

- ## Package Management

Package management systems supply the tools that allow system administrators to automate installing, upgrading, configuring and removing software packages in a known, predictable and consistent manner.

apt-get: It is a high-level package manager for Debian and derivatives and provides a simple way to retrieve and install packages, including dependency resolution, from multiple sources using the command line.

//to install the package

```
ubuntu@ubuntu: ~  
ubuntu@ubuntu:~$  
ubuntu@ubuntu:~$ fdisk -l  
fdisk: cannot open /dev/loop0: Permission denied  
fdisk: cannot open /dev/loop1: Permission denied  
fdisk: cannot open /dev/loop2: Permission denied  
fdisk: cannot open /dev/loop3: Permission denied  
fdisk: cannot open /dev/loop4: Permission denied  
fdisk: cannot open /dev/loop5: Permission denied  
fdisk: cannot open /dev/loop6: Permission denied  
fdisk: cannot open /dev/loop7: Permission denied  
fdisk: cannot open /dev/fd0: Permission denied  
fdisk: cannot open /dev/sda: Permission denied  
fdisk: cannot open /dev/loop8: Permission denied  
ubuntu@ubuntu:~$  
ubuntu@ubuntu:~$ sudo apt-get install  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
0 upgraded, 0 newly installed, 0 to remove and 436 not upgraded.  
ubuntu@ubuntu:~$  
ubuntu@ubuntu:~$ snap install vim  
error: snap "vim" not found  
ubuntu@ubuntu:~$ sudo apt-get install vim  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following additional packages will be installed:  
  vim-common vim-runtime vim-tiny  
Suggested packages:  
  ctags vim-doc vim-scripts indent  
The following NEW packages will be installed:  
  vim vim-runtime  
The following packages will be upgraded:  
  vim-common vim-tiny
```

//to update the packages

```
ubuntu@ubuntu: ~  
ubuntu@ubuntu:~$ sudo apt update  
Ign:1 cdrom://Ubuntu 22.04.1 LTS Jammy Jellyfish - Release amd64 (20220809.1) jammy InRelease  
Hit:2 cdrom://Ubuntu 22.04.1 LTS Jammy Jellyfish - Release amd64 (20220809.1) jammy Release  
Hit:4 http://archive.ubuntu.com/ubuntu jammy InRelease  
Hit:5 http://archive.ubuntu.com/ubuntu jammy-updates InRelease  
Hit:6 http://security.ubuntu.com/ubuntu jammy-security InRelease  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
436 packages can be upgraded. Run 'apt list --upgradable' to see them.  
ubuntu@ubuntu:~$ touch myfile.txt  
ubuntu@ubuntu:~$ cat > myfile.txt  
hello.. this is nikhil zambare..  
welcome to linux..  
^C  
ubuntu@ubuntu:~$ cat myfile.txt  
hello.. this is nikhil zambare..  
welcome to linux..  
ubuntu@ubuntu:~$  
ubuntu@ubuntu:~$ sudo useradd nikhil  
ubuntu@ubuntu:~$ hostnamectl  
Static hostname: ubuntu  
Icon name: computer-vm  
Chassis: vm  
Machine ID: 5e688cfc522f4f66ab5b36784ed844c9  
Boot ID: 98ffcf74490b4918a06ed13aa898clcc  
Virtualization: vmware  
Operating System: Ubuntu 22.04.1 LTS  
Kernel: Linux 5.15.0-43-generic  
Architecture: x86_64
```

```
ubuntu@ubuntu: ~  
ubuntu@ubuntu:~$  
ubuntu@ubuntu:~$ userdel -r nikhil  
userdel: Permission denied.  
userdel: cannot lock /etc/passwd; try again later.  
ubuntu@ubuntu:~$  
ubuntu@ubuntu:~$ groupdel mygroup  
groupdel: Permission denied.  
groupdel: cannot lock /etc/group; try again later.  
ubuntu@ubuntu:~$  
ubuntu@ubuntu:~$ iostat  
Command 'iostat' not found, but can be installed with:  
sudo apt install sysstat  
ubuntu@ubuntu:~$ sudo apt install sysstat  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
Suggested packages:  
  isag  
The following NEW packages will be installed:  
  sysstat  
0 upgraded, 1 newly installed, 0 to remove and 436 not upgraded.  
Need to get 487 kB of archives.  
After this operation, 1,507 kB of additional disk space will be used.  
Get:1 http://security.ubuntu.com/ubuntu jammy-security/main amd64 sysstat amd64 12.5.2-2ubuntu0.1 [487 kB]  
Fetched 487 kB in 12s (41.3 kB/s)  
Preconfiguring packages ...  
Selecting previously unselected package sysstat.  
(Reading database ... 207096 files and directories currently installed.)  
Preparing to unpack .../sysstat_12.5.2-2ubuntu0.1_amd64.deb ...  
Unpacking sysstat (12.5.2-2ubuntu0.1) ...  
Setting up sysstat (12.5.2-2ubuntu0.1) ...
```

