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Linux Compendium

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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.

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.

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
```

```
KernelTable:      137120 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 abt repositories through the following command:

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

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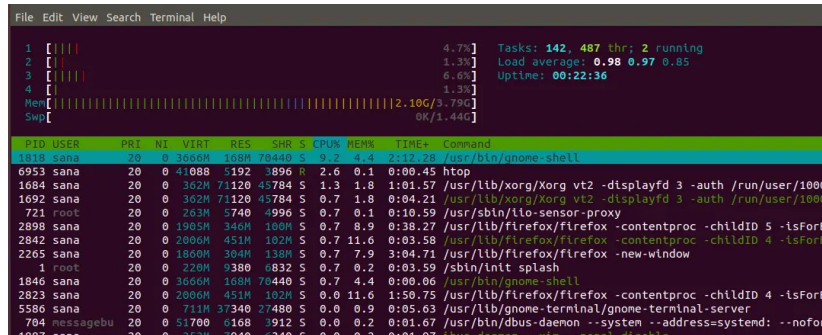
```
$ sudo apt install htop
```

```
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
```

```
Fetched 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 (3.60ubuntu1) ...
```

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

```
$ htop
```


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.