

Commands:

1. **netstat:** This command line utility lists out all the TCP and UDP socket connections, as well as the Unix socket connections.

Example: `$netstat -a`

```
grimscythe2001@ubuntu: ~/Documents/CS-313 OS/Lab 01/Q5
grimscythe2001@ubuntu: ~/Documen... x grimscythe2001@ubuntu: ~/Documen... x
grimscythe2001@ubuntu:~/Documents/CS-313 OS/Lab 01/Q5$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp        0      0 ubuntu:47192            ec2-44-238-202-79:https ESTABLISHED
tcp        0      0 ubuntu:36966            117.18.237.29:http      TIME_WAIT
tcp        0      0 ubuntu:49634            del11s03-in-f3.1e:https ESTABLISHED
tcp        0      0 ubuntu:44134            a23-207-134-199.d:https TIME_WAIT
tcp        0      0 ubuntu:44982            del11s21-in-f8.1e:https ESTABLISHED
tcp        0      0 ubuntu:56892            104.17.129.171:https    ESTABLISHED
tcp        0      0 ubuntu:43498            162.247.243.147:https   ESTABLISHED
tcp        0      0 ubuntu:59550            del11s18-in-f4.1e:https TIME_WAIT
tcp        0      0 ubuntu:58820            104.17.69.176:https     ESTABLISHED
tcp        0      0 ubuntu:54514            104.19.154.83:https     ESTABLISHED
tcp        0      0 ubuntu:40324            del11s20-in-f10.1:https TIME_WAIT
tcp        0      0 ubuntu:58134            104.17.214.204:https    TIME_WAIT
tcp        0      0 ubuntu:45988            151.101.154.137:https   ESTABLISHED
tcp        0      0 ubuntu:52340            del11s16-in-f14.1:https ESTABLISHED
tcp        0      0 ubuntu:48328            162.247.243.146:https   TIME_WAIT
tcp        0      0 ubuntu:56630            23.185.0.3:https        ESTABLISHED
tcp        0      0 ubuntu:54502            104.19.154.83:https     ESTABLISHED
tcp        0      0 ubuntu:42462            104.16.85.5:https       ESTABLISHED
tcp        0      0 ubuntu:56824            104.18.21.191:https     ESTABLISHED
```

2. **telnet:** This command is used to establish a remote connection over a TCP/IP network with a system.

Example: `$telnet localhost`

```
grimscythe2001@ubuntu: ~/Documents/CS-313 OS/Lab 01/Q5
grimscythe2001@ubuntu: ~/Docume... x grimscythe2001@ubuntu: ~/Docume... x
grimscythe2001@ubuntu:~/Documents/CS-313 OS/Lab 01/Q5$ telnet localhost
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
Ubuntu 20.04.3 LTS
ubuntu login: grimscythe2001
Password:
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.11.0-34-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

31 updates can be applied immediately.
18 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Your Hardware Enablement Stack (HWE) is supported until April 2025.

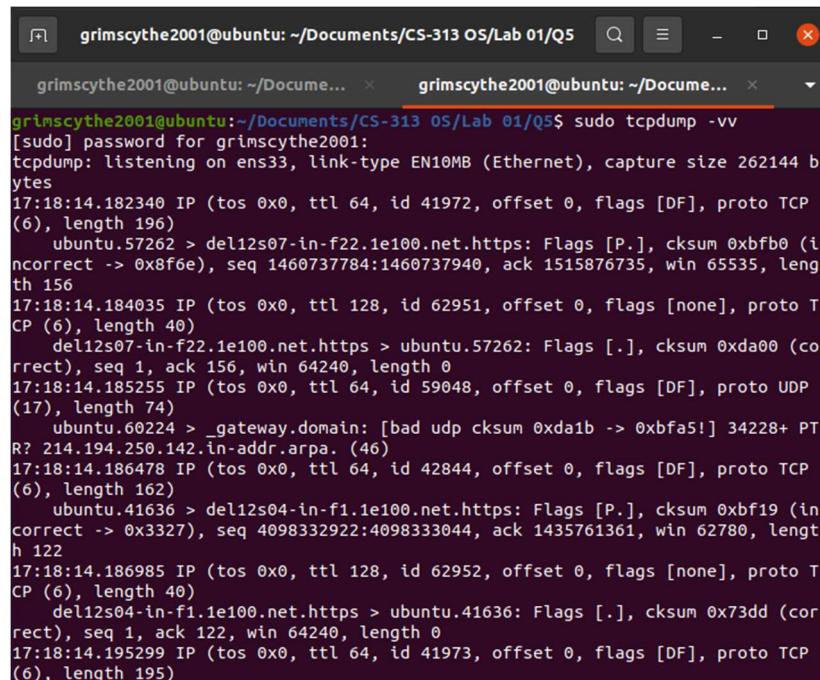
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

grimscythe2001@ubuntu:~$ logout
Connection closed by foreign host.
```

