

EX NO:1A

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BASIC NETWORKING COMMANDS IN WINDOWS OPERATING SYSTEM

AIM:

To display basic networking commands in windows

1.IPCONFIG

The IPCONFIG network command provides a comprehensive view of information regarding the IP address configuration of the device we are currently working on.

Command to enter in Prompt – ipconfig

Wireless LAN adapter Wi-Fi:

```
Connection-specific DNS Suffix  . :  
IPv6 Address. . . . . : 2409:4072:6ec5:3b31:679c:2304:c5e:c858  
Temporary IPv6 Address. . . . . : 2409:4072:6ec5:3b31:7923:2dfb:9236:6d49  
Link-local IPv6 Address . . . . . : fe80::911a:c993:c516:c977%4  
IPv4 Address. . . . . : 192.168.92.107  
Subnet Mask . . . . . : 255.255.255.0  
Default Gateway . . . . . : fe80::4008:acff:fe49:9507%4  
                             192.168.92.41
```

2.NSLOOKUP

The NSLOOKUP command is used to troubleshoot network connectivity issues in the system. Using the nslookup command, we can access the information related to our system's DNS server, i.e., domain name and IP address.

Command to enter in Prompt – nslookup

```
C:\Users\Lenovo>nslookup  
Default Server: UnKnown  
Address: 172.16.52.1  
  
> www.google.com  
Server: UnKnown  
Address: 172.16.52.1  
  
Non-authoritative answer:  
Name: www.google.com  
Addresses: 2404:6800:4007:819::2004  
           142.250.182.4
```

3. HOSTNAME

The HOSTNAME command displays the hostname of the system. The hostname command is much easier to use than going into the system settings to search for it.

Command to enter in Prompt - hostname

```
C:\Users\Lenovo>HOSTNAME
HDC0422230
C:\Users\Lenovo>
```

4. PING

The Ping command is one of the most widely used commands in the prompt tool, as it allows the user to check the connectivity of our system to another host.

Command to enter in Prompt - ping www.destination_host_name.com

```
>
C:\Users\Lenovo>ping www.google.com

Pinging www.google.com [142.250.182.4] with 32 bytes of data:
Reply from 142.250.182.4: bytes=32 time=3ms TTL=120
Reply from 142.250.182.4: bytes=32 time=3ms TTL=120
Reply from 142.250.182.4: bytes=32 time=3ms TTL=120
Reply from 142.250.182.4: bytes=32 time=3ms TTL=120

Ping statistics for 142.250.182.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 3ms, Average = 3ms
```

5. TRACERT

The TRACERT command is used to trace the route during the transmission of the data packet over to the destination host and also provides us with the “hop” count during transmission.

Using the number of hops and the hop IP address, we can troubleshoot network issues and identify the point of the problem during the transmission of the data packet. Command to enter in Prompt- `tracert IP-address OR tracert www.destination_host_name.com`

```
C:\Users\Lenovo>tracert www.google.com

Tracing route to www.google.com [142.250.182.4]
over a maximum of 30 hops:

  1  <1 ms    <1 ms    <1 ms    172.16.52.1
  2   3 ms     6 ms     3 ms     static-41.229.249.49-tataidc.co.in [49.249.229.41]
  3   3 ms     3 ms     2 ms     142.250.171.162
  4   5 ms     5 ms     5 ms     142.251.227.217
  5   3 ms     3 ms     3 ms     142.251.55.219
  6   3 ms     3 ms     3 ms     maa05s18-in-f4.1e100.net [142.250.182.4]

Trace complete.
```

6. NETSTAT

The Netstat command as the name suggests displays an overview of all the network connections in the device. The table shows detail about the connection protocol, address, and the current state of the network.

Command to enter in Prompt - `netstat`

```

C:\Users\Lenovo>netstat

Active Connections

Proto Local Address           Foreign Address         State
TCP   127.0.0.1:49684          HDC0422230:49685       ESTABLISHED
TCP   127.0.0.1:49685          HDC0422230:49684       ESTABLISHED
TCP   127.0.0.1:49686          HDC0422230:49687       ESTABLISHED
TCP   127.0.0.1:49687          HDC0422230:49686       ESTABLISHED
TCP   172.16.52.177:23635     20.24.249.45:https     CLOSE_WAIT
TCP   172.16.52.177:23636     152.195.38.76:http      CLOSE_WAIT
TCP   172.16.52.177:24089     20.198.119.143:https    ESTABLISHED
TCP   172.16.52.177:24424     server-108-158-46-66:https ESTABLISHED
TCP   172.16.52.177:24427     172.64.155.61:https     ESTABLISHED
TCP   172.16.52.177:24428     a23-201-220-154:https   ESTABLISHED
TCP   172.16.52.177:24429     a23-201-220-154:https   ESTABLISHED
TCP   172.16.52.177:24430     172.64.155.61:https     ESTABLISHED
TCP   172.16.52.177:24432     server-18-66-41-102:https ESTABLISHED
TCP   172.16.52.177:24433     server-52-84-12-2:https ESTABLISHED
TCP   172.16.52.177:24434     server-108-158-251-26:https ESTABLISHED
TCP   172.16.52.177:24440     172.66.0.163:https      ESTABLISHED
TCP   172.16.52.177:24445     104.18.32.77:https      ESTABLISHED
TCP   172.16.52.177:24448     151.101.193.138:https   ESTABLISHED
TCP   172.16.52.177:24450     a23-223-244-177:https   CLOSE_WAIT
TCP   172.16.52.177:24451     a23-223-244-177:https   CLOSE_WAIT
TCP   172.16.52.177:24452     a23-223-244-177:https   CLOSE_WAIT
TCP   172.16.52.177:24453     a23-223-244-177:https   CLOSE_WAIT
TCP   172.16.52.177:24454     13.107.226.58:https     CLOSE_WAIT
TCP   172.16.52.177:24455     52.108.8.254:https      CLOSE_WAIT
TCP   172.16.52.177:24456     52.123.128.254:https    CLOSE_WAIT
TCP   172.16.52.177:24457     204.79.197.222:https    CLOSE_WAIT
TCP   172.16.52.177:24458     52.182.143.208:https    CLOSE_WAIT
TCP   172.16.52.177:24459     a23-223-244-88:https    CLOSE_WAIT
TCP   172.16.52.177:24460     a23-223-244-88:https    CLOSE_WAIT
TCP   172.16.52.177:24461     a23-223-244-88:https    CLOSE_WAIT
TCP   172.16.52.177:24462     a23-223-244-88:https    CLOSE_WAIT
TCP   172.16.52.177:24463     a23-223-244-88:https    CLOSE_WAIT
TCP   172.16.52.177:24465     a104-114-94-26:https    ESTABLISHED
TCP   172.16.52.177:24466     204.79.197.239:https    ESTABLISHED
TCP   172.16.52.177:24469     20.198.118.190:https    ESTABLISHED
TCP   [fe80::6730:5879:147c:7b94%9]:1521 HDC0422230:49688       ESTABLISHED
TCP   [fe80::6730:5879:147c:7b94%9]:49688 HDC0422230:1521        ESTABLISHED

