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To TOP or NOT to TOP

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To TOP or NOT to TOP

Using the TOP command in Linux

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SAS Grid Platform Administrator

sas THE POWER TO KNOW.

Monitoring Processes in Linux

- By User
- By CPU
- By Size
- By Command
- By Memory
- By Status

The TOP command - Pro's

- Live output monitoring
- Sorting capability
- Highlighting running processes
- Single out processes by User
- Single out process by PID
- Edit refresh rate
- See processes by Command

Starting TOP

- Open your PUTTY session $>...
- Type: top
- Watch the magic happen…

$>top

```
top - 16:25:30 up 8 days, 22:31,  6 users,  load average: 3.12, 3.13, 2.94
Tasks: 560 total,   1 running, 559 sleeping,   0 stopped,   0 zombie
Cpu(s): 35.8%us,  2.3%sy,  0.0%ni, 61.0%id,  0.8%wa,  0.0%hi,  0.0%si,  0.0%st
Mem:  65932484k total, 63058596k used,  2873888k free,    12204k buffers
Swap:  4194296k total,   101364k used,  4092932k free, 59100164k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
61983 mrekajm   20   0 1429m  62m  25m S 101.4  0.1   7:40.35 sas
24484 thitchin  20   0 1735m 200m  12m S 99.7  0.3  15:12.48 sas
 4424 mrekajm   20   0 1627m  44m  11m S 94.1  0.1  51:07.90 sas
 9916 daemon    20   0 38956 4908 2444 S  1.7  0.0 131:51.86 vasd
65462 root       0 -20 34716 3204 1732 S  1.0  0.0  71:33.27 lim
 3494 mrekajm   20   0 1239m 107m  368 S  0.7  0.2   0:20.37 jproxy
12100 sasinst   20   0 1880m 192m 5084 S  0.7  0.3  14:07.20 sas
12191 venkatm   20   0  224m 8488 7440 S  0.7  0.0   0:01.53 smbd
    9 root      20   0     0    0    0 S  0.3  0.0   1:28.74 ksoftirqd/1
   25 root      20   0     0    0    0 S  0.3  0.0   1:00.56 ksoftirqd/5
 2882 vandenbl  20   0 27200 2056 1276 R  0.3  0.0   0:01.58 top
```

What's innit 4 me? – pt 1

- PID – Process ID
- USER – Who's dunnit?
- PR – Priority value
- NI – NICE value
- VIRT – Virtual Memory used
- RES – Physical Memory used
- SHR – Shared Memory used
- S – Status (S = Sleep, Z = Zombie, R = Running etc.)

What's innit 4 me? – pt 2

- % CPU – Percentage of CPU used
- %MEM – Percentage of the RAM used
- TIME+ - The Total Time of the activity of this PID
- COMMAND – The COMMAND executing this PID

$>top

```
top - 16:25:30 up 8 days, 22:31,  6 users,  load average: 3.12, 3.13, 2.94
Tasks: 560 total,   1 running, 559 sleeping,   0 stopped,   0 zombie
Cpu(s): 35.8%us,  2.3%sy,  0.0%ni, 61.0%id,  0.8%wa,  0.0%hi,  0.0%si,  0.0%st
Mem:  65932484k total, 63058596k used,  2873888k free,    12204k buffers
Swap:  4194296k total,   101364k used,  4092932k free, 59100164k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
61983 mrekajm   20   0 1429m  62m  25m S 101.4  0.1   7:40.35 sas
24484 thitchin  20   0 1735m 200m  12m S 99.7  0.3  15:12.48 sas
 4424 mrekajm   20   0 1627m  44m  11m S 94.1  0.1  51:07.90 sas
 9916 daemon    20   0 38956 4908 2444 S  1.7  0.0 131:51.86 vasd
65462 root       0 -20 34716 3204 1732 S  1.0  0.0  71:33.27 lim
 3494 mrekajm   20   0 1239m 107m  368 S  0.7  0.2   0:20.37 jproxy
12100 sasinst   20   0 1880m 192m 5084 S  0.7  0.3  14:07.20 sas
12191 venkatm   20   0  224m 8488 7440 S  0.7  0.0   0:01.53 smbd
    9 root      20   0     0    0    0 S  0.3  0.0   1:28.74 ksoftirqd/1
   25 root      20   0     0    0    0 S  0.3  0.0   1:00.56 ksoftirqd/5
 2882 vandenbl  20   0 27200 2056 1276 R  0.3  0.0   0:01.58 top
```

