De Jure Standards 7

This chapter discusses the conformance of Solaris to prevailing standards.

ANSI C Programming Language

The need for a single clearly defined C standard arose as use of the C programming language expanded rapidly and a variety of differing translator implementations were being developed. The American National Standard Programming Language C addressed the problems this need posed to the developer and the implementor by specifying the C language precisely.

The ANSI C standard specifies the syntax and semantics of programs written in the C programming language. It specifies the C program's interaction with the execution environment through input and output data. It also specifies restrictions and limits imposed upon conforming implementations of C language translators.

The standard was developed by the X3J11 Technical Committee on the C Programming Language under project 381-D by the American National Standards Committee on Computers and Information Processing (X3). The work of X3J11 began in the summer of 1983, based on several documents that were made available to the Committee. The Committee divided the effort into three pieces: the environment, the language and the library, and each of these areas is addressed in the standard.

Note – The use of American National Standards is completely voluntary.

Compliance With the ANSI C Standard

Sun ANSI C is fully compliant with the ANSI C standard.

ANSI C Specification and Related Publications

The first manual listed below is the ANSI C standard specification. The second and third manuals listed are part of the Solaris documentation set. The *SPARCompiler C Transition Guide* describes techniques for writing new and upgrading existing C code to comply with the ANSI C language specification.

- *American National Standard for Information Systems Programming Language C*, American National Standards Institute
- *SPARCompiler C 3.0.1 Transition Guide for SPARC Systems*–Sun Microsystems
- *SPARCompiler C 3.0.1 User's Guide*–Sun Microsystems

ANSI/IEEE 754

The ANSI/IEEE 754-1985 Standard for Binary Floating-Point Arithmetic is a product of the Floating-Point Working Group of the Microprocessor Standards Subcommittee of the IEEE Computer Society. The standard defines a family of commercially feasible ways for systems to perform binary floating-point arithmetic. The issues of retrofitting were not considered when the standard was defined; instead, the interests of the user community were placed above the goal of industrial continuity at that time.

There are three major aspects to the standard: the format of data types, the arithmetic and the exception handling. The objective of the standard is that an implementation of a floating-point system conforming to it could be realized entirely in software, entirely in hardware, or in any combination of hardware and software.

Compliance With ANSI/IEEE 754

Sun FORTRAN 2.0.1 conforms to ANSI/IEEE Std. 754-1985.

ANSI/IEEE 754-1985 Specification and Related Publications

The first document listed below is the IEEE 754 Standard. It is followed by a Sun publication that discusses the standard.

- *IEEE Standard for Binary Floating-Point Arithmetic,* ANSI/IEEE Std. 754-1985.
- *Numerical Computation Guide*, Sun Microsystems, Inc., 1991
- *A Proposed Standard for Binary Floating-Point Arithmetic,* IEEE COMPUTER, March 1981

International Standards Organization (ISO) 8859-1

ISO 8859 consists of several parts, each of which specifies a set of up to 191 graphic characters and the coded representation of each of these characters by means of a single 8-bit byte. Each set is intended for use for a group of languages.

ISO 8859, Part 1 specifies a set of 191 graphic characters identified as Latin alphabet No. 1. The set of graphic characters comprising Latin alphabet No. 1 is intended for use in data processing and text applications and may also be used for information interchange.

A set of graphic characters is considered in conformance with ISO 8859 if it comprises all graphic characters declared in the specification to the exclusion of any other, and if their coded representations are those specified by ISO 8859.

Compliance With ISO 8859-1

Solaris is entirely compliant with the ISO 8859-1 standard.

ISO 8859 Standard

- *International Standard ISO 8859-1*

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Federal Information Processing Standard (FIPS) 151

Federal Information Processing Standards Publications (FIPS PUBS) are issued by the National Institute of Standards and Technology (NIST) after approval by the Secretary of Commerce.

The FIPS 151 standard is called the Kernel Operations Component of the Applications Portability Profile (APP). FIPS 151 is part of a series of FIPS for the APP.

