis192  pts/0    2013-04-30 09:06 (oslab.cabrillo.edu)
[root@p32-elrond ~]# _
  
```

VLab console

```

root@p32-elrond:~
login as: rsimms
rsimms@oslab.cabrillo.edu's password:
Last login: Tue Apr 30 07:55:34 2013 from 50-0-68-177.dsl.dynamic.sonic.net

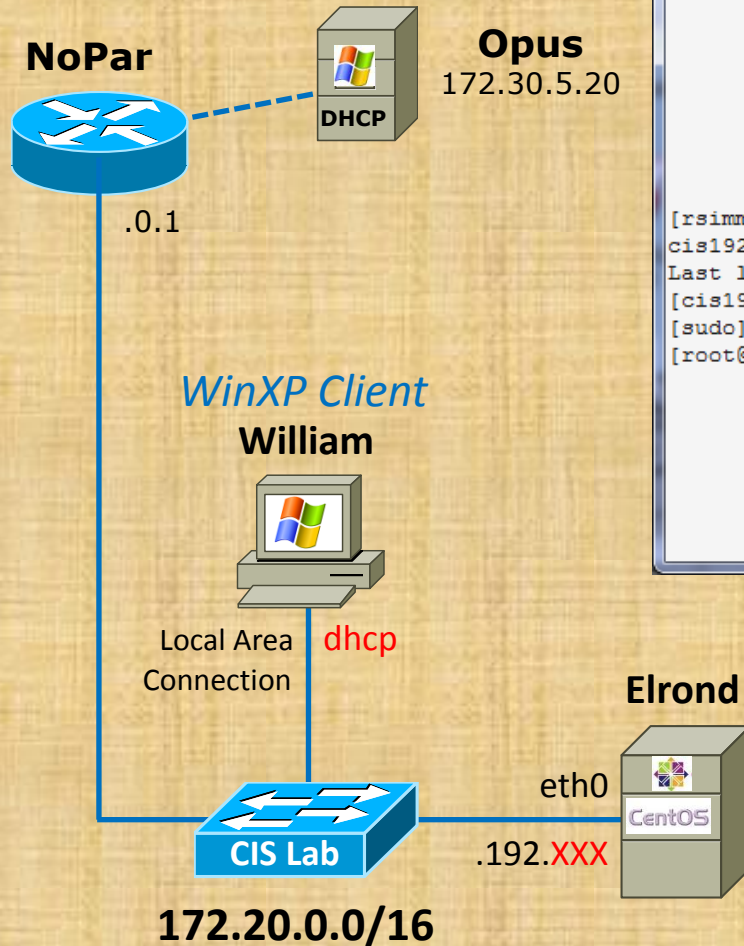
      ( 'v' )
     //--=\
    (\ _ _ /)
     ~ ~ ~

Welcome to Opus
Serving Cabrillo College

[rsimms@oslab ~]$ ssh cis192@172.20.192.XXX
cis192@172.20.192.224's password:
Last login: Sun Dec 30 18:23:18 2012
[cis192@p32-elrond ~]$ sudo -i
[sudo] password for cis192:
[root@p32-elrond ~]# who
root    tty1      2013-04-28 22:08
cis192  pts/0    2013-04-30 09:06 (oslab.cabrillo.edu)
[root@p32-elrond ~]#
  
```

Putty terminal using ssh

Warmup - Partial Lab 8 Prep

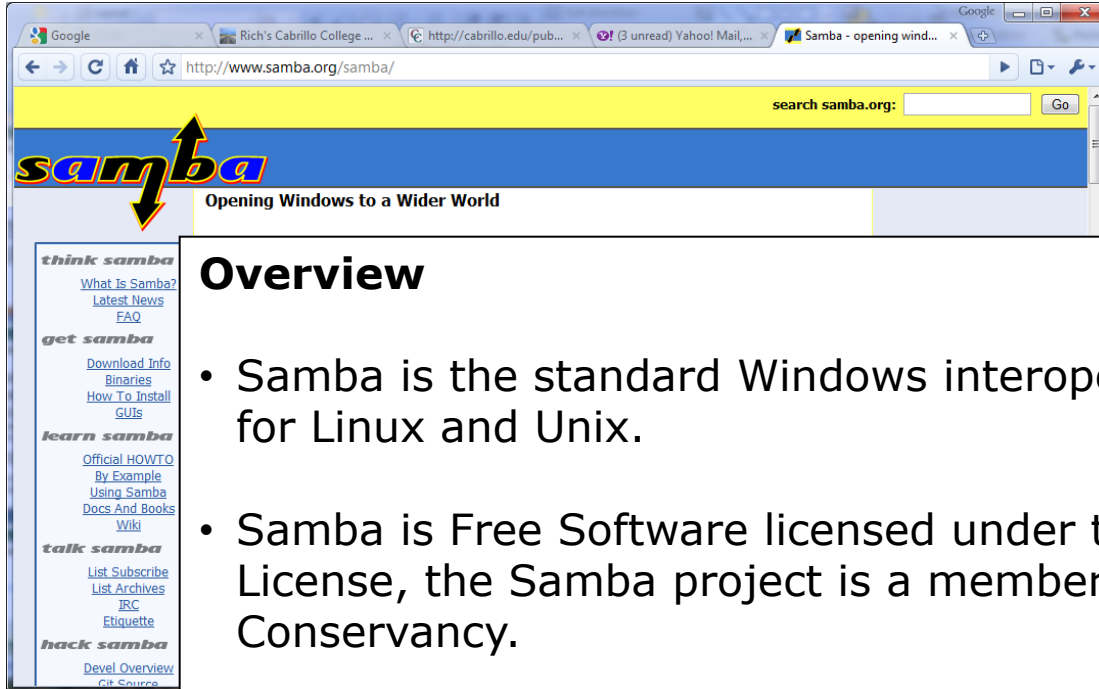


```
root@p32-elrond:~  
login as: rsimms  
rsimms@oslab.cabrillo.edu's password:  
Last login: Tue Apr 30 07:55:34 2013 from 50-0-68-177.dsl.dynamic.sonic.net  
  
      (̄̄̄)  
    //=-\\  
   (\\_=/)  
    ~ ~  
  
    Welcome to Opus  
    Serving Cabrillo College  
  
[rsimms@oslab ~]$ ssh cis192@172.20.192.XXX  
cis192@172.20.192.224's password:  
Last login: Sun Dec 30 18:23:18 2012  
[cis192@p32-elrond ~]$ sudo -i  
[sudo] password for cis192:  
[root@p32-elrond ~]#
```


Samba



Samba



<http://samba.org/>

Overview

- Samba is the standard Windows interoperability suite of programs for Linux and Unix.
- Samba is Free Software licensed under the GNU General Public License, the Samba project is a member of the Software Freedom Conservancy.
- Since 1992, Samba has provided secure, stable and fast file and print services for all clients using the SMB/CIFS protocol, such as all versions of DOS and Windows, OS/2, Linux and many others.
- Samba is an important component to seamlessly integrate Linux/Unix Servers and Desktops into Active Directory environments using the winbind daemon

Samba

Overview

Enables a UNIX/Linux computer to be a Windows File and Print server that interoperates with Windows computers for common file and printer sharing.

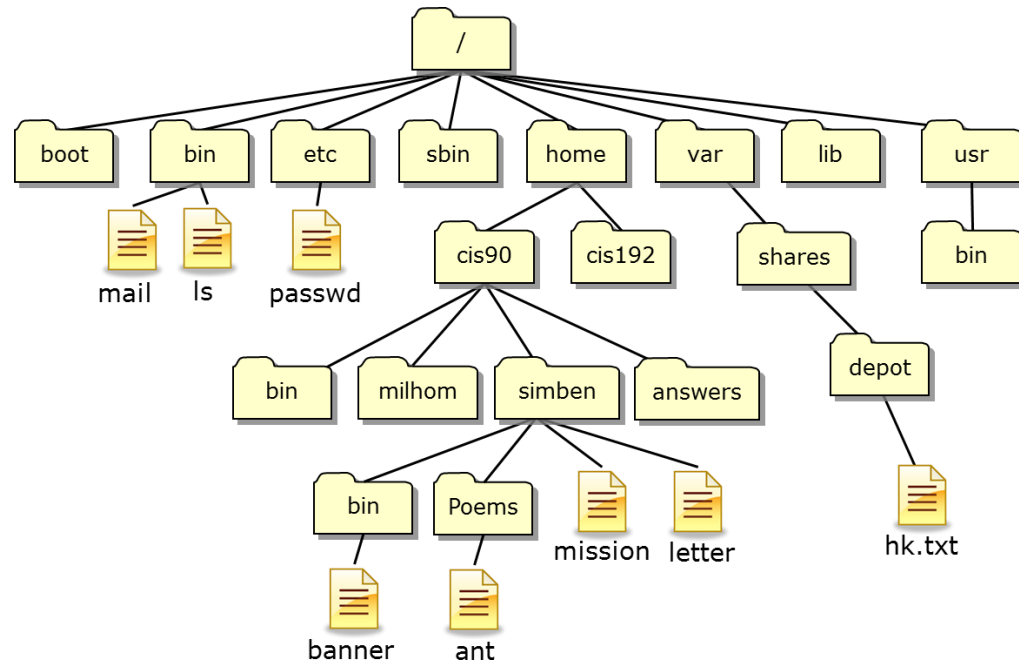
- Andrew Tridgell, an Australian, is the original author. He wanted to mount disk space from a Unix server on his DOS PC!
- SMBServer name was already taken, so Andrew used **grep -i '^s.*m.*b' /usr/share/dict/words** and chose Samba
- Based on the CIFS (Common Internet File System) protocol. The CIFS name was introduced by Microsoft. CIFS is based on SMB (Server Message Block) protocol.
- SMB's history goes back to early days of PC's, DOS, NetBIOS and NetBEUI.
- NFS exported directories can only be used by other UNIX/Linux systems. Samba shared directories can be used by both UNIX/Linux and Windows systems.

Samba

Here is a Linux server and its UNIX File Tree



Elrond



Samba

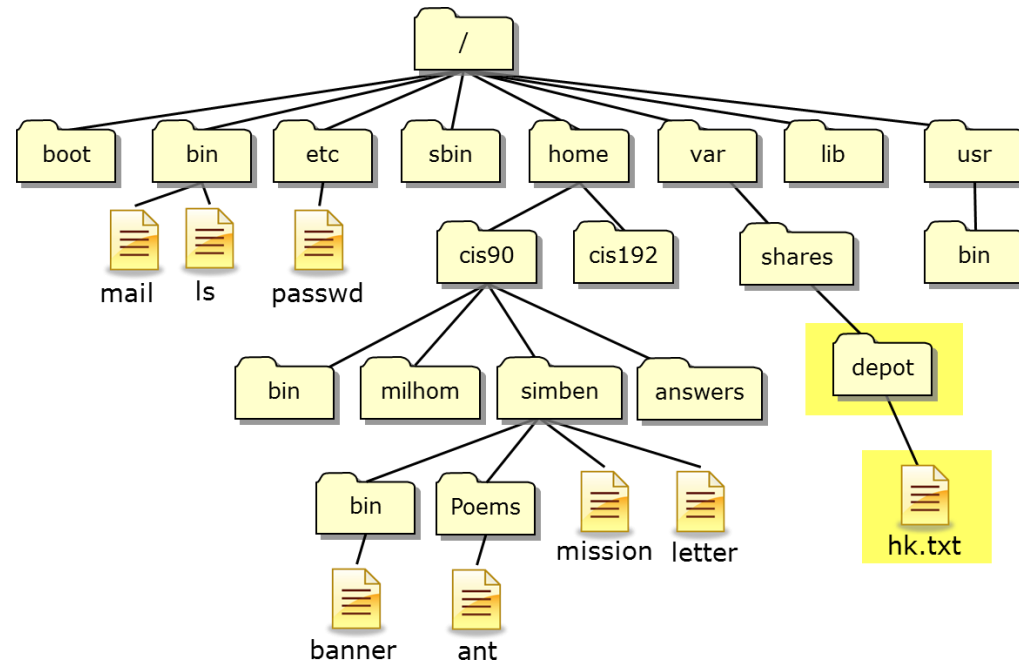
Add this to */etc/samba/smb.conf* to create a shared directory on Elrond

```
[depot]
```

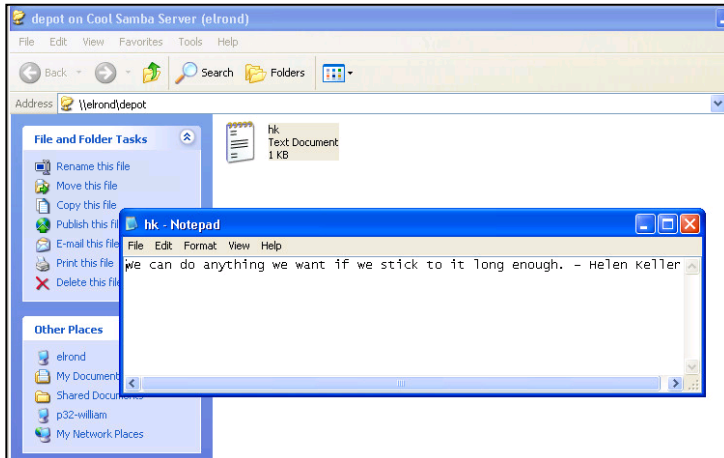
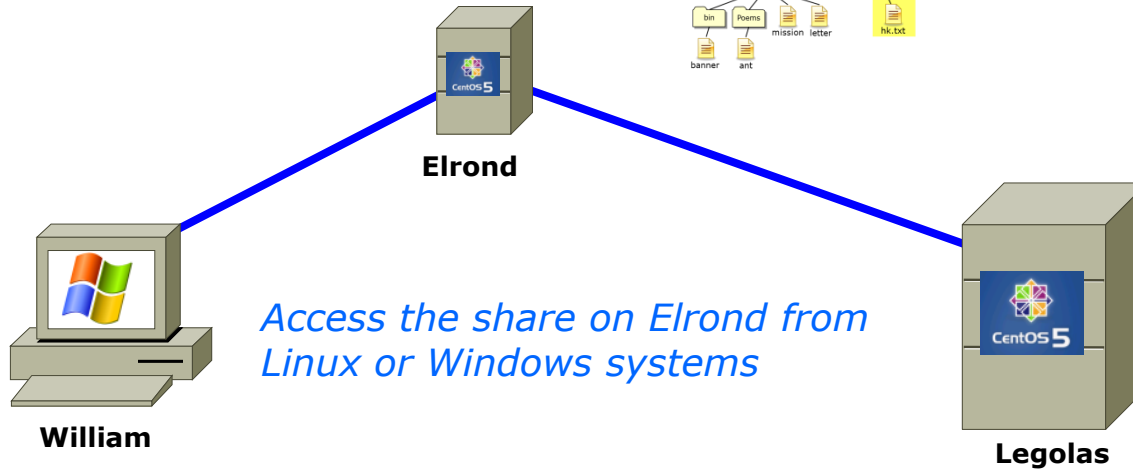
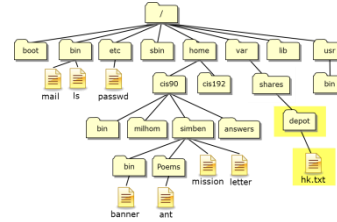
```
comment = Public files on Elrond
path = /var/shares/depot
read only = yes
guest ok = yes
```



Elrond



Samba



```
# mount //elrond/depot192 /mnt -o username=cis192
Password:
# ls /mnt
hk.txt
# cat /mnt/hk.txt
We can do anything we want if we stick to it long
enough. - Helen Keller
```




www.samba.org

Packages

```
[root@elrond ~]# rpm -qa | grep samba
samba-client-3.5.10-125.el6.x86_64
samba-winbind-clients-3.5.10-125.el6.x86_64
samba-common-3.5.10-125.el6.x86_64
samba-3.5.10-125.el6.x86_64
samba-swat-3.5.10-125.el6.x86_64
```

Services

```
[root@elrond ~]# service smb start
```

Starting SMB services:

[OK]

```
[root@elrond ~]# service nmb start
```

Starting NMB services:

[OK]

```
[root@elrond ~]# service smb status
```

smbd (pid 2087) is running...

```
[root@elrond ~]# service nmb status
```

nmbd (pid 2103) is running...

```
[root@elrond ~]# chkconfig smb on
```

```
[root@elrond ~]# chkconfig nmb on
```

Configuration

```
[root@elrond ~]# ls /etc/samba/smb.conf
```

/etc/samba/smb.conf

```
root@elrond ~]# checkparm
```

Firewall Ports Used

137/udp - NetBIOS Name Service

138/udp - NetBIOS Datagram Service

139/tcp - NetBIOS Session Service

445/tcp - Microsoft Directory Service

SELinux

