DEPARTMENT OF COMPUTER ENGINEERING
Computer Network Lab

Semester	T.E. Semester V – Computer Engineering
Subject	Computer Network
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Title: Study of Networking commands

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Implementation:

1. **Netstat** (Network Statistics):
   - Purpose: Displays network-related information, including active network connections, routing tables, interface statistics, and more.
   - Example: Display all listening ports on a Linux system.

```
C:\Users\student>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    172.16.136.91:51414    20.198.119.84:https    ESTABLISHED
  TCP    172.16.136.91:51464    104.17.187.189:https   CLOSE_WAIT
  TCP    172.16.136.91:51591    sa-in-f188:5228        ESTABLISHED
  TCP    172.16.136.91:51676    a23-212-254-41:https   LAST_ACK
  TCP    172.16.136.91:51677    a23-212-254-74:https   LAST_ACK
  TCP    172.16.136.91:51678    52.98.59.18:https      LAST_ACK
  TCP    172.16.136.91:51681    13.107.6.254:https     LAST_ACK
  TCP    172.16.136.91:51682    13.107.3.254:https     LAST_ACK
  TCP    172.16.136.91:51683    13.107.237.254:https   LAST_ACK
  TCP    172.16.136.91:51684    204.79.197.222:https   LAST_ACK
  TCP    172.16.136.91:51792    104.17.187.189:https   CLOSE_WAIT
  TCP    172.16.136.91:51805    104.17.187.189:https   TIME_WAIT
  TCP    172.16.136.91:51900    172.16.136.84:ms-do    ESTABLISHED
  TCP    172.16.136.91:51904    104.17.187.189:https   ESTABLISHED
  TCP    172.16.136.91:51910    104.17.187.189:https   ESTABLISHED
  TCP    172.16.136.91:51911    172.16.116.98:ms-do    ESTABLISHED
  TCP    172.16.136.91:51915    172.16.141.18:ms-do    ESTABLISHED
  TCP    172.16.136.91:51920    bom07s32-in-f14:https  TIME_WAIT
  TCP    172.16.136.91:51921    hkg12s10-in-f46:https  TIME_WAIT
  TCP    172.16.136.91:51923    20.44.229.112:https    ESTABLISHED
  TCP    172.16.136.91:51924    52.139.250.209:https   TIME_WAIT
  TCP    172.16.136.91:51927    1:https                TIME_WAIT
  TCP    172.16.136.91:51928    bom12s18-in-f2:https   TIME_WAIT
  TCP    172.16.136.91:51929    125.99.88.205:https    TIME_WAIT
  TCP    172.16.136.91:51930    125.99.88.205:https    TIME_WAIT
  TCP    172.16.136.91:51931    bom12s17-in-f1:https   TIME_WAIT
  TCP    172.16.136.91:51932    bom07s25-in-f22:https  TIME_WAIT
  TCP    172.16.136.91:51933    bom07s25-in-f22:https  TIME_WAIT
  TCP    172.16.136.91:51935    bom12s20-in-f4:https   TIME_WAIT
  TCP    172.16.136.91:51936    a23-212-254-74:https   ESTABLISHED
  TCP    172.16.136.91:51937    a23-212-254-74:https   ESTABLISHED
  TCP    172.16.136.91:51938    a23-212-254-74:https   ESTABLISHED
  TCP    172.16.136.91:51939    52.98.59.18:https      ESTABLISHED
  TCP    172.16.136.91:51940    a23-212-254-41:https   ESTABLISHED
```

