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LAB:- 1

1) netstat -a : Display all the connections and listening ports.

2) netstat -b : Display the executable involved in creating each connection or listening port.

3) netstat -e : Display Ethernet statistics. This may be combined with -s option.

4) netstat -s : Display Fully Qualified Domain Names (FQDN) for foreign address.

5) netstat -n : Display address and port number in numerical form.

6) netstat -o : Display the owning process ID associated with each connection.

7) netstat -p Proto : shows connections for the Project specified by proto ; Proto can be TCP, UDP, TCPV6, UDPV6

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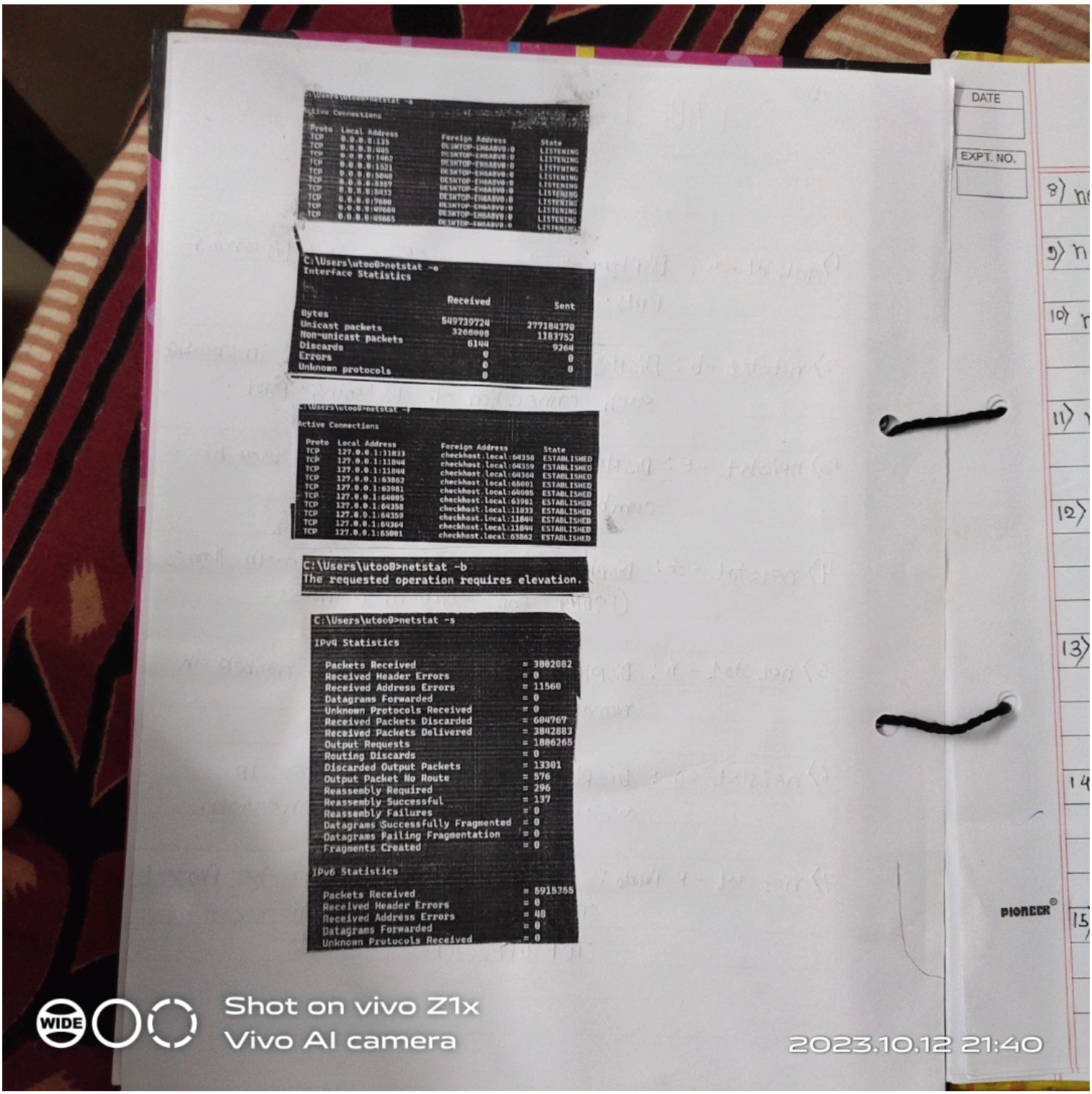

```
C:\Users\utoo0>netstat -a

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    0.0.0.0:135            DESKTOP-EH6ABV0:0      LISTENING
  TCP    0.0.0.0:445            DESKTOP-EH6ABV0:0      LISTENING
  TCP    0.0.0.0:1062           DESKTOP-EH6ABV0:0      LISTENING
  TCP    0.0.0.0:1521           DESKTOP-EH6ABV0:0      LISTENING
  TCP    0.0.0.0:5040           DESKTOP-EH6ABV0:0      LISTENING
  TCP    0.0.0.0:8389           DESKTOP-EH6ABV0:0      LISTENING
  TCP    0.0.0.0:9432           DESKTOP-EH6ABV0:0      LISTENING
  TCP    0.0.0.0:49664          DESKTOP-EH6ABV0:0      LISTENING
  TCP    0.0.0.0:49665          DESKTOP-EH6ABV0:0      LISTENING
```

```
C:\Users\utoo0>netstat -e
Interface Statistics

                           Received            Sent

Bytes                    5497397724       277184370
Unicast packets             3268098         1183752
Non-unicast packets            6144            9264
Discards                          0               0
Errors                            0               0
Unknown protocols                 0
```

```
