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Linux Standard Base (LSB) core specification 3.1 —

Part 6: Specification for PPC64 architecture

Spécifications 3.1 relatives au noyau de base normalisé Linux (LSB) —

Partie 6: Spécifications pour l'architecture PPC64

Reference number
ISO/IEC 23360-6:2006(E)

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ISO/IEC 23360-6:2006(E)
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Contents

Foreword ..... **vii**
Introduction ..... **viii**
I Introductory Elements **0**
1 Scope 1
1.1 General 1
1.2 Module Specific Scope 1
2 References 2
2.1 Normative References 2
2.2 Informative References/Bibliography 4
3 Requirements 6
3.1 Relevant Libraries 6
3.2 LSB Implementation Conformance 6
3.3 LSB Application Conformance 7
4 Definitions 9
5 Terminology 10
6 Documentation Conventions 12
II Executable and Linking Format (ELF) **13**
7 Introduction 14
8 Low Level System Information 15
8.1 Machine Interface 15
8.2 Function Calling Sequence 16
8.3 Traceback Tables 16
8.4 Process Initialization 16
8.5 Coding Examples 16
9 Object Format 18
9.1 Introduction 18
9.2 ELF Header 18
9.3 Special Sections 18
9.4 TOC 20
9.5 Symbol Table 20
9.6 Relocation 20
10 Program Loading and Dynamic Linking 21
10.1 Introduction 21
10.2 Program Loading 21
10.3 Dynamic Linking 21
III Base Libraries **22**
11 Libraries 23
11.1 Program Interpreter/Dynamic Linker 23
11.2 Interfaces for libc 23
11.3 Data Definitions for libc 37
11.4 Interfaces for libm 49
11.5 Data Definitions for libm 54
11.6 Interfaces for libpthread 55
11.7 Data Definitions for libpthread 57
11.8 Interfaces for libgcc_s 58
11.9 Data Definitions for libgcc_s 59
11.10 Interface Definitions for libgcc_s 59
11.11 Interfaces for libdl 65
11.12 Data Definitions for libdl 66
11.13 Interfaces for libcrypt 66
IV Utility Libraries **67**
12 Libraries 68

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12.1 Interfaces for libz 68
12.2 Data Definitions for libz 68
12.3 Interfaces for libncurses 68
12.4 Data Definitions for libncurses 69
12.5 Interfaces for libutil 69
V Package Format and Installation 71
13 Software Installation 72
13.1 Package Dependencies 72
13.2 Package Architecture Considerations 72
A Alphabetical Listing of Interfaces 73
A.1 libgcc_s 73

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List of Tables

2-1 Normative References 2
2-2 Other References 4
3-1 Standard Library Names....6
9-1 ELF Special Sections 18
9-2 Additional Special Sections 19
11-1 libc Definition 23
11-2 libc - RPC Function Interfaces 23
11-3 libc - System Calls Function Interfaces 24
11-4 libc - Standard I/O Function Interfaces 26
11-5 libc - Standard I/O Data Interfaces 27
11-6 libc - Signal Handling Function Interfaces 27
11-7 libc - Signal Handling Data Interfaces 28
11-8 libc - Localization Functions Function Interfaces 28
11-9 libc - Localization Functions Data Interfaces 28
11-10 libc - Socket Interface Function Interfaces 29
11-11 libc - Wide Characters Function Interfaces....29
11-12 libc - String Functions Function Interfaces 31
11-13 libc - IPC Functions Function Interfaces 32
11-14 libc - Regular Expressions Function Interfaces 32
11-15 libc - Character Type Functions Function Interfaces....32
11-16 libc - Time Manipulation Function Interfaces 33
11-17 libc - Time Manipulation Data Interfaces 33
11-18 libc - Terminal Interface Functions Function Interfaces 33
11-19 libc - System Database Interface Function Interfaces....34
11-20 libc - Language Support Function Interfaces 34
11-21 libc - Large File Support Function Interfaces 35
11-22 libc - Standard Library Function Interfaces....35
11-23 libc - Standard Library Data Interfaces 37
11-24 libm Definition 49
11-25 libm - Math Function Interfaces....50
11-26 libm - Math Data Interfaces 53
11-27 libpthread Definition....55
11-28 libpthread - Realtime Threads Function Interfaces 55
11-29 libpthread - Posix Threads Function Interfaces 55
11-30 libpthread - Thread aware versions of libc interfaces Function Interfaces 57
11-31 libgcc_s Definition 58
11-32 libgcc_s - Unwind Library Function Interfaces....58
11-33 libdl Definition 65
11-34 libdl - Dynamic Loader Function Interfaces....65
11-35 libcrypt Definition....66
11-36 libcrypt - Encryption Function Interfaces 66
12-1 libz Definition....68
12-2 libncurses Definition 69
12-3 libutil Definition....69
12-4 libutil - Utility Functions Function Interfaces 70
A-1 libgcc_s Function Interfaces 73

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 23360-6 was prepared by the Free Standards Group and was adopted, under the PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 22, *Programming languages, their environments and system software interfaces*.

ISO/IEC 23360 consists of the following parts, under the general title *Linux Standard Base (LSB) core specification 3.1*:

— *Part 1: Generic specification*

— *Part 2: Specification for IA32 architecture*

— *Part 3: Specification for IA64 architecture*

— *Part 4: Specification for AMD64 architecture*

— *Part 5: Specification for PPC32 architecture*

— *Part 6: Specification for PPC64 architecture*

— *Part 7: Specification for S390 architecture*

— *Part 8: Specification for S390X architecture*

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Introduction

The LSB defines a binary interface for application programs that are compiled and packaged for LSB-conforming implementations on many different hardware architectures. Since a binary specification includes information specific to the computer processor architecture for which it is intended, it is not possible for a single document to specify the interface for all possible LSB-conforming implementations. Therefore, the LSB is a family of specifications, rather than a single one.

This document should be used in conjunction with the documents it references. This document enumerates the system components it includes, but descriptions of those components may be included entirely or partly in this document, partly in other documents, or entirely in other reference documents. For example, the section that describes system service routines includes a list of the system routines supported in this interface, formal declarations of the data structures they use that are visible to applications, and a pointer to the underlying referenced specification for information about the syntax and semantics of each call. Only those routines not described in standards referenced by this document, or extensions to those standards, are described in detail. Information referenced in this way is as much a part of this document as is the information explicitly included here.

The specification carries a version number of either the form `x.y` or `x.y.z`. This version number carries the following meaning:

- The first number (`x`) is the major version number. All versions with the same major version number should share binary compatibility. Any addition or deletion of a new library results in a new version number. Interfaces marked as `deprecated` may be removed from the specification at a major version change.
- The second number (`y`) is the minor version number. Individual interfaces may be added if all certified implementations already had that (previously undocumented) interface. Interfaces may be marked as `deprecated` at a minor version change. Other minor changes may be permitted at the discretion of the LSB workgroup.
- The third number (`z`), if present, is the editorial level. Only editorial changes should be included in such versions.

Since this specification is a descriptive Application Binary Interface, and not a source level API specification, it is not possible to make a guarantee of 100% backward compatibility between major releases. However, it is the intent that those parts of the binary interface that are visible in the source level API will remain backward compatible from version to version, except where a feature marked as `deprecated` in one release may be removed from a future release.

Implementors are strongly encouraged to make use of symbol versioning to permit simultaneous support of applications conforming to different releases of this specification.

This is version 3.1 of the Linux Standard Base Core Specification. This specification is part of a family of specifications under the general title "Linux Standard Base (LSB) core specification 3.1". Developers of applications or implementations interested in using the LSB trademark should see the Free Standards Group Certification Policy for details.

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I Introductory Elements

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Linux Standard Base (LSB) core specification 3.1 —

Part 6:
Specification for PPC64 architecture

1 Scope

1.1 General

The Linux Standard Base (LSB) defines a system interface for compiled applications and a minimal environment for support of installation scripts. Its purpose is to enable a uniform industry standard environment for high-volume applications conforming to the LSB.

These specifications are composed of two basic parts: A common specification ("LSB-generic" or "generic LSB"), ISO/IEC 23360-1, describing those parts of the interface that remain constant across all implementations of the LSB, and an architecture-specific part ("LSB-arch" or "archLSB") describing the parts of the interface that vary by processor architecture. Together, the LSB-generic and the relevant architecture-specific part of ISO/IEC 23360 for a single hardware architecture provide a complete interface specification for compiled application programs on systems that share a common hardware architecture.

ISO/IEC 23360-1, the LSB-generic document, is used in conjunction with an architecture-specific part. Whenever a section of the LSB-generic specification is supplemented by architecture-specific information, the LSB-generic document includes a reference to the architecture part. Architecture-specific parts of ISO/IEC 23360 may also contain additional information that is not referenced in the LSB-generic document.

The LSB contains both a set of Application Program Interfaces (APIs) and Application Binary Interfaces (ABIs). APIs may appear in the source code of portable applications, while the compiled binary of that application may use the larger set of ABIs. A conforming implementation provides all of the ABIs listed here. The compilation system may replace (e.g. by macro definition) certain APIs with calls to one or more of the underlying binary interfaces, and may insert calls to binary interfaces as needed.

The LSB is primarily a binary interface definition. Not all of the source level APIs available to applications may be contained in this specification.

1.2 Module Specific Scope

This is the PPC64 architecture-specific Core part of the Linux Standard Base (LSB). It supplements the generic LSB Core module with those interfaces that differ between architectures.

Interfaces described in this part of ISO/IEC 23360 are mandatory except where explicitly listed otherwise. Core interfaces may be supplemented by other modules; all modules are built upon the core.

