

Submitted By:

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2018EEB1277

CS304

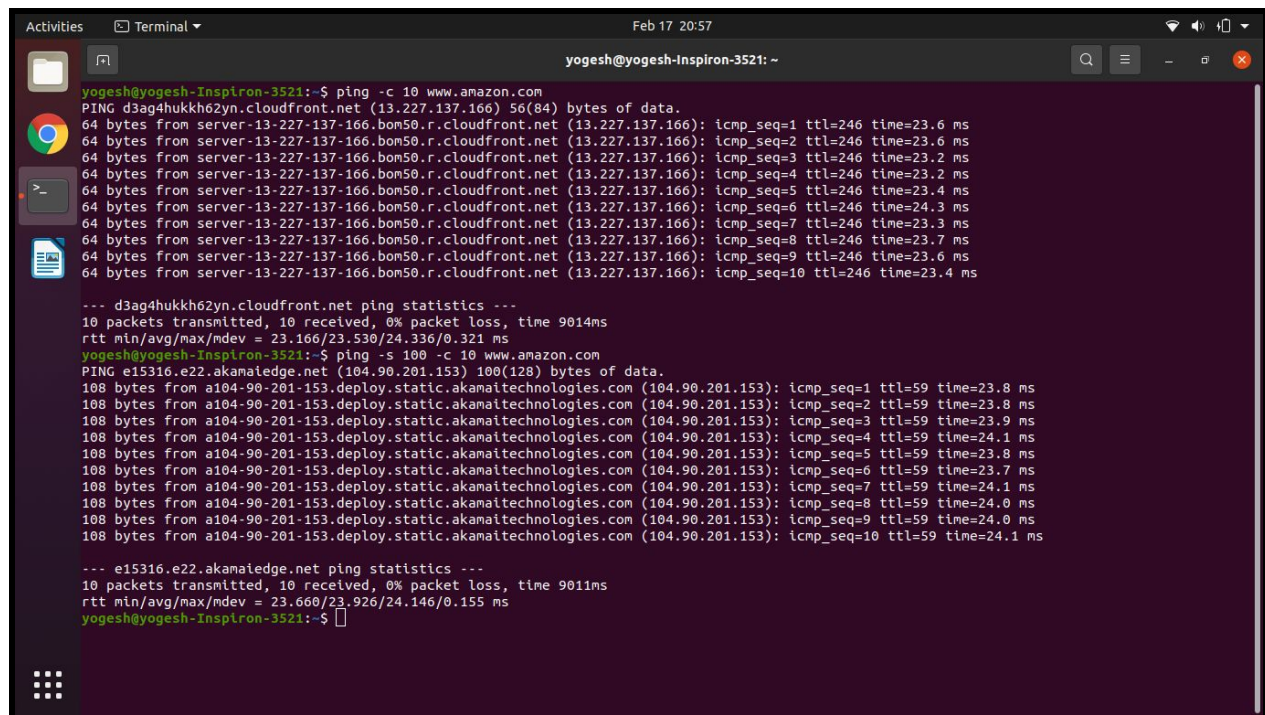
Computer Networks Lab

ASSIGNMENT-1

Question 1

Part 1:

ping Command



```
Activities Terminal Feb 17 20:57
yogesh@yogesh-Inspiron-3521: ~
yogesh@yogesh-Inspiron-3521:~$ ping -c 10 www.amazon.com
PING d3ag4hukkh62yn.cloudfront.net (13.227.137.166) 56(84) bytes of data.
64 bytes from server-13-227-137-166.bom50.r.cloudfront.net (13.227.137.166): icmp_seq=1 ttl=246 time=23.6 ms
64 bytes from server-13-227-137-166.bom50.r.cloudfront.net (13.227.137.166): icmp_seq=2 ttl=246 time=23.6 ms
64 bytes from server-13-227-137-166.bom50.r.cloudfront.net (13.227.137.166): icmp_seq=3 ttl=246 time=23.2 ms
64 bytes from server-13-227-137-166.bom50.r.cloudfront.net (13.227.137.166): icmp_seq=4 ttl=246 time=23.2 ms
64 bytes from server-13-227-137-166.bom50.r.cloudfront.net (13.227.137.166): icmp_seq=5 ttl=246 time=23.4 ms
64 bytes from server-13-227-137-166.bom50.r.cloudfront.net (13.227.137.166): icmp_seq=6 ttl=246 time=24.3 ms
64 bytes from server-13-227-137-166.bom50.r.cloudfront.net (13.227.137.166): icmp_seq=7 ttl=246 time=23.3 ms
64 bytes from server-13-227-137-166.bom50.r.cloudfront.net (13.227.137.166): icmp_seq=8 ttl=246 time=23.7 ms
64 bytes from server-13-227-137-166.bom50.r.cloudfront.net (13.227.137.166): icmp_seq=9 ttl=246 time=23.6 ms
64 bytes from server-13-227-137-166.bom50.r.cloudfront.net (13.227.137.166): icmp_seq=10 ttl=246 time=23.4 ms

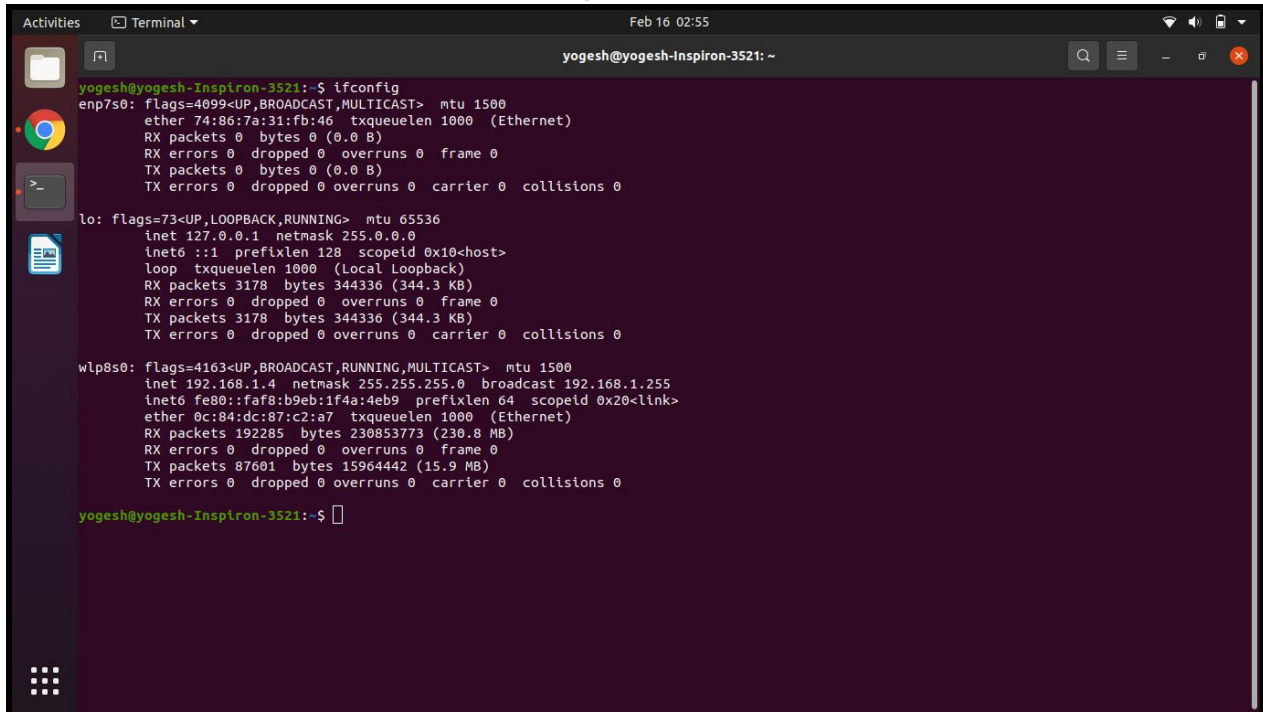
--- d3ag4hukkh62yn.cloudfront.net ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9014ms
rtt min/avg/max/mdev = 23.166/23.536/24.336/0.321 ms
yogesh@yogesh-Inspiron-3521:~$ ping -s 100 -c 10 www.amazon.com
PING e15316.e22.akamaiedge.net (104.90.201.153) 100(128) bytes of data.
108 bytes from a104-90-201-153.deploy.static.akamaitechnologies.com (104.90.201.153): icmp_seq=1 ttl=59 time=23.8 ms
108 bytes from a104-90-201-153.deploy.static.akamaitechnologies.com (104.90.201.153): icmp_seq=2 ttl=59 time=23.8 ms
108 bytes from a104-90-201-153.deploy.static.akamaitechnologies.com (104.90.201.153): icmp_seq=3 ttl=59 time=23.9 ms
108 bytes from a104-90-201-153.deploy.static.akamaitechnologies.com (104.90.201.153): icmp_seq=4 ttl=59 time=24.1 ms
108 bytes from a104-90-201-153.deploy.static.akamaitechnologies.com (104.90.201.153): icmp_seq=5 ttl=59 time=23.8 ms
108 bytes from a104-90-201-153.deploy.static.akamaitechnologies.com (104.90.201.153): icmp_seq=6 ttl=59 time=23.7 ms
108 bytes from a104-90-201-153.deploy.static.akamaitechnologies.com (104.90.201.153): icmp_seq=7 ttl=59 time=24.1 ms
108 bytes from a104-90-201-153.deploy.static.akamaitechnologies.com (104.90.201.153): icmp_seq=8 ttl=59 time=24.0 ms
108 bytes from a104-90-201-153.deploy.static.akamaitechnologies.com (104.90.201.153): icmp_seq=9 ttl=59 time=24.0 ms
108 bytes from a104-90-201-153.deploy.static.akamaitechnologies.com (104.90.201.153): icmp_seq=10 ttl=59 time=24.1 ms

--- e15316.e22.akamaiedge.net ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9011ms
rtt min/avg/max/mdev = 23.660/23.926/24.146/0.155 ms
yogesh@yogesh-Inspiron-3521:~$
```