C:\Users\utoo0>netstat -f

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:11833        checkhost.local:64358  ESTABLISHED
  TCP    127.0.0.1:11844        checkhost.local:64359  ESTABLISHED
  TCP    127.0.0.1:11844        checkhost.local:64364  ESTABLISHED
  TCP    127.0.0.1:63862        checkhost.local:65001  ESTABLISHED
  TCP    127.0.0.1:63981        checkhost.local:64005  ESTABLISHED
  TCP    127.0.0.1:64005        checkhost.local:63981  ESTABLISHED
  TCP    127.0.0.1:64358        checkhost.local:11833  ESTABLISHED
  TCP    127.0.0.1:64359        checkhost.local:11844  ESTABLISHED
  TCP    127.0.0.1:64364        checkhost.local:11844  ESTABLISHED
  TCP    127.0.0.1:65001        checkhost.local:63862  ESTABLISHED
```

```
C:\Users\utoo0>netstat -b
The requested operation requires elevation.
```

```
C:\Users\utoo0>netstat -s

IPv4 Statistics

  Packets Received                   = 3802082
  Received Header Errors             = 0
  Received Address Errors            = 11560
  Datagrams Forwarded                = 0
  Unknown Protocols Received         = 0
  Received Packets Discarded         = 604767
  Received Packets Delivered         = 3842883
  Output Requests                    = 1806265
  Routing Discards                   = 0
  Discarded Output Packets           = 13301
  Output Packet No Route             = 576
  Reassembly Required                = 296
  Reassembly Successful              = 137
  Reassembly Failures                = 0
  Datagrams Successfully Fragmented  = 0
  Datagrams Failing Fragmentation    = 0
  Fragments Created                  = 0

IPv6 Statistics

  Packets Received                   = 5915355
  Received Header Errors             = 0
  Received Address Errors            = 48
  Datagrams Forwarded                = 0
  Unknown Protocols Received         = 0
```