```
chcon -R -t samba_share_t <sharedir(s)>
```

```
setsebool -P samba_enable_home_dirs=1
```



Windows Shares

Windows Shares

Overview:

- Files and printers can be shared on Windows over the network.
- **Simple File Sharing** must be disabled on the **Folder Options** dialog box to allow basic share permissions (Read, Change, Full Control) to be set.
- Shares are configured using the **Properties** dialog box for folders.
 - Use the **Sharing tab** to configure the share.
 - Note, the **Security tab** sets NTFS permissions which are different.
- Both share permissions and NTFS permissions are applied for accessing any file over the network.
- Use **MMC (Computer Management)** to monitor share usage

Windows Shares

Windows Share Permissions:

- **Read** - Allows browsing file and folder names (including subfolders), reading files and executing programs.
- **Change** - Includes all Read permissions plus can add, delete and modify folders and files.
- **Full Control** - Includes all read and Change permissions plus can modify permissions.



Viewing Share Configuration

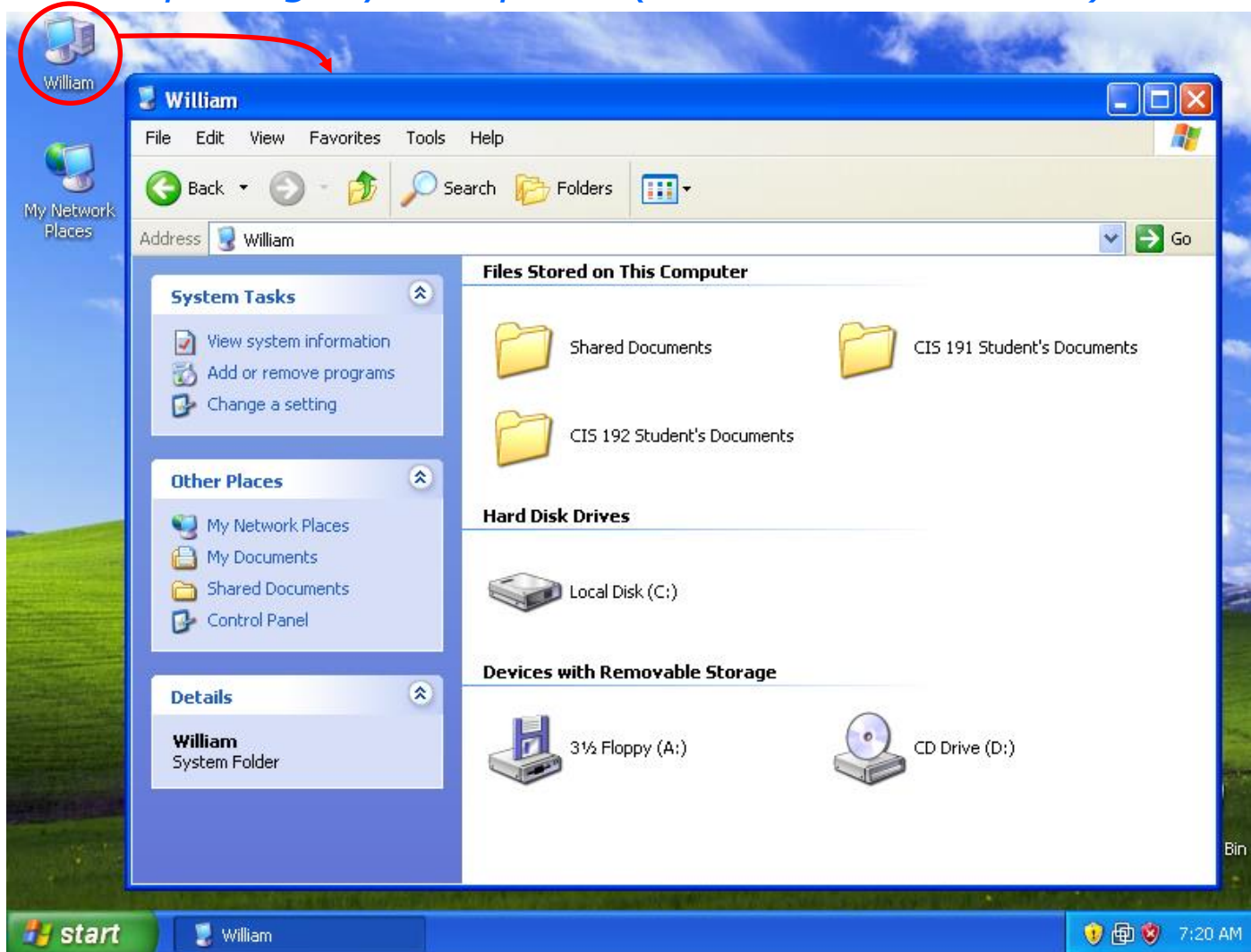
Windows Shares

The next series of slides walkthrough how to view share configurations on Windows

Note that this is only one of many ways to do this

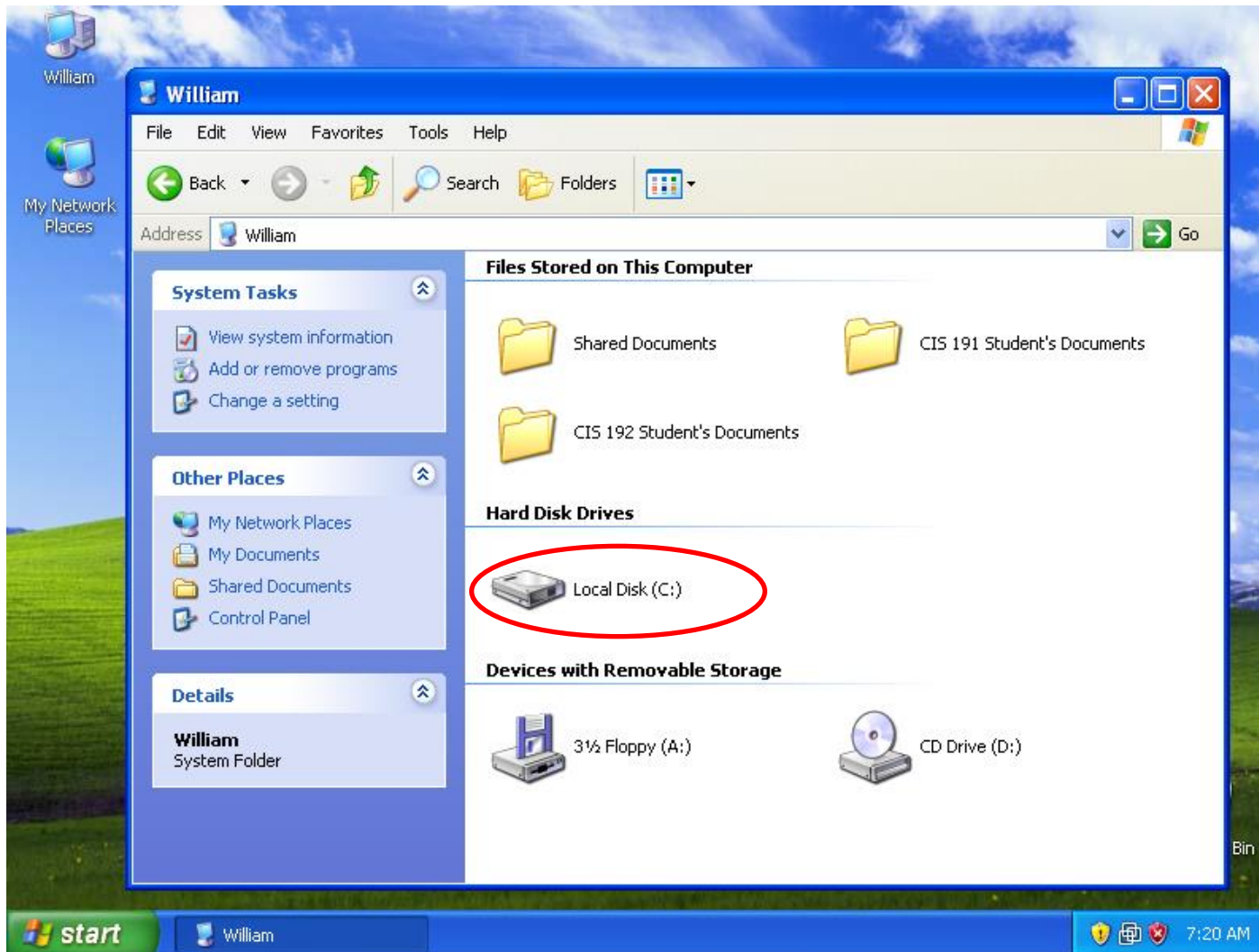
Windows Shares - *viewing share configurations*

After opening My Computer (labeled William here)



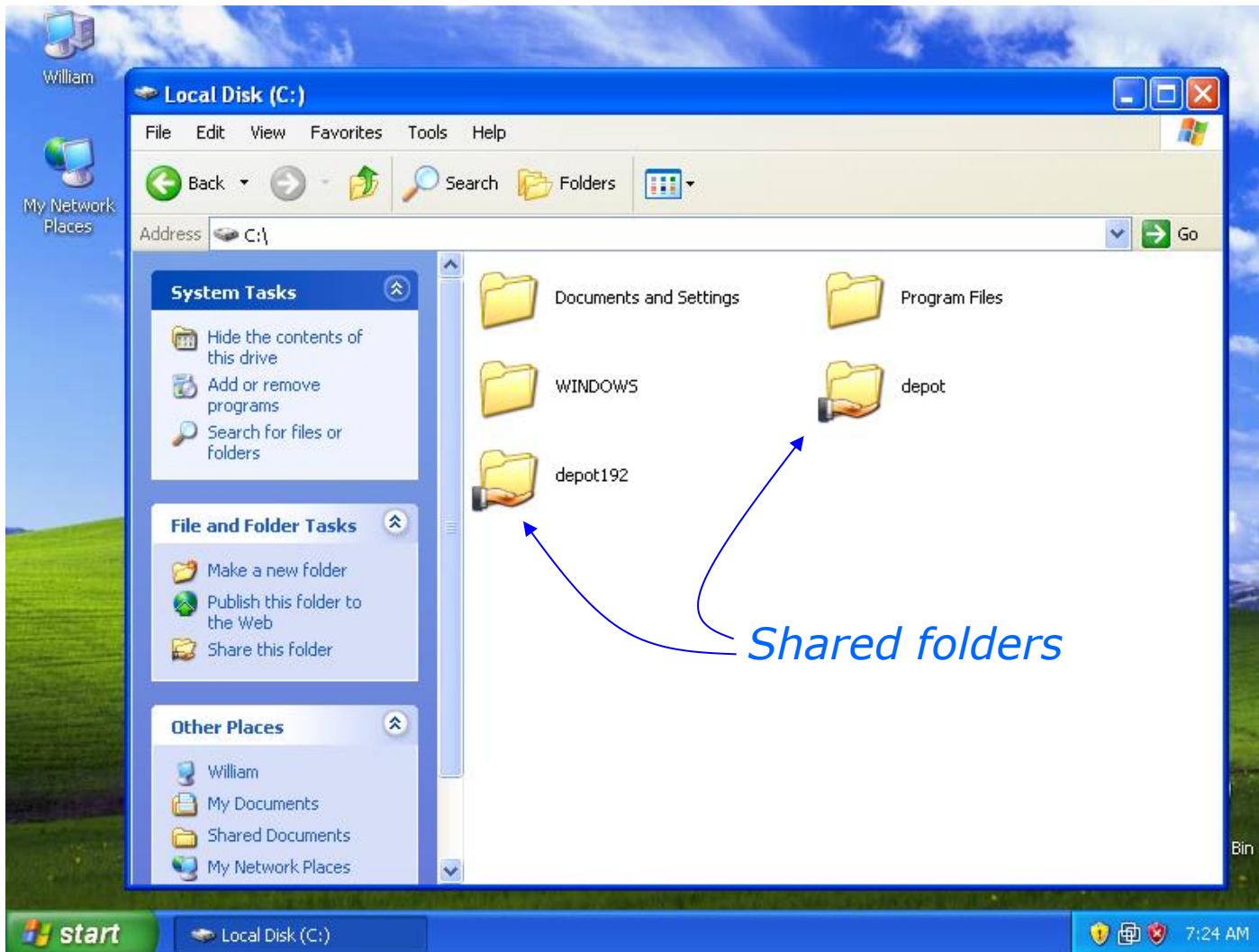
Windows Shares - *viewing share configurations*

Next, open the C: drive



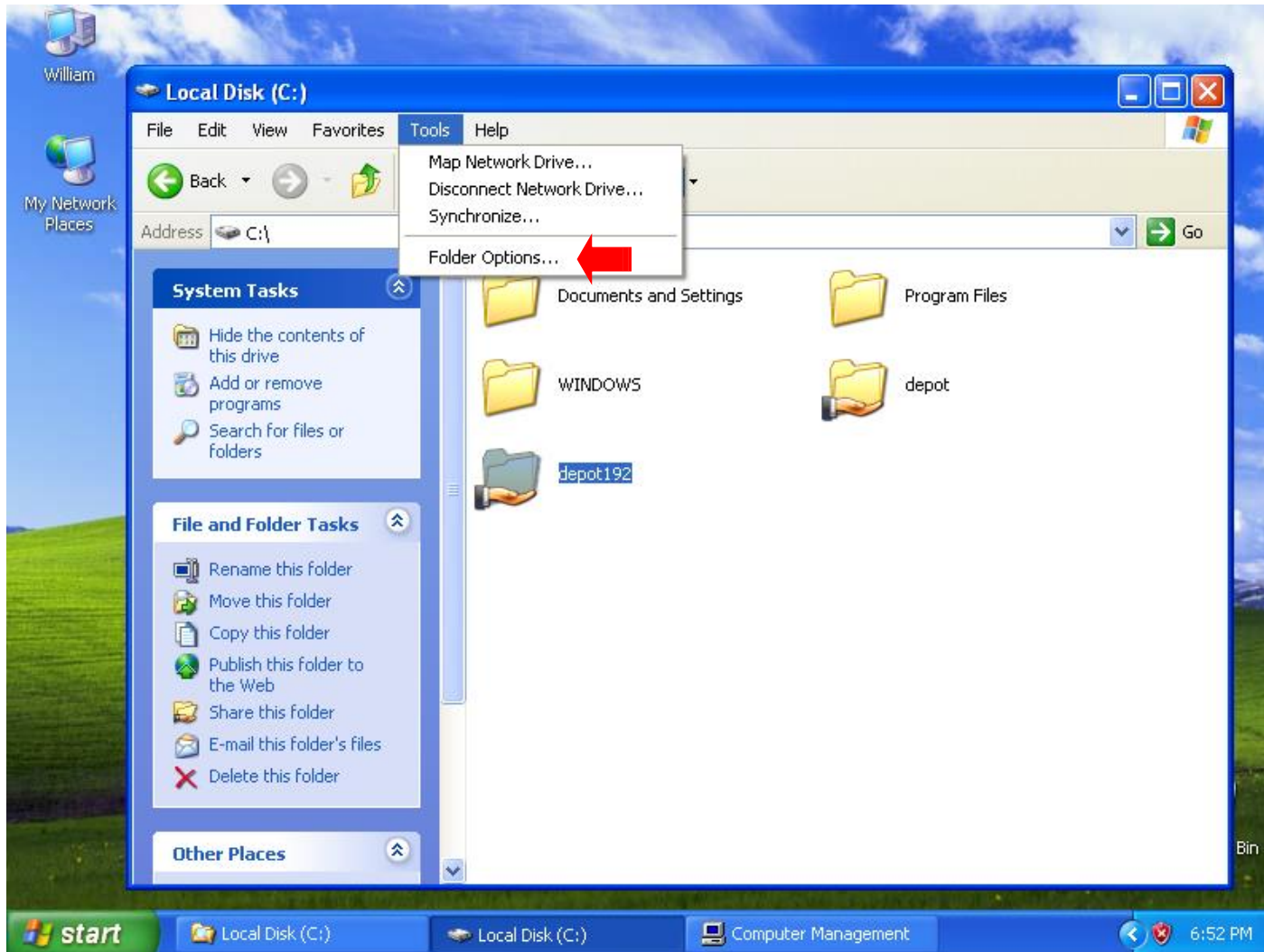
Windows Shares - *viewing share configurations*

Shared folders indicated with an open hand



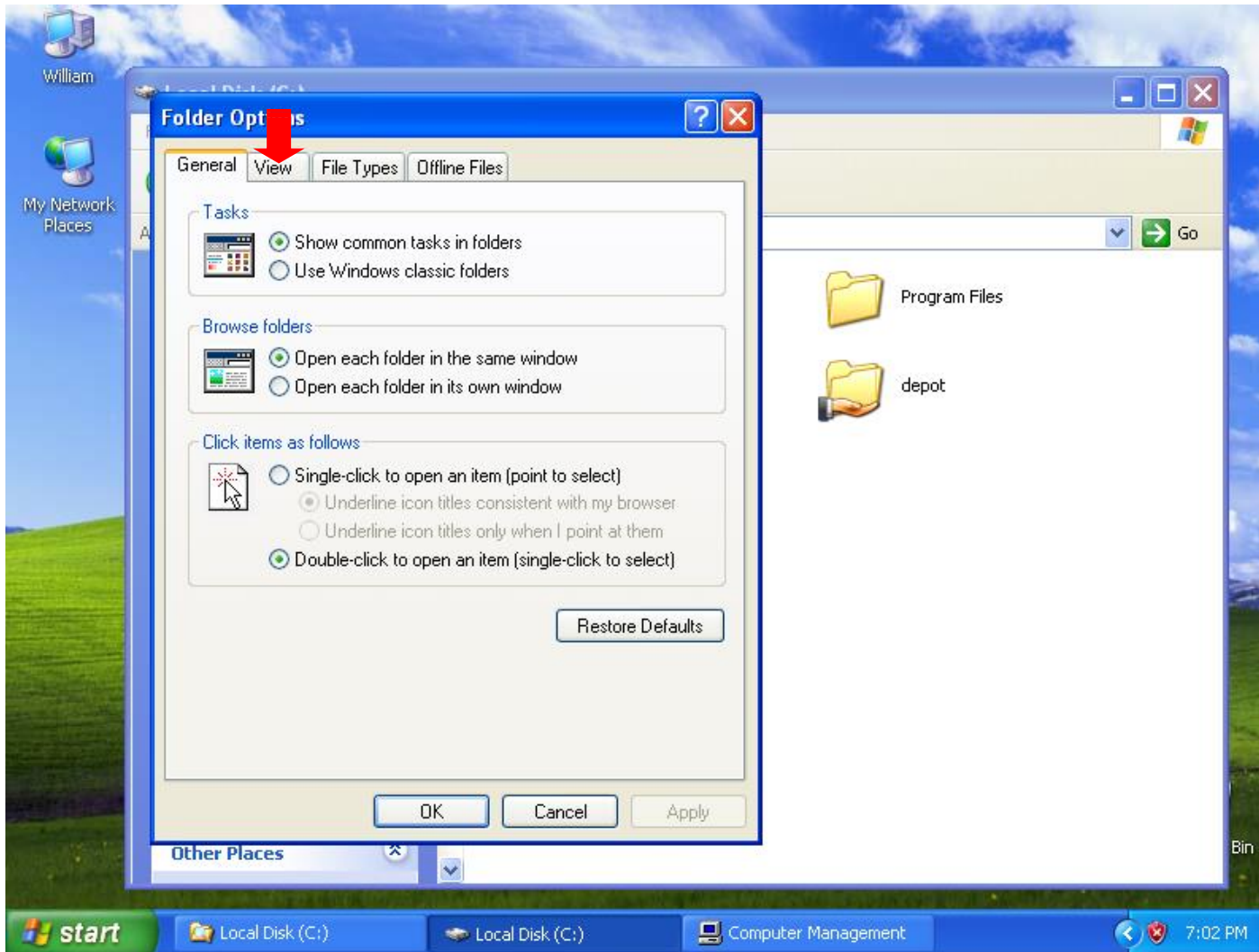
Windows Shares - *viewing share configurations*

Pull down Tools menu and select Folder Options



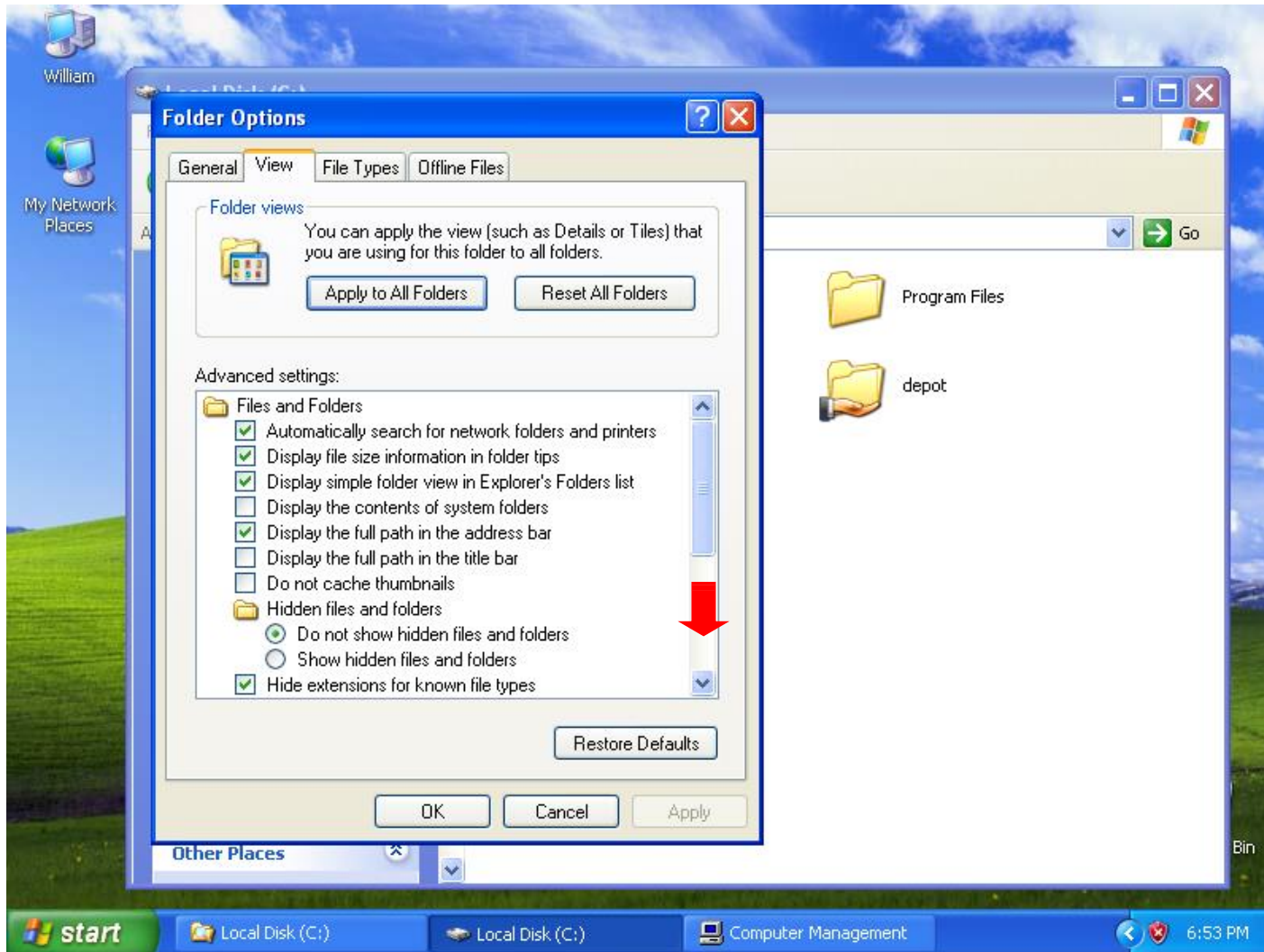
Windows Shares - *viewing share configurations*

Select View tab on Folder Options dialog box



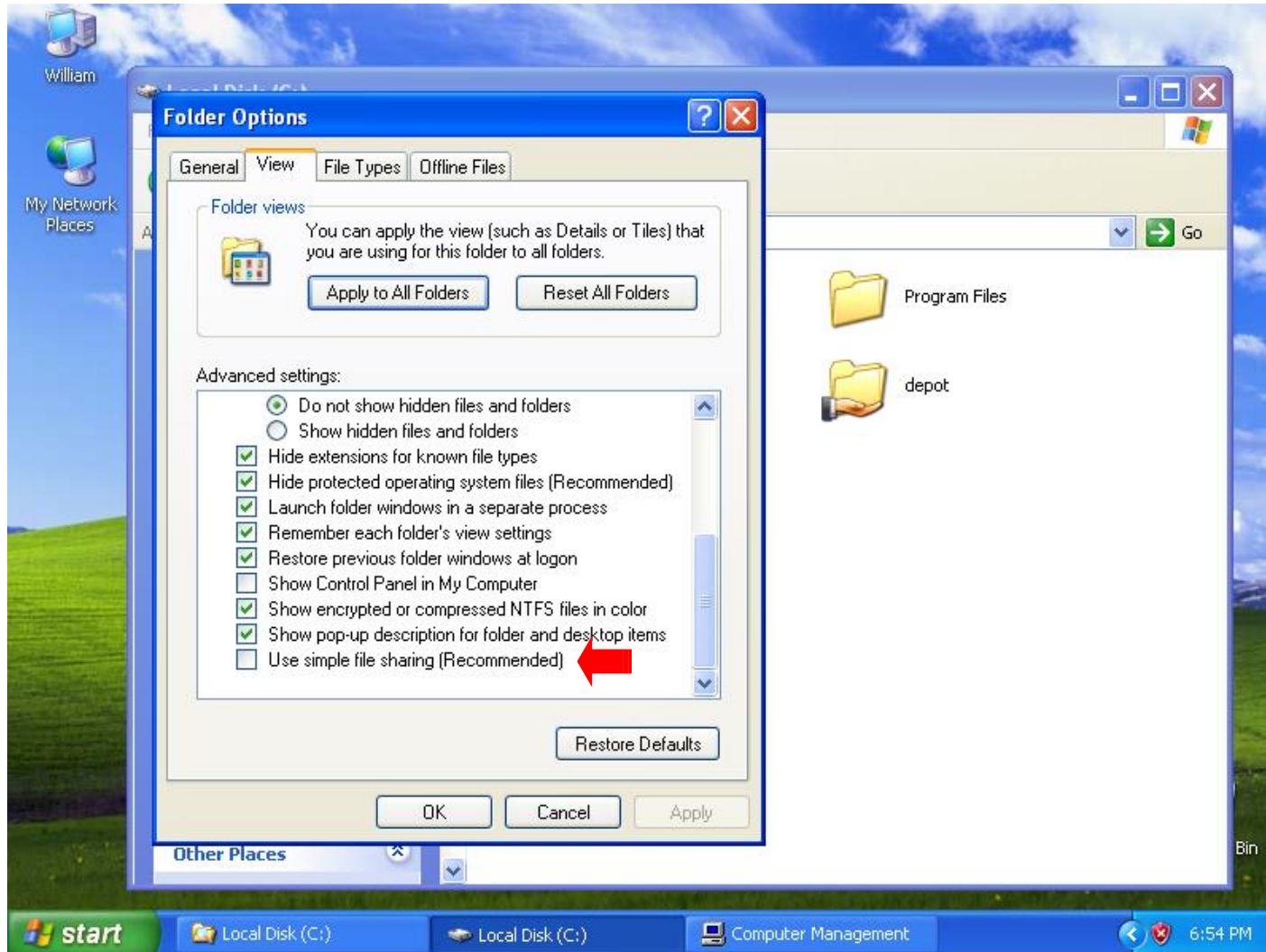
Windows Shares - *viewing share configurations*

Scroll down to the last Advanced setting



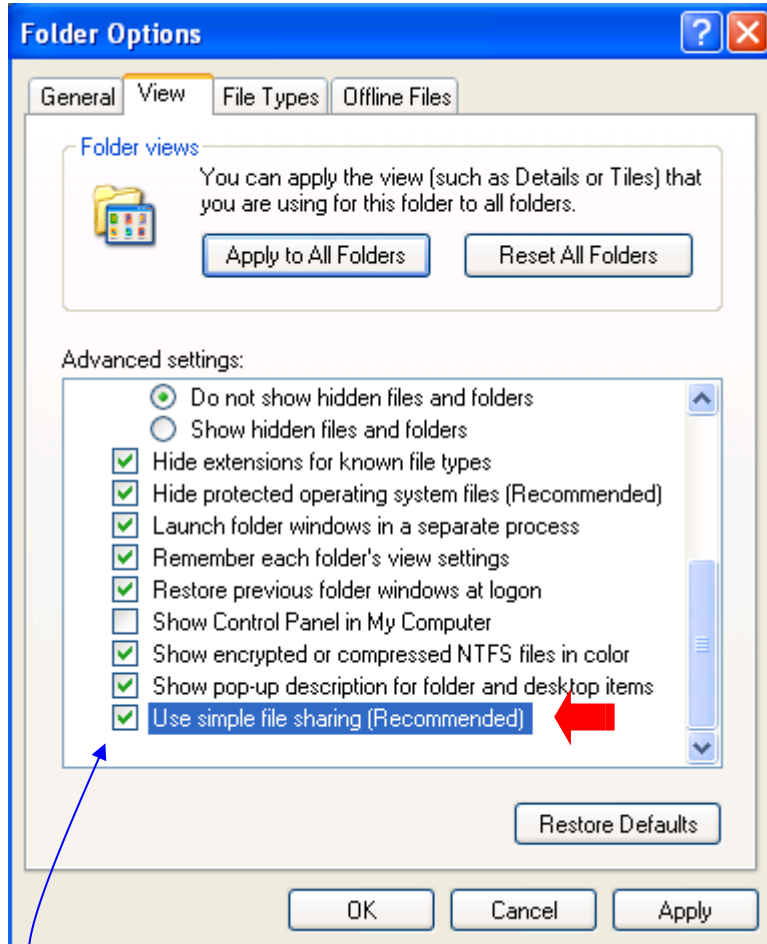
Windows Shares - *viewing share configurations*

Disable simple file sharing (remove the check)

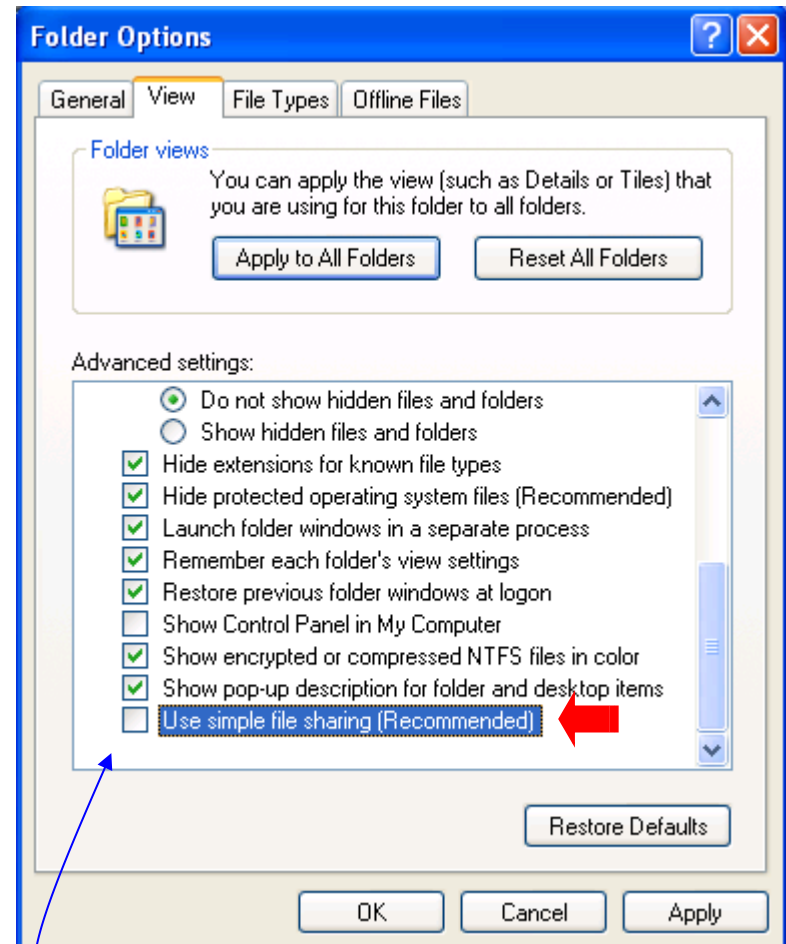


Windows Shares - *viewing share configurations*

Select View Tab on Folder Options dialog box



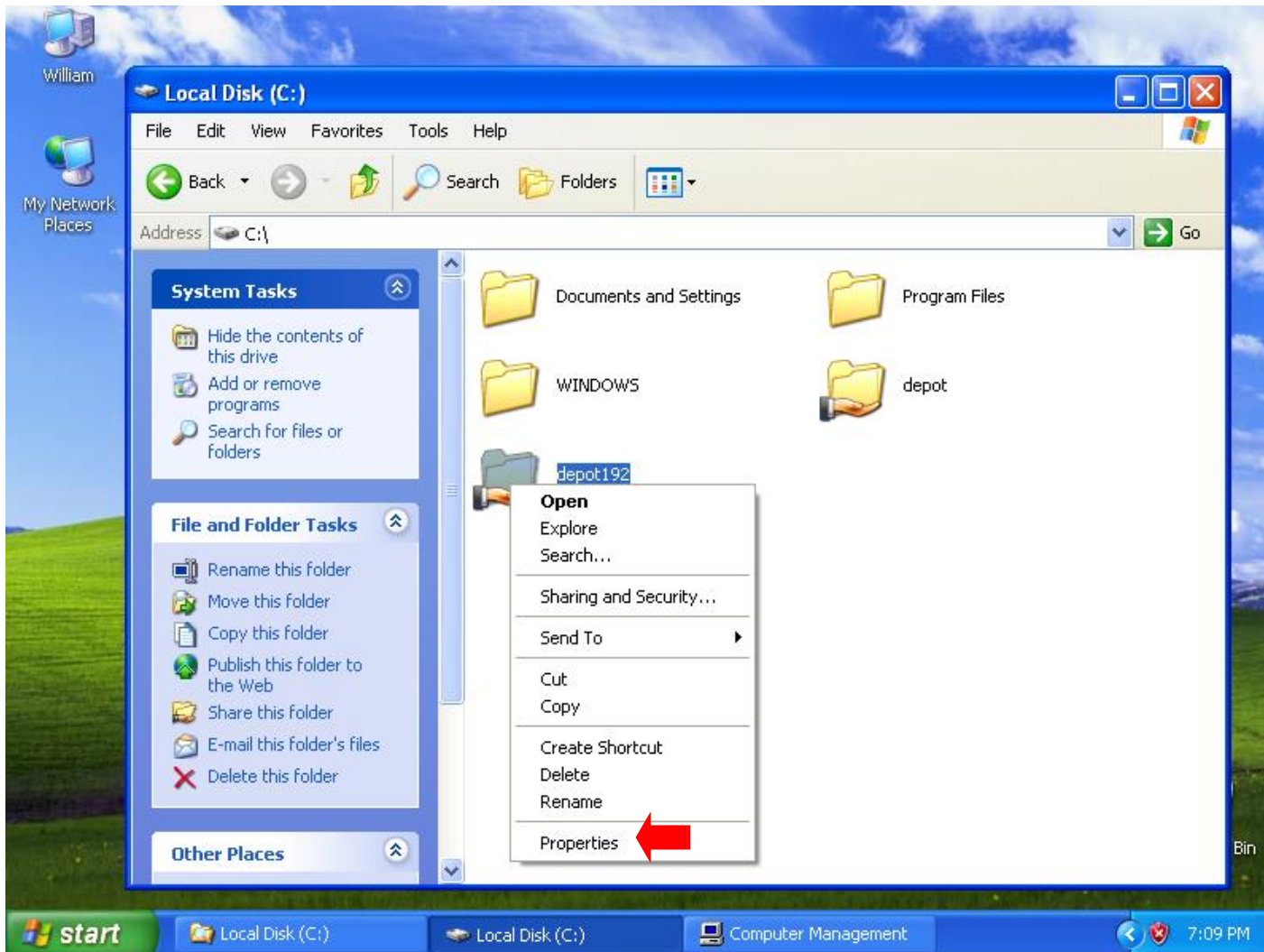
*Simple file sharing **enabled***



*Simple file sharing **disabled***

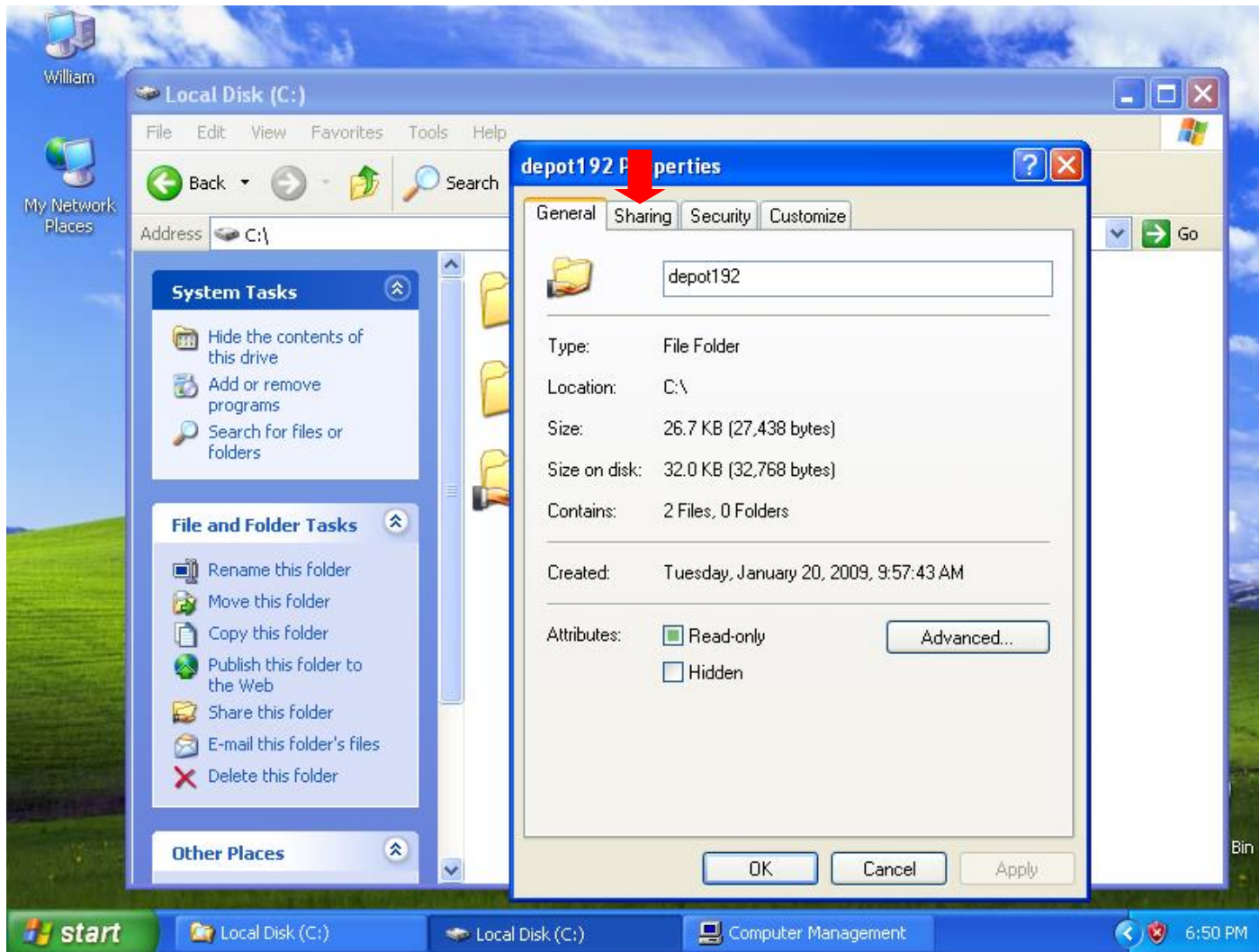
Windows Shares - *viewing share configurations*

For any folder, right click and select properties



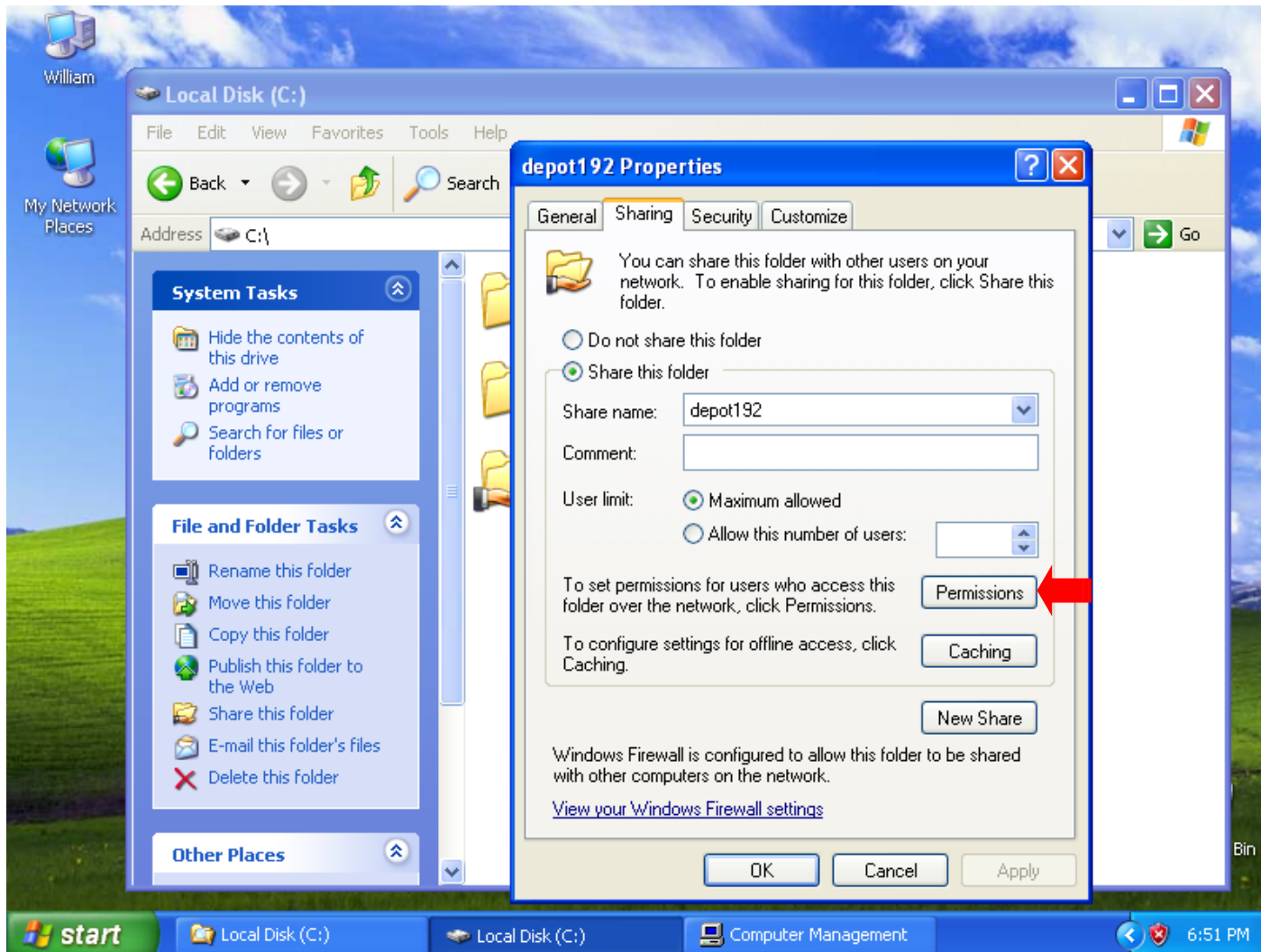
Windows Shares - *viewing share configurations*

Select the *Sharing* tab



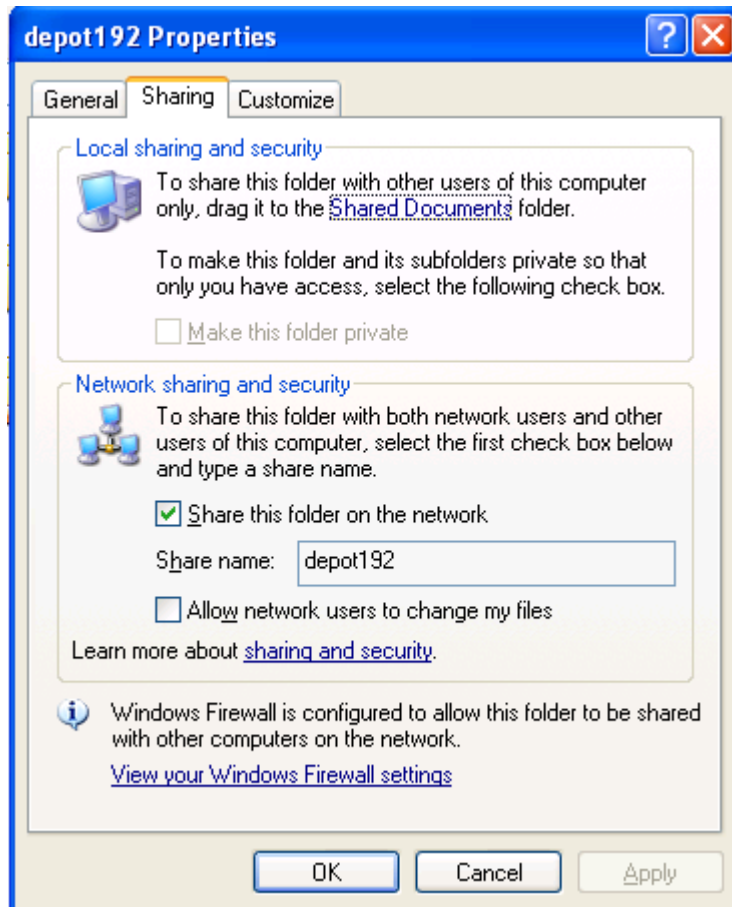
Windows Shares - *viewing share configurations*

Click on the Permissions button

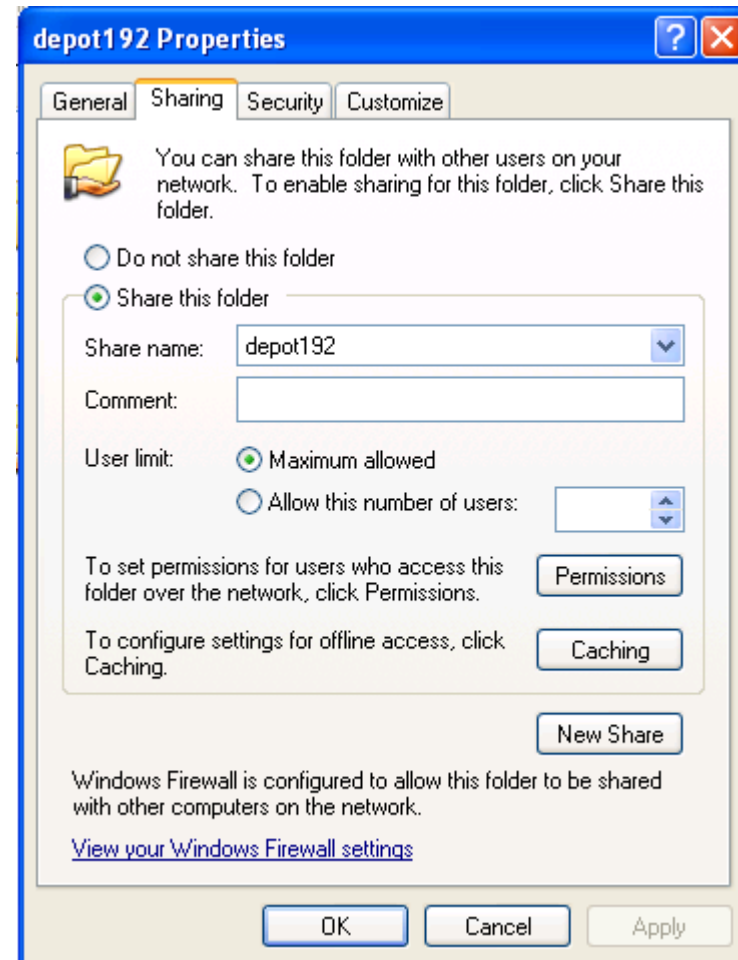


Windows Shares - *viewing share configurations*

Simple file sharing



Simple file sharing disabled



Note: Permissions button and Security tab have been added

Windows Shares - *viewing share configurations*

Share permissions on \\william\depot

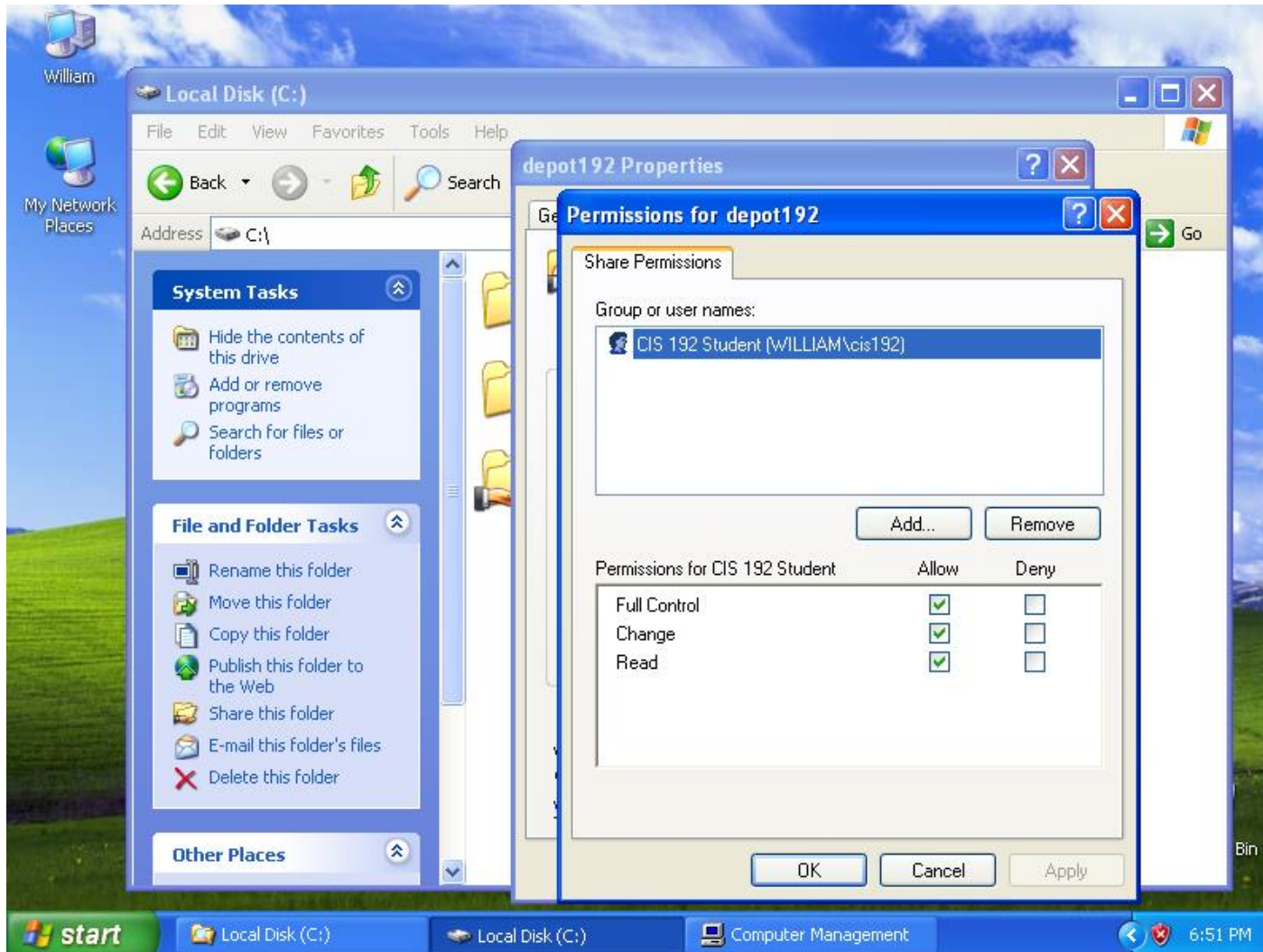
The screenshot shows a Windows XP desktop with a folder named 'depot192' on the local disk (C:). The 'depot Properties' dialog box is open, showing the 'Share Permissions' tab. The 'Group or user names' list contains 'Everyone'. Below this, the 'Permissions for Everyone' table is displayed:

Permissions for Everyone	Allow	Deny
Full Control	<input type="checkbox"/>	<input type="checkbox"/>
Change	<input type="checkbox"/>	<input type="checkbox"/>
Read	<input checked="" type="checkbox"/>	<input type="checkbox"/>

*Read
permissions
for
everyone*

