DEPARTMENT OF INFORMATION TECHNOLOGY

EXPERIMENT NO. 3

ADVANCED COMMANDS IN LINUX

AIM: Study of UNIX Networking Commands.

REQUIREMENT: Computer machine, UBUNTU OS

THEORY: Diagnostic Networking commands are programs written for the purpose of examining the state, or locating problems with the hardware, or operating system environment that it is running on/in, the soft wares or any combination in a system, or a network of systems. Preferably, diagnostic programs provide solutions to the user to solve issues.

Following are some of the networking commands:

1. **ifconfig:** Ifconfig **(**interface configurator) command is use to initialize an interface, assign IP Address to interface and enable or disable interface on demand. With this command, the IP Address and Hardware / MAC addre**ss** assigned to interface and the MTU (Maximum transmission unit**)** size can be viewed.

2. **ping: PING** (**Packet INternet Groper**) command is known for being one of the most basic network commands. It is a command that exists on all operating systems that support TCP/IP. It is based on the ICMP (Internet Control Message Protocol) and is used to determine:

   - If there is connectivity between your machine and another machine on the network whether it is LAN OR WAN.
   - It's used to measure the "speed" or latency time.
   - It monitors the number of packages to send.
   - It is a command that exists on all operating systems that support TCP/IP

3. **traceroute:** It is a network troubleshooting utility which shows number of hops taken to reach destination and also determine packets traveling path.
   The main objective of this tool is :

- To know the travelling path of a package through our network i.e. where the package is going through (machines, switches, routers).
- It also checks that the network is working properly and gives a rough idea about where the fault lies if any problem is encountered.

4. **netstat:** Netstat command identifies all TCP connections and UDP open on a machine. Besides this, it allows us to know the following information:
   - Routing tables to meet our network interfaces and its outputs.
   - Ethernet statistics that show sent and received packages and possible errors.
   - To know the id of the process that is being used by the connection.
5. **nslookup:** Nslookup is a useful tool for troubleshooting DNS problems, such as host name resolution. When started, it shows the host name and IP address of the DNS server that is configured for the local system, and then displays command prompt for further queries.

6. **whois:** This network command is used to query data domains:

   - to find out who owns the domain, when that domain expires,to view the configured logs, contact details, etc.
   - Its use is highly recommended to contact the administrators of the domains or when incidents of migration of services such as mail and web happe
7. **host:** It is used to convert names to IP addresss and vice versa.
8. **tcpdump:** It allows the user to display TCP/IP and other packets being transmitted or received over a network to which the computer is attached.