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2 References

2.1 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Note: Where copies of a document are available on the World Wide Web, a Uniform Resource Locator (URL) is given for informative purposes only. This may point to a more recent copy of the referenced specification, or may be out of date. Reference copies of specifications at the revision level indicated may be found at the Free Standards Group's Reference Specifications (http://refspecs.freestandards.org) site.

Table 2-1 Normative References

Name	Title	URL
ISO/IEC 23360-1	ISO/IEC 23360-1:2006, *Linux Standard Base (LSB) core specification 3.1 — Part 1: Generic Specification*	http://www.linuxbase.org/spec/
64-bit PowerPC™ ELF ABI Supplement	64-bit PowerPC™ ELF ABI Supplement, Version 1.7	http://www.linuxbase.org/spec/ELF/ppc64/
ISO C (1999)	ISO/IEC 9899: 1999, *Programming Languages — C*	
ISO POSIX (2003)	ISO/IEC 9945-1:2003, *Information technology — Portable Operating System Interface (POSIX)—Part 1: Base Definitions* ISO/IEC 9945-2:2003, *Information technology — Portable Operating System Interface (POSIX) —Part 2: System Interfaces* ISO/IEC 9945-3:2003, *Information technology — Portable Operating System Interface (POSIX)—Part 3: Shell and Utilities*	http://www.unix.org/version3/

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Name	Title	URL
	ISO/IEC 9945-4:2003, *Information technology — Portable Operating System Interface (POSIX) —Part 4: Rationale*	
Large File Support	Large File Support	http://www.UNIX-systems.org/version2/whatsnew/lfs20mar.html
SUSv2	CAE Specification, January 1997, System Interfaces and Headers (XSH), Issue 5 (ISBN: 1-85912-181-0, C606)	http://www.opengroup.org/publications/catalog/un.htm
SVID Issue 3	American Telephone and Telegraph Company, System V Interface Definition, Issue 3; Morristown, NJ, UNIX Press, 1989. (ISBN 0201566524)	
SVID Issue 4	System V Interface Definition, Fourth Edition	
System V ABI	System V Application Binary Interface, Edition 4.1	http://www.caldera.com/developers/devspecs/gabi41.pdf
System V ABI Update	System V Application Binary Interface - DRAFT - 17 December 2003	http://www.caldera.com/developers/gabi/2003-12-17/contents.html
The PowerPC™ Microprocessor Family	The PowerPC™ Microprocessor Family: The Programming Environment Manual for 32 and 64-bit Microprocessors	http://refspecs.freestandards.org/PPC_hrm.2005mar31.pdf
X/Open Curses	CAE Specification, May 1996, X/Open Curses, Issue 4, Version 2 (ISBN: 1-85912-171-3, C610), plus Corrigendum U018	http://www.opengroup.org/publications/catalog/un.htm

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2.2 Informative References/Bibliography

In addition, the specifications listed below provide essential background information to implementors of this specification. These references are included for information only.

Table 2-2 Other References

Name	Title	URL
DWARF Debugging Information Format, Revision 2.0.0	DWARF Debugging Information Format, Revision 2.0.0 (July 27, 1993)	http://refspecs.freestandards.org/dwarf/dwarf-2.0.0.pdf
DWARF Debugging Information Format, Revision 3.0.0 (Draft)	DWARF Debugging Information Format, Revision 3.0.0 (Draft)	http://refspecs.freestandards.org/dwarf/
IEC 60559/IEEE 754 Floating Point	IEC 60559:1989, *Binary floating-point arithmetic for microprocessor systems*	http://www.ieee.org/
ISO/IEC TR 14652	ISO/IEC TR 14652:2004, *Information technology — Specification method for cultural conventions*	
ITU-T V.42	International Telecommunication Union Recommendation V.42 (2002): Error-correcting procedures for DCEs using asynchronous-to-synchronous conversion ITUV	http://www.itu.int/rec/recommendation.asp?type=folders&lang=e&parent=T-REC-V.42
Li18nux Globalization Specification	LI18NUX 2000 Globalization Specification, Version 1.0 with Amendment 4	http://www.li18nux.org/docs/html/LI18NUX-2000-amd4.htm
Linux Allocated Device Registry	LINUX ALLOCATED DEVICES	http://www.lanana.org/docs/device-list/devices.txt
PAM	Open Software Foundation, Request For Comments: 86.0 , October 1995, V. Samar & R. Schemers (SunSoft)	http://www.opengroup.org/tech/rfc/mirror-rfc/rfc86.0.txt
RFC 1321: The MD5 Message-Digest Algorithm	IETF RFC 1321: The MD5 Message-Digest Algorithm	http://www.ietf.org/rfc/rfc1321.txt

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Name	Title	URL
RFC 1831/1832 RPC & XDR	IETF RFC 1831 & 1832	http://www.ietf.org/
RFC 1833: Binding Protocols for ONC RPC Version 2	IETF RFC 1833: Binding Protocols for ONC RPC Version 2	http://www.ietf.org/rfc/rfc1833.txt
RFC 1950: ZLIB Compressed Data Format Specication	IETF RFC 1950: ZLIB Compressed Data Format Specification	http://www.ietf.org/rfc/rfc1950.txt
RFC 1951: DEFLATE Compressed Data Format Specification	IETF RFC 1951: DEFLATE Compressed Data Format Specification version 1.3	http://www.ietf.org/rfc/rfc1951.txt
RFC 1952: GZIP File Format Specification	IETF RFC 1952: GZIP file format specification version 4.3	http://www.ietf.org/rfc/rfc1952.txt
RFC 2440: OpenPGP Message Format	IETF RFC 2440: OpenPGP Message Format	http://www.ietf.org/rfc/rfc2440.txt
RFC 2821: Simple Mail Transfer Protocol	IETF RFC 2821: Simple Mail Transfer Protocol	http://www.ietf.org/rfc/rfc2821.txt
RFC 2822: Internet Message Format	IETF RFC 2822: Internet Message Format	http://www.ietf.org/rfc/rfc2822.txt
RFC 791: Internet Protocol	IETF RFC 791: Internet Protocol Specification	http://www.ietf.org/rfc/rfc791.txt
RPM Package Format	RPM Package Format V3.0	http://www.rpm.org/max-rpm/s1-rpm-file-format-rpm-file-format.html
SUSv2 Commands and Utilities	The Single UNIX Specification(SUS) Version 2, Commands and Utilities (XCU), Issue 5 (ISBN: 1-85912-191-8, C604)	http://www.opengroup.org/publications/catalog/un.htm
zlib Manual	zlib 1.2 Manual	http://www.gzip.org/zlib/

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3 Requirements

3.1 Relevant Libraries

The libraries listed in Table 3-1 shall be available on PPC64 Linux Standard Base systems, with the specified runtime names. These names override or supplement the names specified in the generic LSB (ISO/IEC 23360-1) specification. The specified program interpreter, referred to as proginterp in this table, shall be used to load the shared libraries specified by `DT_NEEDED` entries at run time.

Table 3-1 Standard Library Names

Library	Runtime Name
libm	libm.so.6
libdl	libdl.so.2
libcrypt	libcrypt.so.1
libz	libz.so.1
libncurses	libncurses.so.5
libutil	libutil.so.1
libc	libc.so.6
libpthread	libpthread.so.0
proginterp	/lib64/ld-lsb-ppc64.so.3
libgcc_s	libgcc_s.so.1

These libraries will be in an implementation-defined directory which the dynamic linker shall search by default.

3.2 LSB Implementation Conformance

A conforming implementation is necessarily architecture specific, and must provide the interfaces specified by both the generic LSB Core specification (ISO/IEC 23360-1) and the relevant architecture specific part of ISO/IEC 23360.

> **Rationale:** An implementation must provide *at least* the interfaces specified in these specifications. It may also provide additional interfaces.

A conforming implementation shall satisfy the following requirements:

- A processor architecture represents a family of related processors which may not have identical feature sets. The architecture specific parts of ISO/IEC 23360 that supplement this specification for a given target processor architecture describe a minimum acceptable processor. The implementation shall provide all features of this processor, whether in hardware or through emulation transparent to the application.
- The implementation shall be capable of executing compiled applications having the format and using the system interfaces described in this document.
- The implementation shall provide libraries containing the interfaces specified by this document, and shall provide a dynamic linking mechanism that allows

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these interfaces to be attached to applications at runtime. All the interfaces shall behave as specified in this document.

- The map of virtual memory provided by the implementation shall conform to the requirements of this document.
- The implementation's low-level behavior with respect to function call linkage, system traps, signals, and other such activities shall conform to the formats described in this document.
- The implementation shall provide all of the mandatory interfaces in their entirety.
- The implementation may provide one or more of the optional interfaces. Each optional interface that is provided shall be provided in its entirety. The product documentation shall state which optional interfaces are provided.
- The implementation shall provide all files and utilities specified as part of this document in the format defined here and in other referenced documents. All commands and utilities shall behave as required by this document. The implementation shall also provide all mandatory components of an application's runtime environment that are included or referenced in this document.
- The implementation, when provided with standard data formats and values at a named interface, shall provide the behavior defined for those values and data formats at that interface. However, a conforming implementation may consist of components which are separately packaged and/or sold. For example, a vendor of a conforming implementation might sell the hardware, operating system, and windowing system as separately packaged items.
- The implementation may provide additional interfaces with different names. It may also provide additional behavior corresponding to data values outside the standard ranges, for standard named interfaces.

3.3 LSB Application Conformance

A conforming application is necessarily architecture specific, and must conform to both the generic LSB Core specification (ISO/IEC 23360-1)and the relevant architecture specific part of ISO/IEC 23360.

