IEEE POSIX®

Certified by IEEE and The Open Group

POSIX® : *Certified by IEEE and The Open Group – a briefing.*

The Source for POSIX Certification

http://posixcertified.ieee.org

January 2005.

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Agenda

- What is POSIX?
- POSIX 1003.1, 2004 Edition Status
- POSIX 1003.13-2003
- POSIX: *Certified by IEEE and The Open Group*

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POSIX® /pahz-icks/

- *POSIX , pronounced pahz-icks* as in positive, not *poh-six*, or other variations

- POSIX is a registered trademark of the IEEE
  - Licensed through certification

- An acronym for *Portable Operating System Interface*

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POSIX® /pahz-icks/

- POSIX is a family of standards developed by the Portable Applications Standards Committee (PASC) of the IEEE Computer Society

- Main subject areas:
  - System Interfaces (C, Fortran, Ada Bindings)
  - Commands & Utilities
  - Test Methods

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What is POSIX?

- Its about *portability*
  - Both programmers and application source code
  - Portability of the OS kernel itself and/or application binary code are <u>not</u> objectives
- POSIX is a set of books specifying APIs
  - It is neither a piece of code
  - Nor an operating system
 - It is a rich, proven API

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What is an API?

- Application Program Interface
- A written contract between system developers and application developers
- It is not a piece of code, it is a piece of paper defining what the two sets of developers are guaranteed to receive and are in turn responsible for providing

The Need for Standard APIs

Standardized Functionality
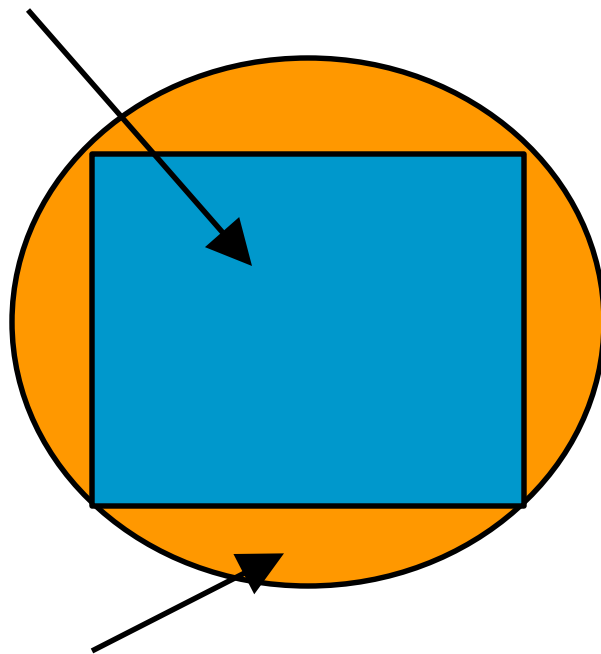
Private Product Specific Functionality

- ❑ Standardized "square" peg in the round hole
  - ▪ "bits where change is not interesting"
  - ▪ Where the benefits of commonality outweigh the value of differences
  - ▪ Where we can achieve economies of scale, including interoperability