CODE AND OUTPUT:

```
ict30@ict30-ThinkCentre-M71e:~$ sudo su
[sudo] password for ict30:
root@ict30-ThinkCentre-M71e:/home/ict30# pwd
/home/ict30
root@ict30-ThinkCentre-M71e:/home/ict30# cd Desktop

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# ifconfig
enp2s0   Link encap:Ethernet  HWaddr 8c:89:a5:93:82:d7
         inet addr:172.24.13.239  Bcast:172.24.255.255  Mask:255.255.0.0
         inet6 addr: fe80::e80c:d4d9:e3b3:3fb/64 Scope:Link
         UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
         RX packets:158145 errors:0 dropped:254 overruns:0 frame:0
         TX packets:63 errors:0 dropped:0 overruns:0 carrier:0
         collisions:0 txqueuelen:1000
         RX bytes:14919972 (14.9 MB)  TX bytes:7237 (7.2 KB)

lo       Link encap:Local Loopback
         inet addr:127.0.0.1  Mask:255.0.0.0
         inet6 addr: ::1/128 Scope:Host
         UP LOOPBACK RUNNING  MTU:65536  Metric:1
         RX packets:17604 errors:0 dropped:0 overruns:0 frame:0
         TX packets:17604 errors:0 dropped:0 overruns:0 carrier:0
         collisions:0 txqueuelen:1000
         RX bytes:1302640 (1.3 MB)  TX bytes:1302640 (1.3 MB)

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# ping 127.0.0.1
PING 127.0.0.1 (127.0.0.1) 56(84) bytes of data.
64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.048 ms
64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.034 ms
64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.034 ms
64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.033 ms
64 bytes from 127.0.0.1: icmp_seq=5 ttl=64 time=0.033 ms
64 bytes from 127.0.0.1: icmp_seq=6 ttl=64 time=0.034 ms
64 bytes from 127.0.0.1: icmp_seq=7 ttl=64 time=0.032 ms
64 bytes from 127.0.0.1: icmp_seq=8 ttl=64 time=0.031 ms
64 bytes from 127.0.0.1: icmp_seq=9 ttl=64 time=0.032 ms
64 bytes from 127.0.0.1: icmp_seq=10 ttl=64 time=0.032 ms
64 bytes from 127.0.0.1: icmp_seq=11 ttl=64 time=0.040 ms
64 bytes from 127.0.0.1: icmp_seq=12 ttl=64 time=0.031 ms

64 bytes from 127.0.0.1: icmp_seq=13 ttl=64 time=0.032 ms
64 bytes from 127.0.0.1: icmp_seq=14 ttl=64 time=0.031 ms
64 bytes from 127.0.0.1: icmp_seq=15 ttl=64 time=0.034 ms
64 bytes from 127.0.0.1: icmp_seq=16 ttl=64 time=0.034 ms
```

64 bytes from 127.0.0.1: icmp_seq=17 ttl=64 time=0.033 ms
64 bytes from 127.0.0.1: icmp_seq=18 ttl=64 time=0.030 ms
^C
--- 127.0.0.1 ping statistics ---
18 packets transmitted, 18 received, 0% packet loss, time 17393ms
rtt min/avg/max/mdev = 0.030/0.033/0.048/0.008 ms

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# ping 172.24.13.223
PING 172.24.13.223 (172.24.13.223) 56(84) bytes of data.
64 bytes from 172.24.13.223: icmp_seq=1 ttl=64 time=0.304 ms
64 bytes from 172.24.13.223: icmp_seq=2 ttl=64 time=0.200 ms
64 bytes from 172.24.13.223: icmp_seq=3 ttl=64 time=0.188 ms
64 bytes from 172.24.13.223: icmp_seq=4 ttl=64 time=0.190 ms
64 bytes from 172.24.13.223: icmp_seq=5 ttl=64 time=0.230 ms
64 bytes from 172.24.13.223: icmp_seq=6 ttl=64 time=0.187 ms
64 bytes from 172.24.13.223: icmp_seq=7 ttl=64 time=0.200 ms
64 bytes from 172.24.13.223: icmp_seq=8 ttl=64 time=0.181 ms
64 bytes from 172.24.13.223: icmp_seq=9 ttl=64 time=0.186 ms
^C
--- 172.24.13.223 ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8171ms
rtt min/avg/max/mdev = 0.181/0.207/0.304/0.038 ms