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8) netstat -r : Display the routing table.

9) netstat -s : Display per-protocol statistics.

10) netstat -t : Display the current connection offload state.

11) netstat -x : Display network direct connections, listeners and shared endPoint.

12) netstat -y : Display the Tcp connection template for all connections. Cannot be combined with other option.

13) netstat interval : Redisplays selected statistics passing interval seconds between each display.

14) netstat -a -all : Show both listing and non-listing sockets. With the interface option, show interface that are not up.

15) netstat -anose : To show both listing and non listing sockets.

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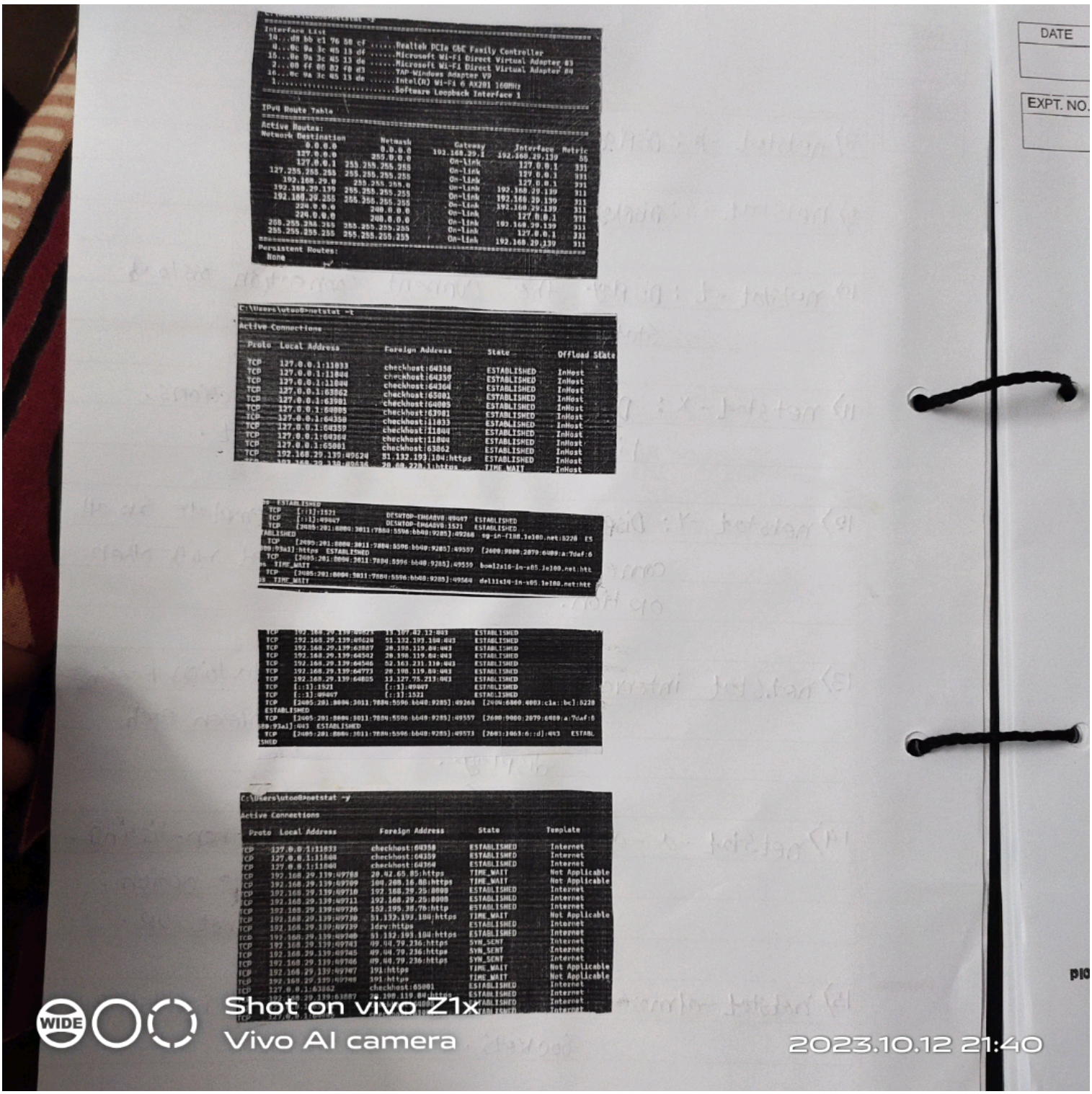
DATE
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Interface List
14...d0 bb c1 76 38 cf ......Realtek PCIe GbE Family Controller
4...0c 9a 3c 45 13 d6 ......Microsoft Wi-Fi Direct Virtual Adapter #3
15...0e 9a 3c 45 13 de ......Microsoft Wi-Fi Direct Virtual Adapter #4
2...08 ff 08 82 f0 d3 ......YAP-Windows Adapter V9
16...0c 9a 3c 45 13 de ......Intel(R) Wi-Fi 6 AX201 160MHz
1...........................Software Loopback Interface 1
IPv4 Route Table
Active Routes:
Network Destination Netmask Gateway Interface Metric
0.0.0.0 0.0.0.0 192.168.29.1 192.168.29.139 55
127.0.0.0 255.0.0.0 On-link 127.0.0.1 331
127.0.0.1 255.255.255.255 On-link 127.0.0.1 331
127.255.255.255 255.255.255.255 On-link 127.0.0.1 331
192.168.29.0 255.255.255.0 On-link 127.0.0.1 331
192.168.29.139 255.255.255.255 On-link 192.168.29.139 311
192.168.29.255 255.255.255.255 On-link 192.168.29.139 311
224.0.0.0 240.0.0.0 On-link 192.168.29.139 311
224.0.0.0 240.0.0.0 On-link 127.0.0.1 331
255.255.255.255 255.255.255.255 On-link 192.168.29.139 311
255.255.255.255 255.255.255.255 On-link 127.0.0.1 331
255.255.255.255 255.255.255.255 On-link 192.168.29.139 311
Persistent Routes:
None
C:\Users\utoo0>netstat -t
Active Connections
Proto Local Address Foreign Address State Offload State
TCP 127.0.0.1:11833 checkhost:64358 ESTABLISHED InHost
TCP 127.0.0.1:11840 checkhost:64359 ESTABLISHED InHost
TCP 127.0.0.1:11840 checkhost:64364 ESTABLISHED InHost
TCP 127.0.0.1:63862 checkhost:65001 ESTABLISHED InHost
TCP 127.0.0.1:63901 checkhost:64005 ESTABLISHED InHost
TCP 127.0.0.1:64005 checkhost:63901 ESTABLISHED InHost
TCP 127.0.0.1:64358 checkhost:11833 ESTABLISHED InHost
TCP 127.0.0.1:64359 checkhost:11840 ESTABLISHED InHost