What's innit 4 me? – pt 3

Quitting Top

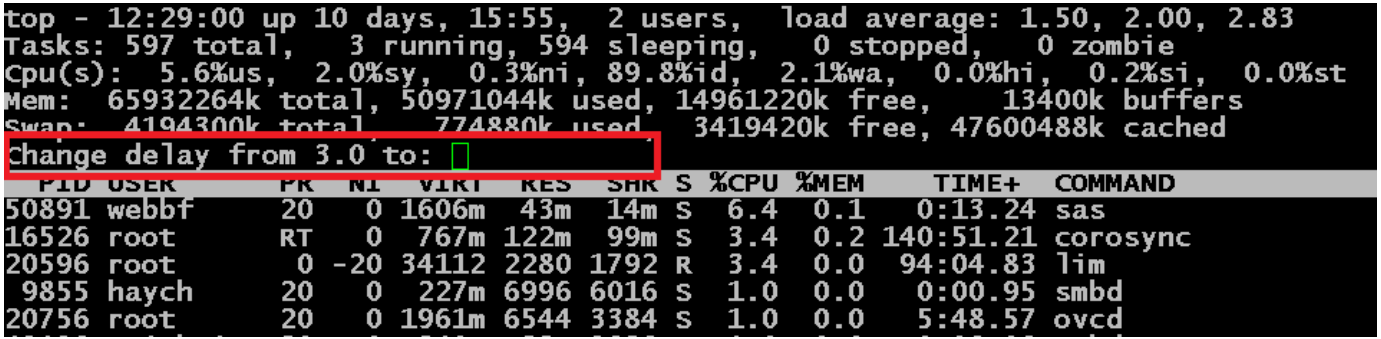
Easy – hit “q” anytime:

$> q

Set the Refresh Rate

Hit “d” or “s” anytime:
The default is 3.0s
$> d Or $> s

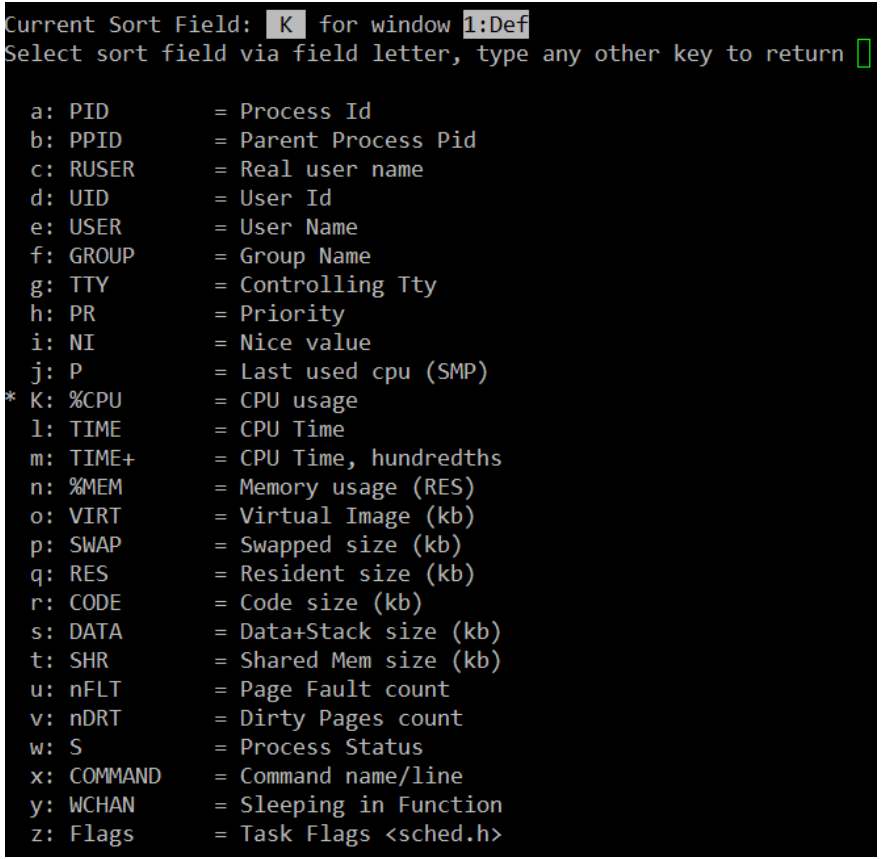
Set the Refresh rate - $>s or $>d



Sorting the output

1. Run TOP => $>top
2. Hit Shift-o (Uppercase O) => $>O

Sorting – Select a Column



Sorting – by CPU

```
top - 16:25:30 up 8 days, 22:31,  6 users,  load average: 3.12, 3.13, 2.94
Tasks: 560 total,   1 running, 559 sleeping,   0 stopped,   0 zombie
Cpu(s): 35.8%us,  2.3%sy,  0.0%ni, 61.0%id,  0.8%wa,  0.0%hi,  0.0%si,  0.0%st
Mem:  65932484k total, 63058596k used,  2873888k free,    12204k buffers
Swap:  4194296k total,   101364k used,  4092932k free, 59100164k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
61983 mrekajm   20   0 1429m  62m  25m S 101.4  0.1   7:40.35 sas
24484 thitchin  20   0 1735m 200m  12m S 99.7  0.3  15:12.48 sas
 4424 mrekajm   20   0 1627m  44m  11m S 94.1  0.1  51:07.90 sas
 9916 daemon    20   0 38956 4908 2444 S  1.7  0.0 131:51.86 vasd
65462 root       0 -20 34716 3204 1732 S  1.0  0.0  71:33.27 lim
 3494 mrekajm   20   0 1239m 107m  368 S  0.7  0.2   0:20.37 jproxy
12100 sasinst   20   0 1880m 192m 5084 S  0.7  0.3  14:07.20 sas
12191 venkatm   20   0  224m 8488 7440 S  0.7  0.0   0:01.53 smbd
    9 root      20   0     0    0    0 S  0.3  0.0   1:28.74 ksoftirqd/1
   25 root      20   0     0    0    0 S  0.3  0.0   1:00.56 ksoftirqd/5
 2882 vandenbl  20   0 27200 2056 1276 R  0.3  0.0   0:01.58 top
```

Reversing the output

Hit Shift – r (Uppercase r)
$>R

This will reverse the sort output.