Windows Shares - *viewing share configurations*

Share permissions on \\william\depot192



cis192 has full control over this share.

cis191 has no permissions specified

Examine the shares on William:

- Verify that Everyone has Read permission on the Depot share
- Verify that cis191 has no permissions for the depot192 share.
- Verify that cis192 has Full Control, Change and Read permissions on the depot192 share.
- Can you give cis192 Full Control and remove (uncheck) Change and Read permissions? What would the UI police say about this?

William

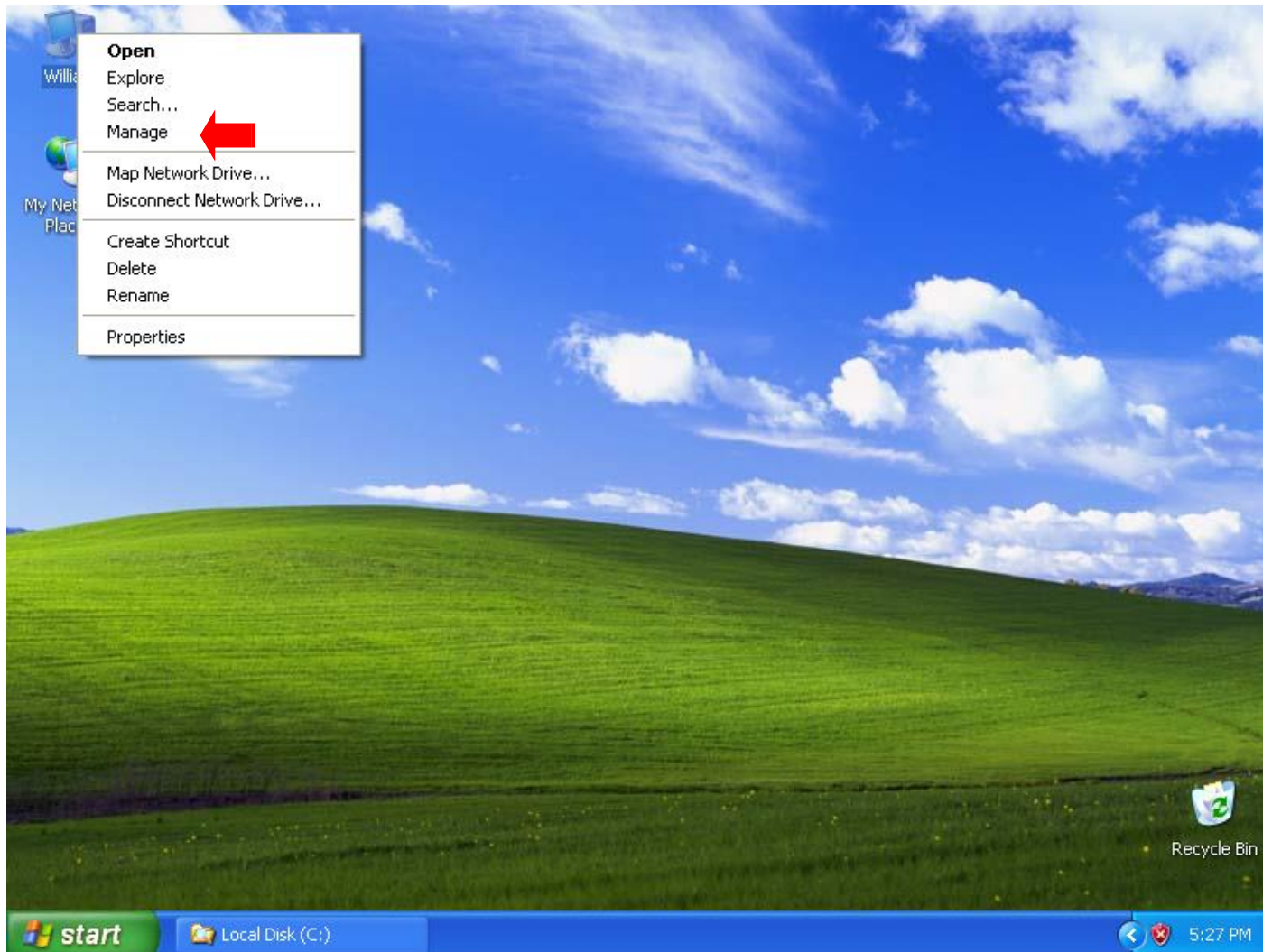




Monitoring Shares

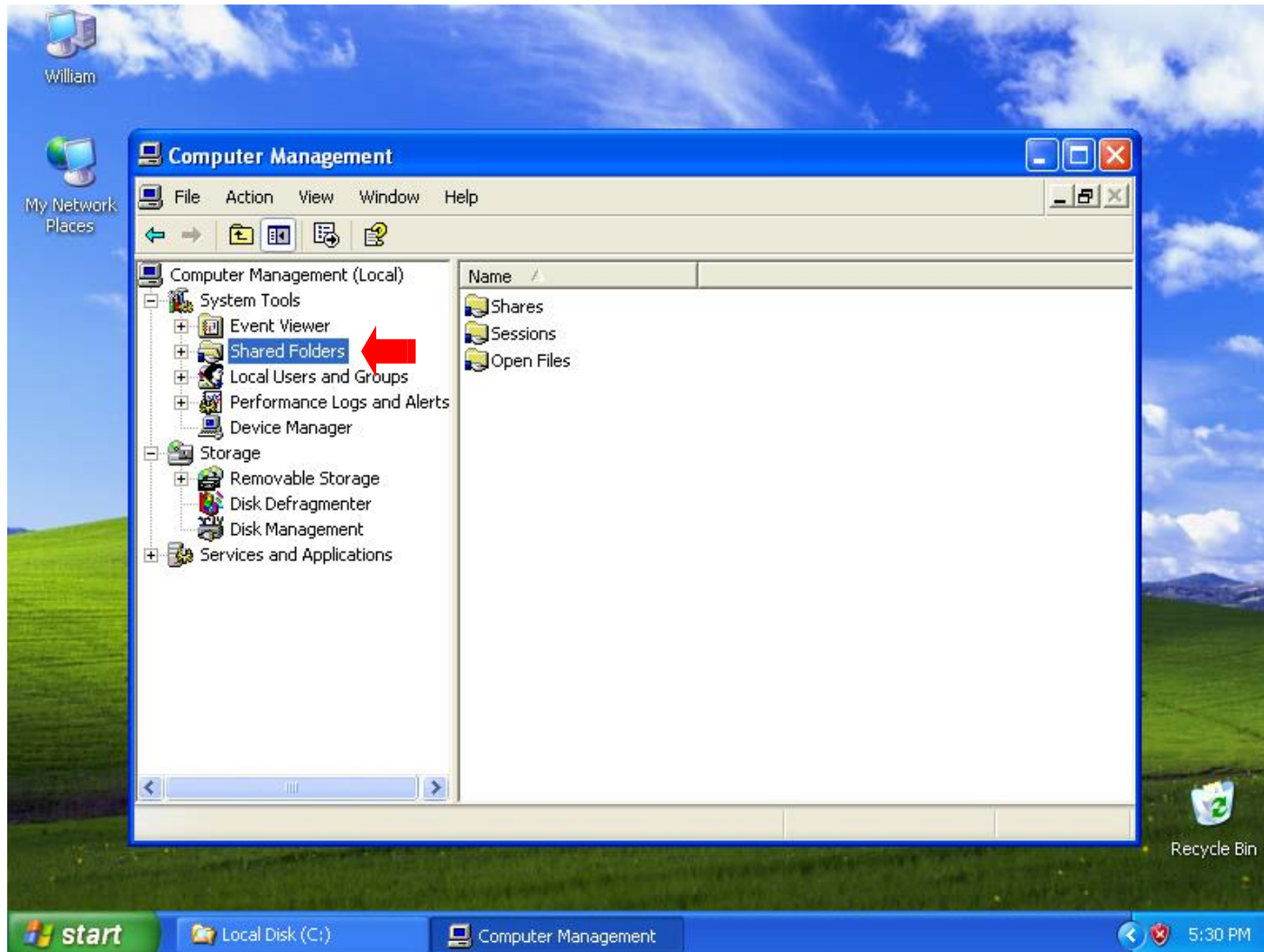
Windows Shares - *monitoring shares*

Right click on My Computer (William here) and select Manage



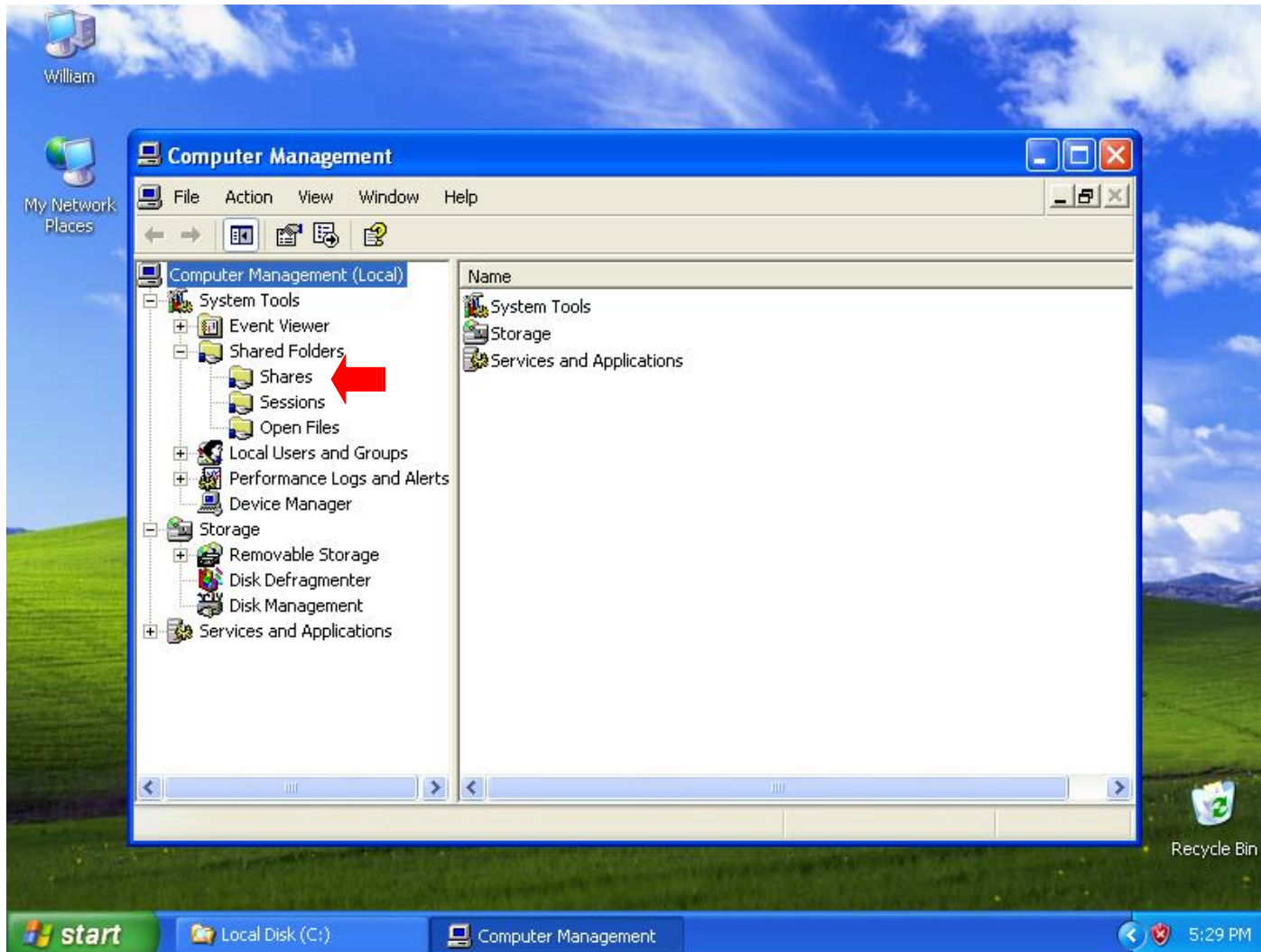
Windows Shares - *monitoring shares*

Expand (click on +) Shared Folders on left panel



Windows Shares - *monitoring shares*

Select Shares on left panel to see available shares



Windows Shares - *monitoring shares*

Shares will show all available shares

The screenshot shows the Windows Computer Management console. In the left-hand tree view, the 'Shares' folder under 'Shared Folders' is highlighted with a red arrow. The main pane displays a table of shared folders:

Shared F...	Shared Path	Type	# Client Connections
ADMIN\$	C:\WINDOWS	Windows	0
C\$	C:\	Windows	0
depot	C:\depot	Windows	1
depot192	C:\depot192	Windows	0
IPC\$		Windows	0

ADMIN\$, C\$ and IPC\$ are hidden administrative shares used by Windows

Windows Shares - *monitoring shares*

Sessions will show users accessing the shares

The screenshot shows a Windows XP desktop environment. A 'Computer Management' window is open, displaying a tree view on the left and a table of sessions on the right. A red arrow points to the 'Sessions' folder in the tree view.

User	Computer	Type	# Open Files	Connected Time
CIS192	127.0.0.1	Windows	1	00:01:41
ROOT	172.30.4.107	Windows	0	00:00:53

Windows Shares - *monitoring shares*

Open Files will show files being accessed (for Windows Users)

The screenshot displays the Windows XP desktop with the Computer Management console open. The console is titled "Computer Management" and shows a tree view on the left. A red arrow points to the "Open Files" folder under the "Shares" folder. The main pane shows a table with the following data:

Open File	Accessed By	Type	# Locks	Open Mode
C:\depot	CIS192	Windows	0	Read

The taskbar at the bottom shows the Start button, two instances of "Local Disk (C:)", the "depot on william" window, and the "Computer Manag..." window. The system tray shows the time as 10:17 AM.

Windows Shares - *viewing share configurations*

Using the **net share** command to view local shares

The screenshot shows a Windows XP desktop with a Command Prompt window open. The window title is "C:\ Command Prompt". The command entered is "C:\Documents and Settings\cis192>net share". The output is as follows:

Share name	Resource	Remark
ADMIN\$	C:\WINDOWS	Remote Admin
C\$	C:\	Default share
IPC\$		Remote IPC
depot	C:\depot	
depot192	C:\depot192	

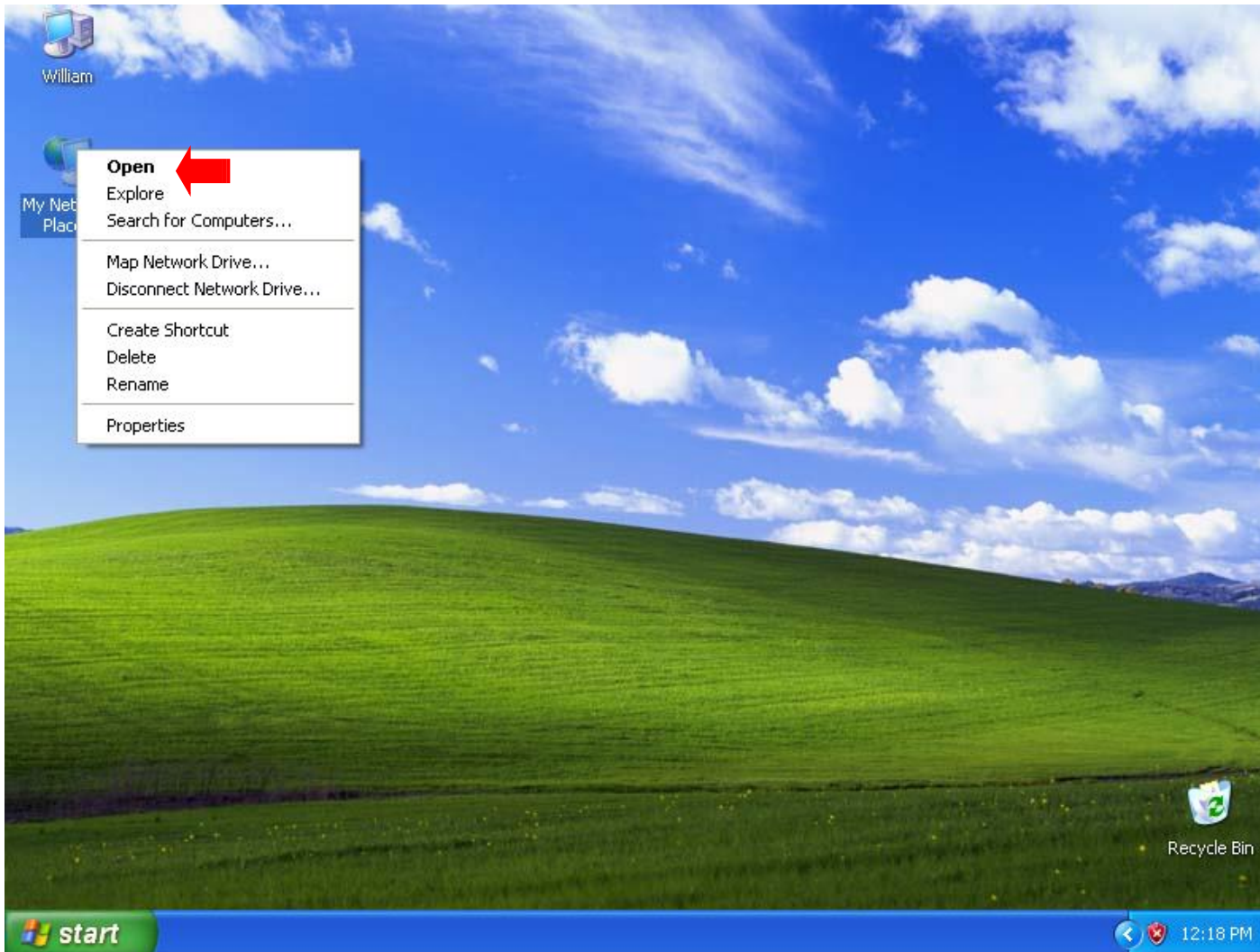
The command completed successfully. The shares ending with a dollar sign (\$) are hidden.



Browsing Shares

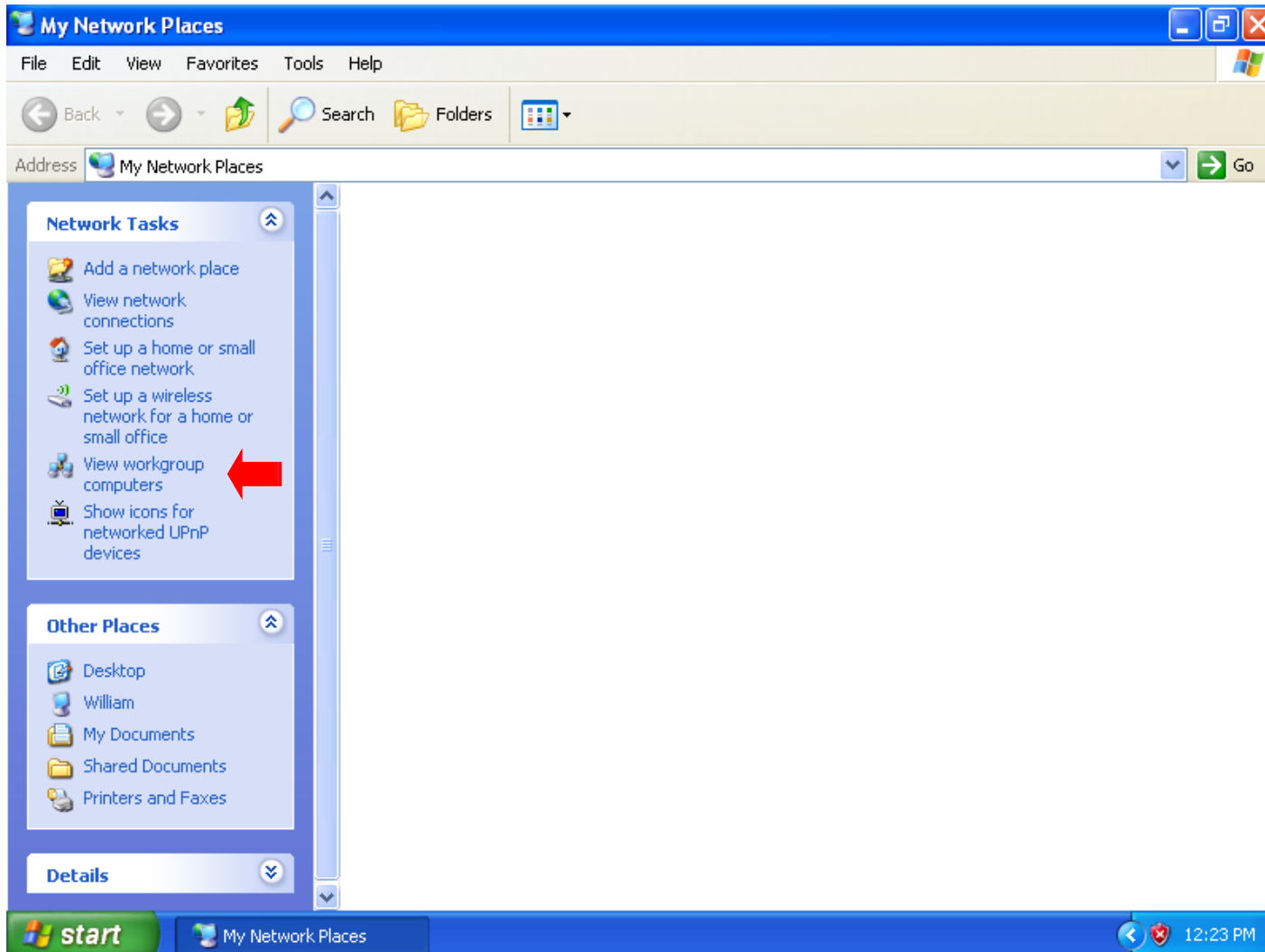
Windows Shares - *browsing shares*

Open My Network Places icon on desktop



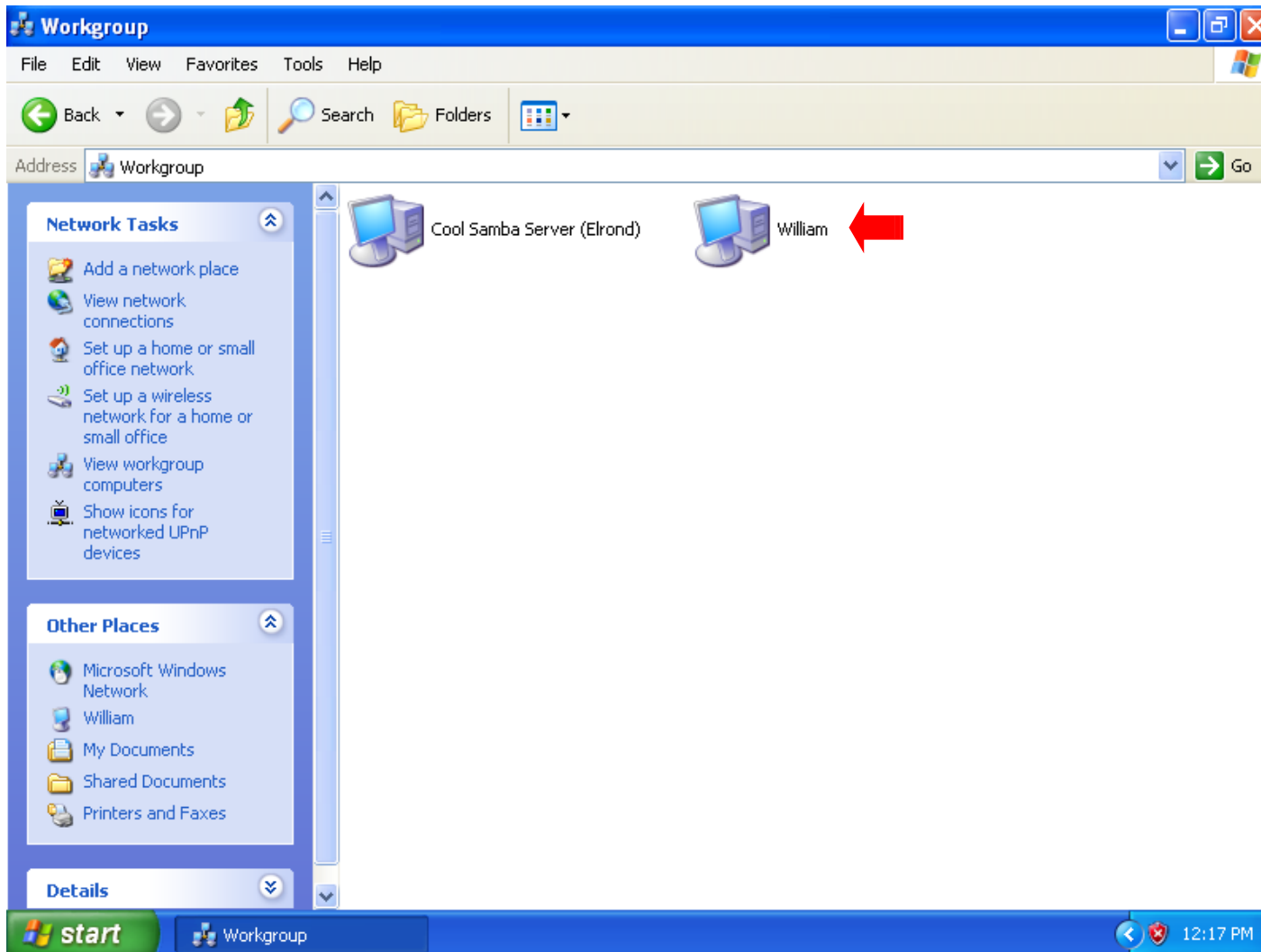
Windows Shares - *browsing shares*

Click on View workgroup computers



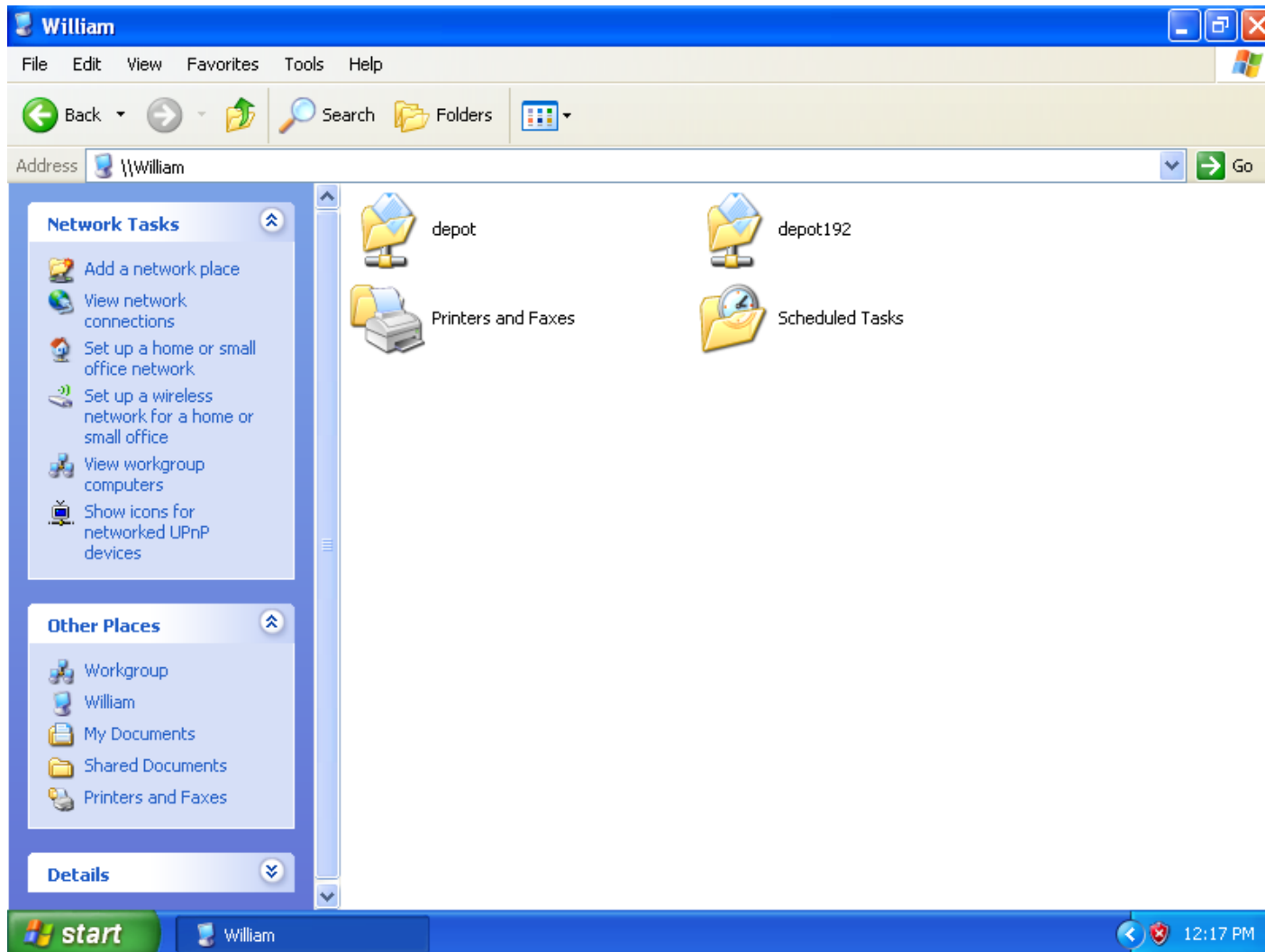
Windows Shares - *browsing shares*

Open William



Windows Shares - *browsing shares*

The depot and depot192 shares on William are displayed



Windows Shares - *browsing shares*

Browsing from the Windows command line

net view shows workgroup computers