TCP 127.0.0.1:64364 checkhost:11840 ESTABLISHED InHost
TCP 127.0.0.1:65001 checkhost:63862 ESTABLISHED InHost
TCP 192.168.29.139:49624 51.132.193.104:https ESTABLISHED InHost
TIME_WAIT InHost
TCP [::1]:1521 DESKTOP-EHGABV8:49407 ESTABLISHED
TCP [::1]:49407 DESKTOP-EHGABV8:1521 ESTABLISHED
TCP [2405:201:8004:3011:7884:5596:bb48:9285]:49557 [2600:9000:2079:6400:a:7daf:6
TCP [2405:201:8004:3011:7884:5596:bb48:9285]:49559 bom12s18-in-x05.1e100.net:htt
TCP [2405:201:8004:3011:7884:5596:bb48:9285]:49560 del11s10-in-x05.1e100.net:htt
TCP 192.168.29.139:49624 51.132.193.104:443 ESTABLISHED
TCP 192.168.29.139:63887 20.198.119.84:443 ESTABLISHED
TCP 192.168.29.139:64542 20.198.119.84:443 ESTABLISHED
TCP 192.168.29.139:64546 52.163.231.110:443 ESTABLISHED
TCP 192.168.29.139:64773 20.198.119.84:443 ESTABLISHED
TCP 192.168.29.139:64805 13.127.75.213:443 ESTABLISHED
TCP [::1]:1521 [::1]:49407 ESTABLISHED
TCP [::1]:49407 [::1]:1521 ESTABLISHED
TCP [2405:201:8004:3011:7884:5596:bb48:9285]:49268 [2404:6800:4003:c1a::bc]:5228
ESTABLISHED
TCP [2405:201:8004:3011:7884:5596:bb48:9285]:49557 [2600:9000:2079:6400:a:7daf:6
TCP [2405:201:8004:3011:7884:5596:bb48:9285]:49573 [2603:1063:6::d]:443 ESTABL
C:\Users\utoo0>netstat -y
Active Connections
Proto Local Address Foreign Address State Template
TCP 127.0.0.1:11833 checkhost:64358 ESTABLISHED Internet
TCP 127.0.0.1:11840 checkhost:64359 ESTABLISHED Internet
TCP 127.0.0.1:11840 checkhost:64364 ESTABLISHED Internet
TCP 192.168.29.139:49708 20.42.65.85:https TIME_WAIT Not Applicable
TCP 192.168.29.139:49709 104.208.16.88:https TIME_WAIT Not Applicable
TCP 192.168.29.139:49710 192.168.29.25:8009 ESTABLISHED Internet
TCP 192.168.29.139:49711 192.168.29.25:8009 ESTABLISHED Internet
TCP 192.168.29.139:49726 152.199.38.76:http ESTABLISHED Internet
TCP 192.168.29.139:49730 51.132.193.104:https TIME_WAIT Not Applicable
TCP 192.168.29.139:49739 ldrv:https ESTABLISHED Internet
TCP 192.168.29.139:49740 51.132.193.104:https ESTABLISHED Internet
TCP 192.168.29.139:49743 49.44.79.236:https SYN_SENT Internet
TCP 192.168.29.139:49745 49.44.79.236:https SYN_SENT Internet
TCP 192.168.29.139:49746 49.44.79.236:https SYN_SENT Internet
TCP 192.168.29.139:49747 191:https TIME_WAIT Not Applicable
TCP 192.168.29.139:49748 191:https TIME_WAIT Not Applicable
TCP 127.0.0.1:63862 checkhost:65001 ESTABLISHED Internet
TCP 192.168.29.139:63887 20.198.119.84:https ESTABLISHED Internet
Shot on vivo Z1x
Vivo AI camera
2023.10.12 21:40

