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## Linux Performance Monitoring with Vmstat and Iostat Commands

By [Ravi Saive](#) Under: [CentOS](#), [Fedora](#), [Linux Commands](#), [Linux Distros](#), [Monitoring Tools](#), [RedHat](#) On: [September 5, 2012](#)

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This is our on-going series of commands and performance monitoring in **Linux**. **Vmstat** and **Iostat** both commands are available on all major **Unix-like (Linux/Unix/FreeBSD/Solaris)** Operating Systems.

If **vmstat** and **iostat** commands are not available on your box, please install **sysstat** package. The **vmstat**, **sar** and **iostat** commands are the collection of package included in **sysstat** – the system monitoring tools. The **iostat** generates reports of **CPU** & all device statistics. You may download and install **sysstat** using source tarball from link [sysstat](#), but we recommend installing through **YUM** command.



Linux Performance Monitoring with Vmstat and Iostat

### Install Sysstat in Linux

```
# yum -y install sysstat
```

1. **vmstat** – Summary information of **Memory, Processes, Paging** etc.
2. **iostat** – Central Processing Unit (**CPU**) statistics and **input/output** statistics for **devices** and **partitions**.

## 6 Vmstat Command Examples in Linux

### 1. List Active and Inactive Memory

In the below example, there are six columns. The significant of the columns are explained in man page of **vmstat** in details. Most important fields are **free** under memory and **si,so** under swap column.

```
[root@tecmint ~]# vmstat -a
```

```
procs -----memory----- --swap--  -----io----- --system--  -----cpu-----
r  b   swpd   free   inact active    si   so    bi   bo    in   cs us sy id wa st
1  0       0 810420  97380  70628     0    0   115    4   89   79  1  6 90  3  0
```

1. **Free** – Amount of free/idle memory spaces.
2. **si** – Swaped in every second from disk in Kilo Bytes.
3. **so** – Swaped out every second to disk in Kilo Bytes.

**Note:** If you run **vmstat** without parameters it'll displays summary report since system boot.

### 2. Execute vmstat 'X' seconds and ('N'number of times)

With this command, **vmstat** execute every two seconds and stop automatically after executing six intervals.

```
[root@tecmint ~]# vmstat 2 6
```

```
procs -----memory----- --swap--  -----io----- --system--  -----cpu-----
r  b   swpd   free   buff  cache    si   so    bi   bo    in   cs us sy id wa st
0  0       0 810420  22064 101368     0    0    56    3   50   57  0  3 95  2  0
0  0       0 810412  22064 101368     0    0     0    0   16   35  0  0 100  0  0
0  0       0 810412  22064 101368     0    0     0    0   14   35  0  0 100  0  0
0  0       0 810412  22064 101368     0    0     0    0   17   38  0  0 100  0  0
0  0       0 810412  22064 101368     0    0     0    0   17   35  0  0 100  0  0
0  0       0 810412  22064 101368     0    0     0    0   18   36  0  1 100  0  0
```

### 3. Vmstat with timestamps

**vmstat** command with **-t** parameter shows timestamps with every line printed as shown below.

```
[tecmint@tecmint ~]$ vmstat -t 1 5
```

```
procs -----memory----- --swap--  -----io----- --system--  -----cpu-----  ---timestamp---
r  b   swpd   free   buff  cache    si   so    bi   bo    in   cs us sy id wa st
0  0       0 632028  24992 192244     0    0    70    5   55   78  1  3 95  1  0      2012-09-02 14:57:18 IST
1  0       0 632028  24992 192244     0    0     0    0  171  514  1  5 94  0  0      2012-09-02 14:57:19 IST
1  0       0 631904  24992 192244     0    0     0    0  195  600  0  5 95  0  0      2012-09-02 14:57:20 IST
0  0       0 631780  24992 192244     0    0     0    0  156  524  0  5 95  0  0      2012-09-02 14:57:21 IST
1  0       0 631656  24992 192244     0    0     0    0  189  592  0  5 95  0  0      2012-09-02 14:57:22 IST
```

### 4. Statistics of Various Counter

**vmstat** command and **-s** switch displays summary of various event counters and memory statistics.

```
[tecmint@tecmint ~]$ vmstat -s
```

```
1030800 total memory
524656  used memory
277784  active memory
185920  inactive memory
506144  free memory
26864   buffer memory
310104  swap cache
2064376 total swap
0        used swap
2064376 free swap
4539    non-nice user cpu ticks
0        nice user cpu ticks
11569   system cpu ticks
329608  idle cpu ticks
5012    IO-wait cpu ticks
79      IRQ cpu ticks
74      softirq cpu ticks
0        stolen cpu ticks
336038  pages paged in
63045   pages paged out
```

```

258526 interrupts
392439 CPU context switches
1346574857 boot time
2309 forks

