

NAME

shm_overview – overview of POSIX shared memory

DESCRIPTION

The POSIX shared memory API allows processes to communicate information by sharing a region of memory.

The interfaces employed in the API are:

- shm_open(3)** Create and open a new object, or open an existing object. This is analogous to **open(2)**. The call returns a file descriptor for use by the other interfaces listed below.
- ftruncate(2)** Set the size of the shared memory object. (A newly created shared memory object has a length of zero.)
- mmap(2)** Map the shared memory object into the virtual address space of the calling process.
- munmap(2)** Unmap the shared memory object from the virtual address space of the calling process.
- shm_unlink(3)** Remove a shared memory object name.
- close(2)** Close the file descriptor allocated by **shm_open(3)** when it is no longer needed.
- fstat(2)** Obtain a *stat* structure that describes the shared memory object. Among the information returned by this call are the object's size (*st_size*), permissions (*st_mode*), owner (*st_uid*), and group (*st_gid*).
- fchown(2)** To change the ownership of a shared memory object.
- fchmod(2)** To change the permissions of a shared memory object.

Versions

POSIX shared memory is supported since Linux 2.4 and glibc 2.2.

Persistence

POSIX shared memory objects have kernel persistence: a shared memory object will exist until the system is shut down, or until all processes have unmapped the object and it has been deleted with **shm_unlink(3)**

Linking

Programs using the POSIX shared memory API must be compiled with *cc -lrt* to link against the real-time library, *librt*.

Accessing shared memory objects via the filesystem

On Linux, shared memory objects are created in a (*tmpfs(5)*) virtual filesystem, normally mounted under */dev/shm*. Since kernel 2.6.19, Linux supports the use of access control lists (ACLs) to control the permissions of objects in the virtual filesystem.

NOTES

Typically, processes must synchronize their access to a shared memory object, using, for example, POSIX semaphores.

System V shared memory (**shmget(2)**, **shmop(2)**, etc.) is an older shared memory API. POSIX shared memory provides a simpler, and better designed interface; on the other hand POSIX shared memory is somewhat less widely available (especially on older systems) than System V shared memory.

SEE ALSO

fchmod(2), **fchown(2)**, **fstat(2)**, **ftruncate(2)**, **mmap(2)**, **mprotect(2)**, **munmap(2)**, **shmget(2)**, **shmop(2)**, **shm_open(3)**, **shm_unlink(3)**, **sem_overview(7)**

COLOPHON

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