Computer Networks

UE21CS252B

4th Semester, Academic Year 2022-23

Date:19-04-24

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Week#___6_____ Program Number: ____1___

Title of the Program

IPV4 Routing

Description: Design a network with at least 2 router networks. Host Ha should be able to communicate with Host Hd using newly assigned addresses.

Note:

1. These commands have to be executed with the super user privilege.
2. To check interface and ip address configuration issue below command line. **$ ip addr show**
3. We will not use ifconfig commands as that is deprecated.

Assigning Ip addresses to the PC's and routers using the following command

Ha: $ sudo ip addr add 172.16.10.1/24 dev eth1

$ ip addr show

R1: $ sudo ip addr add 172.16.10.201/24 dev eth1

$ sudo ip addr add 172.16.11.1/24 dev eth2

$ ip addr show

R2: $ sudo ip addr add 172.16.11.201/24 dev eth2

$ sudo ip addr add 172.16.12.1/24 dev eth1

$ ip addr show

Hd: $ sudo ip addr add 172.16.12.201/24 dev eth1

$ ip addr show

Note 1: The machines are physically on the same LAN, thus you may get ICMP redirect messages from other machines (in case you make some configuration mistakes), so as a precautionary measure disable accepting the ICMP Redirect packets. By default the linux enables accepting the ICMP redirect packets. To have precautionary measures issue below command line in Ha and Hd.

$ sudo sysctl –w net.ipv4.conf.all.accept_redirects=0

Note 2: Since machines are on same physical interface, the router is going to send ICMP redirect message disturbing the routing decision by hosts. Thus, disable sending of the ICMP redirect packets by these routers with aliased interfaces.To have precautionary measures issue below command line in R1 and R2

$ sudo sysctl –w net.ipv4.conf.all.send_redirects=0

Here we are converting Systems PC's to routers:->

Command to set the value of net.ipv4.ip_forward is as given below

2.1 R1: $ sudo sysctl –w net.ipv4.ip_forward=1
2.2 R2: $ sudo sysctl –w net.ipv4.ip_forward=1

Insert Routing Table entries on each system to direct ipv4 packets to ping across the networks

Ha:

$ sudo ip route add 172.16.12.0/24 via 172.16.10.201

$ sudo ip route add 172.16.11.0/24 via 172.16.10.201

$ ip route show

R1:

$ sudo ip route add 172.16.12.0/24 via 172.16.11.201

$ ip route show

R2:

$ sudo ip route add 172.16.10.0/24 via 172.16.11.1

$ ip route show

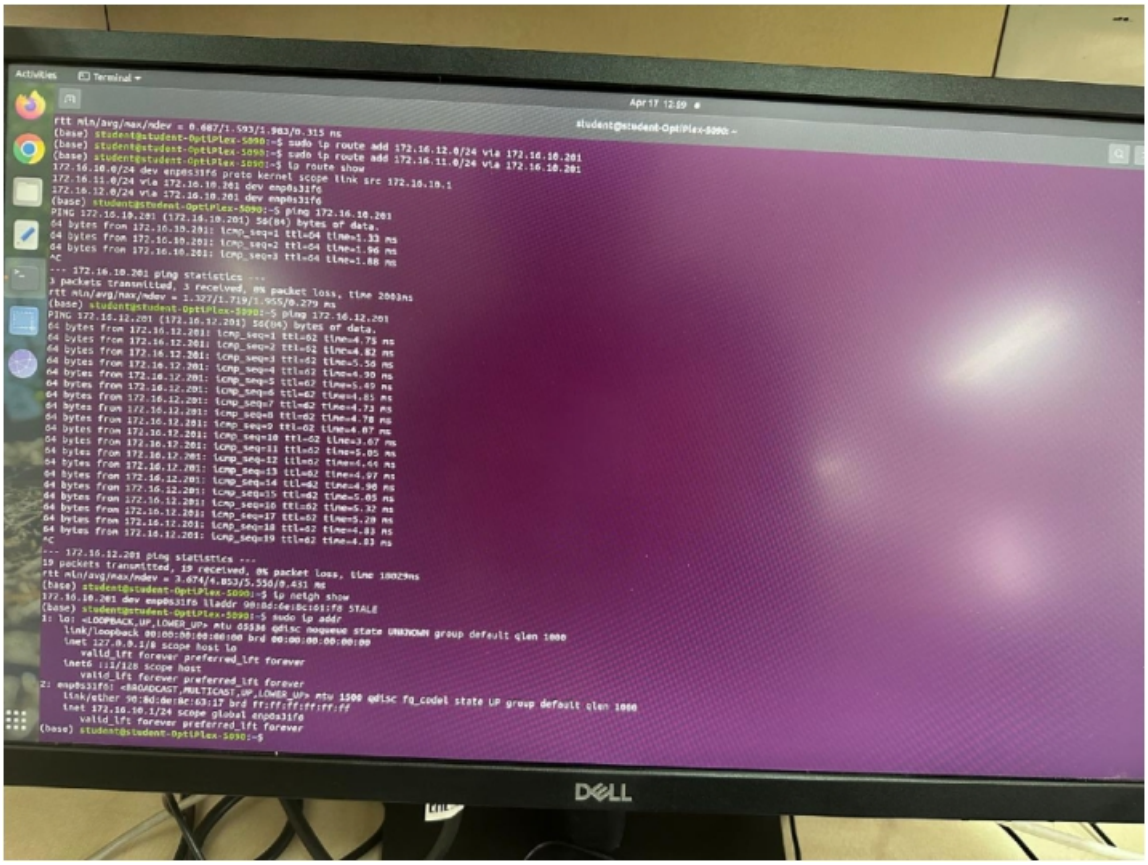
Hd: **$ sudo ip route add 172.16.10.0/24 via 172.16.12.1**

