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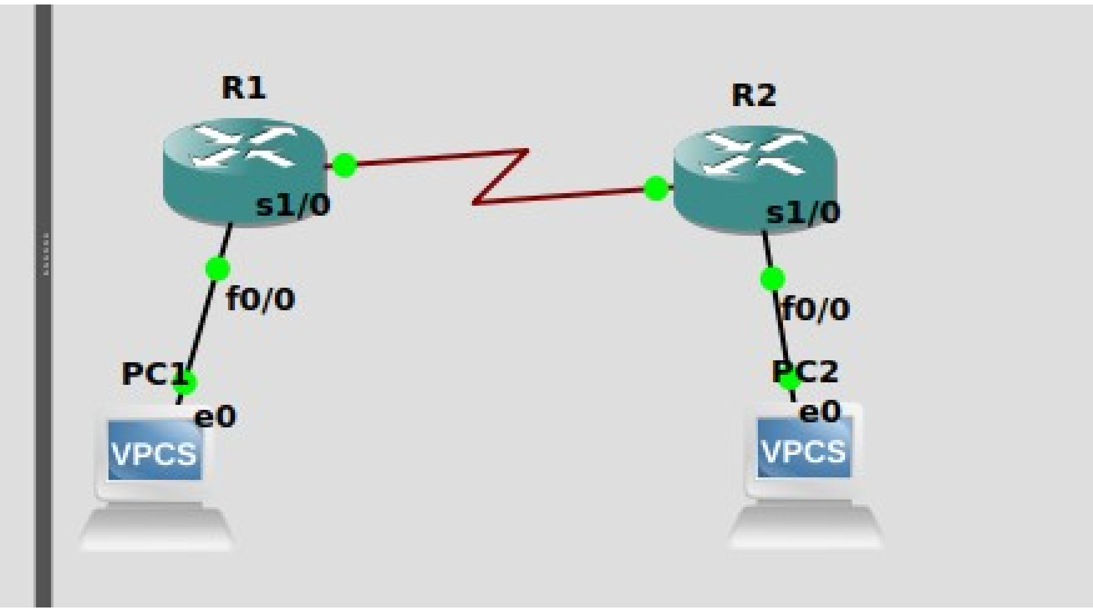
CSE-D , roll number 44

CN lab 4

Question 1)

This exercise demonstrates how to log into a router and how to work with the different Cisco
IOS command modes. It is important to understand the different modes so you know where you
are and what commands are accepted at any time.



Here is a connection of 2 routers and 2 Pcs which are communicating with each other with the help of R1 and R2.

I first constructed the topology and assigned IP addresses to every interface.

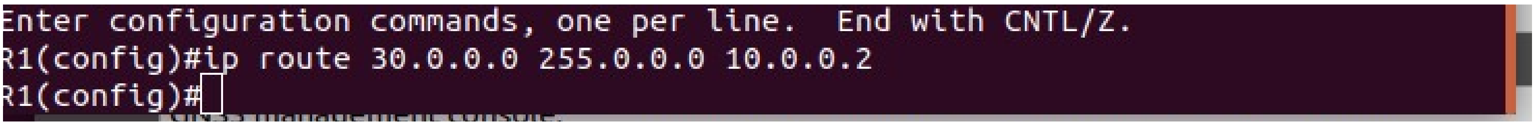
R1:
s1/0: 10.0.0.1 255.0.0.0
f0/0: 20.0.0.1 255.0.0.0

R2:
s1/0: 10.0.0.2 255.0.0.0

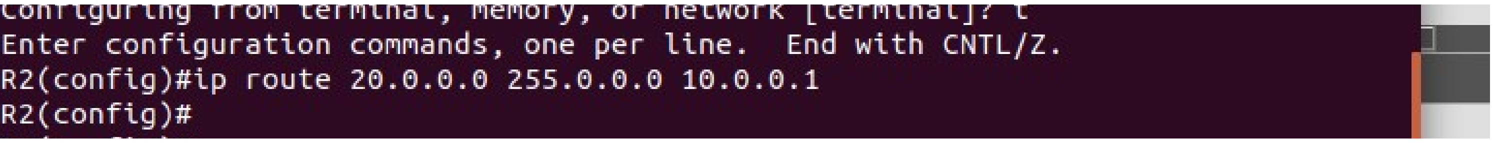
f0/0: 30.0.0.1 255.0.0.0

PC1:
20.0.0.2 Gateway: 20.0.0.1
PC2:
30.0.0.2 Gateway: 30.0.0.1

Afterwards, I tried pinging PC2 from PC1, but there was a timeout. This is because the packets are going through the gateway but not getting routed completely. For this, we need to configure the routers with the destination network and next hop’s IP address.