3. **tcpdump:** This command line utility is used to capture and inspect on-going network traffic to and from the current system.

Example: `$sudo tcpdump -vv`

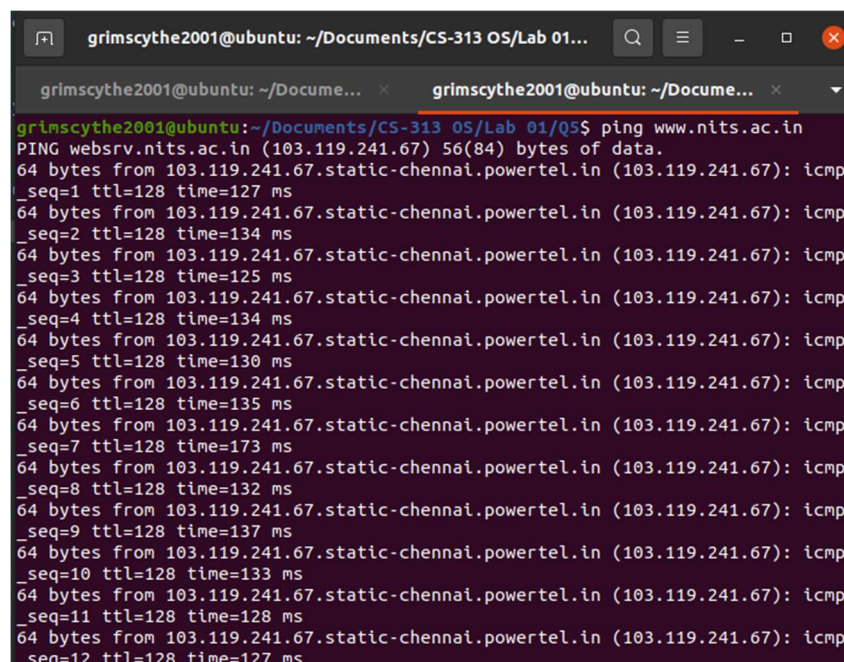


```
grimscythe2001@ubuntu: ~/Documents/CS-313 OS/Lab 01/Q5
grimscythe2001@ubuntu: ~/Docume... x grimscythe2001@ubuntu: ~/Docume... x
grimscythe2001@ubuntu:~/Documents/CS-313 OS/Lab 01/Q5$ sudo tcpdump -vv
[sudo] password for grimscythe2001:
tcpdump: listening on ens33, link-type EN10MB (Ethernet), capture size 262144 bytes
17:18:14.182340 IP (tos 0x0, ttl 64, id 41972, offset 0, flags [DF], proto TCP (6), length 196)
    ubuntu.57262 > del12s07-in-f22.1e100.net.https: Flags [P.], cksum 0xbfb0 (incorrect -> 0x8f6e), seq 1460737784:1460737940, ack 1515876735, win 65535, length 156
17:18:14.184035 IP (tos 0x0, ttl 128, id 62951, offset 0, flags [none], proto TCP (6), length 40)
    del12s07-in-f22.1e100.net.https > ubuntu.57262: Flags [.], cksum 0xda00 (correct), seq 1, ack 156, win 64240, length 0
17:18:14.185255 IP (tos 0x0, ttl 64, id 59048, offset 0, flags [DF], proto UDP (17), length 74)
    ubuntu.60224 > _gateway.domain: [bad udp cksum 0xda1b -> 0xbfa5!] 34228+ PTR? 214.194.250.142.in-addr.arpa. (46)
17:18:14.186478 IP (tos 0x0, ttl 64, id 42844, offset 0, flags [DF], proto TCP (6), length 162)
    ubuntu.41636 > del12s04-in-f1.1e100.net.https: Flags [P.], cksum 0xbf19 (incorrect -> 0x3327), seq 4098332922:4098333044, ack 1435761361, win 62780, length 122
17:18:14.186985 IP (tos 0x0, ttl 128, id 62952, offset 0, flags [none], proto TCP (6), length 40)
    del12s04-in-f1.1e100.net.https > ubuntu.41636: Flags [.], cksum 0x73dd (correct), seq 1, ack 122, win 64240, length 0
17:18:14.195299 IP (tos 0x0, ttl 64, id 41973, offset 0, flags [DF], proto TCP (6), length 195)
```

