UNIX is a registered trademark of The Open Group

UNIX® 03

A Status Update From

The Open Group

http://www.unix.org

UNIX is a registered Trademark of The Open Group

THE *Open* GROUP

Agenda

- ❑ The Single UNIX® Specification

- ❑ New features of UNIX 03

- ❑ UNIX 03 Certification

- ❑ UNIX 03 Product Standards

- ❑ UNIX 03 Internet Server

THE *Open* GROUP

The UNIX® Operating System

- ❑ Continual development over the last thirty years
- ❑ Deployed in millions of installations on nearly every hardware platform
- ❑ A reputation of stability and scalability
- ❑ Continued innovation as new technologies assimilated
- ❑ The popular choice for the internet
- ❑ *Mature, Standardized and Start-of-the-Art*

THE *Open* GROUP

UNIX® Past Perceptions

- ❑ Uncompromising
- ❑ Command line interface required technical competence
- ❑ Command line syntax not intuitive
- ❑ Interface unfriendly
- ❑ Security often nonexistent

- ❑ Today, these perceptions are only of historical interest.

THE *Open* GROUP

UNIX® Present

- A Standard and stable definition of the core application programming environment - the *Standard Base*
  - The Single UNIX Specification
- Graphical User Interface
  - The Common Desktop Environment
- The internet server of choice
- Clustering and other high availability innovations available today

THE *Open* GROUP

UNIX Present

Specification	Product
UNIX	
Trade Mark	Technology

THE *Open* GROUP
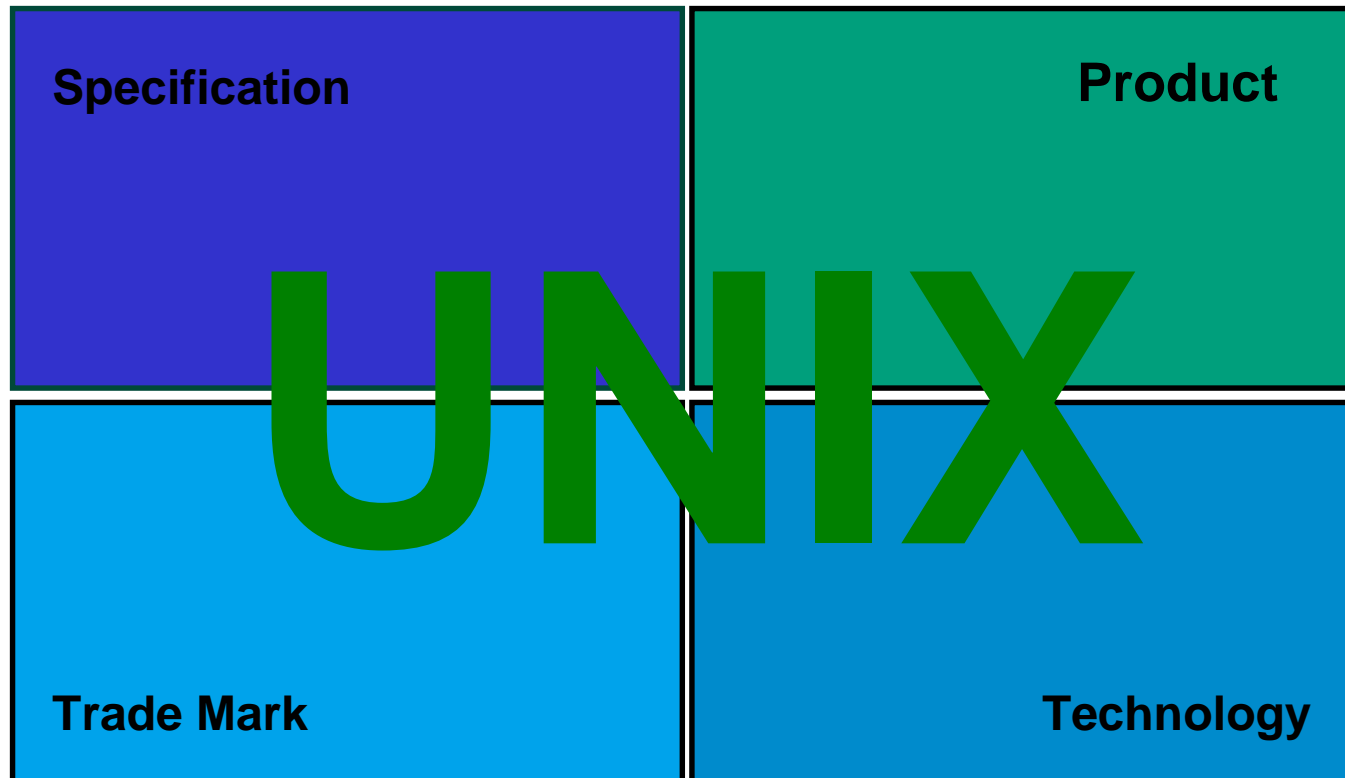
The Single UNIX Specification

- A single set of APIs supported by every UNIX system.

- Shifted the focus from incompatible UNIX system product implementations to compliance to a single set of APIs.

- If an OS meets the specification and commonly available applications run on it, then it is open.

THE *Open* GROUP

The Value of Standards (Cont'd)

- Today, all the major vendors have implemented the Single UNIX Specification

- The UNIX 95, UNIX 98 and UNIX 03 marks are validated using extensive tests that allow objective determination of conformance and backed up by a unique vendor guarantee –

  - *The Open Brand*

The Open Brand

❑ Operates under trademark law

❑ Designates products that are guaranteed to conform to open systems specifications

❑ A vendor guarantees that any non compliances will be fixed within a defined time period

❑ http://www.opengroup.org/openbrand/

THE *Open* GROUP

The Single UNIX Specification
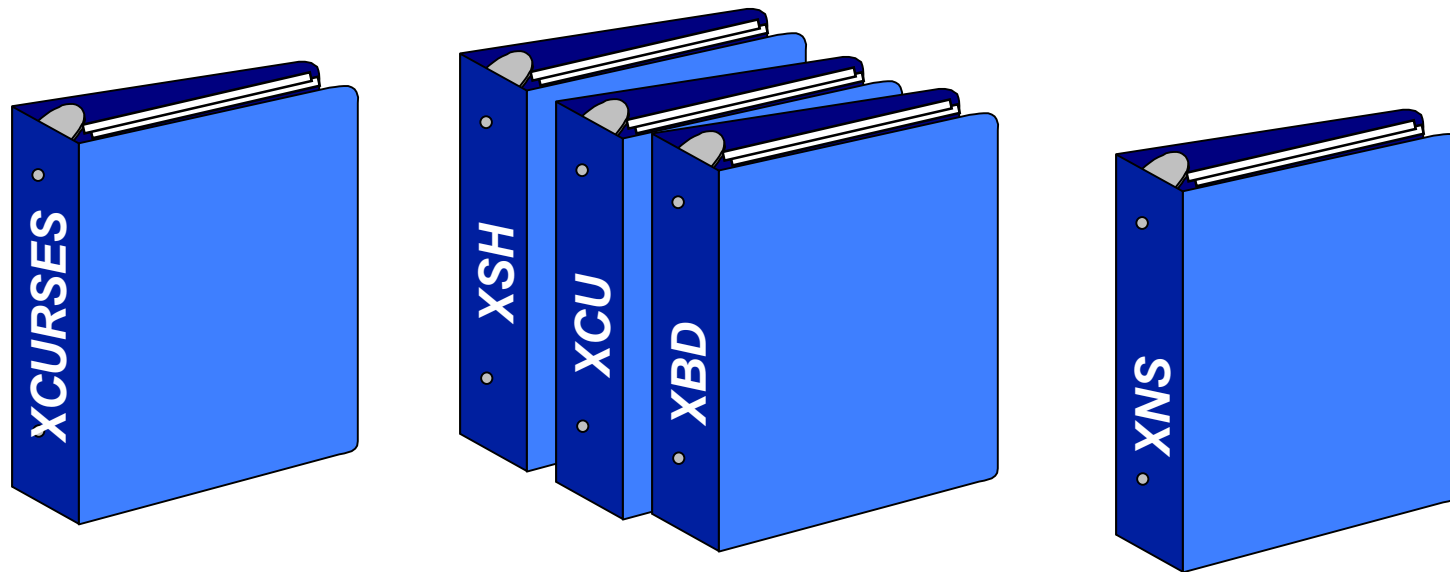

XCURSES

XSH

XCU

XBD

XNS

Diagram shows Version 1 (1994)
and Version 2 (1997)

