



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

C:\>man pidfd_send_signal.2

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

NAME

pidfd_send_signal - send a signal to a process specified by a file descriptor

SYNOPSIS

```
#include <signal.h>

int pidfd_send_signal(int pidfd, int sig, siginfo_t *info,
                     unsigned int flags);
```

DESCRIPTION

The `pidfd_send_signal()` system call sends the signal `sig` to the target process referred to by `pidfd`, a PID file descriptor that refers to a process.

If the `info` argument points to a `siginfo_t` buffer, that buffer should be populated as described in `rt_sigqueueinfo(2)`.

If the `info` argument is a NULL pointer, this is equivalent to specifying a pointer to a `siginfo_t` buffer whose fields match the values that are implicitly supplied when a signal is sent using `kill(2)`:

- * `si_signo` is set to the signal number;
- * `si_errno` is set to 0;
- * `si_code` is set to `SI_USER`;
- * `si_pid` is set to the caller's PID; and
- * `si_uid` is set to the caller's real user ID.

The calling process must either be in the same PID namespace as the process referred to by `pidfd`, or be in an ancestor of that namespace.

The flags argument is reserved for future use; currently, this argument must be specified as 0.

RETURN VALUE

On success, `pidfd_send_signal()` returns 0. On error, -1 is returned and `errno` is set to indicate the cause of the error.

ERRORS

`EBADF` `pidfd` is not a valid PID file descriptor.

`EINVAL` `sig` is not a valid signal.

`EINVAL` The calling process is not in a PID namespace from which it can send a signal to the target process.

`EINVAL` `flags` is not 0.

`EPERM` The calling process does not have permission to send the signal to the target process.

`EPERM` `pidfd` doesn't refer to the calling process, and `info.si_code` is invalid (see `rt_sigqueueinfo(2)`).

`ESRCH` The target process does not exist (i.e., it has terminated and been waited on).

VERSIONS

`pidfd_send_signal()` first appeared in Linux 5.1.

CONFORMING TO

`pidfd_send_signal()` is Linux specific.

NOTES

Currently, there is no glibc wrapper for this system call; call it using `syscall(2)`.

PID file descriptors

The `pidfd` argument is a PID file descriptor, a file descriptor that refers to a process. Such a file descriptor can be obtained in any of the following ways:

- * by opening a `/proc/[pid]` directory;
- * using `pidfd_open(2)`; or
- * via the PID file descriptor that is returned by a call to `clone(2)` or `clone3(2)` that specifies the `CLONE_PIDFD` flag.

The `pidfd_send_signal()` system call allows the avoidance of race conditions that occur when using traditional interfaces (such as `kill(2)`) to signal a process. The

problem is that the traditional interfaces specify the target process via a process ID (PID), with the result that the sender may accidentally send a signal to the wrong process if the originally intended target process has terminated and its PID has been recycled for another process. By contrast, a PID file descriptor is a stable reference to a specific process; if that process terminates, `pidfd_send_signal()` fails with the error `ESRCH`.

EXAMPLE

```
#define _GNU_SOURCE

#include <limits.h>

#include <signal.h>

#include <fcntl.h>

#include <stdio.h>

#include <string.h>

#include <stdlib.h>

#include <unistd.h>

#include <sys/syscall.h>

#ifndef __NR_pidfd_send_signal

#define __NR_pidfd_send_signal 424

#endif

static int

pidfd_send_signal(int pidfd, int sig, siginfo_t *info,

    unsigned int flags)

{

    return syscall(__NR_pidfd_send_signal, pidfd, sig, info, flags);

}

int

main(int argc, char *argv[])

{

    siginfo_t info;

    char path[PATH_MAX];

    int pidfd, sig;

    if (argc != 3) {

        fprintf(stderr, "Usage: %s <pid> <signal>\n", argv[0]);
```

```

    exit(EXIT_FAILURE);
}
sig = atoi(argv[2]);
/* Obtain a PID file descriptor by opening the /proc/PID directory
   of the target process */
snprintf(path, sizeof(path), "/proc/%s", argv[1]);
pidfd = open(path, O_RDONLY);
if (pidfd == -1) {
    perror("open");
    exit(EXIT_FAILURE);
}
/* Populate a 'siginfo_t' structure for use with
   pidfd_send_signal() */
memset(&info, 0, sizeof(info));
info.si_code = SI_QUEUE;
info.si_signo = sig;
info.si_errno = 0;
info.si_uid = getuid();
info.si_pid = getpid();
info.si_value.sival_int = 1234;
/* Send the signal */
if (pidfd_send_signal(pidfd, sig, &info, 0) == -1) {
    perror("pidfd_send_signal");
    exit(EXIT_FAILURE);
}
exit(EXIT_SUCCESS);
}

```

SEE ALSO

clone(2), kill(2), pidfd_open(2), rt_sigqueueinfo(2), sigaction(2), pid_name?
spaces(7), signal(7)

COLOPHON

This page is part of release 5.05 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

2019-09-19

PIDFD_SEND_SIGNAL(2)