

**CS 315: Computer Networks Lab**  
**Spring 2022-23, IIT Dharwad**  
**Assignment-1**  
**Introduction to Networking Tools**  
**January 03, 2023**

<b>Lab Instructions</b>
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- Please leave your bags on the Iron shelf near the SP16 entrance.
- Login to the Ubuntu OS on your machine. The login credentials are as follows:
  - Username: user
  - Password: 123456
- Mark your attendance in the attendance sheet before leaving the lab.
- Handle the lab resources with utmost care.
- Please go through the following exercises in today's lab.
- It is recommended that you complete all the following exercises during the lab slot itself.
- If you face any difficulties, please feel free to seek help online or from your peers or TAs.
- After finishing all exercises, please carry your solutions with you (via email/pen drive) for future reference, and delete the files from the desktop.

<b>Task 1. Background</b>
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In this experiment, you will learn about some network communication utilities in Linux. When you work in a distributed environment, you need to communicate with remote users and you also need to access remote Unix machines. There are several Unix utilities that help users compute in a networked, distributed environment.

Study the following commands/utilities and learn how to use them : **ping, route, traceroute, arp, ifconfig, hostname**

Try out the following and write your understanding of the output:

(i) \$ ping [www.google.com](http://www.google.com)

(ii) \$ traceroute [www.google.com](http://www.google.com)

(iii) \$ arp

(iv) \$ ifconfig

(v) \$ hostname

(vi) Look at the following files in your linux system and write what the files are for?

**/etc/hostname;**

**/etc/hosts;**

**/etc/resolv.conf;**

**/etc/protocols;**

**/etc/services**

(Note : You can run the unix command with man to get the information regarding the command. Ex: man ifconfig)

## Task 2. Warm-up Questions

- (i) What is your machine's hostname 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 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)? How did you get this information?
- (vi) How many of these questions can you answer for the phone running on android/ios?

## Task 3. Questions

- (i) The Unix utility Ping can be used to find the RTT to various Internet hosts. Read the man page for ping, and use it to find the RTT to the following websites.

[www.amazon.in](http://www.amazon.in) and [www.iitb.ac.in](http://www.iitb.ac.in)

### Answer the following:

- (a) Explain the results that you obtain; For example, the success and failure of the Ping,
  - (b) What are the reasons for the values of RTTs that you see?
- (ii) Read the man page for the Unix utility Traceroute and use it for the website [www.amazon.in](http://www.amazon.in).

### Answer the following:

- (a) Explain what you see. Whenever successful, draw a network map from your machine to the destination, which includes the hop addresses obtained from Traceroute.
  - (b) How can you change the maximum hop number?
  - (c) What do the three timestamps signify in the result of Traceroute?
  - (d) What is the use of TTL (Time To Live) field in ICMP packets?

### Submission Guidelines:

- Write your answers in a single text/doc file, and submit its PDF named after your IIT Dharwad roll number, which contains the answers for all the questions of Task-1, 2 & 3.