How to Display the Total Memory Size Used by an Application on Linux?

written by sysadmin | 12 July 2025

I want to see the total memory size used by an application on Linux.

Problem

How to display the total memory size used by an application on Linux?

Solution

I usually use **top** or **htop** to see the process that occurs in Linux. But I want to be more specific to see how much the total size of the memory used by an application on Linux is. After searching on the internet, 2 tools can be used:

A. Using the ps_mem Tool

The ps_mem tool is used to see the use of memory for a program made by Pixelb at Github. To install this tool, make sure you have a Python package on your Linux device. Use the commands below to install ps_mem:

```
sudo wget -qO /usr/local/bin/ps_mem
https://raw.githubusercontent.com/pixelb/ps_mem/master/ps_mem.py
sudo chmod a+x /usr/local/bin/ps_mem
```

If your Linux device has python3 and its location at **/usr/bin/python3** (to know the location of the python, use **whereis python3**), use the command below so that this tool can run on your device:

```
sudo ln -s /usr/bin/python3 /usr/bin/python
```

After that, type the command below whether the ps_mem tool is running or not:

```
ps_mem --version
```

To see the options used in this tool, use the command below:

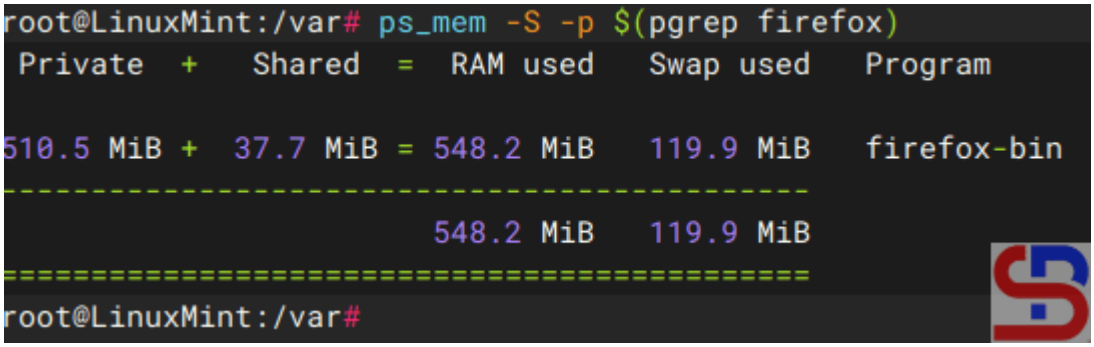
```
ps_mem --help
```

In general, the format used to see the size of a memory used in a Linux application is as follows:

```
ps_mem -S -p $(pgrep application_name)
```

For example, if you want to see how much memory size is used in the Firefox application, then type the command below:

```
ps_mem -S -p $(pgrep firefox)
```



Display the size of total memory using ps_mem

As seen in the picture above, the Firefox application uses memory of 548.2 MB. To see the total memory used per Linux user, you can use the command below:

```
for i in $(ps -e -o user= | sort | uniq); do
  printf '%-20s%10s\n' $i $(sudo ps_mem --total -p $(pgrep -d, -u $i))
done
```

```
sysadmin@LinuxMint:~$ for i in $(ps -e -o user= | sort | uniq); do
  printf '%-20s%10s\n' $i $(sudo ps_mem --total -p $(pgrep -d, -u $i))
done
avahi                1153024
colord                805376
cups-browsed         3265024
kernoops             1047552
messagebus           2910720
polkitd              4500992
root               238114304
rtkit                 395776
sysadmin         11654950912
syslog               2011648
systemd-resolve      5539328
systemd-timesync     1631744
sysadmin@LinuxMint:~$
```

Display used memory by user on Linux

INFO

If you want to change the result to **Megabytes**, use the below command:

```
for i in $(ps -e -o user= | sort | uniq); do
bytes=$(sudo ps_mem –total -p $(pgrep -d, -u “$i”) 2>/dev/null)
bytes=${bytes:-0}
mb=$(( bytes / 1048576 ))
printf ‘%-20s%10s MB\n’ “$i” “$mb”
```

B. Using the smem Tool

This tool provides detailed reports on memory usage per process and per user, as well as providing additional information such as USS (Unique Set Size) that is not available in traditional tools such as top or htop. Below is how to install the smem tool:

Ubuntu/Debian

```
sudo apt update
sudo apt install smem
```

RockyLinux/AlmaLinux/CentOS

```
sudo yum install smem
```

OpenSUSE

```
sudo zypper install smem
```

Type the command below to run a smem command:

```
smem
```

Then the display will appear as shown below:

```
sysadmin@LinuxMint:~$ smem
  PID User     Command                         Swap      USS      PSS      RSS
36848 sysadmin /usr/lib/pritunl_client_ele    16764        0        2      196
23728 sysadmin bwrap --args 39 -- zapzap        184        0        4      504
23745 sysadmin bwrap --args 39 -- zapzap        264        0        4      444
23798 sysadmin bwrap --args 39 -- /app/bin      184        0        4      504
23808 sysadmin bwrap --args 39 -- /app/bin      256        0        4      452
21980 sysadmin sh -c -- mintwelcome              96        4        6      456
21981 sysadmin /usr/bin/sh /usr/bin/mintwe       96        4        6      456
23740 sysadmin bwrap --args 39 -- xdg-dbus      136        4        6      496
```

the smem command

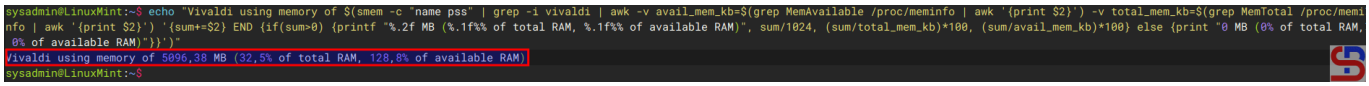
The terms USS, PSS, and RSS can be briefly explained below:

- USS (Unique Set Size) = Memory used exclusively by the process.
- PSS (Proportional Set Size) = Shared memory divided among processes.
- RSS (Resident Set Size) = Total RAM used (including shared).

