

. FREE COMMAND

The Linux free command outputs a summary of RAM usage, including total, used, free, shared, and available memory and swap space. The command helps monitor resource usage and allows an admin to determine if there's enough room for running new programs. In this tutorial, you will learn to use the free command in Linux.

- **free -h :-** The free command displays memory sizes in bytes by default, which isn't practical in modern systems with large amounts of RAM. Make the **free** command output easier to read by specifying the **-h** option .
- **free -s2:-** Use the **-s** option to continually refresh the free command output and monitor an app's resource usage. Invoke the free command with the **-s** option and specify the delay between each output refresh .
- **free -m :-** Specify a unit for displaying the memory values uniformly. Use powers of 1024 (the default) or 1000.

- **free --mega** :- The command produces an output with values expressed in mebibytes.
- **free --si --m** :- The output values are expressed in megabytes. Alternatively, use the --si option followed by the corresponding power of 1024 unit .
- **free -c 4** :- Specify the -c option to instruct free to automatically quit after refreshing the output a specific number of times. In the following example, the command prints the result four times .
- **free -w** :- The buff and cache areas interact and depend on each other, so they are combined in the output. To see the buffers and cache columns separately, specify the -w option .
- **free -h --total** :- The --total option instructs free to print a Total line that sums the values from the total, used, and free columns of the Mem and Swap lines.

- **free -m -s3 -c4** :- Combine different free command options to automate and facilitate memory monitoring in a system. For example, combine the -s and -c options to make free produce an output several times with a delay between refreshes .

```
himanshu@himanshu:~$ free
              total        used         free      shared  buff/cache   available
Mem:       7878872      2285376     2949184      529016    2644312      4794644
Swap:      9765884          0      9765884
himanshu@himanshu:~$ free -h
              total        used         free      shared  buff/cache   available
Mem:       7.5Gi      2.2Gi      2.8Gi      516Mi      2.5Gi      4.6Gi
Swap:      9.3Gi      0B      9.3Gi
himanshu@himanshu:~$ free -h -s 3
              total        used         free      shared  buff/cache   available
Mem:       7.5Gi      2.2Gi      2.8Gi      534Mi      2.5Gi      4.6Gi
Swap:      9.3Gi      0B      9.3Gi
              total        used         free      shared  buff/cache   available
Mem:       7.5Gi      2.2Gi      2.8Gi      514Mi      2.5Gi      4.6Gi
Swap:      9.3Gi      0B      9.3Gi
              total        used         free      shared  buff/cache   available
Mem:       7.5Gi      2.2Gi      2.8Gi      514Mi      2.5Gi      4.6Gi
Swap:      9.3Gi      0B      9.3Gi
              total        used         free      shared  buff/cache   available
Mem:       7.5Gi      2.2Gi      2.8Gi      514Mi      2.5Gi      4.6Gi
Swap:      9.3Gi      0B      9.3Gi
              total        used         free      shared  buff/cache   available
Mem:       7.5Gi      2.2Gi      2.8Gi      515Mi      2.5Gi      4.6Gi
Swap:      9.3Gi      0B      9.3Gi
              total        used         free      shared  buff/cache   available
Mem:       7.5Gi      2.2Gi      2.8Gi      528Mi      2.5Gi      4.6Gi
Swap:      9.3Gi      0B      9.3Gi
              total        used         free      shared  buff/cache   available
Mem:       7.5Gi      2.2Gi      2.8Gi      528Mi      2.5Gi      4.6Gi
Swap:      9.3Gi      0B      9.3Gi
              total        used         free      shared  buff/cache   available
Mem:       7.5Gi      2.2Gi      2.7Gi      572Mi      2.6Gi      4.5Gi
Swap:      9.3Gi      0B      9.3Gi
himanshu@himanshu:~$
```

```
himanshu@himanshu:~
```

```
himanshu@himanshu:~$ free -s2
      total        used         free      shared  buff/cache   available
Mem:   7878872     3173944     1347336    791572     3357592     3621464
Swap:  9765884          0     9765884

      total        used         free      shared  buff/cache   available
Mem:   7878872     3177520     1347336    787988     3354016     3621472
Swap:  9765884          0     9765884

      total        used         free      shared  buff/cache   available
Mem:   7878872     3173720     1350992    788132     3354160     3625128
Swap:  9765884          0     9765884

      total        used         free      shared  buff/cache   available
Mem:   7878872     3174376     1350416    787988     3354080     3624616
Swap:  9765884          0     9765884

      total        used         free      shared  buff/cache   available
Mem:   7878872     3175356     1349436    787988     3354080     3623636
Swap:  9765884          0     9765884

      total        used         free      shared  buff/cache   available
Mem:   7878872     3175376     1353736    783660     3349760     3627944
Swap:  9765884          0     9765884
```

```
himanshu@himanshu:~$ free -m
      total        used         free       shared  buff/cache   available
Mem:    7694        3171       1213        801        3308       3435
Swap:  9536          0       9536
himanshu@himanshu:~$ free --mega
      total        used         free       shared  buff/cache   available
Mem:   8067        3340       1245        843        3482       3584
Swap: 10000          0      10000
himanshu@himanshu:~$ free --si --m
free: option '--m' is ambiguous; possibilities: '--mega' '--mebi'

Usage:
  free [options]

Options:
  -b, --bytes            show output in bytes
  --kilo                 show output in kilobytes
  --mega                show output in megabytes
  --giga                show output in gigabytes
  --tera                show output in terabytes
  --peta                show output in petabytes
  -k, --kibi              show output in kibibytes
  -m, --mebi              show output in mebibytes
  -g, --gibi              show output in gibibytes
  --tebi                show output in tebibytes
  --pebi                show output in pebibytes
  -h, --human             show human-readable output
  --si                  use powers of 1000 not 1024
  -l, --lohi              show detailed low and high memory statistics
  -t, --total             show total for RAM + swap
  -s N, --seconds N      repeat printing every N seconds
  -c N, --count N        repeat printing N times, then exit
  -w, --wide               wide output

  --help     display this help and exit
  -V, --version           output version information and exit

For more details see free(1).
himanshu@himanshu:~$
```

```
himanshu@himanshu:~$ free -c 4
      total        used         free       shared  buff/cache   available
Mem:  7878872      3268032      1227208      805848      3383632      3512772
Swap: 9765884          0      9765884

      total        used         free       shared  buff/cache   available
Mem:  7878872      3273516      1227208      800364      3378148      3512772
Swap: 9765884          0      9765884

      total        used         free       shared  buff/cache   available
Mem:  7878872      3273768      1226956      800364      3378148      3512520
Swap: 9765884          0      9765884

      total        used         free       shared  buff/cache   available
Mem:  7878872      3282332      1218392      800364      3378148      3503956
Swap: 9765884          0      9765884
himanshu@himanshu:~$
```

```
Swap: 9765884      0  9765884
himanshu@himanshu:~$ free -w
      total        used         free       shared      buffers      cache available
Mem:   7878872     3285704    1200144     814692     114768    3278256     3486244
Swap: 9765884      0  9765884
himanshu@himanshu:~$ free -h --total
      total        used         free       shared  buff/cache available
Mem:   7.5Gi      3.1Gi     1.1Gi     794Mi      3.2Gi     3.3Gi
Swap: 9.3Gi      0B     9.3Gi
Total: 16Gi      3.1Gi    10Gi
himanshu@himanshu:~$
```

```
himanshu@himanshu:~$ free -m -s3 -c4
      total        used         free       shared  buff/cache available
Mem:   7694      3200      1175      799      3317     3409
Swap: 9536      0      9536
      total        used         free       shared  buff/cache available
Mem:   7694      3197      1203      774      3293     3437
Swap: 9536      0      9536
      total        used         free       shared  buff/cache available
Mem:   7694      3200      1200      774      3293     3433
Swap: 9536      0      9536
      total        used         free       shared  buff/cache available
Mem:   7694      3204      1196      774      3293     3429
Swap: 9536      0      9536
himanshu@himanshu:~$
```

.TOP (table of processes) COMMAND

The top (table of processes) command shows a real-time view of running processes in Linux and displays kernel-managed tasks. The command also provides a system information summary that

shows resource utilisation, including CPU and memory usage.

Top :- To [list all running Linux processes](#) on your system, open a terminal and enter:

himanshu@himanshu: ~

```
top - 13:37:51 up 3:37, 1 user, load average: 0.76, 0.94, 1.04
Tasks: 268 total, 1 running, 267 sleeping, 0 stopped, 0 zombie
%Cpu(s): 7.5 us, 3.3 sy, 0.0 ni, 88.2 id, 0.1 wa, 0.0 hi, 0.9 si, 0.0 st
MiB Mem : 7694.2 total, 1226.8 free, 3177.2 used, 3290.2 buff/cache
MiB Swap: 9537.0 total, 9537.0 free, 0.0 used. 3503.4 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
4945	himanshu	20	0	2990200	409160	148980	S	7.9	5.2	6:34.88	Isolated Web Co
4208	himanshu	20	0	12.3g	584880	226068	S	6.6	7.4	28:03.57	firefox
5229	himanshu	20	0	2826908	333292	115572	S	4.0	4.2	3:59.49	Isolated Web Co
11018	himanshu	20	0	565316	55556	42404	S	3.3	0.7	0:05.78	gnome-terminal
2118	himanshu	20	0	5701580	307424	140252	S	2.3	3.9	11:53.17	gnome-shell
1903	himanshu	9	-11	2555788	31392	23448	S	2.0	0.4	1:16.50	pulseaudio
12982	himanshu	20	0	2560236	128368	80216	S	2.0	1.6	0:10.62	Isolated Web Co
12612	himanshu	20	0	2501324	154192	104920	S	1.7	2.0	0:35.99	Isolated Web Co
5330	himanshu	20	0	227620	35900	27364	S	1.3	0.5	0:58.18	Utility Process
202	root	-51	0	0	0	0	S	0.7	0.0	0:57.02	irq/131-DELL0AD
471	root	-51	0	0	0	0	S	0.7	0.0	1:34.29	irq/134-rtw88_p
14	root	20	0	0	0	0	I	0.3	0.0	0:10.85	rcu_sched
732	root	20	0	284708	10860	9848	S	0.3	0.1	0:41.87	thermald
829	redis	20	0	78452	11064	8868	S	0.3	0.1	0:18.27	redis-server
1011	tomcat	20	0	5667124	224208	35736	S	0.3	2.8	0:28.63	java
2243	himanshu	20	0	323488	11672	7072	S	0.3	0.1	0:03.00	ibus-daemon
10104	root	0	-20	0	0	0	I	0.3	0.0	0:08.72	kworker/u9:1-hci0
13008	root	0	-20	0	0	0	I	0.3	0.0	0:00.85	kworker/u9:3-rtw_tx_+
13073	himanshu	20	0	2891852	379472	143420	S	0.3	4.8	0:26.41	Isolated Web Co
1	root	20	0	168516	13912	8352	S	0.0	0.2	0:03.11	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.01	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
5	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	slub_flushwq
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	netns
8	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-events_+
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_wq
11	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_tasks_rude_
12	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_tasks_trace
13	root	20	0	0	0	0	S	0.0	0.0	0:00.31	ksoftirqd/0
15	root	rt	0	0	0	0	S	0.0	0.0	0:00.03	migration/0
16	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/0
18	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
19	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/1
20	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/1
21	root	rt	0	0	0	0	S	0.0	0.0	0:00.11	migration/1
22	root	20	0	0	0	0	S	0.0	0.0	0:00.31	ksoftirqd/1
24	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/1:0H-events_+
25	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/2
26	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/2
27	root	rt	0	0	0	0	S	0.0	0.0	0:00.11	migration/2
28	root	20	0	0	0	0	S	0.0	0.0	0:04.17	ksoftirqd/2
30	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/2:0H-events_+
31	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/3
32	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/3
33	root	rt	0	0	0	0	S	0.0	0.0	0:00.11	migration/3
34	root	20	0	0	0	0	S	0.0	0.0	0:00.52	ksoftirqd/3
36	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/3:0H-events_+

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
4945	himanshu	20	0	2990200	406448	148980	S	13.3	5.2	6:38.04	Isolated Web Co
2118	himanshu	20	0	5695724	317764	140320	S	6.7	4.0	11:54.77	gnome-shell
4208	himanshu	20	0	12.3g	584348	226068	S	6.7	7.4	28:05.08	firefox
14245	himanshu	20	0	21872	4252	3384	R	6.7	0.1	0:00.01	top
1	root	20	0	168516	13912	8352	S	0.0	0.2	0:03.12	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.01	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
5	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	slub_flushwq
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	netns
8	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-events_+
10	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_wq
11	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_tasks_rude_
12	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_tasks_trace
13	root	20	0	0	0	0	S	0.0	0.0	0:00.32	ksoftirqd/0
14	root	20	0	0	0	0	I	0.0	0.0	0:10.87	rcu_sched
15	root	rt	0	0	0	0	S	0.0	0.0	0:00.03	migration/0
16	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/0
18	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
19	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/1
20	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/1
21	root	rt	0	0	0	0	S	0.0	0.0	0:00.11	migration/1
22	root	20	0	0	0	0	S	0.0	0.0	0:00.31	ksoftirqd/1
24	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/1:0H-events_+
25	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/2
26	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/2
27	root	rt	0	0	0	0	S	0.0	0.0	0:00.11	migration/2
28	root	20	0	0	0	0	S	0.0	0.0	0:04.17	ksoftirqd/2
30	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/2:0H-events_+
31	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/3
32	root	-51	0	0	0	0	S	0.0	0.0	0:00.00	idle_inject/3
33	root	rt	0	0	0	0	S	0.0	0.0	0:00.11	migration/3
34	root	20	0	0	0	0	S	0.0	0.0	0:00.52	ksoftirqd/3
36	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/3:0H-events_+
37	root	20	0	0	0	0	S	0.0	0.0	0:00.01	kdevtmpfs
38	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	inet_frag_wq
39	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kaudit
40	root	20	0	0	0	0	S	0.0	0.0	0:00.01	khungtaskd
41	root	20	0	0	0	0	S	0.0	0.0	0:00.00	oom_reaper
42	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	writeback
43	root	20	0	0	0	0	S	0.0	0.0	0:00.36	kcompactd0
44	root	25	5	0	0	0	S	0.0	0.0	0:00.00	ksmd
45	root	39	19	0	0	0	S	0.0	0.0	0:00.08	khugepaged
92	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kintegrityd
93	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kblockd
94	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	blkcg_punt_bio
96	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	tpm_dev_wq
98	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	ata_sff

himanshu@himanshu:~\$ top -hv

procps-ng 3.3.17

Usage:

top -hv | -bcEeHiOSS1 -d secs -n max -u|U user -p pid(s) -o field -w [cols]

himanshu@himanshu:~\$

. NETSTAT (NETWORK STATISTICS)

COMMAND

Netstat is a command line utility to display all the network connections on a system. It displays all the tcp, udp and unix socket connections. Apart from connected sockets it also displays listening sockets that are waiting for incoming connections.

- **Netstat :-** netstat command without any argument displays information about the Linux networking subsystem. By default, netstat displays a list of open sockets.
- **netstat -t :-** We can use -t option to display only tcp sockets.
- **netstat -u :-** We can use -u option to display only udp connections. Similarly we can use -w option to display data_gram
- **netstat -au :-** By default netstat command shows only connected sockets. But we can use -a option to display other sockets as well.

- **netstat -l** :- We can use -l command to display listening sockets. Below we show an example of all tcp listening sockets.
- **netstat -lp** :- We can use -p option to show PID and to which program each socket belongs, -e option adds extra info like the user. But run this command as root to see all PIDs.
- **netstat -u -e** :- Output in the above example shows PID/Program, PID is the process id associated with the socket connection and Program denotes the program associated with the socket connection.
- **netstat -an** :- We can use -n option along with other options to disable DNS resolution of symbolic names (shows IP address instead of names).
- **netstat -s** :- We can use -s option to display the summary of network sockets by protocol. By default, statistics are shown for the TCP, UDP, ICMP, and IP protocols.

- **netstat -r** :- netstat command displays the kernel routing tables. We can use the -r or --route option to display the kernel routing table.
- **netstat -i** :- We can use the -i option to display tables of all network interfaces.
- **netstat -i -e** :- We can use -e option to netstat -i command to extend the details of the kernel interface table .

```
himanshu@himanshu:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp     0      0 foreman.example.c:56664  185.239.173.210:https ESTABLISHED
tcp     0      0 foreman.example.c:42194  152.195.38.76:http   ESTABLISHED
tcp     0      0 foreman.example.c:49484  45.133.44.3:https  ESTABLISHED
tcp     0      0 foreman.example.c:56738  185.239.173.210:https ESTABLISHED
tcp     0      0 foreman.example.c:56674  185.239.173.210:https ESTABLISHED
tcp     0      0 foreman.example.c:58336  ec2-34-225-45-79.:https ESTABLISHED
tcp     0      0 foreman.example.c:59554  ec2-52-220-143-19:https ESTABLISHED
tcp     0      0 foreman.example.c:56682  67.199.150.85:https ESTABLISHED
tcp     0      0 foreman.example.c:59310  152.195.38.76:http  ESTABLISHED
tcp     0      0 foreman.example.c:53356  69.173.158.65:https ESTABLISHED
tcp     0      0 foreman.example.c:59612  597.bm-nginx-load:https ESTABLISHED
tcp     0      0 foreman.example.c:59568  597.bm-nginx-load:https ESTABLISHED
tcp     0      0 foreman.example.c:36762  server-108-158-22:https ESTABLISHED
tcp     0      78 foreman.example.c:46588  104.211.158.212:https FIN_WAIT1
tcp     0      0 foreman.example.c:52336  a6370ebea231e0c9a:https ESTABLISHED
tcp     0      0 foreman.example.c:45496  18.117.213.35.bc.:https ESTABLISHED
tcp     0      0 foreman.example.c:58162  172.67.10.198:https ESTABLISHED
tcp     0      0 foreman.example.c:45504  18.117.213.35.bc.:https TIME_WAIT
tcp     0      0 foreman.example.c:46712  ec2-13-250-192-86:https ESTABLISHED
tcp     0      0 foreman.example.c:59302  152.195.38.76:http  ESTABLISHED
tcp     0      0 foreman.example.c:50460  194.23.211.130.bc:https ESTABLISHED
tcp     0      0 foreman.example.c:37642  ec2-67-202-61-128:https TIME_WAIT
tcp     0      0 foreman.example.c:60694  ec2-54-238-176-16:https ESTABLISHED
tcp     1      25 foreman.example.c:55700  69.173.158.65:https CLOSING
tcp     0      0 foreman.example.c:42816  bom07s28-in-f10.1:https ESTABLISHED
tcp     0      0 foreman.example.c:39328  103.231.98.193:https ESTABLISHED
tcp     0      0 foreman.example.c:59902  104.18.25.185:https ESTABLISHED
tcp     0      0 foreman.example.c:42600  bom07s31-in-f10.1:https ESTABLISHED
tcp     0      0 foreman.example.c:59596  597.bm-nginx-load:https ESTABLISHED
tcp     0      0 foreman.example.c:37638  ec2-67-202-61-128:https ESTABLISHED
tcp     0      0 foreman.example.c:59968  maa03s44-in-f10.1:https ESTABLISHED
tcp     0      0 foreman.example.c:59576  597.bm-nginx-load:https ESTABLISHED
tcp     0      0 foreman.example.c:44760  bom07s32-in-f13.1:https TIME_WAIT
tcp     0      89 foreman.example.c:48908  172.67.70.134:https ESTABLISHED
tcp     0      0 foreman.example.c:44752  bom07s32-in-f13.1:https ESTABLISHED
tcp     0      0 foreman.example.c:37066  a104-91-65-54.dep:https ESTABLISHED
tcp     0      690 foreman.example.c:52716  69.173.158.65:https FIN_WAIT1
tcp     0      0 foreman.example.c:54992  123.208.120.34.bc:https ESTABLISHED
tcp     0      0 foreman.example.c:38426  server-18-164-186:https ESTABLISHED
tcp     0      0 foreman.example.c:56774  185.239.173.210:https ESTABLISHED
tcp     0      0 foreman.example.c:58508  239.237.117.34.bc:https ESTABLISHED
tcp     0      0 foreman.example.c:58708  8.159.244.35.bc.g:https ESTABLISHED
tcp     0      0 foreman.example.c:54994  123.208.120.34.bc:https TIME_WAIT
tcp     0      0 foreman.example.c:43318  bom05s12-in-f4.1e:https ESTABLISHED
tcp     0      0 foreman.example.c:43694  145.40.89.200:https ESTABLISHED
tcp     0      0 foreman.example.c:59582  597.bm-nginx-load:https ESTABLISHED
tcp     0      0 foreman.example.c:57278  maa05s12-in-f1.1e:https TIME_WAIT
tcp     0      0 foreman.example.c:35556  104.211.158.212:https ESTABLISHED
tcp     0      0 foreman.example.c:60628  76.237.120.34.bc.:https ESTABLISHED
```