Sorting – by CPU : Reversing - ☺

```
top - 16:25:30 up 8 days, 22:31,  6 users,  load average: 3.12, 3.13, 2.94
Tasks: 560 total,   1 running, 559 sleeping,   0 stopped,   0 zombie
%Cpu(s): 35.8%us,  2.3%sy,  0.0%ni, 61.0%id,  0.8%wa,  0.0%hi,  0.0%si,  0.0%st
Mem:  65932484k total, 63058596k used,  2873888k free,    1220ak buffers
Swap:  41942956k total,   101364k used, 40929332k free, 59100164k cached

  PID USER      PR  NI  VIRT  RES  SHR S  %CPU %MEM    TIME+  COMMAND
61983 mrekajm   20   0 1429m  62m  25m S 101.4  0.1   7:40.35 sas
24484 thitchin  20   0 1735m 200m  12m S  99.7  0.3  15:12.48 sas
 4424 mrekajm   20   0 1627m  44m  11m S  94.1  0.1  51:07.90 sas
 9916 daemon    20   0 38956 4908 2444 S   1.7  0.0 131:51.86 vasd
65462 root      0  -20 34716 3204 1732 S   1.0  0.0  71:33.27 lim
 3494 mrekajm   20   0 1239m 107m  368 S   0.7  0.2   0:20.37 jproxy
12100 sasinst   20   0 1880m 192m 5084 S   0.7  0.3  14:07.20 sas
12191 venkatm   20   0  224m 8488 7440 S   0.7  0.0   0:01.53 smbd
    9 root      20   0     0    0    0 S   0.3  0.0   1:28.74 ksoftirqd/1
   25 root      20   0     0    0    0 S   0.3  0.0   1:00.56 ksoftirqd/5
 2882 vandenbl  20   0 27200 2056 1276 R   0.3  0.0   0:01.58 top
```

Sorting – by CPU : Reversing - ☺

```
top - 14:54:58 up 15 days, 21:00,  5 users,  load average: 3.29, 3.33, 3.21
Tasks: 551 total,   2 running, 549 sleeping,   0 stopped,   0 zombie
Cpu(s): 16.5%us,  5.9%sy,  0.0%ni, 64.1%id, 12.0%wa,  0.0%hi,  1.5%si,  0.0%st
Mem:  65932484k total, 65684756k used,   247728k free,    16360k buffers
Swap:  4194296k total,    98844k used,  4095452k free, 62029724k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
    1 root      20   0 33176 1648 1436 S  0.0  0.0   0:10.81 init
    2 root      20   0     0    0    0 S  0.0  0.0   0:06.32 kthreadd
    5 root      RT   0     0    0    0 S  0.0  0.0   0:00.00 migration/0
    6 root      RT   0     0    0    0 S  0.0  0.0   0:08.32 watchdog/0
    7 root      RT   0     0    0    0 S  0.0  0.0   0:33.56 migration/1
    8 root      RT   0     0    0    0 S  0.0  0.0   0:00.00 migration/1
    9 root      20   0     0    0    0 S  0.0  0.0   2:39.44 ksoftirqd/1
   10 root      RT   0     0    0    0 S  0.0  0.0   0:04.95 watchdog/1
   11 root      RT   0     0    0    0 S  0.0  0.0   0:17.23 migration/2
   12 root      RT   0     0    0    0 S  0.0  0.0   0:00.00 migration/2
   13 root      20   0     0    0    0 S  0.0  0.0   2:37.32 ksoftirqd/2
```

See processing on ALL CPU's

Hit 1
$>1

This will display all CPU's on the Node

See all CPU's

```
top - 15:01:54 up 15 days, 21:07,  5 users,  load average: 2.16, 2.32, 2.79
Tasks: 549 total,   1 running, 547 sleeping,   0 stopped,   1 zombie
Cpu0  :  2.3%us,  8.7%sy,  0.0%ni, 83.9%id,  4.7%wa,  0.0%hi,  0.3%si,  0.0%st
Cpu1  :  3.7%us,  6.5%sy,  0.0%ni, 87.1%id,  2.0%wa,  0.0%hi,  0.7%si,  0.0%st
Cpu2  :  2.3%us,  7.3%sy,  0.0%ni, 89.7%id,  0.7%wa,  0.0%hi,  0.0%si,  0.0%st
Cpu3  :  0.7%us,  0.7%sy,  0.0%ni, 95.0%id,  3.4%wa,  0.0%hi,  0.3%si,  0.0%st
Cpu4  : 43.6%us,  7.4%sy,  0.0%ni,  2.7%id, 29.7%wa,  0.0%hi, 16.6%si,  0.0%st
Cpu5  : 24.1%us,  3.7%sy,  0.0%ni, 24.8%id, 47.3%wa,  0.0%hi,  0.0%si,  0.0%st
Cpu6  :  1.4%us, 11.1%sy,  0.0%ni, 69.3%id, 18.2%wa,  0.0%hi,  0.0%si,  0.0%st
Cpu7  :  2.4%us,  2.0%sy,  0.0%ni, 87.0%id,  8.2%wa,  0.0%hi,  0.3%si,  0.0%st
Mem:  65932484k total, 65680548k used,   251936k free,    18200k buffers
Swap:  4194296k total,    98844k used,  4095452k free, 62154696k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
24699 thitchin  20   0 1570m  31m 8832 S 62.8  0.0   5:11.85 sas
48311 stokessi  20   0 1879m 297m 8308 S 48.9  0.5 130:32.61 sas
 6833 root      20   0     0    0    0 S 10.6  0.0  87:46.60 jbd2/dm-7-8
```