After that, to display the size of memory used by a Linux application, such as the Vivaldi browser application, you can use the following script:

```
echo "Vivaldi using memory of $(smem -c "name pss" | grep -i vivaldi | awk -v
avail_mem_kb=$(grep MemAvailable /proc/meminfo | awk '{print $2}') -v
total_mem_kb=$(grep MemTotal /proc/meminfo | awk '{print $2}') '{sum+=$2} END
```

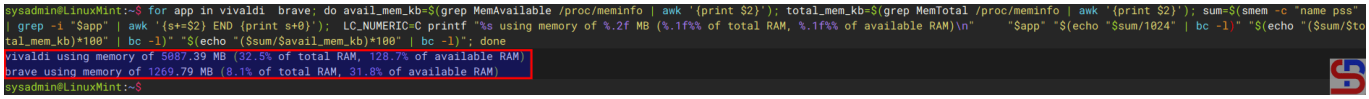
```
{if(sum>0) {printf "%.2f MB (%.1f%% of total RAM, %.1f%% of available RAM)", sum/1024, (sum/total_mem_kb)*100, (sum/avail_mem_kb)*100} else {print "0 MB (0% of total RAM, 0% of available RAM)"}}')"
```



Display the size of the total memory that is used for Vivaldi using smem

If you want to display the memory size used by more than one application, such as Vivaldi and Brave browser applications, copy the script below:

```
for app in vivaldi  brave; do    avail_mem_kb=$(grep MemAvailable /proc/meminfo | awk '{print $2}');   total_mem_kb=$(grep MemTotal /proc/meminfo | awk '{print $2}');   sum=$(smem -c "name pss" | grep -i "$app" | awk '{s+=$2} END {print s+0}');      LC_NUMERIC=C printf "%s using memory of %.2f MB (%.1f%% of total RAM, %.1f%% of available RAM)\n" "$app" "$(echo "$sum/1024" | bc -l)" "$(echo "($sum/$total_mem_kb)*100" | bc -l)" "$(echo "($sum/$avail_mem_kb)*100" | bc -l)"; done
```



Display the size of the total memory of two Linux applications using smem

If you want to see the applications on your Linux device that use the most memory, copy the script below where the script will display the 5 Linux applications that use the most memory:

```
echo; printf "%-20s %12s %16s\n" "Application" "Memory (MB)" "% of Total RAM" && \
smem -c "name pss" | \
awk -v total_mem_kb=$(grep MemTotal /proc/meminfo | awk '{print $2}') \
    '{mem[$1]+=$2} END {for (proc in mem) {
        if (mem[proc] > 0) {
            printf "%-20s %12.1f %15.1f%%\n",
                proc,
                mem[proc]/1024,
                (mem[proc]/total_mem_kb)*100
        }
    }}' | \
sort -k2 -rn | \
head -n 5
```

```
sysadmin@LinuxMint:~$ echo; printf "%-20s %12s %16s\n" "Application" "Memory (MB)" "% of Total RAM" && \
smem -c "name pss" | \
awk -v total_mem_kb=$(grep MemTotal /proc/meminfo | awk '{print $2}') \
    '{mem[$1]+=$2} END {for (proc in mem) {
        if (mem[proc] > 0) {
            printf "%-20s %12.1f %15.1f%%\n",
                proc,
                mem[proc]/1024,
                (mem[proc]/total_mem_kb)*100
        }
    }}' | \
sort -k2 -rn | \
head -n 5

Application          Memory (MB)   % of Total RAM
QtWebEngineProc          1048,3            6,7%
firefox-bin               664,4            4,2%
java                      432,6            2,8%
zapzap                    362,5            2,3%
WebExtensions             308,8            2,0%
sysadmin@LinuxMint:~$
```

List of 5 top application that use the biggest memory in Linux

Note

If you compare the results of the two tools, you can see the results obtained are almost the same as in the picture below:

```
sysadmin@LinuxMint:~$ echo;echo "The result from ps_mem tool:";ps_mem -p $(pgrep firefox);echo;echo "The result from smem tool: "; echo "Firefox using memory of $(smem -c "name pss" | grep -i firefox | awk -v
avail_mem_kb=$(grep MemAvailable /proc/meminfo | awk '{print $2}') -v total_mem_kb=$(grep MemTotal /proc/meminfo | awk '{print $2}') '{sum+=$2} END {if(sum>0) {printf "%.2f MB (%.1f%% of total RAM, %.1f%% of a
vailable RAM)", sum/1024, (sum/total_mem_kb)*100, (sum/avail_mem_kb)*100} else {print "0 MB (0% of total RAM, 0% of available RAM)"}}')"

The result from ps_mem tool:
 Private  +   Shared  =  RAM used       Program

433.8 MiB +  28.7 MiB = 462.5 MiB       firefox-bin
---------------------------------
                       462.5 MiB
=================================

The result from smem tool:
Firefox using memory of 462,41 MB (3,0% of total RAM, 9,3% of available RAM)
sysadmin@LinuxMint:~$
```

Comparison result of ps_mem and smem tools

If you want to see the total size of memory used by an application on Linux easily then you can use the ps_mem tool. However, if you want to see a list of Linux applications that use the most memory, you can use the smem application.

References

stackoverflow.com
lindevs.com
tecmint.com