THE *Open* GROUP

The User Driven Process

50 Popular Applications

Formal and Defacto Standards

The Single UNIX Specification

THE *Open* GROUP
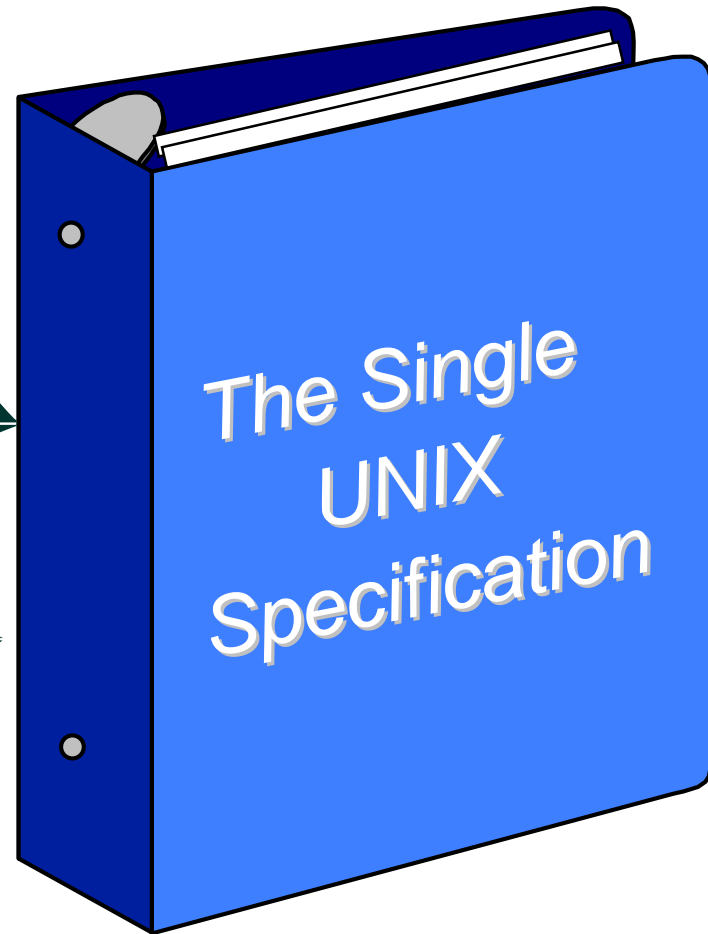
Application Coverage by Specification
For Ten Representative Applications

Legend: XPG4 (blue), UNIX Extension (green)

THE *Open* GROUP
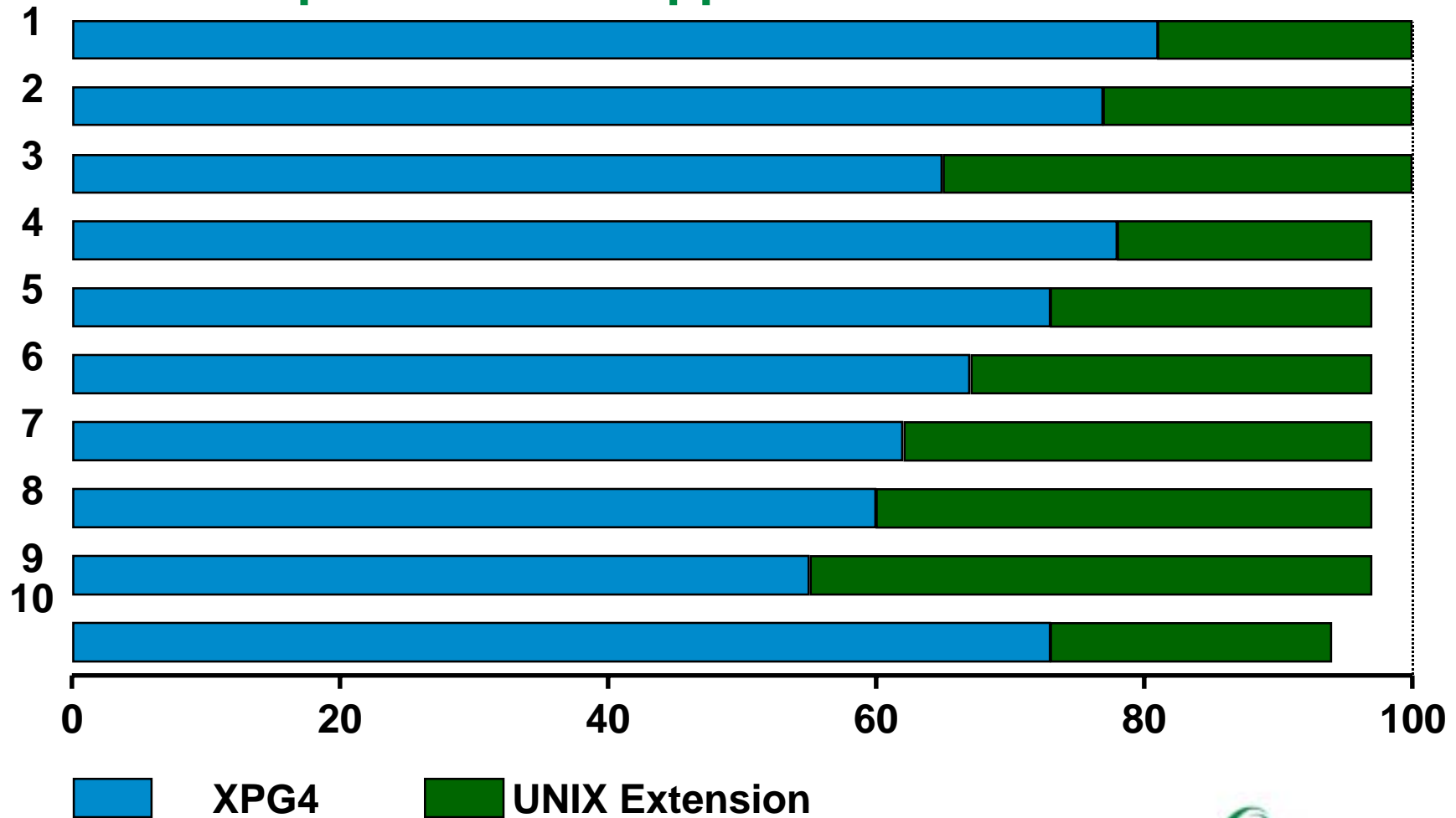
Formal Standards Alignment

- The Single UNIX Specification is a profile built on the foundation of international standards.
    - Has a formal deference policy.
    - Mandates key options from international standards to form a rich foundation which you can depend on.