FIPS 151-2, which corresponds to IEEE Std. 1003.1 - 1990 was ratified by NIST on October 15, 1993. It supersedes FIPS 151-1 (which corresponded to IEEE Std. 1003.1 - 1988) in its entirety as the POSIX.1 reference standard.

Compliance With FIPS 151

Solaris 2.4 conforms to FIPS 151-2 on several SPARC and x86 platforms.

FIPS 151 Specification

- *The Federal Information Processing Standards Publication*, National Institute of Standards and Technology

Federal Information Processing Standard (FIPS) 158

The FIPS 158 standard is called the User Interface Component of the Applications Portability Profile (APP).

The functional components of FIPS 158 constitute a toolbox of standard elements that can be used to develop and maintain portable applications. FIPS 158 is the first step in responding to a need within the federal community for a set of tools to develop standard user interfaces. FIPS 158 is based upon the X Window System developed by the X Consortium. The X Window System assumes a client/server model of distributed computing and user interface applications based upon bit-mapped graphic displays.

The FIPS 158 standard adopts the specifications for X Version 11, Release 3 (X11R3). These specifications consist of the documents for the X Window System Protocol, X Version 11: the Xlib-C language X Interface (Xlib), the X

Toolkit Intrinsics-C Language Interface (Xt) and the Bitmap Distribution Format 2.1. The interfaces specified in FIPS 158 represent the consensus of the industry for lower-level X Window System interfaces.

Compliance With FIPS 158

OpenWindows, the Solaris windowing environment, conforms to FIPS 158 by fully implementing X11 (Xlib) and the X11 protocol.

The OpenWindows OPEN LOOK Intrinsics Toolkit (OLIT) API is an implementation of MIT's Xt toolkit (Xt intrinsics, Version R5) with an OPEN LOOK widget set. OLIT is composed of prebuilt components that fit into intrinsics applications. OLIT conforms with the Xt intrinsics toolkit; because X11, Release 5 is backwardly compatible with X11, Release 4, OLIT conforms to X11, Release 4.

OpenWindows fully supports ICCCM, which provides basic policy on rules for transferring data between applications, transfer of keyboard focus, layout schemes and colormap installation.

FIPS 158 Specification and Related Publications

- *The Federal Information Processing Standards Publication; The User Interface Component of the Applications Portability Profile*, issued by the National Institute of Standards and Technology, October, 1992.
- *Solaris OpenWindows User's Guide*, SunSoft Press

The Application Binary Interface (ABI)

The Application Binary Interface (ABI) defines the binary system interface between compiled applications and the operating system on which they run. The ABI provides binary portability across UNIX System V Release 4 platforms sharing the same CPU architecture.

The System V Application Binary Interface continues to evolve to address new technology and market requirements and is reissued at intervals of approximately three years. Each new edition of the specification is likely to contain extensions and additions that will increase the potential capabilities of applications that are written to conform with the ABI.

Compliance With the ABI

It is the intention of SunSoft to comply with the ABI as it evolves.

ABI Publication

- *AT&T System V Application Binary Interface: Generic ABI and Application Binary Interface SPARC Processor Supplement* - Prentice-Hall.
- *AT&T System V Application Binary Interface Intel 386 Processor Supplement*

SPARC Compliance Definition (SCD)

The SPARC Compliance Definition (SCD) is a formal specification of the system hardware and software to be met by manufacturers of SPARC systems to ensure that those systems run compliant applications. The SCD also details specific interfaces that can be safely used by an application with assurance that the application binary will run on all compliant SPARC hardware platforms.

The SCD specification was developed by members of SPARC International (SI). SI is now responsible for administering usage of the SPARC trademark to compliant systems.

Sun Microsystems and SunSoft worked with SI to develop SCD 2.1 which is closely connected to SVR4 and the SPARC ABI specification.

Compliance With the SCD

Systems produced by Sun Microsystems and SunSoft are fully compliant with SCD 2.1.

SPARC Compliance Definition Specification

- *SPARC Compliance Definition 2.1* - SPARC International