

1. ping – command is one of the most often used networking utilities for detecting devices on a network and for troubleshooting network problems.

```
C:\Users\Acer>ping
Usage: ping [-t] [-a] [-n count] [-l size] [-f] [-i TTL] [-v TOS]
           [-r count] [-s count] [[-j host-list] | [-k host-list]]
           [-w timeout] [-R] [-S srcaddr] [-c compartment] [-p]
           [-4] [-6] target_name

Options:
  -t              Ping the specified host until stopped.
                  To see statistics and continue - type Control-Break;
                  To stop - type Control-C.
  -a              Resolve addresses to hostnames.
  -n count        Number of echo requests to send.
  -l size         Send buffer size.
  -f              Set Don't Fragment flag in packet (IPv4-only).
  -i TTL          Time To Live.
  -v TOS          Type Of Service (IPv4-only). This setting has been deprecated
                  and has no effect on the type of service field in the IP
                  Header).
  -r count        Record route for count hops (IPv4-only).
  -s count        Timestamp for count hops (IPv4-only).
  -j host-list   Loose source route along host-list (IPv4-only).
  -k host-list   Strict source route along host-list (IPv4-only).
  -w timeout     Timeout in milliseconds to wait for each reply.
  -R              Use routing header to test reverse route also (IPv6-only).
                  Per RFC 5095 the use of this routing header has been
                  deprecated. Some systems may drop echo requests if
                  this header is used.
  -S srcaddr     Source address to use.
  -c compartment Routing compartment identifier.
  -p              Ping a Hyper-V Network Virtualization provider address.
  -4              Force using IPv4.
  -6              Force using IPv6.
```

2. hostname – command that displays the hostname of your machine.

```
[nityam@Nityams-MacBook-Air ~ % hostname
Nityams-MacBook-Air.local
```

3. ipconfig – frequently used utility that is used for finding network information about your local machine like ip addresses, dns addresses etc.

```
C:\Users\Acer>ipconfig
Windows IP Configuration

Ethernet adapter Ethernet:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . .

Wireless LAN adapter Local Area Connection* 1:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . .

Wireless LAN adapter Local Area Connection* 10:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . .

Wireless LAN adapter Wi-Fi:
  Connection-specific DNS Suffix . . . : mshome.net
  Link-local IPv6 Address . . . . . : fe80::dcd0:e5af:1341:f689%6
  IPv4 Address. . . . . : 172.16.211.149
  Subnet Mask . . . . . : 255.255.240.0
  Default Gateway . . . . . : 172.16.208.1

Ethernet adapter Bluetooth Network Connection:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . . .
```

4. nbtstat – diagnostic tool for troubleshooting NetBIOS problems.

```
C:\Users\Acer>nbtstat
Displays protocol statistics and current TCP/IP connections using NBT
(NetBIOS over TCP/IP).

NBTSTAT [ [-a RemoteName] [-A IP address] [-c] [-n]
           [-r] [-R] [-RR] [-s] [-S] [interval] ]

-a  (Adapter status) Lists the remote machine's name table given its name
-A  (Adapter status) Lists the remote machine's name table given its
                  IP address.
-c  (cache)          Lists NBT's cache of remote [machine] names and their IP addresses
-n  (names)          Lists local NetBIOS names.
-r  (resolved)       Lists names resolved by broadcast and via WINS
-R  (Reload)         Purges and reloads the remote cache name table
-S  (Sessions)      Lists sessions table with the destination IP addresses
-s  (sessions)       Lists sessions table converting destination IP
                  addresses to computer NETBIOS names.
-RR  (ReleaseRefresh) Sends Name Release packets to WINS and then, starts Refresh

RemoteName   Remote host machine name.
IP address   Dotted decimal representation of the IP address.
interval    Redisplays selected statistics, pausing interval seconds
            between each display. Press Ctrl+C to stop redisplaying
            statistics.
```

5. netstat – used for displaying information about TCP and UDP connections and ports.

```
C:\Users\Acer>netstat
```