```
himanshu@himanshu:~$ netstat -t
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp      0      0 foreman.example.c:56664  185.239.173.210:https ESTABLISHED
tcp      0      0 foreman.example.c:34694  69.173.158.65:https  TIME_WAIT
tcp      0      0 foreman.example.c:42194  152.195.38.76:http   ESTABLISHED
tcp      0      0 foreman.example.c:56738  185.239.173.210:https ESTABLISHED
tcp      0      0 foreman.example.c:58336  ec2-34-225-45-79.:https ESTABLISHED
tcp      0      0 foreman.example.c:59554  ec2-52-220-143-19:https ESTABLISHED
tcp      0      0 foreman.example.c:56682  67.199.150.85:https  ESTABLISHED
tcp      0      0 foreman.example.c:59310  152.195.38.76:http   ESTABLISHED
tcp      0    1120 foreman.example.c:36762  server-108-158-22:https ESTABLISHED
tcp      0      0 foreman.example.c:52336  a6370ebea231e0c9a:https ESTABLISHED
tcp      0      0 foreman.example.c:58162  172.67.10.198:https  ESTABLISHED
tcp      0      0 foreman.example.c:46712  ec2-13-250-192-86:https ESTABLISHED
tcp      0      0 foreman.example.c:59302  152.195.38.76:http   ESTABLISHED
tcp      0      0 foreman.example.c:50460  194.23.211.130.bc:https ESTABLISHED
tcp      0      0 foreman.example.c:60694  ec2-54-238-176-16:https ESTABLISHED
tcp      0      0 foreman.example.c:42816  bom07s28-in-f10.1:https ESTABLISHED
tcp      0    13964 foreman.example.c:39328  103.231.98.193:https ESTABLISHED
tcp      0      0 foreman.example.c:59902  104.18.25.185:https  ESTABLISHED
tcp      0      0 foreman.example.c:42600  bom07s31-in-f10.1:https ESTABLISHED
tcp      0      0 foreman.example.c:37638  ec2-67-202-61-128:https ESTABLISHED
tcp      0      0 foreman.example.c:59968  maa03s44-in-f10.1:https ESTABLISHED
tcp      0     89 foreman.example.c:48908  172.67.70.134:https  ESTABLISHED
tcp      0      0 foreman.example.c:44752  bom07s32-in-f13.1:https ESTABLISHED
tcp      0      0 foreman.example.c:37066  a104-91-65-54.dep:https ESTABLISHED
tcp      0      0 foreman.example.c:56964  69.173.158.65:https  TIME_WAIT
tcp      0      0 foreman.example.c:54992  123.208.120.34.bc:https ESTABLISHED
tcp      0      0 foreman.example.c:38426  server-18-164-186:https ESTABLISHED
tcp      0      0 foreman.example.c:58508  239.237.117.34.bc:https ESTABLISHED
tcp      0      0 foreman.example.c:58708  8.159.244.35.bc.g:https ESTABLISHED
tcp      0      0 foreman.example.c:34678  69.173.158.65:https  TIME_WAIT
tcp      0      0 foreman.example.c:56976  69.173.158.65:https  TIME_WAIT
tcp      0      0 foreman.example.c:43694  145.40.89.200:https  ESTABLISHED
tcp      0      0 foreman.example.c:42360  597.bm-nginx-load:https TIME_WAIT
tcp      0      0 foreman.example.c:35556  104.211.158.212:https ESTABLISHED
tcp      0      0 foreman.example.c:60628  76.237.120.34.bc.:https ESTABLISHED
tcp      0      0 foreman.example.c:44276  maa05s25-in-f14.1:https ESTABLISHED
tcp      0      0 foreman.example.c:48352  server-18-164-246:https ESTABLISHED
tcp      0      0 foreman.example.c:56724  185.239.173.210:https ESTABLISHED
tcp      0      0 foreman.example.c:40954  ec2-54-184-217-24:https ESTABLISHED
tcp      0      0 foreman.example.c:42372  597.bm-nginx-load:https TIME_WAIT
tcp      0      0 foreman.example.c:36022  bom07s29-in-f14.1:https ESTABLISHED
```

```
himanshu@himanshu:~$ netstat -u
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
udp      0      0 foreman.example.:bootpc  dsldevice.lan:bootps ESTABLISHED
udp      0      0 ip6-localhost:33814       localhost:domain    ESTABLISHED
udp      0      0 localhost:58753          localhost:58753    ESTABLISHED
udp      0      0 ip6-localhost:46963       localhost:domain    ESTABLISHED
udp      0      0 ip6-localhost:59999       localhost:domain    ESTABLISHED
udp6     0      0 foreman.example.c:41568   _gateway:domain    ESTABLISHED
udp6     0      0 foreman.example.c:53939   _gateway:domain    ESTABLISHED
udp6     0      0 foreman.example.c:38038   _gateway:domain    ESTABLISHED
udp6     0      0 foreman.example.c:50928   _gateway:domain    ESTABLISHED
himanshu@himanshu:~$ netstat -au
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
udp      0      0 foreman.example.c:48894   dsldevice.lan:domain ESTABLISHED
udp      0      0 0.0.0.0:32818            0.0.0.0:*
udp      0      0 foreman.example.:domain  0.0.0.0:*
udp      0      0 localhost:domain        0.0.0.0:*
udp      0      0 0.0.0.0:bootps         0.0.0.0:*
udp      0      0 foreman.example.:bootpc  dsldevice.lan:bootps ESTABLISHED
udp      0      0 0.0.0.0:631            0.0.0.0:*
udp      0      0 foreman.example.c:33610   dsldevice.lan:domain ESTABLISHED
udp      0      0 0.0.0.0:mdns           0.0.0.0:*
udp      0      0 localhost:58753          localhost:58753    ESTABLISHED
udp      0      0 ip6-localhost:58873       localhost:domain    ESTABLISHED
udp      0      0 0.0.0.0:51714          0.0.0.0:*
udp      0      0 0.0.0.0:59972          0.0.0.0:*
udp      0      0 ip6-localhost:60130       localhost:domain    ESTABLISHED
udp      0      0 0.0.0.0:59972          0.0.0.0:*
udp      0      0 ip6-localhost:60130       localhost:domain    ESTABLISHED
udp6     0      0 [::]:53540            [::]:*
udp6     0      0 foreman.e:dhcpv6-client [::]:*
udp6     0      0 [::]:mdns            [::]:*
udp6     0      0 [::]:42412            [::]:*
udp6     0      0 [::]:42515            [::]:*
udp6     0      0 [::]:59342            [::]:*
udp6     0      0 foreman.example.c:48326  _gateway:domain    ESTABLISHED
himanshu@himanshu:~$
```

```
himanshu@himanshu:~$ netstat -it
Kernel Interface table
Iface      MTU     RX-OK RX-ERR RX-DRP RX-OVR     TX-OK TX-ERR TX-DRP TX-OVR Flg
br0       1500        0     0 0          0          0     0 0          0 BMU
docker0    1500        0     0 0          0          0     0 0          0 BMU
lo        65536   86066        0 0          86066        0     0 0          0 LRU
virbr0    1500        0     0 0          0          0     0 0          0 BMU
wlp2s0    1500  552854        0 305 0        342941        0     0 0          0 BMRU
himanshu@himanshu:~$ netstat -pt
(Not all processes could be identified, non-owned process info
 will not be shown, you would have to be root to see it all.)
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State      PID/Program name
tcp      0      0 foreman.example.c:56664 185.239.173.210:https ESTABLISHED 4208/firefox
tcp      0      0 foreman.example.c:42194 152.195.38.76:http    TIME_WAIT   -
tcp      0      0 foreman.example.c:56738 185.239.173.210:https ESTABLISHED 4208/firefox
tcp      0      592 foreman.example.c:58336 ec2-34-225-45-79.:https ESTABLISHED 4208/firefox
tcp      0      0 foreman.example.c:59554 ec2-52-220-143-19:https ESTABLISHED 4208/firefox
tcp      0      0 foreman.example.c:56682 67.199.150.85:https ESTABLISHED 4208/firefox
tcp      0      0 foreman.example.c:59310 152.195.38.76:http    TIME_WAIT   -
tcp      0      0 foreman.example.c:58930 597.bm-nginx-load:https ESTABLISHED 4208/firefox
tcp      0      0 foreman.example.c:58942 597.bm-nginx-load:https ESTABLISHED 4208/firefox
tcp      0      0 foreman.example.c:36762 server-108-158-22:https ESTABLISHED 4208/firefox
tcp      0      0 foreman.example.c:52336 a6370ebea231e0c9a:https TIME_WAIT   -
tcp      0      0 foreman.example.c:58162 172.67.10.198:https TIME_WAIT   -
tcp      0      0 foreman.example.c:46712 ec2-13-250-192-86:https ESTABLISHED 4208/firefox
tcp      0      0 foreman.example.c:50056 69.173.158.65:https TIME_WAIT   -
tcp      0      0 foreman.example.c:59302 152.195.38.76:http    TIME_WAIT   -
```

```
himanshu@himanshu:~$ netstat -u -e
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State      User   Inode
7553    0      0 foreman.example.:bootpc  dsldevice.lan:bootps  ESTABLISHED root    21
280     0      0 localhost:58753           localhost:58753       ESTABLISHED postgres 29
6807    0      0 ip6-localhost:38601      localhost:domain     ESTABLISHED himanshu 26
261944   0      0 foreman.example.c:45560 _gateway:domain    ESTABLISHED systemd-resol
265829   0      0 foreman.example.c:33463 _gateway:domain    ESTABLISHED systemd-resol
himanshu@himanshu:~$ netstat -ant
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp     0      0 127.0.0.53:53            0.0.0.0:*            LISTEN
tcp     0      0 127.0.1.1:5432          0.0.0.0:*            LISTEN
tcp     0      0 127.0.0.1:6379          0.0.0.0:*            LISTEN
tcp     0      0 192.168.122.1:53        0.0.0.0:*            LISTEN
tcp     0      0 0.0.0.0:22             0.0.0.0:*            LISTEN
tcp     0      0 0.0.0.0:23             0.0.0.0:*            LISTEN
tcp     0      0 127.0.0.1:631           0.0.0.0:*            LISTEN
tcp     0      0 192.168.1.16:56664      185.239.173.210:443 ESTABLISHED
tcp     0      0 192.168.1.16:58336      34.225.45.79:443   ESTABLISHED
tcp     0      0 192.168.1.16:59554      52.220.143.195:443 ESTABLISHED
tcp     0      0 192.168.1.16:56682      67.199.150.85:443  ESTABLISHED
tcp     0      0 192.168.1.16:37402      103.43.90.21:443   ESTABLISHED
tcp     0      32 192.168.1.16:58942      103.43.90.21:443   LAST_ACK
tcp     0      0 192.168.1.16:37404      103.43.90.21:443   ESTABLISHED
tcp     0      0 192.168.1.16:53580      185.239.173.210:443 ESTABLISHED
tcp     0      0 192.168.1.16:36762      108.158.222.8:443  ESTABLISHED
tcp     0      0 192.168.1.16:60676      45.133.44.3:443   ESTABLISHED
tcp     0      0 192.168.1.16:46712      13.250.192.86:443  ESTABLISHED
tcp     0      0 192.168.1.16:37388      103.43.90.21:443   ESTABLISHED
tcp     0      0 192.168.1.16:50460      130.211.23.194:443 ESTABLISHED
tcp     0      0 192.168.1.16:42816      142.250.182.202:443 TIME_WAIT
tcp     0      0 192.168.1.16:39328      103.231.98.193:443 ESTABLISHED
tcp     0      0 192.168.1.16:37538      103.231.98.196:443 ESTABLISHED
tcp     0      0 192.168.1.16:53596      185.239.173.210:443 ESTABLISHED
tcp     0      0 192.168.1.16:37530      69.173.158.65:443  TIME_WAIT
tcp     0      0 192.168.1.16:48908      172.67.70.134:443 ESTABLISHED
tcp     0      0 192.168.1.16:37378      103.43.90.21:443   ESTABLISHED
tcp     0      0 192.168.1.16:37392      103.43.90.21:443   ESTABLISHED
tcp     0      0 192.168.1.16:38426      18.164.186.32:443  ESTABLISHED
tcp     0      0 192.168.1.16:37536      69.173.158.65:443  TIME_WAIT
tcp     0      0 192.168.1.16:43694      145.40.89.200:443  ESTABLISHED
tcp     0      0 192.168.1.16:44276      142.250.193.142:443 ESTABLISHED
tcp     0      0 192.168.1.16:48352      18.164.246.41:443  ESTABLISHED
tcp     0      0 192.168.1.16:40954      54.184.217.240:443 ESTABLISHED
tcp     0      0 192.168.1.16:36022      142.250.182.238:443 ESTABLISHED
tcp6    0      0 ::1:631                ::*:                 LISTEN
tcp6    0      0 ::1:8080               ::*:                 LISTEN
tcp6    0      0 ::1:6379               ::*:                 LISTEN
```

