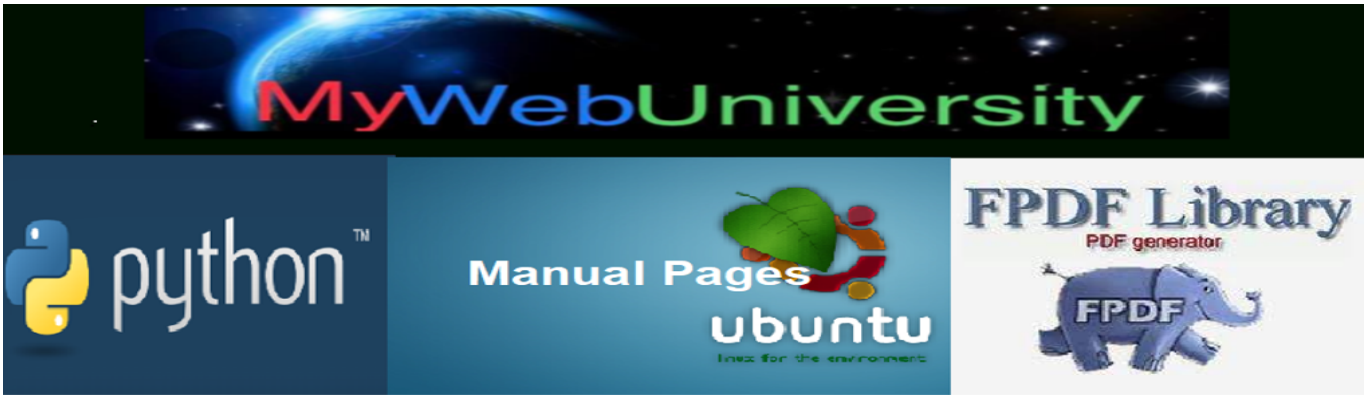

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Rocky Enterprise Linux 9.2 Manual Pages on command 'chmod.2'

$ man chmod.2

CHMOD(2) Linux Programmer's Manual CHMOD(2)

NAME

chmod, fchmod, fchmodat - change permissions of a file

SYNOPSIS

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

int chmod(const char *pathname, mode_t mode);

int fchmod(int fd, mode_t mode);