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Scalable API Portability

Diagram Source: Wind River Systems Inc.
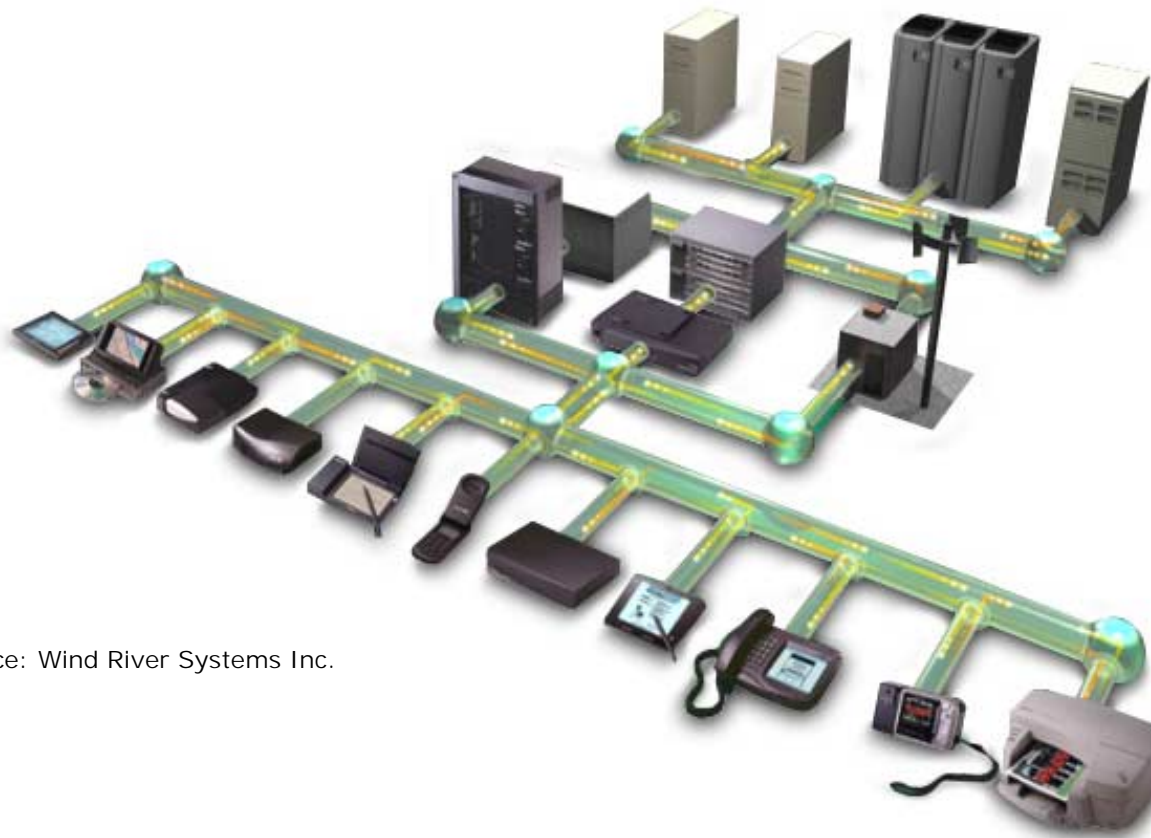
POSIX APIs support portability across a range of devices
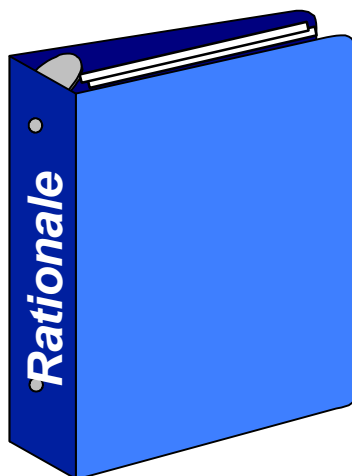
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POSIX *1003.1, 2004 Edition*

- *Approved December 6th 2001*
- 2004 Edition incorporates two Technical Corrigenda
- Developed by the *Austin Group (see later)*
- Supersedes all the major POSIX standards except 1003.13 (realtime profiles) and 1003.5 (Ada bindings)
- A combined system interfaces (including all realtime POSIX) and utilities specification as a single 4000 page standard
- The core of DoD's mandated Joint Technical Architecture (JTA) OS Services, replacing 1003.1-1996 and its amendments
- Technically identical to the Base specifications of the Single UNIX Specification and ISO 9945

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The Common *Base* Specifications

