

SSGMCE	SHRI SANT GAJANAN MAHARAJ COLLEGE OF ENGG.		LABORATORY MANUAL	
	PRACTICAL EXPERIMENT INSTRUCTION SHEET			
	EXPERIMENT TITLE : To study and implement network commands and network configuration commands(for Windows OS)			
EXPERIMENT NO.: SSGMCE/WI/IT/01/4IT06/04		ISSUE NO. : 00	ISSUE DATE : 22.01.2024	
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**01 AIM:** To study and implement network commands and network configuration commands(for Windows OS)

## **02 SOCOPE:**

- Understanding Network Commands: Learn about various commands line tools and their purpose in network analysis and configuration.
- Practical Implementation: Execute commands to inspect network configurations connectivity and performance.
- Network Troubleshooting: Use commands to diagnose and resolve network problems.

## **03 FACILITIES**

- PCs with windows OS installed and network connectivity.
- Access to the Windows Command Prompt.

## **04 THEORY**

### **I. IPCONFIG**

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

The IPConfig command also provides us with some variation in the primary command that targets specific system settings or data, which are:

- IPConfig/all - Provides primary output with additional information about network adapters.
- IPConfig/renew - Used to renew the system's IP address.

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- IPConfig/release - Removes the system's current IP address.

Command to enter in Prompt - ipconfig

```
C:\Users\HITMAN>ipconfig

Windows IP Configuration

Ethernet adapter Bluetooth Network Connection:

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

Wireless LAN adapter Local Area Connection* 12:

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

Wireless LAN adapter Wi-Fi:

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

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::90b0:ff28:353b:61c7%3
    IPv4 Address. . . . . : 10.0.5.155
    Subnet Mask . . . . . : 255.255.248.0
    Default Gateway . . . . . : 10.0.0.2

Tunnel adapter isatap.{85A4F8D4-7029-4186-85A4-162480FD4316}:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
```

## II. 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

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```

C:\Users\HITMAN>NSLOOKUP
DNS request timed out.
    timeout was 2 seconds.
Default Server: UnKnown
Address: 1.1.1.1

> www.google.com
Server: UnKnown
Address: 1.1.1.1

DNS request timed out.
    timeout was 2 seconds.
DNS request timed out.
    timeout was 2 seconds.
DNS request timed out.
    timeout was 2 seconds.
DNS request timed out.
    timeout was 2 seconds.
*** Request to UnKnown timed-out
>

```

### III. 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\HITMAN>hostname
HITESH

```

### IV. 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.

This command sends four experimental packets to the destination host to check whether it receives them successfully, if so, then, we can communicate with the destination host. But in case the packets have not been received, that means, no communication can be established with the destination host.

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Command to enter in Prompt - ping [www.destination\\_host\\_name.com](http://www.destination_host_name.com)

```
C:\Users\HITMAN>PING 10.0.5.155

Pinging 10.0.5.155 with 32 bytes of data:
Reply from 10.0.5.155: bytes=32 time<1ms TTL=128
Reply from 10.0.5.155: bytes=32 time<1ms TTL=128
Reply from 10.0.5.155: bytes=32 time<1ms TTL=128
Reply from 10.0.5.155: bytes=32 time<1ms TTL=128

Ping statistics for 10.0.5.155:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

## V. 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](http://www.destination_host_name.com)

```
C:\Users\HITMAN>TRACERT 10.0.5.155

Tracing route to HITESH [10.0.5.155]
over a maximum of 30 hops:

  1    <1 ms    <1 ms    <1 ms    HITESH [10.0.5.155]

Trace complete.
```

## VI. NETSTAT

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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\HITMAN>NETSTAT
Active Connections

```

Proto	Local Address	Foreign Address	State
TCP	10.0.5.155:53604	sb-in-f188:https	ESTABLISHED
TCP	10.0.5.155:55153	212.111.42.4:https	ESTABLISHED
TCP	10.0.5.155:55487	li695-222:https	ESTABLISHED
TCP	10.0.5.155:55858	whatsapp-cdn-shv-01-bom1:https	ESTABLISHED
TCP	10.0.5.155:55888	HP:wsd	TIME_WAIT
TCP	10.0.5.155:55894	HP:wsd	TIME_WAIT
TCP	10.0.5.155:55898	HP:wsd	TIME_WAIT
TCP	10.0.5.155:55903	DESKTOP-E9K0TCG:wsd	TIME_WAIT
TCP	10.0.5.155:55918	34.193.113.164:https	SYN_SENT
TCP	10.0.5.155:55919	8.8.4.4:https	SYN_SENT
TCP	10.0.5.155:55920	dns:https	SYN_SENT
TCP	10.0.5.155:55921	dns:https	SYN_SENT
TCP	10.0.5.155:55922	dns:https	SYN_SENT
TCP	10.0.5.155:55923	dns:https	SYN_SENT
TCP	10.0.5.155:55924	dns:https	SYN_SENT
TCP	10.0.5.155:55925	bom12s13-in-f3:https	SYN_SENT
TCP	10.0.5.155:55926	8.58.2.8:https	SYN_SENT

## VII. 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

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```

C:\Users\HITMAN>SYSTEMINFO

Host Name:                HITESH
OS Name:                  Microsoft Windows 8.1 Pro
OS Version:               6.3.9600 N/A Build 9600
OS Manufacturer:         Microsoft Corporation
OS Configuration:         Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:         HITMAN
Registered Organization:
Product ID:                00261-50000-00000-AA304
Original Install Date:    7/21/2020, 3:37:09 AM
System Boot Time:         2/23/2024, 3:20:12 PM
System Manufacturer:      Dell Inc.
System Model:              Inspiron 3542
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 69 Stepping 1 GenuineInt
el ~1700 Mhz
BIOS Version:              Dell Inc. A03, 5/27/2014
Windows Directory:        C:\Windows
System Directory:          C:\Windows\system32
Boot Device:               \Device\HarddiskVolume1
System Locale:              en-us;English (United States)
Input Locale:              en-us;English (United States)
Time Zone:                 (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Total Physical Memory:     4.000 MB
Available Physical Memory: 984 MB
Virtual Memory: Max Size:  8.558 MB
Virtual Memory: Available: 1.701 MB
Virtual Memory: In Use:    6.857 MB
Page File Location(s):     C:\pagefile.sys
Domain:                    WORKGROUP
Logon Server:              \\HITESH
Hotfix(s):                 173 Hotfix(s) Installed.
                           [01]: KB2899189_Microsoft-Windows-CameraCodec-Package

```

## VIII. 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

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C:\Users\HITMAN>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. Specifies an internet address.

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.

C:\Users\HITMAN>arp -a

Interface: 10.0.5.155 --- 0x3

Internet Address	Physical Address	Type
10.0.0.1	6c-4b-90-15-82-e2	dynamic
10.0.0.2	6c-6a-77-14-7d-00	dynamic
10.0.0.31	74-bf-c0-ff-75-ea	dynamic
10.0.0.88	ec-b1-d7-34-67-96	dynamic
10.0.0.131	bc-ad-28-aa-e8-c4	dynamic
10.0.0.132	4c-bd-8f-a1-40-4f	dynamic
10.0.0.133	a4-14-32-b4-02-e8	dynamic

## 05 CONCLUSION:

Through hands-on experience we gain insights into inner workings of network operations and the pivotal role of command line tools in network administration.