

Practical No. 4

OBJECTIVE: Use Wireshark to view Network Traffic.

Theory:

Wireshark is a popular open-source packet analyzer used for network troubleshooting, analysis, development, and education. It captures and displays network packets in real-time and allows users to inspect them at a granular level. Wireshark supports various protocols and provides detailed information about network traffic, aiding in diagnosing network problems, detecting security vulnerabilities, and understanding network behaviour. It's widely used by network administrators, security professionals, developers and students to analyze and troubleshoot network issues.

1. Open Command Prompt and ping any IP address or Website.

```
C:\Windows\System32>ping www.google.com

Pinging www.google.com [142.250.193.196] with 32 bytes of data:
Reply from 142.250.193.196: bytes=32 time=474ms TTL=57
Reply from 142.250.193.196: bytes=32 time=1249ms TTL=57
Reply from 142.250.193.196: bytes=32 time=362ms TTL=57
Reply from 142.250.193.196: bytes=32 time=1386ms TTL=57

Ping statistics for 142.250.193.196:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 362ms, Maximum = 1386ms, Average = 867ms

C:\Windows\System32>
```

2. Start capturing the Ethernet frames in WireShark.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	172.25.0.167	172.16.4.91	TCP	1514	[TCP segment of a reassembled PDU]
2	0.000000	172.25.0.65	172.16.4.91	TCP	1514	[TCP segment of a reassembled PDU]
3	0.000044	172.16.4.91	172.25.0.167	TCP	74	53523 → 7680 [ACK] Seq=1461 Win=513 Len=0 SLE=21901 SRE=26281 SLE=10221 SRE=18981
4	0.000085	172.16.4.91	172.25.0.65	TCP	66	53306 → 7680 [ACK] Seq=1 Ack=4294954157 Win=1026 Len=0 SLE=4294955617 SRE=1461
5	0.013961	172.16.4.91	172.17.4.29	TCP	54	53280 → 7680 [ACK] Seq=1 Ack=1 Win=1026 Len=0
6	0.013965	172.16.4.91	103.59.199.211	TCP	66	53610 → 80 [ACK] Seq=1 Ack=1 Win=11 Len=0 TSval=782096093 TSecr=2069234471
7	0.013991	172.16.4.91	103.59.199.210	TCP	66	53748 → 80 [ACK] Seq=1 Ack=1 Win=11 Len=0 TSval=782096093 TSecr=3638663363
8	0.015580	172.25.0.167	172.16.4.91	TCP	1514	[TCP segment of a reassembled PDU]
9	0.015580	172.25.0.65	172.16.4.91	TCP	1514	[TCP segment of a reassembled PDU]
10	0.015580	172.25.0.167	172.16.4.91	TCP	1514	7680 → 53523 [ACK] Seq=2921 Ack=1 Win=8194 Len=1460 [TCP segment of a reassembled PDU]
11	0.015580	172.25.0.65	172.16.4.91	TCP	1514	[TCP segment of a reassembled PDU]
12	0.015580	172.25.0.167	172.16.4.91	TCP	1163	7680 → 53523 [ACK] Seq=4381 Ack=1 Win=8194 Len=1107 [TCP segment of a reassembled PDU]
13	0.015580	172.29.2.24	172.16.4.91	TCP	1514	7680 → 53491 [ACK] Seq=1 Ack=1 Win=512 Len=1460 [TCP segment of a reassembled PDU]
14	0.015580	172.29.2.24	172.16.4.91	TCP	1514	7680 → 53491 [ACK] Seq=1461 Ack=1 Win=512 Len=1460 [TCP segment of a reassembled PDU]
15	0.015580	172.29.2.24	172.16.4.91	TCP	1514	7680 → 53491 [ACK] Seq=2921 Ack=1 Win=512 Len=1460 [TCP segment of a reassembled PDU]
16	0.015580	172.25.0.167	172.16.4.91	TCP	1514	7680 → 53523 [PSH, ACK] Seq=5488 Ack=1 Win=8194 Len=1460 [TCP segment of a reassembled PDU]
17	0.015580	172.25.0.167	172.16.4.91	TCP	1514	[TCP segment of a reassembled PDU]
18	0.015580	172.25.0.167	172.16.4.91	TCP	407	7680 → 53523 [ACK] Seq=9868 Ack=1 Win=8194 Len=353 [TCP segment of a reassembled PDU]
19	0.015580	172.29.2.24	172.16.4.91	TCP	1514	7680 → 53491 [ACK] Seq=4381 Ack=1 Win=512 Len=1460 [TCP segment of a reassembled PDU]
20	0.015580	172.28.1.100	172.16.4.91	TCP	66	7680 → 53493 [ACK] Seq=1 Ack=1 Win=512 Len=0 SLE=4294967288 SRE=1

3. Click on any ICMP frame to view it.

No.	Time	Source	Destination	Protocol	Length	Info
3667	11.144453	172.29.0.131	172.16.4.91	TCP	1514	7680 → 53488 [ACK] Seq=236531 Ack=10 Win=1025 Len=1460 [TCP segment of a reassembled PDU]
3668	11.144453	172.29.0.131	172.16.4.91	TCP	1514	7680 → 53488 [ACK] Seq=237991 Ack=10 Win=1025 Len=1460 [TCP segment of a reassembled PDU]
3669	11.144672	172.16.4.91	172.29.0.131	TCP	54	53488 → 7680 [ACK] Seq=10 Ack=239451 Win=513 Len=0
3670	11.145416	172.29.0.131	172.16.4.91	TCP	1514	7680 → 53488 [ACK] Seq=239451 Ack=10 Win=1025 Len=1460 [TCP segment of a reassembled PDU]
3671	11.145416	172.29.0.131	172.16.4.91	TCP	1514	7680 → 53488 [PSH, ACK] Seq=240911 Ack=10 Win=1025 Len=1460 [TCP segment of a reassembled PDU]
3672	11.145416	172.29.0.131	172.16.4.91	TCP	1514	7680 → 53488 [ACK] Seq=242371 Ack=10 Win=1025 Len=1460 [TCP segment of a reassembled PDU]
3673	11.145416	172.29.0.131	172.16.4.91	TCP	1514	7680 → 53488 [ACK] Seq=243831 Ack=10 Win=1025 Len=1460 [TCP segment of a reassembled PDU]
3674	11.145416	172.29.0.131	172.16.4.91	TCP	1514	7680 → 53488 [ACK] Seq=245291 Ack=10 Win=1025 Len=1460 [TCP segment of a reassembled PDU]
3675	11.145416	172.29.0.131	172.16.4.91	TCP	1514	7680 → 53488 [ACK] Seq=246751 Ack=10 Win=1025 Len=1460 [TCP segment of a reassembled PDU]
3676	11.145559	172.16.4.91	172.29.0.131	TCP	54	53488 → 7680 [ACK] Seq=10 Ack=248211 Win=513 Len=0
3677	11.152038	172.16.2.182	224.0.0.251	NDNS	96	Standard query 0x2fba PTR _spotify-social-listening_tcp.local, "QM" question
3678	11.157748	172.16.2.182	224.0.0.251	NDNS	96	Standard query 0x13bd PTR _spotify-social-listening_tcp.local, "QM" question
3679	11.158479	172.16.2.182	224.0.0.251	NDNS	96	Standard query 0x0081 PTR _spotify-social-listening_tcp.local, "QM" question
3680	11.158479	Intel e51f:2d	Broadcast	ARP	56	Who has 172.16.5.37? Tell 172.16.2.90
3681	11.160329	172.29.0.131	172.16.4.91	TCP	1514	7680 → 53488 [ACK] Seq=248211 Ack=10 Win=1025 Len=1460 [TCP segment of a reassembled PDU]
3682	11.160329	172.29.2.24	172.16.4.91	TCP	1514	7680 → 53491 [ACK] Seq=483268 Ack=10 Win=512 Len=1460 [TCP segment of a reassembled PDU]
3683	11.161182	172.29.2.24	172.16.4.91	TCP	1514	7680 → 53491 [ACK] Seq=484728 Ack=10 Win=512 Len=1460 [TCP segment of a reassembled PDU]
3684	11.161182	172.29.2.24	172.16.4.91	TCP	1514	7680 → 53491 [ACK] Seq=486188 Ack=10 Win=512 Len=1460 [TCP segment of a reassembled PDU]
3685	11.161270	172.16.4.91	172.29.2.24	TCP	54	53491 → 7680 [ACK] Seq=10 Ack=487648 Win=513 Len=0
3686	11.164855	fe80::1c26:9ff:fe7e::f02::2		ICMPv6	70	Router Solicitation from 1e:26:09:7e:5a:17