```
himanshu@himanshu:~$ netstat -su
IcmpMsg:
    InType3: 1186
    OutType3: 1389
Udp:
    289184 packets received
    1542 packets to unknown port received
    0 packet receive errors
    191464 packets sent
    0 receive buffer errors
    0 send buffer errors
    IgnoredMulti: 7
UdpLite:
IpExt:
    InNoRoutes: 20
    InMcastPkts: 2954
    OutMcastPkts: 430
    InBcastPkts: 347
    InOctets: 324227954
    OutOctets: 88570113
    InMcastOctets: 498111
    OutMcastOctets: 51173
    InBcastOctets: 55555
    InNoECTPkts: 439056
    InECT1Pkts: 1
    InECT0Pkts: 6
MPTcpExt:
himanshu@himanshu:~$ netstat -r
Kernel IP routing table
Destination      Gateway          Genmask         Flags   MSS Window irtt Iface
default        dsldevice.lan  0.0.0.0        UG        0 0          0 wlp2s0
link-local     0.0.0.0        255.255.0.0    U         0 0          0 virbr0
172.17.0.0     0.0.0.0        255.255.0.0    U         0 0          0 docker0
192.168.1.0    0.0.0.0        255.255.255.0  U         0 0          0 wlp2s0
192.168.122.0  0.0.0.0        255.255.255.0  U         0 0          0 virbr0
himanshu@himanshu:~$
```

```
himanshu@himanshu:~$ netstat -i
Kernel Interface table
Iface      MTU     RX-OK RX-ERR RX-DRP RX-OVR     TX-OK TX-ERR TX-DRP TX-OVR Flg
br0       1500        0     0 0          0        0     0 0          0 BMU
docker0    1500        0     0 0          0        0     0 0          0 BMU
lo        65536   89491        0     0 0          89491        0     0 0          0 LRU
virbr0    1500        0     0 0          0        0     0 0          0 BMU
wlp2s0    1500  580189        0   310 0        363506        0     0 0          0 BMRU
himanshu@himanshu:~$ netstat -i -e
Kernel Interface table
br0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
      ether aa:83:6c:76:0d:ab  txqueuelen 1000  (Ethernet)
      RX packets 0  bytes 0 (0.0 B)
      RX errors 0  dropped 0  overruns 0  frame 0
      TX packets 0  bytes 0 (0.0 B)
      TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

docker0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
      inet 172.17.0.1  netmask 255.255.0.0  broadcast 172.17.255.255
      ether 02:42:bd:2b:f7:fe  txqueuelen 0  (Ethernet)
      RX packets 0  bytes 0 (0.0 B)
      RX errors 0  dropped 0  overruns 0  frame 0
      TX packets 0  bytes 0 (0.0 B)
      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 89652  bytes 10002942 (10.0 MB)
      RX errors 0  dropped 0  overruns 0  frame 0
      TX packets 89652  bytes 10002942 (10.0 MB)
      TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

virbr0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
      inet 192.168.122.1  netmask 255.255.255.0  broadcast 192.168.122.255
      ether 52:54:00:01:8a:ed  txqueuelen 1000  (Ethernet)
      RX packets 0  bytes 0 (0.0 B)
      RX errors 0  dropped 0  overruns 0  frame 0
      TX packets 0  bytes 0 (0.0 B)
      TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

wlp2s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
      inet 192.168.1.16  netmask 255.255.255.0  broadcast 192.168.1.255
      inet6 2401:4900:1c23:75ed:2553:110c:c240:a303  prefixlen 64  scopeid 0x0<global>
      inet6 2401:4900:1c23:75ed:bb1:5e65:9466:756e  prefixlen 64  scopeid 0x0<global>
      inet6 fe80::a9dd:43ad:eab2:452c  prefixlen 64  scopeid 0x20<link>
      ether 3c:55:76:cf:20:23  txqueuelen 1000  (Ethernet)
      RX packets 581386  bytes 511806327 (511.8 MB)
      RX errors 0  dropped 310  overruns 0  frame 0
      TX packets 364633  bytes 136532281 (136.5 MB)
      TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

himanshu@himanshu:~$
```

. LSCPU COMMAND

The command-line utility “lscpu” in Linux is used to get CPU information of the system. The “lscpu” command fetches the CPU architecture information from the “sysfs” and /proc/cpuinfo files and displays it in a terminal.

- **LSCPU :-** Execute the “lscpu” command without invoking any argument in the terminal to display the complete picture of useful information about the processor .
- **LSCPU –e :-** Run the “-e” option in the terminal; it will gather CPU related data and display it in Human Readable Format .
- **lscpu -e=cpu,code :-** Also, if you want to limit the output with the particular column, then use the “-e” option with the column name .
- **LSCPU –p :-** To display the processor information in a parsing-friendly format, use the “-p” option .

- **LSCPU -x** :- When we execute the “lscpu” command, it displays output in list format by default, but you can use the hexadecimal mask to print CPU sets using the “-x” option .
- **LSCPU -J** :- The “lscpu” command also allows you to print the extended output of CPU information in JSON format through the “-J” option .
- **lscpu -e -b** :- These flags will run only with the execution of “-e” and “-p” options.
Such as, if you want to print the results only for online CPUs, run the given command in a terminal .
- **LSCPU -h** :- To print a help message regarding the “lscpu” command and its options, use the “-h” option .
- **LSCPU -V** :- Run the “-V” option in a terminal to print a version of the “lscpu” command tool .

```
himanshu@himanshu:~$ lscpu
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Address sizes:         39 bits physical, 48 bits virtual
Byte Order:            Little Endian
CPU(s):                4
On-line CPU(s) list:  0-3
Vendor ID:             GenuineIntel
Model name:            11th Gen Intel(R) Core(TM) i3-1115G4 @ 3.00GHz
CPU family:            6
Model:                 140
Thread(s) per core:   2
Core(s) per socket:   2
Socket(s):             1
Stepping:              1
CPU max MHz:          4100.0000
CPU min MHz:          400.0000
BogoMIPS:              5990.40
Flags:                 fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat ps
                       e36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1
                       gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xt
                       topology nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dt
                       es64 monitor ds_cpl vmx est tm2 ssse3 sdbg fma cx16 xtrp pdcm pcid s
                       se4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f1
                       6c rdrandlahf_lm abm 3dnowprefetch cpuid_fault epb cat_l2 invpcid_s
                       ingle cdp_l2 ssbd ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flex
                       priority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2 smep bmi2 erm
                       s invpcid rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflusho
                       pt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec x
                       getbv1 xsaves split_lock_detect dtherm ida arat pln pts hwp hwp_noti
                       fy hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pkru ospke avx5
                       12 vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg avx512_vpoc
                       ntdq rdpid movdir64b fsrm avx512_vp2intersect md_clear flush
                       _lid arch_capabilities
Virtualization features:
  Virtualization:      VT-x
Caches (sum of all):
  L1d:                 96 KiB (2 instances)
  L1i:                 64 KiB (2 instances)
  L2:                  2.5 MiB (2 instances)
  L3:                  6 MiB (1 instance)
NUMA:
  NUMA node(s):        1
  NUMA node0 CPU(s):   0-3
Vulnerabilities:
  Itlb multihit:       Not affected
  L1tf:                Not affected
  Mds:                 Not affected
  Meltdown:            Not affected
  Mmio stale data:    Not affected
  Retbleed:            Not affected
  Spec store bypass:   Mitigation; Speculative Store Bypass disabled via prctl and seccomp
  Spectre v1:           Mitigation; usercopy/swapgs barriers and __user pointer sanitization
  Spectre v2:           Mitigation; Enhanced IBRS, IBPB conditional, RSB filling, PBRSB-eIBR
```

```
himanshu@himanshu:~
```

Retired:

Spec store bypass:	Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Spectre v1:	Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Spectre v2:	Mitigation; Enhanced IBRS, IBPB conditional, RSB filling, PBRSB-eIBR S SW sequence
Srbds:	Not affected
Tsx async abort:	Not affected

```
himanshu@himanshu:~$
```

```
himanshu@himanshu:~$ lscpu -e
```

CPU	NODE	SOCKET	CORE	L1d:L1i:L2:L3	ONLINE	MAXMHZ	MINMHZ	MHZ
0	0	0	0	0:0:0:0	yes	4100.0000	400.0000	3000.000
1	0	0	1	1:1:1:0	yes	4100.0000	400.0000	1274.986
2	0	0	0	0:0:0:0	yes	4100.0000	400.0000	1880.169
3	0	0	1	1:1:1:0	yes	4100.0000	400.0000	1704.625

```
himanshu@himanshu:~$ lscpu -e=cpu,code
```

```
lscpu: unknown column: code
```

```
himanshu@himanshu:~$ lscpu -e
```

CPU	NODE	SOCKET	CORE	L1d:L1i:L2:L3	ONLINE	MAXMHZ	MINMHZ	MHZ
0	0	0	0	0:0:0:0	yes	4100.0000	400.0000	3000.000
1	0	0	1	1:1:1:0	yes	4100.0000	400.0000	3000.000
2	0	0	0	0:0:0:0	yes	4100.0000	400.0000	2347.847
3	0	0	1	1:1:1:0	yes	4100.0000	400.0000	3000.000

```
himanshu@himanshu:~$ lscpu -p
```

```
lscpu: bad usage
```

```
Try 'lscpu --help' for more information.
```

```
himanshu@himanshu:~$ lscpu -x
```

```
lscpu: bad usage
```

```
Try 'lscpu --help' for more information.
```

```
himanshu@himanshu:~$ lscpu -J
```

```
lscpu: bad usage
```

```
Try 'lscpu --help' for more information.
```

```
himanshu@himanshu:~$ lscpu -J
```

```
lscpu: bad usage
```

```
Try 'lscpu --help' for more information.
```

```
himanshu@himanshu:~$ lscpu -b
```

```
lscpu: bad usage
```

```
Try 'lscpu --help' for more information.
```

```
himanshu@himanshu:~$ lscpu -h
```

```
Usage:  
  lscpu [options]
```

Display information about the CPU architecture.

Options:

-a, --all	print both online and offline CPUs (default for -e)
-b, --online	print online CPUs only (default for -p)
-B, --bytes	print sizes in bytes rather than in human readable format
-C, --caches[=<list>]	info about caches in extended readable format
-c, --offline	print offline CPUs only
-J, --json	use JSON for default or extended format
-e, --extended[=<list>]	print out an extended readable format
-p, --parse[=<list>]	print out a parsable format
-s, --sysroot <dir>	use specified directory as system root
-x, --hex	print hexadecimal masks rather than lists of CPUs

```
himanshu@himanshu: ~
board.
about the CPU architecture.