4. **ssh:** This command line utility is used to encrypt a connection between a client and a server. SSH stands for Secure Shell, which is a cryptographic network protocol.

5. **ping:** This command line utility is used to troubleshoot, test and diagnose network connectivity issues.

Example: `$ping www.nits.ac.in`



```
grimscythe2001@ubuntu: ~/Documents/CS-313 OS/Lab 01/Q5
grimscythe2001@ubuntu: ~/Docume... x grimscythe2001@ubuntu: ~/Docume... x
grimscythe2001@ubuntu:~/Documents/CS-313 OS/Lab 01/Q5$ ping www.nits.ac.in
PING websrv.nits.ac.in (103.119.241.67) 56(84) bytes of data.
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=1 ttl=128 time=127 ms
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=2 ttl=128 time=134 ms
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=3 ttl=128 time=125 ms
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=4 ttl=128 time=134 ms
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=5 ttl=128 time=130 ms
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=6 ttl=128 time=135 ms
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=7 ttl=128 time=173 ms
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=8 ttl=128 time=132 ms
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=9 ttl=128 time=137 ms
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=10 ttl=128 time=133 ms
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=11 ttl=128 time=128 ms
64 bytes from 103.119.241.67.static-chennai.powertel.in (103.119.241.67): icmp _seq=12 ttl=128 time=127 ms
```


6. **dmesg**: This command line utility is used to print and control the kernel ring buffer.

Example: `$dmesg -H -T`

```
grimscythe2001@ubuntu: ~/Documents/CS-313 OS/Lab 01...
grimscythe2001@ubuntu: ~/Docume... x grimscythe2001@ubuntu: ~/Docume... x
grimscythe2001@ubuntu:~/Documents/CS-313 OS/Lab 01/Q5$ dmesg -H -T
[Sat Sep 11 12:04:58 2021] Linux version 5.11.0-34-generic (buildd@lgw01-amd6>
[Sat Sep 11 12:04:58 2021] Command line: BOOT_IMAGE=/boot/vmlinuz-5.11.0-34-g>
[Sat Sep 11 12:04:58 2021] KERNEL supported cpus:
[Sat Sep 11 12:04:58 2021] Intel GenuineIntel
[Sat Sep 11 12:04:58 2021] AMD AuthenticAMD
[Sat Sep 11 12:04:58 2021] Hygon HygonGenuine
[Sat Sep 11 12:04:58 2021] Centaur CentaurHauls
[Sat Sep 11 12:04:58 2021] zhaoxin Shanghai
[Sat Sep 11 12:04:58 2021] Disabled fast string operations
[Sat Sep 11 12:04:58 2021] x86/fpu: Supporting XSAVE feature 0x001: 'x87 floa>
[Sat Sep 11 12:04:58 2021] x86/fpu: Supporting XSAVE feature 0x002: 'SSE regi>
[Sat Sep 11 12:04:58 2021] x86/fpu: Supporting XSAVE feature 0x004: 'AVX regi>
[Sat Sep 11 12:04:58 2021] x86/fpu: xstate_offset[2]: 576, xstate_sizes[2]: >
[Sat Sep 11 12:04:58 2021] x86/fpu: Enabled xstate features 0x7, context size>
[Sat Sep 11 12:04:58 2021] BIOS-provided physical RAM map:
[Sat Sep 11 12:04:58 2021] BIOS-e820: [mem 0x0000000000000000-0x000000000000009e>
[Sat Sep 11 12:04:58 2021] BIOS-e820: [mem 0x000000000000009e800-0x000000000000009f>
[Sat Sep 11 12:04:58 2021] BIOS-e820: [mem 0x000000000000dc000-0x000000000000ff>
[Sat Sep 11 12:04:58 2021] BIOS-e820: [mem 0x00000000000100000-0x000000000007fedf>
```

7. **ps**: This command line utility is used to find information about a running instance of a program, called process. the command ps stands for Process Status.