THE *Open* GROUP

Mandated POSIX.1 Options

Mapped Files

File Synch

Memory Protection

1003.1b Realtime

Process Shared Sync

Stack Addr Attribute

Stack Size Attribute

Thread Safe Functions

1003.1c Threads

Restricted Chown

Saved IDs

Job Control

No Truncate

POSIX.1 Base

ISO C
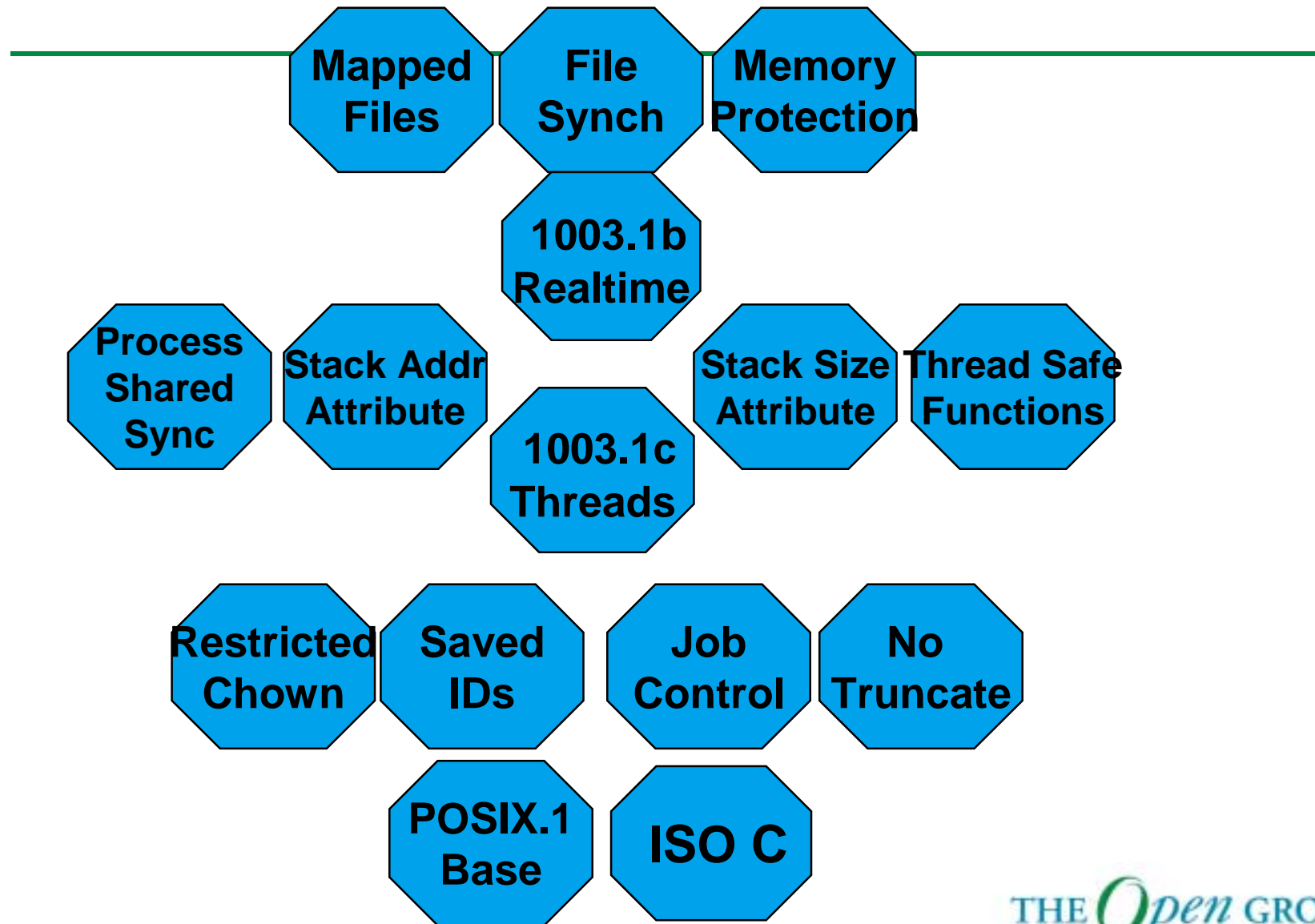
The Single UNIX Specification Version 3

❑ Developed by the Austin Common Standards Revision Group

❑ An open industry initiative to revise the core *POSIX standard* and the *Single UNIX Specification*

THE *Open* GROUP

About the *Austin Group*

- ❑ Over 600 participants

- ❑ Wide industry support:
  - ▪ *AT&T, Compaq, Fujitsu, HP, IBM, Lucent, Microsoft, Red Hat, SGI, Siemens, Sun*
  - ▪ *DoD, USENIX, Canada Customs and Revenue Agency*

- ❑ Participation in the *Austin Group* from the open source community included:
  - ▪ *The Linux Standard Base, NetBSD, FreeBSD, and many others*

THE *Open* GROUP

Scope of the revision

- ❑ Production of a single document to be adopted by multiple parties
- ❑ Minimize the number of changes required to implementations of earlier versions of the Base documents for the revision
- ❑ Limit new work items to those related to integration and consistency, resolving any conflicts
- ❑ Alignment with the ISO C 1999 standard

THE *Open* GROUP

The Common *Base* Specifications

THE *O*pen GROUP   ISO IEC   ◆IEEE

Rationale

System Interfaces   **Commands**   **Definitions**
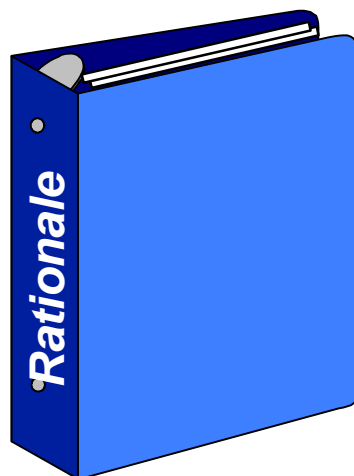
IEEE Std 1003.1,

ISO/IEC 9945

The Open Group Base
Specifications Issue 6

*The Core of the
Single UNIX Specification V3*

THE *O*pen GROUP

Approvals Status

- The Open Group September 12th 2001
- IEEE December 6th 2001
- ISO/IEC 9945:2002 Parts 1 thru 4, November 2002
- Published in hardcopy (3700 pages, 9kg!!), electronic and CDROM

THE *Open* GROUP

Technical Corrigendum 1

- IEEE December 2002

- The Open Group February 2003

- *2003 Edition of Specifications published March 31st 2003*

  - *IEEE Std 1003.1, 2003 Edition*

- *ISO/IEC 9945:2003 August 2003*

THE *Open* GROUP

ISO IEC

IEEE

THE *Open* GROUP

Technical Corrigendum 2

- The Open Group December 2003
- IEEE February 2004
- *2004 Edition of Specifications to be published April 30th 2004*
  - *IEEE Std 1003.1, 2004 Edition*
- *ISO Technical Corrigenda expected to be approved in 2Q2004*

THE *Open* GROUP   ISO IEC   ◆ IEEE

THE *Open* GROUP

The Single UNIX Specification V3

Portability Functions

Bar chart showing number of portability functions by standard:
- Single UNIX V3: 1742
- Single UNIX V2: 1434
- Single UNIX: 1168
- XPG4 Base: 607
- POSIX 1003.1-1996: 390
- SVID3 Base: 582
- AES: 489
- POSIX 1003.2: 130
- 1003.1-90 FIPS 151-2: 199