A conforming application shall satisfy the following requirements:

- Its executable files shall be either shell scripts or object files in the format defined for the Object File Format system interface.
- Its object files shall participate in dynamic linking as defined in the Program Loading and Linking System interface.
- It shall employ only the instructions, traps, and other low-level facilities defined in the Low-Level System interface as being for use by applications.
- If it requires any optional interface defined in this document in order to be installed or to execute successfully, the requirement for that optional interface shall be stated in the application's documentation.
- It shall not use any interface or data format that is not required to be provided by a conforming implementation, unless:
  - If such an interface or data format is supplied by another application through direct invocation of that application during execution, that application shall be in turn an LSB conforming application.

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- The use of that interface or data format, as well as its source, shall be identified in the documentation of the application.

- It shall not use any values for a named interface that are reserved for vendor extensions.

A strictly conforming application shall not require or use any interface, facility, or implementation-defined extension that is not defined in this document in order to be installed or to execute successfully.

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4 Definitions

For the purposes of this document, the following definitions, as specified in the *ISO/IEC Directives, Part 2, 2004, 5th Edition*, apply:

can

be able to; there is a possibility of; it is possible to

cannot

be unable to; there is no possibilty of; it is not possible to

may

is permitted; is allowed; is permissible

need not

it is not required that; no...is required

shall

is to; is required to; it is required that; has to; only...is permitted; it is necessary

shall not

is not allowed [permitted] [acceptable] [permissible]; is required to be not; is required that...be not; is not to be

should

it is recommended that; ought to

should not

it is not recommended that; ought not to

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5 Terminology

For the purposes of this document, the following terms apply:

archLSB

The architectural part of the LSB Specification which describes the specific parts of the interface that are platform specific. The archLSB is complementary to the gLSB.

Binary Standard

The total set of interfaces that are available to be used in the compiled binary code of a conforming application.

gLSB

The common part of the LSB Specification that describes those parts of the interface that remain constant across all hardware implementations of the LSB.

implementation-defined

Describes a value or behavior that is not defined by this document but is selected by an implementor. The value or behavior may vary among implementations that conform to this document. An application should not rely on the existence of the value or behavior. An application that relies on such a value or behavior cannot be assured to be portable across conforming implementations. The implementor shall document such a value or behavior so that it can be used correctly by an application.

Shell Script

A file that is read by an interpreter (e.g., awk). The first line of the shell script includes a reference to its interpreter binary.

Source Standard

The set of interfaces that are available to be used in the source code of a conforming application.

undefined

Describes the nature of a value or behavior not defined by this document which results from use of an invalid program construct or invalid data input. The value or behavior may vary among implementations that conform to this document. An application should not rely on the existence or validity of the value or behavior. An application that relies on any particular value or behavior cannot be assured to be portable across conforming implementations.

unspecified

Describes the nature of a value or behavior not specified by this document which results from use of a valid program construct or valid data input. The value or behavior may vary among implementations that conform to this document. An application should not rely on the existence or validity of the value or behavior. An application that relies on any particular value or behavior cannot be assured to be portable across conforming implementations.

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Other terms and definitions used in this document shall have the same meaning as defined in Chapter 3 of the Base Definitions volume of ISO POSIX (2003).

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6 Documentation Conventions

Throughout this document, the following typographic conventions are used:

`function()`

the name of a function

command

the name of a command or utility

`CONSTANT`

a constant value

`parameter`

a parameter

`variable`

a variable

Throughout this specification, several tables of interfaces are presented. Each entry in these tables has the following format:

name

the name of the interface

(symver)

An optional symbol version identifier, if required.

[*`refno`*]

A reference number indexing the table of referenced specifications that follows this table.

For example,

forkpty(GLIBC_2.0) [SUSv3]

refers to the interface named `forkpty()` with symbol version `GLIBC_2.0` that is defined in the `SUSv3` reference.

Note: Symbol versions are defined in the architecture specific parts of ISO/IEC 23360 only.

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II Executable and Linking Format (ELF)

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7 Introduction

Executable and Linking Format (ELF) defines the object format for compiled applications. This specification supplements the information found in System V ABI Update and 64-bit PowerPC™ ELF ABI Supplement, and is intended to document additions made since the publication of that document.

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8 Low Level System Information

8.1 Machine Interface

8.1.1 Processor Architecture

The PowerPC Architecture is specified by the following documents:

- 64-bit PowerPC™ ELF ABI Supplement
- The PowerPC™ Microprocessor Family

Only the features of the PowerPC Power3 processor instruction set may be assumed to be present. An application should determine if any additional instruction set features are available before using those additional features. If a feature is not present, then the application may not use it.

Conforming applications may use only instructions which do not require elevated privileges.

Conforming applications shall not invoke the implementations underlying system call interface directly. The interfaces in the implementation base libraries shall be used instead.

> **Rationale:** Implementation-supplied base libraries may use the system call interface but applications must not assume any particular operating system or kernel version is present.

An implementation must support the 64-bit computation mode as described in The PowerPC™ Microprocessor Family.

Applications conforming to this specification must provide feedback to the user if a feature that is required for correct execution of the application is not present. Applications conforming to this specification should attempt to execute in a diminished capacity if a required feature is not present.

This specification does not provide any performance guarantees of a conforming system. A system conforming to this specification may be implemented in either hardware or software.

8.1.2 Data Representation

LSB-conforming applications shall use the data representation as defined in Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.1.3 Byte Ordering

LSB-conforming applications shall use big-endian byte ordering. LSB-conforming implementations may support little-endian applications.

8.1.4 Fundamental Types

LSB-conforming applications shall use the fundamental types as defined in Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

LSB-conforming applications shall not use the long double fundamental type.

8.1.5 Aggregates and Unions

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

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8.1.6 Bit Fields

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.2 Function Calling Sequence

LSB-conforming applications shall use the function calling sequence as defined in Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.2.1 Registers

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.2.2 Stack Frame

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.2.3 Parameter Passing

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.2.4 Return Values

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.2.5 Function Descriptors

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.3 Traceback Tables

LSB-conforming applications shall use the traceback tables as defined in Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.3.1 Mandatory Fields

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.3.2 Optional Fields

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.4 Process Initialization

LSB-conforming applications shall use the Operating System Interfaces as defined in Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.4.1 Registers

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.4.2 Process Stack

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5 Coding Examples

LSB-conforming applications may implement fundamental operations using the Coding Examples as defined in Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

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8.5.1 Code Model Overview

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.2 The TOC Section

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.3 TOC Assembly Language Syntax

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.4 Function Prologue and Epilogue

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.5 Register Saving and Restoring Functions

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.6 Saving General Registers Only

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.7 Saving General Registers and Floating Point Registers

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.8 Saving Floating Point Registers Only

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.9 Save and Restore Services

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.10 Data Objects

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.11 Function Calls

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.12 Branching

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

8.5.13 Dynamic Stack Space Allocation

See Chapter 3 of the 64-bit PowerPC™ ELF ABI Supplement.

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9 Object Format

9.1 Introduction

LSB-conforming implementations shall support an object file , called Executable and Linking Format (ELF) as defined by the 64-bit PowerPC™ ELF ABI Supplement and as supplemented by the Linux Standard Base Specification and this document. LSB-conforming implementations need not support tags related functionality. LSB-conforming applications must not rely on tags related functionality.

9.2 ELF Header

LSB-conforming applications shall use the ELF header as defined in 64-bit PowerPC™ ELF ABI Supplement, Chapter 4.

9.3 Special Sections

The following sections are defined in the 64-bit PowerPC™ ELF ABI Supplement.

Table 9-1 ELF Special Sections

Name	Type	Attributes
.glink	SHT_PROGBITS	SHF_ALLOC+SHF_EXECINSTR
.got	SHT_PROGBITS	SHF_ALLOC+SHF_WRITE
.plt	SHT_NOBITS	SHF_ALLOC+SHF_WRITE
.sbss	SHT_NOBITS	SHF_ALLOC+SHF_WRITE
.sdata	SHT_PROGBITS	SHF_ALLOC+SHF_WRITE
.toc	SHT_PROGBITS	SHF_ALLOC+SHF_WRITE
.tocbss	SHT_NOBITS	SHF_ALLOC+SHF_WRITE

.glink

This section may be used to hold the global linkage table which aids the procedure linkage table. See Procedure Linkage Table in Chapter 5 of the processor supplement for more information

.got

This section may be used to hold the Global Offset Table, or GOT. See The Toc Section and Coding Examples in Chapter 3 and Global Offset Table in Chapter 5 of the processor supplement for more information

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.plt

This section holds the procedure linkage table. See Procedure Linkage Table in Chapter 5 of the processor supplement for more information

.sbss

This section holds uninitialized data that contribute to the program's memory image. The system initializes the data with zeroes when the program begins to run.

.sdata

This section holds initialized small data that contribute to the program memory image.

.toc

This section may be used to hold the initialized Table of Contents, or TOC

.tocbss

This section may be used to hold the uninitialized portions of the TOC. This data may also be stored as zero-initialized data in a .toc section

9.3.1 Addition Special Sections

The following additional sections are defined here.

Table 9-2 Additional Special Sections

Name	Type	Attributes
.branch_lt	SHT_PROGBITS	SHF_ALLOC+SHF_WRITE
.opd	SHT_PROGBITS	SHF_ALLOC+SHF_WRITE
.rela.dyn	SHT_RELA	SHF_ALLOC
.rela.plt	SHT_RELA	SHF_ALLOC
.toc1	SHT_PROGBITS	SHF_ALLOC+SHF_WRITE

.branch_lt

This section holds destination addresses for very long branches

.opd

This section contains the official procedure descriptors. A pointer to a function shall reference a procedure descriptor in this section.