Frame 3686: 70 bytes on wire (560 bits), 70 bytes captured (560 bits) on interface \Device\NPF_{00191A98-B82E-469D-9D61-88438091ED10}, id 0

Ethernet II, Src: 1e:26:09:7e:5a:17 (1e:26:09:7e:5a:17), Dst: IPv6mcast_02 (33:33:00:00:00:02)

Internet Protocol Version 6, Src: fe80::1c26:9ff:fe7e:5a17, Dst: ff02::2

Internet Control Message Protocol v6

0000 33 33 00 00 00 02 1e 26 09 7e 5a 17 86 dd 60 00 33...& ~Z...
0010 00 00 00 10 3a ff fe 80 00 00 00 00 00 00 1c 26 ...-Z...&
0020 09 ff fe 7e 5a 17 ff 02 00 00 00 00 00 00 00 00 ...-Z...{...
0030 00 00 00 00 02 85 00 6f b6 00 00 00 00 01 01 ...o...
0040 32 3c 9b ca 39 b5 2c -9-

Wireshark - Packet 2100 - Wi-Fi 2	
Frame 2100: 70 bytes on wire (560 bits), 70 bytes captured (560 bits) on interface \Device\NPF_{00191A98-B82E-469D-9D61-88438091ED10}, id 0	
Ethernet II, Src: 32:3c:9b:ca:39:b5 (32:3c:9b:ca:39:b5), Dst: IPv6mcast_02 (33:33:00:00:00:02)	
Internet Protocol Version 6, Src: fe80::303c:9bff:feca:39b5, Dst: ff02::2	
Internet Control Message Protocol v6	
No. 2100 · Time: 4.308483 · Source: fe80::303c:9bff:feca:39b5 · Destination: ff02::2 · Protocol: ICMPv6 · Length: 70 · Info: Router Solicitation from 32:3c:9b:ca:39:b5	

0000 33 33 00 00 00 02 32 3c 9b ca 39 b5 86 dd 60 00 33...2< -9-
0010 00 00 00 10 3a ff fe 80 00 00 00 00 00 00 30 3c ...-Z...<
0020 09 ff fe ca 39 b5 ff 02 00 00 00 00 00 00 00 00 ...-Z...<
0030 00 00 00 00 02 85 00 6f b6 00 00 00 00 01 01 ...o...
0040 32 3c 9b ca 39 b5 2c -9-

Practical No. 5

OBJECTIVE: Use Ping and Traceroute to test Network Connectivity.

Ping: The "ping" command assesses network connectivity by sending ICMP echo request packets and measuring round-trip time for replies. It aids in troubleshooting, verifies host reachability, and assesses network latency. Statistics such as packet loss and timing are summarized upon completion. It's essential for maintaining reliable connections and diagnosing network anomalies.

(a)

```
C:\Windows\System32>ping google.com

Pinging google.com [142.250.194.14] with 32 bytes of data:
Reply from 142.250.194.14: bytes=32 time=9ms TTL=57
Reply from 142.250.194.14: bytes=32 time=10ms TTL=57
Reply from 142.250.194.14: bytes=32 time=10ms TTL=57
Reply from 142.250.194.14: bytes=32 time=9ms TTL=57

Ping statistics for 142.250.194.14:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 9ms, Maximum = 10ms, Average = 9ms
```

(b)

```
C:\Windows\System32>ping -n 7 google.com

Pinging google.com [142.250.194.206] with 32 bytes of data:
Reply from 142.250.194.206: bytes=32 time=77ms TTL=57
Reply from 142.250.194.206: bytes=32 time=29ms TTL=57
Reply from 142.250.194.206: bytes=32 time=24ms TTL=57
Reply from 142.250.194.206: bytes=32 time=113ms TTL=57
Reply from 142.250.194.206: bytes=32 time=126ms TTL=57
Reply from 142.250.194.206: bytes=32 time=18ms TTL=57
Reply from 142.250.194.206: bytes=32 time=19ms TTL=57

Ping statistics for 142.250.194.206:
    Packets: Sent = 7, Received = 7, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 18ms, Maximum = 126ms, Average = 58ms
```

(c)

```
C:\Windows\System32>ping -f google.com

Pinging google.com [142.250.194.238] with 32 bytes of data:
Reply from 142.250.194.238: bytes=32 time=10ms TTL=57
Reply from 142.250.194.238: bytes=32 time=19ms TTL=57
Reply from 142.250.194.238: bytes=32 time=18ms TTL=57
Reply from 142.250.194.238: bytes=32 time=18ms TTL=57

Ping statistics for 142.250.194.238:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 19ms, Average = 16ms
```

(d)

```
C:\Windows\System32>ping google.com -t

Pinging google.com [142.250.194.238] with 32 bytes of data:
Reply from 142.250.194.238: bytes=32 time=11ms TTL=57
Reply from 142.250.194.238: bytes=32 time=18ms TTL=57
Reply from 142.250.194.238: bytes=32 time=18ms TTL=57
Reply from 142.250.194.238: bytes=32 time=20ms TTL=57
Reply from 142.250.194.238: bytes=32 time=18ms TTL=57
Reply from 142.250.194.238: bytes=32 time=16ms TTL=57
Reply from 142.250.194.238: bytes=32 time=17ms TTL=57
Reply from 142.250.194.238: bytes=32 time=19ms TTL=57
Reply from 142.250.194.238: bytes=32 time=17ms TTL=57
Reply from 142.250.194.238: bytes=32 time=17ms TTL=57
Reply from 142.250.194.238: bytes=32 time=21ms TTL=57

Ping statistics for 142.250.194.238:
    Packets: Sent = 11, Received = 11, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 11ms, Maximum = 21ms, Average = 17ms
Control-C
^C
```

(e)

```
C:\Windows\System32>ping -a 142.250.194.238

Pinging dell2s08-in-f14.1e100.net [142.250.194.238] with 32 bytes of data:
Reply from 142.250.194.238: bytes=32 time=79ms TTL=57
Reply from 142.250.194.238: bytes=32 time=18ms TTL=57
Reply from 142.250.194.238: bytes=32 time=147ms TTL=57
Reply from 142.250.194.238: bytes=32 time=19ms TTL=57

Ping statistics for 142.250.194.238:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 18ms, Maximum = 147ms, Average = 65ms

C:\Windows\System32>ping -a localhost

Pinging LAPTOP-FG8U20B6 [::1] with 32 bytes of data:
Reply from ::1: time<1ms
Reply from ::1: time<1ms
Reply from ::1: time<1ms
Reply from ::1: time<1ms

Ping statistics for ::1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

(f)

```
C:\Windows\System32>ping -l 4000 google.com

Pinging google.com [142.250.194.238] with 4000 bytes of data:
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 142.250.194.238:
    Packets: Sent = 3, Received = 0, Lost = 3 (100% loss),
Control-C
^C
```

(g)

```
C:\Windows\System32>ping google.com -4

Pinging google.com [142.250.194.238] with 32 bytes of data:
Reply from 142.250.194.238: bytes=32 time=12ms TTL=57
Reply from 142.250.194.238: bytes=32 time=18ms TTL=57
Reply from 142.250.194.238: bytes=32 time=19ms TTL=57
Reply from 142.250.194.238: bytes=32 time=19ms TTL=57

Ping statistics for 142.250.194.238:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 12ms, Maximum = 19ms, Average = 17ms
```

Tracert: "Tracert," short for "Trace Route," is a command-line utility used in various operating systems, including Windows, Linux, and macOS. It is employed to trace the route taken by data packets from the user's device to a specified destination, typically a host or IP address, across an IP network.