- A. Sending 10 Packets with default ping packet size to Amazon.com
Maximum Round-Trip Time : 26.184
Minimum Round-Trip Time : 24.879
Average Round-Trip Time : 25.364
- B. Sending 10 Packets with ping packet size of 100 to Amazon.com
Maximum Round-Trip Time : 24.146
Minimum Round-Trip Time : 23.660
Average Round-Trip Time : 23.926

Part 2:

ifconfig command



```
yogesh@yogesh-Inspiron-3521:~$ ifconfig
enp7s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether 74:86:7a:31:fb:46 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 3178 bytes 344336 (344.3 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 3178 bytes 344336 (344.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlp8s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.1.4 netmask 255.255.255.0 broadcast 192.168.1.255
    inet6 fe80::faf8:b9eb:1f4a:4eb9 prefixlen 64 scopeid 0x20<link>
    ether 0c:84:dc:87:c2:a7 txqueuelen 1000 (Ethernet)
    RX packets 192285 bytes 230853773 (230.8 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 87601 bytes 15964442 (15.9 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

yogesh@yogesh-Inspiron-3521:~$
```

Description of Output:

ifconfig stands for interface configuration.

ifconfig command is used to view and change network interfaces in the system.

enp7s0 : It means en → ethernet network, p7 → bus number(7), s0 → slot number(0).

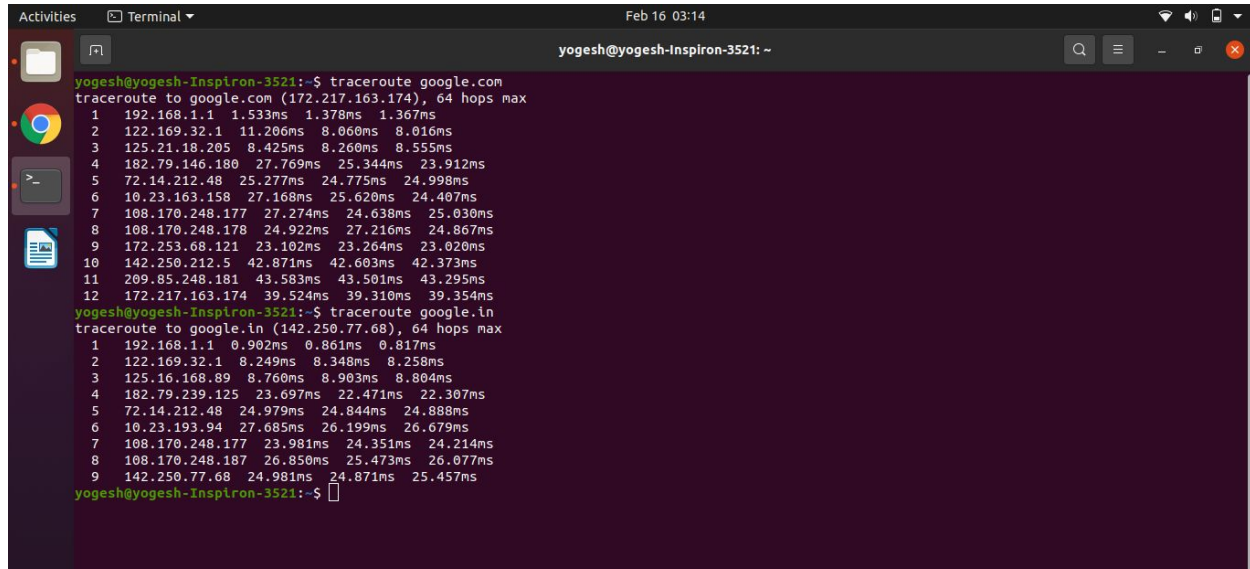
lo : It is a loopback interface. This is used by the system to communicate with itself. It is a special network interface.

wlp8s0 : It is a wireless interface. It means wl → wlan, p8 → bus number(8), s0 → slot number(0).

