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

\$ man rt_sigtimedwait.2

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

NAME

sigwaitinfo, sigtimedwait, rt_sigtimedwait - synchronously wait for queued signals

SYNOPSIS

```
#include <signal.h>

int sigwaitinfo(const sigset_t *set, siginfo_t *info);

int sigtimedwait(const sigset_t *set, siginfo_t *info,
                 const struct timespec *timeout);
```

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

```
sigwaitinfo(), sigtimedwait(): _POSIX_C_SOURCE >= 199309L
```

DESCRIPTION

sigwaitinfo() suspends execution of the calling thread until one of the signals in set is pending (If one of the signals in set is already pending for the calling thread, sigwaitinfo() will return immediately.) sigwaitinfo() removes the signal from the set of pending signals and returns the signal number as its function result. If the info argument is not NULL, then the buffer that it points to is used to return a

structure of type `siginfo_t` (see `sigaction(2)`) containing information about the signal.

If multiple signals in `set` are pending for the caller, the signal that is retrieved by `sigwaitinfo()` is determined according to the usual ordering rules; see `signal(7)` for further details.

`sigtimedwait()` operates in exactly the same way as `sigwaitinfo()` except that it has an additional argument, `timeout`, which specifies the interval for which the thread is suspended waiting for a signal. (This interval will be rounded up to the system clock granularity, and kernel scheduling delays mean that the interval may overrun by a small amount.) This argument is of the following type:

```
struct timespec {
    long   tv_sec;    /* seconds */
    long   tv_nsec;   /* nanoseconds */
}
```

If both fields of this structure are specified as 0, a poll is performed: `sigtimedwait()` returns immediately, either with information about a signal that was pending for the caller, or with an error if none of the signals in `set` was pending.

RETURN VALUE

On success, both `sigwaitinfo()` and `sigtimedwait()` return a signal number (i.e., a value greater than zero). On failure both calls return -1, with `errno` set to indicate the error.

ERRORS

EAGAIN No signal in `set` was became pending within the `timeout` period specified to `sigtimedwait()`.

EINTR The wait was interrupted by a signal handler; see `signal(7)`.
(This handler was for a signal other than one of those in `set`.)

EINVAL `timeout` was invalid.

CONFORMING TO

POSIX.1-2001, POSIX.1-2008.

NOTES

In normal usage, the calling program blocks the signals in `set` via a

prior call to `sigprocmask(2)` (so that the default disposition for these signals does not occur if they become pending between successive calls to `sigwaitinfo()` or `sigtimedwait()`) and does not establish handlers for these signals. In a multithreaded program, the signal should be blocked in all threads, in order to prevent the signal being treated according to its default disposition in a thread other than the one calling `sigwaitinfo()` or `sigtimedwait()`.

The set of signals that is pending for a given thread is the union of the set of signals that is pending specifically for that thread and the set of signals that is pending for the process as a whole (see `signal(7)`).

Attempts to wait for `SIGKILL` and `SIGSTOP` are silently ignored.

If multiple threads of a process are blocked waiting for the same signal(s) in `sigwaitinfo()` or `sigtimedwait()`, then exactly one of the threads will actually receive the signal if it becomes pending for the process as a whole; which of the threads receives the signal is indeterminate.

`sigwaitinfo()` or `sigtimedwait()`, can't be used to receive signals that are synchronously generated, such as the `SIGSEGV` signal that results from accessing an invalid memory address or the `SIGFPE` signal that results from an arithmetic error. Such signals can be caught only via signal handler.

POSIX leaves the meaning of a `NULL` value for the timeout argument of `sigtimedwait()` unspecified, permitting the possibility that this has the same meaning as a call to `sigwaitinfo()`, and indeed this is what is done on Linux.

C library/kernel differences

On Linux, `sigwaitinfo()` is a library function implemented on top of `sigtimedwait()`.

The glibc wrapper functions for `sigwaitinfo()` and `sigtimedwait()` silently ignore attempts to wait for the two real-time signals that are used internally by the NPTL threading implementation. See `nptl(7)` for details.

The original Linux system call was named `sigtimedwait()`. However, with the addition of real-time signals in Linux 2.2, the fixed-size, 32-bit `sigset_t` type supported by that system call was no longer fit for purpose. Consequently, a new system call, `rt_sigtimedwait()`, was added to support an enlarged `sigset_t` type. The new system call takes a fourth argument, `size_t sigsetsize`, which specifies the size in bytes of the signal set in `set`. This argument is currently required to have the value `sizeof(sigset_t)` (or the error `EINVAL` results). The `glibc` `sigtimedwait()` wrapper function hides these details from us, transparently calling `rt_sigtimedwait()` when the kernel provides it.

SEE ALSO

`kill(2)`, `sigaction(2)`, `signal(2)`, `signalfd(2)`, `sigpending(2)`, `sigproc?`
`mask(2)`, `sigqueue(3)`, `sigsetops(3)`, `sigwait(3)`, `signal(7)`, `time(7)`

COLOPHON

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