

**NAME**

**pidfile\_open**, **pidfile\_write**, **pidfile\_close**, **pidfile\_remove** - library for PID files handling

**LIBRARY**

System Utilities Library (libutil, -lutil)

**SYNOPSIS**

```
#include <libutil.h>
```

```
struct pidfh *
```

```
pidfile_open(const char *path, mode_t mode, pid_t *pidptr);
```

```
int
```

```
pidfile_write(struct pidfh *pfh);
```

```
int
```

```
pidfile_close(struct pidfh *pfh);
```

```
int
```

```
pidfile_remove(struct pidfh *pfh);
```

```
int
```

```
pidfile_fileno(struct pidfh *pfh);
```

**DESCRIPTION**

The **pidfile** family of functions allows daemons to handle PID files. It uses `flopen(3)` to lock a pidfile and detect already running daemons.

The **pidfile\_open()** function opens (or creates) a file specified by the *path* argument and locks it. If *pidptr* argument is not NULL and file can not be locked, the function will use it to store a PID of an already running daemon or -1 in case daemon did not write its PID yet. The function does not write process' PID into the file here, so it can be used before **fork()**ing and exit with a proper error message when needed. If the *path* argument is NULL, `/var/run/<progname>.pid` file will be used. The **pidfile\_open()** function sets the O\_CLOEXEC close-on-exec flag when opening the pidfile.

The **pidfile\_write()** function writes process' PID into a previously opened file. The file is truncated before write, so calling the **pidfile\_write()** function multiple times is supported.

The **pidfile\_close()** function closes a pidfile. It should be used after daemon **fork()**s to start a child process.

The **pidfile\_remove()** function closes and removes a pidfile.

The **pidfile\_fileno()** function returns the file descriptor for the open pidfile.

## RETURN VALUES

The **pidfile\_open()** function returns a valid pointer to a *pidfh* structure on success, or NULL if an error occurs. If an error occurs, *errno* will be set.

The **pidfile\_write()**, **pidfile\_close()**, and **pidfile\_remove()** functions return the value 0 if successful; otherwise the value -1 is returned and the global variable *errno* is set to indicate the error.

The **pidfile\_fileno()** function returns the low-level file descriptor. It returns -1 and sets *errno* if a NULL *pidfh* is specified, or if the pidfile is no longer open.

## EXAMPLES

The following example shows in which order these functions should be used. Note that it is safe to pass NULL to **pidfile\_write()**, **pidfile\_remove()**, **pidfile\_close()** and **pidfile\_fileno()** functions.

```
struct pidfh *pfh;
pid_t otherpid, childpid;

pfh = pidfile_open("/var/run/daemon.pid", 0600, &otherpid);
if (pfh == NULL) {
    if (errno == EEXIST) {
        errx(EXIT_FAILURE, "Daemon already running, pid: %jd.",
            (intmax_t)otherpid);
    }
    /* If we cannot create pidfile from other reasons, only warn. */
    warn("Cannot open or create pidfile");
    /*
     * Even though pfh is NULL we can continue, as the other pidfile_*
     * function can handle such situation by doing nothing except setting
     * errno to EDOOFUS.
     */
}

if (daemon(0, 0) == -1) {
    warn("Cannot daemonize");
    pidfile_remove(pfh);
    exit(EXIT_FAILURE);
}
```

```
}

pidfile_write(pfh);

for (;;) {
    /* Do work. */
    childpid = fork();
    switch (childpid) {
    case -1:
        syslog(LOG_ERR, "Cannot fork(): %s.", strerror(errno));
        break;
    case 0:
        pidfile_close(pfh);
        /* Do child work. */
        break;
    default:
        syslog(LOG_INFO, "Child %jd started.", (intmax_t)childpid);
        break;
    }
}

pidfile_remove(pfh);
exit(EXIT_SUCCESS);
```

## ERRORS

The **pidfile\_open()** function will fail if:

- [EEXIST]           Some process already holds the lock on the given pidfile, meaning that a daemon is already running. If *pidptr* argument is not NULL the function will use it to store a PID of an already running daemon or -1 in case daemon did not write its PID yet.
- [ENAMETOOLONG]    Specified pidfile's name is too long.
- [EINVAL]           Some process already holds the lock on the given pidfile, but PID read from there is invalid.

The **pidfile\_open()** function may also fail and set *errno* for any errors specified for the `fstat(2)`, `open(2)`, and `read(2)` calls.

The **pidfile\_write()** function will fail if:

[EDOOOFUS]           Improper function use. Probably called before **pidfile\_open()**.

The **pidfile\_write()** function may also fail and set *errno* for any errors specified for the `fstat(2)`, `ftruncate(2)`, and `write(2)` calls.

The **pidfile\_close()** function may fail and set *errno* for any errors specified for the `close(2)` and `fstat(2)` calls.

The **pidfile\_remove()** function will fail if:

[EDOOOFUS]           Improper function use. Probably called not from the process which made **pidfile\_write()**.

The **pidfile\_remove()** function may also fail and set *errno* for any errors specified for the `close(2)`, `fstat(2)`, `write(2)`, and `unlink(2)` system calls and the `flopen(3)` library function.

The **pidfile\_fileno()** function will fail if:

[EDOOOFUS]           Improper function use. Probably called not from the process which used **pidfile\_open()**.

## SEE ALSO

`open(2)`, `daemon(3)`, `flopen(3)`

## HISTORY

The functions **pidfile\_open()**, **pidfile\_write()**, **pidfile\_close()** and **pidfile\_remove()** first appeared in FreeBSD 5.5.

## AUTHORS

The **pidfile** functionality is based on ideas from John-Mark Gurney <[jmg@FreeBSD.org](mailto:jmg@FreeBSD.org)>.

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