.rela.dyn

This section holds RELA type relocation information for all sections of a shared library except the PLT

.rela.plt

This section holds RELA type relocation information for the PLT section of a shared library or dynamically linked application

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.toc1

This section holds the second level TOC information

9.4 TOC

LSB-conforming applications shall use the Table of Contents (TOC) as defined in 64-bit PowerPC™ ELF ABI Supplement, Chapter 4.

9.5 Symbol Table

LSB-conforming applications shall use the Symbol Table as defined in Chapter 4 of the 64-bit PowerPC™ ELF ABI Supplement.

9.5.1 Symbol Values

See Chapter 4 of the 64-bit PowerPC™ ELF ABI Supplement.

9.6 Relocation

LSB-conforming applications shall use Relocations as defined in Chapter 4 of the 64-bit PowerPC™ ELF ABI Supplement.

9.6.1 Relocation Types

See Chapter 4 of the 64-bit PowerPC™ ELF ABI Supplement.

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10 Program Loading and Dynamic Linking

10.1 Introduction

LSB-conforming implementations shall support the object file information and system actions that create running programs as specified in the System V ABI, 64-bit PowerPC™ ELF ABI Supplement and as supplemented by the Linux Standard Base Specification and this document.

10.2 Program Loading

See 64-bit PowerPC™ ELF ABI Supplement, Chapter 5.1.

10.3 Dynamic Linking

See 64-bit PowerPC™ ELF ABI Supplement, Chapter 5.2.

10.3.1 Dynamic Section

The following dynamic entries are defined in the 64-bit PowerPC™ ELF ABI Supplement, Chapter 5.2.

DT_JMPREL

This entry is associated with a table of relocation entries for the procedure linkage table. This entry is mandatory both for executable and shared object files

DT_PLTGOT

This entry's d_ptr member gives the address of the first byte in the procedure linkage table

In addtion the following dynamic entries are also supported:

DT_RELACOUNT

The number of relative relocations in .rela.dyn

10.3.2 Global Offset Table

See 64-bit PowerPC™ ELF ABI Supplement, Chapter 5.2.2.

10.3.3 Function Addresses

See 64-bit PowerPC™ ELF ABI Supplement, Chapter 5.2.3.

10.3.4 Procedure Linkage Table

See 64-bit PowerPC™ ELF ABI Supplement, Chapter 5.2.4.

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III Base Libraries

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11 Libraries

An LSB-conforming implementation shall support base libraries which provide interfaces for accessing the operating system, processor and other hardware in the system.

Only those interfaces that are unique to the PowerPC 64 platform are defined here. This section should be used in conjunction with the corresponding section in the Linux Standard Base Specification.

11.1 Program Interpreter/Dynamic Linker

The Program Interpreter shall be `/lib64/ld-lsb-ppc64.so.3`.

11.2 Interfaces for libc

Table 11-1 defines the library name and shared object name for the libc library

Table 11-1 libc Definition

Library:	libc
SONAME:	libc.so.6

The behavior of the interfaces in this library is specified by the following specifications:

[LFS] Large File Support
[LSB] ISO/IEC 23360-1
[SUSv2] SUSv2
[SUSv3] ISO POSIX (2003)
[SVID.3] SVID Issue 3
[SVID.4] SVID Issue 4

11.2.1 RPC

11.2.1.1 Interfaces for RPC

An LSB conforming implementation shall provide the architecture specific functions for RPC specified in Table 11-2, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-2 libc - RPC Function Interfaces

authnone_create(GLIBC_2.3) [SVID.4]	clnt_create(GLIBC_2.3) [SVID.4]	clnt_pcreateerror(GLIBC_2.3) [SVID.4]	clnt_perrno(GLIBC_2.3) [SVID.4]
clnt_perror(GLIBC_2.3) [SVID.4]	clnt_spcreateerror(GLIBC_2.3) [SVID.4]	clnt_sperrno(GLIBC_2.3) [SVID.4]	clnt_sperror(GLIBC_2.3) [SVID.4]
key_decryptsession(GLIBC_2.3) [SVID.3]	pmap_getport(GLIBC_2.3) [LSB]	pmap_set(GLIBC_2.3) [LSB]	pmap_unset(GLIBC_2.3) [LSB]
svc_getreqset(GLIBC_2.3) [SVID.3]	svc_register(GLIBC_2.3) [LSB]	svc_run(GLIBC_2.3) [LSB]	svc_sendreply(GLIBC_2.3) [LSB]

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svcerr_auth(GLIBC_2.3) [SVID.3]	svcerr_decode(GLIBC_2.3) [SVID.3]	svcerr_noproc(GLIBC_2.3) [SVID.3]	svcerr_noprog(GLIBC_2.3) [SVID.3]
svcerr_progvers(GLIBC_2.3) [SVID.3]	svcerr_systemerr(GLIBC_2.3) [SVID.3]	svcerr_weakauth(GLIBC_2.3) [SVID.3]	svctcp_create(GLIBC_2.3) [LSB]
svcudp_create(GLIBC_2.3) [LSB]	xdr_accepted_reply(GLIBC_2.3) [SVID.3]	xdr_array(GLIBC_2.3) [SVID.3]	xdr_bool(GLIBC_2.3) [SVID.3]
xdr_bytes(GLIBC_2.3) [SVID.3]	xdr_callhdr(GLIBC_2.3) [SVID.3]	xdr_callmsg(GLIBC_2.3) [SVID.3]	xdr_char(GLIBC_2.3) [SVID.3]
xdr_double(GLIBC_2.3) [SVID.3]	xdr_enum(GLIBC_2.3) [SVID.3]	xdr_float(GLIBC_2.3) [SVID.3]	xdr_free(GLIBC_2.3) [SVID.3]
xdr_int(GLIBC_2.3) [SVID.3]	xdr_long(GLIBC_2.3) [SVID.3]	xdr_opaque(GLIBC_2.3) [SVID.3]	xdr_opaque_auth(GLIBC_2.3) [SVID.3]
xdr_pointer(GLIBC_2.3) [SVID.3]	xdr_reference(GLIBC_2.3) [SVID.3]	xdr_rejected_reply(GLIBC_2.3) [SVID.3]	xdr_replymsg(GLIBC_2.3) [SVID.3]
xdr_short(GLIBC_2.3) [SVID.3]	xdr_string(GLIBC_2.3) [SVID.3]	xdr_u_char(GLIBC_2.3) [SVID.3]	xdr_u_int(GLIBC_2.3) [LSB]
xdr_u_long(GLIBC_2.3) [SVID.3]	xdr_u_short(GLIBC_2.3) [SVID.3]	xdr_union(GLIBC_2.3) [SVID.3]	xdr_vector(GLIBC_2.3) [SVID.3]
xdr_void(GLIBC_2.3) [SVID.3]	xdr_wrapstring(GLIBC_2.3) [SVID.3]	xdrmem_create(GLIBC_2.3) [SVID.3]	xdrrec_create(GLIBC_2.3) [SVID.3]
xdrrec_eof(GLIBC_2.3) [SVID.3]			

11.2.2 System Calls

11.2.2.1 Interfaces for System Calls

An LSB conforming implementation shall provide the architecture specific functions for System Calls specified in Table 11-3, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-3 libc - System Calls Function Interfaces

__fxstat(GLIBC_2.3) [LSB]	__getpgid(GLIBC_2.3) [LSB]	__lxstat(GLIBC_2.3) [LSB]	__xmknod(GLIBC_2.3) [LSB]
__xstat(GLIBC_2.3) [LSB]	access(GLIBC_2.3) [SUSv3]	acct(GLIBC_2.3) [LSB]	alarm(GLIBC_2.3) [SUSv3]
brk(GLIBC_2.3) [SUSv2]	chdir(GLIBC_2.3) [SUSv3]	chmod(GLIBC_2.3) [SUSv3]	chown(GLIBC_2.3) [SUSv3]
chroot(GLIBC_2.3) [SUSv2]	clock(GLIBC_2.3) [SUSv3]	close(GLIBC_2.3) [SUSv3]	closedir(GLIBC_2.3) [SUSv3]