THE *Open* GROUP   ISO IEC   ◆IEEE

IEEE Std 1003.1,

ISO/IEC 9945

The Open Group Base
Specifications Issue 6

The Core of the
Single UNIX Specification V3

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The *Austin Group*

- The *Austin Group* combines the formal standards process of the IEEE and ISO, with the industry standards of The Open Group and the community at large.
- *Electronic participation*
- *Participation in the group is free.*
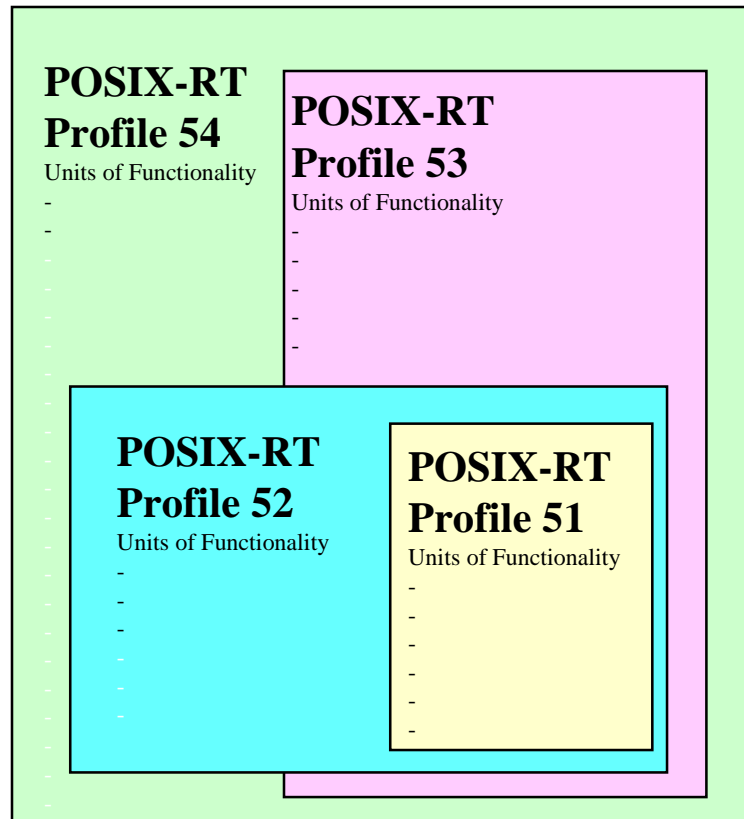- *The final standard in html is available for free download from the world wide web.*

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POSIX *1003.13-2003*

- *Approved December 10th 2003*
- *A set of POSIX Realtime profiles*
- Supersedes POSIX.13-1998 updated to address
  - 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

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POSIX 1003.13 Profiles

**POSIX-RT
Profile 54**
Units of Functionality
-
-

**POSIX-RT
Profile 53**
Units of Functionality
-
-
-
-
-
-

**POSIX-RT
Profile 52**
Units of Functionality
-
-
-

**POSIX-RT
Profile 51**
Units of Functionality
-
-
-
-
-
-

**Portable Operating System Interface
IEEE Standard POSIX 1003.13**

Profile 54: 1003.1-2003 *Base* Multi-process, Threads, File System

Profile 53:
Multi-process, Threads; File System

Profile 52:
Single Process, Threads, File System

Profile 51:
Single Process, Threads; No File System

Allows Portability of Applications

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POSIX 1003.13

- POSIX 1003.13 is a subprofile standard of 1003.1-2001
  - It allows diverse realtime operating systems "clothed" with a runtime library to comply
  - This standardizes the application-to-RTOS API, allowing considerable application code portability between different RTOS offerings, which portability had not been possible in the past
  - RTOS+wrapper offerings can be compared and competed directly
  - There are currently four profiles

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POSIX® *Certified*
by IEEE and The Open Group

How compliance claims can be proven....

Program Principles

- Clear and well-defined:

  - certification policies

  - processes for achieving and maintaining certification

  - based on industry best practice.

- Certification backed up by conformance testing

Certification Agreement

- Vendor guarantee of conformance to specifications.
    - Vendor 'Warrants & Represents'
- This guarantee ensures that:
    - Products conform to a specification
    - Products remain conformant throughout the life of the product's registration
    - Any non-conformance will be fixed in a timely manner

Benefits of Certification(1)

❑ For Procurement:

- Assurance of POSIX conformance and interoperability
- Level of assurance matched to the needs of the particular application

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Benefits of Certification (2)

- ❑ Suppliers can demonstrate and provide objective evidence to their customers that their products are compliant with the industry recognized 2003 edition of IEEE 1003.1 POSIX Standard