It also shows IPv4 address, IPv6 address, netmask, default gateway address(broadcast address) and mac address. It shows RX → received packet and TX → Transmitted packet. Error:0 means the internet is working properly.

Part 3:

traceroute command



```
yogesh@yogesh-Inspiron-3521:~$ traceroute google.com
traceroute to google.com (172.217.163.174), 64 hops max
 1  192.168.1.1  1.533ms  1.378ms  1.367ms
 2  122.169.32.1  11.206ms  8.060ms  8.016ms
 3  125.21.18.205  8.425ms  8.260ms  8.555ms
 4  182.79.146.180  27.769ms  25.344ms  23.912ms
 5  72.14.212.48  25.277ms  24.775ms  24.998ms
 6  10.23.163.158  27.168ms  25.620ms  24.407ms
 7  108.170.248.177  27.274ms  24.638ms  25.030ms
 8  108.170.248.178  24.922ms  27.216ms  24.867ms
 9  172.253.68.121  23.102ms  23.264ms  23.020ms
10  142.250.212.5  42.871ms  42.603ms  42.373ms
11  209.85.248.181  43.583ms  43.501ms  43.295ms
12  172.217.163.174  39.524ms  39.310ms  39.354ms
yogesh@yogesh-Inspiron-3521:~$ traceroute google.in
traceroute to google.in (142.250.77.68), 64 hops max
 1  192.168.1.1  0.902ms  0.861ms  0.817ms
 2  122.169.32.1  8.249ms  8.348ms  8.258ms
 3  125.16.168.89  8.760ms  8.903ms  8.804ms
 4  182.79.239.125  23.697ms  22.471ms  22.307ms
 5  72.14.212.48  24.979ms  24.844ms  24.888ms
 6  10.23.193.94  27.685ms  26.199ms  26.679ms
 7  108.170.248.177  23.981ms  24.351ms  24.214ms
 8  108.170.248.187  26.850ms  25.473ms  26.077ms
 9  142.250.77.68  24.981ms  24.871ms  25.457ms
yogesh@yogesh-Inspiron-3521:~$
```

Description of Output:

For Traceroute google.com:

Path can have a maximum number of hops of 64.

But in the current run it took a total of 12 hops. The first column is the number of hops. In 2nd column IP address of routers is shown. Traceroute sends 3 packets to google.com to trace and their latency times are shown in the 3rd, 4th, and 5th column.

Part 4:

All active TCP connections and the TCP and UDP ports on which my computer is listening (In Windows, as output was bit clear)
Command Used --> netstat -a

```
Command Prompt

C:\Users\ DELL>netstat -a

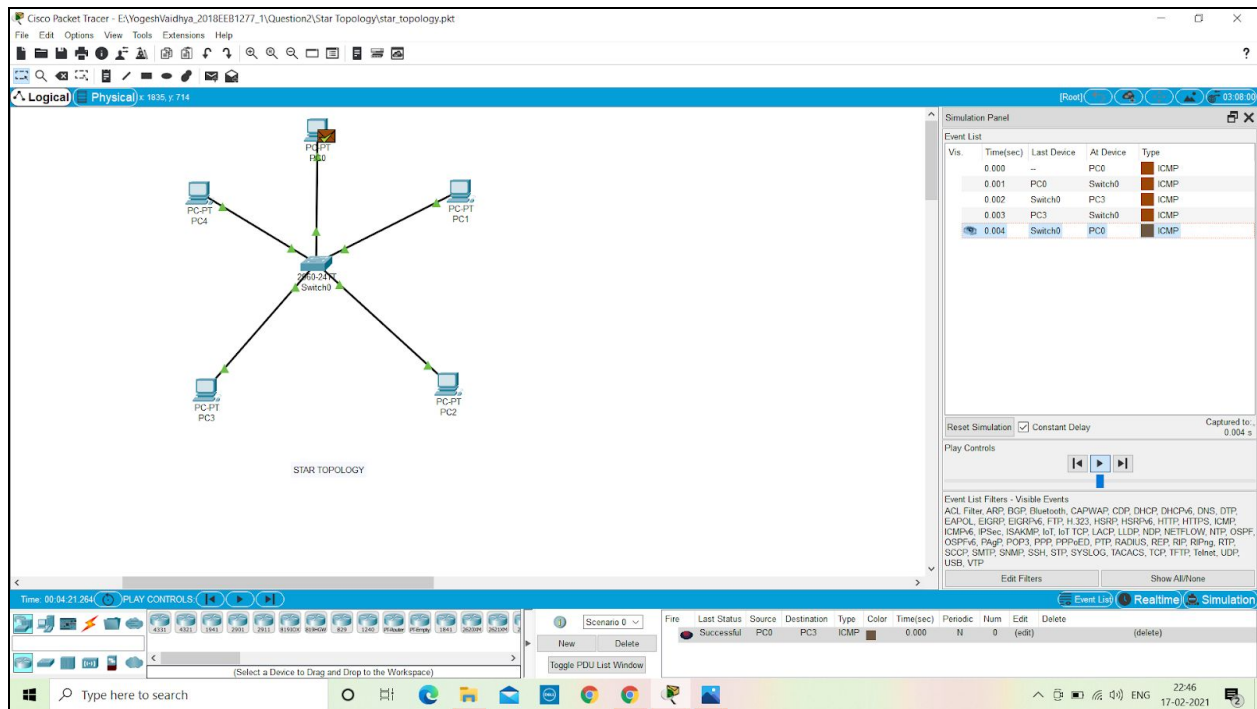
Active Connections

Proto Local Address           Foreign Address         State
TCP    0.0.0.0:135             DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:445             DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:808             DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:5040            DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:5357            DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:5432            DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:5700            DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:6646            DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:49664           DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:49665           DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:49666           DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:49667           DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:49668           DESKTOP-3OK837P:0      LISTENING
TCP    0.0.0.0:49670           DESKTOP-3OK837P:0      LISTENING
TCP    127.0.0.1:8884          DESKTOP-3OK837P:0      LISTENING
TCP    127.0.0.1:9012          DESKTOP-3OK837P:0      LISTENING
TCP    127.0.0.1:50999         DESKTOP-3OK837P:50999  ESTABLISHED
TCP    127.0.0.1:49989         DESKTOP-3OK837P:0      LISTENING
TCP    127.0.0.1:50999         DESKTOP-3OK837P:9012  ESTABLISHED
TCP    127.0.0.1:55384         DESKTOP-3OK837P:0      LISTENING
TCP    127.0.0.1:55482         DESKTOP-3OK837P:55403  ESTABLISHED
TCP    127.0.0.1:55483         DESKTOP-3OK837P:55402  ESTABLISHED
TCP    127.0.0.1:55404         DESKTOP-3OK837P:55405  ESTABLISHED
TCP    127.0.0.1:55405         DESKTOP-3OK837P:55404  ESTABLISHED
TCP    127.0.0.1:55406         DESKTOP-3OK837P:55407  ESTABLISHED
TCP    127.0.0.1:55407         DESKTOP-3OK837P:55406  ESTABLISHED
