

15-441 Networks - Spring 2006 - Lab

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Due: Friday, May 3

Welcome to the Networks Lab. What is a lab? Well it is more hands on than a homework, but unlike a project, there is very little coding. The purpose is to show you how to use “real world” tools to tackle “real world” networking issues. You should not expect to spend more than 2-3 hours on this assignment.

Please read through this lab before starting it.

Lab Overview

Most of this lab can be done on “your own schedule.” Do some today, some tomorrow, some next week. However, for **QUESTION 4 and 5**, you must sign up for a 1 hour block of time to use the netclass machines 9 and 10. When you log in, please run either the `w` or `who` command to make sure you are alone on the machines; if you are not alone, please contact us. The sign up sheet will be on the door of the course secretary’s office.

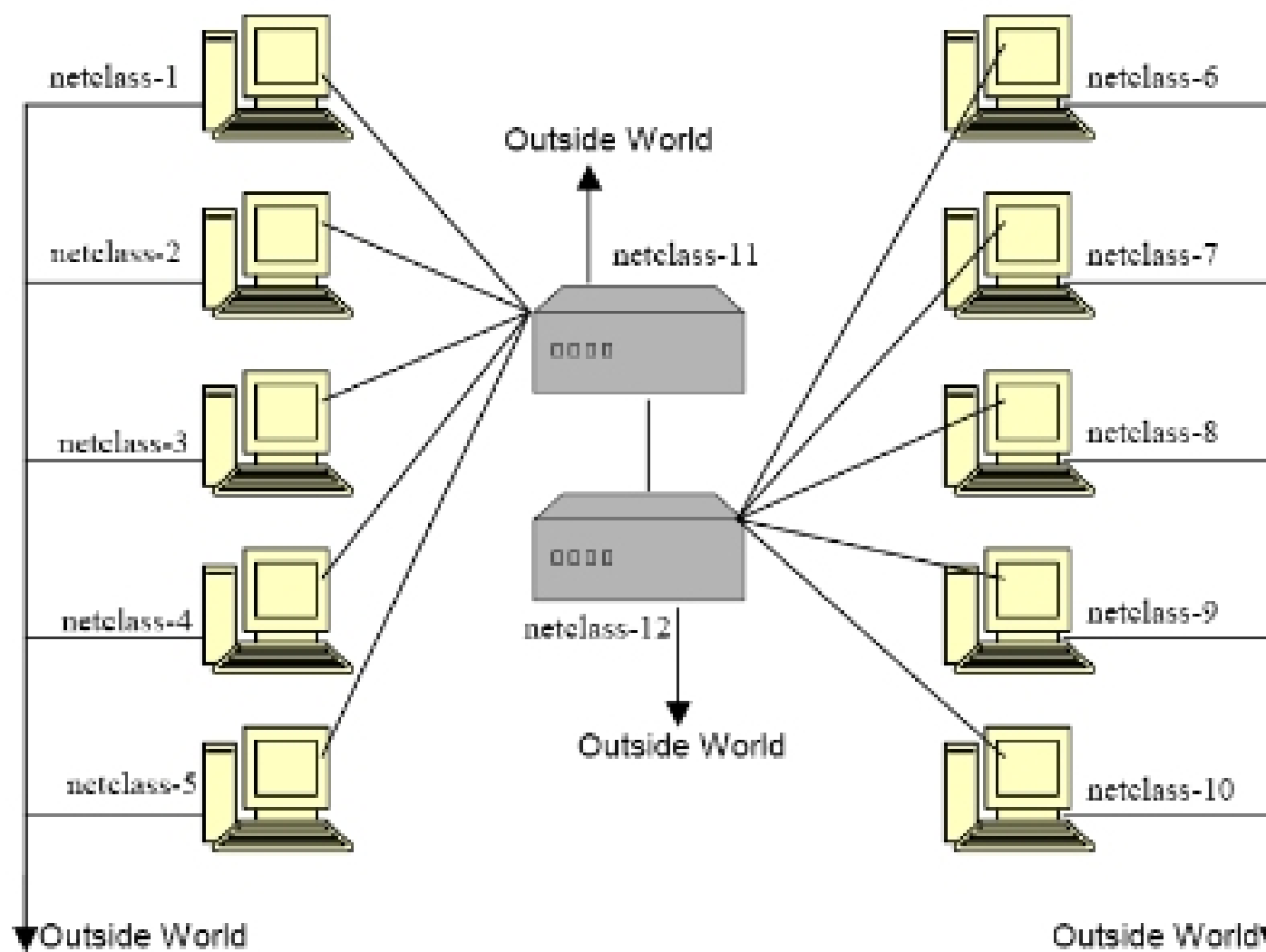
Hand-in

Please do electronic submission like we have done for previous homework assignments.

Setting Up Fish Machines

1. Create a directory in your Andrew home directory called 15-441.
2. Now you need to give access to *campusnet* so type the following:
 - a. `%fs sa /afs/andrew.cmu.edu/usr/<username> system:campusnet all`
 - b. `%fs sa /afs/andrew.cmu.edu/usr/<username>/15-441 system:campusnet all`
3. Create a file called `.klogin` inside the 15-441 folder which contains:
 - a. `username@ANDREW.CMU.EDU`
 - b. Make sure the domain suffix is capitalized.
4. Create a another file called `.login` inside the 15-441 folder which contains:
 - a. `aklog andrew.cmu.edu`
5. You cannot use unsecure telnet to connect to netclass machines. We will *only* support using SSH to connect to the netclass machines. On UNIX, the full command that you can use to login is:
 - a. `ssh -l -l username@ANDREW.CMU.EDU netclass-<Y>.intro.cs.cmu.edu`
 - b. (<Y> ranges from 1-8; note: the first flag is “one” and the second is “ell”).
6. The password is your CMU Andrew password.
7. When you are done with the lab, please make sure to perform step 2 again, but either remove all permissions or set to “1”.