Toggle with All CPU view...

Hit 1again....
$>1

Switch to standard view.

Hide all CPU's

```
top - 14:54:58 up 15 days, 21:00,  5 users,  load average: 3.29, 3.33, 3.21
Tasks: 551 total,   2 running, 549 sleeping,   0 stopped,   0 zombie
Cpu(s): 16.5%us,  5.9%sy,  0.0%ni, 64.1%id, 12.0%wa,  0.0%hi,  1.5%si,  0.0%st
Mem:  65932484k total, 65684756k used,   247728k free,    16360k buffers
Swap:  4194296k total,    98844k used,  4095452k free, 62029724k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
    1 root      20   0 33176 1648 1436 S  0.0  0.0   0:10.81 init
    2 root      20   0     0    0    0 S  0.0  0.0   0:06.32 kthreadd
    5 root      RT   0     0    0    0 S  0.0  0.0   0:00.00 migration/0
    6 root      RT   0     0    0    0 S  0.0  0.0   0:08.32 watchdog/0
    7 root      RT   0     0    0    0 S  0.0  0.0   0:33.56 migration/1
    8 root      RT   0     0    0    0 S  0.0  0.0   0:00.00 migration/1
    9 root      20   0     0    0    0 S  0.0  0.0   2:39.44 ksoftirqd/1
   10 root      RT   0     0    0    0 S  0.0  0.0   0:04.95 watchdog/1
   11 root      RT   0     0    0    0 S  0.0  0.0   0:17.23 migration/2
   12 root      RT   0     0    0    0 S  0.0  0.0   0:00.00 migration/2
   13 root      20   0     0    0    0 S  0.0  0.0   2:37.32 ksoftirqd/2
```

Toggle with All CPU view...

Hit 1again....
$>1

And when you get bored, Hit 1 again...
And again...
And again...

OOPS!!!

Highlight RUNNING processes...

Hit b or z

$>b

Or

$>z

Running processes: (b)

```
top - 15:53:24 up 15 days, 21:59,  5 users,  load average: 2.34, 2.23, 1.98
Tasks: 543 total,   3 running, 539 sleeping,   0 stopped,   1 zombie
Cpu(s): 20.2%us,  5.7%sy,  0.0%ni, 73.6%id,  0.5%wa,  0.0%hi,  0.0%si,  0.0%st
Mem:  65932484k total, 65619144k used,   313340k free,    25916k buffers
Swap:  4194296k total,    98736k used,  4095560k free, 62116492k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
24699 thitchin  20   0 1580m  33m 8908 S 99.8  0.1  28:14.87 sas
48311 stokessi  20   0 1559m  36m 8640 S 96.5  0.1 172:04.18 sas
21702 thitchin  20   0  226m  10m 9184 S  4.0  0.0   0:48.51 smbd
 9916 daemon    20   0 38956 4880 2400 S  1.0  0.0 202:15.13 vasd
 7122 root       0 -20 34724 3196 1716 R  0.3  0.0   1:58.25 lim
 8901 root      -2   0  126m  38m 3940 S  0.3  0.1  46:25.20 qdiskd
12912 root      20   0  204m 5608 4464 S  0.3  0.0  17:59.21 opcle
53151 vandenbl  20   0 27200 2048 1276 R  0.3  0.0   0:25.11 top
    1 root      20   0 33176 1648 1436 S  0.0  0.0   0:10.81 init
```

