man7.org > Linux > man-pages Linux/UNIX system programming training

NAME | SYNOPSIS | DESCRIPTION | RETURN VALUE | ERRORS | CONFORMING TO |
NOTES | SEE ALSO | COLOPHON

Search online pages

FLOCK(2) **Linux Programmer's Manual** **FLOCK(2)**

NAME

top

flock - apply or remove an advisory lock on an open file

SYNOPSIS

top

```
#include <sys/file.h>

int flock(int fd, int operation);
```

DESCRIPTION

top

Apply or remove an advisory lock on the open file specified by *fd*. The argument *operation* is one of the following:

LOCK_SH Place a shared lock. More than one process may hold a shared lock for a given file at a given time.

LOCK_EX Place an exclusive lock. Only one process may hold an exclusive lock for a given file at a given time.

LOCK_UN Remove an existing lock held by this process.

A call to **flock**() may block if an incompatible lock is held by another process. To make a nonblocking request, include **LOCK_NB** (by ORing) with any of the above operations.

A single file may not simultaneously have both shared and exclusive locks.

Locks created by **flock**() are associated with an open file description (see open(2)). This means that duplicate file descriptors (created by, for example, fork(2) or dup(2)) refer to the same lock, and this lock may be modified or released using any of these file descriptors. Furthermore, the lock is released either by an explicit **LOCK_UN** operation on any of these duplicate file descriptors, or when all such file descriptors have been closed.

If a process uses open(2) (or similar) to obtain more than one file descriptor for the same file, these file descriptors are treated independently by **flock**(). An attempt to lock the file using one of these file descriptors may be denied by a lock that the calling process has already placed via another file descriptor.

A process may hold only one type of lock (shared or exclusive) on a file. Subsequent **flock**() calls on an already locked file will convert an existing lock to the new lock mode.

Locks created by **flock**() are preserved across an execve(2).

A shared or exclusive lock can be placed on a file regardless of the mode in which the file was opened.

RETURN VALUE

top

On success, zero is returned. On error, -1 is returned, and *errno* is set appropriately.

ERRORS

top

EBADF *fd* is not an open file descriptor.

EINTR While waiting to acquire a lock, the call was interrupted by delivery of a signal caught by a handler; see signal(7).

EINVAL *operation* is invalid.

ENOLCK The kernel ran out of memory for allocating lock records.

EWOULDBLOCK
The file is locked and the **LOCK_NB** flag was selected.

CONFORMING TO

top

4.4BSD (the **flock**() call first appeared in 4.2BSD). A version of **flock**(), possibly implemented in terms of fcntl(2), appears on most UNIX systems.

NOTES

top

Since kernel 2.0, **flock**() is implemented as a system call in its own right rather than being emulated in the GNU C library as a call to fcntl(2). With this implementation, there is no interaction between the types of lock placed by **flock**() and fcntl(2), and **flock**() does not detect deadlock. (Note, however, that on some systems, such as the modern BSDs, **flock**() and fcntl(2) locks *do* interact with one another.)

In Linux kernels up to 2.6.11, **flock**() does not lock files over NFS (i.e., the scope of locks was limited to the local system). Instead, one could use fcntl(2) byte-range locking, which does work over NFS, given a sufficiently recent version of Linux and a server which supports locking. Since Linux 2.6.12, NFS clients support **flock**()

locks by emulating them as byte-range locks on the entire file. This means that fcntl(2) and **flock**() locks *do* interact with one another over NFS. Since Linux 2.6.37, the kernel supports a compatibility mode that allows **flock**() locks (and also fcntl(2) byte region locks) to be treated as local; see the discussion of the *local_lock* option in nfs(5).

flock() places advisory locks only; given suitable permissions on a file, a process is free to ignore the use of **flock**() and perform I/O on the file.

flock() and fcntl(2) locks have different semantics with respect to forked processes and dup(2). On systems that implement **flock**() using fcntl(2), the semantics of **flock**() will be different from those described in this manual page.

Converting a lock (shared to exclusive, or vice versa) is not guaranteed to be atomic: the existing lock is first removed, and then a new lock is established. Between these two steps, a pending lock request by another process may be granted, with the result that the conversion either blocks, or fails if **LOCK_NB** was specified. (This is the original BSD behavior, and occurs on many other implementations.)

SEE ALSO

top

flock(1), close(2), dup(2), execve(2), fcntl(2), fork(2), open(2), lockf(3), lslocks(8)

Documentation/filesystems/locks.txt in the Linux kernel source tree (*Documentation/locks.txt* in older kernels)

COLOPHON

top

This page is part of release 4.08 of the Linux *man-pages* project. A description of the project, information about reporting bugs, and the latest version of this page, can be found at https://www.kernel.org/doc/man-pages/.

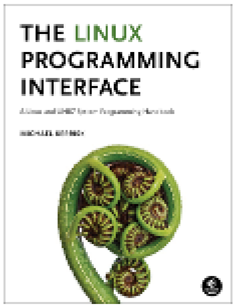
Linux **2016-03-15** **FLOCK(2)**

Copyright and license for this manual page

HTML rendering created 2016-10-08 by Michael Kerrisk, author of *The Linux Programming Interface*, maintainer of the Linux *man-pages* project.

For details of in-depth **Linux/UNIX system programming training courses** that I teach, look here.

Hosting by jambit GmbH.


THE LINUX
PROGRAMMING
INTERFACE
A Linux and UNIX System Programming Handbook
MICHAEL KERRISK