THE Open GROUP
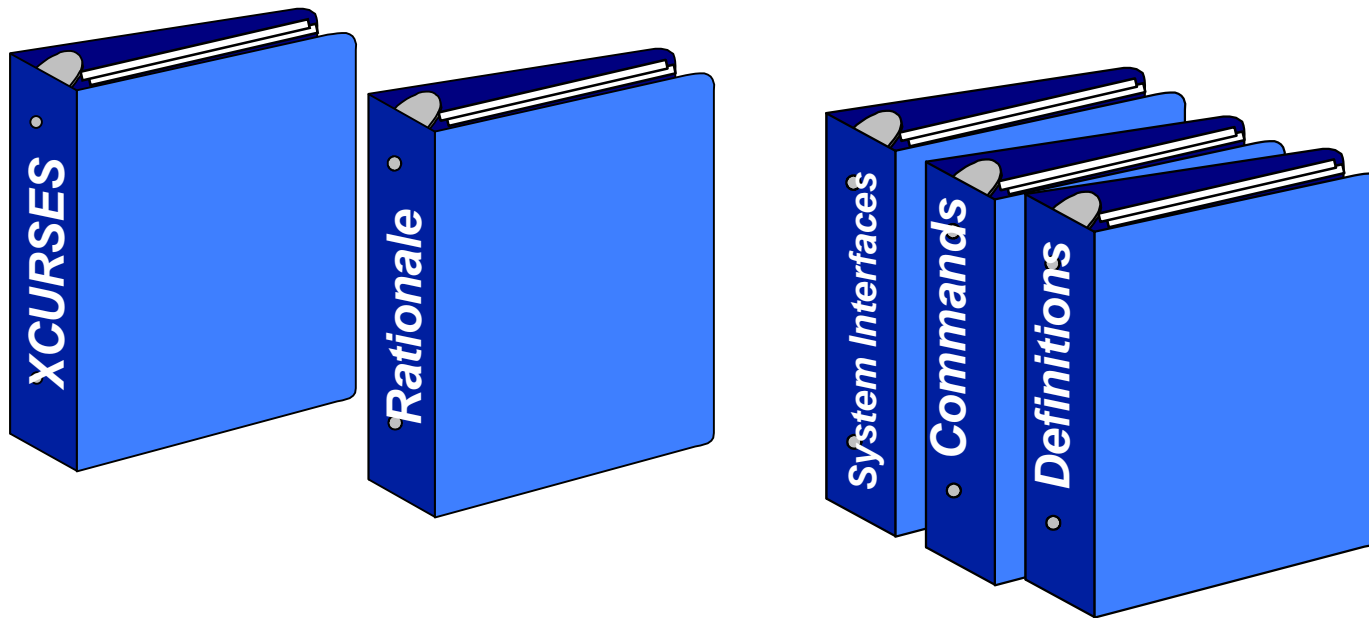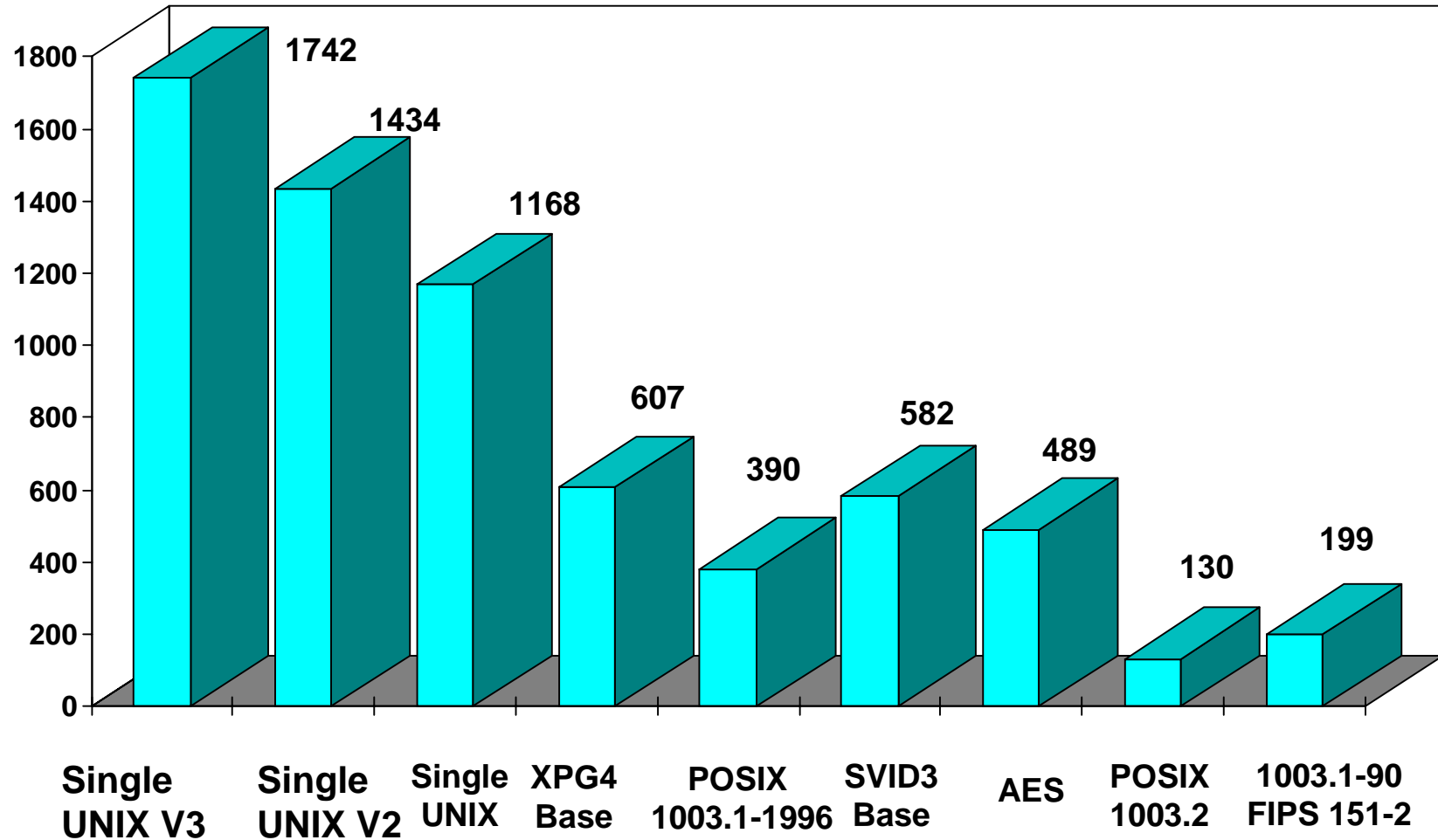
Formal Standards Alignment

- IEEE Std 1003.1, 200x Edition (POSIX.1)
    - The Base Specifications Issue 6 and ISO/IEC 9945:200x are technically identical to POSIX.1, they are all the same document (*word for word, a single publication)*
- ISO/IEC 9899:1999, Programming Languages – C (ISO C)

THE *Open* GROUP

Options

- Encryption
- Realtime
- Realtime Threads
- Advanced Realtime
- Advanced Realtime Threads
- Tracing
- XSI STREAMS
- Legacy

THE *Open* GROUP

Key Changes

- Legacy and obsolescent features dropped
  - Much of this was to compromise between System V and BSD
- Job control and certain options in POSIX.1 mandated now in POSIX *Base* (FIPS 151-2 alignment)
  - No change for the Single UNIX Specification as already mandatory
- Corrigenda incorporated

THE *Open* GROUP

Key Changes (Cont'd)

❑ XTI dropped

  ▪ Is retained as a separate specification but not required for POSIX or UNIX conformance

❑ STREAMS optional

  ▪ An optional feature group for those systems that wish to support the functionality

THE *Open* GROUP

UNIX 03 Certification

Program Principles

- Clear and well-defined:
  - certification policies
  - processes for achieving and maintaining certification
  - based on industry best practice.

THE *Open* GROUP

Trademark License 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

THE *Open* GROUP

Program Elements

Certification Checklist

Product Standards

Techical Standard

Guide to Certification Program

TMLA

Registration Form

Test Campaign Definition

Test Suites

Problem Reporting System

Appeals Process

Conformance Statement

Certification Web site

Certificate

Certification Register

THE *Open* GROUP

Elements (1)

| Certification checklist | Product Standards | Technical Standards | Guide to Certification Program | TMLA | Problem Reporting System | Appeals Process |

Well defined summary steps to achieve Certification

1.Requirements separated into logical units.