TCP    127.0.0.1:55408         DESKTOP-3OK837P:55409  ESTABLISHED
TCP    127.0.0.1:55409         DESKTOP-3OK837P:55408  ESTABLISHED
TCP    192.168.1.10:139        DESKTOP-3OK837P:0      LISTENING
TCP    192.168.1.10:49412     40.119.211.203:https   ESTABLISHED
TCP    192.168.1.10:49692     ec2-35-166-76-47:https CLOSE_WAIT
TCP    192.168.1.10:56283     sa-in-f188:5228        ESTABLISHED
TCP    192.168.1.10:57458     ec2-35-166-76-47:https CLOSE_WAIT
TCP    192.168.1.10:57562     69.173.159.63:https    ESTABLISHED
TCP    192.168.1.10:57563     218:https               ESTABLISHED
TCP    192.168.1.10:57909     bom07s20-in-f3:https   ESTABLISHED
TCP    192.168.1.10:57909     52.98.63.18:https       ESTABLISHED
TCP    192.168.1.10:57990     161.69.226.24:https     TIME_WAIT
TCP    192.168.1.10:58074     bom07s20-in-f14:https   TIME_WAIT
TCP    192.168.1.10:58080     151.101.154.110:https   ESTABLISHED
TCP    192.168.1.10:58081     162.247.243.147:https   TIME_WAIT
TCP    192.168.1.10:58122     162.247.243.147:https   TIME_WAIT
TCP    192.168.1.10:58136     whatsapp-cdn-shv-01-amy2:https ESTABLISHED
TCP    192.168.1.10:58144     whatsapp-cdn-shv-01-amy2:https TIME_WAIT
```

```
Command Prompt

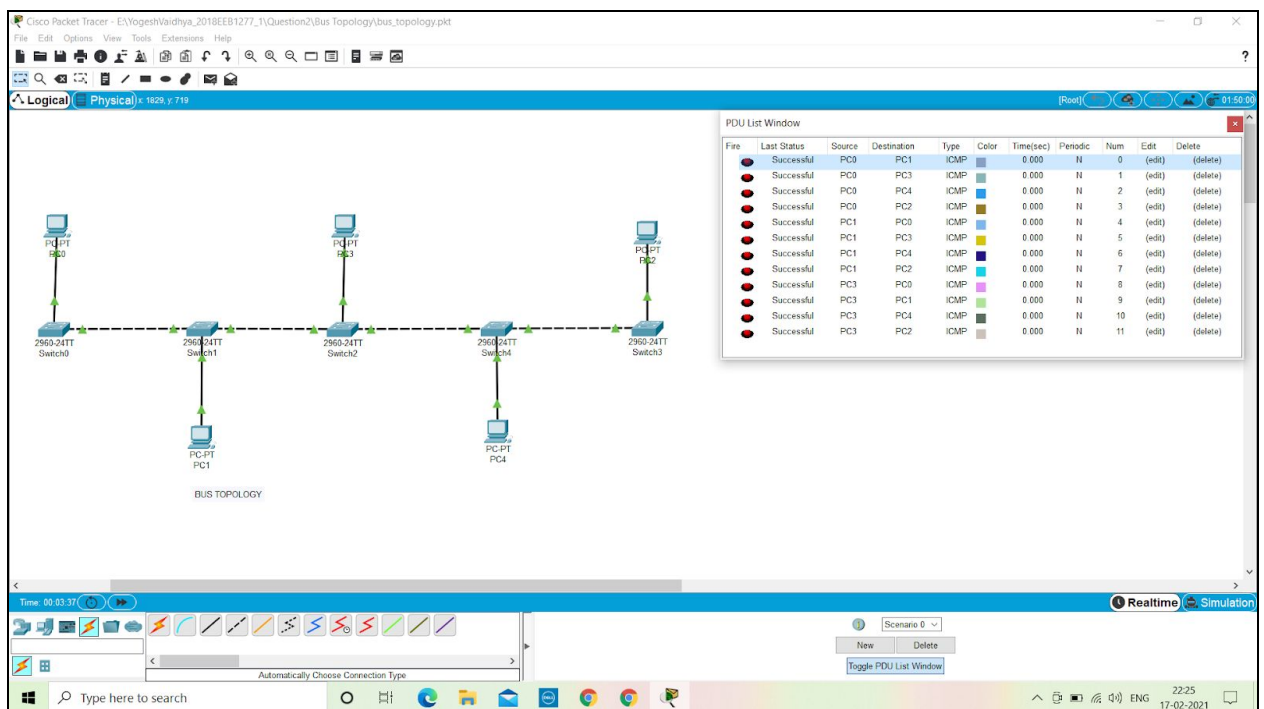
TCP    192.168.1.10:58136     whatsapp-cdn-shv-01-amy2:https ESTABLISHED
TCP    192.168.1.10:58147     whatsapp-cdn-shv-01-amy2:https TIME_WAIT
TCP    192.168.1.10:58150     server-13-227-129-99:https ESTABLISHED
TCP    192.168.1.10:58152     a23-201-221-19:https    ESTABLISHED
TCP    192.168.1.10:58152     103.231.98.193:https    ESTABLISHED
TCP    192.168.1.10:58156     e2-ha:https             TIME_WAIT
TCP    192.168.1.10:58157     a23-201-221-164:https    ESTABLISHED
TCP    192.168.1.10:58158     a23-201-221-164:https    ESTABLISHED
TCP    192.168.1.10:58161     maa03s20-in-f6:https    ESTABLISHED
TCP    192.168.1.10:58163     8:https                  ESTABLISHED
TCP    192.168.1.10:58169     maa05s09-in-f14:https    ESTABLISHED
TCP    192.168.1.10:58170     161.69.226.70:https     TIME_WAIT
TCP    192.168.1.10:58171     a23-201-220-151:https    ESTABLISHED