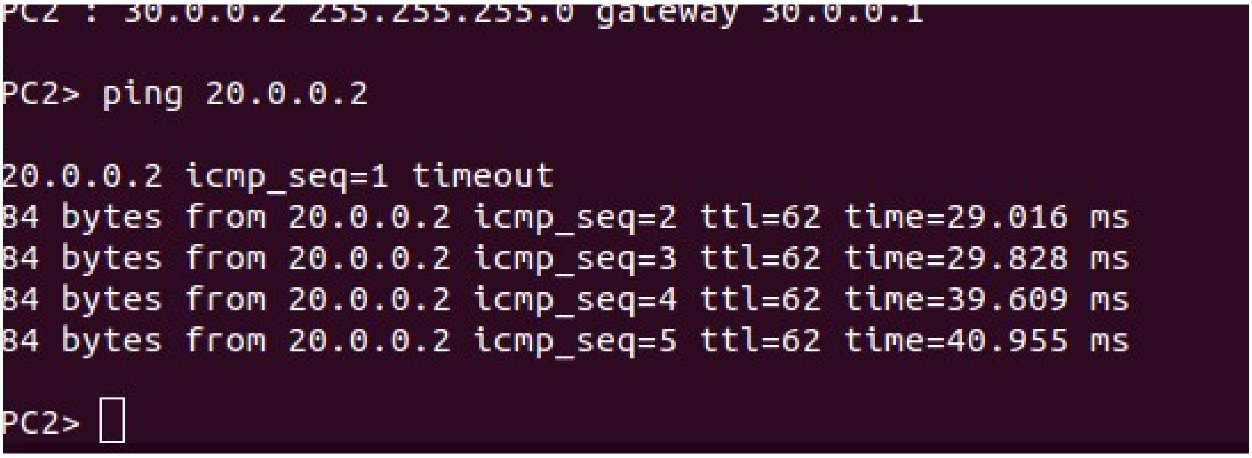
```
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#ip route 30.0.0.0 255.0.0.0 10.0.0.2
R1(config)#
```



```
Configuring from terminal, memory, or network [terminal]? t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip route 20.0.0.0 255.0.0.0 10.0.0.1
R2(config)#
```

So now, the entire route is established.

Ping PC1 from PC2 again, and this is the response:



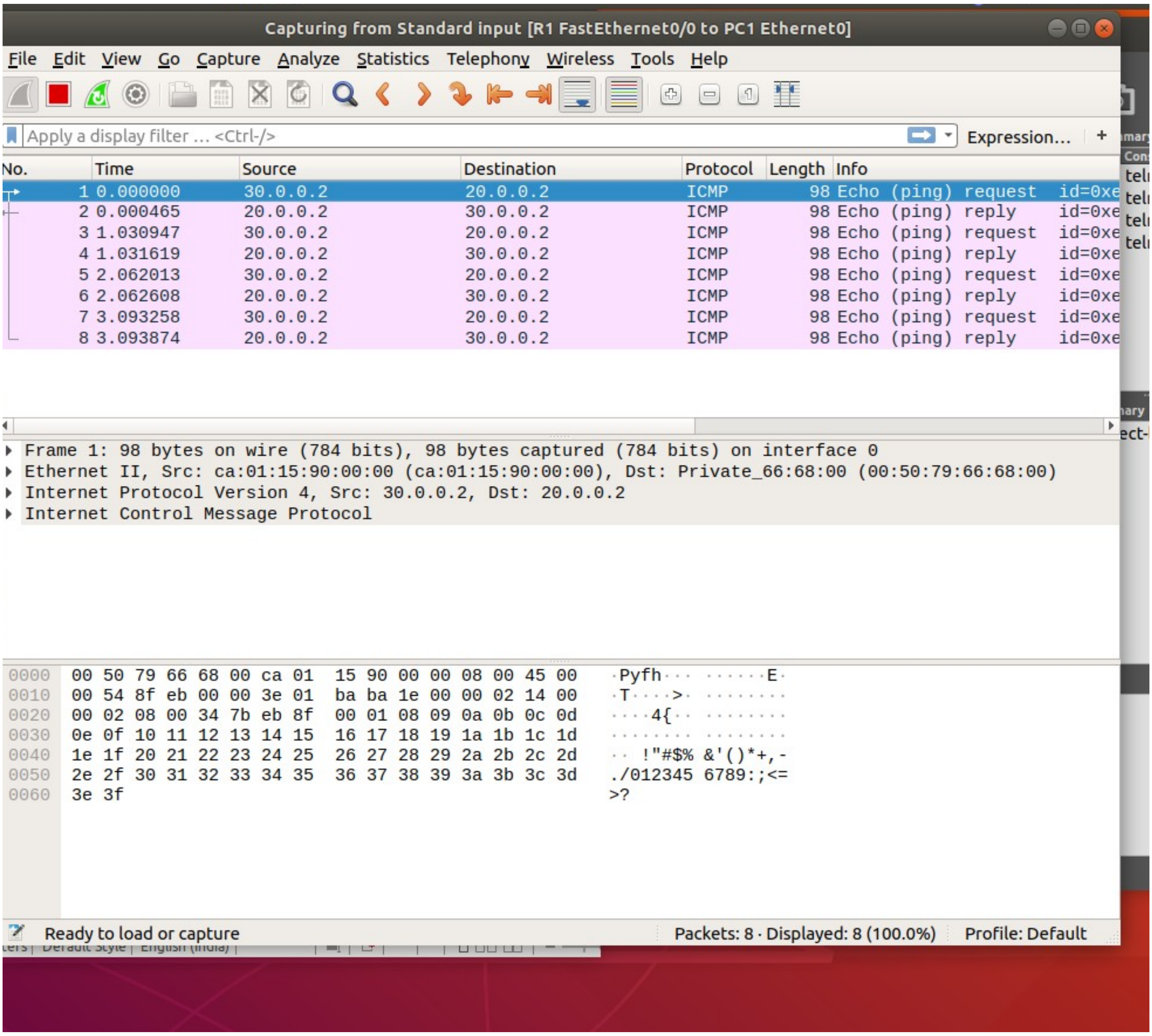
```
PC2 : 30.0.0.2 255.255.255.0 gateway 30.0.0.1

PC2> ping 20.0.0.2

20.0.0.2 icmp_seq=1 timeout
84 bytes from 20.0.0.2 icmp_seq=2 ttl=62 time=29.016 ms
84 bytes from 20.0.0.2 icmp_seq=3 ttl=62 time=29.828 ms
84 bytes from 20.0.0.2 icmp_seq=4 ttl=62 time=39.609 ms
84 bytes from 20.0.0.2 icmp_seq=5 ttl=62 time=40.955 ms

PC2>
```

In the screenshot, we can clearly see ICMP messages being passed from PC1 (20.0.0.2) to PC2(30.0.0.2). This tells us that our Pcs are communicating successfully.


Capturing from Standard input [R1 FastEthernet0/0 to PC1 Ethernet0]
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter … <Ctrl-/>
Expression…
+
Ready to load or capture
Packets: 8 · Displayed: 8 (100.0%)
Profile: Default