2.Includes lists of indicators of compliance.

3.Drawn from Technical Standards

Detailed Guide with the How To get certified information

1. Fair and Objective Problem Reporting and Appeals Processes

2. Sanitized problem reports visible to all participants

3. Web-based database provided, with automated workflow system for processing requests

Detailed Technical Requirements

Supplier warranty through The Open Brand Trademark License Agreement

Well defined Certification Policies

Based on industry certification best practices

THE *Open* GROUP

Elements (2)

Registration Form → Form with details of the product to be registed

Test Campaign Definition → Definition of test campaign to be used for certification

Test Suites →
1. Extensive test coverage
2. Modular test suite architecture

THE Open GROUP

Elements (3)

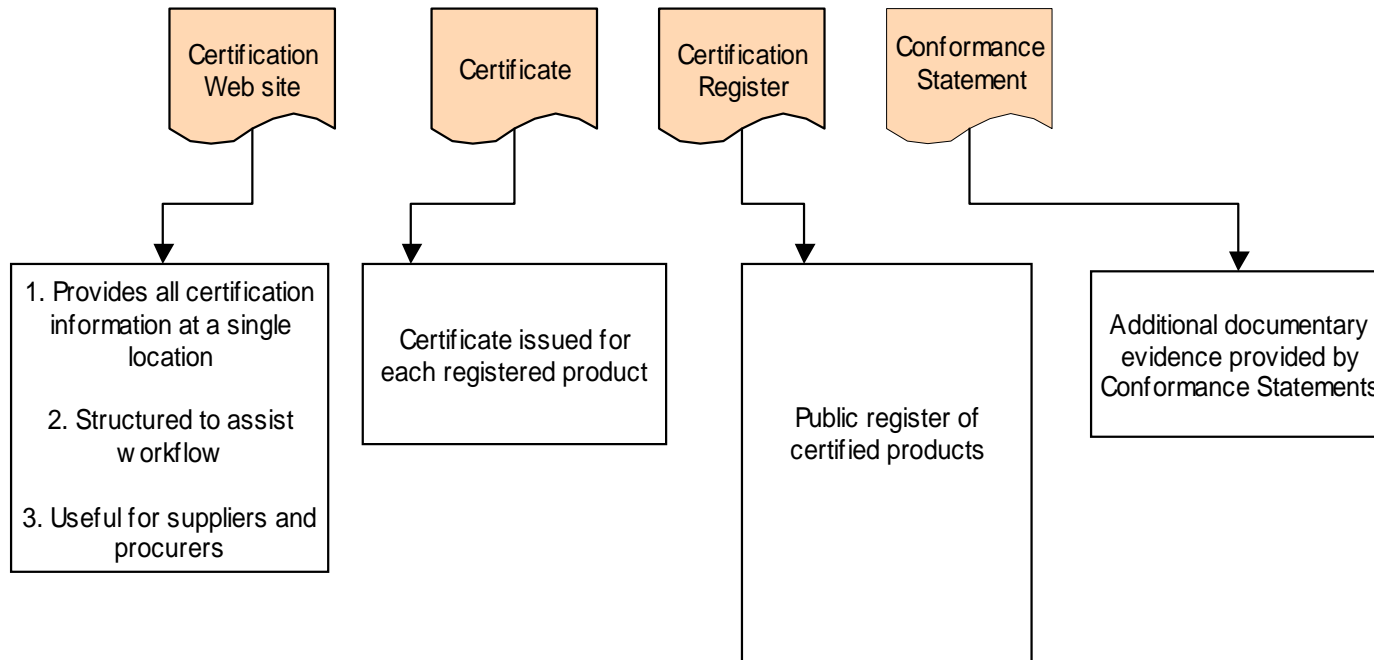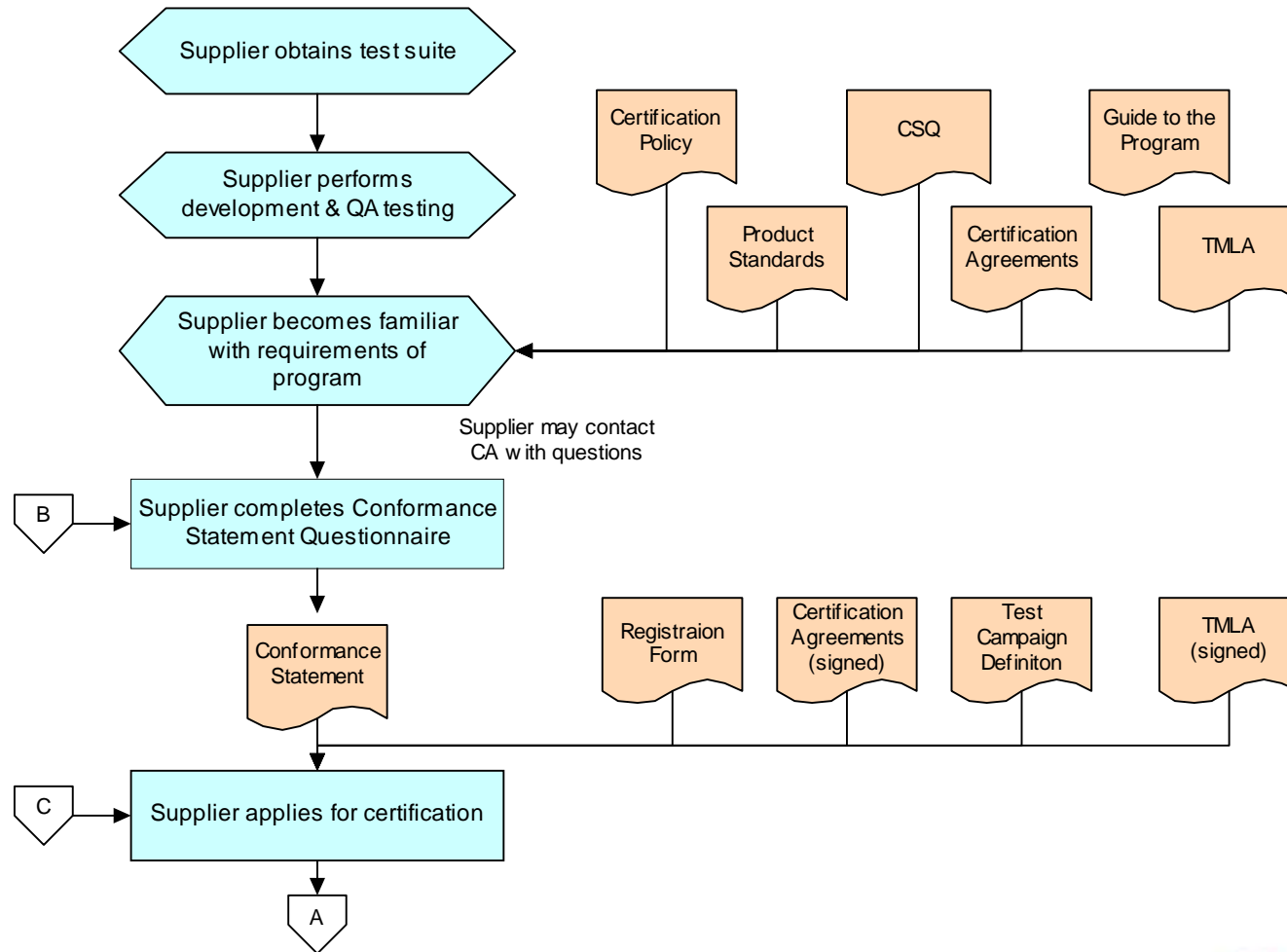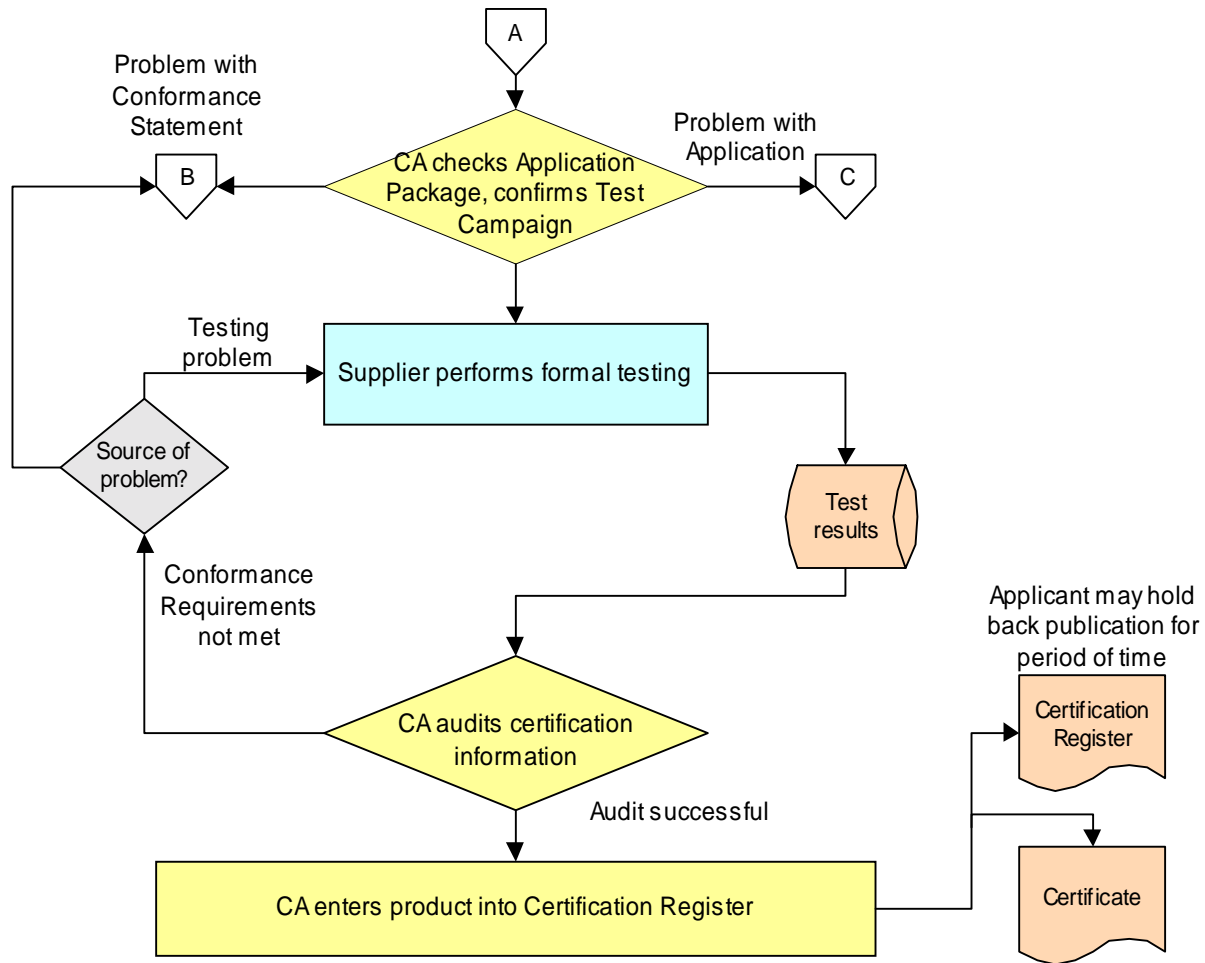| Certification Web site	Certificate	Certification Register	Conformance Statement
1. Provides all certification information at a single location 2. Structured to assist workflow 3. Useful for suppliers and procurers	Certificate issued for each registered product	Public register of certified products	Additional documentary evidence provided by Conformance Statements