TCP    192.168.1.10:58172     104.208.16.0:https       TIME_WAIT
TCP    192.168.1.10:58173     whatsapp-cdn-shv-01-amy2:https TIME_WAIT
TCP    192.168.1.10:58174     bom07s16-in-f3:https     TIME_WAIT
TCP    192.168.1.10:58175     117:https                ESTABLISHED
TCP    192.168.1.10:58176     117:https                TIME_WAIT
TCP    192.168.1.10:58177     bom07s20-in-f5:https     ESTABLISHED
TCP    192.168.1.10:58182     69.173.159.63:https      TIME_WAIT
TCP    192.168.1.10:58184     bom07s16-in-f2:https     TIME_WAIT
TCP    192.168.1.10:58185     bom07s25-in-f14:https    TIME_WAIT
TCP    192.168.1.10:58186     maa03s20-in-f3:https     TIME_WAIT
TCP    192.168.1.10:58190     bom07s16-in-f3:https     ESTABLISHED
TCP    192.168.1.10:58191     bom07s25-in-f14:https    ESTABLISHED
TCP    192.168.1.10:58192     bom12s10-in-f14:https    ESTABLISHED
TCP    192.168.1.10:58193     bom07s16-in-f10:https    ESTABLISHED
TCP    192.168.1.10:58194     bom12s13-in-f10:https    ESTABLISHED
TCP    192.168.1.10:58195     bom12s13-in-f10:https    ESTABLISHED
TCP    [::]:135              DESKTOP-3OK837P:0      LISTENING
TCP    [::]:445              DESKTOP-3OK837P:0      LISTENING
TCP    [::]:808              DESKTOP-3OK837P:0      LISTENING
TCP    [::]:5357             DESKTOP-3OK837P:0      LISTENING
TCP    [::]:5432             DESKTOP-3OK837P:0      LISTENING
TCP    [::]:5700             DESKTOP-3OK837P:0      LISTENING
TCP    [::]:49664            DESKTOP-3OK837P:0      LISTENING
TCP    [::]:49665            DESKTOP-3OK837P:0      LISTENING
TCP    [::]:49666            DESKTOP-3OK837P:0      LISTENING
TCP    [::]:49667            DESKTOP-3OK837P:0      LISTENING
TCP    [::]:49668            DESKTOP-3OK837P:0      LISTENING
TCP    [::]:49670            DESKTOP-3OK837P:0      LISTENING
TCP    [::]:49669            DESKTOP-3OK837P:0      LISTENING
UDP    0.0.0.0:123           *:*
UDP    0.0.0.0:500           *:*
UDP    0.0.0.0:3702          *:*
UDP    0.0.0.0:3702          *:*
UDP    0.0.0.0:4500          *:*
UDP    0.0.0.0:5050          *:*
UDP    0.0.0.0:5353          *:*
```


