Terna Engineering College

Computer Engineering Department

Program: Sem V

Course: Computer Network Lab

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LAB Manual

PART A

(PART A: TO BE REFERRED BY STUDENTS)

Experiment No. 3

A.1 Objective:

Execution of network based commands of Linux and making use of them in configuring, finding route and IP and HW addresses of source and destination..

A.2 Prerequisite:

- Linux Operating System and their basic commands.

A.3 Outcome:

After successful completion of this experiment students will be able to

- Execution of network related commands on command prompt.
- Finding and configuring the IP and HW addresses of source and destination.
- Tracing the route and Troubleshooting for NW connectivity.
- Finding the DNS, HOST and Destination machine names
- To find the Network statistics and understand the speed and the traffic on the NW.

A.4 Theory:

1. ifconfig

ifconfig (**Interface configurator**) command is used to initialize an interface, assign **IP Address** to interface and **enable** or **disable** interface on demand. With this command you can view the IP **Address** and **Hardware / MAC address** assigned to the interface and also **MTU** (**Maximum transmission unit**) size.

2. PING Command

PING (**Packet INternet Groper**) command is the best way to test connectivity between **two nodes**. Whether it is **Local Area Network** (**LAN**) or **Wide Area Network** (**WAN**). Ping uses **ICMP** (**Internet Control Message Protocol**) to communicate to other devices. You can ping host name of **ip address**

3. TRACEROUTE Command

traceroute is a network troubleshooting utility which shows the number of hops taken to reach destination and also determines packets traveling path. Below we are tracing the route to global **DNS server IP Address** and able to reach the destination also shows the path that packet is traveling.

4. NETSTAT Command

Netstat (**Network Statistic**) command display connection info, routing table information etc.

5. DIG Command

Dig (**domain information groper**) query **DNS** related information like **A Record**, **CNAME**, **MX Record** etc. This command is mainly used to troubleshoot **DNS** related queries.

6. NSLOOKUP Command

nslookup command also used to find out **DNS** related queries.

7. ROUTE Command

route command also shows and manipulates the **ip** routing table.

8. HOST Command

host command to find name to **IP** or **IP** to name in **IPv4** or **IPv6** and also query **DNS** records.

9. ARP Command

ARP (Address Resolution Protocol) is useful to **view** / **add** the contents of the kernel's **ARP tables**.

10. ETHTOOL Command

ethtool is a replacement of **mii-tool**. It is to view, setting speed and duplex of your **Network Interface Card** (**NIC**).

11. IWCONFIG Command

iwconfig command in **Linux** is used to configure a **wireless network interface**. You can see and set the basic **Wi-Fi** details like **SSID** channel and encryption.

12. HOSTNAME Command

hostname is to identify in a network. Execute **hostname** command to see the hostname of your box.

PART B

(PART B : TO BE COMPLETED BY STUDENTS)

(Students must submit the soft copy as per following segments within two hours of the practical. The soft copy must be uploaded on the Blackboard or emailed to the concerned lab in charge faculties at the end of the practical in case the there is no Black board access available)

Roll No. 50	Name: Amey Thakur
Class: TE-Comps B	Batch: B3
Date of Experiment: 30/07/2020	Date of Submission: 30/07/2020
Grade :	

B.1 Document created by the student:

(Write the answers to the questions given in section 5.1 during the 2 hours of practical in the lab here)

Refer B.5

B.3 Observations and learning:

(Students are expected to understand the selected topic. Have to list out the components & functionality. Prepare a flow of the algorithm defined in the paper. List the performance metrics that is used)

We have studied the basic networking commands in Linux.

B.4 Conclusion:

(Students must write the conclusion as per the attainment of individual outcome listed above and learning/observation noted in section B.3)

We conclude that Design and setup networking environments in Linux.

Computer Networks Laboratory Experiment - 3

Amey Thakur
TE - Comps B-50
B3

D.O.E. - 30.07.2020
D.O.S. - 30.07.2020

Q.1. Which command is used to test the connectivity ?

Ans:

- Ping is a network administration utility or tool used to test connectivity on an Internet Protocol (IP) network.
- It also measures the latency or delay between two computers.
- To test network connectivity with ping:
  Open the command prompt or Terminal.

Q.2. What is default Gateway ?

Ans:

- A default gateway serves as an access point or IP. router that a networked computer uses to send information to a computer in another network or the internet.
- Default simply means, that this gateway is used by default, unless an application specifies another gateway.
- The default server does not even need to be a router; it may be a computer with two network adapters, where one is connected to the local subnet and the other is connected to an outside network.

Q.3. What is the use of ARP?

Ans:

- ARP works between network layer 2 and 3 of the Open systems Interconnection Model. The MAC address exists on layer 2 of the OSI model, the network layer while the IP address exists on layer 3 the data link layer.
- ARP can also be used for IP over other LAN technologies such as token ring, fiber distributed data interface (FDDI) and IP over ATM
- In IPv6 which uses 128 bit addresses, ARP has been replaced by the Neighbour Discovery Protocol.

Q.4. Why class C IP addresses are assigned in an organization?

Ans:

- Class C IP addresses range from 192-223 in the first byte. They designed to be used in small size companies.
- Starting address : 192.0.0.0
  Ending address : 223.225.225.225
- The network size of the class C is purposefully designed for organization.

Q.5. How do you configure the IP address of your machine?

Ans: Steps.

① Click start menu > Control Panel > Network and sharing center.
② Click change adapter settings
③ Right click on WiFi or LAN
④ Click properties
⑤ Select IP v 4
⑥ Click Properties
⑦ select use the following IP address
⑧ Enter the IP address, Subnet mask, Default gateway and DNS server
⑨ Click OK

Q.6 Can you change the hardware address of the NIC?

Ans:

- Yes, you can change the hardware address of the NIC. since you have multiple MAC addresses for a single network card.
- Setting this address varies over different operating system.
- This can look like a unique connection but will be using the same NIC behind the scenes.

Q.7 Can you change the IP address of destination machine?

Ans:

- No, you cannot change the IP address of destination machine unless you have physical access over destination machine.

Q.8. What is routing table? State the importance of routing table.

Ans:

- A routing table is a database that keeps track of paths like a map and uses these to determine which way to forward traffic.
- A routing table is a data file in RAM that is used to store route information about directly connected and remote networks.
- A routing table contains the information necessary to forward a packet along the best path towards its destination. Each packet contains information about its origin and destination

Q.9. How Netstat will help you in troubleshooting the network.

Ans:

- Netstat (Network statistics) is a tool for troubleshooting the network connections.
- You can use netstat to find network problems and measure the amount of network traffic so it can be a helpful tool to gather the information you need to solve any outage, slow down or bottleneck issues on your network

Q.10. What are the function of DNS

Ans:

- The main function of DNS is to translate domain names into IP addresses which computers can understand
- It also provides a list of mail servers which accept Emails for each domain name.
- Each domain name in DNS will nominate a set of name servers to be authorative for its DNS records