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address   Foreign Address   State
tcp   0   0 localhost:mysql   *:*   LISTEN
udp   0   0 *:37007   *:*
udp   0   0 *:ipp   *:*
udp   0   0 *:mdns   *:*
udp6   0   0 [::]:46848   [::]:*
udp6   0   0 [::]:mdns   [::]:*
raw6   0   0 [::]:ipv6-icmp   [::]:*   7
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags   Type   State   I-Node Path
unix 2   [ACC]   STREAM   LISTENING   21272   /tmp/.X11-unix/X0
unix 2   [ACC]   STREAM   LISTENING   82521   @ict30-
com.canonical.Unity.Scope.scopes.T44787289257991
unix 2   [ACC]   STREAM   LISTENING   25747   /tmp/.ICE-unix/1606
unix 2   [ACC]   STREAM   LISTENING   25746   @/tmp/.ICE-unix/1606
unix 2   [ACC]   STREAM   LISTENING   26104
/tmp/OSL_PIPE_1000_SingleOfficeIPC_482a5d45b4dd7d69d367ef978607c
unix 2   [ACC]   STREAM   LISTENING   24606   /run/user/1000/keyring/pkcs11
unix 2   [ACC]   STREAM   LISTENING   24609   /run/user/1000/keyring/ssh

```
unix 2    [ ACC ]    STREAM    LISTENING    21271   @/tmp/.X11-unix/X0
unix 2    [ ACC ]    STREAM    LISTENING    82495    @ict30-
com.canonical.Unity.Master.Scope.applications.T44783384388679
unix 2    [ ACC ]    STREAM    LISTENING    22483   /home/ict30/.gnupg/S.gpg-agent
unix 2    [ ACC ]    STREAM    LISTENING    23857   /run/user/1000/keyring/control
unix 2    [ ACC ]    STREAM    LISTENING    24687   @/tmp/dbus-UvynOomYdB
unix 2    [ ACC ]    STREAM    LISTENING    25715   /run/user/1000/pulse/native
unix 2    [ ]    DGRAM         22389   /run/user/1000/systemd/notify
unix 2    [ ACC ]    STREAM    LISTENING    22391   /run/user/1000/systemd/private
unix 2    [ ACC ]    STREAM    LISTENING    21640   /var/run/mysqld/mysqld.sock
unix 2    [ ACC ]    STREAM    LISTENING    15753   /run/acpid.socket
unix 2    [ ACC ]    STREAM    LISTENING    82496    @ict30-
com.canonical.Unity.Master.Scope.files.T4478339013531
unix 2    [ ACC ]    STREAM    LISTENING    15755   /var/run/dbus/system_bus_socket
unix 2    [ ACC ]    STREAM    LISTENING    15758   /var/run/avahi-daemon/socket
unix 2    [ ACC ]    STREAM    LISTENING    15761   /run/snapd.socket
unix 2    [ ACC ]    STREAM    LISTENING    15763   /run/snapd-snap.socket
unix 2    [ ACC ]    STREAM    LISTENING    15765   /var/run/cups/cups.sock
unix 2    [ ACC ]    STREAM    LISTENING    15768   /run/uuidd/request
unix 2    [ ACC ]    STREAM    LISTENING    21499    @/com/ubuntu/upstart-
session/1000/1375
unix 2    [ ACC ]    STREAM    LISTENING    24638   @/tmp/ibus/dbus-j8XP8uiS
unix 3    [ ]    DGRAM         478    /run/systemd/notify
unix 2    [ ACC ]    STREAM    LISTENING    480    /run/systemd/private
unix 2    [ ACC ]    STREAM    LISTENING    82520    @ict30-
com.canonical.Unity.Scope.applications.T44787282741650
unix 2    [ ]    DGRAM         492    /run/systemd/journal/syslog
unix 2    [ ACC ]    SEQPACKET LISTENING    495    /run/udev/control
unix 2    [ ACC ]    STREAM    LISTENING    22436   @/tmp/dbus-Lob9b96tfy
unix 2    [ ACC ]    STREAM    LISTENING    497    /run/systemd/journal/stdout
unix 2    [ ACC ]    STREAM    LISTENING    82515    @ict30-
com.canonical.Unity.Scope.files.T44784144632226
unix 7    [ ]    DGRAM         499    /run/systemd/journal/socket
unix 2    [ ACC ]    STREAM    LISTENING    37438   @/tmp/dbus-KFwBwa6Fhc