```

7. ARP(Address Resolution Protocol)

The ARP command is used to access the mapping structure of IP addresses to the MAC address. This provides us with a better understanding of the transmission of packets in the network channel.

Command to enter in Prompt – arp

```

C:\Users\Lenovo>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. SYSTEMINFO

Using the SYSTEMINFO command, we can access the system's hardware and software details, such as processor data, booting data, Windows version, etc.

Command to enter in Prompt – systeminfo


```

Host Name:                HDC0422230
OS Name:                  Microsoft Windows 11 Pro
OS Version:               10.0.22000 N/A Build 22000
OS Manufacturer:         Microsoft Corporation
OS Configuration:        Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:         Lenovo
Registered Organization:
Product ID:                00331-20000-73468-AA240
Original Install Date:     6/10/2022, 1:45:14 AM
System Boot Time:          8/5/2024, 3:49:29 PM
System Manufacturer:       LENOVO
System Model:              11QCS01V00
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 167 Stepping 1 GenuineIntel ~2592 Mhz
BIOS Version:              LENOVO M3GKT34A, 3/2/2022
Windows Directory:         C:\WINDOWS
System Directory:          C:\WINDOWS\system32
Boot Device:               \Device\HarddiskVolume1
System Locale:              en-us;English (United States)
Input Locale:               00004009
Time Zone:                 (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Total Physical Memory:      16,122 MB
Available Physical Memory:  11,017 MB
Virtual Memory: Max Size:  18,554 MB
Virtual Memory: Available: 11,061 MB
Virtual Memory: In Use:     7,493 MB
Page File Location(s):      C:\pagefile.sys
Domain:                     WORKGROUP
Logon Server:               \\HDC0422230
Hotfix(s):                  7 Hotfix(s) Installed.
                           [01]: KB5029717
                           [02]: KB5028014
                           [03]: KB5007575
                           [04]: KB5011048
                           [05]: KB5012170
                           [06]: KB5030217
                           [07]: KB5029782
Network Card(s):            1 NIC(s) Installed.
                           [01]: Realtek PCIe GbE Family Controller
                               Connection Name: Ethernet
                               DHCP Enabled:    No
                               IP address(es)
                                   [01]: 172.16.52.177
                                   [02]: fe80::6730:5879:147c:7b94
Hyper-V Requirements:       VM Monitor Mode Extensions: Yes
                           Virtualization Enabled In Firmware: Yes
                           Second Level Address Translation: Yes
                           Data Execution Prevention Available: Yes

```

9. ROUTE

Provides the data of routing data packets in the system over the communication channel.

Command to enter in Prompt – route print

```
C:\Users\Lenovo>route print
=====
Interface List
  9...88 ae dd 12 c7 fc .....Realtek PCIe GbE Family Controller
  1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
0.0.0.0                    0.0.0.0          172.16.52.1      172.16.52.177    281
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
172.16.52.0                255.255.252.0    On-link          172.16.52.177    281
172.16.52.177             255.255.255.255  On-link          172.16.52.177    281
172.16.55.255             255.255.255.255  On-link          172.16.52.177    281
224.0.0.0                  240.0.0.0        On-link          127.0.0.1        331
224.0.0.0                  240.0.0.0        On-link          172.16.52.177    281
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          172.16.52.177    281
=====
Persistent Routes:
Network Address        Netmask  Gateway Address  Metric
0.0.0.0                0.0.0.0    172.16.52.1      Default
=====

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
1    331 ::1/128               On-link
9    281 fe80::/64            On-link
9    281 fe80::6730:5879:147c:7b94/128
                                   On-link
1    331 ff00::/8              On-link
9    281 ff00::/8              On-link
=====
Persistent Routes:
None
```