Command: netstat -tuln

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2. **TraceRoute** (Traceroute) :
   - Purpose: Traces the route that packets take from one host to another, showing the IP addresses and response times of each hop.
   - Example: Trace the route to google.com.

```
C:\Users\student>tracert google.com

Tracing route to google.com [142.250.192.46]
over a maximum of 30 hops:

  1    <1 ms    25 ms    4 ms  172.16.136.1
  2    <1 ms    <1 ms   <1 ms  172.16.0.1
  3     1 ms     2 ms    8 ms  125.99.106.137
  4     2 ms     1 ms    1 ms  192.168.210.129
  5     2 ms     2 ms    2 ms  192.168.27.34
  6     2 ms     *        1 ms  125.99.55.254
  7     1 ms     2 ms    1 ms  125.99.55.253
  8     3 ms     *        3 ms  125.99.55.163
  9     *        4 ms    4 ms  125.99.55.165
 10     3 ms     2 ms    3 ms  142.251.225.77
 11     2 ms     2 ms    2 ms  142.250.212.171
 12     1 ms     1 ms    2 ms  bom12s15-in-f14.1e100.net [142.250.192.46]

Trace complete.
```

   Command: traceroute google.com

3. **Ifconfig**:
   - Purpose: Used to configure and display information about network interfaces on Unix-like systems (Linux, macOS).
   - Example: Display network information for the "eth0" interface on a Linux system.

   Command: ifconfig

4. **IpConfig**:
   - Purpose: Displays or configures IP-related information on Windows systems.
   - Example: Display IP configuration information for all interfaces on a Windows system.

   Command: ipconfig /all

5. **IpAddr**:
   - Purpose: Similar to `ifconfig`, used to show or manipulate IP addresses on Linux systems.
   - Example: Display IP address information for all interfaces on a Linux system.

```
C:\Users\student>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet 3:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::f77e:b6fb:bd31:69d4%16
   IPv4 Address. . . . . . . . . . . : 172.16.136.91
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 172.16.136.1
```

Command: ip addr show

6. **Dig** (Domain Information Groper):
   - Purpose: Performs DNS queries to look up DNS records (A, MX, NS, etc.) for domain names.
   - Example: Look up the IP address of example.com using Dig.

```
C:\Users\student>Nslookup github.com
Server:  WDC-SRV-22.wdc.vidyalankarlive.com
Address:  172.16.1.5

Non-authoritative answer:
Name:    github.com
Address:  20.207.73.82
```

Command: dig example.com •

7. **Host**:
 - Purpose: Resolves domain names to IP addresses and vice versa.
 - Example: Resolve the IP address of google.com using the host command.

 Command: host google.com

8. **ARP** (Address Resolution Protocol):
   - Purpose: Maps an IP address to a physical MAC address on a local network.
   - Example: Display the ARP cache on a Windows system.

   Command: arp -a

```
C:\Users\student>arp -a

Interface: 172.16.136.91 --- 0x10
  Internet Address        Physical Address      Type
  172.16.136.1            64-9e-f3-64-4a-71     dynamic
  172.16.136.84           f4-4d-30-ab-fc-3b     dynamic
  172.16.136.90           f4-4d-30-ac-74-3e     dynamic
  172.16.136.99           f4-4d-30-ab-f7-ec     dynamic
  172.16.136.255          ff-ff-ff-ff-ff-ff     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
  239.255.255.250         01-00-5e-7f-ff-fa     static
```

9. **FTP** (File Transfer Protocol):
   - Purpose: A protocol for transferring files between a client and a server over a network.
   - Example: Connect to an FTP server and upload a file using FTP.

   Command: ftp ftp.example.com

10. **TelNet**:
    - Purpose: Allows remote terminal access to a device or server over a network.
    - Example: Connect to a remote server with IP address 192.168.1.100 on port 22 (SSH).

    Command: telnet 192.168.1.100 22

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Differences between ifconfig , ipconfig, and ip addr:

- **ifconfig**(Unix/Linux):
  - Primarily used on Unix-like systems (Linux, macOS).
  - Displays and configures network interfaces.
- **ipconfig** (Windows):
  - Specific to Windows.
  - Displays and configures IP-related information.
- **ip addr** (Unix/Linux):
  - Similar to ipconfig on Windows.
  - Provides detailed IP address information on Linux systems.

End Result:

Conclusion: In summary, these commands are used for various networking tasks such as network configuration, diagnostics, DNS queries, and file transfer. The choice of command depends on your operating system and specific networking needs.