unix 2    [ ACC ]    STREAM    LISTENING    508    /run/systemd/fsck.progress
unix 16   [ ]    DGRAM         510    /run/systemd/journal/dev-log
unix 3    [ ]    STREAM    CONNECTED    24487
unix 3    [ ]    STREAM    CONNECTED    24232   @/tmp/.X11-unix/X0
unix 3    [ ]    STREAM    CONNECTED    24007   @/tmp/dbus-UvynOomYdB
unix 3    [ ]    STREAM    CONNECTED    23165   @/tmp/.X11-unix/X0
unix 3    [ ]    STREAM    CONNECTED    82490
unix 3    [ ]    STREAM    CONNECTED    25006
unix 3    [ ]    STREAM    CONNECTED    24860
unix 3    [ ]    STREAM    CONNECTED    23937   @/tmp/dbus-Lob9b96tfy
```

```
unix  3   [ ]     STREAM    CONNECTED    15041
unix  3   [ ]     STREAM    CONNECTED    24999
unix  3   [ ]     STREAM    CONNECTED    25876
unix  3   [ ]     STREAM    CONNECTED    24788    @/tmp/dbus-Lob9b96tfy
unix  3   [ ]     STREAM    CONNECTED    22798    /var/run/dbus/system_bus_socket
unix  3   [ ]     STREAM    CONNECTED    25224    @/dbus-vfs-daemon/socket-W7D2umNc
unix  3   [ ]     STREAM    CONNECTED    25000
unix  3   [ ]     STREAM    CONNECTED    24235
unix  3   [ ]     STREAM    CONNECTED    24813
unix  3   [ ]     STREAM    CONNECTED    24747
unix  3   [ ]     STREAM    CONNECTED    84572    /run/systemd/journal/stdout
unix  3   [ ]     STREAM    CONNECTED    23136    @/tmp/ibus/dbus-j8XP8uiS
unix  3   [ ]     STREAM    CONNECTED    24704    /run/systemd/journal/stdout
unix  3   [ ]     STREAM    CONNECTED    14977    /run/systemd/journal/stdout
unix  3   [ ]     STREAM    CONNECTED    25865    /run/systemd/journal/stdout
unix  3   [ ]     STREAM    CONNECTED    24990
unix  3   [ ]     STREAM    CONNECTED    23134
unix  3   [ ]     STREAM    CONNECTED    17279
unix  3   [ ]     STREAM    CONNECTED    25238
unix  3   [ ]     STREAM    CONNECTED    25825    @/tmp/dbus-Lob9b96tfy
unix  3   [ ]     STREAM    CONNECTED    27922
unix  3   [ ]     STREAM    CONNECTED    23507
unix  3   [ ]     STREAM    CONNECTED    25819    @/tmp/.X11-unix/X0
unix  3   [ ]     STREAM    CONNECTED    82523    @ict30-
com.canonical.Unity.Scope.scopes.T44787289257991
unix  3   [ ]     STREAM    CONNECTED    25020    @/tmp/dbus-Lob9b96tfy
unix  3   [ ]     STREAM    CONNECTED    24768
unix  3   [ ]     STREAM    CONNECTED    25623
unix  3   [ ]     STREAM    CONNECTED    27012    @/tmp/dbus-UvynOomYdB
unix  3   [ ]     STREAM    CONNECTED    24822    @/tmp/dbus-Lob9b96tfy
unix  3   [ ]     STREAM    CONNECTED    24793
unix  3   [ ]     STREAM    CONNECTED    27069    @/tmp/.X11-unix/X0
unix  3   [ ]     STREAM    CONNECTED    23509
unix  3   [ ]     STREAM    CONNECTED    24145
unix  3   [ ]     STREAM    CONNECTED    25654
unix  3   [ ]     STREAM    CONNECTED    24426    @/tmp/.X11-unix/X0
unix  3   [ ]     STREAM    CONNECTED    24074    /run/user/1000/pulse/native
unix  3   [ ]     STREAM    CONNECTED    23172    /run/systemd/journal/stdout
unix  3   [ ]     STREAM    CONNECTED    25622
unix  3   [ ]     STREAM    CONNECTED    23074
unix  3   [ ]     STREAM    CONNECTED    24972    /run/systemd/journal/stdout
unix  3   [ ]     STREAM    CONNECTED    24071    @/tmp/ibus/dbus-j8XP8uiS
unix  3   [ ]     STREAM    CONNECTED    18441    /run/systemd/journal/stdout
unix  3   [ ]     STREAM    CONNECTED    25773    @/tmp/.X11-unix/X0
```