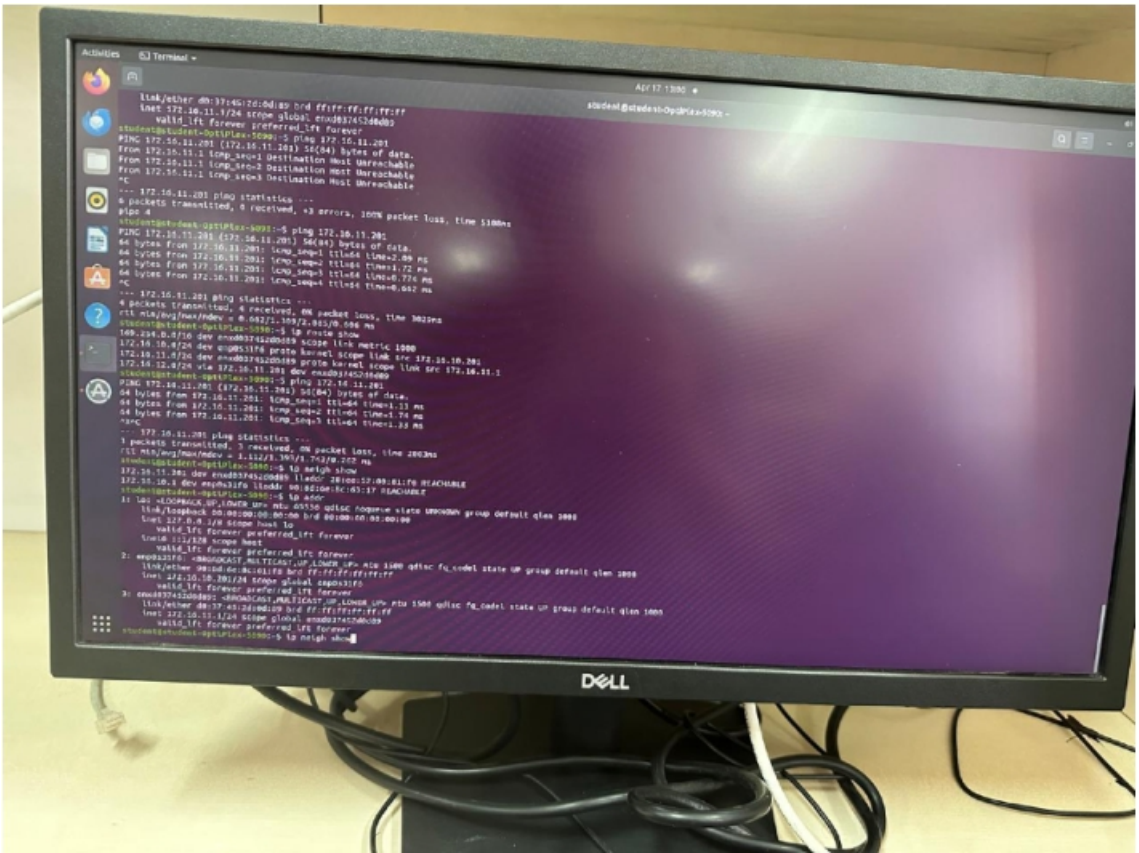
$ sudo ip route add 172.16.11.0/24 via 172.16.2.1