Certification Process - Roles

- Specification Authority
  - Specification owner – responsible for developing, maintaining and interpreting the specification(s)
- Certification Authority (CA)
  - Manages the day-to-day operations of the certification program
  - Ensures quality, fairness and integrity
- Test Suite Maintenance Authority (TSMA)
  - Maintain the test suites

THE *Open* GROUP

Certification Process (1)

Supplier obtains test suite

Supplier performs development & QA testing

Supplier becomes familiar with requirements of program

Certification Policy

CSQ

Guide to the Program

Product Standards

Certification Agreements

TMLA

Supplier may contact CA with questions

B

Supplier completes Conformance Statement Questionnaire

Conformance Statement

Registraion Form

Certification Agreements (signed)

Test Campaign Definiton

TMLA (signed)

C

Supplier applies for certification

A

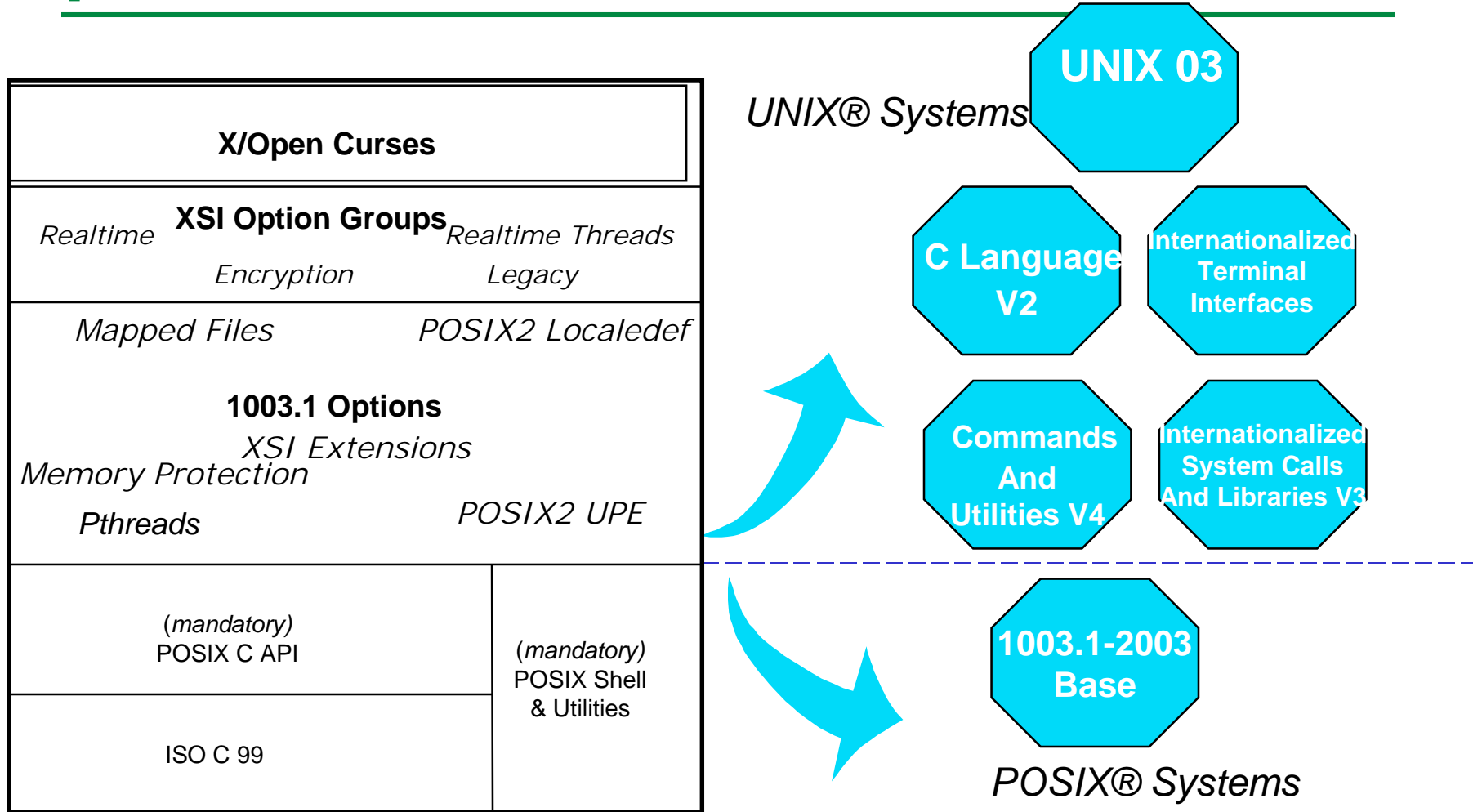THE Open GROUP

Certification Process (2)