- ❑ Products that successfully pass all the test suites and obtain a related certification certificate are able to carry the POSIX Certified trademark
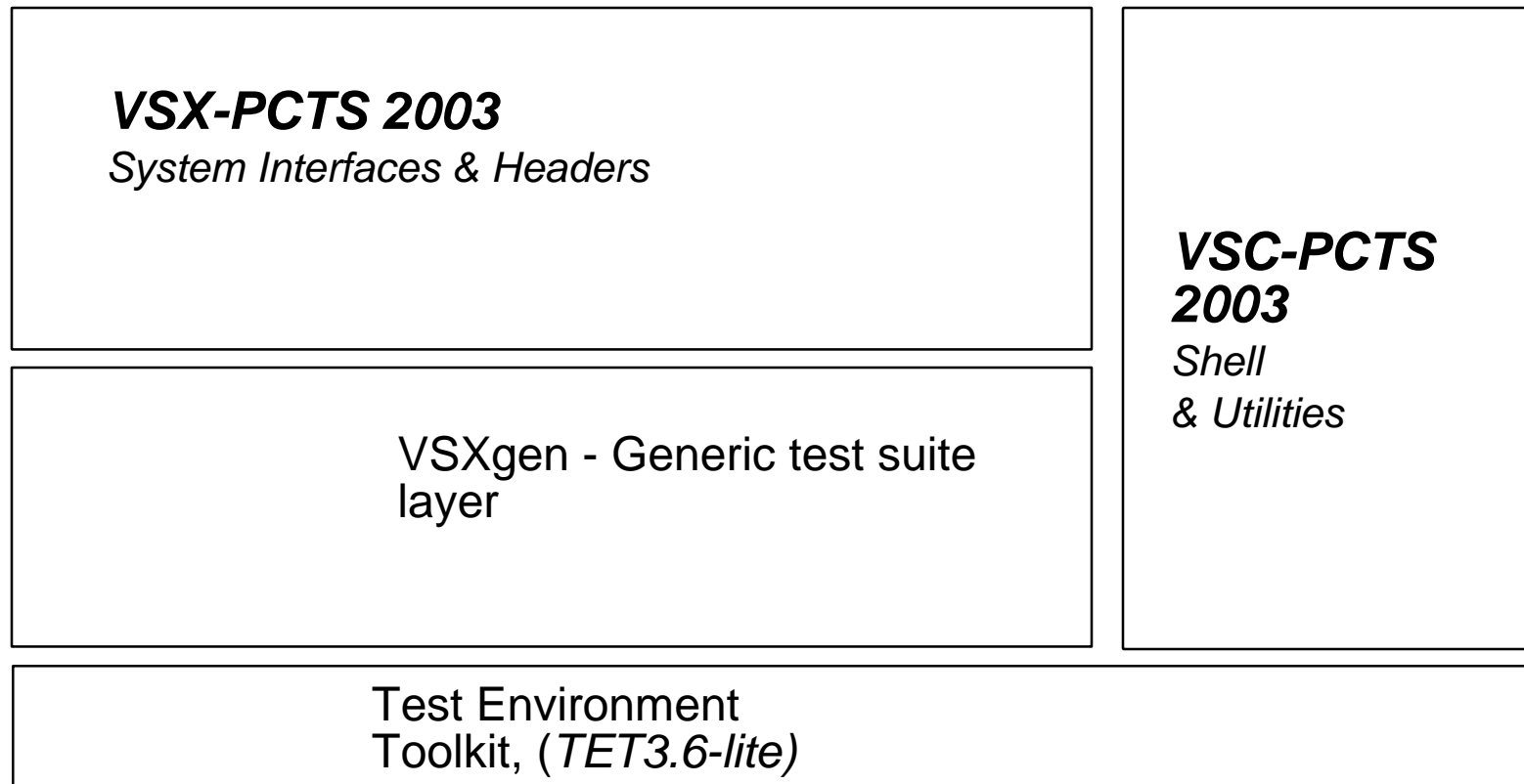
1003.1-2003 *Base* Certification

- Certification for the *Base mandatory* features of POSIX 1003.1
- 1003.1-2003 System Interfaces
  - Mandatory POSIX System Interfaces
  - Tested by VSX-PCTS2003
- 1003.1-2003 Shell and Utilities
  - Mandatory POSIX Shell & Utilities
  - Tested by VSC-PCTS2004

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POSIX 1003.1, 2003 Test Suites

