IEEE Standards Interpretations for IEEE Std 1003.1c™-1995 IEEE Standard for Information Technology--Portable Operating System Interface (POSIX(R)) - System Application Program Interface (API) Amendment 2: Threads Extension (C Language)

Interpretation Request #30
Topic: Thread Scheduling Functions, Description **Relevant Clauses:** 13.5.1.2

The standard currently requires that the pthread_attr_setschedparam and pthread_attr_getschedparam functions be present if {_POSIX_THREADS} is defined, while all other thread scheduling attribute functions are present if {_POSIX_THREAD_PRIORITY_SCHEDULING} is defined. It is pointless to have pthread_attr_setschedparam without also having pthread_attr_setpolicy and pthread_attr_setinheritsched, for example. The rationale for this section (B.13.1) makes clear the original intent of the working group -- "In this standard, the basic thread scheduling functions are defined under the {_POSIX_THREADS} option so that they are required of all threads implementations. However, there are no specific scheduling policies required by this option to allow for conforming thread implementations that are not targeted to realtime applications." Although it is understood that rationale (however clearly following the intent of the working group) is not normative or binding, it is not reasonable that all thread implementations support "scheduling parameters" but not scheduling policy, or the other mechanism that gives scheduling parameters meaning. The standard must be repaired to, at least, restore consistency. While the best policy would be to follow the intent of the working group, and make all of the scheduling-related functions available if {_POSIX_THREADS}, it would be acceptable to make them all available only if {_POSIX_THREAD_PRIORITY_SCHEDULING}. REF: pages 300-301, section 13.5.1.2, lines 509, 552 page 303, section 13.5.2.2, line 599 page 548, section B.13.1, lines 7897-7901

Interpretation Response
The standard is clear that on p. 300, line 509, _POSIX_THREAD_PRIORITY_SCHEDULING} is defined then the functions: pthread_attr_setscope(), pthread_attr_getscope(),

pthread_attr_setinheritsched(), pthread_attr_getinheritsched(), pthread_attr_setschedpolicy(), pthread_attr_getschedpolicy() shall be provided. It is also clear on page 301, line 552, that if _POSIX_THREADS is defined then the functions: pthread_attr_setschedparam() and pthread_attr_getschedparam() shall be provided. Conforming implementations must conform to these.

Rationale for Interpretation
None.