unix 3	[ ]	STREAM	CONNECTED	24786	/var/run/dbus/system_bus_socket	
unix 3	[ ]	STREAM	CONNECTED	23171	/run/systemd/journal/stdout	
unix 3	[ ]	STREAM	CONNECTED	26055		
unix 3	[ ]	STREAM	CONNECTED	25011		
unix 3	[ ]	STREAM	CONNECTED	25632		
unix 3	[ ]	STREAM	CONNECTED	23982		
unix 3	[ ]	STREAM	CONNECTED	18315	/run/systemd/journal/stdout	
unix 3	[ ]	STREAM	CONNECTED	25875		
unix 3	[ ]	STREAM	CONNECTED	24791	@/tmp/dbus-Lob9b96tfy	
unix 3	[ ]	STREAM	CONNECTED	24377	@/tmp/dbus-Lob9b96tfy	
unix 3	[ ]	STREAM	CONNECTED	24738		
unix 3	[ ]	STREAM	CONNECTED	83675	@/tmp/dbus-Lob9b96tfy	
unix 3	[ ]	STREAM	CONNECTED	25901		
unix 3	[ ]	STREAM	CONNECTED	24393	@/tmp/.X11-unix/X0	
unix 3	[ ]	STREAM	CONNECTED	26843	/var/run/dbus/system_bus_socket	
unix 3	[ ]	STREAM	CONNECTED	27919		
unix 3	[ ]	STREAM	CONNECTED	24231		
unix 3	[ ]	STREAM	CONNECTED	24009	@/tmp/dbus-UvynOomYdB	
unix 3	[ ]	STREAM	CONNECTED	25251	/run/systemd/journal/stdout	
unix 3	[ ]	STREAM	CONNECTED	24958		
unix 3	[ ]	STREAM	CONNECTED	25625	@/tmp/.X11-unix/X0	
unix 3	[ ]	STREAM	CONNECTED	24703		
unix 3	[ ]	STREAM	CONNECTED	24970		
unix 2	[ ]	DGRAM		17277		
unix 3	[ ]	STREAM	CONNECTED	24805	/run/user/1000/pulse/native	
unix 3	[ ]	STREAM	CONNECTED	27920		
unix 3	[ ]	STREAM	CONNECTED	24146		
unix 3	[ ]	STREAM	CONNECTED	25829	@/tmp/dbus-UvynOomYdB	
unix 3	[ ]	STREAM	CONNECTED	22527	@/tmp/dbus-Lob9b96tfy	
unix 3	[ ]	STREAM	CONNECTED	15097		
unix 3	[ ]	STREAM	CONNECTED	24971		
unix 3	[ ]	STREAM	CONNECTED	25896	/run/systemd/journal/stdout	
unix 3	[ ]	STREAM	CONNECTED	24794	/run/systemd/journal/stdout	
unix 2	[ ]	DGRAM		18382		
unix 3	[ ]	STREAM	CONNECTED	36425	/run/systemd/journal/stdout	
unix 3	[ ]	STREAM	CONNECTED	24054	@/tmp/dbus-Lob9b96tfy	
unix 3	[ ]	STREAM	CONNECTED	25647		
unix 3	[ ]	STREAM	CONNECTED	27716	@/tmp/.X11-unix/X0	
unix 3	[ ]	STREAM	CONNECTED	24425	@/tmp/.X11-unix/X0	
unix 2	[ ]	STREAM	CONNECTED	30676		
unix 3	[ ]	STREAM	CONNECTED	23190		
unix 3	[ ]	STREAM	CONNECTED	24693		
unix 3	[ ]	STREAM	CONNECTED	18648	/var/run/dbus/system_bus_socket	

```
unix  3    []      STREAM    CONNECTED    83683
unix  3    []      STREAM    CONNECTED    26758    /run/systemd/journal/stdout
unix  3    []      STREAM    CONNECTED    27878    /run/systemd/journal/stdout
unix  3    []      STREAM    CONNECTED    26915
unix  3    []      STREAM    CONNECTED    19490    /var/run/dbus/system_bus_socket
unix  3    []      STREAM    CONNECTED    25255
unix  3    []      STREAM    CONNECTED    24367
unix  3    []      STREAM    CONNECTED    25862
unix  3    []      STREAM    CONNECTED    25221    @/dbus-vfs-daemon/socket-yrxjtpGX
unix  2    []      DGRAM                  30687
unix  3    []      STREAM    CONNECTED    23375
unix  3    []      STREAM    CONNECTED    24692
unix  3    []      STREAM    CONNECTED    17284
unix  3    []      STREAM    CONNECTED    25206    /var/run/dbus/system_bus_socket
unix  3    []      STREAM    CONNECTED    20403
unix  3    []      STREAM    CONNECTED    23867
unix  3    []      STREAM    CONNECTED    22271
unix  3    []      STREAM    CONNECTED    17163
unix  3    []      DGRAM                  622
unix  3    []      STREAM    CONNECTED    24024    @/tmp/dbus-Lob9b96tfy
unix  3    []      STREAM    CONNECTED    21077    /run/systemd/journal/stdout
unix  2    []      DGRAM                  17265
