

**NAME**

**signal, SIGADDSET, SIGDELSET, SETEMPTYSET, SIGFILLSET, SIGISMEMBER, SIGISEMPTY, SIGNOTEMPTY, SIGSETEQ, SIGSETNEQ, SIGSETOR, SIGSETAND, SIGSETNAND, SIGSETCANTMASK, SIG\_STOPSIGMASK, SIG\_CONTSIGMASK, SIGPENDING, cursig, execsig, issignal, killproc, pgsigio, postsig, sigexit, siginit, signotify, trapsignal** - kernel signal functions

**SYNOPSIS**

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

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

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

*void*

```
SIGADDSET(sigset_t set, int signo);
```

*void*

```
SIGDELSET(sigset_t set, int signo);
```

*void*

```
SIGEMPTYSET(sigset_t set);
```

*void*

```
SIGFILLSET(sigset_t set);
```

*int*

```
SIGISMEMBER(sigset_t set, int signo);
```

*int*

```
SIGISEMPTY(sigset_t set);
```

*int*

```
SIGNOTEMPTY(sigset_t set);
```

*int*

```
SIGSETEQ(sigset_t set1, sigset_t set2);
```

*int*

```
SIGSETNEQ(sigset_t set1, sigset_t set2);
```

*void*

```
SIGSETOR(sigset_t set1, sigset_t set2);
```

*void*

**SIGSETAND**(*sigset\_t set1, sigset\_t set2*);

*void*

**SIGSETNAND**(*sigset\_t set1, sigset\_t set2*);

*void*

**SIG\_CANTMASK**(*sigset\_t set*);

*void*

**SIG\_STOPSIGMASK**(*sigset\_t set*);

*void*

**SIG\_CONTSIGMASK**(*sigset\_t set*);

*int*

**SIGPENDING**(*struct proc \*p*);

*int*

**cursig**(*struct thread \*td*);

*void*

**execsigs**(*struct proc \*p*);

*int*

**issignal**(*struct thread \*td*);

*void*

**killproc**(*struct proc \*p, char \*why*);

*void*

**pgsigio**(*struct sigio \*\*sigiop, int sig, int checkctty*);

*void*

**postsig**(*int sig*);

*void*

**sigexit**(*struct thread \*td, int signum*);

*void*

**siginit**(*struct proc \*p*);

*void*

**signotify**(*struct thread \*td*);

*void*

**trapsignal**(*struct thread \*td, int sig, u\_long code*);

## DESCRIPTION

The **SIGADDSET**() macro adds *signo* to *set*. No effort is made to ensure that *signo* is a valid signal number.

The **SIGDELSET**() macro removes *signo* from *set*. No effort is made to ensure that *signo* is a valid signal number.

The **SIGEMPTYSET**() macro clears all signals in *set*.

The **SIGFILLSET**() macro sets all signals in *set*.

The **SIGISMEMBER**() macro determines if *signo* is set in *set*.

The **SIGISEMPTY**() macro determines if *set* does not have any signals set.

The **SIGNOTEMPTY**() macro determines if *set* has any signals set.

The **SIGSETEQ**() macro determines if two signal sets are equal; that is, the same signals are set in both.

The **SIGSETNEQ**() macro determines if two signal sets differ; that is, if any signal set in one is not set in the other.

The **SIGSETOR**() macro ORs the signals set in *set2* into *set1*.

The **SIGSETAND**() macro ANDs the signals set in *set2* into *set1*.

The **SIGSETNAND**() macro NANDs the signals set in *set2* into *set1*.

The **SIG\_CANTMASK**() macro clears the SIGKILL and SIGSTOP signals from *set*. These two signals cannot be blocked or caught and **SIG\_CANTMASK**() is used in code where signals are manipulated to ensure this policy is enforced.

The **SIG\_STOPSIGMASK()** macro clears the SIGSTOP, SIGTSTP, SIGTTIN, and SIGTTOU signals from *set*. **SIG\_STOPSIGMASK()** is used to clear stop signals when a process is waiting for a child to exit or exec, and when a process is continuing after having been suspended.

