

NAME

pdfork, **pdgetpid**, **pdkill** - System calls to manage process descriptors

LIBRARY

Standard C Library (libc, -lc)

SYNOPSIS

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

pid_t

```
pdfork(int *fdp, int flags);
```

int

```
pdgetpid(int fd, pid_t *pidp);
```

int

```
pdkill(int fd, int signum);
```

DESCRIPTION

Process descriptors are special file descriptors that represent processes, and are created using **pdfork()**, a variant of `fork(2)`, which, if successful, returns a process descriptor in the integer pointed to by *fdp*.

Processes created via **pdfork()** will not cause SIGCHLD on termination. **pdfork()** can accept the flags:

PD_DAEMON Instead of the default terminate-on-close behaviour, allow the process to live until it is explicitly killed with `kill(2)`.

This option is not permitted in capsicum(4) capability mode (see `cap_enter(2)`).

PD_CLOEXEC

Set close-on-exec on process descriptor.

pdgetpid() queries the process ID (PID) in the process descriptor *fd*.

pdkill() is functionally identical to `kill(2)`, except that it accepts a process descriptor, *fd*, rather than a PID.

The following system calls also have effects specific to process descriptors:

`fstat(2)` queries status of a process descriptor; currently only the *st_mode*, *st_birthtime*, *st_atime*, *st_ctime* and *st_mtime* fields are defined. If the owner read, write, and execute bits are set then the

process represented by the process descriptor is still alive.

`poll(2)` and `select(2)` allow waiting for process state transitions; currently only `POLLHUP` is defined, and will be raised when the process dies. Process state transitions can also be monitored using `kqueue(2)` filter `EVFILT_PROCDESC`; currently only `NOTE_EXIT` is implemented.

`close(2)` will close the process descriptor unless `PD_DAEMON` is set; if the process is still alive and this is the last reference to the process descriptor, the process will be terminated with the signal `SIGKILL`.

RETURN VALUES

`pdfork()` returns a PID, 0 or -1, as `fork(2)` does.

`pdgetpid()` and `pdkill()` return 0 on success and -1 on failure.

ERRORS

These functions may return the same error numbers as their PID-based equivalents (e.g. `pdfork()` may return the same error numbers as `fork(2)`), with the following additions:

[EINVAL] The signal number given to `pdkill()` is invalid.

[ENOTCAPABLE] The process descriptor being operated on has insufficient rights (e.g. `CAP_PDKILL` for `pdkill()`).

SEE ALSO

`close(2)`, `fork(2)`, `fstat(2)`, `kill(2)`, `kqueue(2)`, `poll(2)`, `wait4(2)`, `capsicum(4)`, `procdesc(4)`

HISTORY

The `pdfork()`, `pdgetpid()`, and `pdkill()` system calls first appeared in FreeBSD 9.0.

Support for process descriptors mode was developed as part of the TrustedBSD Project.

AUTHORS

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