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creat(GLIBC_2.3) [SUSv3]	dup(GLIBC_2.3) [SUSv3]	dup2(GLIBC_2.3) [SUSv3]	execl(GLIBC_2.3) [SUSv3]
execle(GLIBC_2.3) [SUSv3]	execlp(GLIBC_2.3) [SUSv3]	execv(GLIBC_2.3) [SUSv3]	execve(GLIBC_2.3) [SUSv3]
execvp(GLIBC_2.3) [SUSv3]	exit(GLIBC_2.3) [SUSv3]	fchdir(GLIBC_2.3) [SUSv3]	fchmod(GLIBC_2.3) [SUSv3]
fchown(GLIBC_2.3) [SUSv3]	fcntl(GLIBC_2.3) [LSB]	fdatasync(GLIBC_2.3) [SUSv3]	flock(GLIBC_2.3) [LSB]
fork(GLIBC_2.3) [SUSv3]	fstatvfs(GLIBC_2.3) [SUSv3]	fsync(GLIBC_2.3) [SUSv3]	ftime(GLIBC_2.3) [SUSv3]
ftruncate(GLIBC_2.3) [SUSv3]	getcontext(GLIBC_2.3.4) [SUSv3]	getegid(GLIBC_2.3) [SUSv3]	geteuid(GLIBC_2.3) [SUSv3]
getgid(GLIBC_2.3) [SUSv3]	getgroups(GLIBC_2.3) [SUSv3]	getitimer(GLIBC_2.3) [SUSv3]	getloadavg(GLIBC_2.3) [LSB]
getpagesize(GLIBC_2.3) [SUSv2]	getpgid(GLIBC_2.3) [SUSv3]	getpgrp(GLIBC_2.3) [SUSv3]	getpid(GLIBC_2.3) [SUSv3]
getppid(GLIBC_2.3) [SUSv3]	getpriority(GLIBC_2.3) [SUSv3]	getrlimit(GLIBC_2.3) [SUSv3]	getrusage(GLIBC_2.3) [SUSv3]
getsid(GLIBC_2.3) [SUSv3]	getuid(GLIBC_2.3) [SUSv3]	getwd(GLIBC_2.3) [SUSv3]	initgroups(GLIBC_2.3) [LSB]
ioctl(GLIBC_2.3) [LSB]	kill(GLIBC_2.3) [LSB]	killpg(GLIBC_2.3) [SUSv3]	lchown(GLIBC_2.3) [SUSv3]
link(GLIBC_2.3) [LSB]	lockf(GLIBC_2.3) [SUSv3]	lseek(GLIBC_2.3) [SUSv3]	mkdir(GLIBC_2.3) [SUSv3]
mkfifo(GLIBC_2.3) [SUSv3]	mlock(GLIBC_2.3) [SUSv3]	mlockall(GLIBC_2.3) [SUSv3]	mmap(GLIBC_2.3) [SUSv3]
mprotect(GLIBC_2.3) [SUSv3]	msync(GLIBC_2.3) [SUSv3]	munlock(GLIBC_2.3) [SUSv3]	munlockall(GLIBC_2.3) [SUSv3]
munmap(GLIBC_2.3) [SUSv3]	nanosleep(GLIBC_2.3) [SUSv3]	nice(GLIBC_2.3) [SUSv3]	open(GLIBC_2.3) [SUSv3]
opendir(GLIBC_2.3) [SUSv3]	pathconf(GLIBC_2.3) [SUSv3]	pause(GLIBC_2.3) [SUSv3]	pipe(GLIBC_2.3) [SUSv3]
poll(GLIBC_2.3) [SUSv3]	read(GLIBC_2.3) [SUSv3]	readdir(GLIBC_2.3) [SUSv3]	readdir_r(GLIBC_2.3) [SUSv3]
readlink(GLIBC_2.3) [SUSv3]	readv(GLIBC_2.3) [SUSv3]	rename(GLIBC_2.3) [SUSv3]	rmdir(GLIBC_2.3) [SUSv3]
sbrk(GLIBC_2.3) [SUSv2]	sched_get_priority_max(GLIBC_2.3) [SUSv3]	sched_get_priority_min(GLIBC_2.3) [SUSv3]	sched_getparam(GLIBC_2.3) [SUSv3]
sched_getscheduler(GLIBC_2.3) [SUSv3]	sched_rr_get_interval(GLIBC_2.3) [SUSv3]	sched_setparam(GLIBC_2.3) [SUSv3]	sched_setscheduler(GLIBC_2.3) [SUSv3]
sched_yield(GLI	select(GLIBC_2.3	setcontext(GLIB	setegid(GLIBC_2.

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BC_2.3) [SUSv3]	) [SUSv3]	C_2.3.4) [SUSv3]	3) [SUSv3]
seteuid(GLIBC_2.3) [SUSv3]	setgid(GLIBC_2.3) [SUSv3]	setitimer(GLIBC_2.3) [SUSv3]	setpgid(GLIBC_2.3) [SUSv3]
setpgrp(GLIBC_2.3) [SUSv3]	setpriority(GLIBC_2.3) [SUSv3]	setregid(GLIBC_2.3) [SUSv3]	setreuid(GLIBC_2.3) [SUSv3]
setrlimit(GLIBC_2.3) [SUSv3]	setrlimit64(GLIBC_2.3) [LFS]	setsid(GLIBC_2.3) [SUSv3]	setuid(GLIBC_2.3) [SUSv3]
sleep(GLIBC_2.3) [SUSv3]	statvfs(GLIBC_2.3) [SUSv3]	stime(GLIBC_2.3) [LSB]	symlink(GLIBC_2.3) [SUSv3]
sync(GLIBC_2.3) [SUSv3]	sysconf(GLIBC_2.3) [SUSv3]	time(GLIBC_2.3) [SUSv3]	times(GLIBC_2.3) [SUSv3]
truncate(GLIBC_2.3) [SUSv3]	ulimit(GLIBC_2.3) [SUSv3]	umask(GLIBC_2.3) [SUSv3]	uname(GLIBC_2.3) [SUSv3]
unlink(GLIBC_2.3) [LSB]	utime(GLIBC_2.3) [SUSv3]	utimes(GLIBC_2.3) [SUSv3]	vfork(GLIBC_2.3) [SUSv3]
wait(GLIBC_2.3) [SUSv3]	wait4(GLIBC_2.3) [LSB]	waitpid(GLIBC_2.3) [LSB]	write(GLIBC_2.3) [SUSv3]
writev(GLIBC_2.3) [SUSv3]			

11.2.3 Standard I/O

11.2.3.1 Interfaces for Standard I/O

An LSB conforming implementation shall provide the architecture specific functions for Standard I/O specified in Table 11-4, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-4 libc - Standard I/O Function Interfaces

_IO_feof(GLIBC_2.3) [LSB]	_IO_getc(GLIBC_2.3) [LSB]	_IO_putc(GLIBC_2.3) [LSB]	_IO_puts(GLIBC_2.3) [LSB]
asprintf(GLIBC_2.3) [LSB]	clearerr(GLIBC_2.3) [SUSv3]	ctermid(GLIBC_2.3) [SUSv3]	fclose(GLIBC_2.3) [SUSv3]
fdopen(GLIBC_2.3) [SUSv3]	feof(GLIBC_2.3) [SUSv3]	ferror(GLIBC_2.3) [SUSv3]	fflush(GLIBC_2.3) [SUSv3]
fflush_unlocked(GLIBC_2.3) [LSB]	fgetc(GLIBC_2.3) [SUSv3]	fgetpos(GLIBC_2.3) [SUSv3]	fgets(GLIBC_2.3) [SUSv3]
fgetwc_unlocked(GLIBC_2.3) [LSB]	fileno(GLIBC_2.3) [SUSv3]	flockfile(GLIBC_2.3) [SUSv3]	fopen(GLIBC_2.3) [SUSv3]
fprintf(GLIBC_2.3) [SUSv3]	fputc(GLIBC_2.3) [SUSv3]	fputs(GLIBC_2.3) [SUSv3]	fread(GLIBC_2.3) [SUSv3]
freopen(GLIBC_2.3) [SUSv3]	fscanf(GLIBC_2.3) [LSB]	fseek(GLIBC_2.3) [SUSv3]	fseeko(GLIBC_2.3) [SUSv3]
fsetpos(GLIBC_2.	ftell(GLIBC_2.3)	ftello(GLIBC_2.3)	fwrite(GLIBC_2.3

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3) [SUSv3]	[SUSv3]	[SUSv3]	) [SUSv3]
getc(GLIBC_2.3) [SUSv3]	getc_unlocked(GLIBC_2.3) [SUSv3]	getchar(GLIBC_2.3) [SUSv3]	getchar_unlocked(GLIBC_2.3) [SUSv3]
getw(GLIBC_2.3) [SUSv2]	pclose(GLIBC_2.3) [SUSv3]	popen(GLIBC_2.3) [SUSv3]	printf(GLIBC_2.3) [SUSv3]
putc(GLIBC_2.3) [SUSv3]	putc_unlocked(GLIBC_2.3) [SUSv3]	putchar(GLIBC_2.3) [SUSv3]	putchar_unlocked(GLIBC_2.3) [SUSv3]
puts(GLIBC_2.3) [SUSv3]	putw(GLIBC_2.3) [SUSv2]	remove(GLIBC_2.3) [SUSv3]	rewind(GLIBC_2.3) [SUSv3]
rewinddir(GLIBC_2.3) [SUSv3]	scanf(GLIBC_2.3) [LSB]	seekdir(GLIBC_2.3) [SUSv3]	setbuf(GLIBC_2.3) [SUSv3]
setbuffer(GLIBC_2.3) [LSB]	setvbuf(GLIBC_2.3) [SUSv3]	snprintf(GLIBC_2.3) [SUSv3]	sprintf(GLIBC_2.3) [SUSv3]
sscanf(GLIBC_2.3) [LSB]	telldir(GLIBC_2.3) [SUSv3]	tempnam(GLIBC_2.3) [SUSv3]	ungetc(GLIBC_2.3) [SUSv3]
vasprintf(GLIBC_2.3) [LSB]	vdprintf(GLIBC_2.3) [LSB]	vfprintf(GLIBC_2.3) [SUSv3]	vprintf(GLIBC_2.3) [SUSv3]
vsnprintf(GLIBC_2.3) [SUSv3]	vsprintf(GLIBC_2.3) [SUSv3]		

An LSB conforming implementation shall provide the architecture specific data interfaces for Standard I/O specified in Table 11-5, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-5 libc - Standard I/O Data Interfaces

stderr(GLIBC_2.3) [SUSv3]	stdin(GLIBC_2.3) [SUSv3]	stdout(GLIBC_2.3) [SUSv3]	

11.2.4 Signal Handling

11.2.4.1 Interfaces for Signal Handling

An LSB conforming implementation shall provide the architecture specific functions for Signal Handling specified in Table 11-6, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-6 libc - Signal Handling Function Interfaces