```

C:\Documents and Settings\cis192>net view
Server Name          Remark
-----
\\AHMAD-PC
\\BTL-WIN8
\\FAM-WIN8
\\IMH-PC
\\JSS-WINDOWS2012
\\MONITOR
\\P29-WILLIAM          CIS 192 Pod Computer
\\P32-ELROND           Cool Samba Server
\\P32-WILLIAM          CIS 192 Pod Computer
\\SERVER2
\\MIN-NTB14CN0UD6
The command completed successfully.

C:\Documents and Settings\cis192>net view \\elrond
Shared resources at \\elrond

Cool Samba Server

Share name  Type  Used as  Comment
-----
cis192     Disk  Home Directories
depot      Disk  Public files on Elrond
depot192   Disk  CIS 192 files on Elrond
The command completed successfully.
    
```

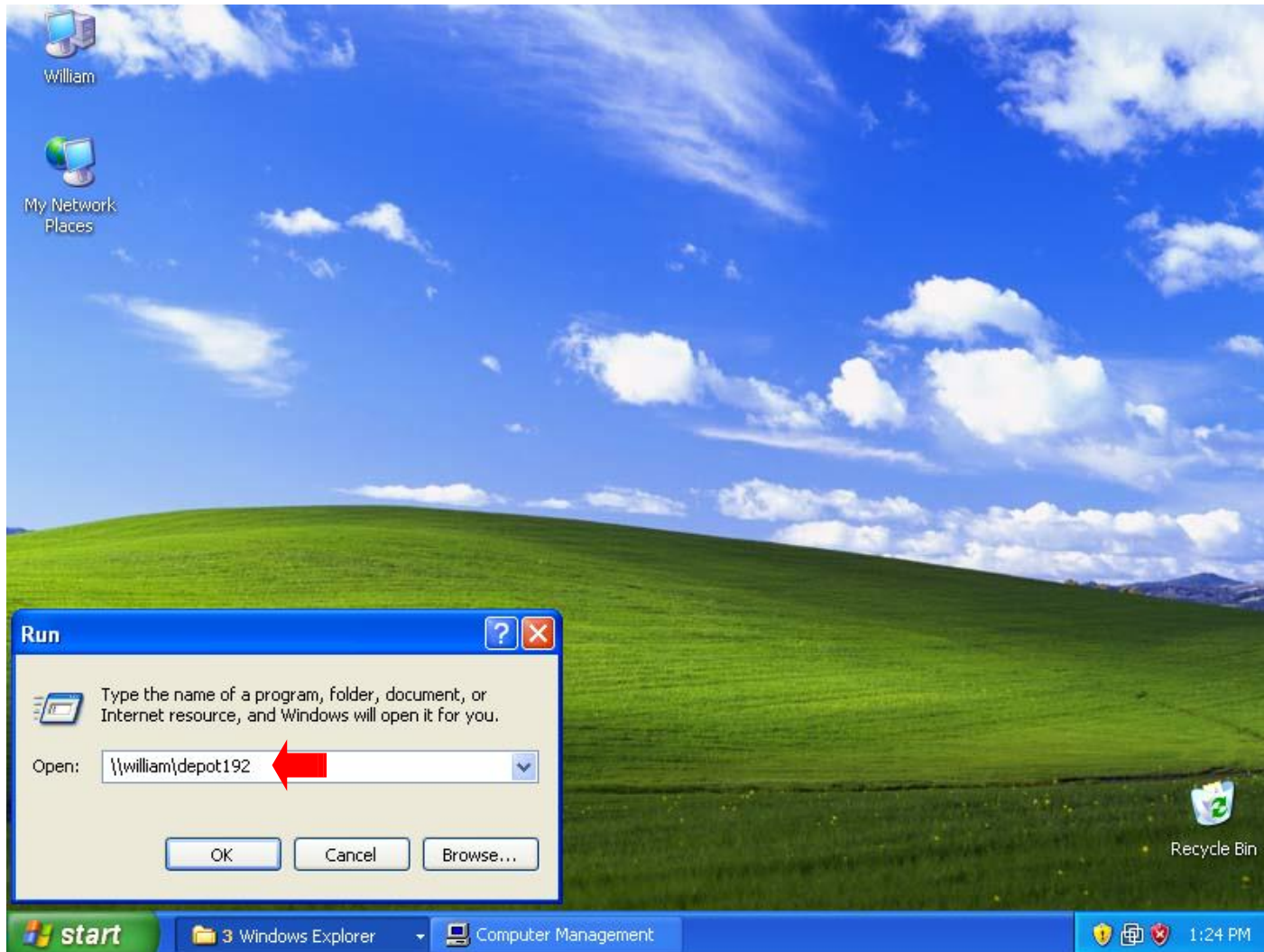
net view \\<computername> shows shares on that computer



Successful Share Access

Windows Shares - *accessing shares*

As cis192, Start > Run... > `\\hostname\sharename`



Windows Shares - *accessing shares*

As cis192, view the files on the depot192 share

The screenshot shows a Windows Explorer window titled "depot192 on william". The address bar contains the path "\\william\depot192". A red arrow points to this path with the text "Note, this is a share rather than an absolute path". The main pane displays two text documents: "bho" (14 KB) and "jfk" (14 KB). The left sidebar shows "File and Folder Tasks" and "Other Places". The taskbar at the bottom includes the Start button, Windows Explorer, Computer Management, and the system tray with the time 1:28 PM.

Windows Shares - *accessing shares*

As cis192, open the files on the depot192 share

The screenshot shows a Windows XP desktop environment. At the top, the taskbar includes the Start button and several open applications: 'depot192 on william', 'bho - Notepad', and system tray icons for help, network, and volume, along with the time '8:15 AM'.

The main window is 'depot192 on william', a File Explorer window. The address bar shows the network path '\\william\depot192'. The left sidebar contains 'File and Folder Tasks' (Rename, Move, Copy, Publish, E-mail, Print, Delete) and 'Other Places' (william, My Documents, Shared Documents, William, My Network Places). The main pane shows two text files: 'bho' (14 KB) and 'jfk' (14 KB). The 'bho' file is selected and opened in a Notepad window.

The Notepad window, titled 'bho - Notepad', displays the following text:

```

Inaugural Address
-----

My fellow citizens:

I stand here today humbled by the task before us,
grateful for the trust you have bestowed, mindful of the
sacrifices borne by our ancestors. I thank President
Bush for his service to our nation, as well as the
generosity and co-operation he has shown throughout this
transition.