Options:
-a, --all          print both online and offline CPUs (default for -e)
-b, --online       print online CPUs only (default for -p)
-B, --bytes        print sizes in bytes rather than in human readable format
-C, --caches[=<list>] info about caches in extended readable format
-c, --offline      print offline CPUs only
-J, --json         use JSON for default or extended format
-e, --extended[=<list>] print out an extended readable format
-p, --parse[=<list>] print out a parsable format
-s, --sysroot <dir> use specified directory as system root
-x, --hex          print hexadecimal masks rather than lists of CPUs
-y, --physical     print physical instead of logical IDs
--output-all       print all available columns for -e, -p or -C

-h, --help         display this help
-V, --version      display version

Available output columns for -e or -p:
BOGOMIPS  crude measurement of CPU speed
CPU        logical CPU number
CORE       logical core number
SOCKET    logical socket number
CLUSTER   logical cluster number
NODE      logical NUMA node number
BOOK      logical book number
DRAWER    logical drawer number
CACHE     shows how caches are shared between CPUS
POLARIZATION CPU dispatching mode on virtual hardware
ADDRESS    physical address of a CPU
CONFIGURED shows if the hypervisor has allocated the CPU
ONLINE    shows if Linux currently makes use of the CPU
MHZ       shows the currently MHz of the CPU
MAXMHZ   shows the maximum MHz of the CPU
MINMHZ   shows the minimum MHz of the CPU

Available output columns for -C:
ALL-SIZE  size of all system caches
LEVEL     cache level
NAME      cache name
ONE-SIZE  size of one cache
TYPE      cache type
WAYS      ways of associativity
ALLOC-POLICY allocation policy
WRITE-POLICY write policy
PHY-LINE  number of physical cache line per cache
SETS      number of sets in the cache; set lines has the same cache index
COHERENCY-SIZE minimum amount of data in bytes transferred from memory to cache

For more details see lscpu(1).
himanshu@himanshu:~$ lscpu -V
lscpu from util-linux 2.37.2
himanshu@himanshu:~$
```

. DMIDESENSE (DESKTOP MANAGEMENT INTERFACE DECODER) COMMAND

The DMI table decoder is a command-line tool for Linux systems. It is commonly used to translate a machine's DMI table (System Management BIOS, or SMBIOS) into a human-readable format .

Example 1: Running a simple DMIDECODE command to get hardware information.

Example 2: To get information about the Processor.

- **-d, --dev-mem FILE**: This option is used to read memory from device **FILE**, where **FILE** is the file name being used. By default it is **/dev/mem**.
- **-h, --help**: Display help and exit.
- **-q, --quiet**: This option is used to print less verbose output.
- **-s, --string KEYWORD**: Only display the value of the given DMI string. Suppose if we want to know the value of processor-frequency, we can use the following command along with the keyword(processor-frequency)

- **-t, --type TYPE**: This option is helpful when we only want to display the entries of a given type. With the help of DMI type id, we can get particular information about a hardware component. Type ids are equivalent to the keyword thus we can either use the type id's # or we can use the entire keyword to get the information related to that keyword. Type keywords are not case sensitive.

Example 3: To get information about Baseboard we can execute any of the following commands.

`sudo DMIDECODE -t baseboard`

Or

`sudo DMIDECODE -t 2`

Or

`sudo DMIDECODE --type baseboard`

Example 4: To get information about Chassis.

- **-u, --dump**: Mostly used in debugging processes. This option is used when we don't want to decode the entries, rather we want them to be dumped in hexadecimal form.

- **-dump-bin FILE**: This option comes handy when we don't want DMIDECODE to decode the entries but to dump the DMI information to a binary file. The file is the name of the file that is to be used.
- **-from-dump FILE**: This option Read the DMI data from a given binary file.
- **-V, --version**: Display the version and exit.

```
himanshu@himanshu:~$ sudo dmidecode |more
# dmidecode 3.3
Getting SMBIOS data from sysfs.
SMBIOS 3.2 present.
70 structures occupying 5389 bytes.
Table at 0x60955000.

Handle 0xDA00, DMI type 218, 251 bytes
OEM-specific Type
    Header and Data:
        DA FB 00 DA B2 00 7C FF 1F B6 50 1E 00 1E 00 00
        00 22 00 22 00 01 00 23 00 23 00 00 00 28 00 28
        00 00 00 29 00 29 00 01 00 2A 00 2A 00 02 00 2B
        00 2B 00 FF FF 2C 00 2C 00 FF FF 2D 00 2D 00 02
        00 2E 00 2E 00 00 00 50 00 50 00 01 00 55 00 55
        00 00 00 6D 00 6D 00 05 00 6E 00 6E 00 01 00 7D
        00 7D 00 FF FF 90 00 90 00 01 00 91 00 91 00 00
        00 92 00 92 00 02 00 93 00 93 00 01 00 94 00 94
        00 00 00 9B 00 9B 00 01 00 9C 00 9C 00 00 00 BA
        00 BA 00 00 BB 00 BB 00 01 00 BC 00 BC 00 02
        00 D1 00 D1 00 01 00 D2 00 D2 00 00 00 ED 00 ED
        00 00 00 F0 00 F0 00 01 00 09 01 09 01 00 00 0E
        01 0E 01 01 00 0F 01 0F 01 00 00 17 01 17 01 00
        00 18 01 18 01 01 00 27 01 27 01 03 00 2B 01 2B
        01 01 00 2C 01 2C 01 00 00 35 01 35 01 FF 00 38
        01 38 01 01 00 FF FF FF FF 00 00

Handle 0xDA01, DMI type 218, 251 bytes
OEM-specific Type
    Header and Data:
        DA FB 01 DA B2 00 7C FF 1F B6 50 39 01 39 01 02
        00 4A 01 4A 01 00 00 4B 01 4B 01 01 00 4C 01 4C
        01 01 00 4D 01 4D 01 00 00 52 01 52 01 01 00 53
        01 53 01 00 00 7B 01 7B 01 00 00 7C 01 7C 01 01
        00 7F 01 7F 01 00 00 80 01 80 01 01 00 89 01 89
        01 00 00 8A 01 8A 01 01 00 98 01 98 01 04 00 9B
        01 9B 01 00 00 9C 01 9C 01 01 00 DE 01 DE 01 00
        00 DF 01 DF 01 01 00 E0 01 E0 01 05 00 EA 01 EA
        01 00 00 EB 01 EB 01 01 00 02 02 02 02 00 00 03
        02 03 02 01 00 04 02 04 02 00 00 05 02 05 02 01
        00 16 02 16 02 06 00 32 02 32 02 02 00 33 02 33
        02 01 00 35 02 35 02 01 00 36 02 36 02 00 00 4B
        02 4B 02 01 00 4C 02 4C 02 00 00 64 02 64 02 01
        00 65 02 65 02 00 00 66 02 66 02 01 00 67 02 67
        02 00 00 68 02 68 02 01 00 69 02 69 02 00 00 6C
        02 6C 02 01 00 FF FF FF FF 00 00

Handle 0xDA02, DMI type 218, 251 bytes
OEM-specific Type
    Header and Data:
        DA FB 02 DA B2 00 7C FF 1F B6 50 6D 02 6D 02 00
        00 6E 02 6E 02 00 00 85 02 85 02 01 00 86 02 86
        02 00 00 94 02 94 02 01 00 95 02 95 02 00 00 A7
        02 A7 02 01 00 A8 02 A8 02 00 00 BD 02 BD 02 01
```

```
himanshu@himanshu:~$ sudo dmidecode -t processor
# dmidecode 3.3
Getting SMBIOS data from sysfs.
SMBIOS 3.2 present.

Handle 0x0400, DMI type 4, 48 bytes
Processor Information
    Socket Designation: CPU 1
    Type: Central Processor
    Family: Core i3
    Manufacturer: Intel(R) Corporation
    ID: C1 06 08 00 FF FB EB BF
    Signature: Type 0, Family 6, Model 140, Stepping 1
    Flags:
        FPU (Floating-point unit on-chip)
        VME (Virtual mode extension)
        DE (Debugging extension)
        PSE (Page size extension)
        TSC (Time stamp counter)
        MSR (Model specific registers)
        PAE (Physical address extension)
        MCE (Machine check exception)
        CX8 (CMPXCHG8 instruction supported)
        APIC (On-chip APIC hardware supported)
        SEP (Fast system call)
        MTRR (Memory type range registers)
        PGE (Page global enable)
        MCA (Machine check architecture)
        CMOV (Conditional move instruction supported)
        PAT (Page attribute table)
        PSE-36 (36-bit page size extension)
        CLFLUSH (CLFLUSH instruction supported)
        DS (Debug store)
        ACPI (ACPI supported)
        MMX (MMX technology supported)
        FXSR (FXSAVE and FXSTOR instructions supported)
        SSE (Streaming SIMD extensions)
        SSE2 (Streaming SIMD extensions 2)
        SS (Self-snoop)
        HTT (Multi-threading)
        TM (Thermal monitor supported)
        PBE (Pending break enabled)
    Version: 11th Gen Intel(R) Core(TM) i3-1115G4 @ 3.00GHz
    Voltage: 0.8 V
    External Clock: 100 MHz
    Max Speed: 4100 MHz
    Current Speed: 3000 MHz
    Status: Populated, Enabled
    Upgrade: Other
    L1 Cache Handle: 0x0701
    L2 Cache Handle: 0x0702
    L3 Cache Handle: 0x0703
    Serial Number:
    Asset Tag:
    Part Number:
```

```
himanshu@himanshu:~$ sudo dmidecode -t bios
# dmidecode 3.3
Getting SMBIOS data from sysfs.
SMBIOS 3.2 present.