16) netstat -at : To list all Tcp ports.

17) netstat -au: To list all UDP ports

18) netstat -l: To list all listing ports.

19) netstat -lt : To list only listing Tcp ports.

20) netstat -lu : To list only listing UDP ports.

21) netstat -lx : To list only unix ports.

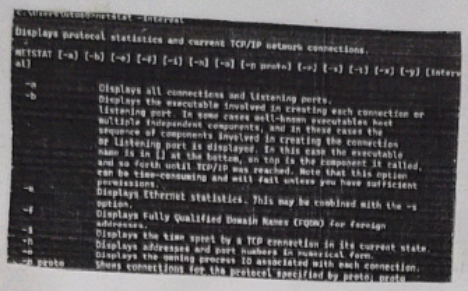
22) netstat -su: List statistics for UDP ports.

23) netstat - st: To list statistis for Tcp ports.

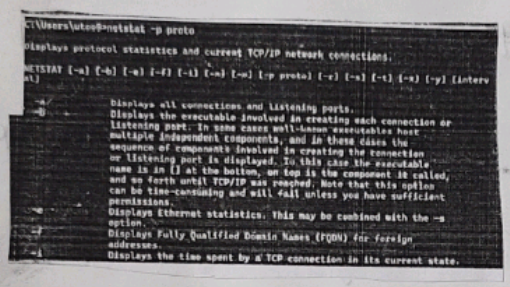
24) netstat - pt : To display PID and Program names.

25) netstat -c : To print netstat information. Continuasly.

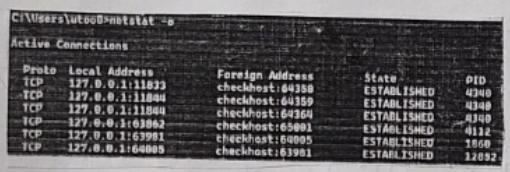
26) netstat -verbose : To get non-supportive address families in the system.



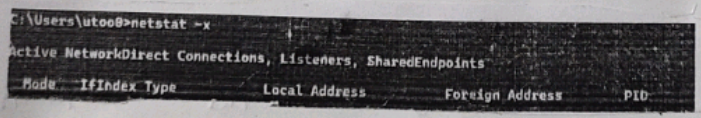
```
Displays protocol statistics and current TCP/IP network connections.

NETSTAT [-a] [-b] [-e] [-f] [-i] [-n] [-o] [-p proto] [-r] [-s] [-t] [-x] [-y] [Interv
al]

  -a            Displays all connections and Listening ports.
  -b            Displays the executable involved in creating each connection or
                Listening port. In some cases well-known executables host
                multiple independent components, and in these cases the
                sequence of components involved in creating the connection
                or Listening port is displayed. In this case the executable
                name is in [] at the bottom, on top is the component it called,
                and so forth until TCP/IP was reached. Note that this option
                can be time-consuming and will fail unless you have sufficient
                permissions.
  -e            Displays Ethernet statistics. This may be combined with the -s
                option.
  -f            Displays Fully Qualified Domain Names (FQDN) for foreign
                addresses.
  -i            Displays the time spent by a TCP connection in its current state.
  -n            Displays addresses and port numbers in numerical form.
  -o            Displays the owning process ID associated with each connection.
  -p proto      Shows connections for the protocol specified by proto; proto
```



```
C:\Users\utoo0>netstat -p proto

Displays protocol statistics and current TCP/IP network connections.

NETSTAT [-a] [-b] [-e] [-f] [-i] [-n] [-o] [-p proto] [-r] [-s] [-t] [-x] [-y] [Interv
al]

  -a            Displays all connections and Listening ports.
  -b            Displays the executable involved in creating each connection or
                Listening port. In some cases well-known executables host
                multiple independent components, and in these cases the
                sequence of components involved in creating the connection
                or Listening port is displayed. In this case the executable
                name is in [] at the bottom, on top is the component it called,
                and so forth until TCP/IP was reached. Note that this option
                can be time-consuming and will fail unless you have sufficient
                permissions.
  -e            Displays Ethernet statistics. This may be combined with the -s
                option.
  -f            Displays Fully Qualified Domain Names (FQDN) for foreign
                addresses.
  -i            Displays the time spent by a TCP connection in its current state.
```



```
C:\Users\utoo0>netstat -o

Active Connections

  Proto  Local Address          Foreign Address        State           PID
  TCP    127.0.0.1:11833        checkhost:64358        ESTABLISHED     4340
  TCP    127.0.0.1:11844        checkhost:64359        ESTABLISHED     4340
  TCP    127.0.0.1:11844        checkhost:64364        ESTABLISHED     4340
  TCP    127.0.0.1:63862        checkhost:65001        ESTABLISHED     4132
  TCP    127.0.0.1:63981        checkhost:64005        ESTABLISHED     1860
  TCP    127.0.0.1:64005        checkhost:63981        ESTABLISHED     12092
```



```
C:\Users\utoo0>netstat -x

Active NetworkDirect Connections, Listeners, SharedEndpoints

  Mode   IfIndex Type            Local Address          Foreign Address        PID
```

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27) netstat -aplgnep ssh : To get the port in which the program is running.