__libc_current_sigrtmax(GLIBC_2.3) [LSB]	__libc_current_sigrtmin(GLIBC_2.3) [LSB]	__sigsetjmp(GLIBC_2.3.4) [LSB]	__sysv_signal(GLIBC_2.3) [LSB]
bsd_signal(GLIBC_2.3) [SUSv3]	psignal(GLIBC_2.3) [LSB]	raise(GLIBC_2.3) [SUSv3]	sigaction(GLIBC_2.3) [SUSv3]
sigaddset(GLIBC_2.3) [SUSv3]	sigaltstack(GLIBC_2.3) [SUSv3]	sigandset(GLIBC_2.3) [LSB]	sigdelset(GLIBC_2.3) [SUSv3]
sigemptyset(GLI	sigfillset(GLIBC_	sighold(GLIBC_2	sigignore(GLIBC

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BC_2.3) [SUSv3]	2.3) [SUSv3]	.3) [SUSv3]	_2.3) [SUSv3]
siginterrupt(GLIBC_2.3) [SUSv3]	sigisemptyset(GLIBC_2.3) [LSB]	sigismember(GLIBC_2.3) [SUSv3]	siglongjmp(GLIBC_2.3.4) [SUSv3]
signal(GLIBC_2.3) [SUSv3]	sigorset(GLIBC_2.3) [LSB]	sigpause(GLIBC_2.3) [SUSv3]	sigpending(GLIBC_2.3) [SUSv3]
sigprocmask(GLIBC_2.3) [SUSv3]	sigqueue(GLIBC_2.3) [SUSv3]	sigrelse(GLIBC_2.3) [SUSv3]	sigreturn(GLIBC_2.3) [LSB]
sigset(GLIBC_2.3) [SUSv3]	sigsuspend(GLIBC_2.3) [SUSv3]	sigtimedwait(GLIBC_2.3) [SUSv3]	sigwait(GLIBC_2.3) [SUSv3]
sigwaitinfo(GLIBC_2.3) [SUSv3]			

An LSB conforming implementation shall provide the architecture specific data interfaces for Signal Handling specified in Table 11-7, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-7 libc - Signal Handling Data Interfaces

_sys_siglist(GLIBC_2.3.3) [LSB]			

11.2.5 Localization Functions

11.2.5.1 Interfaces for Localization Functions

An LSB conforming implementation shall provide the architecture specific functions for Localization Functions specified in Table 11-8, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-8 libc - Localization Functions Function Interfaces

bind_textdomain_codeset(GLIBC_2.3) [LSB]	bindtextdomain(GLIBC_2.3) [LSB]	catclose(GLIBC_2.3) [SUSv3]	catgets(GLIBC_2.3) [SUSv3]
catopen(GLIBC_2.3) [SUSv3]	dcgettext(GLIBC_2.3) [LSB]	dcngettext(GLIBC_2.3) [LSB]	dgettext(GLIBC_2.3) [LSB]
dngettext(GLIBC_2.3) [LSB]	gettext(GLIBC_2.3) [LSB]	iconv(GLIBC_2.3) [SUSv3]	iconv_close(GLIBC_2.3) [SUSv3]
iconv_open(GLIBC_2.3) [SUSv3]	localeconv(GLIBC_2.3) [SUSv3]	ngettext(GLIBC_2.3) [LSB]	nl_langinfo(GLIBC_2.3) [SUSv3]
setlocale(GLIBC_2.3) [SUSv3]	textdomain(GLIBC_2.3) [LSB]		

An LSB conforming implementation shall provide the architecture specific data interfaces for Localization Functions specified in Table 11-9, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-9 libc - Localization Functions Data Interfaces

_nl_msg_cat_cntr (GLIBC_2.3)			

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[LSB]			

11.2.6 Socket Interface

11.2.6.1 Interfaces for Socket Interface

An LSB conforming implementation shall provide the architecture specific functions for Socket Interface specified in Table 11-10, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-10 libc - Socket Interface Function Interfaces

__h_errno_location(GLIBC_2.3) [LSB]	accept(GLIBC_2.3) [SUSv3]	bind(GLIBC_2.3) [SUSv3]	bindresvport(GLIBC_2.3) [LSB]
connect(GLIBC_2.3) [SUSv3]	gethostid(GLIBC_2.3) [SUSv3]	gethostname(GLIBC_2.3) [SUSv3]	getpeername(GLIBC_2.3) [SUSv3]
getsockname(GLIBC_2.3) [SUSv3]	getsockopt(GLIBC_2.3) [LSB]	if_freenameindex(GLIBC_2.3) [SUSv3]	if_indextoname(GLIBC_2.3) [SUSv3]
if_nameindex(GLIBC_2.3) [SUSv3]	if_nametoindex(GLIBC_2.3) [SUSv3]	listen(GLIBC_2.3) [SUSv3]	recv(GLIBC_2.3) [SUSv3]
recvfrom(GLIBC_2.3) [SUSv3]	recvmsg(GLIBC_2.3) [SUSv3]	send(GLIBC_2.3) [SUSv3]	sendmsg(GLIBC_2.3) [SUSv3]
sendto(GLIBC_2.3) [SUSv3]	setsockopt(GLIBC_2.3) [LSB]	shutdown(GLIBC_2.3) [SUSv3]	sockatmark(GLIBC_2.3) [SUSv3]
socket(GLIBC_2.3) [SUSv3]	socketpair(GLIBC_2.3) [SUSv3]		

11.2.7 Wide Characters

11.2.7.1 Interfaces for Wide Characters

An LSB conforming implementation shall provide the architecture specific functions for Wide Characters specified in Table 11-11, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-11 libc - Wide Characters Function Interfaces

__wcstod_internal(GLIBC_2.3) [LSB]	__wcstof_internal(GLIBC_2.3) [LSB]	__wcstol_internal(GLIBC_2.3) [LSB]	__wcstold_internal(GLIBC_2.3) [LSB]
__wcstoul_internal(GLIBC_2.3) [LSB]	btowc(GLIBC_2.3) [SUSv3]	fgetwc(GLIBC_2.3) [SUSv3]	fgetws(GLIBC_2.3) [SUSv3]
fputwc(GLIBC_2.3) [SUSv3]	fputws(GLIBC_2.3) [SUSv3]	fwide(GLIBC_2.3) [SUSv3]	fwprintf(GLIBC_2.3) [SUSv3]
fwscanf(GLIBC_2.3) [LSB]	getwc(GLIBC_2.3) [SUSv3]	getwchar(GLIBC_2.3) [SUSv3]	mblen(GLIBC_2.3) [SUSv3]

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mbrlen(GLIBC_2.3) [SUSv3]	mbrtowc(GLIBC_2.3) [SUSv3]	mbsinit(GLIBC_2.3) [SUSv3]	mbsnrtowcs(GLIBC_2.3) [LSB]
mbsrtowcs(GLIBC_2.3) [SUSv3]	mbstowcs(GLIBC_2.3) [SUSv3]	mbtowc(GLIBC_2.3) [SUSv3]	putwc(GLIBC_2.3) [SUSv3]
putwchar(GLIBC_2.3) [SUSv3]	swprintf(GLIBC_2.3) [SUSv3]	swscanf(GLIBC_2.3) [LSB]	towctrans(GLIBC_2.3) [SUSv3]
towlower(GLIBC_2.3) [SUSv3]	towupper(GLIBC_2.3) [SUSv3]	ungetwc(GLIBC_2.3) [SUSv3]	vfwprintf(GLIBC_2.3) [SUSv3]
vfwscanf(GLIBC_2.3) [LSB]	vswprintf(GLIBC_2.3) [SUSv3]	vswscanf(GLIBC_2.3) [LSB]	vwprintf(GLIBC_2.3) [SUSv3]
vwscanf(GLIBC_2.3) [LSB]	wcpcpy(GLIBC_2.3) [LSB]	wcpncpy(GLIBC_2.3) [LSB]	wcrtomb(GLIBC_2.3) [SUSv3]
wcscasecmp(GLIBC_2.3) [LSB]	wcscat(GLIBC_2.3) [SUSv3]	wcschr(GLIBC_2.3) [SUSv3]	wcscmp(GLIBC_2.3) [SUSv3]
wcscoll(GLIBC_2.3) [SUSv3]	wcscpy(GLIBC_2.3) [SUSv3]	wcscspn(GLIBC_2.3) [SUSv3]	wcsdup(GLIBC_2.3) [LSB]
wcsftime(GLIBC_2.3) [SUSv3]	wcslen(GLIBC_2.3) [SUSv3]	wcsncasecmp(GLIBC_2.3) [LSB]	wcsncat(GLIBC_2.3) [SUSv3]
wcsncmp(GLIBC_2.3) [SUSv3]	wcsncpy(GLIBC_2.3) [SUSv3]	wcsnlen(GLIBC_2.3) [LSB]	wcsnrtombs(GLIBC_2.3) [LSB]
wcspbrk(GLIBC_2.3) [SUSv3]	wcsrchr(GLIBC_2.3) [SUSv3]	wcsrtombs(GLIBC_2.3) [SUSv3]	wcsspn(GLIBC_2.3) [SUSv3]
wcsstr(GLIBC_2.3) [SUSv3]	wcstod(GLIBC_2.3) [SUSv3]	wcstof(GLIBC_2.3) [SUSv3]	wcstoimax(GLIBC_2.3) [SUSv3]
wcstok(GLIBC_2.3) [SUSv3]	wcstol(GLIBC_2.3) [SUSv3]	wcstold(GLIBC_2.3) [SUSv3]	wcstoll(GLIBC_2.3) [SUSv3]
wcstombs(GLIBC_2.3) [SUSv3]	wcstoq(GLIBC_2.3) [LSB]	wcstoul(GLIBC_2.3) [SUSv3]	wcstoull(GLIBC_2.3) [SUSv3]
wcstoumax(GLIBC_2.3) [SUSv3]	wcstouq(GLIBC_2.3) [LSB]	wcswcs(GLIBC_2.3) [SUSv3]	wcswidth(GLIBC_2.3) [SUSv3]
wcsxfrm(GLIBC_2.3) [SUSv3]	wctob(GLIBC_2.3) [SUSv3]	wctomb(GLIBC_2.3) [SUSv3]	wctrans(GLIBC_2.3) [SUSv3]
wctype(GLIBC_2.3) [SUSv3]	wcwidth(GLIBC_2.3) [SUSv3]	wmemchr(GLIBC_2.3) [SUSv3]	wmemcmp(GLIBC_2.3) [SUSv3]
wmemcpy(GLIBC_2.3) [SUSv3]	wmemmove(GLIBC_2.3) [SUSv3]	wmemset(GLIBC_2.3) [SUSv3]	wprintf(GLIBC_2.3) [SUSv3]
wscanf(GLIBC_2.3) [LSB]			