```
C:\WINDOWS\system32>tracert google.com

Tracing route to google.com [142.250.194.14]
over a maximum of 30 hops:

  0  8 ms    8 ms    6 ms   172.20.10.1
  1 249 ms   64 ms   352 ms  192.168.29.10
  2  64 ms   22 ms   57 ms   192.168.28.73
  3  87 ms   16 ms   64 ms   192.168.31.21
  4 160 ms   70 ms   29 ms   192.168.31.33
  5  *        *        *      Request timed out.
  6  22 ms   50 ms   64 ms   61.95.165.73
  7  73 ms   29 ms   29 ms   74.125.51.184
  8 176 ms   34 ms   42 ms   142.251.66.171
  9  51 ms   40 ms   38 ms   142.251.52.201
 10  51 ms   45 ms   41 ms   del12s01-in-f14.1e100.net [142.250.194.14]

Trace complete.

C:\WINDOWS\system32>
```

ipconfig/all: ipconfig/all is a command-line utility primarily used in Windows operating systems to display comprehensive information about the network configuration of a computer. When executed in the Command Prompt, it provides details about all network interfaces, including IP addresses, subnet masks, default gateways, DNS servers, MAC addresses, and more.

```
C:\Windows\System32>ipconfig/all

Windows IP Configuration

Host Name . . . . . : LAPTOP-FG8U20B6
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : abesec.ac.in

Wireless LAN adapter Local Area Connection* 3:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #3
Physical Address. . . . . : 72-66-55-FA-63-8F
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 4:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #4
Physical Address. . . . . : F2-66-55-FA-63-8F
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Ethernet adapter VMware Network Adapter VMnet1:

Connection-specific DNS Suffix . :
Description . . . . . : VMware Virtual Ethernet Adapter for VMnet1
Physical Address. . . . . : 00-50-56-C0-00-01
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::41ab:359e:12ef:4ac%8(Preferred)
IPv4 Address. . . . . : 192.168.92.1(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : 03 April 2024 22:52:45
Lease Expires . . . . . : 03 April 2024 23:52:37
Default Gateway . . . . . :
DHCP Server . . . . . : 192.168.92.254
DHCPv6 IAID . . . . . : 687886422
DHCPv6 Client DUID. . . . . : 00-01-00-01-29-8C-2C-2A-70-66-55-FA-63-8F
NetBIOS over Tcpip. . . . . : Enabled

Ethernet adapter VMware Network Adapter VMnet8:

C:\Windows\System32>ipconfig /all
Host Name . . . . . : LAPTOP-FG8U20B6
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : abesec.ac.in

Wireless LAN adapter Local Area Connection* 3:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #3
Physical Address. . . . . : 72-66-55-FA-63-8F
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 4:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #4
Physical Address. . . . . : F2-66-55-FA-63-8F
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Ethernet adapter VMware Network Adapter VMnet1:

Connection-specific DNS Suffix . :
Description . . . . . : VMware Virtual Ethernet Adapter for VMnet1
Physical Address. . . . . : 00-50-56-C0-00-01
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::41ab:359e:12ef:4ac%8(Preferred)
IPv4 Address. . . . . : 192.168.92.1(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : 03 April 2024 22:52:45
Lease Expires . . . . . : 03 April 2024 23:52:37
Default Gateway . . . . . :
DHCP Server . . . . . : 192.168.92.254
DHCPv6 IAID . . . . . : 687886422
DHCPv6 Client DUID. . . . . : 00-01-00-01-29-8C-2C-2A-70-66-55-FA-63-8F
NetBIOS over Tcpip. . . . . : Enabled

Ethernet adapter VMware Network Adapter VMnet8:

Connection-specific DNS Suffix . :
Description . . . . . : VMware Virtual Ethernet Adapter for VMnet8
Physical Address. . . . . : 00-50-56-C0-00-08
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::62e8:d8ee:4cb:83de%6(Preferred)
IPv4 Address. . . . . : 192.168.175.1(Preferred)
Subnet Mask . . . . . : 255.255.255.0
```


netstat: The netstat command is commonly employed for diagnosing network problems, monitoring network activity, and analyzing network performance. It provides valuable insights into the current state of network connections and can help identify issues such as port conflicts, network congestion, and unauthorized connections.

```
C:\Windows\System32>netstat
Active Connections

Proto Local Address           Foreign Address         State
TCP    127.0.0.1:1521           LAPTOP-FG8U20B6:49679  ESTABLISHED
TCP    127.0.0.1:49679         LAPTOP-FG8U20B6:1521  ESTABLISHED
TCP    172.16.14.195:63597     20.198.119.84:https    ESTABLISHED
TCP    172.16.14.195:63716     52.123.172.8:https     ESTABLISHED
TCP    172.16.14.195:63798     52.123.168.213:https   ESTABLISHED
TCP    172.16.14.195:63863     20.198.119.84:https    ESTABLISHED
TCP    172.16.14.195:63931     sb-in-f188:5228       ESTABLISHED
TCP    172.16.14.195:64577     20.189.173.27:https    ESTABLISHED
TCP    172.16.14.195:64585     151.101.157.91:https   ESTABLISHED
TCP    172.16.14.195:64586     151.101.157.91:https   ESTABLISHED
TCP    172.16.14.195:64592     52.252.156.53:https    ESTABLISHED
TCP    172.16.14.195:64739     204.79.197.239:https   ESTABLISHED
TCP    172.16.14.195:64755     40.76.174.66:https     LAST_ACK
TCP    172.16.14.195:64756     40.76.174.66:https     CLOSE_WAIT
TCP    172.16.14.195:64757     40.76.174.66:https     CLOSE_WAIT
TCP    172.16.14.195:64761     152.195.38.76:http     ESTABLISHED
TCP    172.16.14.195:64763     51.104.167.48:https    TIME_WAIT
TCP    172.16.14.195:64764     a23-208-65-107:https   ESTABLISHED
TCP    172.16.14.195:64766     a23-208-65-107:https   ESTABLISHED
TCP    172.16.14.195:64771     172.64.41.3:https      ESTABLISHED
TCP    172.16.14.195:64772     dns:https              ESTABLISHED
TCP    172.16.14.195:64773     dns:https              ESTABLISHED
TCP    172.16.14.195:64774     dns:https              ESTABLISHED
TCP    172.16.14.195:64775     del12s09-in-f3:https   ESTABLISHED
TCP    172.16.14.195:64776     162.159.61.3:https     ESTABLISHED
TCP    172.16.14.195:64777     162.159.61.3:https     ESTABLISHED
TCP    172.16.14.195:64778     162.159.61.3:https     ESTABLISHED
```

arp -a: The "arp -a" command displays the Address Resolution Protocol (ARP) cache, showing IP addresses and their corresponding MAC addresses on a local network. It aids in network troubleshooting by revealing recent device communication, assisting in resolving network connectivity issues and managing network resources efficiently.