//to remove the package

```
ubuntu@ubuntu:~$  
ubuntu@ubuntu:~$ sudo apt-get remove vim  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
Package 'vim' is not installed, so not removed  
0 upgraded, 0 newly installed, 0 to remove and 436 not upgraded.  
ubuntu@ubuntu:~$
```

• Disk Management

//to list all the disks on harddrive

```
ubuntu@ubuntu:~$ lsblk -a  
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINTS  
fd0 2:0 1 4K 0 disk  
loop0 7:0 0 2.1G 1 loop /rofs  
loop1 7:1 0 62M 1 loop /snap/core20/1587  
loop2 7:2 0 4K 1 loop /snap/bare/5  
loop3 7:3 0 163.3M 1 loop /snap/firefox/1635  
loop4 7:4 0 400.8M 1 loop /snap/gnome-3-38-2004/112  
loop5 7:5 0 91.7M 1 loop /snap/gtk-common-themes/1535  
loop6 7:6 0 47M 1 loop /snap/snapd/16292  
loop7 7:7 0 45.9M 1 loop /snap/snap-store/582  
loop8 7:8 0 284K 1 loop /snap/snapd-desktop-integration/14  
loop9 7:9 0 0B 0 loop  
sda 8:0 0 20G 0 disk  
sr0 11:0 1 126.8M 0 rom  
sr1 11:1 1 3.6G 0 rom /cdrom  
ubuntu@ubuntu:~$  
ubuntu@ubuntu:~$ lsblk -b  
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINTS  
fd0 2:0 1 4096 0 disk  
loop0 7:0 0 2288189440 1 loop /rofs  
loop1 7:1 0 64970752 1 loop /snap/core20/1587  
loop2 7:2 0 4096 1 loop /snap/bare/5  
loop3 7:3 0 171225088 1 loop /snap/firefox/1635  
loop4 7:4 0 420265984 1 loop /snap/gnome-3-38-2004/112  
loop5 7:5 0 96141312 1 loop /snap/gtk-common-themes/1535  
loop6 7:6 0 49242112 1 loop /snap/snapd/16292  
loop7 7:7 0 48091136 1 loop /snap/snap-store/582  
loop8 7:8 0 290816 1 loop /snap/snapd-desktop-integration/14  
sda 8:0 0 21474836480 0 disk
```

// to show the partition table of each disk, with details such as the device name, the number of partitions on the disk, the size and type of each partition

```
ubuntu@ubuntu: ~  
ubuntu@ubuntu:~$ sudo fdisk -l  
Disk /dev/loop0: 2.13 GiB, 2288189440 bytes, 4469120 sectors  
Units: sectors of 1 * 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
  
Disk /dev/loop1: 61.96 MiB, 64970752 bytes, 126896 sectors  
Units: sectors of 1 * 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
  
Disk /dev/loop2: 4 KiB, 4096 bytes, 8 sectors  
Units: sectors of 1 * 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
  
Disk /dev/loop3: 163.29 MiB, 171225088 bytes, 334424 sectors  
Units: sectors of 1 * 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
  
Disk /dev/loop4: 91.69 MiB, 96141312 bytes, 187776 sectors  
Units: sectors of 1 * 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

//to retrieve hardware system information

```
ubuntu@ubuntu: ~  
ubuntu@ubuntu:~$ sudo dmidecode -t bios  
# dmidecode 3.3  
Getting SMBIOS data from sysfs.  
SMBIOS 2.7 present.  
  