Forty-four Americans have now taken the presidential
oath. The words have been spoken during rising tides of
prosperity and the still waters of peace. Yet, every so
often the oath is taken amidst gathering clouds and

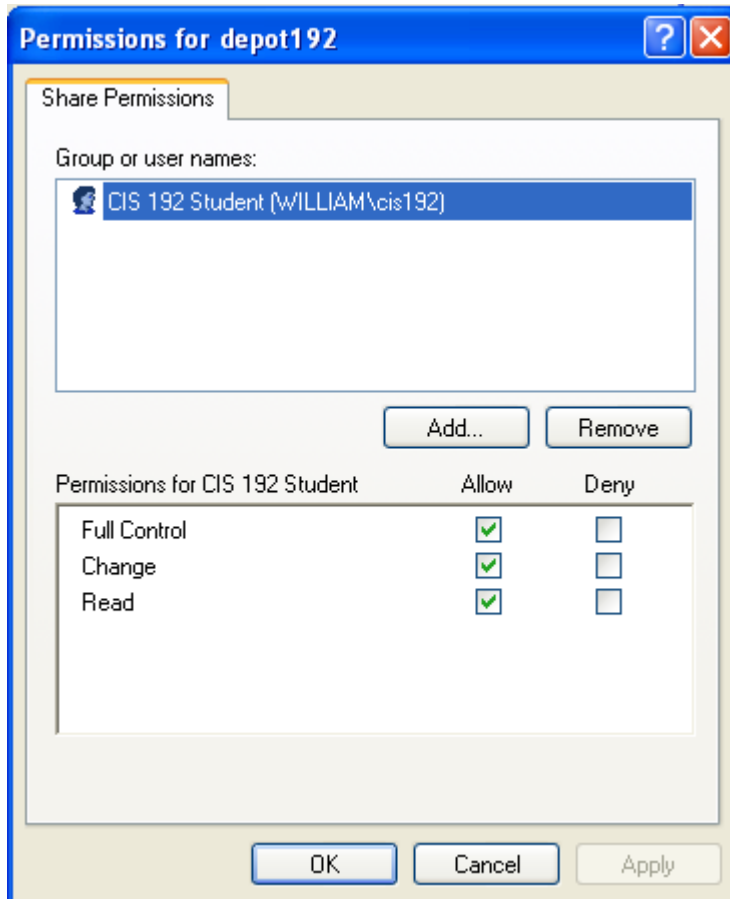
```

After opening the file bho.txt on the \\william\depot192 share



Failed Share Access

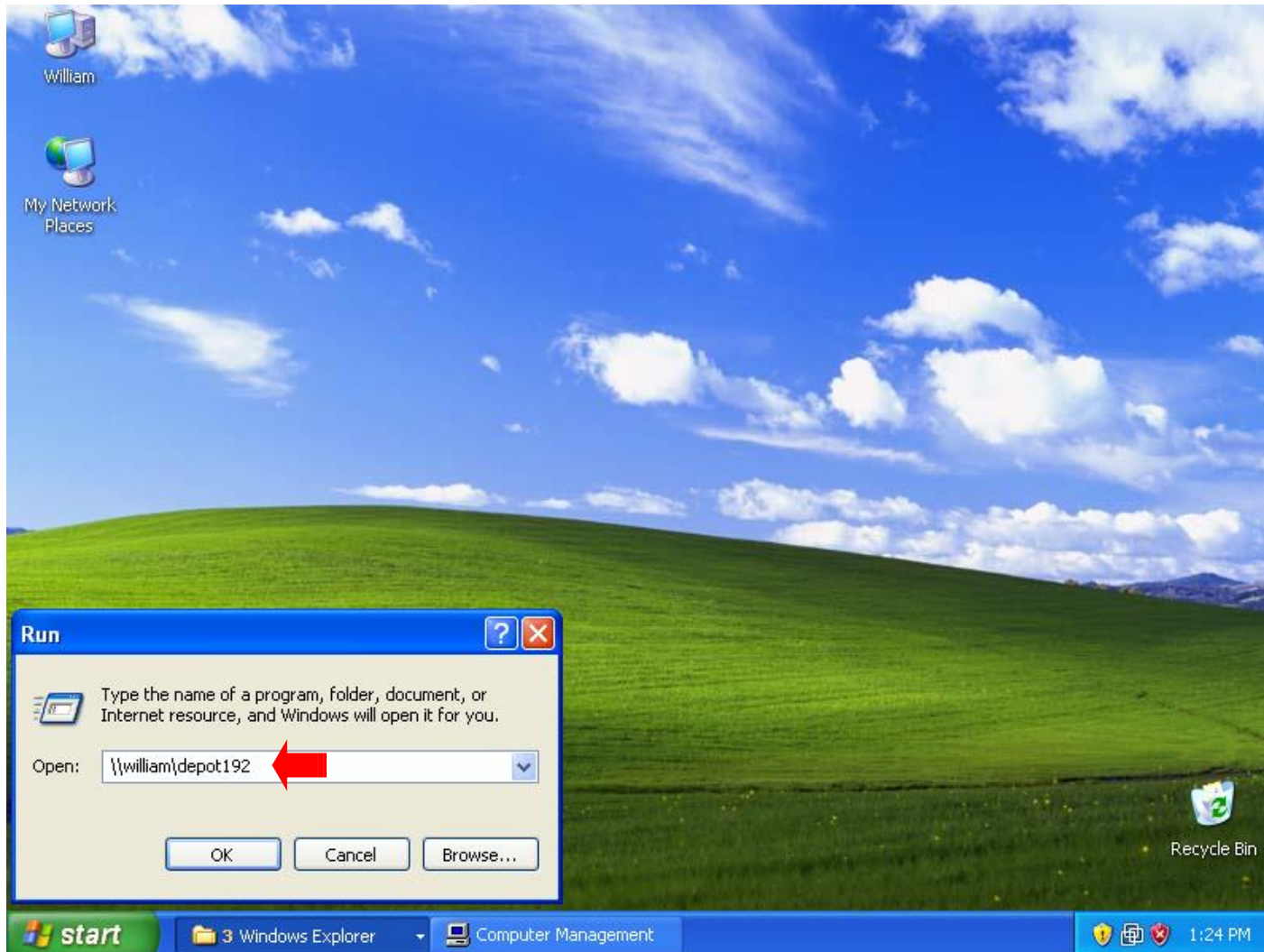
Windows Shares - *failed share access*



Note the cis191 user has no permissions to access the \\william\depot192 share

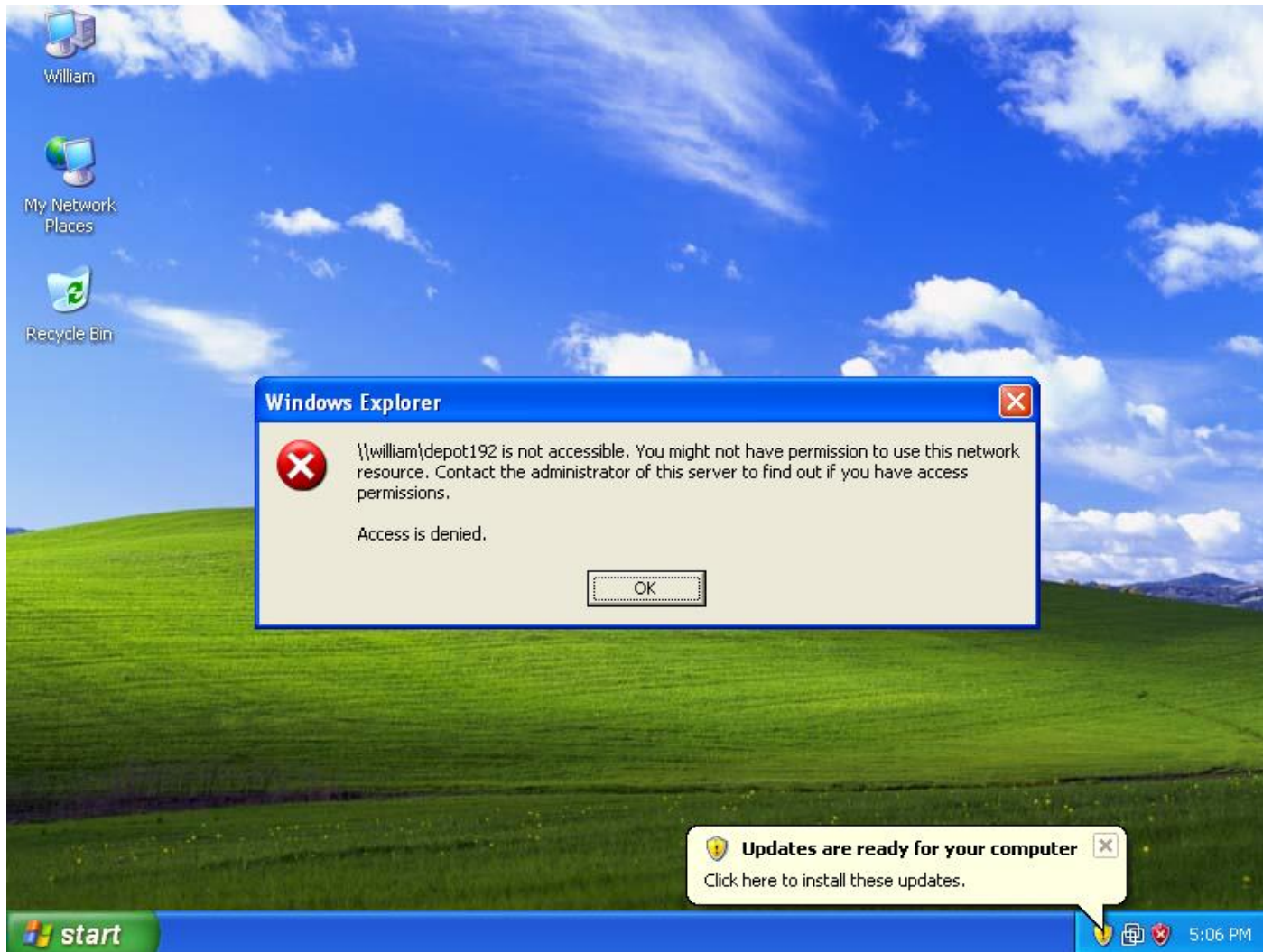
Windows Shares - *failed share access*

Switch to the cis191 user and try again



Windows Shares - *failed share access*

Note cis191 user cannot access the \\william\depot192 share





Command Line Share Access

Windows Shares - *accessing shares*

net use drive: \\computername\share command

The screenshot shows a Windows XP desktop with a blue sky background. A Command Prompt window is open, displaying the following text:

```

C:\Documents and Settings\cis192>net use G: \\william\depot
The command completed successfully.

C:\Documents and Settings\cis192>dir g:
Volume in drive G has no label.
Volume Serial Number is 101A-A2C2

Directory of G:\

01/21/2009  10:07 AM    <DIR>          .
01/21/2009  10:07 AM    <DIR>          ..
01/21/2009  10:07 AM                13,775 bho.txt
01/21/2009  10:03 AM                13,663 jfk.txt
                2 File(s)      27,438 bytes
                2 Dir(s)    3,392,061,440 bytes free

C:\Documents and Settings\cis192>type g:\bho.txt
Inaugural Address
-----
My fellow citizens:

I stand here today humbled by the task before us, grateful for the trust you have bestowed, mindful of the sacrifices borne by our ancestors. I thank President
  
```

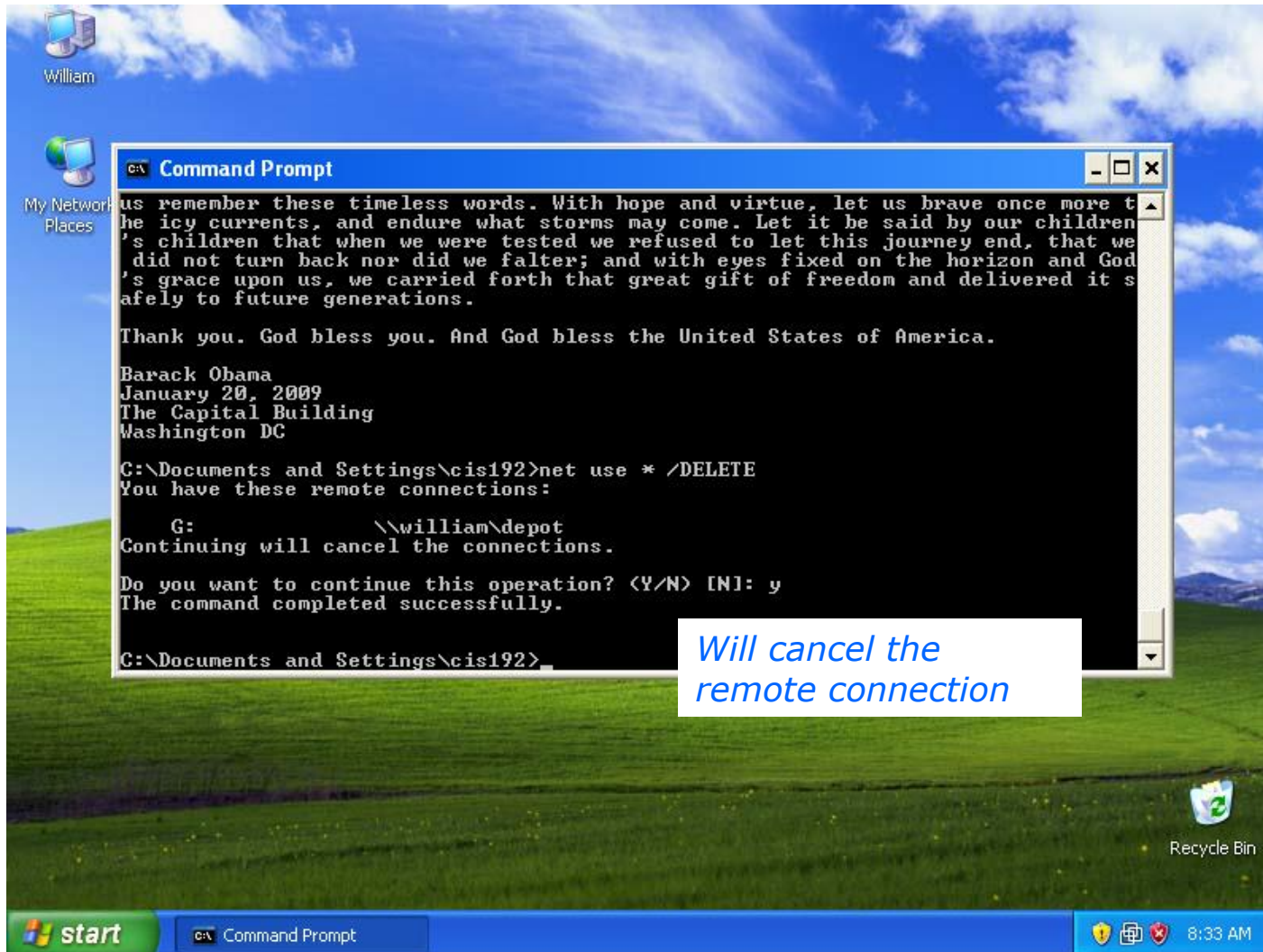
Two callout boxes are present:

- Makes the share available on drive G:* (pointing to the 'net use' command)
- The files on the share are now available on the G:\ drive* (pointing to the 'dir' command output)

The desktop includes icons for 'William', 'My Network Places', and 'Recycle Bin'. The taskbar shows the 'start' button, 'Command Prompt', and the system tray with the time '8:31 AM'.

Windows Shares - *accessing shares*

The ***net use * /DELETE*** command



William



- As the cis192 user on William:
 - GUI method
 - Start > Run... > \\pNN-william\depot
 - Open bho.txt file in notepad
 - DOS command method
 - **net use G: \\pNN-william\depot192**
 - View jfk.txt with **type G:\jfk.txt**
- Run MMC/Computer Management
 - View Shares
 - View Sessions
 - View Open Files



Browsing from Linux

Installing Samba Client

Check if already installed:

```
[root@p32-legolas ~]# rpm -qa | grep samba  
samba-winbind-clients-3.6.9-151.el6.x86_64  
samba-client-3.6.9-151.el6.x86_64  
samba-common-3.6.9-151.el6.x86_64  
samba-winbind-3.6.9-151.el6.x86_64
```

```
[root@p32-legolas ~]# rpm -qa | grep cifs  
cifs-utils-4.8.1-18.el6.x86_64
```

If the packages above are not installed then install with:

```
[root@p32-legolas ~]# yum install samba-client cifs-utils
```

The cifs-utils package enables the mount command to properly mount samba shares

Elrond



- Install the Samba client on Elrond:

```
yum install samba-client cifs-utils
```



Browsing shares from Linux

```
[root@elrond ~]# smbtree
Password:
WORKGROUP
  \\WILLIAM
    \\WILLIAM\C$           Default share
    \\WILLIAM\ADMIN$      Remote Admin
    \\WILLIAM\depot192
    \\WILLIAM\depot
    \\WILLIAM\IPC$        Remote IPC
  \\ELROND                 Cool Samba Server
    \\ELROND\IPC$         IPC Service (Cool Samba Server)
    \\ELROND\depot192     CIS 192 files on Elrond
    \\ELROND\depot        Public files on Elrond
```

This is equivalent to doing viewing a network neighborhood on Windows

*(For debugging try **smbtree -Nd2** or **smbtree -Nd3**)*

Browsing shares from Linux

*Add hostnames to
/etc/hosts*

```
[root@elrond ~]# smbclient -L p32-william
Password: <no password used>
Domain=[P32-WILLIAM] OS=[Windows 5.1] Server=[Windows 2000 LAN Manager]
```

*The depot and
depot192 shares
are visible*

Sharename	Type	Comment
-----	----	-----
IPC\$	IPC	Remote IPC
SharedDocs	Disk	
depot	Disk	
depot192	Disk	
ADMIN\$	Disk	Remote Admin
C\$	Disk	Default share

*Note: Password not
needed to browse
shares*

```
Domain=[P32-WILLIAM] OS=[Windows 5.1] Server=[Windows 2000 LAN Manager]
```

Server	Comment
-----	-----
Workgroup	Master
-----	-----

Note, if you are browsing a Windows computer, you will see the hidden administrative shares IPC\$, ADMIN\$, and C\$. Using the \$ at the end of the share name makes it hidden.

Browsing shares from Linux

```
[root@elrond ~]# smbclient -L p32-elrond
Password: <no password used>
Anonymous login successful
Domain=[WORKGROUP] OS=[Unix] Server=[Samba 3.5.10-125.el6]
```

*Add hostnames to
/etc/hosts*

Sharename	Type	Comment
depot	Disk	Public files on Elrond
depot192	Disk	CIS 192 files on Elrond
IPC\$	IPC	IPC Service (Cool Samba Server)

*Password not needed
to browse shares*

*The depot and
depot192 shares
are visible*

```
Anonymous login successful
Domain=[WORKGROUP] OS=[Unix] Server=[Samba 3.5.10-125.el6]
```

Server	Comment
MONITOR	
P32-ELROND	Cool Samba Server

Workgroup	Master
WORKGROUP	MONITOR

Note: Elrond must be first configured as a Samba server before you can do this!

Elrond



- Try using the **smbtree** command
- Browse the shares on William:
smbclient -L pNN-william



Accessing shares from Linux

Accessing shares from Linux

```
[root@p32-elrond ~]# mount //p32-william/depot /mnt -o user=cis192  
Password:
```

```
[root@p32-elrond ~]# ls /mnt  
arwen.jpg                celebrian.jpg  holy-grail.jpg  legolas.jpg  
benji-grail-600.jpg     elrond.jpg    index.html      remus-farm.jpg
```

```
[root@p32-elrond ~]# head -3 /mnt/index.html  
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"  
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">  
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">  
<head>
```

```
[root@p32-elrond ~]# umount /mnt
```

Accessing shares from Linux

```
[root@p32-elrond ~]# mount //p32-william/depot192 /mnt -o user=cis191
Password:
mount error(13): Permission denied
Refer to the mount.cifs(8) manual page (e.g. man mount.cifs)
```

Error because cis191 does not have access to the depot192 share on William

```
[root@p32-elrond ~]# mount //p32-william/badname /mnt -o user=cis191
Password:
Retrying with upper case share name
mount error(6): No such device or address
Refer to the mount.cifs(8) manual page (e.g. man mount.cifs)
```

Error because badname share on William does not exist

Elrond



- Mount the depot share on William:
`mount -o user=cis192 //pNN-william/depot /mnt`
- List and probe the files on /mnt
`ls /mnt`
`file /mnt/*`
- Unmount with: `umount /mnt`

Accessing shares from Linux

An FTP-like access method

```
[root@p32-elrond ~]# smbclient -U cis192 //p32-william/depot192
Enter cis192's password:
Domain=[P32-WILLIAM] OS=[Windows 5.1] Server=[Windows 2000 LAN Manager]
smb: \> help
?                allinfo          altname          archive          blocksize
cancel           case_sensitive  cd               chmod            chown
close           del             dir              du               echo
exit            get             getfacl          hardlink         help
history         iosize          lcd              link             lock
< snipped >
rd              recurse         reget            rename           reput
rm              rmdir          showacls         setmode          stat
symlink         tar             tarmode          translate        unlock
volume          void            wdel            logon            listconnect
showconnect     ..              !

smb: \> ls
.                D                0    Sun Apr 28 16:49:07 2013
..              D                0    Sun Apr 28 16:49:07 2013
bho.txt         A                13743 Sat Jan 5 17:54:31 2013
jfk.txt         A                13763 Sat Jan 5 17:54:31 2013

                40915 blocks of size 262144. 27711 blocks available

smb: \> get jfk.txt
getting file \jfk.txt of size 13763 as jfk.txt (4480.0 KiloBytes/sec) (average 4480.1
KiloBytes/sec)
smb: \> exit
[root@p32-elrond ~]#
```

Elrond



- Try the alternative FTP-like method

```
smbclient -U cis192 //pNN-william/depot192
```

```
help
```

```
ls
```

```
get jfk.txt
```

```
exit
```



Installing Samba Server

Service Applications

Steps to installing services

1. Install software package using **yum**, **rpm** or build from source code
2. Customize service's configuration file
3. Modify the firewall to allow access to the service
4. Customize SELinux context settings to allow use
5. Start the service
6. Configure service to automatically start when system boots
7. Monitor and verify service is running
8. Troubleshoot as necessary
9. Monitor log files as appropriate
10. Configure additional security

Installing Samba Server

Step 1 *Install software*

```
[root@p32-elrond ~]# rpm -qa | grep samba
samba-client-3.5.10-125.el6.x86_64
samba-winbind-clients-3.5.10-125.el6.x86_64
samba-common-3.5.10-125.el6.x86_64
samba-3.5.10-125.el6.x86_64
[root@p32-elrond ~]#
```

Install with yum if needed:

```
[root@p32-elrond ~]# yum install samba
```

Elrond



- Check which samba packages have been installed on Elrond with **rpm -qa | grep samba**
- Install the samba server package on Elrond with **yum install samba**
- Check again which samba packages have been installed on Elrond with **rpm -qa | grep samba**
- Use **rpm -qi** on any of the Samba packages to see what they do

Elrond



Make Shares

Elrond



Make a sample file to share:

```
echo "We can do anything we want if we stick to it  
long enough." - Helen Keller > /tmp/hk.txt
```

Make two directories to be shared in /var/shares:

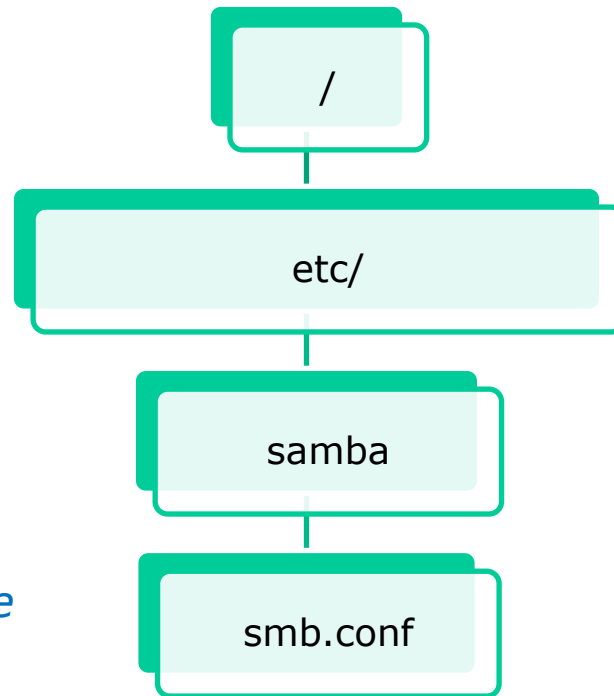
```
cd /var  
mkdir -p shares/depot shares/depot192  
cd shares  
cp /tmp/hk.txt depot/  
cp /tmp/hk.txt depot192/  
chmod 755 *  
chown -R cis192:users *
```

smb.conf

/etc/samba/smb.conf

Step 2 *Customize the configuration files*

*main configuration file
for Samba daemon*



/etc/samba/smb.conf

Step 2 *Customize the services configuration file*

Changes we will make to smb.conf

- workgroup = `xxxxxxxx` *Workgroup membership*
- server string = `xxxxxxxx` *Server description*
- [`xxxxxxxx`] *Share specification*

Finding smb.conf

```
[root@elrond var]# smbd -b | grep PRIVATE_DIR
PRIVATE_DIR: /etc/samba
```

```
[root@elrond var]# ls -l /etc/samba/
total 52
-rw-r--r-- 1 root root    20 Jun 21  2008 lmhosts
-rw----- 1 root root  4096 Jan 21 11:04 passdb.tdb
-rw----- 1 root root  8192 Jan 21 11:04 secrets.tdb
-rw-r--r-- 1 root root 10006 Jan 21 14:38 smb.conf
-rw-r--r-- 1 root root    97 Jun 21  2008 smbusers
```

/etc/samba/smb.conf

```
[root@legolas ~]# cat /etc/samba/smb.conf
# This is the main Samba configuration file. You should read the
# smb.conf(5) manual page in order to understand the options listed
# here. Samba has a huge number of configurable options (perhaps too
# many!) most of which are not shown in this example
#
# For a step to step guide on installing, configuring and using samba,
# read the Samba-HOWTO-Collection. This may be obtained from:
# http://www.samba.org/samba/docs/Samba-HOWTO-Collection.pdf
#
# Many working examples of smb.conf files can be found in the
# Samba-Guide which is generated daily and can be downloaded from:
# http://www.samba.org/samba/docs/Samba-Guide.pdf
#
# Any line which starts with a ; (semi-colon) or a # (hash)
# is a comment and is ignored. In this example we will use a #
# for commentry and a ; for parts of the config file that you
# may wish to enable
#
# NOTE: Whenever you modify this file you should run the command "testparm"
# to check that you have not made any basic syntactic errors.
#
```

Good advice!

/etc/samba/smb.conf

```
#-----
# SELINUX NOTES:
#
# If you want to use the useradd/groupadd family of binaries please run:
# setsebool -P samba_domain_controller on
#
# If you want to share home directories via samba please run:
# setsebool -P samba_enable_home_dirs on
#
# If you create a new directory you want to share you should mark it as
# "samba-share_t" so that selinux will let you write into it.
# Make sure not to do that on system directories as they may already have
# been marked with othe SELinux labels.
#
# Use ls -ldZ /path to see which context a directory has
#
# Set labels only on directories you created!
# To set a label use the following: chcon -t samba_share_t /path
#
# If you need to share a system created directory you can use one of the
# following (read-only/read-write):
# setsebool -P samba_export_all_ro on
# or
# setsebool -P samba_export_all_rw on
#
# If you want to run scripts (preexec/root preexec/print command/...) please
# put them into the /var/lib/samba/scripts directory so that smbd will be
# allowed to run them.
# Make sure you COPY them and not MOVE them so that the right SELinux context
# is applied, to check all is ok use restorecon -R -v /var/lib/samba/scripts
#
```

*Lab 8 will not work
unless this is done*

*Lab 8 will not work
unless this is done*

/etc/samba/smb.conf

#===== Global Settings =====

[global]

```
# ----- Network Related Options -----
#
# workgroup = NT-Domain-Name or Workgroup-Name, eg: MIDEARTH
#
# server string is the equivalent of the NT Description field
#
# netbios name can be used to specify a server name not tied to the hostname
#
# Interfaces lets you configure Samba to use multiple interfaces
# If you have multiple network interfaces then you can list the ones
# you want to listen on (never omit localhost)
#
# Hosts Allow/Hosts Deny lets you restrict who can connect, and you can
# specify it as a per share option as well
#
```

```
workgroup = MYGROUP
server string = Samba Server Version %v
```



Modify to:

```
workgroup = WORKGROUP
server string = Cool Samba Server
```

```
; netbios name = MYSERVER

; interfaces = lo eth0 192.168.12.2/24 192.168.13.2/24
; hosts allow = 127. 192.168.12. 192.168.13.
```

/etc/samba/smb.conf

```
# ----- Logging Options -----  
#  
# Log File let you specify where to put logs and how to split them up.  
#  
# Max Log Size let you specify the max size log files should reach  
  
# logs split per machine  
; log file = /var/log/samba/%m.log  
# max 50KB per log file, then rotate  
; max log size = 50  
  
# ----- Standalone Server Options -----  
#  
# Security can be set to user, share(deprecated) or server(deprecated)  
#  
# Backend to store user information in. New installations should  
# use either tdbsam or ldapsam. smbpasswd is available for backwards  
# compatibility. tdbsam requires no further configuration.
```

Lab 8 will use a stand-alone server model

security = user

passdb backend = tdbsam

This is the default

*Good choice for local servers and < 250 users.
Use ldapsam for larger organizations*

With tdbsam, the Samba account information will be stored in /etc/samba/passdb.tdb. Note: This file requires that account information is available from the /etc/passwd file.

/etc/samba/smb.conf

```
# ----- Domain Members Options -----
#
# Security must be set to domain or ads
#
# Use the realm option only with security = ads
# Specifies the Active Directory realm the host is part of
#
# Backend to store user information in. New installations should
# use either tdbsam or ldapsam. smbpasswd is available for backwards
# compatibility. tdbsam requires no further configuration.
#
# Use password server option only with security = server or if you can't
# use the DNS to locate Domain Controllers
# The argument list may include:
#   password server = My_PDC_Name [My_BDC_Name] [My_Next_BDC_Name]
# or to auto-locate the domain controller/s
#   password server = *

;   security = domain
;   passdb backend = tdbsam
;   realm = MY_REALM

;   password server = <NT-Server-Name>
```

The Samba server can join a domain. Not using for Lab 8

```

# ----- Domain Controller Options -----
#
# Security must be set to user for domain controllers
#
# Backend to store user information in. New installations should
# use either tdbsam or ldapsam. smbpasswd is available for backwards
# compatibility. tdbsam requires no further configuration.
#
# Domain Master specifies Samba to be the Domain Master Browser. This
# allows Samba to collate browse lists between subnets. Don't use this
# if you already have a Windows NT domain controller doing this job
#
# Domain Logons let Samba be a domain logon server for Windows workstations.
#
# Logon Script let you specify a script to be run at login time on the client
# You need to provide it in a share called NETLOGON
#
# Logon Path let you specify where user profiles are stored (UNC path)
#
# Various scripts can be used on a domain controller or stand-alone
# machine to add or delete corresponding unix accounts
#
;      security = user
;      passwd backend = tdbsam

;      domain master = yes
;      domain logons = yes

;      # the login script name depends on the machine name
;      logon script = %m.bat
;      # the login script name depends on the unix user used
;      logon script = %u.bat
;      logon path = \\%L\Profiles\%u
;      # disables profiles support by specifying an empty path
;      logon path =

;      add user script = /usr/sbin/useradd "%u" -n -g users
;      add group script = /usr/sbin/groupadd "%g"
;      add machine script = /usr/sbin/useradd -n -c "Workstation (%u)" -M -d /nohome -s /bin/false "%u"
;      delete user script = /usr/sbin/userdel "%u"
;      delete user from group script = /usr/sbin/userdel "%u" "%g"
;      delete group script = /usr/sbin/groupdel "%g"

```

Samba can act as a domain controller. Not using this for Lab 8

/etc/samba/smb.conf

```
# ----- Browser Control Options -----  
#  
# set local master to no if you don't want Samba to become a master  
# browser on your network. Otherwise the normal election rules apply  
#  
# OS Level determines the precedence of this server in master browser  
# elections. The default value should be reasonable  
#  
# Preferred Master causes Samba to force a local browser election on startup  
# and gives it a slightly higher chance of winning the election  
;  
    local master = no  
;  
    os level = 33  
;  
    preferred master = yes
```

Browser control is about letting Windows and Samba servers appear in Network Neighborhood views. Only one master can be allowed on a domain or workgroup.

/etc/samba/smb.conf

```
#----- Name Resolution -----  
# Windows Internet Name Serving Support Section:  
# Note: Samba can be either a WINS Server, or a WINS Client, but NOT both  
#  
# - WINS Support: Tells the NMBD component of Samba to enable it's WINS Server  
#  
# - WINS Server: Tells the NMBD components of Samba to be a WINS Client  
#  
# - WINS Proxy: Tells Samba to answer name resolution queries on  
# behalf of a non WINS capable client, for this to work there must be  
# at least one WINS Server on the network. The default is NO.  
#  
# DNS Proxy - tells Samba whether or not to try to resolve NetBIOS names  
# via DNS nslookups.  
  
; wins support = yes  
; wins server = w.x.y.z  
; wins proxy = yes  
  
; dns proxy = yes
```

Not using for Lab 8.

We will just use /etc/hosts files.

/etc/samba/smb.conf

```
# ----- Printing Options -----  
#  
# Load Printers let you load automatically the list of printers rather  
# than setting them up individually  
#  
# Cups Options let you pass the cups libs custom options, setting it to raw  
# for example will let you use drivers on your Windows clients  
#  
# Printcap Name let you specify an alternative printcap file  
#  
# You can choose a non default printing system using the Printing option  
  
    load printers = yes  
    cups options = raw  
  
;    printcap name = /etc/printcap  
    #obtain list of printers automatically on SystemV  
;    printcap name = lpstat  
;    printing = cups
```

Leave as is for Lab 8

/etc/samba/smb.conf

```
# ----- Filesystem Options -----  
#  
# The following options can be uncommented if the filesystem supports  
# Extended Attributes and they are enabled (usually by the mount option  
# user_xattr). These options will let the admin store the DOS attributes  
# in an EA and make samba not mess with the permission bits.  
#  
# Note: these options can also be set just per share, setting them in global  
# makes them the default for all shares  
  
;      map archive = no  
;      map hidden = no  
;      map read only = no  
;      map system = no  
;      store dos attributes = yes
```

*Leave these options
commented out for
Lab 8*

/etc/samba/smb.conf

```
#===== Share Definitions =====
```

```
[homes]
```

```
    comment = Home Directories
    browseable = no
    writable = yes
;    valid users = %S
;    valid users = MYDOMAIN\%S
```

*The default will allow
access to home directories*

```
[printers]
```

```
    comment = All Printers
    path = /var/spool/samba
    browseable = no
    guest ok = no
    writable = no
    printable = yes
```

```
# Un-comment the following and create the netlogon directory for Domain Logons
```

```
;    [netlogon]
;    comment = Network Logon Service
;    path = /var/lib/samba/netlogon
;    guest ok = yes
;    writable = no
;    share modes = no
```

/etc/samba/smb.conf

```
#===== Share Definitions =====
```

```
# Un-comment the following to provide a specific roving profile share
```

```
# the default is to use the user's home directory
```

```
;  
    [Profiles]  
;  
    path = /var/lib/samba/profiles  
;  
    browseable = no  
;  
    guest ok = yes
```

```
# A publicly accessible directory, but read only, except for people in  
# the "staff" group
```

```
;  
    [public]  
;  
    comment = Public Stuff  
;  
    path = /home/samba  
;  
    public = yes  
;  
    writable = yes  
;  
    printable = no  
;  
    write list = +staff
```

```
[root@legolas ~]#
```

*Leave these example
shares commented out
for Lab 8*

/etc/samba/smb.conf

Add these shares to the end of smb.conf

```
[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
writeable = yes
```


/etc/samba/smb.conf

Some share options

- `path` = *Absolute path to share*
- `guest ok` = *Yes or no, for guest user access*
- `read only` = *Yes or no (default is yes)*
- `writable` = *Yes or no (alternate way to specify)*
- `valid users` = *Limits users that can access this share*
- `browseable` = *Yes or no to appear in network neighborhood*
- `comment` = *Shown to users browsing share*
- `hosts allow` = *List of hostnames (e.g. localhost 192.168.2. 10.10.10.)*
- `hosts deny` = *List of hostnames (use ALL or 0.0.0.0/0 for all hosts)*

*Of course, there are many more options than this!
(use **man smb.conf** or Google)*

testparm

```
[root@legolas shares]# testparm
Load smb config files from /etc/samba/smb.conf
rlimit_max: increasing rlimit_max (1024) to minimum
Windows limit (16384)
Processing section "[homes]"
Processing section "[printers]"
Processing section "[depot]"
Processing section "[depot192]"
Loaded services file OK.
Server role: ROLE_STANDALONE
Press enter to see a dump of your service definitions
```

```
[global]
server string = Cool Samba Server
log file = /var/log/samba/log.%m
max log size = 50
cups options = raw
```

```
[homes]
comment = Home Directories
read only = No
browseable = No
```

```
[printers]
comment = All Printers
path = /var/spool/samba
printable = Yes
browseable = No
```

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

```
[depot192]
comment = CIS 192 files on Elrond
path = /var/shares/depot192
valid users = cis192
read only = No
```

testparm

*After making any changes
to smb.conf, use
testparm to validate*

Elrond



- Validate smb.conf with **testparm** command
- Fix any errors found

Create users and passwords

Adding Users

Add a normal user account to the system

```
[root@elrond var]# useradd -c "CIS 191" -g users cis191
[root@elrond var]# passwd cis191
Changing password for user cis191.
New UNIX password:
BAD PASSWORD: it is based on a dictionary word
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```


Adding Users

Add Samba passwords

```
[root@elrond var]# smbpasswd -a cis191  
New SMB password:  
Retype new SMB password:  
Added user cis191.
```

```
[root@elrond var]# smbpasswd -a cis192  
New SMB password:  
Retype new SMB password:  
Added user cis192.
```

Elrond



"cis"

- Check if cis192 user exists:
cat /etc/passwd | grep cis191
- Create a cis191 user:
useradd -c "CIS 191" -g users cis191
- Add a password for cis191:
passwd cis191
- Configure Samba user passwords:
smbpasswd -a cis191
smbpasswd -a cis192

Firewall

Samba and the Firewall

Step 3 *Modify the firewall*

Firewall ports used for file and printer sharing

UDP 137	<i>NetBIOS Name Service</i>
UDP 138	<i>NetBIOS Datagram Service</i>
TCP 139	<i>NetBIOS Session Service</i>
TCP 445	<i>Microsoft Directory Service</i> <i>(allows SMB to run over IP)</i>

Samba and the Firewall

With command line

```
iptables -I INPUT 4 -p udp -m state --state NEW -m udp --dport 137 -j ACCEPT
iptables -I INPUT 4 -p udp -m state --state NEW -m udp --dport 138 -j ACCEPT
iptables -I INPUT 4 -p tcp -m state --state NEW -m tcp --dport 139 -j ACCEPT
iptables -I INPUT 4 -p tcp -m state --state NEW -m tcp --dport 445 -j ACCEPT
service iptables save
```

With GUI

The screenshot shows the CentOS 5 desktop environment. The 'System' menu is open, and the 'Security Level and Firewall' option is selected. The 'Security Level Configuration' window is displayed, showing the following settings:

- Firewall: Enabled
- Trusted services:
 - FTP
 - Mail (SMTP)
 - NFS4
 - SSH
 - Samba
 - Secure WWW (HTTPS)

The 'Apply' button is highlighted, indicating the configuration is being saved.

Samba and the Firewall

```
[root@p32-elrond ~]# cat /etc/sysconfig/iptables
# Generated by iptables-save v1.4.7 on Sun Apr 28 20:06:10 2013
*nat
:PREROUTING ACCEPT [18:2314]
:POSTROUTING ACCEPT [0:0]
:OUTPUT ACCEPT [1:70]
-A POSTROUTING -o eth0 -j MASQUERADE
COMMIT
# Completed on Sun Apr 28 20:06:10 2013
# Generated by iptables-save v1.4.7 on Sun Apr 28 20:06:10 2013
*filter
:INPUT ACCEPT [0:0]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [55:6700]
-A INPUT -m state --state RELATED,ESTABLISHED -j ACCEPT
-A INPUT -p icmp -j ACCEPT
-A INPUT -i lo -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 445 -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 139 -j ACCEPT
-A INPUT -p udp -m state --state NEW -m udp --dport 138 -j ACCEPT
-A INPUT -p udp -m state --state NEW -m udp --dport 137 -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 22 -j ACCEPT
-A INPUT -j REJECT --reject-with icmp-host-prohibited
COMMIT
# Completed on Sun Apr 28 20:06:10 2013
[root@p32-elrond ~]#
```

*udp/137
udp/138
tcp/139
tcp/445
are open now*

Elrond



- View the default firewall:
iptables -nL

- Insert rules to open the Samba ports:

```
iptables -I INPUT 9 -p udp -m state --state NEW -m udp --dport 137 -j ACCEPT
iptables -I INPUT 9 -p udp -m state --state NEW -m udp --dport 138 -j ACCEPT
iptables -I INPUT 9 -p tcp -m state --state NEW -m tcp --dport 139 -j ACCEPT
iptables -I INPUT 9 -p tcp -m state --state NEW -m tcp --dport 445 -j ACCEPT
```

- View the default firewall:
iptables -nL

- Save the firewall:
service iptables save

SELinux

SELinux

Step 4 *Configure SELinux*

Overview

SELinux is like an internal firewall where you can define what subjects (users, programs) can access which objects (files, devices)

- Originally created by the NSA (National Security Agency)
- Based on the MAC (Mandatory Access Control) concept where administrators control all interactions between programs.
- Programs and users start with no rights. Any rights must be granted by the administrator as part of the security policy for the system.
- Standard UNIX permissions are checked first then SELinux rules are applied if necessary.

SELinux

Security Contexts

Security context have three components: a **user identity**, a **role**, and a **type** (also known as a domain).

```
[root@celebrian var]# ls -ldZ shares/
drwxr-xr-x root root root:object_r:var_t shares/
```

```
[root@elrond var]# ls -lZ /usr/sbin/[sn]mbd
-rwxr-xr-x root root system_u:object_r:nmbd_exec_t /usr/sbin/nmbd
-rwxr-xr-x root root system_u:object_r:smbd_exec_t /usr/sbin/smbd
```

```
[root@elrond var]# id root
uid=0(root) gid=0(root)
groups=0(root),1(bin),2(daemon),3(sys),4(adm),6(disk),10(wheel)
context=root:system_r:unconfined_t:SystemLow-SystemHigh
```

A user identity is the SELinux user account

Types (use "_t" suffix) are the primary method used by SELinux to make authorization decisions.

A role (uses "_r" suffix) defines a set of permissions granted to a SELinux user.

/etc/samba/smb.conf

```
#-----  
# SELINUX NOTES:  
#  
# If you want to use the useradd/groupadd family of binaries please run:  
# setsebool -P samba_domain_controller on  
#  
# If you want to share home directories via samba please run:  
# setsebool -P samba_enable_home_dirs on  
#  
# If you create a new directory you want to share you should mark it as  
# "samba-share_t" so that selinux will let you write into it.  
# Make sure not to do that on system directories as they may already have  
# been marked with othe SELinux labels.  
#  
# Use ls -ldZ /path to see which context a directory has  
#  
# Set labels only on directories you created!  
# To set a label use the following: chcon -t samba_share_t /path  
#  
# If you need to share a system created directory you can use one of the  
# following (read-only/read-write):  
# setsebool -P samba_export_all_ro on  
# or  
# setsebool -P samba_export_all_rw on  
#  
# If you want to run scripts (preexec/root preexec/print command/...) please  
# put them into the /var/lib/samba/scripts directory so that smbd will be  
# allowed to run them.  
# Make sure you COPY them and not MOVE them so that the right SELinux context  
# is applied, to check all is ok use restorecon -R -v /var/lib/samba/scripts  
#
```

*Lab 8 will not work
unless this is done*

*Lab 8 will not work
unless this is done*

Samba and SELinux

Set permissive mode

```
[root@legolas ~]# setenforce permissive  
[root@legolas ~]# getenforce  
Permissive
```

Set enforcing mode

```
[root@legolas ~]# setenforce enforcing  
[root@legolas ~]# getenforce  
Enforcing
```

Show SELinux status

```
[root@legolas ~]# sestatus  
SELinux status:                enabled  
SELinuxfs mount:                /selinux  
Current mode:                    enforcing  
Mode from config file:           enforcing  
Policy version:                  21  
Policy from config file:         targeted
```

In Lab 8 we will configure Samba to work in enforcing mode

Samba and SELinux

This share on Elrond can be accessed ...

```
[root@elrond var]# ls -ld shares/
```

```
drwxr-xr-x 4 root root 4096 Jan 21 13:23 shares/
```

```
[root@elrond var]# ls -ld shares/depot
```

```
drwxr-xr-x 2 cis192 users 4096 Apr 27 02:30 shares/depot
```

```
[root@elrond var]# ls -ld shares/depot/jfk.txt
```

```
-rw-r--r-- 1 root root 13663 Apr 27 02:30 shares/depot/jfk.txt
```

This share on Celebrian cannot be accessed ...

```
[root@celebrian var]# ls -ld shares/
```

```
drwxr-xr-x 4 root root 4096 Apr 25 08:59 shares/
```

```
[root@celebrian var]# ls -ld shares/depot
```

```
drwxr-xr-x 2 cis192 users 4096 Apr 25 09:03 shares/depot
```

```
[root@celebrian var]# ls -ld shares/depot/jfk.txt
```

```
-rw-r--r-- 1 root root 13675 Apr 25 09:03 shares/depot/jfk.txt
```

Can you see why? ... I can't!

Samba and SELinux

This works ...

Use the Z option to show SELinux info

```
[root@elrond var]# ls -ldZ shares/
drwxr-xr-x  root root root:object_r:var_t          shares/

[root@elrond var]# ls -ldZ shares/depot
drwxr-xr-x  cis192 users root:object_r:samba_share_t  shares/depot

[root@elrond var]# ls -ldZ shares/depot/jfk.txt
-rw-r--r--  root root root:object_r:samba_share_t  shares/depot/jfk.txt
```

This does NOT work ...

```
[root@celebrian var]# ls -ldZ shares/
drwxr-xr-x  root root root:object_r:var_t          shares/

[root@celebrian var]# ls -ldZ shares/depot
drwxr-xr-x  cis192 users root:object_r:var_t          shares/depot

[root@celebrian var]# ls -ldZ shares/depot/jfk.txt
-rw-r--r--  root root root:object_r:var_t          shares/depot/jfk.txt
```

Can you see why?

Samba and SELinux

This works ...

Use the Z option to show SELinux info

```
[root@elrond var]# ls -ldZ shares/
drwxr-xr-x  root root root:object_r:var_t          shares/

[root@elrond var]# ls -ldZ shares/depot
drwxr-xr-x  cis192 users root:object_r:samba_share_t  shares/depot

[root@elrond var]# ls -ldZ shares/depot/jfk.txt
-rw-r--r--  root root root:object_r:samba_share_t  shares/depot/jfk.txt
```

This does NOT work ...

```
[root@celebrian var]# ls -ldZ shares/
drwxr-xr-x  root root root:object_r:var_t          shares/

[root@celebrian var]# ls -ldZ shares/depot
drwxr-xr-x  cis192 users root:object_r:var_t          shares/depot

[root@celebrian var]# ls -ldZ shares/depot/jfk.txt
-rw-r--r--  root root root:object_r:var_t          shares/depot/jfk.txt
```

Can you see why? ... I can!