```
C
C:\Windows\System32>arp -a

Interface: 172.16.14.195 --- 0x3
Internet Address      Physical Address        Type
172.16.12.1           d4-c1-9e-14-47-1d      dynamic
172.16.12.22          30-03-c8-89-c3-55      dynamic
172.16.12.38          14-13-33-b0-5c-db      dynamic
172.16.13.43          50-c2-e8-c2-81-35      dynamic
172.16.13.73          5a-90-2c-b2-05-88      dynamic
172.16.13.74          50-c2-e8-c2-26-19      dynamic
172.16.13.83          14-13-33-9e-a0-03      dynamic
172.16.13.84          f4-4e-e3-90-ee-62      dynamic
172.16.13.110         4c-d5-77-e1-4d-c7      dynamic
172.16.13.118         bc-f4-d4-6b-7e-c5      dynamic
172.16.13.173         20-2b-20-c1-c9-b5      dynamic
172.16.13.211         54-6c-ab-c8-82-7e      dynamic
172.16.13.227         34-6f-24-91-4a-38      dynamic
172.16.13.239         b4-8c-9d-15-28-4d      dynamic
172.16.13.254         54-6c-ab-cb-61-5a      dynamic
172.16.14.1          ac-50-dc-7a-8c-21      dynamic
172.16.14.39          3c-55-76-6a-57-93      dynamic
172.16.14.72          30-03-c8-89-5c-9b      dynamic
172.16.14.131        50-9a-c5-7f-02-39      dynamic
172.16.14.142        b4-8c-9d-18-51-e1      dynamic
172.16.14.156        48-5f-99-4a-40-3b      dynamic
172.16.14.189        00-e0-3a-36-e0-a1      dynamic
172.16.14.194        30-03-c8-10-0a-45      dynamic
172.16.14.211        ba-e3-d7-d2-bd-f2      dynamic
172.16.15.79         00-f4-8d-e0-1b-0f      dynamic
172.16.15.255        ff-ff-ff-ff-ff-ff      static
224.0.0.2            01-00-5e-00-00-02      static
224.0.0.22           01-00-5e-00-00-16      static
224.0.0.251          01-00-5e-00-00-fb      static
224.0.0.252          01-00-5e-00-00-fc      static
224.0.0.255          01-00-5e-00-00-ff      static
224.77.77.77         01-00-5e-4d-4d-4d      static
239.255.192.18       01-00-5e-7f-66-12      static
239.255.255.250      01-00-5e-7f-ff-fa      static
255.255.255.255      ff-ff-ff-ff-ff-ff      static

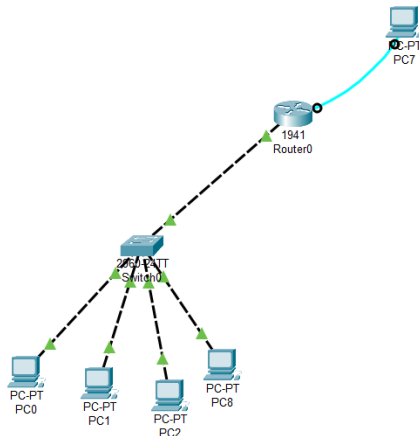
Interface: 192.168.175.1 --- 0x6
Internet Address      Physical Address        Type
192.168.175.254       00-50-56-fb-4c-9e      dynamic
192.168.175.255       ff-ff-ff-ff-ff-ff      static
224.0.0.2            01-00-5e-00-00-02      static
224.0.0.22           01-00-5e-00-00-16      static
224.0.0.251          01-00-5e-00-00-fb      static
224.0.0.252          01-00-5e-00-00-fc      static
224.77.77.77         01-00-5e-4d-4d-4d      static
239.255.192.18       01-00-5e-7f-66-12      static
239.255.255.250      01-00-5e-7f-ff-fa      static
255.255.255.255      ff-ff-ff-ff-ff-ff      static

Interface: 192.168.92.1 --- 0x8
Internet Address      Physical Address        Type
192.168.92.254       00-50-56-fb-4c-9e      dynamic
192.168.92.255       ff-ff-ff-ff-ff-ff      static
224.0.0.2            01-00-5e-00-00-02      static
224.0.0.22           01-00-5e-00-00-16      static
224.0.0.251          01-00-5e-00-00-fb      static
224.0.0.252          01-00-5e-00-00-fc      static
224.77.77.77         01-00-5e-4d-4d-4d      static
239.255.192.18       01-00-5e-7f-66-12      static
239.255.255.250      01-00-5e-7f-ff-fa      static
255.255.255.255      ff-ff-ff-ff-ff-ff      static
```


Practical No. 6

Objective: Configuring DHCP (Dynamic Host Configuration Protocol) on router using CISCO Packet tracer.

Topology Diagram:



1. Changing state to up of Default Gateway LAN 1:

```
Router>enable
Router#configure-terminal
Translating "configure-terminal"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address

Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#description link to LAN1
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
```

2. DHCP Configuration for LAN POOL 1:

```
Router(config-if)#exit
Router(config)#ip dhcp exclude 192.168.1.1
Router(config)#ip dhcp pool LAN-POOL-1
Router(dhcp-config)#network 192.168.1.0 255.255.255.0
Router(dhcp-config)#default ^
% Invalid input detected at '^' marker.

Router(dhcp-config)#default-router 192.168.1.1
Router(dhcp-config)#
```


3. IP configuration, subnet and default gateway of PC0:

The screenshot shows a configuration window for PC0 with tabs for Physical, Config, Desktop, Programming, and Attributes. The 'Config' tab is active, displaying the 'IP Configuration' window for the 'FastEthernet0' interface. The window is divided into three sections: IP Configuration, IPv6 Configuration, and 802.1X.

IP Configuration

Interface: FastEthernet0

☒ DHCP ☐ Static

IPv4 Address: 192.168.1.2

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

DNS Server: 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address: /

Link Local Address: FE80::20C:85FF:FED8:1486

Default Gateway:

DNS Server:

802.1X

☐ Use 802.1X Security

Authentication: MD5

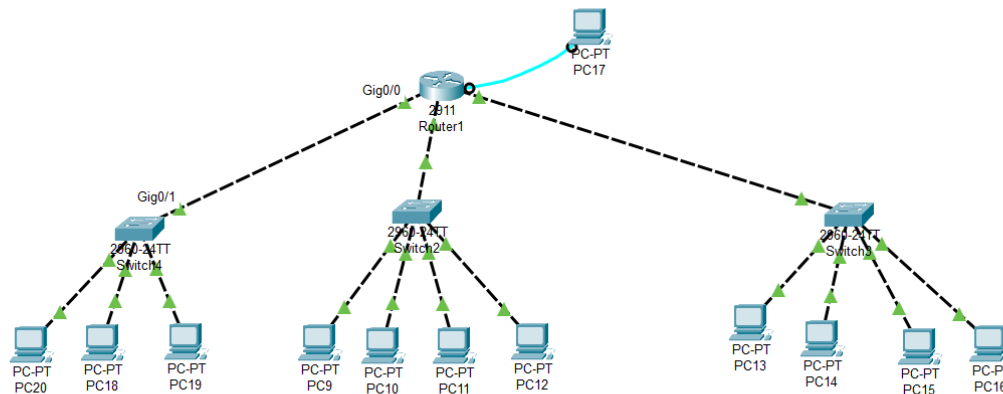
Username:

Password:

Practical No. 7

Objective: Create subnets with Classful addressing using CISCO Packet Trace.

Topology Diagram:



1. Configuration of GigabitEthernet for each LAN:

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitethernet 0/0
Router(config-if)#description link to LAN1
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#interface gigabitethernet 0/1
Router(config-if)#description link to LAN2
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router(config-if)#exit
Router(config)#interface gigabitethernet 0/2
Router(config-if)#description link to LAN3
Router(config-if)#ip address 192.168.3.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up

Router(config-if)#exit
```