VSX-PCTS 2003

System Interfaces & Headers

VSC-PCTS 2003

Shell & Utilities

VSXgen - Generic test suite layer

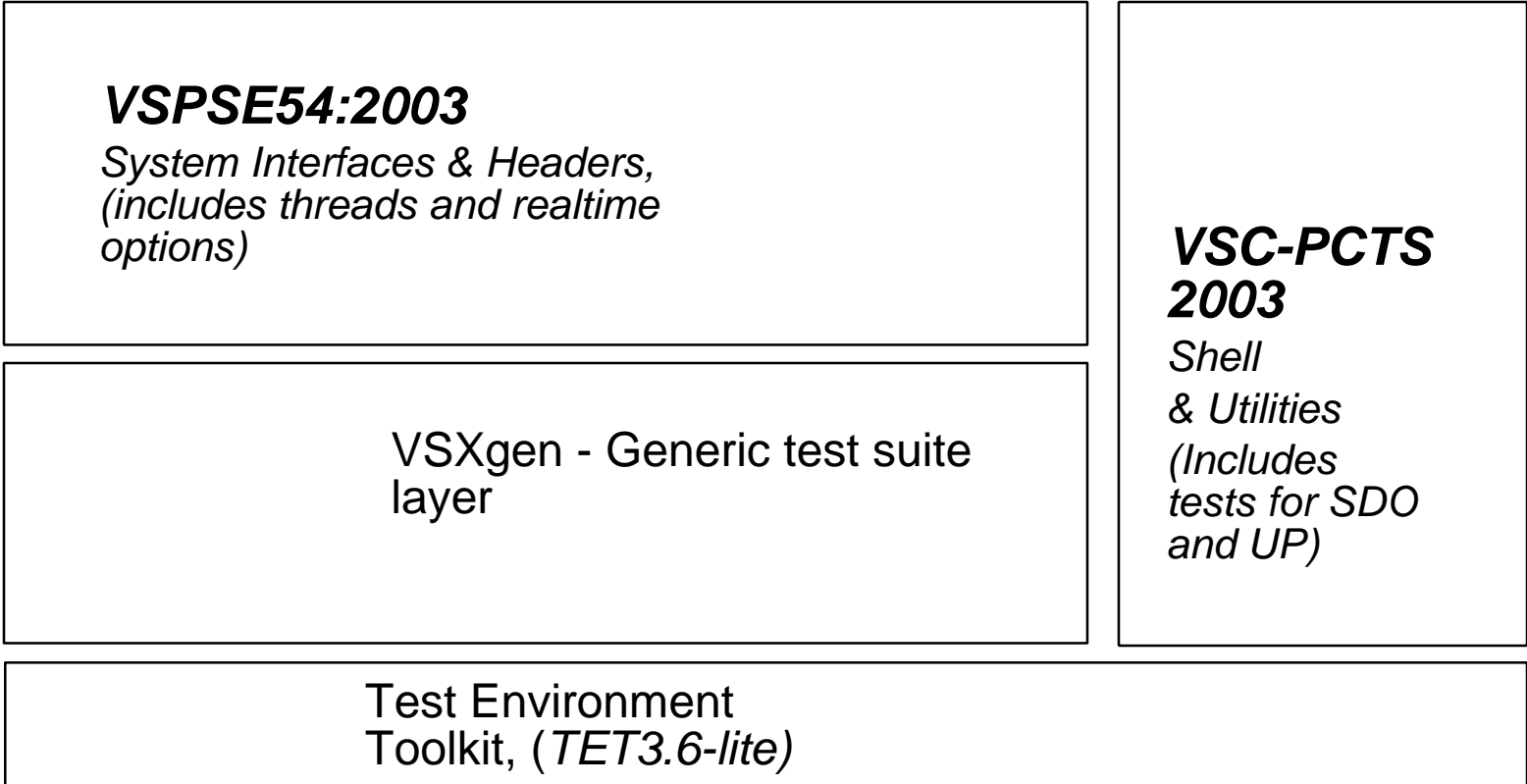Test Environment Toolkit, (*TET3.6-lite)*

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Coming soon… 1003.13 Certification

- Initially PSE54:2003 Certification
  - Covers in addition Realtime options from 1003.1
  - Pilot program for certification program in October/November 2004
  - PSE54 Test suite GA December 2004
  - Conformance requirements developed with those companies participating in pilot
  - Certification open for business End January
  - Expected to be basis for DoD procurements
- Proposed developments in 2005
  - PSE53:2003 certification subject to funding

POSIX 1003.13 PSE54 , 2003 Test Suites

VSPSE54:2003

System Interfaces & Headers, (includes threads and realtime options)

VSXgen - Generic test suite layer

VSC-PCTS 2003

Shell & Utilities (Includes tests for SDO and UP)

Test Environment Toolkit, (*TET3.6-lite)*

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