

5 Ways to Check Available Memory in Ubuntu 22.04



As Ubuntu users, especially as administrators, we need to check how much RAM resources our system uses and how much of it is free. We also know that most administrative tasks are better done from the Linux command line than from the graphical user interface. For example, servers usually work on the shell, with no graphical user interface. Since it is most important to control the memory resources on servers, it is best to learn the appropriate commands to help us manage servers.

In this article, we will explain how you can check the available memory using the following 5 commands:

1. free command
2. vmstat command
3. /proc/meminfo command
4. top command
5. htop command

With these commands, you can always be sure that there are enough memory resources for the very important processes on your servers. For example, if you are running a web server, you can be sure that a lack of resources will not slow down access to the website or even crash the website.

We ran the commands and procedures mentioned in this article on an **Ubuntu 22.04** LTS system.

To view memory usage, we use the Ubuntu command line and Terminal application. You can open Terminal using the system dash or the `Ctrl+alt+T` key combination.

Method 1: The free command

Since the free command is the most widely used and, without any doubt, the most helpful, we will mention its usage first. This command is used to check information about the RAM usage by your system. Here is the command you will enter in the Terminal:

```
$ free -m
```

The `m` flag means that the information will be displayed in MBs.

```
File Edit View Search Terminal Help
sana@linux:~$ free -m
              total        used        free      shared  buff/cache   available
Mem:           3878         1876         503         244         1498         1493
Swap:          1477           0         1477
```

The available column indicates the available memory. The used column in the swap entry is also 0 which means that it is all unused and thus free.

Method 2: The vmstat command

To view memory statistics through the vmstat command, you can use it in the following manner:

```
$ vmstat -s
```

The s flag provides detailed statistics about memory usage.

```
File Edit View Search Terminal Help
sana@linux:~$ vmstat -s
3971644 K total memory
1882764 K used memory
2339656 K active memory
788660 K inactive memory
538528 K free memory
130664 K buffer memory
1419688 K swap cache
1513148 K total swap
0 K used swap
1513148 K free swap
38021 non-nice user cpu ticks
3138 nice user cpu ticks
9385 system cpu ticks
172990 idle cpu ticks
18450 IO-wait cpu ticks
0 IRQ cpu ticks
331 softirq cpu ticks
0 stolen cpu ticks
1296373 pages paged in
658280 pages paged out
0 pages swapped in
0 pages swapped out
1063960 interrupts
```

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You can view the free memory and the free swap memory entry in the output, indicating the available memory in your system.

Method 3: The /proc/meminfo command

The following command extracts memory-related information from the /proc file system. These files contain dynamic information about the system and the kernel rather than the real system files.

This is the command you will use to print memory information:

```
$ cat /proc/meminfo
```

```
File Edit View Search Terminal Help
sana@linux:~$ cat /proc/meminfo
MemTotal:       3971644 kB
MemFree:        522808 kB
MemAvailable:   1547120 kB
```

```
MemFree: 157120 kB
Buffers: 130820 kB
Cached: 1293904 kB
SwapCached: 0 kB
Active: 2349724 kB
Inactive: 793620 kB
Active(anon): 1720088 kB
Inactive(anon): 259992 kB
Active(file): 629636 kB
Inactive(file): 533628 kB
Unevictable: 16 kB
Mlocked: 16 kB
SwapTotal: 1513148 kB
SwapFree: 1513148 kB
Dirty: 184 kB
Writeback: 0 kB
AnonPages: 1718684 kB
Mapped: 377436 kB
Shmem: 261464 kB
Slab: 180852 kB
SReclaimable: 131272 kB
SUnreclaim: 49580 kB
KernelStack: 11968 kB
PageTables: 47008 kB
NFS_Unstable: 0 kB
```

The output of this command is similar to the `vmstat` command. You can easily view the free memory in the `MemFree` result and the free swap memory in the `SwapFree` result.