unix  3    []      STREAM    CONNECTED    22525
unix  2    []      STREAM    CONNECTED    21569
unix  3    []      STREAM    CONNECTED    20571    /var/run/dbus/system_bus_socket
unix  3    []      STREAM    CONNECTED    24810    @/tmp/dbus-Lob9b96tfy
unix  3    []      STREAM    CONNECTED    83714
unix  3    []      STREAM    CONNECTED    23128
unix  2    []      DGRAM                  17166
unix  3    []      STREAM    CONNECTED    82508
unix  3    []      STREAM    CONNECTED    24019
unix  3    []      STREAM    CONNECTED    22517
unix  3    []      STREAM    CONNECTED    18515    /var/run/dbus/system_bus_socket
unix  3    []      STREAM    CONNECTED    23929    @/tmp/dbus-Lob9b96tfy
unix  3    []      DGRAM                  16656
unix  3    []      STREAM    CONNECTED    23935
unix  3    []      STREAM    CONNECTED    18629
unix  3    []      STREAM    CONNECTED    83678    /run/systemd/journal/stdout
unix  3    []      STREAM    CONNECTED    38002

unix  3    []      STREAM    CONNECTED    17216
unix  3    []      STREAM    CONNECTED    24613    @/com/ubuntu/upstart-
session/1000/1375
unix  3    []      STREAM    CONNECTED    14599
```

```
unix 3   [ ]   STREAM   CONNECTED   23194   @/tmp/dbus-Lob9b96tfy
unix 3   [ ]   STREAM   CONNECTED   23368
unix 3   [ ]   STREAM   CONNECTED   22518
unix 3   [ ]   STREAM   CONNECTED   22482
unix 3   [ ]   STREAM   CONNECTED   38003
unix 3   [ ]   STREAM   CONNECTED   24032
unix 3   [ ]   STREAM   CONNECTED   38010
unix 2   [ ]   DGRAM            13180
unix 3   [ ]   STREAM   CONNECTED   24624
unix 2   [ ]   DGRAM            22379
unix 3   [ ]   DGRAM    623
unix 2   [ ]   DGRAM            22963
unix 3   [ ]   STREAM   CONNECTED   36426   /run/systemd/journal/stdout
unix 3   [ ]   STREAM   CONNECTED   25627   @/tmp/dbus-Lob9b96tfy
unix 3   [ ]   STREAM   CONNECTED   23983   @/tmp/dbus-Lob9b96tfy
unix 3   [ ]   STREAM   CONNECTED   21044   /run/systemd/journal/stdout
unix 3   [ ]   STREAM   CONNECTED   15354
unix 3   [ ]   STREAM   CONNECTED   82517   @ict30-
com.canonical.Unity.Scope.files.T44784144632226
unix 3   [ ]   STREAM   CONNECTED   23376
unix 3   [ ]   STREAM   CONNECTED   25356
unix 3   [ ]   STREAM   CONNECTED   24020
unix 3   [ ]   STREAM   CONNECTED   22512
unix 3   [ ]   STREAM   CONNECTED   23186
unix 3   [ ]   STREAM   CONNECTED   22519   @/tmp/dbus-Lob9b96tfy
unix 3   [ ]   STREAM   CONNECTED   21449   /run/systemd/journal/stdout
unix 3   [ ]   DGRAM            16658
unix 3   [ ]   STREAM   CONNECTED   18517   /run/systemd/journal/stdout
unix 3   [ ]   STREAM   CONNECTED   24755
unix 3   [ ]   STREAM   CONNECTED   24673   @/tmp/dbus-Lob9b96tfy
unix 3   [ ]   STREAM   CONNECTED   23920
unix 2   [ ]   DGRAM            22376
unix 3   [ ]   STREAM   CONNECTED   19407
unix 3   [ ]   STREAM   CONNECTED   18647
unix 3   [ ]   STREAM   CONNECTED   82516
unix 3   [ ]   STREAM   CONNECTED   82522   @ict30-
com.canonical.Unity.Scope.applications.T44787282741650
unix 3   [ ]   STREAM   CONNECTED   23979   @/tmp/dbus-Lob9b96tfy
unix 3   [ ]   STREAM   CONNECTED   23878
unix 3   [ ]   STREAM   CONNECTED   22370
unix 3   [ ]   STREAM   CONNECTED   19509   /var/run/dbus/system_bus_socket
unix 3   [ ]   STREAM   CONNECTED   26136


root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# netstat -at
```