Running processes: (z) in Technicolor!!

```
top - 15:56:35 up 15 days, 22:02,  5 users,  load average: 2.38, 2.36, 2.07
Tasks: 538 total,   1 running, 537 sleeping,   0 stopped,   0 zombie
Cpu(s): 16.9%us, 13.3%sy,  0.0%ni, 66.7%id,  0.2%wa,  0.0%hi,  2.9%si,  0.0%st
Mem:  65932484k total, 65665580k used,   266904k free,    25632k buffers
Swap:  4194296k total,    98736k used,  4095560k free, 61668220k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
24699 thitchin  20   0 1580m  33m 8452 S 99.4  0.1  31:20.68 sas
48311 stokessi  20   0 1559m  33m 5332 S 52.7  0.1 175:01.33 sas
 9467 root      20   0     0    0    0 S 46.1  0.0  11:07.48 glock_workqueue
38655 root      20   0     0    0    0 S 17.2  0.0   0:11.37 flush-253:59
   21 root      20   0     0    0    0 S 14.6  0.0  31:10.64 ksoftirqd/4
21702 thitchin  20   0  226m  10m 9196 S  6.6  0.0   0:57.57 smbd
 9916 daemon    20   0 38956 4880 2400 S  3.0  0.0 202:17.37 vasd
 8661 root      RT   0  772m 129m  98m S  1.7  0.2 362:11.46 corosync
 7122 root       0 -20 34724 3136 1656 S  1.0  0.0   1:59.36 lim
53151 vandenbl  20   0 27200 2048 1276 R  0.7  0.0   0:26.21 top
```

To view SAS (and related) processes

$> top –c sas

List SAS (and related) processes $> top –c sas

```
top - 16:00:23 up 15 days, 22:06,  5 users,  load average: 3.95, 3.18, 2.44
Tasks: 543 total,   1 running, 542 sleeping,   0 stopped,   0 zombie
Cpu(s): 20.0%us,  6.7%sy,  0.0%ni, 72.4%id,  0.3%wa,  0.0%hi,  0.5%si,  0.0%st
Mem:  65932484k total, 58627576k used,  7304908k free,    24208k buffers
Swap:  4194296k total,    97112k used,  4097184k free, 54090884k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
12100 sasinst   20   0 2016m 260m 5416 S  0.0  0.4  23:57.96 sas
 8661 root      RT   0  772m 129m  98m S  0.3  0.2 362:16.56 corosync
11379 sasinst   20   0 1746m  60m 1576 S  0.0  0.1   1:17.84 sas
32624 halilh    20   0 1227m  57m  224 S  0.0  0.1   0:20.52 jproxy
30045 haych     20   0 1863m  46m 1604 S  0.0  0.1 256:54.81 sas
34385 nannaman  20   0 1601m  42m  10m S  0.0  0.1   0:41.79 sas
13356 stokessi  20   0 1693m  38m 2204 S  0.0  0.1 292:51.47 sas
 8901 root      -2   0  126m  38m 3940 S  0.0  0.1  46:26.21 qdiskd
53712 konfortj  20   0 1634m  37m 1608 S  0.0  0.1   3:38.79 sas
 9356 root      20   0  180m  36m 3284 S  0.0  0.1   0:25.14 clvmd
27069 stokessi  20   0 1511m  34m 2228 S  0.0  0.1   9:37.69 sas
23459 stokessi  20   0 1336m  34m 1552 S  0.0  0.1   0:26.47 sas
48311 stokessi  20   0 1559m  33m 5172 S 98.1  0.1 178:32.11 sas
49746 rapuanov  20   0 1493m  32m 1540 S  0.0  0.1  13:11.94 sas
32173 halilh    20   0 1545m  32m 1572 S  0.0  0.1   9:45.01 sas
```

To view the FULL command path

While TOP is running:

Hit c

$> c

Toggle on and off by hitting c...

