

# TOP CPU Usage

Mar 2020

## Overview

Top is a great tool for showing how much CPU and memory is being consumed on a server, on a multi CPU system however, the CPU percentages can be confusing. Look at the example below.

```
top - 10:56:52 up 3 days, 2:25, 1 user, load average: 33.93, 36.51, 34.64
Tasks: 658 total, 1 running, 657 sleeping, 0 stopped, 0 zombie
%Cpu(s): 70.8 us, 3.3 sy, 0.0 ni, 25.8 id, 0.0 wa, 0.0 hi, 0.1 si, 0.0 st
KiB Mem : 65681824 total, 47889932 free, 16411244 used, 1380648 buff/cache
KiB Swap: 0 total, 0 free, 0 used. 48418516 avail Mem
```

| PID   | USER     | PR | NI | VIRT    | RES    | SHR  | S | %CPU  | %MEM | TIME+     | COMMAND         |
|-------|----------|----|----|---------|--------|------|---|-------|------|-----------|-----------------|
| 61798 | ericsson | 20 | 0  | 6632116 | 3.1g   | 7136 | S | 1377  | 4.9  | 124:42.15 | liveTranscoder  |
| 61808 | ericsson | 20 | 0  | 6185680 | 2.7g   | 7124 | S | 1336  | 4.3  | 130:12.41 | liveTranscoder  |
| 57234 | ericsson | 20 | 0  | 8333764 | 4.0g   | 7132 | S | 763.7 | 6.4  | 263:56.78 | liveTranscoder  |
| 12224 | ericsson | 20 | 0  | 278752  | 4308   | 628  | S | 11.0  | 0.0  | 527:20.10 | automation-prox |
| 12281 | ericsson | 20 | 0  | 278752  | 4308   | 628  | S | 11.6  | 0.0  | 527:38.15 | automation-prox |
| 12637 | ericsson | 20 | 0  | 1134012 | 66676  | 2000 | S | 3.6   | 0.1  | 112:27.87 | python          |
| 12302 | rabbitmq | 20 | 0  | 25.7g   | 155820 | 2152 | S | 2.6   | 0.2  | 123:23.53 | beam.smp        |
| 15991 | ericsson | 20 | 0  | 922780  | 72148  | 2656 | S | 2.3   | 0.1  | 29:59.56  | uwsgi           |
| 12834 | ericsson | 20 | 0  | 401856  | 26544  | 1808 | S | 1.3   | 0.0  | 33:00.22  | envivio-server- |
| 15965 | ericsson | 20 | 0  | 918936  | 68268  | 2776 | S | 1.3   | 0.1  | 15:24.63  | uwsgi           |
| 12581 | ericsson | 20 | 0  | 1361672 | 58384  | 2032 | S | 1.0   | 0.1  | 34:37.70  | ericsson-server |
| 12780 | ericsson | 20 | 0  | 142960  | 4664   | 540  | S | 1.0   | 0.0  | 22:31.19  | redis-server    |
| 13258 | mongod   | 20 | 0  | 1237572 | 105644 | 7164 | S | 1.0   | 0.2  | 33:44.43  | mongod          |
| 15944 | ericsson | 20 | 0  | 918816  | 69784  | 4176 | S | 1.0   | 0.1  | 15:18.88  | uwsgi           |
| 15955 | ericsson | 20 | 0  | 918748  | 69896  | 4272 | S | 1.0   | 0.1  | 15:26.39  | uwsgi           |
| 15972 | ericsson | 20 | 0  | 921724  | 71284  | 2852 | S | 1.0   | 0.1  | 15:16.50  | uwsgi           |
| 15985 | ericsson | 20 | 0  | 922540  | 72272  | 3060 | S | 1.0   | 0.1  | 15:23.77  | uwsgi           |
| 12303 | etcd     | 20 | 0  | 12.7g   | 29472  | 2800 | S | 0.7   | 0.0  | 23:20.00  | etcd            |
| 12884 | ericsson | 20 | 0  | 1044460 | 60840  | 2100 | S | 0.7   | 0.1  | 26:48.71  | ericsson-interf |
| 12890 | root     | 20 | 0  | 406160  | 26488  | 2116 | S | 0.7   | 0.0  | 1:12.33   | ericsson-licens |
| 15928 | ericsson | 20 | 0  | 911248  | 65920  | 2812 | S | 0.7   | 0.1  | 0:20.61   | uwsgi           |
| 15941 | ericsson | 20 | 0  | 918788  | 69968  | 4388 | S | 0.7   | 0.1  | 0:19.74   | uwsgi           |
| 15960 | ericsson | 20 | 0  | 918836  | 69820  | 4176 | S | 0.7   | 0.1  | 15:17.78  | uwsgi           |
| 10    | root     | 20 | 0  | 0       | 0      | 0    | S | 0.3   | 0.0  | 12:15.63  | rcu_sched       |
| 12237 | ericsson | 20 | 0  | 267176  | 38988  | 1260 | S | 0.3   | 0.1  | 6:45.43   | celery          |
| 12261 | ericsson | 20 | 0  | 142964  | 4496   | 580  | S | 0.3   | 0.0  | 5:50.61   | redis-server    |
| 12664 | ericsson | 20 | 0  | 758892  | 61888  | 1756 | S | 0.3   | 0.1  | 23:13.72  | daphne          |
| 12771 | ericsson | 20 | 0  | 557760  | 30884  | 1920 | S | 0.3   | 0.0  | 6:20.14   | ericsson-alarm- |
| 12833 | ericsson | 20 | 0  | 142960  | 4484   | 588  | S | 0.3   | 0.0  | 9:07.54   | redis-server    |