2. Configuring IP in PCs of each LAN:

LAN1:

PC20

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address 169.254.61.221

Subnet Mask 255.255.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

LAN2:

PC9

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.2.10

Subnet Mask 255.255.255.0

Default Gateway 192.168.2.1

DNS Server 0.0.0.0

LAN3:

PC13

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

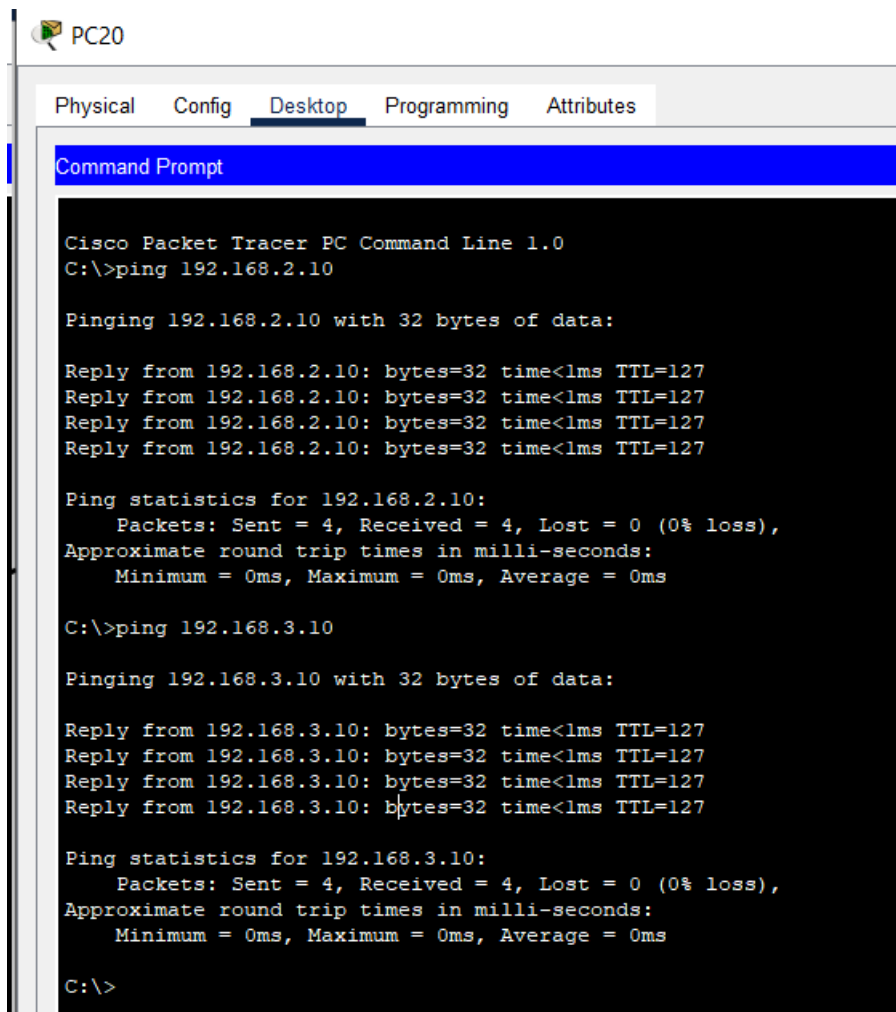
IPv4 Address 192.168.3.10

Subnet Mask 255.255.255.0

Default Gateway 192.168.3.1

DNS Server 0.0.0.0

3. Sending ping to other PCs from PC20:



The screenshot shows the 'PC20' window in Cisco Packet Tracer. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The text in the command prompt is as follows:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.10

Pinging 192.168.2.10 with 32 bytes of data:

Reply from 192.168.2.10: bytes=32 time<1ms TTL=127
Reply from 192.168.2.10: bytes=32 time<1ms TTL=127
Reply from 192.168.2.10: bytes=32 time<1ms TTL=127
Reply from 192.168.2.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.2.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.3.10

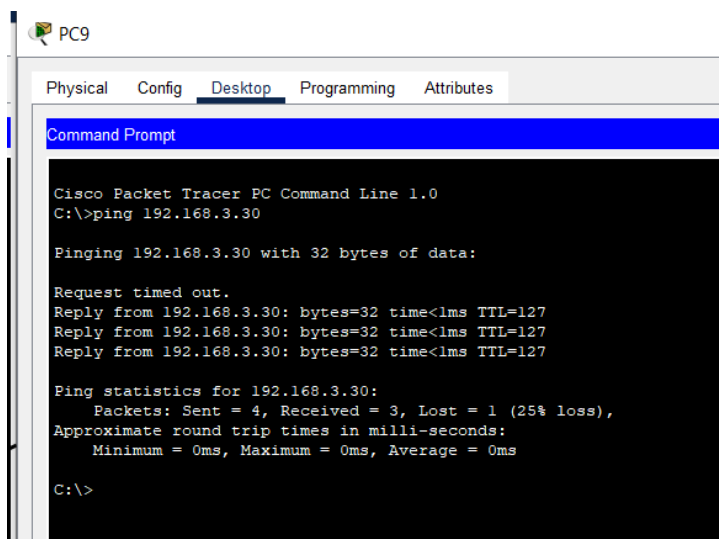
Pinging 192.168.3.10 with 32 bytes of data:

Reply from 192.168.3.10: bytes=32 time<1ms TTL=127
Reply from 192.168.3.10: bytes=32 time<1ms TTL=127
Reply from 192.168.3.10: bytes=32 time<1ms TTL=127
Reply from 192.168.3.10: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.3.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

3. Sending ping to other PCs from PC9:



The screenshot shows the 'PC9' window in Cisco Packet Tracer. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The text in the command prompt is as follows:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.3.30

Pinging 192.168.3.30 with 32 bytes of data:

Request timed out.
Reply from 192.168.3.30: bytes=32 time<1ms TTL=127
Reply from 192.168.3.30: bytes=32 time<1ms TTL=127
Reply from 192.168.3.30: bytes=32 time<1ms TTL=127

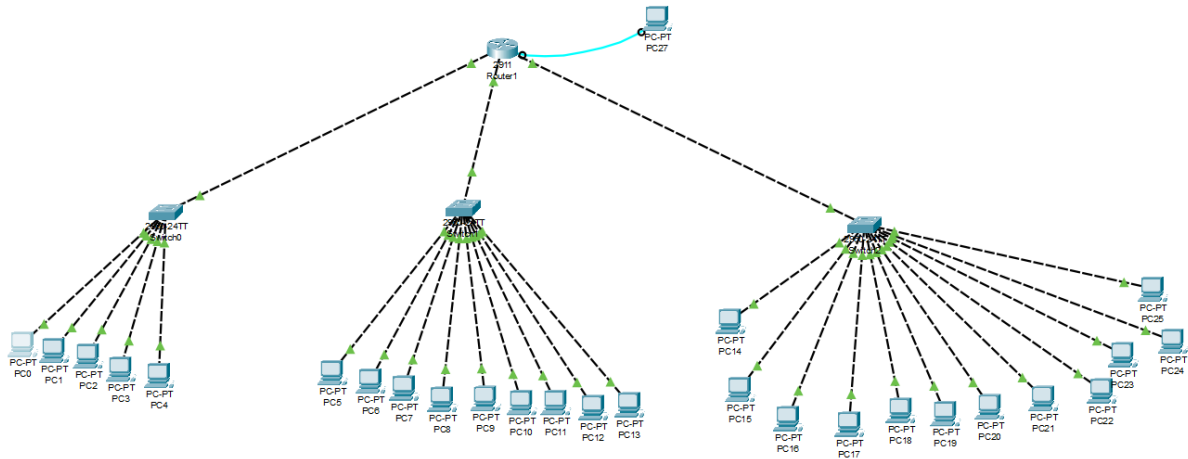
Ping statistics for 192.168.3.30:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Practical No. 8

Objective: Create subnets with VLSM (Variable Length Subnet Masking) using CISCO Packet Tracer

Topology Diagram:



1. Changing state to up Default gateway LAN 1

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface g0/0
Router(config-if)#ip address 192.168.1.33 255.255.255.248
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#exit
```

2.Changing state to up Default gateway LAN 2

```
Router(config)#interface g0/1
Router(config-if)#ip addresss 192.168.1.1 255.255.255.240
^
% Invalid input detected at '^' marker.