```

## 5. Disks Statistics

**vmstat** with **-d** option display all disks statistics.

```
[tecmint@tecmint ~]$ vmstat -d
```

```

disk- -----reads----- -----writes----- -----IO-----
      total merged sectors      ms total merged sectors      ms      cur      sec
ram0      0      0      0      0      0      0      0      0      0      0
ram1      0      0      0      0      0      0      0      0      0      0
ram2      0      0      0      0      0      0      0      0      0      0
ram3      0      0      0      0      0      0      0      0      0      0
ram4      0      0      0      0      0      0      0      0      0      0
ram5      0      0      0      0      0      0      0      0      0      0
ram6      0      0      0      0      0      0      0      0      0      0
ram7      0      0      0      0      0      0      0      0      0      0
ram8      0      0      0      0      0      0      0      0      0      0
ram9      0      0      0      0      0      0      0      0      0      0
ram10     0      0      0      0      0      0      0      0      0      0
ram11     0      0      0      0      0      0      0      0      0      0
ram12     0      0      0      0      0      0      0      0      0      0
ram13     0      0      0      0      0      0      0      0      0      0
ram14     0      0      0      0      0      0      0      0      0      0
ram15     0      0      0      0      0      0      0      0      0      0
loop0     0      0      0      0      0      0      0      0      0      0
loop1     0      0      0      0      0      0      0      0      0      0
loop2     0      0      0      0      0      0      0      0      0      0
loop3     0      0      0      0      0      0      0      0      0      0
loop4     0      0      0      0      0      0      0      0      0      0
loop5     0      0      0      0      0      0      0      0      0      0
loop6     0      0      0      0      0      0      0      0      0      0
loop7     0      0      0      0      0      0      0      0      0      0
sr0       0      0      0      0      0      0      0      0      0      0
sda      7712    5145  668732  409619   3282  28884  257402  644566      0    126
dm-0     11578      0  659242  1113017  32163      0  257384  8460026      0    126
dm-1       324      0    2592    3845      0      0      0      0      0      2

```

## 6. Display Statistics in Megabytes

The **vmstat** displays in **Megabytes** with parameters **-S** and **M**(Uppercase & megabytes). By default **vmstat** displays statistics in kilobytes.

```
[root@tecmint ~]# vmstat -S M 1 5
```

```

procs -----memory----- ---swap-- -----io----- --system-- -----cpu-----
 r b  swpd  free  buff  cache  si  so  bi  bo  in  cs  us  sy  id  wa  st
 0 0    0   346   53   476   0  0   95   8  42  55  0  2  96  2  0
 0 0    0   346   53   476   0  0   0   0  12  15  0  0 100  0  0
 0 0    0   346   53   476   0  0   0   0  32  62  0  0 100  0  0
 0 0    0   346   53   476   0  0   0   0  15  13  0  0 100  0  0
 0 0    0   346   53   476   0  0   0   0  34  61  0  1  99  0  0

```

## 6 Iostat Command Examples in Linux

## 7. Display CPU and I/O statistics

**iostat** without arguments displays **CPU** and **I/O** statistics of all partitions as shown below.

```
[root@tecmint ~]# iostat
```

```

Linux 2.6.32-279.el6.i686 (tecmint.com)      09/03/2012      _i686_ (1 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           0.12    0.01   1.54    2.08    0.00   96.24

Device:            tps    Blk_read/s    Blk_wrtn/s    Blk_read    Blk_wrtn
sda                  3.59       161.02       13.48     1086002     90882
dm-0                  5.76       159.71       13.47     1077154     90864
dm-1                  0.05         0.38         0.00         2576         0

```

## 8. Shows only CPU Statistics

**iostat** with **-c** arguments displays only **CPU** statistics as shown below.

```
[root@tecmint ~]# iostat -c

Linux 2.6.32-279.el6.i686 (tecmint.com)          09/03/2012      _i686_   (1 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           0.12    0.01    1.47    1.98    0.00   96.42
```

