## NAME

**iostat** - report I/O statistics

## SYNOPSIS

**iostat** [**-CdhIKoTxz**] [**-c** *count*] [**-M** *core*] [**-n** *devs*] [**-N** *system*] [**-t** *type,if,pass*] [**-w** *wait*] [*drives*]

## DESCRIPTION

The **iostat** utility displays kernel I/O statistics on terminal, device and cpu operations. The first statistics that are printed are averaged over the system uptime. To get information about the current activity, a suitable wait time should be specified, so that the subsequent sets of printed statistics will be averaged over that time.

The options are as follows:

**-C**  Display CPU statistics. This is on by default, unless **-d** or **-x** is specified.

**-c**  Repeat the display *count* times. If no repeat *count* is specified, the default depends on whether **-w** is specified. With **-w** the default repeat count is infinity, otherwise it is 1.

**-d**  Display only device statistics. If this flag is turned on, only device statistics will be displayed, unless **-C** or **-T** is also specified to enable the display of CPU or TTY statistics.

**-h**  Put **iostat** in 'top' mode. In this mode, **iostat** will show devices in order from highest to lowest bytes per measurement cycle.

**-I**  Display total statistics for a given time period, rather than average statistics for each second during that time period.

**-K**  In the blocks transferred display (-o), display block count in kilobytes rather then the device native block size.

**-M**  Extract values associated with the name list from the specified core instead of the default "*/dev/kmem*".

**-N**  Extract the name list from the specified system instead of the default "*/boot/kernel/kernel*".

**-n**  Display up to *devs* number of devices. The **iostat** utility will display fewer devices if there are not *devs* devices present.

**-o**  Display old-style **iostat** device statistics. Sectors per second, transfers per second, and milliseconds

per seek are displayed.  If **-I** is specified, total blocks/sectors, total transfers, and milliseconds per seek are displayed.

**-T**    Display TTY statistics.  This is on by default, unless **-d** or **-x** is specified.

**-t**    Specify which types of devices to display.  There are three different categories of devices:

device type:

| | |
|---|---|
| da | Direct Access devices |
| sa | Sequential Access devices |
| printer | Printers |
| proc | Processor devices |
| worm | Write Once Read Multiple devices |
| cd | CD devices |
| scanner | Scanner devices |
| optical | Optical Memory devices |
| changer | Medium Changer devices |
| comm | Communication devices |
| array | Storage Array devices |
| enclosure | Enclosure Services devices |
| floppy | Floppy devices |

interface:

| | |
|---|---|
| IDE | Integrated Drive Electronics devices |
| SCSI | Small Computer System Interface devices |
| other | Any other device interface |

passthrough:

| | |
|---|---|
| pass | Passthrough devices |

The user must specify at least one device type, and may specify at most one device type from each category.  Multiple device types in a single device type statement must be separated by commas.

Any number of **-t** arguments may be specified on the command line.  All **-t** arguments are ORed together to form a matching expression against which all devices in the system are compared.  Any device that fully matches any **-t** argument will be included in the **iostat** output, up to the number of devices that can be displayed in 80 columns, or the maximum number of devices specified by the user.

**-w**    Pause *wait* seconds between each display.  If no *wait* interval is specified, the default is 1 second.

The **iostat** command will accept and honor a non-integer number of seconds. Note that the interval only has millisecond granularity. Finer values will be truncated. E.g., "-w1.0001" is the same as "-w1.000". The interval will also suffer from modifications to *kern.hz* so your mileage may vary.

**-x**    Show extended disk statistics. Each disk is displayed on a line of its own with all available statistics. If this flag is turned on, only disk statistics will be displayed, unless **-C** or **-T** is also specified to enable the display of CPU or TTY statistics.