Product Standards

- ❑ Define the Conformance Requirements
  - ▪ Define what a conforming product must do to be compliant
    - ▪ Also defines what it must not do to be considered compliant
  - ▪ Separate document for each product type or grouping of functionality
  - ▪ Provides mapping between products and Technical Standards and other referenced specifications
- ❑ Define the testing requirements

THE *Open* GROUP

Specifications vs Product Standards

X/Open Curses

XSI Option Groups

Realtime   *Realtime Threads*

Encryption   *Legacy*

Mapped Files   *POSIX2 Localedef*

1003.1 Options

XSI Extensions

Memory Protection

Pthreads   *POSIX2 UPE*

(mandatory)
POSIX C API

(mandatory)
POSIX Shell
& Utilities

ISO C 99

UNIX® Systems

UNIX 03

C Language V2

Internationalized Terminal Interfaces

Commands And Utilities V4

Internationalized System Calls And Libraries V3

1003.1-2003 Base

POSIX® Systems

THE Open GROUP

UNIX 03 Product Standards

❑ UNIX 03 - the mark for systems conforming to Version 3 of the Single UNIX Specification

❑ UNIX 03 - "*the standard base*"

❑ UNIX 03 Server

  ▪ UNIX 03 plus Internet Server capabilities

  ▪ Adds interoperability services to the UNIX 03 APIs in support of internet/intranet services

THE *Open* GROUP

UNIX 03 Product Standards (1)

- ❑ Organized as a hierarchy
- ❑ UNIX 03
  - ■ Top-level foundation product standard
  - ■ Four constituent product standards organized by subject area
    - ■ *Internationalized System Interfaces Extended V3*
    - ■ *Commands & Utilities V4*
    - ■ *C Language V2*
    - ■ *Internationalized Terminal Interfaces*

THE *Open* GROUP

UNIX 03 "*the standard base*"

- ❑ There are four constituents to the *base*
  - ▪ Internationalized System Interfaces Extended V3
    - ▪ A rich set of system interfaces mandating key options in the common specifications
  - ▪ Commands and Utilities V4
    - ▪ Mandates key options from the common specifications
  - ▪ C Language V2
  - ▪ Internationalized Terminal Interfaces

THE *Open* GROUP

UNIX 03 Server

- Builds on the Base foundation.
- *Captures existing de-facto practice.*
- Includes a *platform-independent* Internet Server Product Standard.
- Additional functionality over existing UNIX 03 Product standard includes:
  - The Internet Protocol Suite, including IPv6.
  - Java Support.
  - Internet capabilities to support network clients.

Java is a trademark of Sun Microsystems Inc ∎

THE *Open* GROUP

UNIX 03 Server - Internet Services

OSI Model

DOD Model

OSI Model		DOD Model
Application	**Telnet Ftp NFS Http DNS Lpd Smtp WebNFS** **NTP LDAP SNMP POP3 IMAP4 ssh**	Application
Presentation	**Sockets XTI RPC**	Application
Session	**TCP** **UDP**	Host to Host
Transport	**TCP** **UDP**	Host to Host
Network	**IPv4 IPv6** **icmp** **bootp**	**dhcp**	**tftp**	Internet
Data Link	Ethernet Token Ring Other	Network Access
Physical	Ethernet Token Ring Other	Network Access

THE *Open* GROUP

UNIX 03 Certification

❑ Product Standards

  ▪ http://www.unix.org/unix03.html

❑ The Open Brand Certification Program

  ▪ http://www.opengroup.org/openbrand/

  ▪ http://www.opengroup.org/openbrand/register/

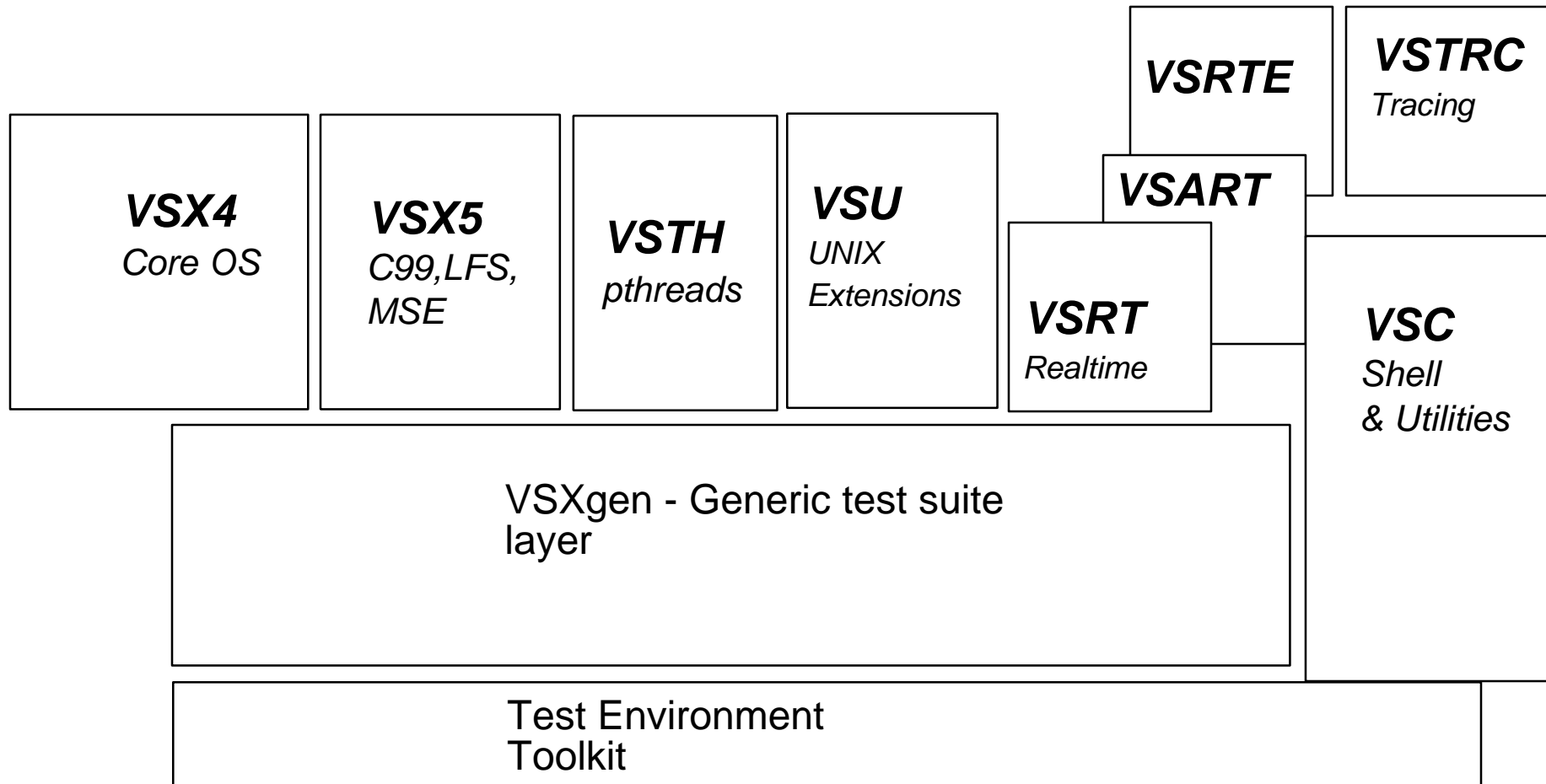 ▪ http://www.opengroup.org/openbrand/testing/checklist/