STAR TOPOLOGY SIMULATION VIEW

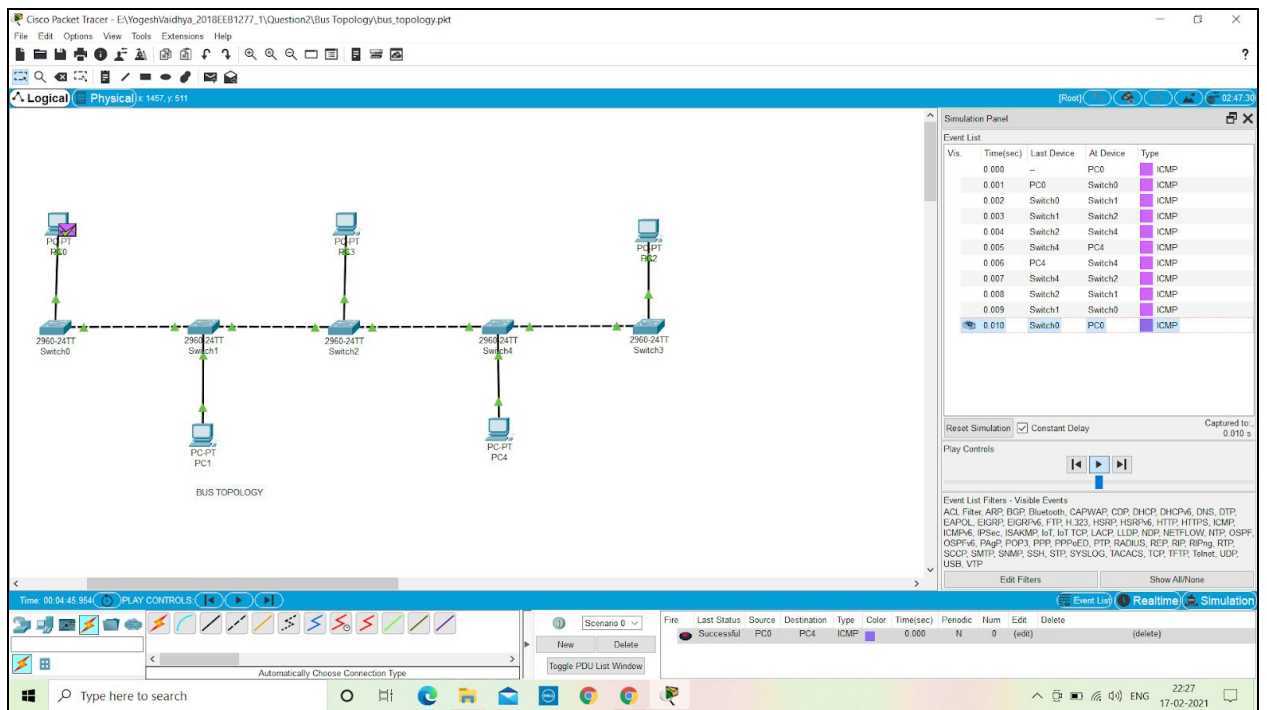


B. BUS TOPOLOGY

BUS TOPOLOGY



BUS TOPOLOGY SIMULATION VIEW



C. TREE TOPOLOGY

TREE TOPOLOGY

Cisco Packet Tracer - E:\VogeshVaidhya_2018EE1277_1\Question2\Tree Topology\Tree_Topology.pkt

File Edit Options View Tools Extensions Help

Logical Physical 884, 710

TREE TOPOLOGY

PDU List Window

File	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
Successful	PC0	PC1	ICMP	0.000	N	0	(edit)	(delete)		
Successful	PC0	PC4	ICMP	0.000	N	1	(edit)	(delete)		
Successful	PC0	PC2	ICMP	0.000	N	2	(edit)	(delete)		
Successful	PC0	PC5	ICMP	0.000	N	3	(edit)	(delete)		
Successful	PC1	PC0	ICMP	0.000	N	4	(edit)	(delete)		
Successful	PC1	PC2	ICMP	0.000	N	5	(edit)	(delete)		
Successful	PC1	PC4	ICMP	0.000	N	6	(edit)	(delete)		
Successful	PC1	PC5	ICMP	0.000	N	7	(edit)	(delete)		
Successful	PC4	PC1	ICMP	0.000	N	8	(edit)	(delete)		
Successful	PC4	PC0	ICMP	0.000	N	9	(edit)	(delete)		
Successful	PC4	PC2	ICMP	0.000	N	10	(edit)	(delete)		
Successful	PC4	PC5	ICMP	0.000	N	11	(edit)	(delete)		

Time: 00:03:00

Realtime Simulation

Scenario 0

New Delete

Toggle PDU List Window

Type here to search

22:32 17-02-2021

TREE TOPOLOGY SIMULATION VIEW

Cisco Packet Tracer - E:\VogeshVaidhya_2018EE1277_1\Question2\Tree Topology\Tree_Topology.pkt

File Edit Options View Tools Extensions Help

Logical Physical 1395, 453

TREE TOPOLOGY

Simulation Panel

Event List

Vis	Time(sec)	Last Device	At Device	Type
0.000	PC5	Switch5	ICMP	
0.001	PC5	Switch5	ICMP	
0.002	Switch5	Switch2	ICMP	
0.003	Switch2	Switch0	ICMP	
0.004	Switch0	Switch1	ICMP	
0.005	Switch1	PC1	ICMP	
0.006	PC1	Switch1	ICMP	
0.007	Switch1	Switch0	ICMP	
0.008	Switch0	Switch2	ICMP	
0.009	Switch2	Switch5	ICMP	
0.010	Switch5	PC5	ICMP	

Reset Simulation ☒ Constant Delay Captured to: 0.010 s

Play Controls

Event List Filters - Visible Events

ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, ISOT, ISOTv6, LACP, LLDP, NBP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPng, RTP, SCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TFTP, Telnet, UDP, USB, VTP

Edit Filters Show All/None

Time: 00:04:34.244

PLAY CONTROLS

Scenario 0

New Delete

Toggle PDU List Window

Type here to search

22:35 17-02-2021