Method 4: The `top` command

The `top` command is used to print CPU and memory usage of your system. You can use this command as follows:

```
$ top
```

```
File Edit View Search Terminal Help
top - 09:12:24 up 19 min, 1 user, load average: 1.09, 0.97, 0.82
Tasks: 252 total, 1 running, 200 sleeping, 0 stopped, 0 zombie
%Cpu(s): 4.4 us, 1.2 sy, 0.0 ni, 94.3 id, 0.2 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 3971644 total, 468572 free, 1944316 used, 1558756 buff/cache
KiB Swap: 1513148 total, 1513148 free, 0 used. 1500100 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
 1818 sana      20   0 3752224 170244 70384 S   12.9   4.3   1:53.57 gnome-shell
 1684 sana      20   0 371524  70700 45436 S    2.6   1.8   0:53.98 Xorg
 2823 sana      20   0 1876388 441196 104812 S    1.7  11.1   1:36.39 Web Content
 2265 sana      20   0 1898856 306748 141372 S    1.0   7.7   2:45.48 firefox
```

In the output header, you can see the `KiB Mem` and `KiB Swap` entries through which you can check the used and free memory resources.

Method 5: The `htop` command

Like the `top` command, the `htop` command also gives a detailed analysis of your CPU and memory usage. If you do not have installed `htop` on your system, you can install it by first updating your apt repositories through the following command:

```
$ sudo apt-get update
```

And then install `htop` by entering the following command as `sudo`:

```
$ sudo apt install htop
```

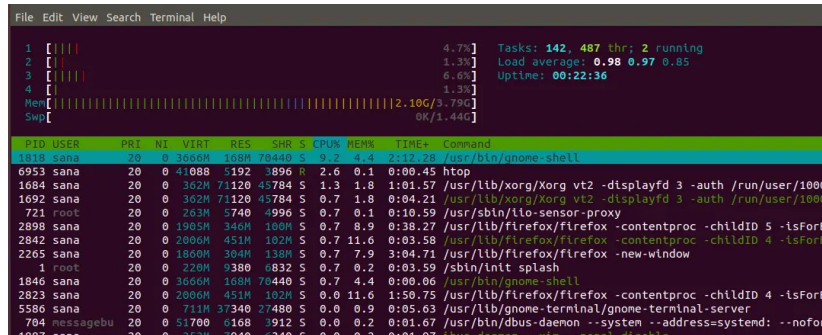
```
sana@linux:~$ sudo apt install htop
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and
  linux-headers-4.15.0-20
Use 'sudo apt autoremove' to remove it.
The following NEW packages will be installed:
  htop
0 upgraded, 1 newly installed, 0 to remove and 7 not u
Need to get 80.0 kB of archives.
After this operation, 221 kB of additional disk space
Get:1 http://us.archive.ubuntu.com/ubuntu bionic/main
```

```

 100% |#####| 80.0 kB in 2s (38.5 kB/s)
Selecting previously unselected package htop.
(Reading database ... 189475 files and directories cur
Preparing to unpack .../htop_2.1.0-3_amd64.deb ...
Unpacking htop (2.1.0-3) ...
Processing triggers for mime-support (3.6ubuntu1) ...
```

Once htop is installed, you can use the following command to print the required information:

```
$ htop
```



The screenshot shows the htop interface. At the top, it displays system statistics: Tasks: 142, 487 thr; 2 running; Load average: 0.98 0.97 0.85; Uptime: 00:22:36. Below this, it shows memory usage: Mem: 2.10G/3.79G and Swap: 0K/1.44G. The main part of the screen is a table of running processes with columns for PID, USER, PRI, NI, VIRT, RES, SHR, S, CPU%, MEM%, TIME+, and Command. The processes listed include /usr/bin/gnome-shell, htop, /usr/lib/xorg/Xorg vt2 -displayfd 3 -auth /run/user/1000, /usr/sbin/ltt-sensor-proxy, /usr/lib/firefox/firefox -contentproc -childID 5 -isForB, /usr/lib/firefox/firefox -contentproc -childID 4 -isForB, /usr/bin/init splash, /usr/bin/gnome-shell, /usr/lib/firefox/firefox -contentproc -childID 4 -isForB, /usr/lib/gnome-terminal/gnome-terminal-server, /usr/bin/dbus-daemon --system --address=systemd: --nofor, and /usr/bin/gnome-terminal disable.

The **Mem** (Memory aka RAM) and **Swp** (Swap) entries in the header indicate the used and total memory through which you can calculate the free memory available on your system.

With the commands that we have mentioned in this article, you can monitor that your system processes are never out of memory. You can avoid the GUI altogether and still keep a check on memory usage on your personal computers and servers.