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.

AUTHORS

Kenneth Merry <*ken@FreeBSD.org*>

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.