Handle 0x0001, DMI type 0, 26 bytes
BIOS Information
    Vendor: Dell Inc.
    Version: 1.18.2
    Release Date: 10/27/2022
    ROM Size: 32 MB
    Characteristics:
        PCI is supported
        PNP is supported
        BIOS is upgradeable
        BIOS shadowing is allowed
        Boot from CD is supported
        Selectable boot is supported
        EDD is supported
        Print screen service is supported (int 5h)
        8042 keyboard services are supported (int 9h)
        Serial services are supported (int 14h)
        Printer services are supported (int 17h)
        ACPI is supported
        USB legacy is supported
        Smart battery is supported
        BIOS boot specification is supported
        Function key-initiated network boot is supported
        Targeted content distribution is supported
        UEFI is supported
    BIOS Revision: 1.18

Handle 0x0D00, DMI type 13, 22 bytes
BIOS Language Information
    Language Description Format: Abbreviated
    Installable Languages: 1
        enUS
    Currently Installed Language: enUS

himanshu@himanshu:~$
```

```
himanshu@himanshu:~$ sudo dmidecode --help
Usage: dmidecode [OPTIONS]
Options are:
-d, --dev-mem FILE      Read memory from device FILE (default: /dev/mem)
-h, --help                Display this help text and exit
-q, --quiet               Less verbose output
-s, --string KEYWORD    Only display the value of the given DMI string
-t, --type TYPE          Only display the entries of given type
-H, --handle HANDLE     Only display the entry of given handle
-u, --dump                Do not decode the entries
--dump-bin FILE          Dump the DMI data to a binary file
--from-dump FILE         Read the DMI data from a binary file
--no-sysfs               Do not attempt to read DMI data from sysfs files
--oem-string N           Only display the value of the given OEM string
-V, --version              Display the version and exit
himanshu@himanshu:~$ sudo dmidecode -q
BIOS Information
  Vendor: Dell Inc.
  Version: 1.18.2
  Release Date: 10/27/2022
  ROM Size: 32 MB
  Characteristics:
    PCI is supported
    PNP is supported
    BIOS is upgradeable
    BIOS shadowing is allowed
    Boot from CD is supported
    Selectable boot is supported
    EDD is supported
    Print screen service is supported (int 5h)
    8042 keyboard services are supported (int 9h)
    Serial services are supported (int 14h)
    Printer services are supported (int 17h)
    ACPI is supported
    USB legacy is supported
    Smart battery is supported
    BIOS boot specification is supported
    Function key-initiated network boot is supported
    Targeted content distribution is supported
    UEFI is supported
  BIOS Revision: 1.18

System Information
  Manufacturer: Dell Inc.
  Product Name: Inspiron 15 3511
  Version: Not Specified
  Serial Number: 28CRXR3
  UUID: 4c4c4544-0038-4310-8052-b2c04f585233
  Wake-up Type: Other
  SKU Number: 0AD9
  Family: Inspiron

Base Board Information
  Manufacturer: Dell Inc.
  Product Name: 0J8GM4
```

```
himanshu@himanshu:~$ sudo dmidecode -t baseboard
# dmidecode 3.3
Getting SMBIOS data from sysfs.
SMBIOS 3.2 present.

Handle 0x0200, DMI type 2, 17 bytes
Base Board Information
    Manufacturer: Dell Inc.
    Product Name: 0J8GM4
    Version: A00
    Serial Number: /28CRXR3/CNCMC0028B1959/
    Asset Tag: Not Specified
    Features:
        Board is a hosting board
        Board is replaceable
    Location In Chassis: Not Specified
    Chassis Handle: 0x0300
    Type: Motherboard
    Contained Object Handles: 0

Handle 0x2900, DMI type 41, 11 bytes
Onboard Device
    Reference Designation:
    Type: Video
    Status: Enabled
    Type Instance: 0
    Bus Address: 0000:00:02.0

Handle 0x2901, DMI type 41, 11 bytes
Onboard Device
    Reference Designation:
    Type: Ethernet
    Status: Disabled
    Type Instance: 0
    Bus Address: 0000:00:1f.6

Handle 0x2902, DMI type 41, 11 bytes
Onboard Device
    Reference Designation:
    Type: Sound
    Status: Disabled
    Type Instance: 0
    Bus Address: 0000:00:1f.3

Handle 0x2903, DMI type 41, 11 bytes
Onboard Device
    Reference Designation:
    Type: SATA Controller
    Status: Disabled
    Type Instance: 0
    Bus Address: 0000:00:17.0

himanshu@himanshu:~$
```

```
himanshu@himanshu:~$ sudo dmidecode -t 3
# dmidecode 3.3
Getting SMBIOS data from sysfs.
SMBIOS 3.2 present.

Handle 0x0300, DMI type 3, 22 bytes
Chassis Information
    Manufacturer: Dell Inc.
    Type: Notebook
    Lock: Not Present
    Version: Not Specified
    Serial Number: 28CRXR3
    Asset Tag: Not Specified
    Boot-up State: Safe
    Power Supply State: Safe
    Thermal State: Safe
    Security Status: None
    OEM Information: 0x00000000
    Height: Unspecified
    Number Of Power Cords: 1
    Contained Elements: 0
    SKU Number: Notebook

himanshu@himanshu:~$
```

```
himanshu@himanshu:~$ dmidecode -v
dmidecode: invalid option -- 'v'
himanshu@himanshu:~$ sudo dmidecode --version
3.3
himanshu@himanshu:~$
```

. LSBLK COMMAND

LSBLK lists information about all available or the specified block devices. The lsblk command reads the sysfs filesystem and udev db to gather information. If the udev db is not available or lsblk is compiled without udev support, then it tries to

read LABELs, UUIDs and filesystem types from the block device .

1. To display block devices.

```
$ LSBLK
```

2. To display empty block devices as well.

```
$ LSBLK -a
```

3. To print size information in bytes.

```
$ LSBLK -b
```

4. To print zone models for devices.

```
$ LSBLK -z
```

5. To skip slave entries.

```
$ LSBLK -d
```

6. To use ASCII characters for tree formatting.

```
$ LSBLK -i
```

7. To print information about device owner, group, and mode of block devices.

```
$ LSBLK -m
```

8. To print selected columns of block-devices.

```
$ LSBLK -o SIZE, NAME, MOUNTPOINT
```

9. To hide column headings.

```
$ LSBLK -dn
```

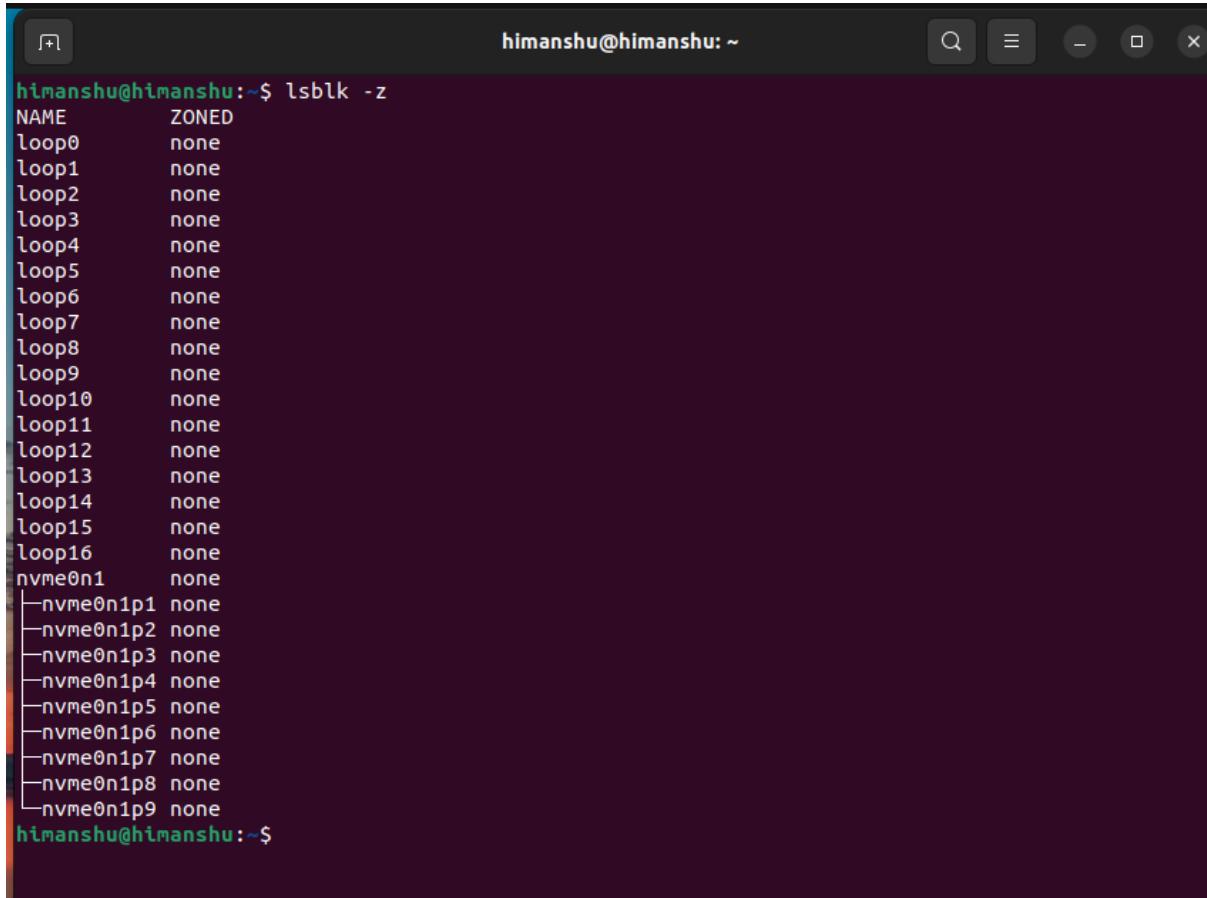
10. To display the help section of the command.