List SAS (and related) processes $> top –c sas

```
top - 16:15:22 up 15 days, 22:21,  5 users,  load average: 1.04, 1.64, 2.03
Tasks: 533 total,   1 running, 532 sleeping,   0 stopped,   0 zombie
Cpu(s): 11.2%us,  7.0%sy,  0.0%ni, 81.6%id,  0.1%wa,  0.0%hi,  0.1%si,  0.0%st
Mem:  65932484k total, 65676416k used,   256068k free,     5884k buffers
Swap:  4194296k total,    97104k used,  4097192k free, 61260044k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
48311 stokessi  20   0 2137m 552m 6304 S 130.6  0.9 188:00.46 /SASbin/prod/software/SASFoundation/9.3/sasexe/sas -noterm
   99 root      20   0     0    0    0 S  3.6  0.0  66:38.60 [kswapd1]
   98 root      20   0     0    0    0 S  3.3  0.0  66:28.22 [kswapd0]
 9916 daemon    20   0 38956 4876 2396 S  2.0  0.0 202:34.35 /opt/quest/sbin/vasd -p /var/opt/quest/vas/vasd/.vasd.pid
 7122 root       0 -20 34724 3148 1668 S  1.3  0.0   2:07.42 /SASbin/thirdparty/lsf/7.0/linux2.6-glibc2.3-x86_64/etc/lim
 9917 daemon    20   0 38980 5360 2776 S  1.0  0.0  19:28.85 /opt/quest/sbin/vasd -p /var/opt/quest/vas/vasd/.vasd.pid
12100 sasinst   20   0 2015m 259m 4136 S  0.7  0.4  23:59.11 /SASbin/prod/software/SASFoundation/9.3/sasexe/sas
```

To watch a single user

Hit top –u naughtyboy

$> top –u naughtyboy

List PIDs by single user $> top –u username

```
top - 16:23:59 up 15 days, 22:29,  5 users,  load average: 3.47, 2.99, 2.48
Tasks: 526 total,   1 running, 525 sleeping,   0 stopped,   0 zombie
Cpu(s): 21.5%us,  4.4%sy,  0.0%ni, 73.7%id,  0.1%wa,  0.0%hi,  0.2%si,  0.0%st
Mem:  65932484k total, 48492152k used, 17440332k free,     8564k buffers
Swap:  4194296k total,    97104k used,  4097192k free, 44619688k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
48311 stokessi  20   0 1564m  35m 3080 S 99.4  0.1 196:29.86 sas
13356 stokessi  20   0 1693m  38m 2204 S  0.0  0.1 292:51.52 sas
23459 stokessi  20   0 1336m  34m 1552 S  0.0  0.1   0:26.52 sas
27069 stokessi  20   0 1511m  34m 2228 S  0.0  0.1   9:37.75 sas
41387 stokessi  20   0 1277m  19m 1552 S  0.0  0.0   0:01.18 sas
```

To watch a single Process

Hit top –p Process ID

$> top –p 48311

List single PIDs $> top –p 48311

```
top - 16:41:16 up 15 days, 22:46,  4 users,  load average: 2.86, 3.20, 2.90
Tasks:   1 total,   0 running,   1 sleeping,   0 stopped,   0 zombie
Cpu(s): 11.9%us,  7.5%sy,  0.0%ni, 62.6%id, 14.6%wa,  0.0%hi,  3.5%si,  0.0%st
Mem:  65932484k total, 65682952k used,   249532k free,    12252k buffers
Swap:  4194296k total,    97104k used,  4097192k free, 61381308k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
48311 stokessi  20   0 2128m 548m 2988 S 11.7  0.9 213:05.56 sas
```