28) netstat -aplgncp '.80' : To get the process which is using the given port.

29) netstat -i : To get list of network interface.

30) netstat -ie: To display extended information on interface.

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LAB:-2

Setup FTP Server and Clinet: Ensure that an FTP server is running, and a client is ready to connect.

Windows:

Setting up FTP server:

1. Install Internet Information Services (IIS):
   - Open control Panel > Programs and Features > Turn windows features on or off.
   - Check "Internet Information Services" and FTP server.
   - click OK to install.
2. Configune FTP site:
   - Open IIS Manager.
   - Right-click "sites" > Add FTP site.
   - Provide a name and choose a physical path for your FTP site.
   - choose "No SSL" if you are testing locally
   - Assign permission for users.
3. Allow Firewall Rules (is applicable):
   - open Windows Firewall
   - Allow FTP traffic on ports 20 and 21.

Setting up FTP client:

1. Use Built-in Windows FTP client or Install Third-Party client (e.g. Filezilla):

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- Open command Prompt.
- Type 'ftp localhost' and press Enter.
- Enter the username and password as configured in the FTP server.

2. Access Files:

- Use 'get' and 'put' commands to download and upload files respectively.

VDP Header Fields and operations (TFTP Session Cap tone)

Required tools:

- Wireshark
- TFTP client and server setup

VDP Header Fields:

1) Source Port
2) Destination Port
3) Length
4) Checksum

Windows:

Setting up TFTP server:

1) Install TFTP server software:

Download and install the software from the official site.

Run the software and choose a directory for file sharing.

Configure servers settings.

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2) Set up security, logging, or other specific configurations as needed.

3) Allow Firewall Rules (if applicable):
Open Windows Firewall
Allow TFTP traffic on port 69.

Setting up TFTP client:
1) Use Built-in Windows TFTP Client:
Open command Prompt.
Use tftp command followed by the host and operations like get or put.
For example: tftp localhost get filename.txt.

Filters:
1) Protocol Filters:
- HTTP Traffic: 'http'
- ICMPv6 Traffic: 'icmpv6'

2) Port Filters:
- SSH Traffic (TCP port 22): 'tcp.port==22'
- Non-DNS Traffic (UDP port 53): 'udp.port!=53'

3) IP Address Filters:
- Packets from specific source IP: 'ip.src == 192.168.1.10'.

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- Pakets to specisic Destination IP: 'ip.dst == 192.168.2.20'

4) Logical Operators:

- Tcp Packets ~~with~~ La from Specisic Source IP: 'ip.src && tcp == 192.1681.1'

- ~~Packe~~ ARP or DHCP ~~Pa~~ckets: 'arp || bootp'

5) Comparison operators:

- Tcp Packets with length > 500 : 'tcp.len > 500'

- UDP packets with length ≤ 300 : 'UDP. length ≤ 300'

6) Expression Filteers:

- HTTP GET Requested : 'http.request.method == "GET"'.

- DNS queries for specisic Domain : 'dns.qu any. name contains "google.com"'.

7) Conversation and Flow Filters:

- specific Tcp stream Number 10 : 'tcp.stream eq 10'

- Specisic UDP Stream Number 5 : 'udp.stream eq 5'

8) Frame Filters:

- Frames with length ≥ 100 Bytes : 'frame.len >= 1000'

- 200th Frame: 'frame.number == 200'

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2) Custom Filters:

- SMTP Traffic with Specific Source Port: 'smtp && tcp.srcport == 25'
- Tcp Packets with SYN flag set: 'tcp.flags.syn==1'

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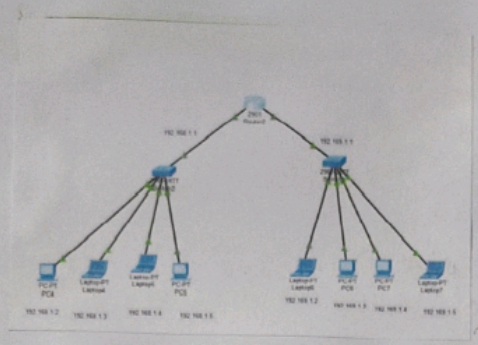
LAB: 3

