Instructor: **Dr. James W. Hong**	**Computer Science CS357b** **Assignment 4**	**Due: Noon** **Monday** **April 03, 1995**

This assignment is to be done individually and is worth a total of 8% of the final mark.

Configuration management is one of the network management functions. It is responsible for detecting and controlling the state of the network (for both logical and physical configurations). One of the requirements for this function is that a network administrator has access to a topological map of the network (either in an electronic or paper form). It would be really nice if such a map can be generated automatically.

Attached to the assignment is a copy of the map showing the logical topology of the UWO campus network. It shows the names of subnets and routers connecting them. One way to discover the topology of such an internet network is to use information provided by the internet domain name servers. The first part of this discovery process involves retrieving all the hosts (including routers) and their IP addresses that exist on the internet by querying the domain name servers. The second part involves determining which hosts are on which subnets and how these subnets are interconnected. The last part involves outputting the discovered topology.

You are to implement the first part of the discovery process and determine the total number of hosts on the UWO campus network. To achieve this, you may actually write a program (if you wish) or a shell script possibly containing a number of UNIX utility commands (more desirable solution!).

Hints:

- use the *nslookup* or *host* utility provided in UNIX (see man pages for what these utilities do)
- the default *host* program found on obelix lacks one feature that may be very useful. Use the *host* program found in the following directory: obelix:/gaul/s0/course/cs357/host/solaris.
- you may need to use some UNIX utilities such as *sort*, *grep*, *wc*, *etc.* (see the attached list of useful UNIX utilities and their man pages)
- the UWO campus network consists of a domain (uwo.ca – IP address 129.100) and a number of subdomains (*e.g.*, csd.uwo.ca, ccs.uwo.ca, sscl.uwo.ca, engga.uwo.ca, *etc.*)
- a router has multiple IP addresses (this should count as one host)
- since there may be one or more hosts added to the campus network on each day, the total number of hosts may not be the same from one day to the next

Submissions:

- Title page
- Table of Contents
- 1-page description of the steps (algorithm) used to find the number
- Proof of execution
- Source listing of your program or shell script (be sure to comment well)

Make sure to include my and the TA's usernames in your .rhosts file and state where your program can be found so that we can verify your program (if necessary).

Note that the first three people who can send me the solution (via e-mail) will each get a prize!!!

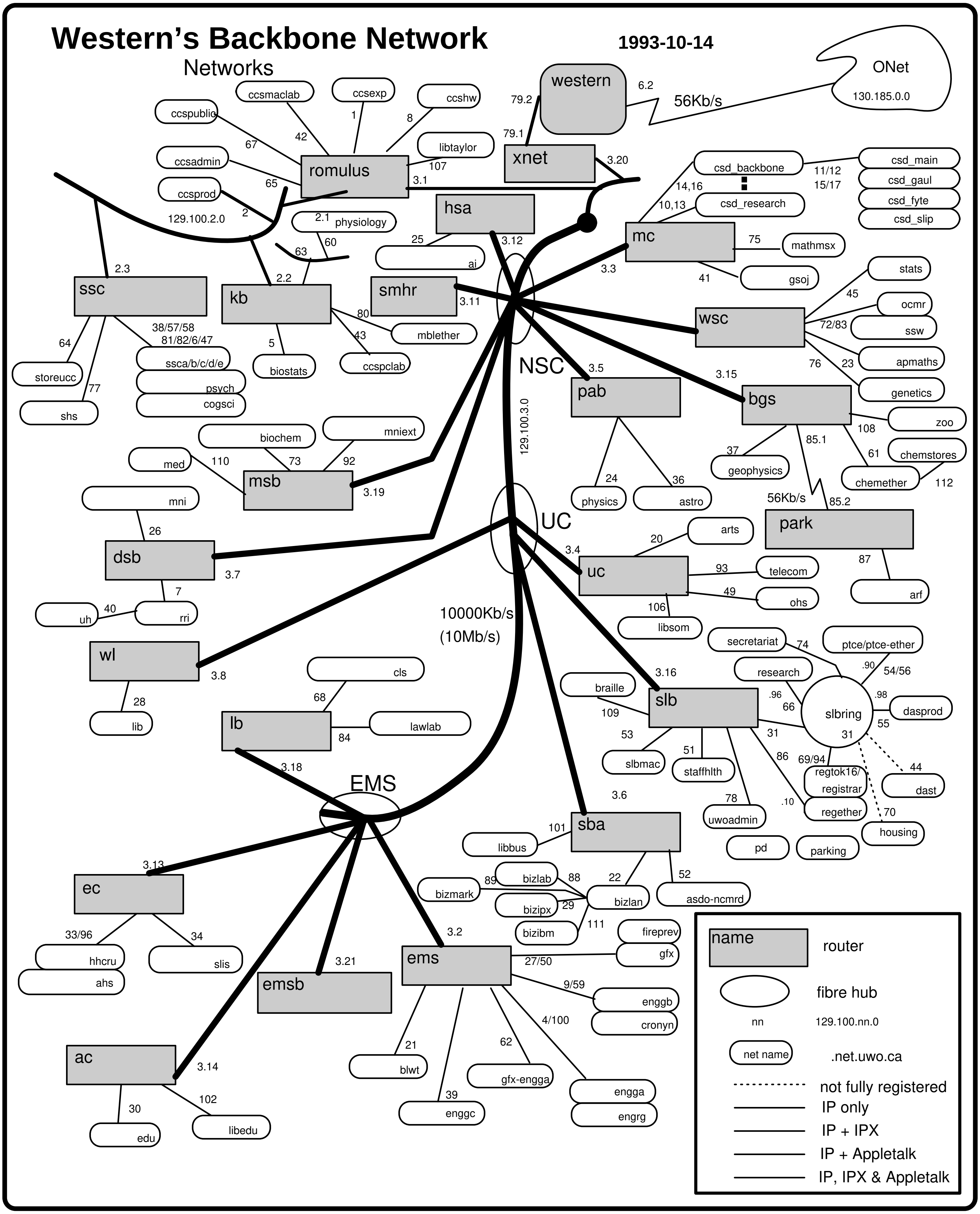
Save trees and don't put your assignment in an envelop – just staple the pages.

BONUS:

Up to 10% bonus marks will be given to a solution that will find subdomains automatically given only the domain name and find the total number of hosts. For example, you need not know the names for uwo subdomains such as csd.uwo.ca, ccs.uwo.ca, etc. Your discovery program should be able to start from uwo.ca and find all the hosts.

Your program should also work for any other campus networks if done correctly. For example, your discovery program should be able to find the total number of hosts for U of Toronto by starting with utoronto.ca and UWO by starting with uwo.ca.

Note that no bonus mark will be awarded for your effort given to this part if the regular part does not work. That is, get the regular part working before you attempt for the bonus part.


Western's Backbone Network
1993-10-14
Networks
western
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xnet
3.20
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csd_backbone
csd_research
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csd_gaul
csd_fyte
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EMS
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dasprod
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libbus
bizlab
bizmark
bizipx
bizibm
bizlan
asdo-ncmrd
fireprev
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hhcru
ahs
slis
emsb
ems
enggb
cronyn
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not fully registered
IP only
IP + IPX
IP + Appletalk
IP, IPX & Appletalk