Active Connections

Proto	Local Address	Foreign Address	State
TCP	172.16.211.149:49889	4.213.25.241:https	ESTABLISHED
TCP	172.16.211.149:49954	4.213.25.241:https	ESTABLISHED
TCP	172.16.211.149:50015	40.74.78.229:https	CLOSE_WAIT
TCP	172.16.211.149:50116	162.159.192.1:https	TIME_WAIT
TCP	172.16.211.149:50125	a23-219-57-221:https	TIME_WAIT
TCP	172.16.211.149:50126	a23-34-254-84:https	TIME_WAIT
TCP	172.16.211.149:50131	20.50.73.9:https	ESTABLISHED
TCP	172.16.211.149:50134	20.190.146.39:https	TIME_WAIT
TCP	172.16.211.149:50136	20.190.146.39:https	TIME_WAIT
TCP	172.16.211.149:50137	1drv:https	TIME_WAIT
TCP	172.16.211.149:50140	52.109.56.3:https	TIME_WAIT
TCP	172.16.211.149:50141	52.109.56.3:https	TIME_WAIT
TCP	172.16.211.149:50142	52.109.56.3:https	TIME_WAIT
TCP	172.16.211.149:50143	52.109.56.3:https	TIME_WAIT
TCP	172.16.211.149:50145	13.89.179.9:https	TIME_WAIT
TCP	172.16.211.149:50148	20.42.73.28:https	TIME_WAIT
TCP	172.16.211.149:50149	a23-195-105-97:https	TIME_WAIT
TCP	172.16.211.149:50150	52.109.56.129:https	TIME_WAIT
TCP	172.16.211.149:50151	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50152	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50153	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50154	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50155	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50156	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50157	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50158	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50159	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50160	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50161	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50162	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50163	103.3.33.9:https	TIME_WAIT
TCP	172.16.211.149:50164	1drv:https	TIME_WAIT
TCP	172.16.211.149:50165	1drv:https	TIME_WAIT
TCP	172.16.211.149:50166	1drv:https	TIME_WAIT
TCP	172.16.211.149:50167	52.111.227.11:https	ESTABLISHED
TCP	172.16.211.149:50168	1drv:https	TIME_WAIT
TCP	172.16.211.149:50169	1drv:https	TIME_WAIT
TCP	172.16.211.149:50170	1drv:https	TIME_WAIT
TCP	172.16.211.149:50171	1drv:https	TIME_WAIT
TCP	172.16.211.149:50172	1drv:https	TIME_WAIT
TCP	172.16.211.149:50173	1drv:https	TIME_WAIT

6. getmac – command that shows the MAC address of your network interfaces.

```
C:\Users\Acer>getmac
```

Physical Address	Transport Name
08-97-98-DE-69-AE	Media disconnected
64-BC-58-3C-13-6F	\Device\Tcpip_{38D06656-FA21-4941-99DF-E2AD5267B328}
64-BC-58-3C-13-73	Media disconnected

7. arp – for showing the address resolution cache. This command must be used with a command line switch –a is the most common.

```
C:\Users\Acer>arp
```

```
Displays and modifies the IP-to-Physical address translation tables used by address resolution protocol (ARP).
```

```
ARP -s inet_addr eth_addr [if_addr]  
ARP -d inet_addr [if_addr]  
ARP -a [inet_addr] [-N if_addr] [-v]
```

-a	Displays current ARP entries by interrogating the current protocol data. If inet_addr is specified, the IP and Physical addresses for only the specified computer are displayed. If more than one network interface uses ARP, entries for each ARP table are displayed.
-g	Same as -a.
-v	Displays current ARP entries in verbose mode. All invalid entries and entries on the loop-back interface will be shown.
inet_addr	Specifies an internet address.
-N if_addr	Displays the ARP entries for the network interface specified by if_addr .
-d	Deletes the host specified by inet_addr . inet_addr may be wildcarded with * to delete all hosts.
-s	Adds the host and associates the Internet address inet_addr with the Physical address eth_addr . The Physical address is given as 6 hexadecimal bytes separated by hyphens. The entry is permanent.
eth_addr	Specifies a physical address.
if_addr	If present, this specifies the Internet address of the interface whose address translation table should be modified. If not present, the first applicable interface will be used.

