

# Block layer statistics in /sys/block/<dev>/stat

This file documents the contents of the /sys/block/<dev>/stat file.

The stat file provides several statistics about the state of block device <dev>.

- Q. Why are there multiple statistics in a single file? Doesn't sysfs normally contain a single value per file?
- A. By having a single file, the kernel can guarantee that the statistics represent a consistent snapshot of the state of the device. If the statistics were exported as multiple files containing one statistic each, it would be impossible to guarantee that a set of readings represent a single point in time.

The stat file consists of a single line of text containing 17 decimal values separated by whitespace. The fields are summarized in the following table, and described in more detail below.

Name	units	description
read I/Os	requests	number of read I/Os processed
read merges	requests	number of read I/Os merged with in-queue I/O
read sectors	sectors	number of sectors read
read ticks	milliseconds	total wait time for read requests
write I/Os	requests	number of write I/Os processed
write merges	requests	number of write I/Os merged with in-queue I/O
write sectors	sectors	number of sectors written
write ticks	milliseconds	total wait time for write requests
in_flight	requests	number of I/Os currently in flight
io_ticks	milliseconds	total time this block device has been active
time_in_queue	milliseconds	total wait time for all requests
discard I/Os	requests	number of discard I/Os processed
discard merges	requests	number of discard I/Os merged with in-queue I/O
discard sectors	sectors	number of sectors discarded
discard ticks	milliseconds	total wait time for discard requests
flush I/Os	requests	number of flush I/Os processed
flush ticks	milliseconds	total wait time for flush requests

## read I/Os, write I/Os, discard I/Os

These values increment when an I/O request completes.

## flush I/Os

These values increment when an flush I/O request completes.

Block layer combines flush requests and executes at most one at a time. This counts flush requests executed by disk. Not tracked for partitions.

## read merges, write merges, discard merges

These values increment when an I/O request is merged with an already-queued I/O request.

## read sectors, write sectors, discard sectors

These values count the number of sectors read from, written to, or discarded from this block device. The "sectors" in question are the standard UNIX 512-byte sectors, not any device- or filesystem-specific block size. The counters are incremented when the I/O completes.

## read ticks, write ticks, discard ticks, flush ticks

These values count the number of milliseconds that I/O requests have waited on this block device. If there are multiple I/O requests waiting, these values will increase at a rate greater than 1000/second; for example, if 60 read requests wait for an average of 30 ms, the read\_ticks field will increase by  $60 \times 30 = 1800$ .

## in\_flight

This value counts the number of I/O requests that have been issued to the device driver but have not yet completed. It does not include I/O requests that are in the queue but not yet issued to the device driver.

## **io\_ticks**

This value counts the number of milliseconds during which the device has had I/O requests queued.

## **time\_in\_queue**

This value counts the number of milliseconds that I/O requests have waited on this block device. If there are multiple I/O requests waiting, this value will increase as the product of the number of milliseconds times the number of requests waiting (see "read ticks" above for an example).