Handle 0x0000, DMI type 0, 24 bytes  
BIOS Information  
    Vendor: Phoenix Technologies LTD  
    Version: 6.00  
    Release Date: 11/12/2020  
    Address: 0xEA480  
    Runtime Size: 88960 bytes  
    ROM Size: 64 kB  
    Characteristics:  
        ISA is supported  
        PCI is supported  
        PC Card (PCMCIA) is supported  
        PNP is supported  
        APM is supported  
        BIOS is upgradeable  
        BIOS shadowing is allowed  
        ESCD support is available  
        Boot from CD is supported  
        Selectable boot is supported  
        EDD is supported  
        Print screen service is supported (int 5h)  
        8042 keyboard services are supported (int 9h)  
        Serial services are supported (int 14h)  
        Printer services are supported (int 17h)  
        CGA/mono video services are supported (int 10h)
```


//to create a new partition

```
ubuntu@ubuntu: ~$ sudo fdisk /dev/sda

Welcome to fdisk (util-linux 2.37.2).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table.
Created a new DOS disklabel with disk identifier 0x5f653427.

Command (m for help): m

Help:

DOS (MBR)
a toggle a bootable flag
b edit nested BSD disklabel
c toggle the dos compatibility flag

Generic
d delete a partition
F list free unpartitioned space
l list known partition types
n add a new partition
p print the partition table
t change a partition type
v verify the partition table
i print information about a partition

Misc
m print this menu
u change display/entry units
x extra functionality (experts only)
```

```
Command (m for help): n
Partition type
  p primary (0 primary, 0 extended, 4 free)
  e extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1): 2
First sector (2048-41943039, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-41943039, default 41943039):

Created a new partition 2 of type 'Linux' and of size 20 GiB.

Command (m for help): m
```

//to view the created partition

```
Command (m for help): p

Disk /dev/sda: 20 GiB, 21474836480 bytes, 41943040 sectors
Disk model: VMware Virtual S
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x5f653427

Device      Boot Start      End  Sectors  Size Id Type
/dev/sda2             2048 41943039 41940992   20G 83 Linux

Command (m for help):
All unwritten changes will be lost, do you really want to quit?
```

//to delete a disk partition

```
Command (m for help): p
Disk /dev/sda: 20 GiB, 21474836480 bytes, 41943040 sectors
Disk model: VMware Virtual S
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x582a6c9d

Device      Boot Start      End  Sectors  Size Id Type
/dev/sda1                2048 41943039 41940992   20G 83 Linux

Command (m for help): d
Selected partition 1
Partition 1 has been deleted.

Command (m for help):
```

- I/O Monitoring

//to interactively monitor the system's vital resources or server's processes

```
ubuntu@ubuntu: ~$ sudo apt install htop
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
  lm-sensors
The following NEW packages will be installed:
  htop
0 upgraded, 1 newly installed, 0 to remove and 436 not upgraded.
Need to get 128 kB of archives.
After this operation, 342 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu jammy/main amd64 htop amd64 3.0.5-7build2 [128 kB]
Fetched 128 kB in 1s (158 kB/s)
Selecting previously unselected package htop.
(Reading database ... 207158 files and directories currently installed.)
Preparing to unpack .../htop_3.0.5-7build2_amd64.deb ...
Unpacking htop (3.0.5-7build2) ...
Setting up htop (3.0.5-7build2) ...
Processing triggers for mailcap (3.70+nmu1ubuntu1) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
Processing triggers for man-db (2.10.2-1) ...
ubuntu@ubuntu:~$
ubuntu@ubuntu:~$ htop
ubuntu@ubuntu:~$
```

```
ubuntu@ubuntu: ~$ htop

 0% 0.0% 3% 0.0%
 1% 0.0% 4% 0.0%
 2% 0.0% 5% 0.0%
Mem[|||||]1.79G/3.80G Tasks: 114, 277 thr; 1 running
Swp[|||||]0K/0K Load average: 0.09 0.09 0.09
Uptime: 01:17:12