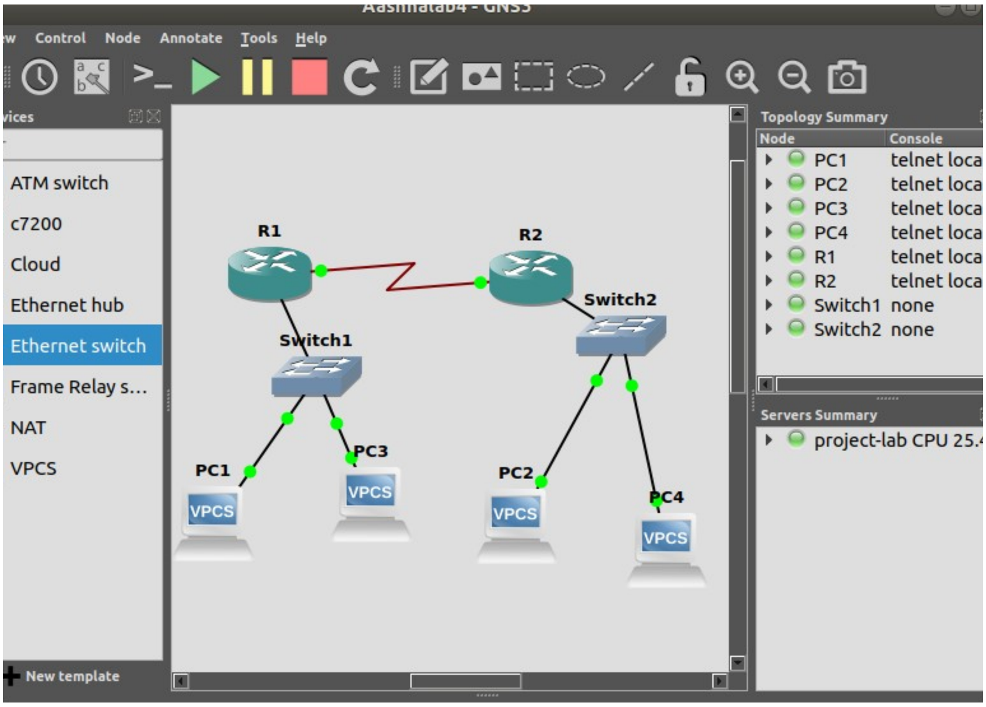
```
No.  Time       Source      Destination   Protocol  Length  Info
   1 0.000000   30.0.0.2    20.0.0.2      ICMP          98 Echo (ping) request  id=0xe
   2 0.000465   20.0.0.2    30.0.0.2      ICMP          98 Echo (ping) reply    id=0xe
   3 1.030947   30.0.0.2    20.0.0.2      ICMP          98 Echo (ping) request  id=0xe
   4 1.031619   20.0.0.2    30.0.0.2      ICMP          98 Echo (ping) reply    id=0xe
   5 2.062013   30.0.0.2    20.0.0.2      ICMP          98 Echo (ping) request  id=0xe
   6 2.062608   20.0.0.2    30.0.0.2      ICMP          98 Echo (ping) reply    id=0xe
   7 3.093258   30.0.0.2    20.0.0.2      ICMP          98 Echo (ping) request  id=0xe
   8 3.093874   20.0.0.2    30.0.0.2      ICMP          98 Echo (ping) reply    id=0xe
```

```
▸ Frame 1: 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on interface 0
▸ Ethernet II, Src: ca:01:15:90:00:00 (ca:01:15:90:00:00), Dst: Private_66:68:00 (00:50:79:66:68:00)
▸ Internet Protocol Version 4, Src: 30.0.0.2, Dst: 20.0.0.2
▸ Internet Control Message Protocol
```

```
0000  00 50 79 66 68 00 ca 01  15 90 00 00 08 00 45 00   ·Pyfh··· ······E·
0010  00 54 8f eb 00 00 3e 01  ba ba 1e 00 00 02 14 00   ·T····>· ········
0020  00 02 08 00 34 7b eb 8f  00 01 08 09 0a 0b 0c 0d   ····4{·· ········
0030  0e 0f 10 11 12 13 14 15  16 17 18 19 1a 1b 1c 1d   ········ ········
0040  1e 1f 20 21 22 23 24 25  26 27 28 29 2a 2b 2c 2d   ·· !"#$% &'()*+,-
0050  2e 2f 30 31 32 33 34 35  36 37 38 39 3a 3b 3c 3d   ./012345 6789:;<=
0060  3e 3f                                              >?
```

Question 2)

**1. Configure the below network topology as shown in Figure 7.8 and check the connectivity
by pinging from PC0 to PC2.**



Node	Console
PC1	telnet loca
PC2	telnet loca
PC3	telnet loca
PC4	telnet loca
R1	telnet loca
R2	telnet loca
Switch1	none
Switch2	none

Here is a connection of 2 routers and 4 Pcs which are communicating with each other with the help of R1 and R2. Since there are multiple Pcs on each network, we use a switch to help us forward the data to the destination device.

I first constructed the topology and assigned IP addresses to every interface.