The figures for the highlighted processes are defined as 100% chunks of each CPU (or part of a CPU) so when we see a CPU usage of '1377' we know that that process is using nearly 14 CPUs worth of power (not necessarily 14 CPUs, that is different, but consuming 14 CPUs worth of resource that could be spread across more than 14 CPUs).

This makes it challenging to work out how much CPU is being used, as you need to know the number of CPUs in the first place.

Thankfully, TOP is able to show CPU usage as a percentage of total available CPU. To do this, when TOP is running press "shift - i"

```

top - 10:58:19 up 3 days, 2:26, 1 user, load average: 43.02, 38.97, 35.68
Tasks: 658 total, 2 running, 656 sleeping, 0 stopped, 0 zombie
%Cpu(s): 76.0 us, 3.6 sy, 0.0 ni, 20.4 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 65681824 total, 47763020 free, 16538076 used, 1380728 buff/cache
KiB Swap: 0 total, 0 free, 0 used. 48292068 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
 61808 ericsson  20   0 6185680 2.7g  71240 S 32.2   4.3 150:40.00 liveTranscoder
 61798 ericsson  20   0 6763188 3.1g  71360 S 25.9   5.0 142:51.28 liveTranscoder
 57234 ericsson  20   0 8464836 4.1g  71328 R 19.9   6.5 274:42.52 liveTranscoder
12281  ericsson  20   0 278752 4308   628 S 0.3   0.0 327:48.40 automation-prox
12224  ericsson  20   0 278752 4308   628 S 0.2   0.0 527:39.40 automation-prox
12302 rabbitmq  20   0 25.7g 156132 2152 S 0.1   0.2 123:26.04 beam.smp
12637 ericsson  20   0 1134012 66676 2000 S 0.1   0.1 112:30.64 python
12769 ericsson  20   0 568328 37488 2040 S 0.0   0.1 13:38.53 envivio-service
15955 ericsson  20   0 918748 69896 4272 S 0.0   0.1 15:27.09 uwsgi
15985 ericsson  20   0 922540 72272 3060 S 0.0   0.1 15:24.75 uwsgi
12780 ericsson  20   0 142960 4664   540 S 0.0   0.0 22:32.07 redis-server
12994 ericsson  20   0 17.3g 51380 2040 S 0.0   0.1 5:20.62 liveencoder-con
12261 ericsson  20   0 142964 4496   580 S 0.0   0.0 5:50.77 redis-server
12303 etcd      20   0 12.7g 29624 2800 S 0.0   0.0 23:20.62 etcd
12587 ericsson  20   0 507556 68860 1564 S 0.0   0.1 10:26.16 celery
12664 ericsson  20   0 758892 61888 1756 S 0.0   0.1 23:14.24 daphne
12834 ericsson  20   0 401856 26544 1808 S 0.0   0.0 33:01.18 envivio-server-
12884 ericsson  20   0 1044460 60840 2100 S 0.0   0.1 26:49.33 ericsson-interf
13258 mongod    20   0 1237572 105736 7164 S 0.0   0.2 33:45.48 mongod
15928 ericsson  20   0 911248 65928 2812 S 0.0   0.1 0:21.34 uwsgi
15941 ericsson  20   0 918788 69968 4388 S 0.0   0.1 0:20.43 uwsgi
15944 ericsson  20   0 918816 69784 4176 S 0.0   0.1 15:19.58 uwsgi
15960 ericsson  20   0 918836 69820 4176 S 0.0   0.1 15:18.51 uwsgi
15965 ericsson  20   0 918936 68268 2776 S 0.0   0.1 15:25.37 uwsgi
15972 ericsson  20   0 921724 71284 2852 S 0.0   0.1 15:17.27 uwsgi
15978 ericsson  20   0 921252 70864 2812 S 0.0   0.1 15:27.26 uwsgi
15991 ericsson  20   0 922780 72160 2656 S 0.0   0.1 30:00.78 uwsgi
  10 root      20   0 0 0 0 S 0.0   0.0 12:15.91 rcu_sched
11438 root      16  -4 62060 944 324 S 0.0   0.0 0:32.40 auditd

```

Above we can see that the highlighted processes now show as a total CPU consumed figure, which is much simpler to work with.

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