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Red Hat Enterprise Linux Release 9.2 Manual Pages on 'execveat.2' command

$ man execveat.2

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

NAME

execveat - execute program relative to a directory file descriptor

SYNOPSIS

#include <unistd.h>

int execveat(int dirfd, const char *pathname,

char *const argv[], char *const envp[],

int flags);

DESCRIPTION

The execveat() system call executes the program referred to by the com?

bination of dirfd and pathname. It operates in exactly the same way as

execve(2), except for the differences described in this manual page.

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 execve(2) 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 execve(2)).

If pathname is absolute, then dirfd is ignored.

If pathname is an empty string and the AT_EMPTY_PATH flag is specified,

then the file descriptor dirfd specifies the file to be executed (i.e.,

dirfd refers to an executable file, rather than a directory).

The flags argument is a bit mask that can include zero or more of the following flags:

AT_EMPTY_PATH

If pathname is an empty string, operate on the file referred to by dirfd (which may have been obtained using the open(2) O_PATH flag).

AT_SYMLINK_NOFOLLOW

If the file identified by dirfd and a non-NULL pathname is a symbolic link, then the call fails with the error ELOOP.

RETURN VALUE

On success, execveat() does not return. On error, -1 is returned, and errno is set appropriately.

ERRORS

The same errors that occur for execve(2) can also occur for execveat().

The following additional errors can occur for execveat():

EBADF dirfd is not a valid file descriptor.

EINVAL Invalid flag specified in flags.

ELOOP flags includes AT_SYMLINK_NOFOLLOW and the file identified by dirfd and a non-NULL pathname is a symbolic link.

ENOENT The program identified by dirfd and pathname requires the use of an interpreter program (such as a script starting with "#!"), but the file descriptor dirfd was opened with the O_CLOEXEC flag, with the result that the program file is inaccessible to the launched interpreter. See BUGS.

ENOTDIR

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

VERSIONS

execveat() was added to Linux in kernel 3.19. GNU C library support is pending.

CONFORMING TO

The execveat() system call is Linux-specific.

NOTES

In addition to the reasons explained in openat(2), the execveat() system call is also needed to allow fexecve(3) to be implemented on systems that do not have the /proc filesystem mounted.

When asked to execute a script file, the argv[0] that is passed to the script interpreter is a string of the form /dev/fd/N or /dev/fd/N/P, where N is the number of the file descriptor passed via the dirfd argument. A string of the first form occurs when AT_EMPTY_PATH is employed. A string of the second form occurs when the script is specified via both dirfd and pathname; in this case, P is the value given in pathname.

For the same reasons described in fexecve(3), the natural idiom when using execveat() is to set the close-on-exec flag on dirfd. (But see BUGS.)

BUGS

The ENOENT error described above means that it is not possible to set the close-on-exec flag on the file descriptor given to a call of the form:

```
execveat(fd, "", argv, envp, AT_EMPTY_PATH);
```

However, the inability to set the close-on-exec flag means that a file descriptor referring to the script leaks through to the script itself. As well as wasting a file descriptor, this leakage can lead to file-descriptor exhaustion in scenarios where scripts recursively employ execveat().

SEE ALSO

execve(2), openat(2), fexecve(3)

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/.