#include <fcntl.h>          /* Definition of AT_* constants */

#include <sys/stat.h>

int fchmodat(int dirfd, const char *pathname, mode_t mode, int flags);
```

Feature Test Macro Requirements for glibc (see feature_test_macros(7)):

fchmod():

Since glibc 2.24:

_POSIX_C_SOURCE >= 199309L

Glibc 2.19 to 2.23

_POSIX_C_SOURCE

Glibc 2.16 to 2.19:

_BSD_SOURCE || _POSIX_C_SOURCE

Glibc 2.12 to 2.16:

_BSD_SOURCE || _XOPEN_SOURCE >= 500 ||

_POSIX_C_SOURCE >= 200809L

Glibc 2.11 and earlier:

_BSD_SOURCE || _XOPEN_SOURCE >= 500

fchmodat():

Since glibc 2.10:

_POSIX_C_SOURCE >= 200809L

Before glibc 2.10:

_ATFILE_SOURCE

DESCRIPTION

The chmod() and fchmod() system calls change a files mode bits. (The file mode consists of the file permission bits plus the set-user-ID, set-group-ID, and sticky bits.) These system calls differ only in how the file is specified:

* chmod() changes the mode of the file specified whose pathname is given in pathname, which is dereferenced if it is a symbolic link.
* fchmod() changes the mode of the file referred to by the open file descriptor fd.

The new file mode is specified in mode, which is a bit mask created by ORing together zero or more of the following:

S_ISUID (04000) set-user-ID (set process effective user ID on execve(2))

S_ISGID (02000) set-group-ID (set process effective group ID on execve(2); mandatory locking, as described in fcntl(2); take a new file's group from parent directory, as described in chown(2) and mkdir(2))

S_ISVTX (01000) sticky bit (restricted deletion flag, as described in unlink(2))

S_IRUSR (00400) read by owner

S_IWUSR (00200) write by owner

S_IXUSR (00100) execute/search by owner ("search" applies for directories, and means that entries within the directory can be accessed)

S_IRGRP (00040) read by group

S_IWGRP (00020) write by group

S_IXGRP (00010) execute/search by group

S_IROTH (00004) read by others

S_IWOTH (00002) write by others

S_IXOTH (00001) execute/search by others

The effective UID of the calling process must match the owner of the file, or the process must be privileged (Linux: it must have the CAP_FOWNER capability).

If the calling process is not privileged (Linux: does not have the CAP_FSETID capability), and the group of the file does not match the effective group ID of the process or one of

its supplementary group IDs, the S_ISGID bit will be turned off, but this will not cause an error to be returned.

As a security measure, depending on the filesystem, the set-user-ID and set-group-ID execution bits may be turned off if a file is written. (On Linux, this occurs if the writing process does not have the CAP_FSETID capability.) On some filesystems, only the superuser can set the sticky bit, which may have a special meaning. For the sticky bit, and for set-user-ID and set-group-ID bits on directories, see inode(7).

On NFS filesystems, restricting the permissions will immediately influence already open files, because the access control is done on the server, but open files are maintained by the client. Widening the permissions may be delayed for other clients if attribute caching is enabled on them.

fchmodat()

The fchmodat() system call operates in exactly the same way as chmod(), except for the differences described here.

If the pathname given in pathname is relative, then it is interpreted relative to the directory referred to by the file descriptor dirfd (rather than relative to the current working directory of the calling process, as is done by chmod() for a relative pathname).

If pathname is relative and dirfd is the special value AT_FDCWD, then pathname is interpreted relative to the current working directory of the calling process (like chmod()).

If pathname is absolute, then dirfd is ignored.

flags can either be 0, or include the following flag:

AT_SYMLINK_NOFOLLOW

If pathname is a symbolic link, do not dereference it: instead operate on the link itself. This flag is not currently implemented.

See openat(2) for an explanation of the need for fchmodat().

RETURN VALUE

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

ERRORS

Depending on the filesystem, errors other than those listed below can be returned.

The more general errors for chmod() are listed below:

EACCES Search permission is denied on a component of the path prefix. (See also path_resolution(7).)

EFAULT pathname points outside your accessible address space.

EIO An I/O error occurred.

ELOOP Too many symbolic links were encountered in resolving pathname.

ENAMETOOLONG

pathname is too long.

ENOENT The file does not exist.

ENOMEM Insufficient kernel memory was available.

ENOTDIR

A component of the path prefix is not a directory.

EPERM The effective UID does not match the owner of the file, and the process is not

privileged (Linux: it does not have the CAP_FOWNER capability).

EPERM The file is marked immutable or append-only. (See ioctl_iflags(2).)

EROFS The named file resides on a read-only filesystem.

The general errors for fchmod() are listed below:

EBADF The file descriptor fd is not valid.

EIO See above.

EPERM See above.

EROFS See above.

The same errors that occur for chmod() can also occur for fchmodat(). The following addi?

tional errors can occur for fchmodat():

EBADF dirfd is not a valid file descriptor.

EINVAL Invalid flag specified in flags.

ENOTDIR

pathname is relative and dirfd is a file descriptor referring to a file other than

a directory.

ENOTSUP

flags specified AT_SYMLINK_NOFOLLOW, which is not supported.

VERSIONS

fchmodat() was added to Linux in kernel 2.6.16; library support was added to glibc in ver?

sion 2.4.

CONFORMING TO

chmod(), fchmod(): 4.4BSD, SVr4, POSIX.1-2001i, POSIX.1-2008.

fchmodat(): POSIX.1-2008.

NOTES

C library/kernel differences

The GNU C library fchmodat() wrapper function implements the POSIX-specified interface de?scribed in this page. This interface differs from the underlying Linux system call, which does not have a flags argument.

Glibc notes

On older kernels where fchmodat() is unavailable, the glibc wrapper function falls back to the use of chmod(). When pathname is a relative pathname, glibc constructs a pathname based on the symbolic link in /proc/self/fd that corresponds to the dirfd argument.

SEE ALSO

chmod(1), chown(2), execve(2), open(2), stat(2), inode(7), path_resolution(7), symlink(7)

COLOPHON

This page is part of release 5.10 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/.