Router(config-if)#ip addresss 192.168.1.1 255.255.255.240
^
% Invalid input detected at '^' marker.

Router(config-if)#ip address 192.168.1.1 255.255.255.240
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router(config-if)#exit
```

3. Changing state to up Default gateway LAN 3

```
Router(config)#interface g0/2
^
% Invalid input detected at '^' marker.

Router(config)#interface g0/2
Router(config-if)#ip address 192.168.1.1.17 255.255.255.240
^
% Invalid input detected at '^' marker.

Router(config-if)#ip address 192.168.1.17 255.255.255.240
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up

Router(config-if)#exit
```

3. IP configuration, subnet mask & default gateway LAN 1,2,3

IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	192.168.1.2
Subnet Mask	255.255.255.240
Default Gateway	192.168.1.1
DNS Server	0.0.0.0

IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	192.168.1.34
Subnet Mask	255.255.255.248
Default Gateway	192.168.1.33
DNS Server	0.0.0.0
IPv6 Configuration	

IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	192.168.1.18
Subnet Mask	255.255.255.240
Default Gateway	192.168.1.17
DNS Server	0.0.0.0
IPv6 Configuration	

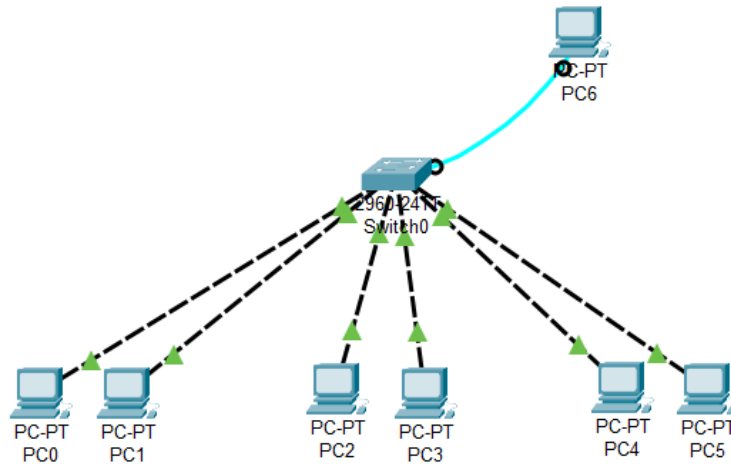
4.Ping command for checking the Connectivity:

```
Router>ping 192.168.1.18  
  
Type escape sequence to abort.  
Sending 5, 100-byte ICMP Echos to 192.168.1.18, timeout is 2 seconds:  
!!!!!  
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

Practical No. 9

Objective: Create VLAN using CISCO Packet tracer.

Topology Diagram:



1. Configuring names for VLANs:

```
Switch>enable
Switch#show vlan brief

VLAN Name                Status    Ports
-----
1    default                active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                           Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                           Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                           Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                           Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                           Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                           Gig0/1, Gig0/2

1002 fddi-default          active
1003 token-ring-default    active
1004 fddinet-default        active
1005 trnet-default          active

Switch#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name Faculty
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name Student
Switch(config-vlan)#exit
Switch(config)#vlan 30
Switch(config-vlan)#name Staff
Switch(config-vlan)#exit
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console
```

2. VLAN Port Assignment:

(a)

```
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#interface Fa0/1
Switch(config-if)#switch port mode access
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#exit
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vlan brief
```

VLAN Name	Status	Ports
1 default	active	Fa0/2, Fa0/3, Fa0/4, Fa0/5 Fa0/6, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Fa0/11, Fa0/12, Fa0/13 Fa0/14, Fa0/15, Fa0/16, Fa0/17 Fa0/18, Fa0/19, Fa0/20, Fa0/21 Fa0/22, Fa0/23, Fa0/24, Gig0/1 Gig0/2
10 Faculty	active	Fa0/1
20 Student	active	
30 Staff	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

(b)

```
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface Fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#exit
Switch(config)#interface Fa0/10
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#exit
Switch(config)#interface Fa0/11
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#exit
Switch(config)#interface Fa0/20
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
Switch(config-if)#exit
Switch(config)#interface Fa0/21
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
Switch(config-if)#exit
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console

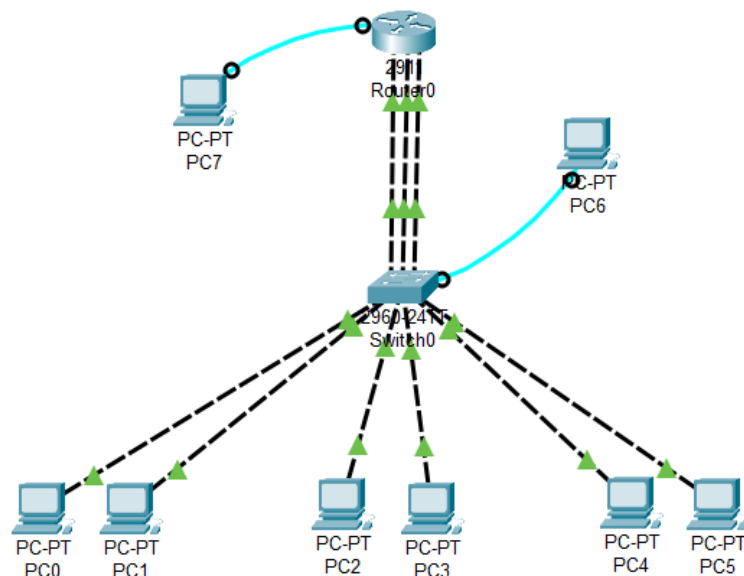
Switch#show vlan brief
```

VLAN Name	Status	Ports
1 default	active	Fa0/3, Fa0/4, Fa0/5, Fa0/6 Fa0/7, Fa0/8, Fa0/9, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/22 Fa0/23, Fa0/24, Gig0/1, Gig0/2
10 Faculty	active	Fa0/1, Fa0/2
20 Student	active	Fa0/10, Fa0/11
30 Staff	active	Fa0/20, Fa0/21
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

Practical No. 10

Objective: Inter-VLAN routing using CISCO Packet Tracer.

