

## IEEE Standards Interpretation for IEEE Std 1003.1™-2001 IEEE Standard Standard for Information Technology -- Portable Operating System Interface (POSIX®)

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### Interpretation Request #83

**Topic:** pthread\_mutexattr\_setprotocol PTHREAD\_PRIO\_PROTECT **Relevant Sections:** XSH pthread\_mutexattr\_setprotocol

The description of the PTHREAD\_PRIO\_PROTECT mutex protocol have raised several questions.

1. Is it possible to set up by pthread\_setschedparam() or pthread\_setschedprio() the priority of the thread while the thread owns a mutex initialized with the PTHREAD\_PRIO\_PROTECT mutex protocol?

2.1. SHALL pthread\_mutex\_setprioceiling() fail with EDEADLK if the calling thread already owns the mutex?

2.2. If no, shall the new priority ceiling of the mutex impact the priority of the calling thread?

The description of the PTHREAD\_PRIO\_PROTECT mutex protocol functions/pthread\_mutexattr\_setprotocol.html] reads: "When a thread owns one or more mutexes initialized with the PTHREAD\_PRIO\_PROTECT protocol, it shall execute at the higher of its priority or the highest of the priority ceilings of all the mutexes owned by this thread and initialized with this attribute, regardless of whether other threads are blocked on any of these mutexes or not."

This quotation has as a consequence the following answers:

1. No, it is not. pthread\_setschedparam() or pthread\_setschedprio() shall fail. What er-

ror code is expected? EPERM?

2.1. Yes.

or

2.1. No.

2.2. Yes, in this case the priority of the calling thread shall be adjusted according the new priority ceiling of the mutex.

Is this interpretation correct?

I believe some clarification of the correlation between automatic modifications of the priority of the thread as a result of `pthread_mutex_lock()` call and explicit modifications of the priority by `pthread_setschedparam()` call is required.

### **Interpretation Response**

The standard clearly states the requirements, and conforming implementations must conform to this. No change is required.

Responses to specific questions raised are as follows:

Is this interpretation correct? No

1. Yes

2.1 Undefined

2.2. Does not apply

### **Rationale for Interpretation**

The working group felt that this is an unambiguous situation.