

**NAME**

getpriority, setpriority – get/set program scheduling priority

**LIBRARY**

Standard C library (*libc*, *-lc*)

**SYNOPSIS**

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

```
int getpriority(int which, id_t who);
```

```
int setpriority(int which, id_t who, int prio);
```

**DESCRIPTION**

The scheduling priority of the process, process group, or user, as indicated by *which* and *who* is obtained with the **getpriority()** call and set with the **setpriority()** call. The process attribute dealt with by these system calls is the same attribute (also known as the "nice" value) that is dealt with by **nice(2)**.

The value *which* is one of **PRIO\_PROCESS**, **PRIO\_PGRP**, or **PRIO\_USER**, and *who* is interpreted relative to *which* (a process identifier for **PRIO\_PROCESS**, process group identifier for **PRIO\_PGRP**, and a user ID for **PRIO\_USER**). A zero value for *who* denotes (respectively) the calling process, the process group of the calling process, or the real user ID of the calling process.

The *prio* argument is a value in the range  $-20$  to  $19$  (but see NOTES below), with  $-20$  being the highest priority and  $19$  being the lowest priority. Attempts to set a priority outside this range are silently clamped to the range. The default priority is  $0$ ; lower values give a process a higher scheduling priority.

The **getpriority()** call returns the highest priority (lowest numerical value) enjoyed by any of the specified processes. The **setpriority()** call sets the priorities of all of the specified processes to the specified value.

Traditionally, only a privileged process could lower the nice value (i.e., set a higher priority). However, since Linux 2.6.12, an unprivileged process can decrease the nice value of a target process that has a suitable **RLIMIT\_NICE** soft limit; see **getrlimit(2)** for details.

**RETURN VALUE**

On success, **getpriority()** returns the calling thread's nice value, which may be a negative number. On error, it returns  $-1$  and sets *errno* to indicate the error.

Since a successful call to **getpriority()** can legitimately return the value  $-1$ , it is necessary to clear *errno* prior to the call, then check *errno* afterward to determine if  $-1$  is an error or a legitimate value.

**setpriority()** returns  $0$  on success. On failure, it returns  $-1$  and sets *errno* to indicate the error.

**ERRORS****EACCES**

The caller attempted to set a lower nice value (i.e., a higher process priority), but did not have the required privilege (on Linux: did not have the **CAP\_SYS\_NICE** capability).

**EINVAL**

*which* was not one of **PRIO\_PROCESS**, **PRIO\_PGRP**, or **PRIO\_USER**.

**EPERM**

A process was located, but its effective user ID did not match either the effective or the real user ID of the caller, and was not privileged (on Linux: did not have the **CAP\_SYS\_NICE** capability). But see NOTES below.

**ESRCH**

No process was located using the *which* and *who* values specified.

**STANDARDS**

POSIX.1-2001, POSIX.1-2008, SVr4, 4.4BSD (these interfaces first appeared in 4.2BSD).

**NOTES**

For further details on the nice value, see **sched(7)**.

*Note:* the addition of the "autogroup" feature in Linux 2.6.38 means that the nice value no longer has its

traditional effect in many circumstances. For details, see **sched(7)**.

A child created by **fork(2)** inherits its parent's nice value. The nice value is preserved across **execve(2)**.

The details on the condition for **EPERM** depend on the system. The above description is what POSIX.1-2001 says, and seems to be followed on all System V-like systems. Linux kernels before Linux 2.6.12 required the real or effective user ID of the caller to match the real user of the process *who* (instead of its effective user ID). Linux 2.6.12 and later require the effective user ID of the caller to match the real or effective user ID of the process *who*. All BSD-like systems (SunOS 4.1.3, Ultrix 4.2, 4.3BSD, FreeBSD 4.3, OpenBSD-2.5, ...) behave in the same manner as Linux 2.6.12 and later.

#### C library/kernel differences

The getpriority system call returns nice values translated to the range 40..1, since a negative return value would be interpreted as an error. The glibc wrapper function **forgetpriority()** translates the value back according to the formula  $unice = 20 - knice$  (thus, the 40..1 range returned by the kernel corresponds to the range -20..19 as seen by user space).

#### BUGS

According to POSIX, the nice value is a per-process setting. However, under the current Linux/NPTL implementation of POSIX threads, the nice value is a per-thread attribute: different threads in the same process can have different nice values. Portable applications should avoid relying on the Linux behavior, which may be made standards conformant in the future.

#### SEE ALSO

**nice(1)**, **renice(1)**, **fork(2)**, **capabilities(7)**, **sched(7)**

*Documentation/scheduler/sched-nice-design.txt* in the Linux kernel source tree (since Linux 2.6.23)