Topology Diagram:



1. Configuring names for VLANs:

```
Switch>enable
Switch#show vlan brief

VLAN Name                Status    Ports
----
1    default                active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                           Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                           Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                           Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                           Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                           Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                           Gig0/1, Gig0/2
1002 fddi-default          active
1003 token-ring-default    active
1004 fddinet-default        active
1005 trnet-default          active
Switch#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name Faculty
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name Student
Switch(config-vlan)#exit
Switch(config)#vlan 30
Switch(config-vlan)#name Staff
Switch(config-vlan)#exit
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console
```

2. VLAN Port Assignment:

(a)

```
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#interface Fa0/1
Switch(config-if)#switch port mode access
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#exit
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vlan brief
```

VLAN Name	Status	Ports
1 default	active	Fa0/2, Fa0/3, Fa0/4, Fa0/5 Fa0/6, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Fa0/11, Fa0/12, Fa0/13 Fa0/14, Fa0/15, Fa0/16, Fa0/17 Fa0/18, Fa0/19, Fa0/20, Fa0/21 Fa0/22, Fa0/23, Fa0/24, Gig0/1 Gig0/2
10 Faculty	active	Fa0/1
20 Student	active	
30 Staff	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

(b)

```
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#interface Fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#exit
Switch(config)#interface Fa0/10
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#exit
Switch(config)#interface Fa0/11
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#exit
Switch(config)#interface Fa0/20
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
Switch(config-if)#exit
Switch(config)#interface Fa0/21
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
Switch(config-if)#exit
Switch(config)#exit
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vlan brief
```

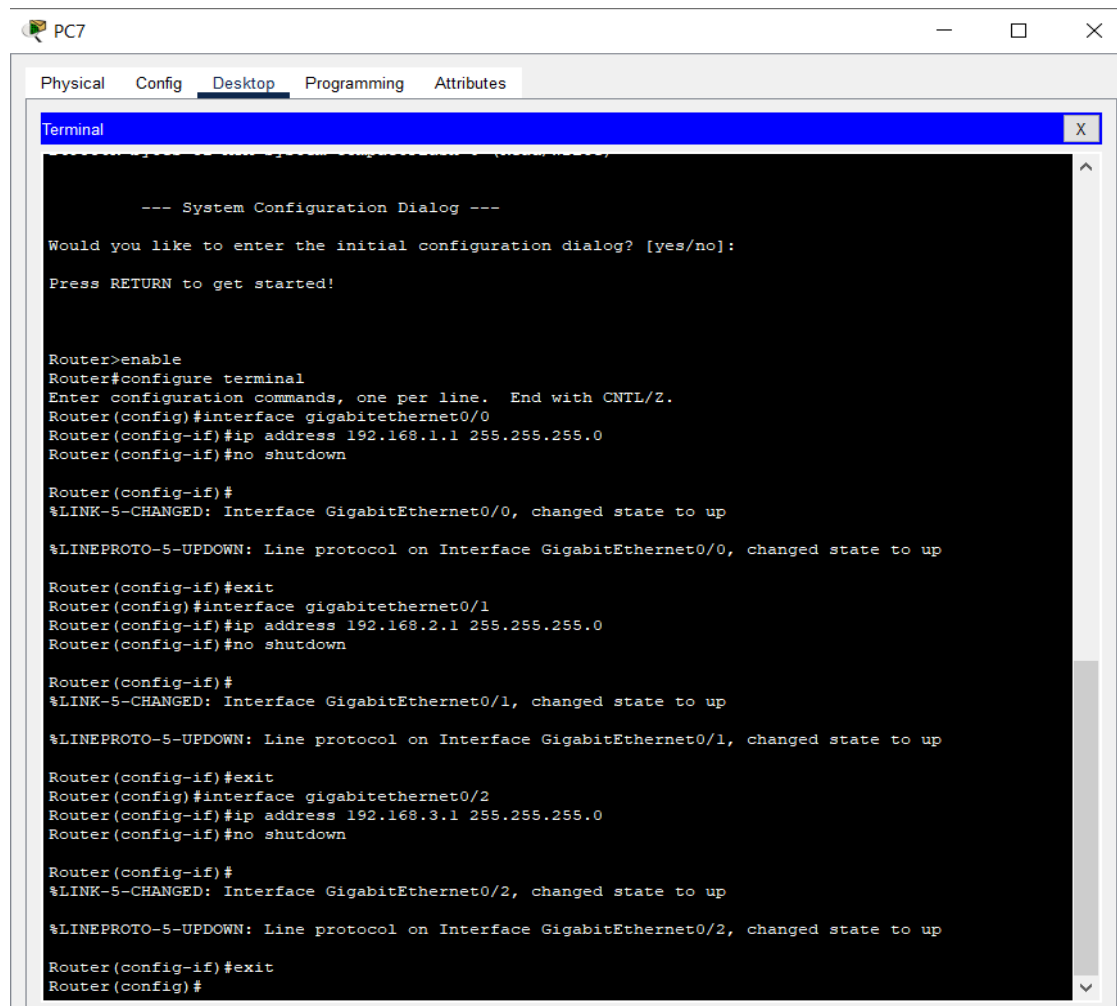
VLAN Name	Status	Ports
1 default	active	Fa0/3, Fa0/4, Fa0/5, Fa0/6 Fa0/7, Fa0/8, Fa0/9, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/22 Fa0/23, Fa0/24, Gig0/1, Gig0/2
10 Faculty	active	Fa0/1, Fa0/2
20 Student	active	Fa0/10, Fa0/11
30 Staff	active	Fa0/20, Fa0/21
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

(c)

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface fa0/3
Switch(config-if)#interface fa0/3
Switch#
%SYS-5-CONFIG_I: Configured from console by console