**-z**    If **-x** is specified, omit lines for devices with no activity.

The **iostat** utility displays its information in the following format:

tty
>    tin    characters read from terminals
>    tout   characters written to terminals

devices
>    Device operations. The header of the field is the device name and unit number. The **iostat** utility will display as many devices as will fit in a standard 80 column screen, or the maximum number of devices in the system, whichever is smaller. If **-n** is specified on the command line, **iostat** will display the smaller of the requested number of devices, and the maximum number of devices in the system. To force **iostat** to display specific drives, their names may be supplied on the command line. The **iostat** utility will not display more devices than will fit in an 80 column screen, unless the **-n** argument is given on the command line to specify a maximum number of devices to display. If fewer devices are specified on the command line than will fit in an 80 column screen, **iostat** will show only the specified devices.
>
>    The standard **iostat** device display shows the following statistics:
>
>    KB/t    kilobytes per transfer
>    tps     transfers per second
>    MB/s    megabytes per second
>
>    The standard **iostat** device display, with the **-I** flag specified, shows the following statistics:
>
>    KB/t    kilobytes per transfer
>    xfrs    total number of transfers
>    MB      total number of megabytes transferred
>
>    The extended **iostat** device display, with the **-x** flag specified, shows the following statistics:

r/s     read operations per second
w/s     write operations per second
kr/s    kilobytes read per second
kw/s    kilobytes write per second
qlen    transactions queue length
ms/r    average duration of read transactions, in milliseconds
ms/w    average duration of write transactions, in milliseconds
ms/o    average duration of all other transactions, in milliseconds
ms/t    average duration of all transactions, in milliseconds
%b      % of time the device had one or more outstanding transactions

The extended **iostat** device display, with the **-x** and **-I** flags specified, shows the following statistics:

r/i     read operations per time period
w/i     write operations per time period
kr/i    kilobytes read per time period
kw/i    kilobytes write per time period
qlen    transactions queue length
tsvc_t/i
        total duration of transactions per time period, in seconds
sb/i    total time the device had one or more outstanding transactions per time period, in seconds

The old-style **iostat** display (using **-o**) shows the following statistics:

sps     sectors transferred per second
tps     transfers per second
msps    average milliseconds per transaction

The old-style **iostat** display, with the **-I** flag specified, shows the following statistics:

blk     total blocks/sectors transferred
xfr     total transfers
msps    average milliseconds per transaction

cpu
    us      % of cpu time in user mode
    ni      % of cpu time in user mode running niced processes
    sy      % of cpu time in system mode
    in      % of cpu time in interrupt mode
    id      % of cpu time in idle mode

**FILES**
   */boot/kernel/kernel*  Default kernel namelist.
   */dev/kmem*          Default memory file.

**EXAMPLES**
      iostat -w 1 da0 da1 cd0

Display statistics for the first two Direct Access devices and the first CDROM device every second ad infinitum.

      iostat -c 2

Display the statistics for the first four devices in the system twice, with a one second display interval.

      iostat -t da -t cd -w 1

Display statistics for all CDROM and Direct Access devices every second ad infinitum.

      iostat -t da,scsi,pass -t cd,scsi,pass

Display statistics once for all SCSI passthrough devices that provide access to either Direct Access or CDROM devices.

      iostat -h -n 8 -w 1

Display up to 8 devices with the most I/O every second ad infinitum.

      iostat -dh -t da -w 1

Omit the TTY and CPU displays, show devices in order of performance and show only Direct Access devices every second ad infinitum.

      iostat -Iw 3

Display total statistics every three seconds ad infinitum.

      iostat -odICTw 2 -c 9

Display total statistics using the old-style output format 9 times, with a two second interval between each measurement/display.  The **-d** flag generally disables the TTY and CPU displays, but since the **-T**

and **-C** flags are given, the TTY and CPU displays will be displayed.

**SEE ALSO**

fstat(1), netstat(1), nfsstat(1), ps(1), systat(1), devstat(3), ctlstat(8), gstat(8), pstat(8), vmstat(8)

The sections starting with ''Interpreting system activity'' in *Installing and Operating 4.3BSD*.

**HISTORY**

This version of **iostat** first appeared in FreeBSD 3.0.

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**BUGS**

The use of **iostat** as a debugging tool for crash dumps is probably limited because there is currently no way to get statistics that only cover the time immediately before the crash.