## 9. Shows only Disks I/O Statistics

**iostat** with **-d** arguments displays only disks **I/O** statistics of all partitions as shown.

```
[root@tecmint ~]# iostat -d

Linux 2.6.32-279.el6.i686 (tecmint.com)          09/03/2012      _i686_   (1 CPU)

Device:            tps    Blk_read/s    Blk_wrtn/s    Blk_read    Blk_wrtn
sda                 3.35       149.81       12.66      1086002      91746
dm-0                5.37       148.59       12.65      1077154      91728
dm-1                0.04         0.36         0.00         2576         0
```

## 10. Shows I/O statistics only of a single device.

By default it displays statistics of all partitions, with **-p** and device name arguments displays only disks **I/O** statistics for specific device only as shown.

```
[root@tecmint ~]# iostat -p sda

Linux 2.6.32-279.el6.i686 (tecmint.com)          09/03/2012      _i686_   (1 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           0.11    0.01    1.44    1.92    0.00   96.52

Device:            tps    Blk_read/s    Blk_wrtn/s    Blk_read    Blk_wrtn
sda                 3.32       148.52       12.55      1086002      91770
sda1                0.07         0.56         0.00         4120         18
sda2                3.22       147.79       12.55      1080650      91752
```

## 11. Display LVM Statistics

With **-N** (Uppercase) parameter displays only **LVM** statistics as shown.

```
[root@tecmint ~]# iostat -N

Linux 2.6.32-279.el6.i686 (tecmint.com)          09/03/2012      _i686_   (1 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           0.11    0.01    1.39    1.85    0.00   96.64

Device:            tps    Blk_read/s    Blk_wrtn/s    Blk_read    Blk_wrtn
sda                 3.20       142.84       12.16      1086002      92466
vg_tecmint-lv_root   5.13       141.68       12.16      1077154      92448
vg_tecmint-lv_swap   0.04         0.34         0.00         2576         0
```

## 12. iostat version.

With **-V** (Uppercase) parameter displays version of **iostat** as shown.

```
[root@tecmint ~]# iostat -V

sysstat version 9.0.4
(C) Sebastien Godard (sysstat orange.fr)
```

**Note:** **vmstat** and **iostat** contains number of columns and flags which may not possible to explain in details. If you want to know more about it you may refer man page of **vmstat** and **iostat**. Please share it if you find this article is useful through our comment box below.

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**Ravi Saive**

Owner at [TecMint.com](#)

Simple Word a Computer Geek and Linux Guru who loves to share tricks and tips on Internet. Most Of My Servers runs on Open Source Platform called Linux.

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## 9 Responses

1. *asd* says:  
[April 23, 2013 at 4:08 pm](#)

you made a mistake

si – Swaped in every second from disk in Kilo Bytes.  
si – Swaped out every second to disk in Kilo Bytes.

(i think you meant so second time)

- *Ravi Saive* says:  
[April 24, 2013 at 11:50 am](#)

Thanks. its corrected now..

[Reply](#)

2. *YM* says:  
[June 25, 2013 at 4:54 pm](#)

i need to monitor iostat and netstat for the app server, i need to monitor it for a particular time period with a time interval of 5 sec and write these logs to a particular file. am not sure of how do i do that. please gice suggestions.

[Reply](#)

- *Ravi Saive* says:  
[June 25, 2013 at 5:58 pm](#)

Do that this way, The below command append output to file “monitor.txt” every 5 seconds.

```
# iostat -d 5 >> monitor.txt
```

Same way do it for netstat.

[Reply](#)

3. *YM* says:  
[June 28, 2013 at 3:59 pm](#)

Thank you.

Was able to write io logs, but when tried the same, i get “netstat: extra arguements”, but when tried netstat -a, logs were written into a file.

Please advice me on how to overcome this?

Thanks in advance.

[Reply](#)

4. *quydo* says:  
[July 3, 2013 at 1:46 pm](#)

@YM:

```
iostat -d 5 | tee -a monitor.txt
```

Log will appear in screen and save to monitor.txt simultaneously :D

[Reply](#)

5. *Mark* says:  
[August 18, 2013 at 6:15 pm](#)

I have a question.

I wanted to print vmstat with timestamp on LinuxMint 13 with bash shell but seems your command

```
vmstat -t
```

does not works. It says there is no such argument as -t.

Is there other command for vmstat on OS like Linux Mint/Ubuntu which i can use to print vmstat with Timestamp.

[Reply](#)

6. *Pavan* says:

[February 26, 2014 at 4:13 pm](#)

Can we show only vmstat cpu? If so, how?

[Reply](#)

7. *Krishna* says:

[April 9, 2014 at 2:23 pm](#)

Just to mention, vmstat is not from package sysstat, it is from procps

[Reply](#)

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
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