IPv4 Routing Configuration: (static)

```
Router > en
Router # conf t
Enter configuration commands, one per line. End with
CNTL/Z.
Router (config) # int gig 0/0
Router (config-if)# ip add 192.168.1.1 255.255.255.0
Router (config-if)# No shut
Router (config-if)#
% LINK-5-CHANGED: Interface GigabitEthernet 0/0,
  changed state to UP
% LINEPROTO-5-UPDOWN: Line Protocol on Interface GigabitEthernet
  0/0, changed state to UP
Router (config-if)# exit
Router (config)# int gig 0/1
Router (config-if)# ip add 192.169.1.1 255.255.255.0
Router (config-if)# No shut
Router (config-if)#
% LINK-5-CHANGED: Interface GigabitEthernet 0/1,
  changed state to UP
% LINEPROTO-5-UPDOWN: Line Protocol on Interface
  GigabitEthernet 0/1, changed state to UP.
Router (config-if)# exit
```



Physical Config CLI Attributes

IOS Command Line Interface

```
2 Gigabit Ethernet interfaces
2 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
24903K bytes of ATA System CompactFlash 0 (Read/Write)

         --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int gig0/0
Router(config-if)#ip add 192.168.1.1
% Incomplete command.
Router(config-if)#ip add 192.168.1.1 255.255.255.0
Router(config-if)#no shut

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)#int gig0/1
Router(config-if)#ip add 192.169.1.1 255.255.255.0
Router(config-if)#no shut

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)#
```

Copy Paste

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time=1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

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IPV6 Routing Configuration: (static)

```
Router> en
Router# conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# ipv6 unicast-routing
Router(config)# int gig 0/0
Router(config-if)# ipv6 add 2001:DB8:0:1::1/64
Router(config-if)# no shut
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet 0/0, changed
  state to up
%LINEPROTO-5-UPDOWN: Line Protocol on Interface GigabitEthernet
0/0, changed state to up
Router(config-if)# exit
Router(config)# ipv6 unicast-routing
Router(config)# int gig 0/1
Router(config-if)# ipv6 add 2001:DB8:0:2::1/64
Router(config-if)# no shut
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet 0/1, changed
  state to up
%LINEPROTO-5-UPDOWN: Line Protocol on Interface
GigabitEthernet 0/1, changed state to up.
```

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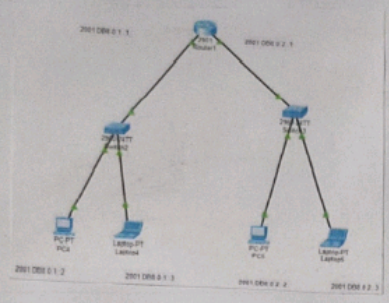
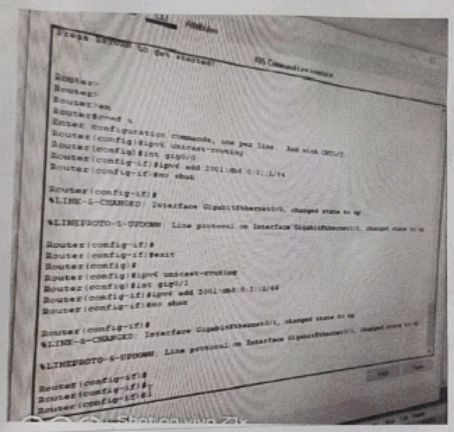
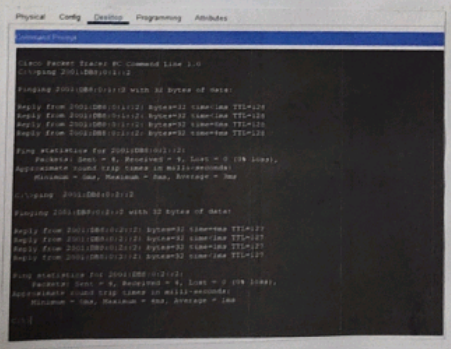
IPV6







