

# Realtime POSIX Status

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# The Recent 1003.1 Revision

- The UNIX/POSIX world is unifying, largely driven by the threat of Windows NT/2000/XP
- The result is a single 3,679-page standard (in four large volumes) carrying the badges of all three cooperating standards organizations, IEEE, ISO, and The Open Group
  - The four volumes are *Base Definitions and Headers*, *System Interfaces*, *Shell & Utilities*, and *Rationale*
  - The process took three years, culminating in approval of IEEE Std 1003.1-2001 by TOG and IEEE in 2001 (ISO soon to follow)
  - The resulting standard will become the core of DoD's mandated Joint Technical Architecture (JTA) OS Services, replacing 1003.1-1996 and its amendments
- IEEE Std 1003.1-2001 supersedes all the major POSIX standards except 1003.13 (realtime profiles) and 1003.5 (Ada bindings)

# The Ongoing 1003.13 Revision

- The completion of the 1003.1 Revision requires that 1003.13-1998 (123 pages) in turn be revised, as it depended upon the now superseded previous version of 1003.1
- The 1003.13 Revision will include:
  - 1003.1-2001 (which includes all of realtime POSIX)
  - Profiles of all 1003.5-series standards (Ada bindings to POSIX)
  - Field experience with 1003.13-1998
  - Input from the Linux, realtime and/or embedded Linux, and traditional RTOS communities
- P1003.13 (~160 pages) will go to ballot in a few months

# P1003.26 — Device Control

- Device Control is a standardized and type-safe version of the traditional `ioctl()` function
  - Used mainly to control I/O hardware
- The P1003.26 draft standard will go to ballot in a few months

# Interrupt Control

- Interrupt Control allows applications to directly handle device interrupt, allowing application-level I/O drivers to be implemented
- An unofficial draft standard now exists, carried over from a prior standard effort
  - Authority to write a standard will soon be sought

# Future Work under Consideration by SSWG-RT

- Application-defined scheduling
- Allocation of threads to processors
- Priority inheritance and/or priority ceiling protocol for reader/writer locks

# Some Major POSIX Base Standards (now subsumed into 1003.1-2001)

- ISO/IEC 9945-1:1996 (740 pages)
  - This was the basic POSIX standard defining the UNIX programming interface since 1996, being the merger of 1003.1-1988 (the then base standard) with its amendments 1003.1b (realtime), 1003.1c (threads), and 1003.1i (corrigenda).
- ISO/IEC 9945-2 (~1,400 pages)
  - Shells and Utilities. This was the basic POSIX standard defining the UNIX command line (shell) interface.

# Some Major POSIX Realtime Amendment Standards (now subsumed into 1003.1-2001)

- IEEE Std 1003.1d-1999 (114 pages)
  - Added realtime functions: spawn, the sporadic-server scheduling policy, cpu-time clocks and timers, advisory information, and timeouts.
- IEEE Std 1003.1j-1999 (88 pages)
  - More realtime functions: typed memory, absolute nanosleep, barrier synchronization, reader/writer locks, and spinlocks.
- IEEE Std 1003.1q-2000 (109 pages)
  - Tracing of application calls on the OS, I/O activity, user-defined events, and the like.

# How to Vote on POSIX Standards

- To vote, you must be a member of the IEEE-SA, or pay a per-ballot fee
  - Per-ballot fee is US \$145
  - IEEE dues are \$105 to \$132 (by region); +SA is \$10 more
  - Standards Association (SA) membership alone is \$145
- To receive invitations, join the PASC (Portable Applications Standards Committee) ballot pool
  - <http://standards.ieee.org/db/balloting/ballotform.html>
  - Check the “Portable Applications” box under “Computer Society”
- Drafts will also be available on The Open Group’s website