The topology of the CS441 lab is shown below: (all end with .intro.cs.cmu.edu)



The lab consists of 12 PCs as shown with 2 of them (11 and 12) configured as routers and the rest configured as endpoints. As can be seen the PCs are connected to form a LAN as well as being connected to the outside world (that's how you can telnet in). This is achieved by the use of 2 interfaces on each PC – one connected to local LAN and one to the outside world. The traffic going on in the LAN is considered private traffic – it is isolated from the outside world. In order to login to these machines use your `andrew-id` and password and don't log on to 11 and 12.

Question 1: Determining Important Hardware Addresses aka *69

The hardware addresses on our LAN are 6 byte Ethernet addresses. We want to know two hardware addresses on the LAN: the address of the machine on which you are running the Analyzer (`etherreal`) and a target machine (“netclass-11” or “netclass-12”), which is emitting packets to the other machines on the LAN and from which you will be sniffing the network traffic.

1. SSH to one of the netclass machines (1-8). Use the `ping` command to contact “netclass-12.intro.cs.cmu.edu” (you may substitute “netclass-12” for this, as you are on a machine which shares the same domain, `intro.cs.cmu.edu`). `ping` will cause your local host to create an entry in its ARP cache for the hardware address of the corresponding interface on the machine named “netclass-12”.

Find the IP and Hardware addresses of “netclass-12”. Write the addresses in the spaces provided below:

IP address: _____

HW address: ____:____:____:____:____:____

2. Now we want to get the Ethernet hardware address and the IP (inet) address for *both* Ethernet interfaces on netclass-8.

netclass-8 eth0 IP address: _____ HW address: ____:____:____:____:____:____

netclass-8 eth1 IP address: _____ HW address: ____:____:____:____:____:____

3. Determine which Ethernet interface is used for the default route on netclass-8 (use the man pages as a guide to find the command to use) _____.