```
$ LSBLK --help
```

```
lsblk: no drives found
himanshu@himanshu:~$ lsblk
NAME      MAJ:MIN RM    SIZE RO TYPE MOUNTPOINTS
loop0       7:0    0     4K  1 loop /snap/bare/5
loop1       7:1    0   63.3M  1 loop /snap/core20/1828
loop2       7:2    0   72.9M  1 loop /snap/core22/522
loop3       7:3    0  239.8M  1 loop /snap/firefox/2391
loop4       7:4    0  400.8M  1 loop /snap/gnome-3-38-2004/112
loop5       7:5    0   63.3M  1 loop /snap/core20/1822
loop6       7:6    0  91.7M  1 loop /snap/gtk-common-themes/1535
loop7       7:7    0 346.3M  1 loop /snap/gnome-3-38-2004/119
loop8       7:8    0 240.6M  1 loop /snap/firefox/2356
loop9       7:9    0   45.9M  1 loop /snap/snap-store/582
loop10      7:10   0   49.8M  1 loop /snap/snapd/17950
loop11      7:11   0   45.9M  1 loop /snap/snap-store/638
loop12      7:12   0   49.8M  1 loop /snap/snapd/18357
loop13      7:13   0   284K  1 loop /snap/snapd-desktop-integration/14
loop14      7:14   0   304K  1 loop /snap/snapd-desktop-integration/49
loop15      7:15   0   20.7M  1 loop /snap/terraform/465
loop16      7:16   0   21.4M  1 loop /snap/terraform/471
nvme0n1    259:0  0 476.9G  0 disk
└─nvme0n1p1 259:1  0   400M  0 part /boot/efi
└─nvme0n1p2 259:2  0   128M  0 part
└─nvme0n1p3 259:3  0  354.7G  0 part
└─nvme0n1p4 259:4  0   990M  0 part
└─nvme0n1p5 259:5  0   14.9G  0 part
└─nvme0n1p6 259:6  0   1.3G  0 part
└─nvme0n1p7 259:7  0   58G  0 part /home
└─nvme0n1p8 259:8  0  37.3G  0 part /var/snap/firefox/common/host-hunspell
                           /
└─nvme0n1p9 259:9  0   9.3G  0 part [SWAP]
himanshu@himanshu:~$
```

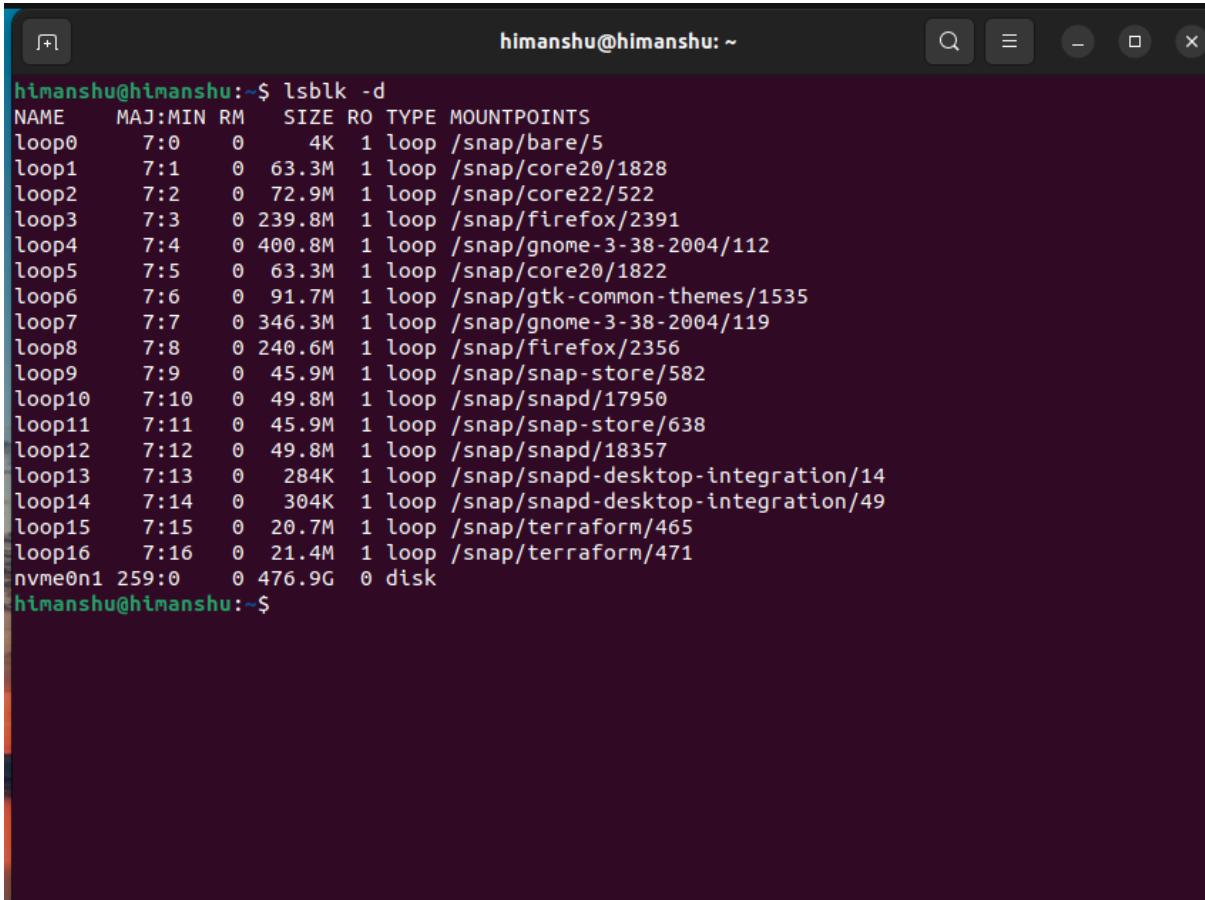
```
loop0      7:0    0  2.1G 1 loop /snap/tar/2938
loop9      7:9    0  45.9M 1 loop /snap/snap-store/582
loop10     7:10   0  49.8M 1 loop /snap/snapd/17950
loop11     7:11   0  45.9M 1 loop /snap/snap-store/638
loop12     7:12   0  49.8M 1 loop /snap/snapd/18357
loop13     7:13   0  284K 1 loop /snap/snapd-desktop-integration/14
loop14     7:14   0  304K 1 loop /snap/snapd-desktop-integration/49
loop15     7:15   0  20.7M 1 loop /snap/terraform/465
loop16     7:16   0  21.4M 1 loop /snap/terraform/471
nvme0n1   259:0  0  476.9G 0 disk
└─nvme0n1p1 259:1  0  400M 0 part /boot/efi
└─nvme0n1p2 259:2  0  128M 0 part
└─nvme0n1p3 259:3  0  354.7G 0 part
└─nvme0n1p4 259:4  0  990M 0 part
└─nvme0n1p5 259:5  0  14.9G 0 part
└─nvme0n1p6 259:6  0  1.3G 0 part
└─nvme0n1p7 259:7  0  58G 0 part /home
└─nvme0n1p8 259:8  0  37.3G 0 part /var/snap/firefox/common/host-hunspell
   /
└─nvme0n1p9 259:9  0  9.3G 0 part [SWAP]
himanshu@himanshu:~$ lsblk -a
NAME      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
loop0      7:0    0  4K  1 loop /snap/bare/5
loop1      7:1    0 63.3M 1 loop /snap/core20/1828
loop2      7:2    0 72.9M 1 loop /snap/core22/522
loop3      7:3    0 239.8M 1 loop /snap/firefox/2391
loop4      7:4    0 400.8M 1 loop /snap/gnome-3-38-2004/112
loop5      7:5    0 63.3M 1 loop /snap/core20/1822
loop6      7:6    0 91.7M 1 loop /snap/gtk-common-themes/1535
loop7      7:7    0 346.3M 1 loop /snap/gnome-3-38-2004/119
loop8      7:8    0 240.6M 1 loop /snap/firefox/2356
loop9      7:9    0 45.9M 1 loop /snap/snap-store/582
loop10     7:10   0 49.8M 1 loop /snap/snapd/17950
loop11     7:11   0 45.9M 1 loop /snap/snap-store/638
loop12     7:12   0 49.8M 1 loop /snap/snapd/18357
loop13     7:13   0 284K 1 loop /snap/snapd-desktop-integration/14
loop14     7:14   0 304K 1 loop /snap/snapd-desktop-integration/49
loop15     7:15   0 20.7M 1 loop /snap/terraform/465
loop16     7:16   0 21.4M 1 loop /snap/terraform/471
loop17     7:17   0  0B 0 loop
nvme0n1   259:0  0 476.9G 0 disk
└─nvme0n1p1 259:1  0  400M 0 part /boot/efi
└─nvme0n1p2 259:2  0  128M 0 part
└─nvme0n1p3 259:3  0  354.7G 0 part
└─nvme0n1p4 259:4  0  990M 0 part
└─nvme0n1p5 259:5  0  14.9G 0 part
└─nvme0n1p6 259:6  0  1.3G 0 part
└─nvme0n1p7 259:7  0  58G 0 part /home
└─nvme0n1p8 259:8  0  37.3G 0 part /var/snap/firefox/common/host-hunspell
   /
└─nvme0n1p9 259:9  0  9.3G 0 part [SWAP]
himanshu@himanshu:~$
```

```
himanshu@himanshu:~$ lsblk -b
NAME      MAJ:MIN RM    SIZE RO TYPE MOUNTPOINTS
loop0      7:0    0   4096  1 loop /snap/bare/5
loop1      7:1    0 66359296  1 loop /snap/core20/1828
loop2      7:2    0 76447744  1 loop /snap/core22/522
loop3      7:3    0 251461632 1 loop /snap/firefox/2391
loop4      7:4    0 420265984 1 loop /snap/gnome-3-38-2004/112
loop5      7:5    0 66355200  1 loop /snap/core20/1822
loop6      7:6    0 96141312  1 loop /snap/gtk-common-themes/1535
loop7      7:7    0 363151360 1 loop /snap/gnome-3-38-2004/119
loop8      7:8    0 252301312 1 loop /snap/firefox/2356
loop9      7:9    0 48091136  1 loop /snap/snap-store/582
loop10     7:10   0 52248576  1 loop /snap/snapd/17950
loop11     7:11   0 48160768  1 loop /snap/snap-store/638
loop12     7:12   0 52260864  1 loop /snap/snapd/18357
loop13     7:13   0 290816  1 loop /snap/snapd-desktop-integration/14
loop14     7:14   0 311296  1 loop /snap/snapd-desktop-integration/49
loop15     7:15   0 21696512 1 loop /snap/terraform/465
loop16     7:16   0 22437888 1 loop /snap/terraform/471
nvme0n1   259:0  0 512110190592 0 disk
└─nvme0n1p1 259:1  0 419430400 0 part /boot/efi
└─nvme0n1p2 259:2  0 134217728 0 part
└─nvme0n1p3 259:3  0 380839657472 0 part
└─nvme0n1p4 259:4  0 1038090240 0 part
└─nvme0n1p5 259:5  0 16002318336 0 part
└─nvme0n1p6 259:6  0 1439694848 0 part
└─nvme0n1p7 259:7  0 62234034176 0 part /home
└─nvme0n1p8 259:8  0 40000028672 0 part /var/snap/firefox/common/host-hunspell
                           /
└─nvme0n1p9 259:9  0 10000269312 0 part [SWAP]
himanshu@himanshu:~$
```



A screenshot of a terminal window titled "himanshu@himanshu: ~". The window shows the output of the command "lsblk -z". The output lists various block devices with their ZONED status. Most devices have a ZONED status of "none", except for "nvme0n1" which has a ZONED status of "nvme". The "nvme0n1" device is expanded to show its partitions: "nvme0n1p1" through "nvme0n1p9", all of which also have a ZONED status of "none".