R1:
s1/0: 10.0.0.1 255.0.0.0
f0/0: 20.0.0.1 255.0.0.0

R2:
s1/0: 10.0.0.2 255.0.0.0
f0/0: 30.0.0.1 255.0.0.0

PC1:
20.0.0.2 Gateway: 20.0.0.1
PC2:
30.0.0.2 Gateway: 30.0.0.1

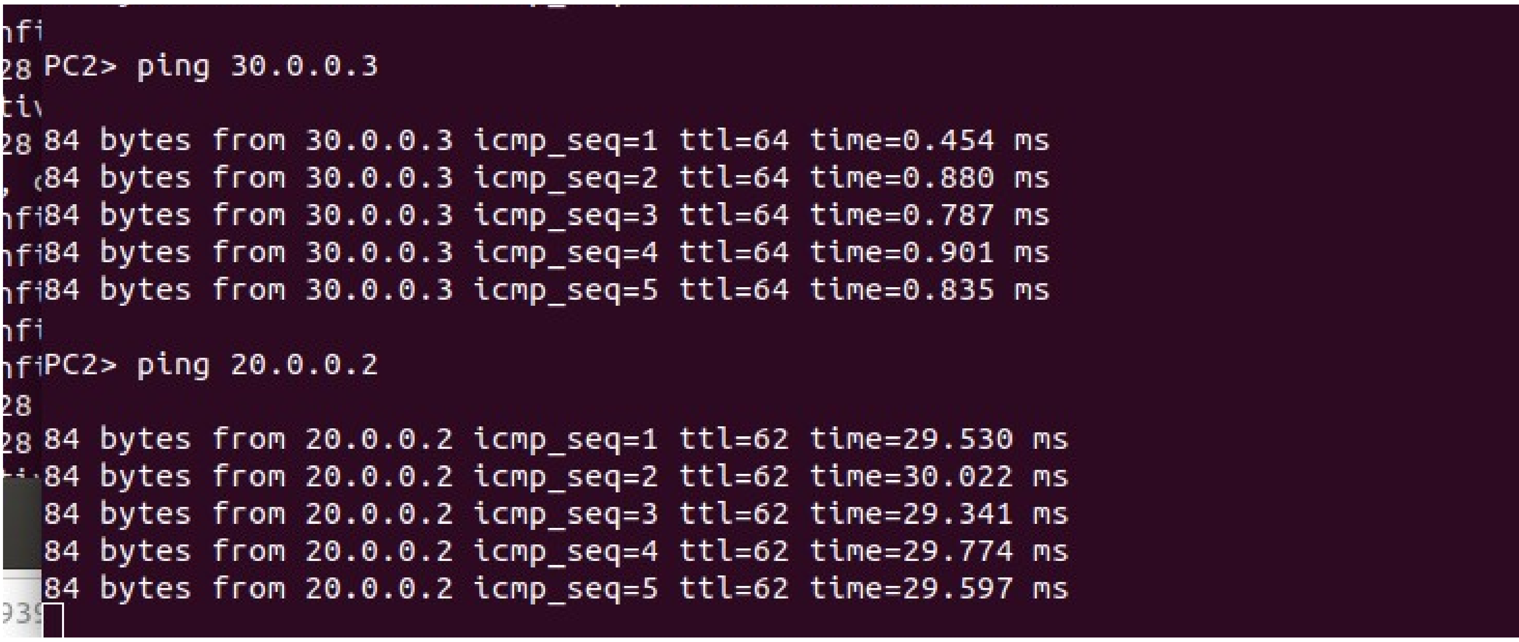
PC3:
20.0.0.3 Gateway: 20.0.0.1

PC4:
30.0.0.3 Gateway: 30.0.0.1

- Next, just like in the previous question, i configured the routers with their respective routes(destination network ID and next hop IP address).

- First, to check whether the individual network with ID 30.0.0.0 is working, I pinged PC4 (30.0.0.3) from PC32(30.0.0.2) and i could clearly see ICMP messages being exchanged between the two devices which confirmed the exchange of data.

- Next, to check whether my routers are working properly, I pinged PC1 (20.0.0.2) from PC2(30.0.0.2), and again, Wireshark showed me ICMP messages getting exchanged from address 30.0.0.2 to 20.0.0.2 and vice versa. **This means the routers, switches and overall network is working just fine.**
--- the end ---



```
PC2> ping 30.0.0.3

84 bytes from 30.0.0.3 icmp_seq=1 ttl=64 time=0.454 ms
84 bytes from 30.0.0.3 icmp_seq=2 ttl=64 time=0.880 ms
84 bytes from 30.0.0.3 icmp_seq=3 ttl=64 time=0.787 ms
84 bytes from 30.0.0.3 icmp_seq=4 ttl=64 time=0.901 ms
84 bytes from 30.0.0.3 icmp_seq=5 ttl=64 time=0.835 ms

PC2> ping 20.0.0.2

84 bytes from 20.0.0.2 icmp_seq=1 ttl=62 time=29.530 ms
84 bytes from 20.0.0.2 icmp_seq=2 ttl=62 time=30.022 ms
84 bytes from 20.0.0.2 icmp_seq=3 ttl=62 time=29.341 ms
84 bytes from 20.0.0.2 icmp_seq=4 ttl=62 time=29.774 ms
84 bytes from 20.0.0.2 icmp_seq=5 ttl=62 time=29.597 ms
```