How to evict file from system cache on Linux?

Asked 16 years, 2 months ago   Modified 15 years, 5 months ago

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6

When running performance tests file system cache hit or miss can significantly influence test results. Therefore generally before running such tests used files are evicted from system cache. How to do that on Linux?

Clarification: If possible, the solution should not require root privileges.

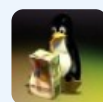linux   performance   testing   caching   file-io

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edited Oct 2, 2008 at 13:28

asked Oct 2, 2008 at 11:53

Paweł Hajdan
18.5k ● 9 ● 52 ● 65

5 Answers

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As a superuser you can do the following:

To free pagecache:

- echo 1 > /proc/sys/vm/drop_caches

To free dentries and inodes:

- echo 2 > /proc/sys/vm/drop_caches

To free pagecache, dentries and inodes:

- echo 3 > /proc/sys/vm/drop_caches

This operation will not "lose" any data (caches are written out to disk before their data is dropped), however, to really make sure all cache is cleaned, you should sync first. E.g. all caches should be cleared if you run

```
sync; echo 3 > /proc/sys/vm/drop_caches
```

As I said, only a superuser (root) may do so.

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answered Oct 2, 2008 at 12:38

Mecki

133k ● 34 ● 259 ● 269

Ha, I have the answer:

```
#include <unistd.h>
#include <fcntl.h>
int main(int argc, char *argv[]) {
    int fd;
    fd = open(argv[1], O_RDONLY);
    fdatasync(fd);
```

```
        posix_fadvise(fd, 0,0,POSIX_FADV_DONTNEED);
        close(fd);
        return 0;
    }
```
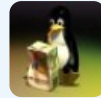
This is from http://insights.oetiker.ch/linux/fadvise.html

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answered Oct 2, 2008 at 14:58

Paweł Hajdan
18.5k ● 9 ● 52 ● 65

There is a command line utility by Eric Wong that makes it easy to invoke posix_fadvise:

http://git.bogomips.org/cgit/pcu.git/tree/README

It's then as simple as

```
$ pcu-fadvise -a dontneed filename-to-evict
```

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answered Jul 22, 2009 at 20:12

user143174
61 ● 1 ● 1

Regarding use of O_DIRECT: that would perturb the results in another way. The kernel will attempt to DMA the filesystem data directly into your read() buffer, so it can be handed up to your application without any additional copy being done. Without O_DIRECT the kernel DMAs the file

data into the page cache, and copies it from the page cache to your read() buffer.

This is fine if your app is really going to use O_DIRECT in production. If you run performance tests with O_DIRECT and then remove O_DIRECT for production, your performance test will be unrealistic.

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answered Oct 2, 2008 at 13:55

DGentry
16.3k ● 8 ● 53 ● 66

-1

If you can put the test data in a separate filesystem then mounting the filesystem afresh for the test will give you empty caches.

If you list the test fileystem in /etc/fstab with the "user" option then you can mount it for the test without being superuser

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answered Oct 12, 2008 at 11:35

James
979 ● 2 ● 12 ● 22