

NAME

`sem_init` – initialize an unnamed semaphore

SYNOPSIS

```
#include <semaphore.h>
```

```
int sem_init(sem_t *sem, int pshared, unsigned int value);
```

Link with `-pthread`.

DESCRIPTION

`sem_init()` initializes the unnamed semaphore at the address pointed to by *sem*. The *value* argument specifies the initial value for the semaphore.

The *pshared* argument indicates whether this semaphore is to be shared between the threads of a process, or between processes.

If *pshared* has the value 0, then the semaphore is shared between the threads of a process, and should be located at some address that is visible to all threads (e.g., a global variable, or a variable allocated dynamically on the heap).

If *pshared* is nonzero, then the semaphore is shared between processes, and should be located in a region of shared memory (see `shm_open(3)`, `mmap(2)`, and `shmget(2)`). (Since a child created by `fork(2)` inherits its parent's memory mappings, it can also access the semaphore.) Any process that can access the shared memory region can operate on the semaphore using `sem_post(3)`, `sem_wait(3)`, and so on.

Initializing a semaphore that has already been initialized results in undefined behavior.

RETURN VALUE

`sem_init()` returns 0 on success; on error, `-1` is returned, and *errno* is set to indicate the error.

ERRORS**EINVAL**

value exceeds `SEM_VALUE_MAX`.

ENOSYS

pshared is nonzero, but the system does not support process-shared semaphores (see `sem_overview(7)`).

ATTRIBUTES

For an explanation of the terms used in this section, see `attributes(7)`.

Interface	Attribute	Value
<code>sem_init()</code>	Thread safety	MT-Safe

CONFORMING TO

POSIX.1-2001.

NOTES

Bizarrely, POSIX.1-2001 does not specify the value that should be returned by a successful call to `sem_init()`. POSIX.1-2008 rectifies this, specifying the zero return on success.

SEE ALSO

`sem_destroy(3)`, `sem_post(3)`, `sem_wait(3)`, `sem_overview(7)`

COLOPHON

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