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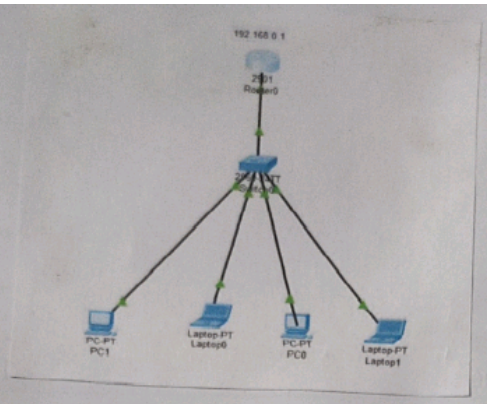
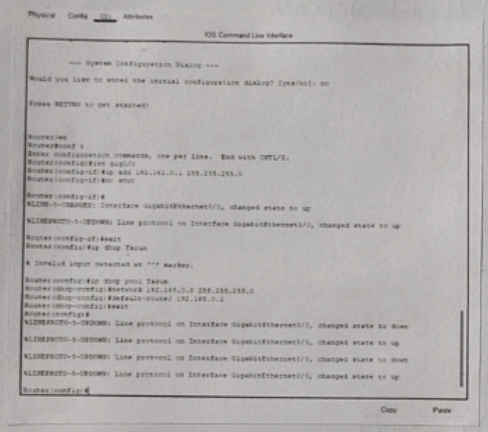
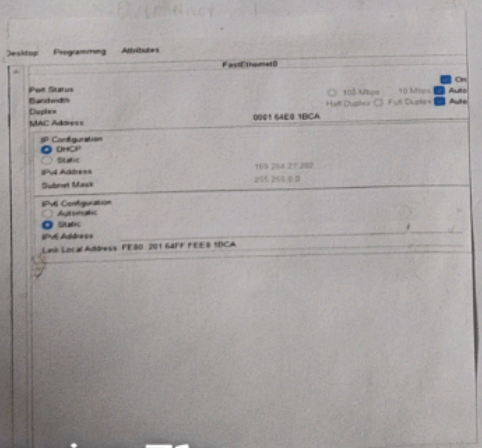
IPV4 Router Configuration: (DHCP)

```
Router> en
Router# conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# int gig 0/0
Router(config-if)# ip add 192.162.0.1 255.255.255.0
Router(config-if)# no shut
Router(config-if)#
%. LINK-5-CHANGED: Interface GigabitEthernet 0/0, changed
state to UP
%. LINEPROTO-5-UPDOWN : Line protocol on Interface GigabitEthernet
0/0, changed state to UP.
Router(config-if)# exit
Router(config)# ip dhcp Pool Tarun
Router(dhcp-config)# network 192.162.0.0 255.255.255.0
Router(dhcp-config)# default-router 192.162.0.1
Router(dhcp-config)# exit
Router(config)#
```







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IPv6 Router Configuration : (Automatic)

```
Router> en
Router # conf t
Enter configuration commands, one per line, End with
CNTL/Z.
Router (config) # ipv6 unicast-routing
Router (config) # int gig 0/0
Router (config-if)# ipv6 add 2001:0B8:0:1::1/64
Router (config-if)# no shut
Router (config-if)#
% LINK-5-CHANGED: Interface GigabitEthernet 0/0, changed
state to up
% LINEPROTO-5-UPDOWN: Line Protocol on Interface
GigabitEthernet 0/0, changed state to UP.
```

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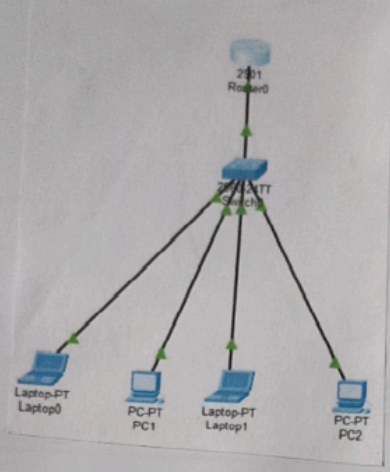

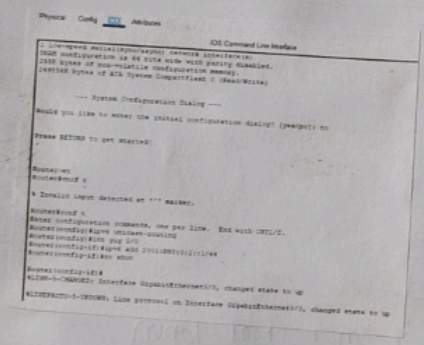

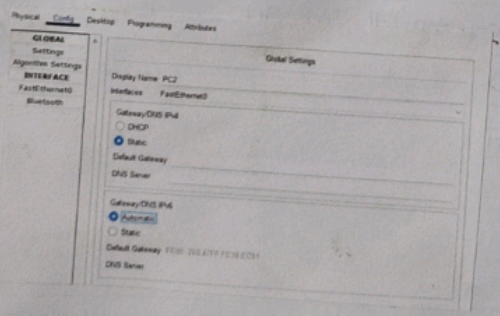

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