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This second edition cancels and replaces the first edition (ISO/IEC/IEEE 9945:2009), which has been technically revised. It also incorporates the Technical Corrigenda ISO/IEC/IEEE 9945:2009/Cor. 1:2013 and ISO/IEC/IEEE 9945:2009/Cor. 2:2017.

The main changes are as follows:

— Change history is described in the Rationale (Informative) volume of POSIX.1-2024 and in the CHANGE HISTORY section of reference pages.

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IEEE Std 1003.1™-2024
(Revision of IEEE Std 1003.1-2017)

The Open Group Standard, Base Specifications, Issue 8

IEEE Standard for Information Technology—Portable Operating System Interface (POSIX™)

Base Specifications, Issue 8

Developed by the

Microprocessor Committee
of the
IEEE Computer Society

and

The Open Group

Approved 20 May 2024

IEEE SA Standards Board

IEEE Std 1003.1™-2024 (Revision of IEEE Std 1003.1-2017)
IEEE Standard for Information Technology—Portable Operating System Interface (POSIX®)
The Open Group Standard, Base Specifications, Issue 8

Abstract: POSIX.1-2024 is simultaneously IEEE Std 1003.1™-2024 and The Open Group Standard Base Specifications, Issue 8.

POSIX.1-2024 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. POSIX.1-2024 is intended to be used by both application developers and system implementors and comprises four major components (each in an associated volume):

- 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.
- 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.
- 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.
- Extended rationale that did not fit well into the rest of the document structure, which contains historical information concerning the contents of POSIX.1-2024 and why features were included or discarded by the standard developers, is included in the Rationale (Informative) volume.

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This release of this standard is dedicated to the memory of Jörg Schilling and Donn Terry.

This standard has been prepared by the Austin Group. Feedback relating to the material contained within this standard may be submitted by using the Austin Group web site at www.opengroup.org/austin/defectform.html.

The following areas are outside the scope of POSIX.1-2024:

- Graphics interfaces
- Database management system interfaces
- Record I/O considerations
- Object or binary code portability
- System configuration and resource availability

POSIX.1-2024 describes the external characteristics and facilities that are of importance to application developers, rather than the internal construction techniques employed to achieve these capabilities. Special emphasis is placed on those functions and facilities that are needed in a wide variety of commercial applications.

Keywords: application program interface (API), argument, asynchronous, basic regular expression (BRE), built-in utility, byte, child, command language interpreter, CPU, extended regular expression (ERE), FIFO, file access control mechanism, IEEE 1003.1™, input/output (I/O), job control, network, parent, portable operating system interface (POSIX™), shell, stream, string, synchronous, system, thread, X/Open System Interface (XSI)

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Participants

IEEE Std 1003.1™-2024 was prepared by the Austin Group, sponsored by the Microprocessor Standards Committee of the IEEE Computer Society, The Open Group, and ISO/IEC JTC 1/SC22.

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Introduction

This introduction is not part of IEEE Std 1003.1™-2024, IEEE Standard for Information Technology—Portable Operating System Interface (POSIX™)—Base Specifications, Issue 8.

This draft standard was developed, and is maintained, by a joint working group of members of the IEEE Microprocessor Standards Committee, members of The Open Group, and members of ISO/IEC Joint Technical Committee 1. This joint working group is known as the Austin Group.[4]

The Austin Group arose out of discussions amongst the parties which started in early 1998, leading to an initial meeting and formation of the group in September 1998. The purpose of the Austin Group is to develop and maintain the core open systems interfaces that are the POSIX 1003.1 (and former 1003.2) standards, ISO/IEC 9945, and the core of the Single UNIX® Specification.

The approach to specification development has been one of "write once, adopt everywhere", with the deliverables being a set of specifications that carry the IEEE POSIX designation, The Open Group Standard designation, and an ISO/IEC designation.

This unique development has combined both the industry-led efforts and the formal standardization activities into a single initiative, and included a wide spectrum of participants. The Austin Group continues as the maintenance body for this document.

Anyone wishing to participate in the Austin Group should contact the chair with their request. There are no fees for participation or membership. You may participate as an observer or as a contributor. You do not have to attend face-to-face meetings to participate; electronic participation is most welcome. For more information on the Austin Group and how to participate, see www.opengroup.org/austin.

Background

The developers of POSIX.1-2024 represent a cross-section of hardware manufacturers, vendors of operating systems and other software development tools, software designers, consultants, academics, authors, applications programmers, and others.

Conceptually, POSIX.1-2024 describes a set of fundamental services needed for the efficient construction of application programs. Access to these services has been provided by defining an interface, using the C programming language, a command interpreter, and common utility programs that establish standard semantics and syntax. Since this interface enables application developers to write portable applications – it was developed with that goal in mind – it has been designated POSIX,[5] an acronym for Portable Operating System Interface.

Although originated to refer to the original IEEE Std 1003.1-1988, the name POSIX more correctly refers to a *family* of related standards: IEEE Std 1003.*n* and the parts of ISO/IEC 9945. In earlier editions of the IEEE Standard, the term POSIX was used as a synonym for IEEE Std 1003.1-1988. A preferred term, POSIX.1, emerged. This maintained the advantages of readability of the symbol "POSIX" without being ambiguous with the POSIX family of standards.

[4] The Austin Group is named after the location of the inaugural meeting held at the IBM facility in Austin, Texas in September 1998.

[5] The name POSIX was suggested by Richard Stallman. It is expected to be pronounced with the first two syllables as in positive, not poh-six, or other variations. The pronunciation has been published in an attempt to promulgate a standardized way of referring to a standard operating system interface.

