

21BCE1955
VAIBHAV BANKA

Register Number	21BCE1955	Subject Code	BCSE 308P
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Programme	BTECH CSE	Slot	L1+L2
Course		Semester	IV

EXPERIMENT 1

AIM: Study of basic Network commands

COMMANDS COVERED:

- ✓ Ifconfig or ipconfig
- ✓ Ping
- ✓ Traceroute
- ✓ Netstat
- ✓ Nslookup

1. Ifconfig (Interface configuration) or ipconfig(windows):

- Purpose: Configures or displays network interface parameters for a network using TCP/IP.
- Syntax: ifconfig Interface [ProtocolFamily] Interface ProtocolFamily
- Flags: -a: This flag instructs ifconfig to display information about all interfaces in the system.
 - d: displays interfaces that are down
 - l: lists all the available interfaces on the system
 - u: displays interfaces that are up
 - arp: enables ifconfig in mapping between network level addresses and link-level addresses. Is in effect by default.
 - arp: disables the above command
 - s: displays a shortlist instead of details
- References: https://sites.ualberta.ca/dept/chemeng/AIX-43/share/man/info/C/a_doc_lib/cmds/aixcmds3/ifconfig.htm

```
oslab@oslab-VirtualBox: ~/Desktop/Vaibhav_Banka_21BCE1955$ ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.10.129 netmask 255.255.255.0 broadcast 192.168.10.255
    inet6 fe80::dffd:f5ec:636a:c5f8 prefixlen 64 scopeid 0x20<link>
    ether 00:0c:29:2c:73:37 txqueuelen 1000 (Ethernet)
    RX packets 7531 bytes 10876320 (10.8 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 1775 bytes 149954 (149.9 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 201 bytes 19051 (19.0 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 201 bytes 19051 (19.0 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

21BCE1955
VAIBHAV BANKA

```
oslab@oslab-VirtualBox:~/Desktop/Vaibhav_Banka_21BCE1955$ ifconfig -a
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.10.129 netmask 255.255.255.0 broadcast 192.168.10.255
    inet6 fe80::dffd:f5ec:636a:c5f8 prefixlen 64 scopeid 0x20<link>
    ether 00:0c:29:2c:73:37 txqueuelen 1000 (Ethernet)
    RX packets 7534 bytes 10876557 (10.8 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 1779 bytes 150298 (150.2 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 202 bytes 19124 (19.1 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 202 bytes 19124 (19.1 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
oslab@oslab-VirtualBox:~/Desktop/Vaibhav_Banka_21BCE1955$ ifconfig -s
Iface    MTU     RX-OK RX-ERR RX-DRP RX-OVR    TX-OK TX-ERR TX-DRP TX-OVR Flg
ens33    1500    7534   0      0 0      1779   0      0      0 0 BMRU
lo       65536   202    0      0 0      202    0      0      0 0 LRU
```

2. Ping (Packet Internet or Inter-Network Groper):

- Purpose: allows a user to test and verify if a particular destination IP address exists and can accept requests in computer network administration.
- Syntax: ping [site-name] or ping[ip-address]
- Flags:
 - t: Ping the specified host until stooped
 - a: Resolve addresses to hostnames
 - c count: Number of echo requests to send
 - i count: Specifies an interval between successive packet transmissions. (By default it is 1s)

```
oslab@oslab-VirtualBox:~/Desktop/Vaibhav_Banka_21BCE1955$ ping www.google.com
PING www.google.com (142.250.195.228) 56(84) bytes of data.
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=1 ttl=128 ti
me=4.55 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=2 ttl=128 ti
me=4.44 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=3 ttl=128 ti
me=4.45 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=4 ttl=128 ti
me=4.44 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=5 ttl=128 ti
me=4.40 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=6 ttl=128 ti
me=4.58 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=7 ttl=128 ti
me=4.52 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=8 ttl=128 ti
me=4.73 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=9 ttl=128 ti
me=5.66 ms
^C
--- www.google.com ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8013ms
rtt min/avg/max/mdev = 4.399/4.640/5.660/0.372 ms
```

```
oslab@oslab-VirtualBox:~/Desktop/Vaibhav_Banka_21BCE1955$ ping -c 5 www.google.
com
PING www.google.com (142.250.195.228) 56(84) bytes of data.
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=1 ttl=128 ti
me=4.74 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=2 ttl=128 ti
me=4.31 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=3 ttl=128 ti
me=4.48 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=4 ttl=128 ti
me=4.67 ms
64 bytes from maa03s43-in-f4.1e100.net (142.250.195.228): icmp_seq=5 ttl=128 ti
me=4.61 ms

--- www.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4007ms
rtt min/avg/max/mdev = 4.314/4.562/4.739/0.151 ms
```

3. TraceRoute(For linux) and tracert(for windows):

- Purpose: to trace the IP route from a source to a destination inside an IP network
- Syntax : traceroute [site-name]

```
oslab@oslab-VirtualBox:~/Desktop/Vaibhav_Banka_21BCE1955$ traceroute www.youtube.com
traceroute to youtube-ui.l.google.com (142.250.193.142), 64 hops max
 1  192.168.10.2  0.193ms  0.204ms  0.158ms
 2  * * *
 3  * * *
 4  * * *
```

4. Nslookup (Name Server Lookup):

- Purpose: It is a network administration tool for querying the Domain Name System (DNS) to obtain domain name or IP address mapping or any other specific DNS record
- Syntax: nslookup [site-name]

```
oslab@oslab-VirtualBox:~/Desktop/Vaibhav_Banka_21BCE1955$ nslookup www.google.com
Server:      127.0.0.53
Address:     127.0.0.53#53

Non-authoritative answer:
Name:   www.google.com
Address: 142.250.195.228
Name:   www.google.com
Address: 2404:6800:4007:828::2004
```

5. Netstat

- Purpose: The netstat command displays the contents of various network-related data structures for active connections.
- Syntax: netstat [site-name]
- Flag:
 - a: To show both listening and non-listening sockets
 - at: To list all tcp ports
 - au: lists all udp ports
 - l: lists only listening ports
 - lt: lists the listening tcp ports
 - lu: lists listening udp ports
 - s: lists the statistics of all the ports
 - su: lists statistics for udp ports
 - st: lists statistics for tcp ports
 - i: get the list of network interfaces
- References: <https://www.geeksforgeeks.org/netstat-command-linux>

```
oslab@oslab-VirtualBox:~/Desktop/Vaibhav_Banka_21BCE1955$ netstat www.google.com
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 oslab-VirtualBox:bootpc 192.168.10.254:bootps   ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags     Type       State           I-Node  Path
unix  2      [ ]       DGRAM          CONNECTED      23046   /run/user/1000/systemd/notify
unix  3      [ ]       DGRAM          CONNECTED      16054   /run/systemd/notify
unix  2      [ ]       DGRAM          CONNECTED      16068   /run/systemd/journal/syslog
unix  17     [ ]       DGRAM          CONNECTED      16077   /run/systemd/journal/dev-log
unix  9      [ ]       DGRAM          CONNECTED      16079   /run/systemd/journal/socket
unix  3      [ ]       STREAM         CONNECTED      25864
unix  3      [ ]       STREAM         CONNECTED      25302
unix  2      [ ]       DGRAM          CONNECTED      20074
unix  2      [ ]       DGRAM          CONNECTED      18146
unix  3      [ ]       STREAM         CONNECTED      42997
unix  2      [ ]       STREAM         CONNECTED      20855
unix  3      [ ]       STREAM         CONNECTED      25525
```