Samba and SELinux

Recursive and verbose

new context type that allows sharing by Samba

path to the shares

```
[root@elrond ~]# chcon -Rv -t samba_share_t /var/shares/*
context of /var/shares/depot retained as root:object_r:samba_share_t
context of /var/shares/depot/hk.txt retained as root:object_r:samba_share_t
context of /var/shares/depot192 retained as root:object_r:samba_share_t
context of /var/shares/depot192/hk.txt retained as root:object_r:samba_share_t
[root@elrond ~]#
```

Note the use of the recursive and verbose options to make the change on all files in the directory and show what was changed

Samba and SELinux

Sharing user home directories

```
[root@elrond bin]# setsebool -P samba_enable_home_dirs=1  
[root@elrond bin]# getsebool samba_enable_home_dirs  
samba_enable_home_dirs --> on
```

This SELinux boolean must be enabled to allow the sharing of home directories

Elrond



- Leave SELinux in the default Enforcing mode
- View the security contexts on the shares:
ls -lRZ /var/shares
- Change the security context for the shares
chcon -vR -t samba_share_t /var/shares/*
- Enable home dirs to be shared
setsebool -P samba_enable_home_dirs=1
- View the revised security contexts on the shares:
ls -lRZ /var/shares

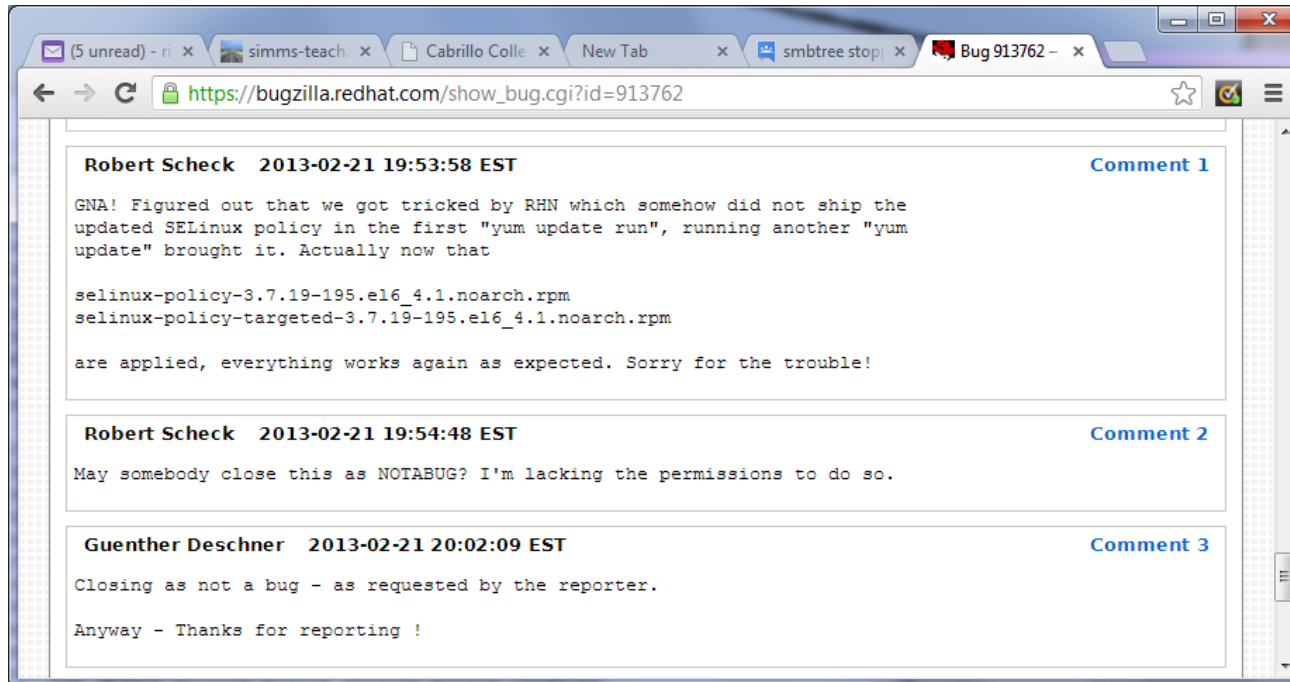
Samba and SELinux

We need to address

https://bugzilla.redhat.com/show_bug.cgi?id=913762

by installing updated SELinux policies:

yum update selinux-policy selinux-policy-targeted



This will allow the nmbd service to start properly

start
services

Samba

Step 5 *Start the service*

```
[root@elrond var]# service smb start  
Starting SMB services: [ OK ]
```

```
[root@elrond var]# service nmb start  
Starting NMB services: [ OK ]
```

Step 6 *Start the service automatically during system startup*

```
[root@elrond var]# chkconfig smb on  
[root@elrond var]# chkconfig nmb on
```


Samba

Step 7 *Monitor and verify service is running*

```
[root@p32-elrond ~]# service smb status  
smbd (pid 2087) is running...
```

```
[root@p32-elrond ~]# service nmb status  
nmbd (pid 2103) is running...
```

Samba

Step 7 Monitor TCP ports and verify service is running

```
[root@p32-elrond ~]# netstat -tln
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 0.0.0.0:111             0.0.0.0:*               LISTEN
tcp      0      0 0.0.0.0:22             0.0.0.0:*               LISTEN
tcp      0      0 0.0.0.0:41732          0.0.0.0:*               LISTEN
tcp      0      0 :::901                  :::*                     LISTEN
tcp      0      0 :::139                  :::*                     LISTEN
tcp      0      0 :::111                  :::*                     LISTEN
tcp      0      0 :::22                   :::*                     LISTEN
tcp      0      0 :::34359                 :::*                     LISTEN
tcp      0      0 :::445                  :::*                     LISTEN
[root@p32-elrond ~]#
```

*Port 139 is used for NetBIOS sessions (file and print sharing)
Port 445 is used for Microsoft Active Directory Services and it enables
SMB to run over IP*

NETSTAT (8)

Linux Programmer's Manual

NETSTAT(8)

NAME

`netstat` - Print network connections, routing tables, interface statistics, masquerade connections, and multicast memberships

SYNOPSIS

```
netstat [address_family_options] [--tcp|-t] [--udp|-u] [--raw|-w] [--listening|-l]
[--all|-a] [--numeric|-n] [--numeric-hosts] [--numeric-ports] [--numeric-ports] [--sym-
bolic|-N] [--extend|-e[--extend|-e]] [--timers|-o] [--program|-p] [--verbose|-v] [--continu-
ous|-c] [delay]
```

```
netstat [--route|-r] [address_family_options] [--extend|-e[--extend|-e]] [--verbose|-v]
[--numeric|-n] [--numeric-hosts] [--numeric-ports] [--numeric-ports] [--continuous|-c] [delay]
```

```
netstat [--interfaces|-I|-i] [iface] [--all|-a] [--extend|-e] [--verbose|-v] [--program|-p]
[--numeric|-n] [--numeric-hosts] [--numeric-ports] [--numeric-ports] [--continuous|-c] [delay]
```

```
netstat [--groups|-g] [--numeric|-n] [--numeric-hosts] [--numeric-ports] [--numeric-ports]
[--continuous|-c] [delay]
```

```
netstat [--masquerade|-M] [--extend|-e] [--numeric|-n] [--numeric-hosts] [--numeric-
ports] [--numeric-ports] [--continuous|-c] [delay]
```

```
netstat [--statistics|-s] [--tcp|-t] [--udp|-u] [--raw|-w] [delay]
```

```
netstat [--version|-V]
```

```
netstat [--help|-h]
```

address_family_options:

```
[--protocol={inet,unix,ipx,ax25,netrom,ddp}[,...]] [--unix|-x] [--inet|--ip] [--ax25]
[--ipx] [--netrom] [--ddp]
```

NOTE

This program is obsolete. Replacement for `netstat` is `ss`. Replacement for `netstat -r` is `ip route`. Replacement for `netstat -i` is `ip -s link`. Replacement for `netstat -g` is `ip maddr`.

Samba

Step 7 Monitor and verify service is running

```
[root@p32-elrond ~]# ss -tlnp -a
State      Recv-Q Send-Q      Local Address:Port      Peer Address:Port      users
LISTEN     0      64          :::901                  :::*                    users: (("xinetd",2505,5))
LISTEN     0      50          :::139                  :::*                    users: (("smbd",2087,26))
LISTEN     0      128         :::111                  :::*                    users: (("rpcbind",1359,11))
LISTEN     0      128         *:111                   *:*                    users: (("rpcbind",1359,8))
LISTEN     0      128         :::22                   :::*                    users: (("sshd",1481,4))
LISTEN     0      128         *:22                    *:~                    users: (("sshd",1481,3))
LISTEN     0      128         :::34359                :::*                    users: (("rpc.statd",1377,11))
LISTEN     0      50          :::445                  :::*                    users: (("smbd",2087,25))
LISTEN     0      128         *:41732                 *:~                    users: (("rpc.statd",1377,9))
[root@p32-elrond ~]#
```

*Port 139 is used for NetBIOS sessions (file and print sharing)
Port 445 is used for Microsoft Active Directory Services and it enables
SMB to run over IP*

Do a verbose scan of TCP ports on Elrond from Frodo

```
root@p28-frodo:~# nmap -v -sT p32-elrond
```

```
Starting Nmap 5.21 ( http://nmap.org ) at 2013-04-30 14:26 PDT
Initiating ARP Ping Scan at 14:26
Scanning p32-elrond (172.20.192.224) [1 port]
Completed ARP Ping Scan at 14:26, 0.00s elapsed (1 total hosts)
Initiating Connect Scan at 14:26
Scanning p32-elrond (172.20.192.224) [1000 ports]
Discovered open port 22/tcp on 172.20.192.224
Discovered open port 139/tcp on 172.20.192.224
Discovered open port 445/tcp on 172.20.192.224
Connect Scan Timing: About 50.40% done; ETC: 14:27 (0:00:31 remaining)
Discovered open port 901/tcp on 172.20.192.224
Completed Connect Scan at 14:27, 49.35s elapsed (1000 total ports)
Nmap scan report for p32-elrond (172.20.192.224)
```

```
Host is up (0.97s latency).
Not shown: 996 filtered ports
```

PORT	STATE	SERVICE
22/tcp	open	ssh
139/tcp	open	netbios-ssn
445/tcp	open	microsoft-ds
901/tcp	open	samba-swat

TCP port probe shows ports 139 and 445 which are used by Samba.

Samba swat on TCP port 901 is a web-based Samba utility (discussed in next section)

```
MAC Address: 00:50:56:BD:95:BF (VMware)
```

```
Read data files from: /usr/share/nmap
Nmap done: 1 IP address (1 host up) scanned in 49.49 seconds
```

```
Raw packets sent: 1 (42B) | Rcvd: 1 (42B)
```

```
root@p28-frodo:~#
```

Samba

Step 7 Monitor UDP ports and verify service is running

```
[root@p32-elrond ~]# netstat -uln
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp      0      0 0.0.0.0:111             0.0.0.0:*
udp      0      0 172.20.255.255:137     0.0.0.0:*
udp      0      0 172.20.192.224:137     0.0.0.0:*
udp      0      0 192.168.32.255:137     0.0.0.0:*
udp      0      0 192.168.32.1:137      0.0.0.0:*
udp      0      0 0.0.0.0:137            0.0.0.0:*
udp      0      0 172.20.255.255:138     0.0.0.0:*
udp      0      0 172.20.192.224:138     0.0.0.0:*
udp      0      0 192.168.32.255:138     0.0.0.0:*
udp      0      0 192.168.32.1:138      0.0.0.0:*
udp      0      0 0.0.0.0:138            0.0.0.0:*
udp      0      0 0.0.0.0:686            0.0.0.0:*
udp      0      0 0.0.0.0:35771          0.0.0.0:*
udp      0      0 0.0.0.0:705            0.0.0.0:*
udp      0      0 :::36055                :::*
udp      0      0 :::111                  :::*
udp      0      0 :::686                  :::*
```

UDP Port 138 is used for NetBIOS name service (file and print sharing)

UDP Port 139 is used for NetBIOS datagram service (file and print sharing)

```
[root@p32-elrond ~]# ss -ulnp -a
State      Recv-Q  Send-Q   Local Address:Port      Peer Address:Port
UNCONN    0        0         *:111                    *:*                    users:(("rpcbind",1359,6))
UNCONN    0        0         172.20.255.255:137      *:*                    users:(("nmbd",2103,16))
UNCONN    0        0         172.20.192.224:137      *:*                    users:(("nmbd",2103,15))
UNCONN    0        0         192.168.32.255:137      *:*                    users:(("nmbd",2103,12))
UNCONN    0        0         192.168.32.1:137       *:*                    users:(("nmbd",2103,11))
UNCONN    0        0         *:137                   *:*                    users:(("nmbd",2103,9))
UNCONN    0        0         172.20.255.255:138      *:*                    users:(("nmbd",2103,18))
UNCONN    0        0         172.20.192.224:138      *:*                    users:(("nmbd",2103,17))
UNCONN    0        0         192.168.32.255:138      *:*                    users:(("nmbd",2103,14))
UNCONN    0        0         192.168.32.1:138       *:*                    users:(("nmbd",2103,13))
UNCONN    0        0         *:138                   *:*                    users:(("nmbd",2103,10))
UNCONN    0        0         *:686                   *:*                    users:(("rpcbind",1359,7))
UNCONN    0        0         *:35771                 *:*                    users:(("rpc.statd",1377,8))
UNCONN    0        0         *:705                   *:*                    users:(("rpc.statd",1377,5))
UNCONN    0        0         :::36055                :::*                   users:(("rpc.statd",1377,10))
UNCONN    0        0         :::111                  :::*                   users:(("rpcbind",1359,9))
UNCONN    0        0         :::686                  :::*                   users:(("rpcbind",1359,10))
[root@p32-elrond ~]#
```

UDP Port 138 is used for NetBIOS name service (file and print sharing)
UDP Port 139 is used for NetBIOS datagram service (file and print sharing)


```
root@p28-frodo:~# nmap -v -sU p32-elrond
```

*Do a verbose scan of UDP ports
on Elrond from Frodo*

```
Starting Nmap 5.21 ( http://nmap.org ) at 2013-04-30 14:55 PDT
Initiating ARP Ping Scan at 14:55
Scanning p32-elrond (172.20.192.224) [1 port]
Completed ARP Ping Scan at 14:55, 0.00s elapsed (1 total hosts)
Initiating UDP Scan at 14:55
Scanning p32-elrond (172.20.192.224) [1000 ports]
Increasing send delay for 172.20.192.224 from 0 to 50 due to max_successful_tryno increase to 4
Increasing send delay for 172.20.192.224 from 50 to 100 due to max_successful_tryno increase to 5
Increasing send delay for 172.20.192.224 from 100 to 200 due to max_successful_tryno increase to 6
Increasing send delay for 172.20.192.224 from 200 to 400 due to 11 out of 17 dropped probes since last increase.
Increasing send delay for 172.20.192.224 from 400 to 800 due to 11 out of 11 dropped probes since last increase.
UDP Scan Timing: About 5.42% done; ETC: 15:05 (0:09:00 remaining)
UDP Scan Timing: About 8.12% done; ETC: 15:08 (0:11:30 remaining)
UDP Scan Timing: About 11.11% done; ETC: 15:09 (0:12:08 remaining)
UDP Scan Timing: About 29.00% done; ETC: 15:12 (0:11:26 remaining)
UDP Scan Timing: About 35.43% done; ETC: 15:12 (0:10:36 remaining)
UDP Scan Timing: About 41.54% done; ETC: 15:12 (0:09:44 remaining)
UDP Scan Timing: About 47.23% done; ETC: 15:12 (0:08:51 remaining)
UDP Scan Timing: About 52.60% done; ETC: 15:12 (0:07:59 remaining)
Discovered open port 137/udp on 172.20.192.224
UDP Scan Timing: About 57.85% done; ETC: 15:12 (0:07:07 remaining)
UDP Scan Timing: About 62.94% done; ETC: 15:12 (0:06:13 remaining)
UDP Scan Timing: About 68.23% done; ETC: 15:12 (0:05:22 remaining)
UDP Scan Timing: About 73.39% done; ETC: 15:12 (0:04:30 remaining)
UDP Scan Timing: About 78.55% done; ETC: 15:12 (0:03:38 remaining)
UDP Scan Timing: About 83.62% done; ETC: 15:12 (0:02:47 remaining)
UDP Scan Timing: About 88.79% done; ETC: 15:12 (0:01:55 remaining)
UDP Scan Timing: About 93.86% done; ETC: 15:12 (0:01:03 remaining)
Completed UDP Scan at 15:13, 1070.34s elapsed (1000 total ports)
Nmap scan report for p32-elrond (172.20.192.224)
Host is up (0.00030s latency).
Not shown: 998 filtered ports
PORT      STATE      SERVICE
137/udp   open      netbios-ns
138/udp   open|filtered netbios-dgm
MAC Address: 00:50:56:BD:95:BF (VMware)

Read data files from: /usr/share/nmap
Nmap done: 1 IP address (1 host up) scanned in 1070.40 seconds
Raw packets sent: 1437 (40.867KB) | Rcvd: 1086 (61.129KB)
root@p28-frodo:~#
```

*UDP port probe shows ports
137 and 138 are open*

Trouble Shooting

Samba

Step 8 Troubleshoot

```
[root@elrond bin]# smbclient -L william100
Password:
Anonymous login successful
Domain=[WORKGROUP] OS=[Windows 5.1] Server=[Windows 2000 LAN Manager]
```

Sharename	Type	Comment
-----	----	-----

```
cli_rpc_pipe_open: cli_nt_create failed on pipe \srvsvc to machine william100.
Error was NT_STATUS_ACCESS_DENIED
Error returning browse list: NT_STATUS_ACCESS_DENIED
```

```
Anonymous login successful
Domain=[WORKGROUP] OS=[Windows 5.1] Server=[Windows 2000 LAN Manager]
```

Server	Comment
-----	-----
DV2000	
ELROND	Cool Samba Server
WILLIAM100	

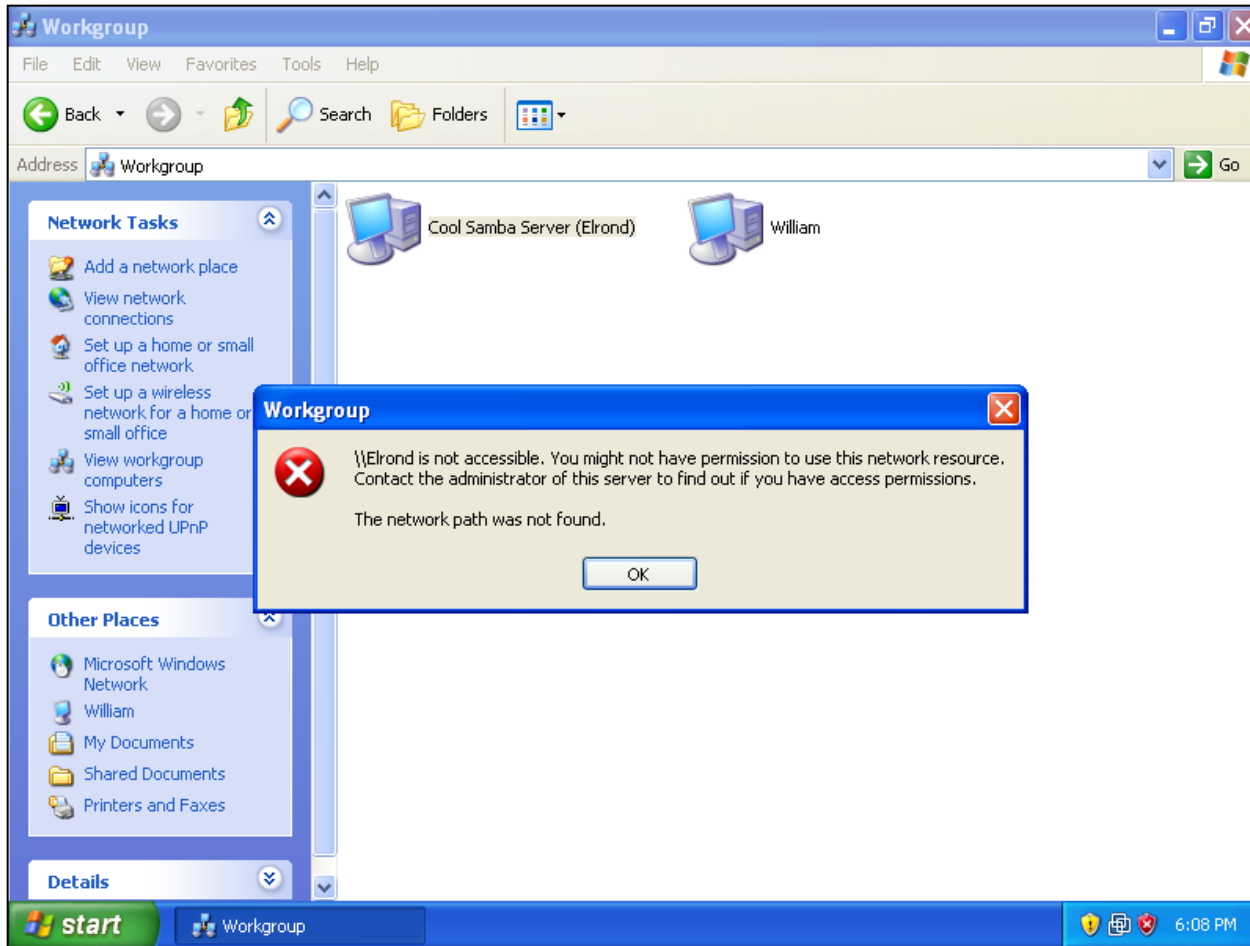
Workgroup	Master
-----	-----
WORKGROUP	WILLIAM100

```
[root@elrond bin]#
```

Problem: Get error message above when trying to browse Samba Server.

Fix: specify a user (e.g. `smbclient -L william100 -U cis192`) and supply the password for that user when prompted.

Step 8 Troubleshoot



Problem: Get error message above when trying to open Cool Samba Server.

Fix: Open firewall on Samba server to allow (ports 137/udp, 138/udp, 139/tcp, and 445/tcp)

Samba

Step 8 Troubleshoot

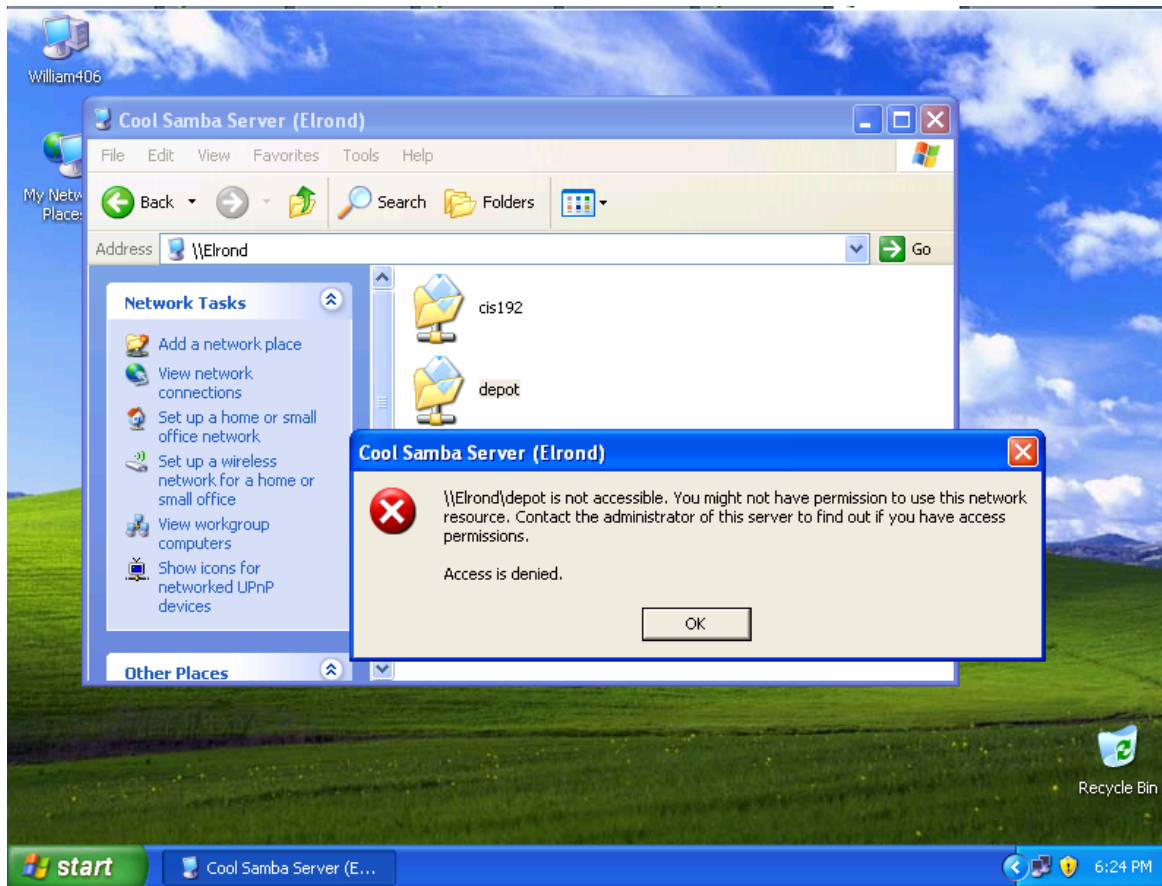
```
[root@legolas ~]# ping -c1 elrond
PING elrond (192.168.2.1) 56(84) bytes of data.
64 bytes from elrond (192.168.2.1): icmp_seq=1 ttl=64 time=2.10 ms

--- elrond ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 2.108/2.108/2.108/0.000 ms
[root@legolas ~]# smbclient -L elrond
Error connecting to 192.168.2.1 (No route to host)
Connection to elrond failed (Error NT_STATUS_HOST_UNREACHABLE)
[root@legolas ~]#
```

Problem: Get error message above when trying to browse Samba Server.