The **SIG\_CONTSIGMASK()** macro clears the SIGCONT signal from *set*. **SIG\_CONTSIGMASK()** is called when a process is stopped.

The **SIGPENDING()** macro determines if the given process has any pending signals that are not masked. If the process has a pending signal and the process is currently being traced, **SIGPENDING()** will return true even if the signal is masked.

The **currsig()** function returns the signal number that should be delivered to process *td->td\_proc*. If there are no signals pending, zero is returned.

The **execsig()** function resets the signal set and signal stack of a process in preparation for an *execve(2)*. The process lock for *p* must be held before **execsig()** is called.

The **issignal()** function determines if there are any pending signals for process *td->td\_proc* that should be caught, or cause this process to terminate or interrupt its current system call. If process *td->td\_proc* is currently being traced, ignored signals will be handled and the process is always stopped. Stop signals are handled and cleared right away by **issignal()** unless the process is a member of an orphaned process group and the stop signal originated from a TTY. The process spin lock for *td->td\_proc* may be acquired and released. The *sigacts* structure *td->td\_proc->p\_sigacts* must be locked before calling **issignal()** and may be released and reacquired during the call. The process lock for *td->td\_proc* must be acquired before calling **issignal()** and may be released and reacquired during the call. Default signal actions are not taken for system processes and init.

The **killproc()** function delivers SIGKILL to *p*. *why* is logged as the reason *why* the process was killed.

The **pgsigio()** function sends the signal *sig* to the process or process group *sigiop->sio\_pgid*. If *checkctty* is non-zero, the signal is only delivered to processes in the process group that have a controlling terminal. If *sigiop->sio\_pgid* is for a process (> 0), the lock for *sigiop->sio\_proc* is acquired and released. If *sigiop->sio\_pgid* is for a process group (< 0), the process group lock for *sigiop->sio\_pgrp* is acquired and released. The lock *sigio\_lock* is acquired and released.

The **postsig()** function handles the actual delivery of the signal *sig*. **postsig()** is called from **ast()** after the kernel has been notified that a signal should be delivered (via a call to **signotify()**, which causes the flag PS\_NEEDSIGCHK to be set). The process lock for process that owns *curthread* must be held before **postsig()** is called, and the current process cannot be 0. The lock for the *p\_sigacts* field of the current process must be held before **postsig()** is called, and may be released and reacquired.

The **sigexit()** function causes the process that owns *td* to exit with a return value of signal number *sig*. If required, the process will dump core. The process lock for the process that owns *td* must be held before **sigexit()** is called.

The **siginit()** function is called during system initialization to cause every signal with a default property of SA\_IGNORE (except SIGCONT) to be ignored by *p*. The process lock for *p* is acquired and released, as is the lock for sigacts structure *p->p\_sigacts*. The only process that **siginit()** is ever called for is *proc0*.

The **signotify()** function flags that there are unmasked signals pending that **ast()** should handle. The process lock for process *td->td\_proc* must be held before **signotify()** is called, and the thread lock is acquired and released.

The **trapsignal()** function sends a signal that is the result of a trap to process *td->td\_proc*. If the process is not being traced and the signal can be delivered immediately, **trapsignal()** will deliver it directly; otherwise, **trapsignal()** will call **psignal(9)** to cause the signal to be delivered. The process lock for *td->td\_proc* is acquired and released. The lock for the *p\_sigacts* field of *td->td\_proc* is acquired and released.

## RETURN VALUES

The **SIGISMEMBER()**, **SIGISEMPTY()**, **SIGNOTEMPTY()**, **SIGSETEQ()**, **SIGSETNEQ()**, and **SIGPENDING()** macros all return non-zero (true) if the condition they are checking is found to be true; otherwise, zero (false) is returned.

The **cursig()** function returns either a valid signal number or zero.

**issignal()** returns either a valid signal number or zero.

## SEE ALSO

**pgsignal(9)**, **psignal(9)**

## AUTHORS

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