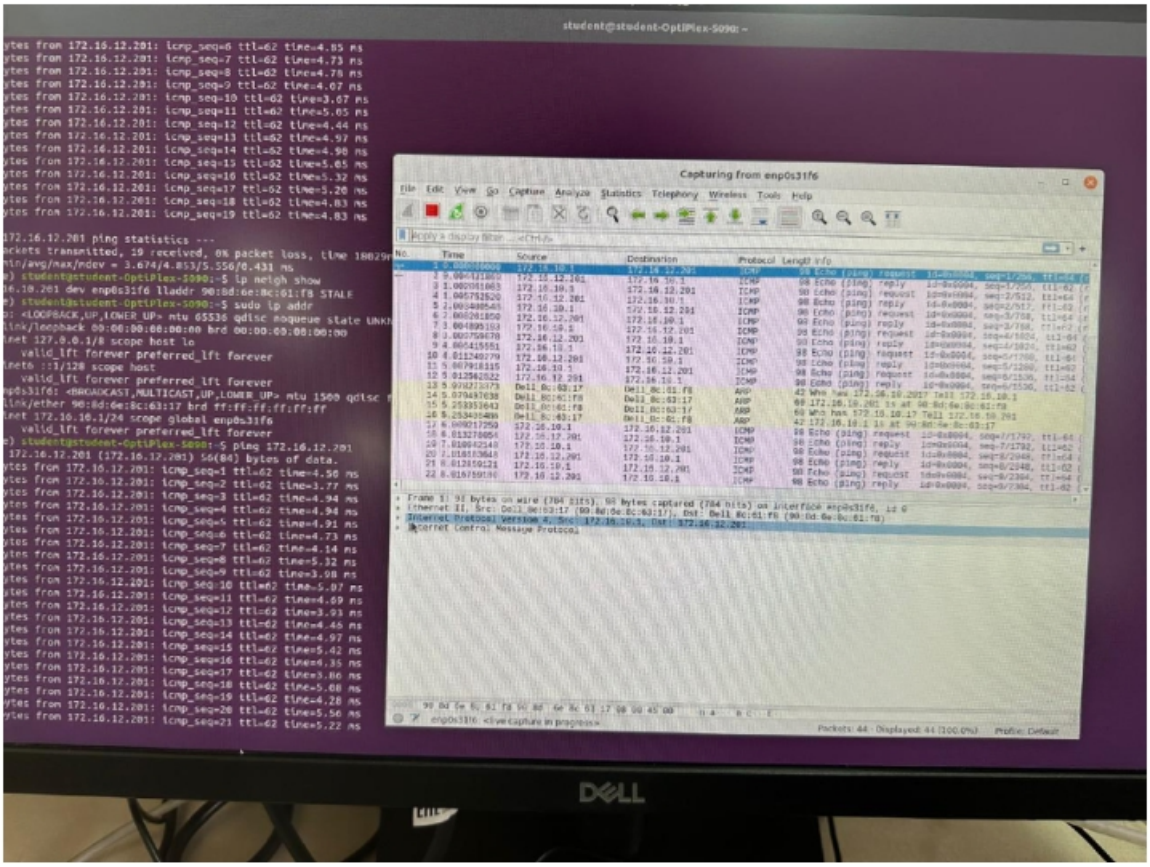
$ ip route show

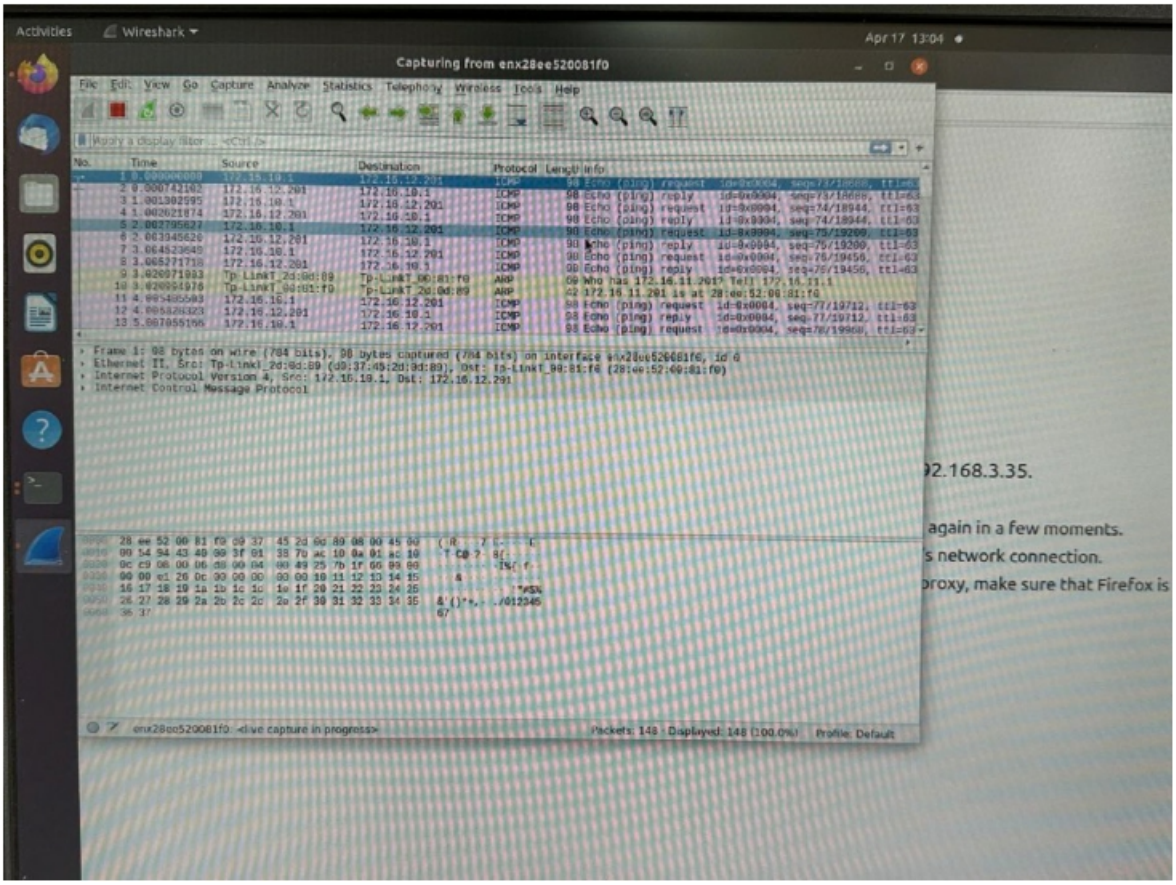
Pinging the Ip addresses and WireShark Implementation with screenShots:

->Pinging Destination address and Routers from Source

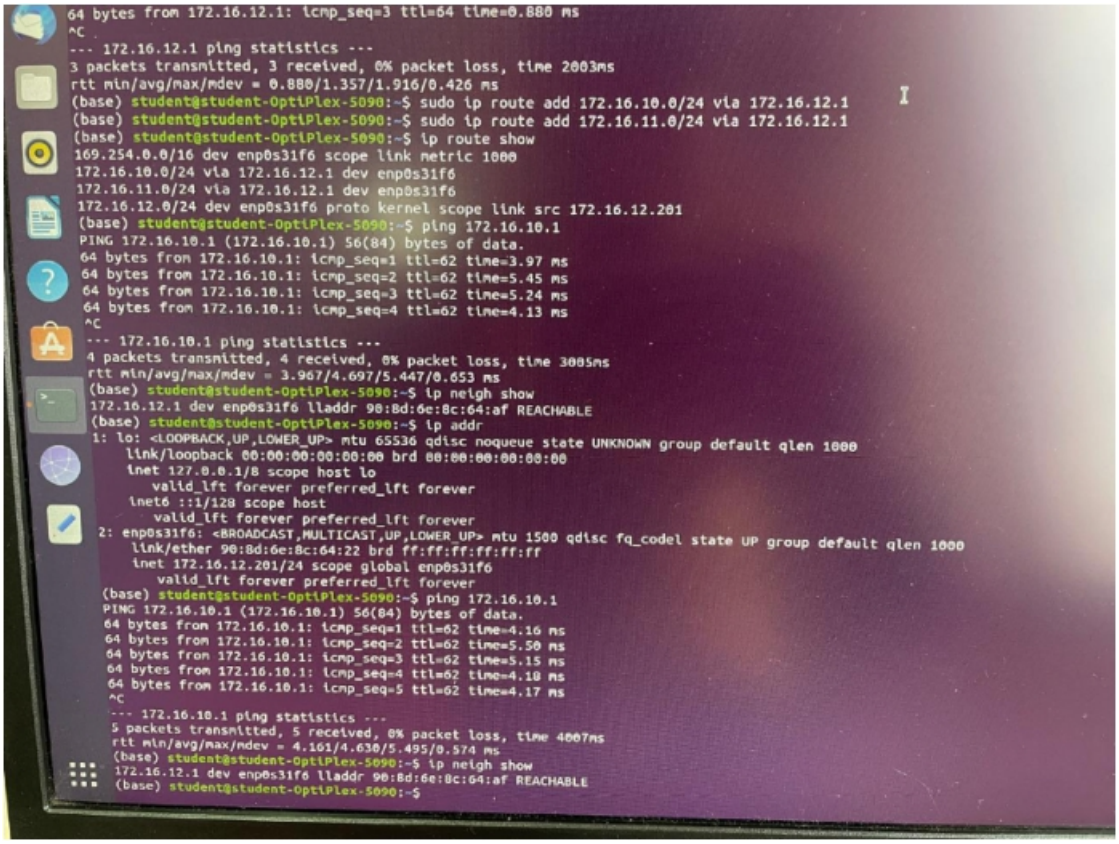


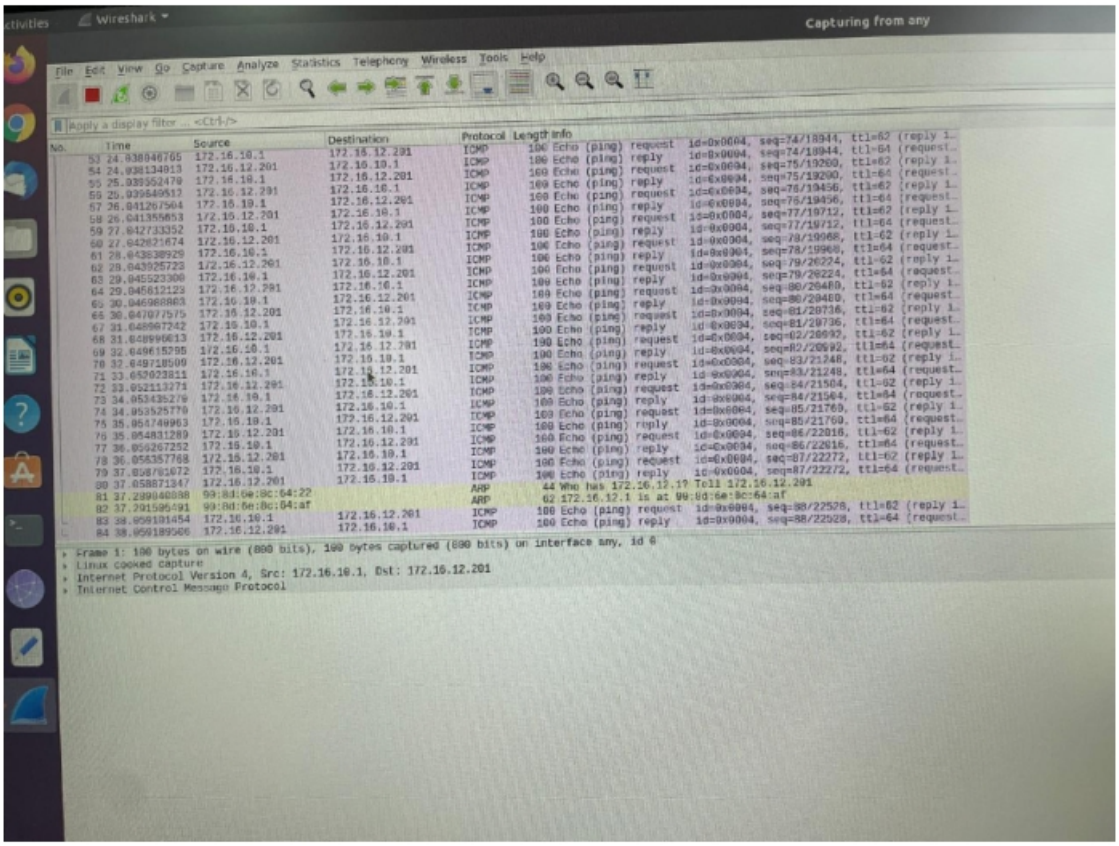



student@student-OptiPlex-5090: ~
Capturing from enp0s31f6
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
DELL


Activities
Wireshark
Apr 17 13:04
Capturing from enx28ee520081f0
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
No. Time Source Destination Protocol Length Info
Frame 1: 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on interface enx28ee520081f0, id 0
Ethernet II, Src: Tp-LinkT_2d:0d:89 (d0:37:45:2d:0d:89), Dst: Hs-LinkT_00:81:f0 (28:ee:52:00:81:f0)
Internet Protocol Version 4, Src: 172.16.10.1, Dst: 172.16.12.201
Internet Control Message Protocol
enx28ee520081f0: <live capture in progress>
Packets: 148 · Displayed: 148 (100.0%)
Profile: Default
92.168.3.35.
again in a few moments.
s network connection.
roxy, make sure that Firefox is

->Pinging Source address from Destination address:





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