```
himanshu@himanshu:~$ lsblk -z
NAME      ZONED
loop0     none
loop1     none
loop2     none
loop3     none
loop4     none
loop5     none
loop6     none
loop7     none
loop8     none
loop9     none
loop10    none
loop11    none
loop12    none
loop13    none
loop14    none
loop15    none
loop16    none
nvme0n1   nvme
└─nvme0n1p1 none
└─nvme0n1p2 none
└─nvme0n1p3 none
└─nvme0n1p4 none
└─nvme0n1p5 none
└─nvme0n1p6 none
└─nvme0n1p7 none
└─nvme0n1p8 none
└─nvme0n1p9 none
himanshu@himanshu:~$
```



himanshu@himanshu:~\$ lsblk -d

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
loop0	7:0	0	4K	1	loop	/snap/bare/5
loop1	7:1	0	63.3M	1	loop	/snap/core20/1828
loop2	7:2	0	72.9M	1	loop	/snap/core22/522
loop3	7:3	0	239.8M	1	loop	/snap/firefox/2391
loop4	7:4	0	400.8M	1	loop	/snap/gnome-3-38-2004/112
loop5	7:5	0	63.3M	1	loop	/snap/core20/1822
loop6	7:6	0	91.7M	1	loop	/snap/gtk-common-themes/1535
loop7	7:7	0	346.3M	1	loop	/snap/gnome-3-38-2004/119
loop8	7:8	0	240.6M	1	loop	/snap/firefox/2356
loop9	7:9	0	45.9M	1	loop	/snap/snap-store/582
loop10	7:10	0	49.8M	1	loop	/snap/snapd/17950
loop11	7:11	0	45.9M	1	loop	/snap/snap-store/638
loop12	7:12	0	49.8M	1	loop	/snap/snapd/18357
loop13	7:13	0	284K	1	loop	/snap/snapd-desktop-integration/14
loop14	7:14	0	304K	1	loop	/snap/snapd-desktop-integration/49
loop15	7:15	0	20.7M	1	loop	/snap/terraform/465
loop16	7:16	0	21.4M	1	loop	/snap/terraform/471
nvme0n1	259:0	0	476.9G	0	disk	

himanshu@himanshu:~\$

```
himanshu@himanshu:~$ lsblk -i
NAME      MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0      7:0     0    4K  1 loop /snap/bare/5
loop1      7:1     0  63.3M  1 loop /snap/core20/1828
loop2      7:2     0  72.9M  1 loop /snap/core22/522
loop3      7:3     0 239.8M  1 loop /snap/firefox/2391
loop4      7:4     0 400.8M  1 loop /snap/gnome-3-38-2004/112
loop5      7:5     0  63.3M  1 loop /snap/core20/1822
loop6      7:6     0  91.7M  1 loop /snap/gtk-common-themes/1535
loop7      7:7     0 346.3M  1 loop /snap/gnome-3-38-2004/119
loop8      7:8     0 240.6M  1 loop /snap/firefox/2356
loop9      7:9     0  45.9M  1 loop /snap/snap-store/582
loop10     7:10    0  49.8M  1 loop /snap/snapd/17950
loop11     7:11    0  45.9M  1 loop /snap/snap-store/638
loop12     7:12    0  49.8M  1 loop /snap/snapd/18357
loop13     7:13    0   284K  1 loop /snap/snapd-desktop-integration/14
loop14     7:14    0   304K  1 loop /snap/snapd-desktop-integration/49
loop15     7:15    0  20.7M  1 loop /snap/terraform/465
loop16     7:16    0  21.4M  1 loop /snap/terraform/471
nvme0n1   259:0   0 476.9G  0 disk
|-nvme0n1p1 259:1  0   400M  0 part /boot/efi
|-nvme0n1p2 259:2  0   128M  0 part
|-nvme0n1p3 259:3  0  354.7G  0 part
|-nvme0n1p4 259:4  0   990M  0 part
|-nvme0n1p5 259:5  0   14.9G  0 part
|-nvme0n1p6 259:6  0   1.3G  0 part
|-nvme0n1p7 259:7  0   58G  0 part /home
|-nvme0n1p8 259:8  0   37.3G  0 part /var/snap/firefox/common/host-hunspell
`-nvme0n1p9 259:9  0   9.3G  0 part [SWAP]
himanshu@himanshu:~$
```

```
himanshu@himanshu:~$ lsblk -m
NAME      SIZE OWNER GROUP MODE
loop0      4K   root  disk  brw-rw----
loop1     63.3M root  disk  brw-rw----
loop2     72.9M root  disk  brw-rw----
loop3    239.8M root  disk  brw-rw----
loop4    400.8M root  disk  brw-rw----
loop5     63.3M root  disk  brw-rw----
loop6     91.7M root  disk  brw-rw----
loop7    346.3M root  disk  brw-rw----
loop8    240.6M root  disk  brw-rw----
loop9     45.9M root  disk  brw-rw----
loop10    49.8M root  disk  brw-rw----
loop11    45.9M root  disk  brw-rw----
loop12    49.8M root  disk  brw-rw----
loop13    284K root  disk  brw-rw----
loop14    304K root  disk  brw-rw----
loop15    20.7M root  disk  brw-rw----
loop16    21.4M root  disk  brw-rw----
nvme0n1   476.9G root  disk  brw-rw----
└─nvme0n1p1  400M root  disk  brw-rw----
└─nvme0n1p2  128M root  disk  brw-rw----
└─nvme0n1p3 354.7G root  disk  brw-rw----
└─nvme0n1p4 990M root  disk  brw-rw----
└─nvme0n1p5 14.9G root  disk  brw-rw----
└─nvme0n1p6  1.3G root  disk  brw-rw----
└─nvme0n1p7  58G root  disk  brw-rw----
└─nvme0n1p8 37.3G root  disk  brw-rw----
└─nvme0n1p9  9.3G root  disk  brw-rw----
himanshu@himanshu:~$
```

A screenshot of a terminal window titled "himanshu@himanshu: ~". The window shows the output of the "lsblk" command. The output lists various block devices, primarily loop devices mounted as snaps, along with their sizes and mount points. The terminal has a dark background with light-colored text. The title bar and some window controls are visible at the top.

```
himanshu@himanshu:~$ lsblk -o SIZE, NAME, MOUNTPOINT
lsblk: unknown column: SIZE,
himanshu@himanshu:~$ lsblk -o
lsblk: option requires an argument -- 'o'
Try 'lsblk --help' for more information.
himanshu@himanshu:~$ lsblk -o SIZE, NAME, MOUNTPOINT
lsblk: unknown column: SIZE,
himanshu@himanshu:~$ lsblk -dn
loop0    7:0    0      4K  1 loop  /snap/bare/5
loop1    7:1    0   63.3M  1 loop  /snap/core20/1828
loop2    7:2    0   72.9M  1 loop  /snap/core22/522
loop3    7:3    0  239.8M  1 loop  /snap/firefox/2391
loop4    7:4    0  400.8M  1 loop  /snap/gnome-3-38-2004/112
loop5    7:5    0   63.3M  1 loop  /snap/core20/1822
loop6    7:6    0   91.7M  1 loop  /snap/gtk-common-themes/1535
loop7    7:7    0  346.3M  1 loop  /snap/gnome-3-38-2004/119
loop8    7:8    0  240.6M  1 loop  /snap/firefox/2356
loop9    7:9    0   45.9M  1 loop  /snap/snap-store/582
loop10   7:10   0   49.8M  1 loop  /snap/snapd/17950
loop11   7:11   0   45.9M  1 loop  /snap/snap-store/638
loop12   7:12   0   49.8M  1 loop  /snap/snapd/18357
loop13   7:13   0   284K  1 loop  /snap/snapd-desktop-integration/14
loop14   7:14   0   304K  1 loop  /snap/snapd-desktop-integration/49
loop15   7:15   0   20.7M  1 loop  /snap/terraform/465
loop16   7:16   0   21.4M  1 loop  /snap/terraform/471
nvme0n1 259:0  0 476.9G  0 disk
himanshu@himanshu:~$
```

```
himanshu@himanshu:~$ lsblk --help

Usage:
lsblk [options] [<device> ...]

List information about block devices.

Options:
-D, --discard      print discard capabilities
-E, --dedup <column> de-duplicate output by <column>
-I, --include <list> show only devices with specified major numbers
-J, --json         use JSON output format
-O, --output-all   output all columns
-P, --pairs        use key="value" output format
-S, --scsi         output info about SCSI devices
-T, --tree[=<column>] use tree format output
-a, --all          print all devices
-b, --bytes         print SIZE in bytes rather than in human readable format
-d, --nodeps        don't print slaves or holders
-e, --exclude <list> exclude devices by major number (default: RAM disks)
-f, --fs            output info about filesystems
-i, --ascii         use ascii characters only
-l, --list          use list format output
-M, --merge         group parents of sub-trees (usable for RAIDs, Multi-path)
-m, --perms         output info about permissions
-n, --noheadings    don't print headings
-o, --output <list> output columns
-p, --paths         print complete device path
-r, --raw           use raw output format
-s, --inverse       inverse dependencies
-t, --topology      output info about topology
-w, --width <num>   specifies output width as number of characters
-x, --sort <column> sort output by <column>
-z, --zoned         print zone model
--sysroot <dir>    use specified directory as system root

-h, --help          display this help
-V, --version       display version

Available output columns:
  NAME  device name
  KNAME internal kernel device name
  PATH  path to the device node
  MAJ:MIN major:minor device number
  FSAVAIL filesystem size available
  FSSIZE filesystem size
  FSTYPE filesystem type
  FSUSED filesystem size used
  FSUSE% filesystem use percentage
  FSROOTS mounted filesystem roots
  FSVER  filesystem version
  MOUNTPOINT where the device is mounted
  MOUNTPOINTS all locations where device is mounted
  LABEL  filesystem LABEL
  UUID  filesystem UUID
```

```
himanshu@himanshu: ~
```

FSSIZE	filesystem size
FSTYPE	filesystem type
FSUSED	filesystem size used
FSUSE%	filesystem use percentage
FSROOTS	mounted filesystem roots
FSVER	filesystem version
MOUNTPOINT	where the device is mounted
MOUNTPOINTS	all locations where device is mounted
LABEL	filesystem LABEL
UUID	filesystem UUID
PTUUID	partition table identifier (usually UUID)
PTTYPE	partition table type
PARTTYPE	partition type code or UUID
PARTTYPENAME	partition type name
PARTLABEL	partition LABEL
PARTUUID	partition UUID
PARTFLAGS	partition flags
RA	read-ahead of the device
RO	read-only device
RM	removable device
HOTPLUG	removable or hotplug device (usb, pcmcia, ...)
MODEL	device identifier
SERIAL	disk serial number
SIZE	size of the device
STATE	state of the device
OWNER	user name
GROUP	group name
MODE	device node permissions
ALIGNMENT	alignment offset
MIN-I0	minimum I/O size
OPT-I0	optimal I/O size
PHY-SEC	physical sector size
LOG-SEC	logical sector size
ROTA	rotational device
SCHED	I/O scheduler name
RQ-SIZE	request queue size
TYPE	device type
DISC-ALN	discard alignment offset
DISC-GRAN	discard granularity
DISC-MAX	discard max bytes
DISC-ZERO	discard zeroes data
WSAME	write same max bytes
WWN	unique storage identifier
RAND	adds randomness
PKNAME	internal parent kernel device name
HCTL	Host:Channel:Target:Lun for SCSI
TRAN	device transport type
SUBSYSTEMS	de-duplicated chain of subsystems
REV	device revision
VENDOR	device vendor
ZONED	zone model
DAX	dax-capable device

```
For more details see lsblk(8).
```

```
himanshu@himanshu:~$
```