THE *Open* GROUP

UNIX 03 Testing

- ❑ Certification is backed by an extensive set of tests
- ❑ Used by vendors to demonstrate conformance as part of formal certification
- ❑ A family of tests available for UNIX 03
  - ▪ Known as *Westwood*
  - ▪ Modular test suites
  - ▪ Covers mandatory features and key options
  - ▪ http://www.opengroup.org/testing/info/Westwood_datasheet.html

THE *Open* GROUP

UNIX 03 Test Suites

VSRTE

VSTRC
Tracing

VSX4
Core OS

VSX5
C99,LFS, MSE

VSTH
pthreads

VSU
UNIX Extensions

VSART

VSRT
Realtime

VSC
Shell & Utilities

VSXgen - Generic test suite layer

Test Environment Toolkit

THE *Open* GROUP

UNIX 03 Test Suites (mandatory)

VSX4
Core OS

VSX5
*C99,LFS,
MSE*

VSTH
pthreads

VSU
*UNIX
Extensions*

VSART
*Reader/
Writer Locks
Tests*

VSC
*Shell
& Utilities*

VSXgen - Generic test suite layer

Test Environment
Toolkit
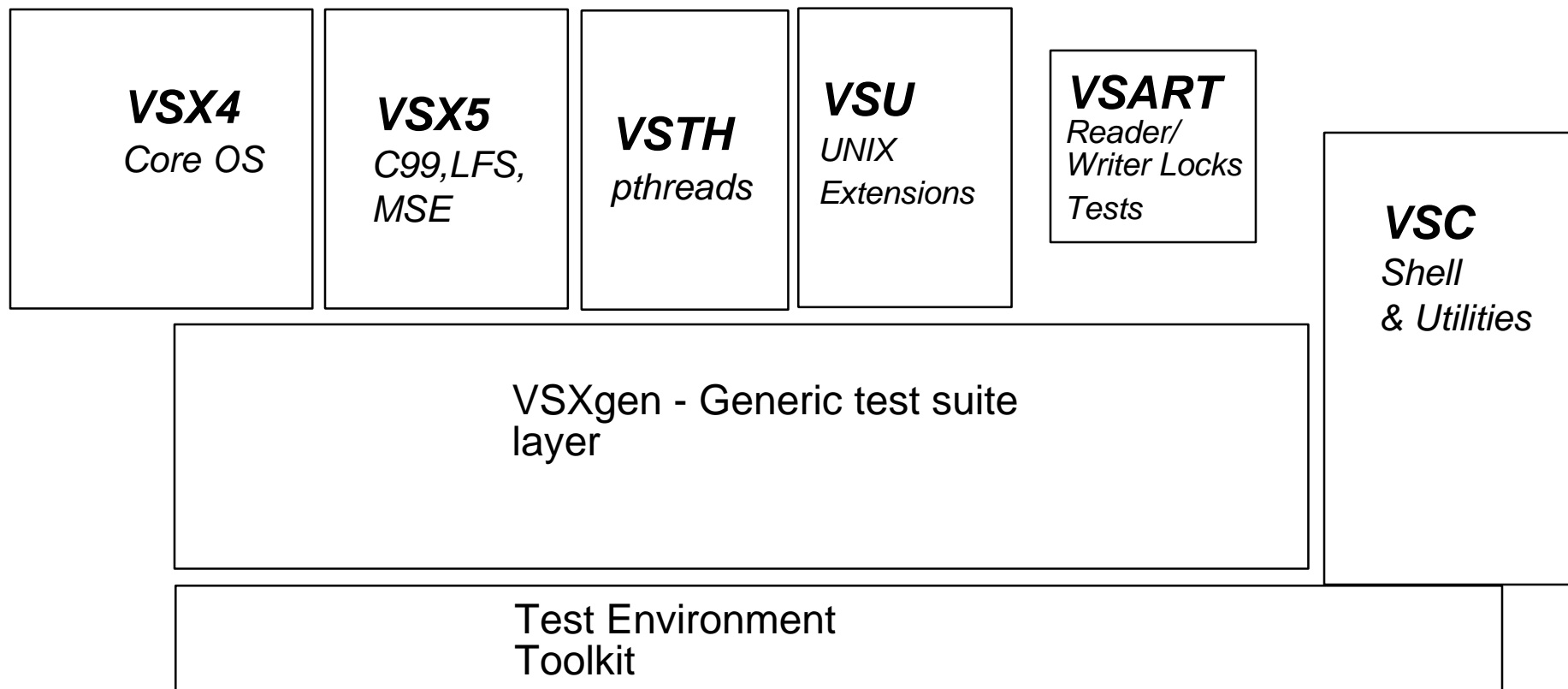
THE *Open* GROUP

Where to Obtain the Specification?

- ❑ The html version is online at
  - ▪ http://www.UNIX.org/version3
- ❑ PDF either electronically or on CDROM can be ordered from
  http://www.opengroup.org/pubs/catalog/un.htm
  - ▪ The PDF is free to members of The Open Group
- ❑ Available also on CDROM with *The Authorized Guide to the Single UNIX Specification Version 3* and the latest edition of the UNIX Internationalization Guide

THE *Open* GROUP

File   Edit   View   Go   Communicator   Help

Internet Lookup New&Cool

Back   Forward   Reload   Home   Search   Netscape   Print   Security   Shop   Stop

Bookmarks   Go To: http://www.UNIX-systems.org/version3/   What's Related

INDEX

Search..

[Alphabetical | Topic]

Select a Volume:
[*Base Definitions* |
Shell & Utilities |
System Interfaces |
Rationale]

Base Definitions

- Introduction
- Conformance
- Definitions
- General Concepts
- File Format Notation
- Character Set
- Locale
- Environment Variables
- Regular Expressions

The Open Group Base Specifications Issue 6
IEEE Std 1003.1-2001
Copyright © 2001 The IEEE and The Open Group

IEEE   **THE Open GROUP**

GoTo: Non-Frames Index

This standard has been jointly developed by the IEEE and The Open Group. It is both an IEEE Standard and an Open Group Technical Standard.

Abstract: This standard defines a standard operating system interface and environment, including a command interpreter (or "shell"), and common utility programs to support applications portability at the source code level. This standard is the single common revision to IEEE Std 1003.1-1996, IEEE Std 1003.2-1992, and the Base Specifications of The Open Group Single UNIX Specification, Version 2. This standard is intended to be used by both applications developers and system implementors. It comprises four major components (each in an associated volume):

1. General terms, concepts, and interfaces common to all volumes of this standard , including utility conventions and C-language header definitions, are included in the Base Definitions volume (XBD).
2. Definitions for system service functions and subroutines, language-specific system services for the C programming language, function issues, including portability, error handling, and error recovery, are included in the System Interfaces volume (XSH).
3. Definitions for a standard source code-level interface to command interpretation services (a "shell" and common utility programs for application programs are included in the Shell and Utilities volume (XCU).
4. Extended rationale that did not fit well into the rest of the document structure, containing historical information concerning the contents of this standard and why features were included or discarded by the standard developers, is included in the Rationale (Informative) volume (XRAT).

Frontmatter (*Informative*)

[Preface | Participants | Referenced Documents | Trademarks | Typographical Conventions]

100%

THE Open GROUP