  PID USER   PRI NI   VIRT   RES   SHR  S  CPU% MEM%  TIME+  Command
 11200 ubuntu  20  0 20004 4852 3496 R  0.7  0.1  0:00.70 htop
 1477 systemd-o 20  0 14824 6368 5568 S  0.0  0.2  0:06.86 /lib/systemd/systemd-oomd
 2181 ubuntu  39 19 657M 33016 16168 S  0.0  0.8  0:04.80 /usr/libexec/tracker-miner-fs-3
 6298 ubuntu  20  0 345M 87624 46220 S  0.7  2.2  1:26.48 /usr/lib/xorg/Xorg vt2 -displayfd 3 -aut
 6553 ubuntu  20  0 299M 48380 29888 S  0.0  1.2  0:49.21 /usr/bin/vmtoolsd -n vmusr --blockFd 3
 9819 ubuntu  20  0 891M 63076 43560 S  0.0  1.6  0:28.40 /usr/libexec/gnome-terminal-server
10417 ubuntu  20  0 2989M 57648 42328 S  0.0  1.4  0:09.54 gjs /usr/share/gnome-shell/extensions/di
    1 root    20  0 164M 13840 8592 S  0.0  0.3  0:11.69 /sbin/init splash --- auto automatic-ubi
 1179 root    19 -1 31844 11800 10344 S  0.0  0.3  0:01.94 /lib/systemd/systemd-journald
 1213 root    20  0 30196 10408 4512 S  0.0  0.3  0:03.92 /lib/systemd/systemd-udev
 1478 systemd-r 20  0 26060 14492 9780 S  0.0  0.4  0:03.38 /lib/systemd/systemd-resolved
 1479 systemd-t 20  0 89376 6688 5820 S  0.0  0.2  0:00.23 /lib/systemd/systemd-timesyncd
 1487 systemd-t 20  0 89376 6688 5820 S  0.0  0.2  0:00.04 /lib/systemd/systemd-timesyncd
 1694 root    20  0 2812 1144 1060 S  0.0  0.0  0:00.32 /usr/sbin/acpid
 1697 avahi    20  0 7630 3640 3284 S  0.0  0.1  0:00.44 avahi-daemon: running [ubuntu.local]
 1698 root    20  0 10584 5456 5032 S  0.0  0.1  0:00.95 /usr/lib/bluetooth/bluetoothd
 1700 messagebu 20  0 11040 6624 4196 S  0.0  0.2  0:02.41 @dbus-daemon -s -system --address=systemd:
 1701 root    20  0 263M 18900 16100 S  0.0  0.5  0:03.61 /usr/sbin/NetworkManager --no-daemon
 1706 root    20  0 82832 3788 3412 S  0.0  0.1  0:00.77 /usr/sbin/irqbalance --foreground
 1708 root    20  0 49692 19360 10064 S  0.0  0.5  0:03.26 /usr/bin/python3 /usr/bin/networkd-dispa
 1709 root    20  0 231M 10184 7348 S  0.0  0.3  0:00.96 /usr/libexec/polkitd --no-debug
 1710 root    20  0 242M 7124 6500 S  0.0  0.2  0:00.07 /usr/libexec/power-profiles-daemon
 1711 syslog  20  0 217M 5992 4372 S  0.0  0.2  0:01.83 /usr/sbin/rsyslogd -n -iNONE
 1712 root    20  0 1648M 25924 13524 S  0.0  0.7  0:08.22 /usr/lib/snapd/snapd

F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice F8Nice F9Kill F10Quit
```

iostat: It is the basic workhorse utility for monitoring I/O device activity on the system.

- **iostat:** Get report and statistic.
- **iostat -x:** Show more details statistics information.
- **iostat -c:** Show only the cpu statistic.
- **iostat -d:** Display only the device report.
- **iostat -xd:** Show extended I/O statistic for device only.
- **iostat -k:** Capture the statistics in kilobytes or megabytes.
- **iostat -k 2 3:** Display cpu and device statistics with delay.
- **iostat -j ID mmcblk0 sda6 -x -m 2 2:** Display persistent device name statistics.
- **iostat -p:** Display statistics for block devices.
- **iostat -N:** Display lvm2 statistic information.

```
ubuntu@ubuntu: ~  
ubuntu@ubuntu:~$ iostat  
Linux 5.15.0-43-generic (ubuntu)      04/15/2023      _x86_64_      (6 CPU)  
  
avg-cpu:  %user   %nice %system %iowait  %steal   %idle  
           0.91    0.00    1.84    1.45    0.00   95.79  
  
Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd  
loop0             19.72      287.37        0.00         0.00     1233352      0         0  
loop1             0.18        3.24        0.00         0.00      13911       0         0  
loop2             0.00        0.00        0.00         0.00        21        0         0  
loop3             0.38       18.93        0.00         0.00     81240       0         0  
loop4             0.75       14.26        0.00         0.00     61200       0         0  
loop5             0.43        1.57        0.00         0.00      6739        0         0  
loop6             0.01        0.36        0.00         0.00      1525         0         0  
loop7             0.02        0.48        0.00         0.00      2074         0         0  
loop8             0.01        0.04        0.00         0.00       192          0         0  
loop9             0.00        0.00        0.00         0.00        14          0         0  
sda               0.16        3.17        0.00         0.00     13588        0         0  
sr0              0.07        1.98        0.00         0.00      8497         0         0  
sr1              8.40      884.45        0.00         0.00    3795925      0         0  
  
ubuntu@ubuntu:~$ iostat -x  
Linux 5.15.0-43-generic (ubuntu)      04/15/2023      _x86_64_      (6 CPU)  
  
avg-cpu:  %user   %nice %system %iowait  %steal   %idle  
           0.91    0.00    1.84    1.45    0.00   95.80  
  