Example:

```
> arp -s 157.55.85.212 00-aa-00-62-c6-09 .... Adds a static entry.  
> arp -a ..... Displays the arp table.
```

8. tracert – command prints the path. If all routes on the path are functional, this command prints the full path.

```
C:\Users\Acer>tracert

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
                [-R] [-S srcaddr] [-4] [-6] target_name

Options:
    -d           Do not resolve addresses to hostnames.
    -h maximum_hops Maximum number of hops to search for target.
    -j host-list  Loose source route along host-list (IPv4-only).
    -w timeout    Wait timeout milliseconds for each reply.
    -R           Trace round-trip path (IPv6-only).
    -S srcaddr   Source address to use (IPv6-only).
    -4           Force using IPv4.
    -6           Force using IPv6.
```

9. path - command specifies the location where ms-dos should look when it executes a command.

```
C:\Users\Acer>path
PATH=C:\WINDOWS\system32;C:\WINDOWS;C:\WINDOWS\System32\Wbem;C:\WINDOWS\System32\WindowsPowerShell\v1.0\;C:\WINDOWS\System32\OpenSSH\;C:\MinGW\bin;C:\Users\Acer\Downloads\python-3.13.1-and64;C:\Program Files\nodejs\;C:\Program Files\Git\cmd\;C:\Program Files\Cloudflare\Cloudflare WARP\;C:\Users\Acer\local\bin;C:\Users\Acer\scoop\shims;C:\Users\Acer\AppData\Local\Programs\Python\Python313\Scripts\;C:\Users\Acer\AppData\Local\Programs\Python\Python313\;C:\Users\Acer\AppData\Local\Programs\Python\Launcher\;C:\Users\Acer\AppData\Local\Microsoft\WindowsApps;C:\Users\Acer\AppData\Local\Programs\Microsoft VS Code\bin;C:\Users\Acer\AppData\Local\Microsoft\WinGet\Packages\Schniz.fnm_Microsoft.Winget.Source_8wekyb3d8bbwe\;C:\Users\Acer\AppData\Roaming\npm;C:\Program Files\nodejs\;C:\Users\Acer\AppData\Local\Microsoft\WinGet\Packages\uutils.coreutils_Microsoft.Winget.Source_8wekyb3d8bbwe\coreutils-0.1.0-x86_64-pc-windows-msvc;C:\Users\Acer\AppData\Local\Programs\Ollama
```

10. route – command allows you to make manual entries into the network routing tables.

```
C:\Users\Acer>route

Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
        [MASK netmask] [gateway] [METRIC metric] [IF interface]

-f           Clears the routing tables of all gateway entries. If this is used in conjunction with one of the commands, the tables are cleared prior to running the command.

-p           When used with the ADD command, makes a route persistent across boots of the system. By default, routes are not preserved when the system is restarted. Ignored for all other commands, which always affect the appropriate persistent routes.

-4           Force using IPv4.

-6           Force using IPv6.

command      One of these:
            PRINT     Prints a route
            ADD      Adds a route
            DELETE   Deletes a route
            CHANGE   Modifies an existing route

destination  Specifies the host.
MASK         Specifies that the next parameter is the 'netmask' value.
netmask      Specifies a subnet mask value for this route entry.
            If not specified, it defaults to 255.255.255.255.
```

11. pathping – after sending out packets from you to a given destination, it analyzes the route taken and computes packet loss on a per-hop basis.

```
C:\Users\Acer>pathping

Usage: pathping [-g host-list] [-h maximum_hops] [-i address] [-n]
                [-p period] [-q num_queries] [-w timeout]
                [-4] [-6] target_name

Options:
  -g host-list      Loose source route along host-list.
  -h maximum_hops  Maximum number of hops to search for target.
  -i address        Use the specified source address.
  -n               Do not resolve addresses to hostnames.
  -p period         Wait period milliseconds between pings.
  -q num_queries   Number of queries per hop.
  -w timeout        Wait timeout milliseconds for each reply.
  -4               Force using IPv4.
  -6               Force using IPv6.
```