Fix: Open firewall on Samba server to allow (ports 137/udp, 138/udp, 139/tcp, and 445/tcp)

Step 8 Troubleshoot



Problem: Get error message above when trying to open a share on Samba server

Fix: On Samba server, set the SELinux type on the shares with:
chcon -R -t samba_share_t /var/shares/*

Samba

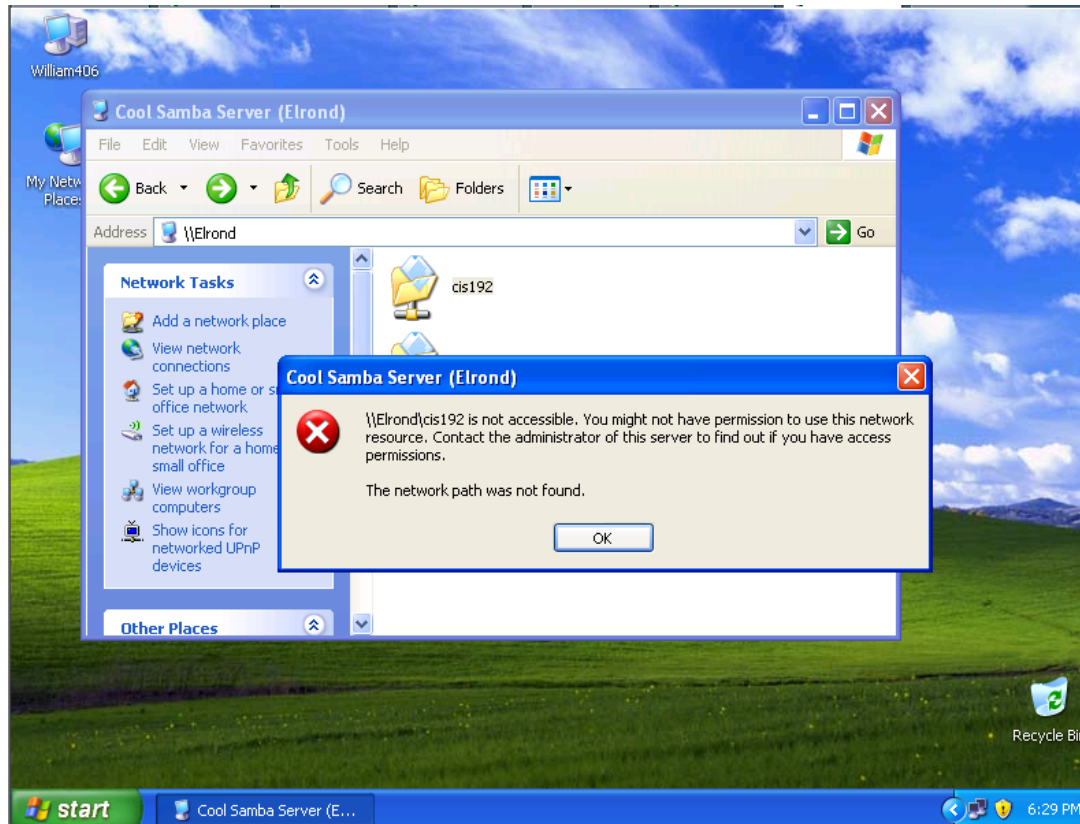
Step 8 *Troubleshoot*

```
[root@legolas ~]# mount -o username=cis192 //elrond/depot /mnt
Password:
[root@legolas ~]# ls /mnt
ls: reading directory /mnt: Permission denied
[root@legolas ~]#
```

Problem: Get error message above when trying to open a share in /var/shares

Fix: On Samba server, set the SELinux type on the shares with:
chcon -R -t samba_share_t /var/shares/*

Step 8 Troubleshoot



Problem: Get error message above when trying to open home directory share on Samba server

Fix: Set the SELinux type with **setsebool -P samba_enable_home_dirs=1** to enable sharing home directories on the Samba server

Samba

Step 8 *Troubleshoot*

```
[root@legolas ~]# mount -o username=cis192 //elrond/cis192 /mnt
Password:
retrying with upper case share name
mount error 6 = No such device or address
Refer to the mount.cifs(8) manual page (e.g.man mount.cifs)
[root@legolas ~]#
```

Problem: Get error message above when trying to open home directory share on Samba server

Fix: Set the SELinux type with **setsebool -P samba_enable_home_dirs=1** to enable sharing home directories on the Samba server

Samba

Step 8 Troubleshoot

```
[root@legolas shares]# smbpasswd -a cis191
New SMB password:
Retype new SMB password:
tdbsam_open: Converting version 0 database to version 3.
account_policy_get: tdb_fetch_uint32 failed for field 1 (min password length), returning 0
account_policy_get: tdb_fetch_uint32 failed for field 2 (password history), returning 0
account_policy_get: tdb_fetch_uint32 failed for field 3 (user must logon to change password), returning 0
account_policy_get: tdb_fetch_uint32 failed for field 4 (maximum password age), returning 0
account_policy_get: tdb_fetch_uint32 failed for field 5 (minimum password age), returning 0
account_policy_get: tdb_fetch_uint32 failed for field 6 (lockout duration), returning 0
account_policy_get: tdb_fetch_uint32 failed for field 7 (reset count minutes), returning 0
account_policy_get: tdb_fetch_uint32 failed for field 8 (bad lockout attempt), returning 0
account_policy_get: tdb_fetch_uint32 failed for field 9 (disconnect time), returning 0
account_policy_get: tdb_fetch_uint32 failed for field 10 (refuse machine password change), returning 0
Added user cis191.
```

Misleading messages that can happen the first time a new user is added. It still works and doesn't happen again.

Logs

Samba

Step 9 Monitor log files

```
[root@elrond ~]# tail -20 /var/log/messages
Apr 23 19:27:37 elrond nmbd[327]:
Apr 23 19:27:37 elrond nmbd[327]: *****
Apr 23 20:14:39 elrond nmbd[327]: [2010/04/23 20:14:39, 0] nmbd/nmbd.c:terminate(58)
Apr 23 20:14:39 elrond nmbd[327]: Got SIGTERM: going down...
Apr 23 20:16:39 elrond nmbd[626]: [2010/04/23 20:16:39, 0] nmbd/nmbd.c:terminate(58)
Apr 23 20:16:39 elrond nmbd[626]: Got SIGTERM: going down...
Apr 23 20:18:45 elrond kernel: CIFS VFS: cifs_read_super: get root inode failed
Apr 23 20:22:04 elrond kernel: CIFS VFS: cifs_read_super: get root inode failed
Apr 23 20:22:22 elrond nmbd[677]: [2010/04/23 20:22:22, 0]
nmbd/nmbd_become_lmb.c:become_local_master_stage2(396)
Apr 23 20:22:22 elrond nmbd[677]: *****
Apr 23 20:22:22 elrond nmbd[677]:
Apr 23 20:22:22 elrond nmbd[677]: Samba name server ELROND is now a local master browser for workgroup
WORKGROUP on subnet 172.30.4.131
Apr 23 20:22:22 elrond nmbd[677]:
Apr 23 20:22:22 elrond nmbd[677]: *****
Apr 23 20:22:22 elrond nmbd[677]: [2010/04/23 20:22:22, 0]
nmbd/nmbd_become_lmb.c:become_local_master_stage2(396)
Apr 23 20:22:22 elrond nmbd[677]: *****
Apr 23 20:22:22 elrond nmbd[677]:
Apr 23 20:22:22 elrond nmbd[677]: Samba name server ELROND is now a local master browser for workgroup
WORKGROUP on subnet 192.168.2.1
Apr 23 20:22:22 elrond nmbd[677]:
Apr 23 20:22:22 elrond nmbd[677]: *****
[root@elrond ~]#
```

Samba

Step 9 Monitor log files

```
[root@elrond ~]# tail -20 /var/log/samba/nmbd.log
```

```
[2010/04/23 20:14:40, 0] nmbd/nmbd.c:main(724)
```

```
Netbios nameserver version 3.0.33-3.15.el5_4.1 started.
```

```
Copyright Andrew Tridgell and the Samba Team 1992-2008
```

```
[2010/04/23 20:16:39, 0] nmbd/nmbd.c:terminate(58)
```

```
Got SIGTERM: going down...
```

```
[2010/04/23 20:16:40, 0] nmbd/nmbd.c:main(724)
```

```
Netbios nameserver version 3.0.33-3.15.el5_4.1 started.
```

```
Copyright Andrew Tridgell and the Samba Team 1992-2008
```

```
[2010/04/23 20:22:22, 0] nmbd/nmbd_become_lmb.c:become_local_master_stage2(396)
```

```
*****
```

```
Samba name server ELROND is now a local master browser for workgroup WORKGROUP on subnet 172.30.4.131
```

```
*****
```

```
[2010/04/23 20:22:22, 0] nmbd/nmbd_become_lmb.c:become_local_master_stage2(396)
```

```
*****
```

```
Samba name server ELROND is now a local master browser for workgroup WORKGROUP on subnet 192.168.2.1
```

```
*****
```

```
[root@elrond ~]#
```

Logs

Step 9 Monitor log files

```
[root@elrond ~]# tail -20 /var/log/samba/smbd.log
192.168.2.105 (192.168.2.105) connect to service depot192 initially as user cis192 (uid=500, gid=500) (pid
30617)
[2010/04/23 05:45:43, 1] smbd/service.c:close_cnum(1239)
    192.168.2.105 (192.168.2.105) closed connection to service depot192
[2010/04/23 05:45:49, 1] smbd/service.c:make_connection_snum(1042)
    192.168.2.105 (192.168.2.105) connect to service depot192 initially as user cis192 (uid=500, gid=500)
(pid 30619)
[2010/04/23 19:22:01, 1] smbd/service.c:close_cnum(1239)
    192.168.2.105 (192.168.2.105) closed connection to service depot192
[2010/04/23 19:22:04, 0] smbd/server.c:main(944)
    smbd version 3.0.33-3.15.el5_4.1 started.
    Copyright Andrew Tridgell and the Samba Team 1992-2008
[2010/04/23 19:30:24, 1] smbd/service.c:make_connection_snum(1042)
    192.168.2.105 (192.168.2.105) connect to service depot192 initially as user cis192 (uid=500, gid=500)
(pid 504)
[2010/04/23 20:14:39, 1] smbd/service.c:close_cnum(1239)
    192.168.2.105 (192.168.2.105) closed connection to service depot192
[2010/04/23 20:14:40, 0] smbd/server.c:main(944)
    smbd version 3.0.33-3.15.el5_4.1 started.
    Copyright Andrew Tridgell and the Samba Team 1992-2008
[2010/04/23 20:16:40, 0] smbd/server.c:main(944)
    smbd version 3.0.33-3.15.el5_4.1 started.
    Copyright Andrew Tridgell and the Samba Team 1992-2008
[root@elrond bin]#
```


Security

Samba

Step 10 *Configure additional security*

- Maintain a firewall that prevents Internet access to ports 137-139 and 445
- smb.conf
 - [global] host based security example:
hosts allow = 127.0.0.1 172.30.4.0/24
hosts deny = 0.0.0.0/0
 - [global] Interface based security example:
interfaces = lo eth1
 - [share-name] User based security example:
valid users = cis192, cis192

SWAT

SWAT

Overview

SWAT (Samba Web Administration Tool) is a web base configuration tool for samba shares

- Works under xinetd super daemon.
- Install the samba-swat package on Red Hat family of systems
- Edit the `/etc/xinetd.d/swat` configuration file and set *disable=no*
- Start or restart the xinetd service
- Browse to `http://localhost:901`
- Make a backup of your `smb.conf` file because it will be modified by SWAT
- For remote access, open firewall port `tcp/901` and edit the *only_from* setting in `/etc/xinetd.d/swat`

SWAT Installation

```
[root@p32-elrond ~]# rpm -qa | grep samba-swat  
samba-swat-3.5.10-125.el6.x86_64
```

If needed, install with:

```
[root@p32-elrond ~]# yum install samba-swat
```

SWAT Configuration

```
[root@elrond samba]# cat /etc/xinetd.d/swat
# default: off
# description: SWAT is the Samba Web Admin Tool. Use swat \
#               to configure your Samba server. To use SWAT, \
#               connect to port 901 with your favorite web browser.
service swat
{
    port                = 901
    socket_type         = stream
    wait                = no
    only_from           = 127.0.0.1 172.20.0.0
    user                = root
    server              = /usr/sbin/swat
    log_on_failure      += USERID
    disable             = no
}
```

For remote access

Change to no to enable SWAT service

```
[root@elrond samba]# service xinetd start
```

```
Starting xinetd:
```

```
[ OK ]
```

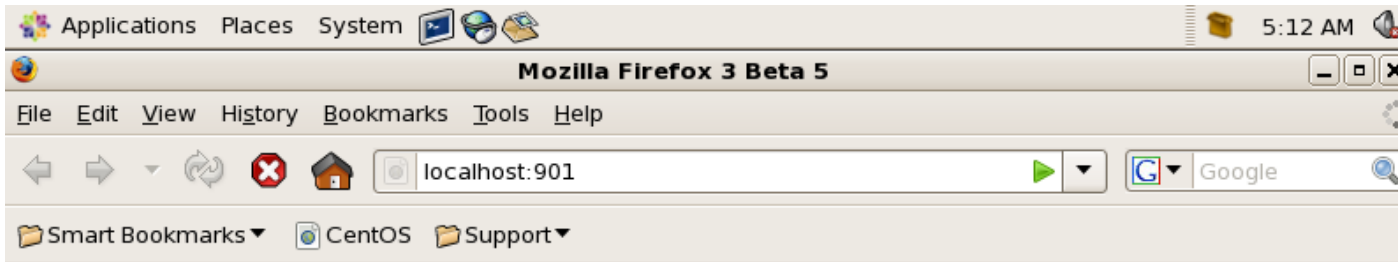
```
[root@elrond samba]#
```

SWAT Configuration (For remote access)

```
[root@p32-elrond ~]# cat /etc/sysconfig/iptables
# Generated by iptables-save v1.4.7 on Mon Apr 29 09:17:51 2013
*filter
:INPUT ACCEPT [0:0]
:FORWARD ACCEPT [6:360]
:OUTPUT ACCEPT [266:34887]
-A INPUT -m state --state RELATED,ESTABLISHED -j ACCEPT
-A INPUT -p icmp -j ACCEPT
-A INPUT -i lo -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 445 -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 139 -j ACCEPT
-A INPUT -p udp -m state --state NEW -m udp --dport 138 -j ACCEPT
-A INPUT -p udp -m state --state NEW -m udp --dport 137 -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 901 -j ACCEPT
-A INPUT -p tcp -m state --state NEW -m tcp --dport 22 -j ACCEPT
-A INPUT -j REJECT --reject-with icmp-host-prohibited
COMMIT
# Completed on Mon Apr 29 09:17:51 2013
# Generated by iptables-save v1.4.7 on Mon Apr 29 09:17:51 2013
*nat
:PREROUTING ACCEPT [3097:512470]
:POSTROUTING ACCEPT [451:42204]
:OUTPUT ACCEPT [1703:143408]
-A POSTROUTING -o eth0 -j MASQUERADE
COMMIT
# Completed on Mon Apr 29 09:17:51 2013
```


SWAT

Browse to <http://localhost:901> and login



SWAT

Home page has documentation

Applications Places System 5:14 AM

Samba Web Administration Tool - Mozilla Firefox 3 Beta 5

File Edit View History Bookmarks Tools Help

http://localhost:901/ Google

samba

HOME GLOBALS SHARES PRINTERS WIZARD STATUS VIEW PASSWORD

Welcome to SWAT!

Please choose a configuration action using one of the above buttons

Samba Documentation

- **Daemons**
 - [smbd](#) - the SMB daemon
 - [nmbd](#) - the NetBIOS nameserver
 - [winbindd](#) - the winbind daemon
- **Configuration Files**
 - [smb.conf](#) - the main Samba configuration file
 - [lmhosts](#) - NetBIOS hosts file
 - [smbpasswd](#) - SMB password file
- **Administrative Utilities**
 - [smbcontrol](#) - send control messages to Samba daemons
 - [smbpasswd](#) - managing SMB passwords
 - [SWAT](#) - web configuration tool
 - [net](#) - tool for administration of Samba and remote CIFS servers
 - [pdbedit](#) - Samba user account management tool
 - [tdbbackup](#) - Tool for backing up TDB databases
- **Client Tools**

Done

[root@elrond:/et... [VMware Tools Pr... Welcome to Cen... Samba Web Ad...

SWAT

Globals page

Applications Places System 5:14 AM

Samba Web Administration Tool - Mozilla Firefox 3 Beta 5

File Edit View History Bookmarks Tools Help

http://localhost:901/globals

samba

HOME GLOBALS SHARES PRINTERS WIZARD STATUS VIEW PASSWORD

Global Parameters

Current View Is: Basic Advanced
Change View To:

Base Options

Help	workgroup	<input type="text" value="WORKGROUP"/>	<input type="button" value="Set Default"/>
Help	realm	<input type="text"/>	<input type="button" value="Set Default"/>
Help	netbios name	<input type="text" value="ELROND"/>	<input type="button" value="Set Default"/>
Help	netbios aliases	<input type="text"/>	<input type="button" value="Set Default"/>
Help	server string	<input type="text" value="Cool Samba Server"/>	<input type="button" value="Set Default"/>
Help	interfaces	<input type="text"/>	<input type="button" value="Set Default"/>

Done

[root@elrond:/et...] [VMware Tools Pr...] Welcome to Cen... Samba Web Ad...

SWAT

Shares page where a share can be selected

The screenshot displays the Samba Web Administration Tool (SWAT) interface within a Mozilla Firefox 3 Beta 5 browser window. The browser's address bar shows the URL `http://localhost:901/shares`. The interface includes a navigation menu with options: HOME, GLOBALS, SHARES, PRINTERS, WIZARD, STATUS, VIEW, and PASSWORD. The main section is titled "Share Parameters" and shows the "Current View Is:" set to "Basic". Below this, there are "Change View To:" buttons for "Basic" and "Advanced". A "Choose Share" dropdown menu is open, displaying "depot" and "depot192". A "Create Share" button is also visible. A yellow arrow points to the "samba" logo above the interface. The bottom of the screenshot shows the Windows taskbar with several open applications, including a terminal window showing `[root@elrond:/et...]`, a VMware Tools window, and the SWAT browser window.

SWAT

Configure a specific share

Applications Places System 5:16 AM

Samba Web Administration Tool - Mozilla Firefox 3 Beta 5

File Edit View History Bookmarks Tools Help

http://localhost:901/shares

Google

samba

HOME GLOBALS SHARES PRINTERS WIZARD STATUS VIEW PASSWORD

Share Parameters

Current View Is: Basic Advanced
Change View To:

depot192

Base Options

[Help](#) comment CIS 192 files on Elrond

[Help](#) path /var/shares/depot192

Security Options

[Help](#) invalid users

Done

[root@elrond:/et... [VMware Tools Pr... Welcome to Cen... Samba Web Ad...

SWAT

Overall service status

Applications Places System 5:16 AM

Samba Web Administration Tool - Mozilla Firefox 3 Beta 5

File Edit View History Bookmarks Tools Help

http://localhost:901/status

samba

HOME GLOBALS SHARES PRINTERS WIZARD STATUS VIEW PASSWORD

Server Status

Auto Refresh

Refresh Interval: 30

version: 3.0.33-3.7.e15

smbd: running [Stop smbd] [Restart smbd]

nmbd: running [Stop nmbd] [Restart nmbd]

winbindd: not running [Start winbindd] [Restart winbindd]

[Stop All] [Restart All]

Active Connections

PID	Client	IP address	Date	Kill
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Active Shares

Done

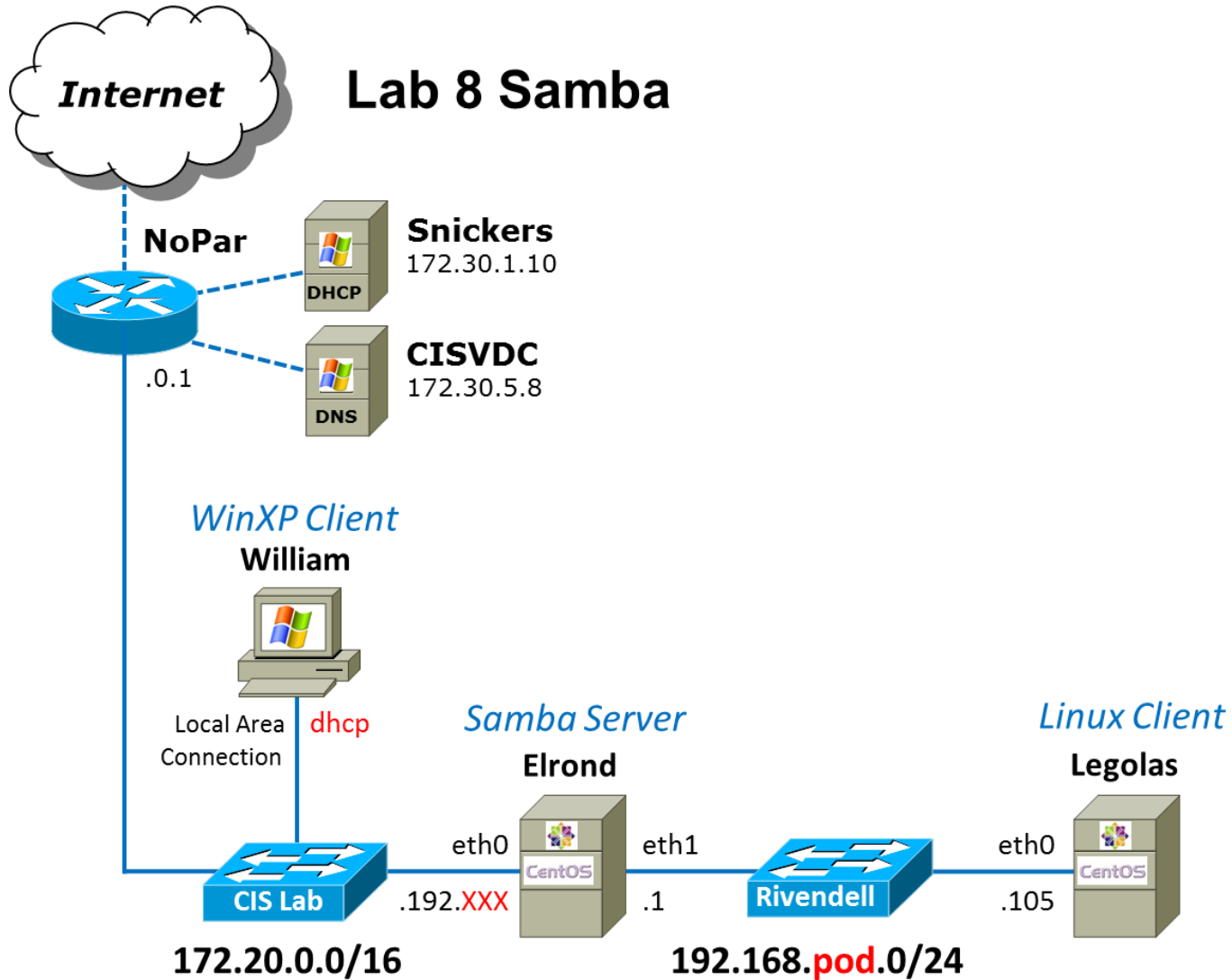
[root@elrond:/et... [VMware Tools Pr... Welcome to Cen... Samba Web Ad...

Elrond



- Install samba-swat with **yum install samba-swat**
- Edit */etc/xinetd.d/swat* and set
 - *disable=no*
 - *only_from= 127.0.0.1 172.20.0.0*
- Open TCP 901 in the firewall:
iptables -I INPUT 5 -p tcp -m state --state NEW -m tcp --dport 901 -j ACCEPT
- Start xinetd with **service xinetd start**
- Browse to SWAT at `http://<elrond IP address>:901`

Lab 8



Wrap

References

Samba

- <http://www.samba.org>
- <http://www.rxn.com/services/faq/smb/samba.history.txt>
- <http://www.samba.org/samba/docs/Samba-HOWTO-Collection.pdf>
- http://www.linuxhomenetworking.com/wiki/index.php/Quick_HOWTO:_Ch10:_Windows,_Linux,_and_Samba

Samba and the firewall

- <http://troy.jdmz.net/samba/fw/>

TDB database

- http://www.linuxtopia.org/online_books/network_administration_guides/samba_reference_guide/07_install_06.html#tdbpermfiledesc
- <http://www.centos.org/docs/4/html/rhel-rg-en-4/s1-samba-account-info-dbs.html>

Network Browsing

- <http://www.centos.org/docs/4/html/rhel-rg-en-4/s1-samba-network-browsing.html>

Share options

http://oreilly.com/catalog/samba/chapter/book/ch04_05.html

SELinux

<http://www.crypt.gen.nz/selinux/faq.html#WWW.1>

http://www.linuxtopia.org/online_books/getting_started_with_SELinux/SELinux_overview.html

New commands, daemons:

```
chcon -Rv -t samba_share_t *  
ls -lRZ  
smbclient -L computername  
smbtree  
testparm  
smbd -b | grep PRIVATE_DIR
```

Windows commands

```
net view  
net view \\computername  
net use driveletter: \\computername\sharename  
net use * /DELETE
```

Configuration files

```
/etc/samba/smb.conf
```

Windows configuration files

```
C:\WINDOWS\system32\drivers\etc\hosts
```

Next Class

Assignment: Check Calendar Page

<http://simms-teach.com/cis192calendar.php>

Lab 8 and
five posts due

Quiz questions for next class:

- What firewall ports must be opened for Samba?
- If you see the IPC\$, ADMIN\$ and C\$ shares on a server is the server most likely running Linux or Windows?
- What option on the ls command will let you view the SELinux security contexts?

Backup

Samba

I. Four main goals of Samba software

- *File and print services*
- *Authentication and authorization*
- *Name Resolution*
- *Service announcement or browsing*

II. Software downloads from www.samba.org

III. Samba may be configured for one of four security modes:

- *Share - no user-level authentication required*
- *User - Authenticates against the local /etc/passwd file*
- *Server - Uses a Microsoft server for its accounts database*
- *Domain - Uses a Domain Controller to authenticate the incoming user*

Samba

IV. Microsoft networking concepts

- *NetBIOS - Network Basic Input Output System*
- *SMB - Server Message Blocks protocol - performs file and print sharing*
- *NMB - Name Message Blocks - name resolution and browsing functions*

V. Connecting to Microsoft systems

- ***smbclient*** - used to list and connect to shares on an MS client
smbclient -L Servername -U account%password
smbclient //Servername/sharename -U account[%password]
- *smb interpreter: cd, ls, get, put, mget, mput, md, lcd, !*

Samba

VI. Mounting a remote file share

For a persistent share, you can mount a remote filesystem with:

- *mount -t smbfs -o username=username,password=password
//servername/sharename /mntpoint*
- *smbmount //servername/sharename /mntpoint -o username=username*

VII. Configuring the Samba software

- *rpm -qi samba*
- *smb.conf:*
 - *Global Section - server-wide parameters*
 - *Share Definitions - share listings are specified here*

Samba

VIII. Creating file shares for use with the Samba Server

- *Home directories are shared by default*
- *Each share needs a section with one or more of the following defined:*
 - comment - a descriptive comment about the share visible to those browsing*
 - path - the absolute path to the share directory on the Samba server*
 - writable - allows users connected to the share to add or modify files in the share*
 - browseable - specifies whether the share should be visible in Network Neighborhood and other share lists*