Example: `$ps u`

```
grimscythe2001@ubuntu: ~/Documents/CS-313 OS/Lab 01...
grimscythe2001@ubuntu: ~/Docume... x grimscythe2001@ubuntu: ~/Docume... x
grimscythe2001@ubuntu:~/Documents/CS-313 OS/Lab 01/Q5$ ps u
USER          PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
grimscy+      1594  0.0  0.2 172652  4968 tty2      Ssl+  12:06   0:00 /usr/lib/gd
grimscy+      1610  4.9  2.7 394228 55064 tty2      Sl+   12:06  16:11 /usr/lib/xo
grimscy+      1712  0.0  0.4 199236  8228 tty2      Sl+   12:06   0:00 /usr/libexe
grimscy+     18257  0.0  0.1 19252   2616 pts/0      Ss+   16:50   0:00 bash
grimscy+     21901  0.0  0.2 19248   4728 pts/1      Ss    17:33   0:00 bash
grimscy+     21924  0.0  0.1 20132   3256 pts/1      R+    17:34   0:00 ps u
grimscythe2001@ubuntu:~/Documents/CS-313 OS/Lab 01/Q5$
```

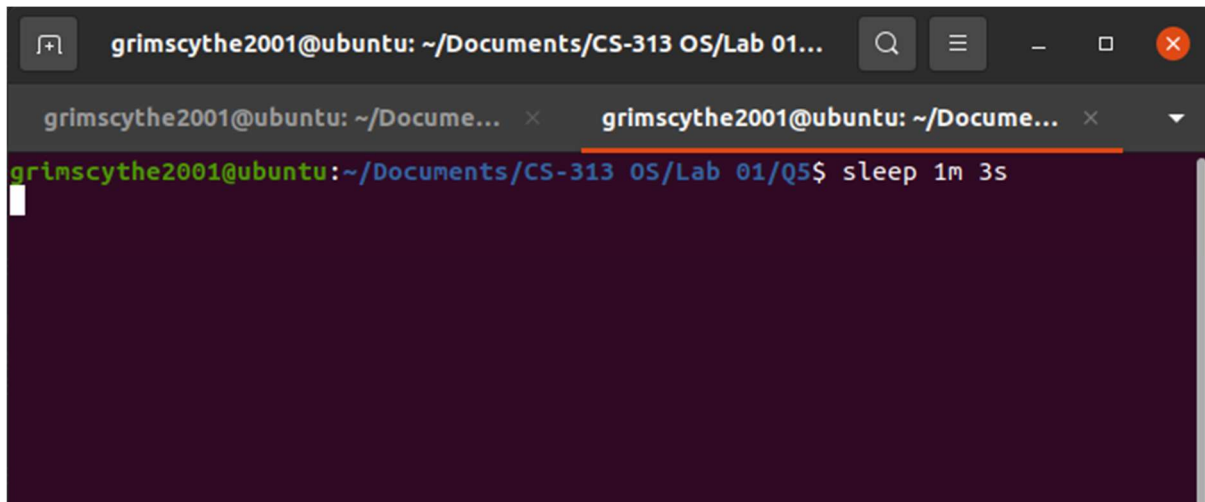
8. **kill**: This command line utility is used to terminate errant application processes.

Example: `$kill -1 $(pidof firefox)`

```
grimscythe2001@ubuntu: ~/Documents/CS-313 OS/Lab 01...
grimscythe2001@ubuntu: ~/Docume... x grimscythe2001@ubuntu: ~/Docume... x
grimscythe2001@ubuntu:~/Documents/CS-313 OS/Lab 01/Q5$ kill -1 $(pidof firefox
)
grimscythe2001@ubuntu:~/Documents/CS-313 OS/Lab 01/Q5$
```

9. **sleep:** This command-line utility is used to suspend the execution of the calling process for a specified number of seconds.

Example: `$sleep 1m 3s`



A terminal window titled "grimscythe2001@ubuntu: ~/Documents/CS-313 OS/Lab 01..." shows the command `sleep 1m 3s` being entered at the prompt. The cursor is at the end of the command line.

10. **xargs:** This command-line utility is used to build and execute commands from standard input.