Device            r/s    rkB/s    rrqm/s    %rrqm  r_await  rareq-sz    w/s    wKB/s    wrqm/s    %wrqm  w_await  
t wareq-sz      d/s    dKB/s    drqm/s    %drqm  d_await  dareq-sz    f/s    f_await    aqu-sz    %util  
loop0           19.65    286.36      0.00     0.00     0.00     2.88    14.57     0.00     0.00     0.00     0.00  
0               0.00     0.00      0.00     0.00     0.00     0.00     0.00     0.00     0.06     4.57  
loop1           0.18     3.23      0.00     0.00     0.00    11.97    17.56     0.00     0.00     0.00     0.00  
0               0.00     0.00      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.25  
  
ubuntu@ubuntu:~$ iostat -c  
Linux 5.15.0-43-generic (ubuntu)      04/15/2023      _x86_64_      (6 CPU)  
  
avg-cpu:  %user   %nice %system %iowait  %steal   %idle  
           0.90    0.00    1.81    1.43    0.00   95.85  
  
ubuntu@ubuntu:~$ iostat -d  
Linux 5.15.0-43-generic (ubuntu)      04/15/2023      _x86_64_      (6 CPU)  
  
Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd  
loop0             19.39      282.51        0.00         0.00     1233352      0         0  
loop1             0.18        3.19        0.00         0.00      13911       0         0  
loop2             0.00        0.00        0.00         0.00        21        0         0  
loop3             0.37       18.61        0.00         0.00     81240       0         0  
loop4             0.73       14.02        0.00         0.00     61200       0         0  
loop5             0.42        1.54        0.00         0.00      6739        0         0  
loop6             0.01        0.35        0.00         0.00      1525         0         0  
loop7             0.02        0.48        0.00         0.00      2074         0         0  
loop8             0.01        0.04        0.00         0.00       192          0         0  
loop9             0.00        0.00        0.00         0.00        14          0         0  
sda               0.16        3.11        0.00         0.00     13588        0         0  
sr0              0.07        1.95        0.00         0.00      8497         0         0  
sr1              8.26      869.49        0.00         0.00    3795925      0         0
```



```
ubuntu@ubuntu: ~  
ubuntu@ubuntu:~$ iostat -k 2 3  
Linux 5.15.0-43-generic (ubuntu)      04/15/2023      _x86_64_      (6 CPU)  
  
avg-cpu:  %user   %nice %system %iowait  %steal   %idle  
           0.88    0.00    1.76    1.39    0.00   95.97  
  
Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd  
loop0             18.83        274.34         0.00         0.00    1233352         0         0  
loop1              0.18         3.09         0.00         0.00     13911         0         0  
loop2              0.00         0.00         0.00         0.00         21         0         0  
loop3              0.36        18.07         0.00         0.00     81240         0         0  
loop4              0.71        13.61         0.00         0.00     61200         0         0  
loop5              0.41         1.50         0.00         0.00     6739         0         0  
loop6              0.01         0.34         0.00         0.00     1525         0         0  
loop7              0.02         0.46         0.00         0.00     2074         0         0  
loop8              0.01         0.04         0.00         0.00        192         0         0  
loop9              0.00         0.00         0.00         0.00         14         0         0  
sda                0.15         3.02         0.00         0.00    13588         0         0  
sr0                0.07         1.89         0.00         0.00     8497         0         0  
sr1                8.02        844.34         0.00         0.00   3795925         0         0  
  
avg-cpu:  %user   %nice %system %iowait  %steal   %idle  
           0.00    0.00    0.17    0.00    0.00   99.83  
  
Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd  
loop0              0.00         0.00         0.00         0.00         0         0         0  
loop1              0.00         0.00         0.00         0.00         0         0         0  
loop2              0.00         0.00         0.00         0.00         0         0         0  
loop3              0.00         0.00         0.00         0.00         0         0         0  
loop4              0.00         0.00         0.00         0.00         0         0         0  
loop5              0.00         0.00         0.00         0.00         0         0         0  
loop6              0.00         0.00         0.00         0.00         0         0         0  
loop7              0.00         0.00         0.00         0.00         0         0         0
```