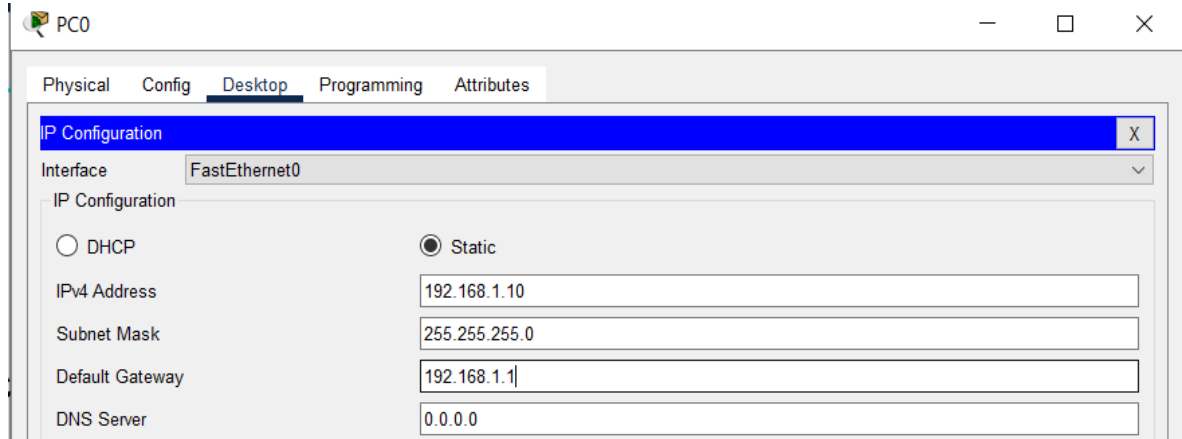
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface f0/3
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#exit
Switch(config)#interface f0/12
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#exit
Switch(config)#interface f0/22
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
Switch(config-if)#exit
Switch(config)#
```

3. GigabitEthernet Configuration / Router Configuration:



4. IP Configuration for each VLAN:

(a)



PC0

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

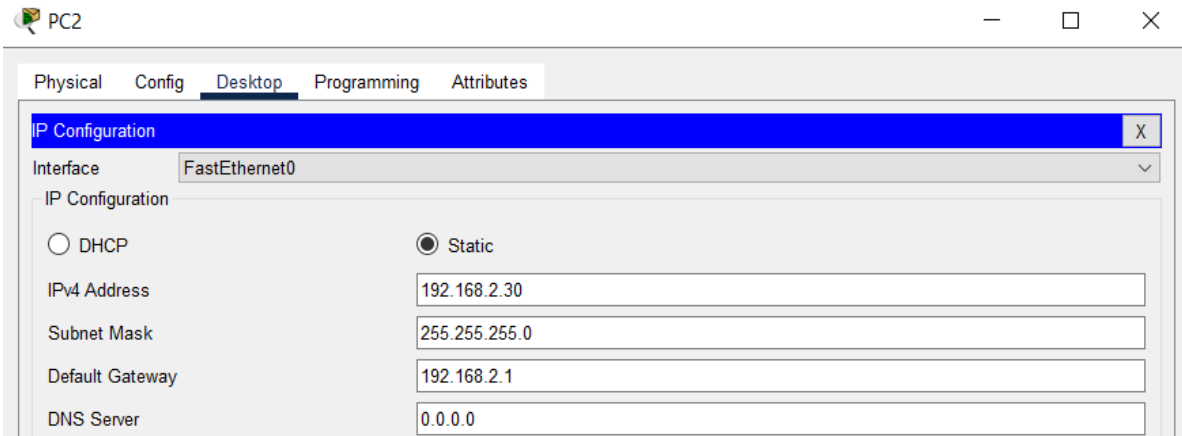
IPv4 Address 192.168.1.10

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

(b)



PC2

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

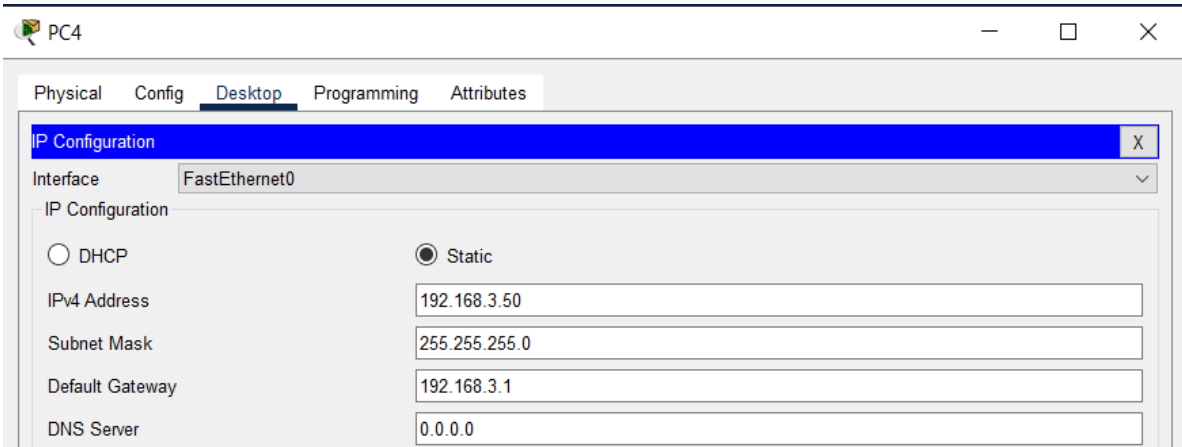
IPv4 Address 192.168.2.30

Subnet Mask 255.255.255.0

Default Gateway 192.168.2.1

DNS Server 0.0.0.0

(c)



PC4

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

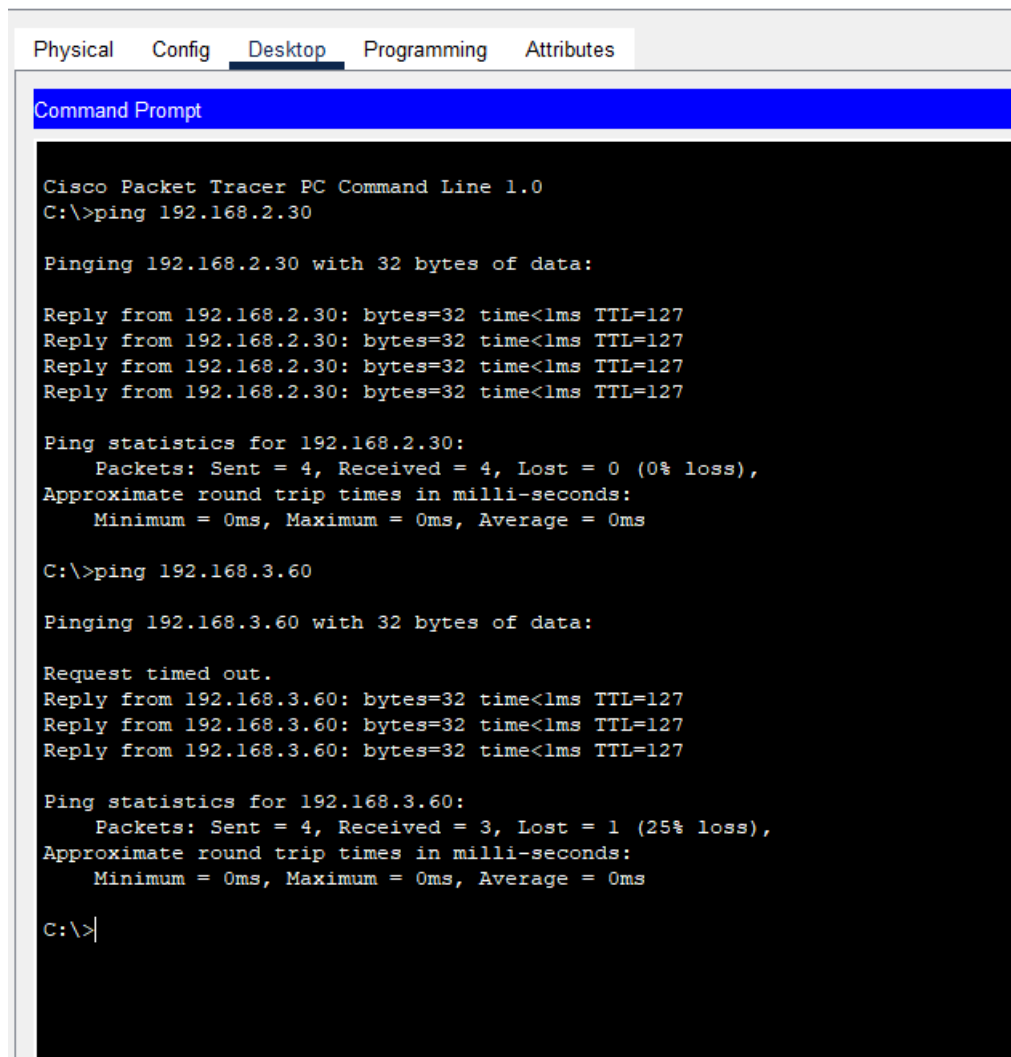
IPv4 Address 192.168.3.50

Subnet Mask 255.255.255.0

Default Gateway 192.168.3.1

DNS Server 0.0.0.0

5. Verifying Inter-VLAN routing via ping:



The screenshot shows the Cisco Packet Tracer interface with the 'Desktop' tab selected. A 'Command Prompt' window is open, displaying the following text:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.30

Pinging 192.168.2.30 with 32 bytes of data:

Reply from 192.168.2.30: bytes=32 time<1ms TTL=127
Reply from 192.168.2.30: bytes=32 time<1ms TTL=127
Reply from 192.168.2.30: bytes=32 time<1ms TTL=127
Reply from 192.168.2.30: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.2.30:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.3.60

Pinging 192.168.3.60 with 32 bytes of data:

Request timed out.
Reply from 192.168.3.60: bytes=32 time<1ms TTL=127
Reply from 192.168.3.60: bytes=32 time<1ms TTL=127
Reply from 192.168.3.60: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.3.60:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>|
```