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11.2.8 String Functions

11.2.8.1 Interfaces for String Functions

An LSB conforming implementation shall provide the architecture specific functions for String Functions specified in Table 11-12, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-12 libc - String Functions Function Interfaces

__mempcpy(GLIBC_2.3) [LSB]	__rawmemchr(GLIBC_2.3) [LSB]	__stpcpy(GLIBC_2.3) [LSB]	__strdup(GLIBC_2.3) [LSB]
__strtod_internal(GLIBC_2.3) [LSB]	__strtof_internal(GLIBC_2.3) [LSB]	__strtok_r(GLIBC_2.3) [LSB]	__strtol_internal(GLIBC_2.3) [LSB]
__strtold_internal(GLIBC_2.3) [LSB]	__strtoll_internal(GLIBC_2.3) [LSB]	__strtoul_internal(GLIBC_2.3) [LSB]	__strtoull_internal(GLIBC_2.3) [LSB]
bcmp(GLIBC_2.3) [SUSv3]	bcopy(GLIBC_2.3) [SUSv3]	bzero(GLIBC_2.3) [SUSv3]	ffs(GLIBC_2.3) [SUSv3]
index(GLIBC_2.3) [SUSv3]	memccpy(GLIBC_2.3) [SUSv3]	memchr(GLIBC_2.3) [SUSv3]	memcmp(GLIBC_2.3) [SUSv3]
memcpy(GLIBC_2.3) [SUSv3]	memmove(GLIBC_2.3) [SUSv3]	memrchr(GLIBC_2.3) [LSB]	memset(GLIBC_2.3) [SUSv3]
rindex(GLIBC_2.3) [SUSv3]	stpcpy(GLIBC_2.3) [LSB]	stpncpy(GLIBC_2.3) [LSB]	strcasecmp(GLIBC_2.3) [SUSv3]
strcasestr(GLIBC_2.3) [LSB]	strcat(GLIBC_2.3) [SUSv3]	strchr(GLIBC_2.3) [SUSv3]	strcmp(GLIBC_2.3) [SUSv3]
strcoll(GLIBC_2.3) [SUSv3]	strcpy(GLIBC_2.3) [SUSv3]	strcspn(GLIBC_2.3) [SUSv3]	strdup(GLIBC_2.3) [SUSv3]
strerror(GLIBC_2.3) [SUSv3]	strerror_r(GLIBC_2.3) [LSB]	strfmon(GLIBC_2.3) [SUSv3]	strftime(GLIBC_2.3) [SUSv3]
strlen(GLIBC_2.3) [SUSv3]	strncasecmp(GLIBC_2.3) [SUSv3]	strncat(GLIBC_2.3) [SUSv3]	strncmp(GLIBC_2.3) [SUSv3]
strncpy(GLIBC_2.3) [SUSv3]	strndup(GLIBC_2.3) [LSB]	strnlen(GLIBC_2.3) [LSB]	strpbrk(GLIBC_2.3) [SUSv3]
strptime(GLIBC_2.3) [LSB]	strrchr(GLIBC_2.3) [SUSv3]	strsep(GLIBC_2.3) [LSB]	strsignal(GLIBC_2.3) [LSB]
strspn(GLIBC_2.3) [SUSv3]	strstr(GLIBC_2.3) [SUSv3]	strtof(GLIBC_2.3) [SUSv3]	strtoimax(GLIBC_2.3) [SUSv3]
strtok(GLIBC_2.3) [SUSv3]	strtok_r(GLIBC_2.3) [SUSv3]	strtold(GLIBC_2.3) [SUSv3]	strtoll(GLIBC_2.3) [SUSv3]
strtoq(GLIBC_2.3) [LSB]	strtoull(GLIBC_2.3) [SUSv3]	strtoumax(GLIBC_2.3) [SUSv3]	strtouq(GLIBC_2.3) [LSB]
strxfrm(GLIBC_2.3) [SUSv3]	swab(GLIBC_2.3) [SUSv3]		

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11.2.9 IPC Functions

11.2.9.1 Interfaces for IPC Functions

An LSB conforming implementation shall provide the architecture specific functions for IPC Functions specified in Table 11-13, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-13 libc - IPC Functions Function Interfaces

ftok(GLIBC_2.3) [SUSv3]	msgctl(GLIBC_2.3) [SUSv3]	msgget(GLIBC_2.3) [SUSv3]	msgrcv(GLIBC_2.3) [SUSv3]
msgsnd(GLIBC_2.3) [SUSv3]	semctl(GLIBC_2.3) [SUSv3]	semget(GLIBC_2.3) [SUSv3]	semop(GLIBC_2.3) [SUSv3]
shmat(GLIBC_2.3) [SUSv3]	shmctl(GLIBC_2.3) [SUSv3]	shmdt(GLIBC_2.3) [SUSv3]	shmget(GLIBC_2.3) [SUSv3]

11.2.10 Regular Expressions

11.2.10.1 Interfaces for Regular Expressions

An LSB conforming implementation shall provide the architecture specific functions for Regular Expressions specified in Table 11-14, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-14 libc - Regular Expressions Function Interfaces

regcomp(GLIBC_2.3) [SUSv3]	regerror(GLIBC_2.3) [SUSv3]	regexec(GLIBC_2.3.4) [LSB]	regfree(GLIBC_2.3) [SUSv3]

11.2.11 Character Type Functions

11.2.11.1 Interfaces for Character Type Functions

An LSB conforming implementation shall provide the architecture specific functions for Character Type Functions specified in Table 11-15, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-15 libc - Character Type Functions Function Interfaces

__ctype_get_mb_cur_max(GLIBC_2.3) [LSB]	_tolower(GLIBC_2.3) [SUSv3]	_toupper(GLIBC_2.3) [SUSv3]	isalnum(GLIBC_2.3) [SUSv3]
isalpha(GLIBC_2.3) [SUSv3]	isascii(GLIBC_2.3) [SUSv3]	iscntrl(GLIBC_2.3) [SUSv3]	isdigit(GLIBC_2.3) [SUSv3]
isgraph(GLIBC_2.3) [SUSv3]	islower(GLIBC_2.3) [SUSv3]	isprint(GLIBC_2.3) [SUSv3]	ispunct(GLIBC_2.3) [SUSv3]
isspace(GLIBC_2.3) [SUSv3]	isupper(GLIBC_2.3) [SUSv3]	iswalnum(GLIBC_2.3) [SUSv3]	iswalpha(GLIBC_2.3) [SUSv3]
iswblank(GLIBC_2.3) [SUSv3]	iswcntrl(GLIBC_2.3) [SUSv3]	iswctype(GLIBC_2.3) [SUSv3]	iswdigit(GLIBC_2.3) [SUSv3]
iswgraph(GLIBC_2.3) [SUSv3]	iswlower(GLIBC_2.3) [SUSv3]	iswprint(GLIBC_2.3) [SUSv3]	iswpunct(GLIBC_2.3) [SUSv3]

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iswspace(GLIBC_2.3) [SUSv3]	iswupper(GLIBC_2.3) [SUSv3]	iswxdigit(GLIBC_2.3) [SUSv3]	isxdigit(GLIBC_2.3) [SUSv3]
toascii(GLIBC_2.3) [SUSv3]	tolower(GLIBC_2.3) [SUSv3]	toupper(GLIBC_2.3) [SUSv3]	

11.2.12 Time Manipulation

11.2.12.1 Interfaces for Time Manipulation

An LSB conforming implementation shall provide the architecture specific functions for Time Manipulation specified in Table 11-16, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-16 libc - Time Manipulation Function Interfaces

adjtime(GLIBC_2.3) [LSB]	asctime(GLIBC_2.3) [SUSv3]	asctime_r(GLIBC_2.3) [SUSv3]	ctime(GLIBC_2.3) [SUSv3]
ctime_r(GLIBC_2.3) [SUSv3]	difftime(GLIBC_2.3) [SUSv3]	gmtime(GLIBC_2.3) [SUSv3]	gmtime_r(GLIBC_2.3) [SUSv3]
localtime(GLIBC_2.3) [SUSv3]	localtime_r(GLIBC_2.3) [SUSv3]	mktime(GLIBC_2.3) [SUSv3]	tzset(GLIBC_2.3) [SUSv3]
ualarm(GLIBC_2.3) [SUSv3]			

An LSB conforming implementation shall provide the architecture specific data interfaces for Time Manipulation specified in Table 11-17, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-17 libc - Time Manipulation Data Interfaces