```
ubuntu@ubuntu: ~  
ubuntu@ubuntu:~$ iostat -k  
Linux 5.15.0-43-generic (ubuntu)      04/15/2023      _x86_64_      (6 CPU)  
  
avg-cpu:  %user   %nice %system %iowait  %steal   %idle  
           0.90    0.00    1.80    1.42    0.00   95.87  
  
Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd  
loop0             19.30        281.27         0.00         0.00    1233352         0         0  
loop1              0.18         3.17         0.00         0.00     13911         0         0  
loop2              0.00         0.00         0.00         0.00         21         0         0  
loop3              0.37        18.53         0.00         0.00     81240         0         0  
loop4              0.73        13.96         0.00         0.00     61200         0         0  
loop5              0.42         1.54         0.00         0.00     6739         0         0  
loop6              0.01         0.35         0.00         0.00     1525         0         0  
loop7              0.02         0.47         0.00         0.00     2074         0         0  
loop8              0.01         0.04         0.00         0.00        192         0         0  
loop9              0.00         0.00         0.00         0.00         14         0         0  
sda                0.16         3.10         0.00         0.00    13588         0         0  
sr0                0.07         1.94         0.00         0.00     8497         0         0  
sr1                8.23        865.66         0.00         0.00   3795925         0         0  
  
ubuntu@ubuntu:~$ iostat -xd  
Linux 5.15.0-43-generic (ubuntu)      04/15/2023      _x86_64_      (6 CPU)  
  
Device            r/s    rkB/s    rrqm/s    %rrqm    r_await    rareq-sz    w/s    wkB/s    wrqm/s    %wrqm    w_await  
t wareq-sz      d/s    dkB/s    drqm/s    %drqm    d_await    dareq-sz    f/s    f_await    aqu-sz    %util  
loop0           19.17    279.23     0.00     0.00     2.88     14.57     0.00     0.00     0.00     0.00     0.00  
0 0.00      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.06     4.46  
loop1            0.18     3.15     0.00     0.00    11.97     17.56     0.00     0.00     0.00     0.00     0.00  
0 0.00      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.24  
loop2            0.00     0.00     0.00     0.00     3.60     1.40     0.00     0.00     0.00     0.00     0.00  
0 0.00      0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00     0.00  
loop3            0.37    18.39     0.00     0.00     9.91     50.37     0.00     0.00     0.00     0.00     0.00
```

```
ubuntu@ubuntu: ~  
ubuntu@ubuntu:~$ iostat -p  
Linux 5.15.0-43-generic (ubuntu)      04/15/2023      _x86_64_      (6 CPU)  
  
avg-cpu:  %user   %nice %system %iowait  %steal   %idle  
           0.87    0.00    1.75    1.37    0.00   96.00  
  
Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd  
loop0             18.68       272.12         0.00         0.00    1233352         0         0  
loop1              0.17         3.07         0.00         0.00     13911         0         0  
loop2              0.00         0.00         0.00         0.00         21         0         0  
loop3              0.36       17.92         0.00         0.00     81240         0         0  
loop4              0.71       13.50         0.00         0.00     61200         0         0  
loop5              0.40         1.49         0.00         0.00      6739         0         0  
loop6              0.01         0.34         0.00         0.00      1525         0         0  
loop7              0.02         0.46         0.00         0.00      2074         0         0  
sr0                0.07         1.87         0.00         0.00      8497         0         0  
sr1                7.96      837.53         0.00         0.00   3795925         0         0  
sda                0.15         3.00         0.00         0.00     13588         0         0  
loop8              0.01         0.04         0.00         0.00         192         0         0  
loop9              0.00         0.00         0.00         0.00          14         0         0  
  
ubuntu@ubuntu:~$ iostat -N  
Linux 5.15.0-43-generic (ubuntu)      04/15/2023      _x86_64_      (6 CPU)  
  
avg-cpu:  %user   %nice %system %iowait  %steal   %idle  
           0.87    0.00    1.75    1.37    0.00   96.00  
  
Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd  
loop0             18.66       271.94         0.00         0.00    1233352         0         0  
loop1              0.17         3.07         0.00         0.00     13911         0         0  
loop2              0.00         0.00         0.00         0.00         21         0         0  
loop3              0.36       17.91         0.00         0.00     81240         0         0  
loop4              0.71       13.49         0.00         0.00     61200         0         0
```