Active Internet connections (servers and established)

Proto Recv-Q Send-Q Local Address   Foreign Address   State

tcp   0   0 localhost:mysql   *:*   LISTEN

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# netstat -au

Active Internet connections (servers and established)

Proto Recv-Q Send-Q Local Address   Foreign Address   State

udp   0   0 *:37007   *:*

udp   0   0 *:ipp   *:*

udp   0   0 *:mdns   *:*

udp6   0   0 [::]:46848   [::]:*

udp6   0   0 [::]:mdns   [::]:*

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# traceroute

The program 'traceroute' can be found in the following packages:

 * inetutils-traceroute

 * traceroute

Try: apt install <selected package>

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# nslookup google.com

;; connection timed out; no servers could be reached

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# whois google.com

The program 'whois' is currently not installed. You can install it by typing:

apt install whois

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# host 172.0.0.1

;; connection timed out; no servers could be reached

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# route

Kernel IP routing table

Destination   Gateway   Genmask   Flags Metric Ref   Use Iface

link-local   *   255.255.0.0   U   1000   0   0 enp2s0

172.24.0.0   *   255.255.0.0   U   100   0   0 enp2s0

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# arp

Address   HWtype HWaddress   Flags Mask   Iface

172.24.13.223   ether 8c:89:a5:93:81:c4   C   enp2s0

172.24.22.100   (incomplete)   enp2s0

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# mtr

root@ict30-ThinkCentre-M71e:/home/ict30/Desktop# mtr 127.0.0.1

OUTCOME: The study of advance user commands in UNIX has helped us learn about various advanced commands and their use in detail to work on a system connected in a network.

CONCLUSION: We successfully studied the basic user commands in UNIX on our machine.