To kill a Process

While top is running – Hit k

$>k

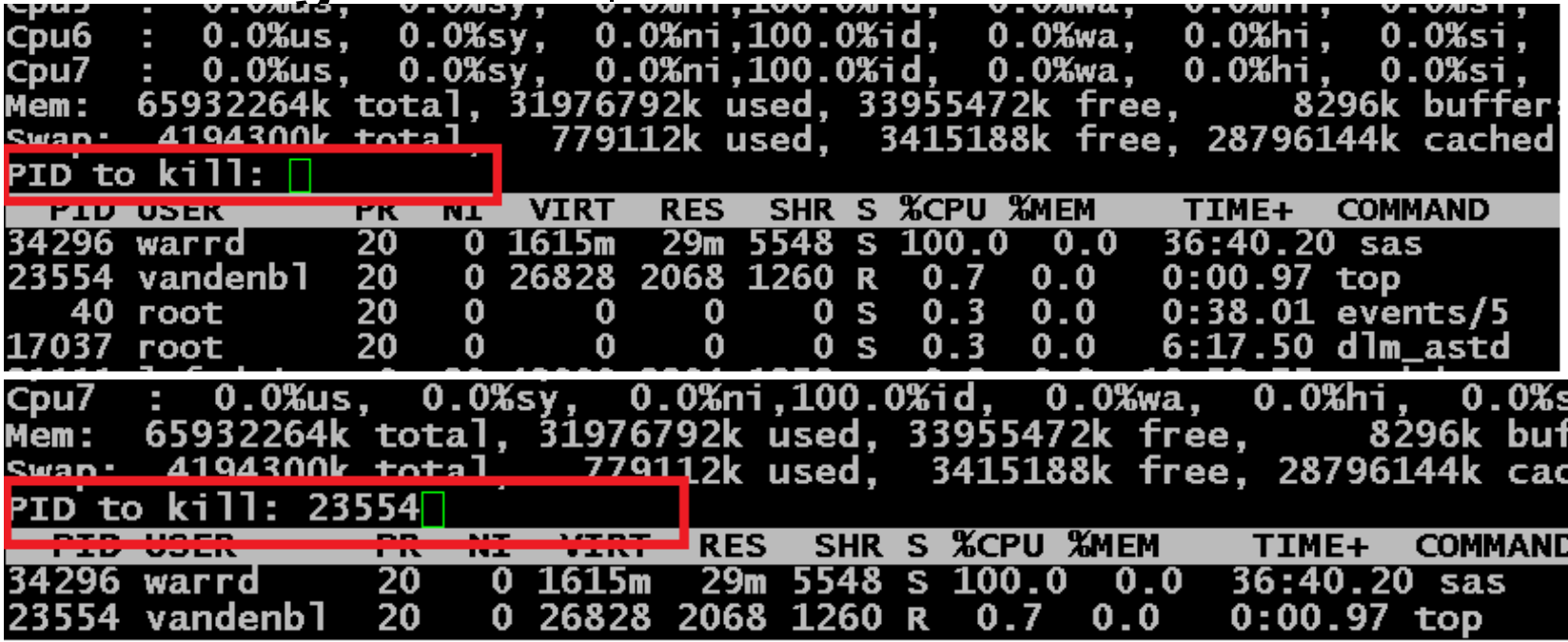
Prompt: PID to Kill:

Type a PID: PID to Kill: 48311

Prompt: Kill PID 48311 with signal [15]?

Type: y or n : y

Kill a single PIDs $> k



Kill PID 23554 with signal [15]? y

You can save your top!

- Run top
- Set your preferred view (>top –c sas)
- Decide all CPUs or not (Hit 1)
- Hit Uppercase w => $> W

To see all processes except ROOT

- Check your TOP version => top –version
- Requires Top version 3.2.9 and higher.
- Hit top –u!root
- $>top –u!root

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To TOP or NOT to TOP

Len van den Berg

Questions and Answers?