C S E 5 1 1 C O M P U T I N G L A B - I

A D V A N C E D C O M P U T E R N E T W O R K S

I Semester, M.Tech CSE

(AUGUST 2014)

L A B M A N U A L

DEPT. OF COMPUTER SCIENCE & ENGINEERING

M. I. T., MANIPAL

2014

INSTRUCTIONS TO STUDENTS

1. Students should be regular and come prepared for the lab.
2. In case a student misses a class, it is his/her responsibility to complete that missed experiment(s).
3. Student should implement the given experiment individually, other than group experiments.
4. While conducting the experiments students should see that their lab work/ programs/simulations would meet the following criteria:
   - Lab work/programs/simulations should be interactive with appropriate comments, if any, and descriptive comments for outputs.
5. Copying Lab work/programs/simulations from other students or yesteryears is strictly prohibited and will be penalized.
6. Follow the **submission guidelines** for **report** and **code** submissions.

SUBMISSION GUIDELINES

The Report and Code submissions should be made via department portal. The deadline for submissions is on or before 2 working days from the due date. As per the policy regarding late submissions, the submissions received more than 2 working days from the due date will be marked **LATE SUBMISSION** and will be penalized. Submissions that are not made via portal, or that are in archives which do not meet the above guidelines will be penalized.

The **laboratory report** in **pdf format** for each lab should include the following items/sections:

- A cover page with your name, course information, lab number and title, and date of laboratory.
- A summary of the addressed topic and objectives of the lab.
- Implementation: a brief description of the process you followed in conducting the implementation of the lab scenarios.
- Results obtained throughout the lab implementation, the analysis of these results, and a comparison of these results with your expectations.
- Answers to the given questions at the end of the lab. If an answer incorporates new graphs, analysis of these graphs should be included here.
- A conclusion that includes what you learnt, difficulties you faced, and any suggested extensions/improvements to the lab. **Do not make the report exact copy of lab manual**.

For submission of **code** you should prepare an electronic copy of your source code and **Makefile** (do not submit compiled binaries) archived as a **.tar.gz** file that expands into a directory named after your 9-digit registration number followed by "-submission***X***". For example, if your registration number is **120948001**, your archive should expand to create a directory "**120948001submission2**" with your files inside. You can create the archive using a command such as: **tar cvzf 120948001-submission2.tar.gz 120948001-submission2/**

If your archive is formatted correctly, you should see something like the following when running the **tar ztf** command:

```
$ tar ztf 120948001-submission2.tar.gz
0301234-submission2/
0301234-submission2/Makefile
0301234-submission2/tcp_server.c
0301234-submission2/tcp_client.c
$
```

(the **120948001**-submission2/ prefix shows that the archive expands into a subdirectorynd with the appropriate name for this registration number, submission2 refers to week 2 lab).

MODE OF EVALUATION

CONTINUOUS EVALUATION [60 marks]

- 10 marks for completion of each lab as per the guidelines given for the lab, including timely report submission.

EXAM [40 marks]

Implementation[20] & Writeup[20]

CONTENTS

1. Write a program to distinguish between IPv4 and IPv6 addresses.

2. Write a program for IP checksum computation and error detection.

3. Implement a UDP echo server, chat server.

4. Implement a TCP chat server, math server.

5. Execute appropriate commands and answer the following questions.

   i. What is your machine's host name and IP address? How did you get this information?
   ii. What is the next hop router's IP address and MAC address? How did you get this information?
   iii. What is the local DNS server's host name and IP address? How did you get this information?
   iv. What do the numbers in the file /etc/protocols represent?
   v. What is the port number associated with applications: ssh, ftp, nfs,smtp (email)?

6. Design an experiment that captures only those packets that are exchanged between your machine and another specified machine.

7. Design experiments that will produce ICMP messages of the following type in a packet trace.
   - Type 0, code 0
   - Type 3, code 3
   - Type 8, code 0

8. NS-2 Simulator

9. **LAB EXAM**

REFERENCES:

1.Stevens, Fenner, and Rudoff, "Unix Network Programming volume 1: The Sockets Networking API", 3rd Edition, Addison-Wesley, 2003.

2.Relevant research papers, tutorials and other materials.