__daylight(GLIBC_2.3) [LSB]	__timezone(GLIBC_2.3) [LSB]	__tzname(GLIBC_2.3) [LSB]	daylight(GLIBC_2.3) [SUSv3]
timezone(GLIBC_2.3) [SUSv3]	tzname(GLIBC_2.3) [SUSv3]		

11.2.13 Terminal Interface Functions

11.2.13.1 Interfaces for Terminal Interface Functions

An LSB conforming implementation shall provide the architecture specific functions for Terminal Interface Functions specified in Table 11-18, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-18 libc - Terminal Interface Functions Function Interfaces

cfgetispeed(GLIBC_2.3) [SUSv3]	cfgetospeed(GLIBC_2.3) [SUSv3]	cfmakeraw(GLIBC_2.3) [LSB]	cfsetispeed(GLIBC_2.3) [SUSv3]
cfsetospeed(GLIBC_2.3) [SUSv3]	cfsetspeed(GLIBC_2.3) [LSB]	tcdrain(GLIBC_2.3) [SUSv3]	tcflow(GLIBC_2.3) [SUSv3]
tcflush(GLIBC_2.3) [SUSv3]	tcgetattr(GLIBC_2.3) [SUSv3]	tcgetpgrp(GLIBC_2.3) [SUSv3]	tcgetsid(GLIBC_2.3) [SUSv3]
tcsendbreak(GLI	tcsetattr(GLIBC_	tcsetpgrp(GLIBC	

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BC_2.3) [SUSv3]	2.3) [SUSv3]	_2.3) [SUSv3]	

11.2.14 System Database Interface

11.2.14.1 Interfaces for System Database Interface

An LSB conforming implementation shall provide the architecture specific functions for System Database Interface specified in Table 11-19, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-19 libc - System Database Interface Function Interfaces

endgrent(GLIBC_2.3) [SUSv3]	endprotoent(GLIBC_2.3) [SUSv3]	endpwent(GLIBC_2.3) [SUSv3]	endservent(GLIBC_2.3) [SUSv3]
endutent(GLIBC_2.3) [LSB]	endutxent(GLIBC_2.3) [SUSv3]	getgrent(GLIBC_2.3) [SUSv3]	getgrgid(GLIBC_2.3) [SUSv3]
getgrgid_r(GLIBC_2.3) [SUSv3]	getgrnam(GLIBC_2.3) [SUSv3]	getgrnam_r(GLIBC_2.3) [SUSv3]	getgrouplist(GLIBC_2.3) [LSB]
gethostbyaddr(GLIBC_2.3) [SUSv3]	gethostbyname(GLIBC_2.3) [SUSv3]	getprotobyname(GLIBC_2.3) [SUSv3]	getprotobynumber(GLIBC_2.3) [SUSv3]
getprotoent(GLIBC_2.3) [SUSv3]	getpwent(GLIBC_2.3) [SUSv3]	getpwnam(GLIBC_2.3) [SUSv3]	getpwnam_r(GLIBC_2.3) [SUSv3]
getpwuid(GLIBC_2.3) [SUSv3]	getpwuid_r(GLIBC_2.3) [SUSv3]	getservbyname(GLIBC_2.3) [SUSv3]	getservbyport(GLIBC_2.3) [SUSv3]
getservent(GLIBC_2.3) [SUSv3]	getutent(GLIBC_2.3) [LSB]	getutent_r(GLIBC_2.3) [LSB]	getutxent(GLIBC_2.3) [SUSv3]
getutxid(GLIBC_2.3) [SUSv3]	getutxline(GLIBC_2.3) [SUSv3]	pututxline(GLIBC_2.3) [SUSv3]	setgrent(GLIBC_2.3) [SUSv3]
setgroups(GLIBC_2.3) [LSB]	setprotoent(GLIBC_2.3) [SUSv3]	setpwent(GLIBC_2.3) [SUSv3]	setservent(GLIBC_2.3) [SUSv3]
setutent(GLIBC_2.3) [LSB]	setutxent(GLIBC_2.3) [SUSv3]	utmpname(GLIBC_2.3) [LSB]	

11.2.15 Language Support

11.2.15.1 Interfaces for Language Support

An LSB conforming implementation shall provide the architecture specific functions for Language Support specified in Table 11-20, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-20 libc - Language Support Function Interfaces

__libc_start_main(GLIBC_2.3) [LSB]			

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11.2.16 Large File Support

11.2.16.1 Interfaces for Large File Support

An LSB conforming implementation shall provide the architecture specific functions for Large File Support specified in Table 11-21, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-21 libc - Large File Support Function Interfaces

__fxstat64(GLIBC_2.3) [LSB]	__lxstat64(GLIBC_2.3) [LSB]	__xstat64(GLIBC_2.3) [LSB]	creat64(GLIBC_2.3) [LFS]
fgetpos64(GLIBC_2.3) [LFS]	fopen64(GLIBC_2.3) [LFS]	freopen64(GLIBC_2.3) [LFS]	fseeko64(GLIBC_2.3) [LFS]
fsetpos64(GLIBC_2.3) [LFS]	fstatvfs64(GLIBC_2.3) [LFS]	ftello64(GLIBC_2.3) [LFS]	ftruncate64(GLIBC_2.3) [LFS]
ftw64(GLIBC_2.3) [LFS]	getrlimit64(GLIBC_2.3) [LFS]	lockf64(GLIBC_2.3) [LFS]	mkstemp64(GLIBC_2.3) [LFS]
mmap64(GLIBC_2.3) [LFS]	nftw64(GLIBC_2.3.3) [LFS]	readdir64(GLIBC_2.3) [LFS]	statvfs64(GLIBC_2.3) [LFS]
tmpfile64(GLIBC_2.3) [LFS]	truncate64(GLIBC_2.3) [LFS]		

11.2.17 Standard Library

11.2.17.1 Interfaces for Standard Library

An LSB conforming implementation shall provide the architecture specific functions for Standard Library specified in Table 11-22, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-22 libc - Standard Library Function Interfaces

_Exit(GLIBC_2.3) [SUSv3]	__assert_fail(GLIBC_2.3) [LSB]	__cxa_atexit(GLIBC_2.3) [LSB]	__errno_location(GLIBC_2.3) [LSB]
__fpending(GLIBC_2.3) [LSB]	__getpagesize(GLIBC_2.3) [LSB]	__isinf(GLIBC_2.3) [LSB]	__isinff(GLIBC_2.3) [LSB]
__isinfl(GLIBC_2.3) [LSB]	__isnan(GLIBC_2.3) [LSB]	__isnanf(GLIBC_2.3) [LSB]	__isnanl(GLIBC_2.3) [LSB]
__sysconf(GLIBC_2.3) [LSB]	_exit(GLIBC_2.3) [SUSv3]	_longjmp(GLIBC_2.3.4) [SUSv3]	_setjmp(GLIBC_2.3.4) [SUSv3]
a64l(GLIBC_2.3) [SUSv3]	abort(GLIBC_2.3) [SUSv3]	abs(GLIBC_2.3) [SUSv3]	atof(GLIBC_2.3) [SUSv3]
atoi(GLIBC_2.3) [SUSv3]	atol(GLIBC_2.3) [SUSv3]	atoll(GLIBC_2.3) [SUSv3]	basename(GLIBC_2.3) [SUSv3]
bsearch(GLIBC_2.3) [SUSv3]	calloc(GLIBC_2.3) [SUSv3]	closelog(GLIBC_2.3) [SUSv3]	confstr(GLIBC_2.3) [SUSv3]
cuserid(GLIBC_2.3) [SUSv2]	daemon(GLIBC_2.3) [LSB]	dirname(GLIBC_2.3) [SUSv3]	div(GLIBC_2.3) [SUSv3]

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drand48(GLIBC_2.3) [SUSv3]	ecvt(GLIBC_2.3) [SUSv3]	erand48(GLIBC_2.3) [SUSv3]	err(GLIBC_2.3) [LSB]
error(GLIBC_2.3) [LSB]	errx(GLIBC_2.3) [LSB]	fcvt(GLIBC_2.3) [SUSv3]	fmtmsg(GLIBC_2.3) [SUSv3]
fnmatch(GLIBC_2.3) [SUSv3]	fpathconf(GLIBC_2.3) [SUSv3]	free(GLIBC_2.3) [SUSv3]	freeaddrinfo(GLIBC_2.3) [SUSv3]
ftrylockfile(GLIBC_2.3) [SUSv3]	ftw(GLIBC_2.3) [SUSv3]	funlockfile(GLIBC_2.3) [SUSv3]	gai_strerror(GLIBC_2.3) [SUSv3]
gcvt(GLIBC_2.3) [SUSv3]	getaddrinfo(GLIBC_2.3) [SUSv3]	getcwd(GLIBC_2.3) [SUSv3]	getdate(GLIBC_2.3) [SUSv3]
getenv(GLIBC_2.3) [SUSv3]	getlogin(GLIBC_2.3) [SUSv3]	getnameinfo(GLIBC_2.3) [SUSv3]	getopt(GLIBC_2.3) [LSB]
getopt_long(GLIBC_2.3) [LSB]	getopt_long_only(GLIBC_2.3) [LSB]	getsubopt(GLIBC_2.3) [SUSv3]	gettimeofday(GLIBC_2.3) [SUSv3]
glob(GLIBC_2.3) [SUSv3]	glob64(GLIBC_2.3) [LSB]	globfree(GLIBC_2.3) [SUSv3]	globfree64(GLIBC_2.3) [LSB]
grantpt(GLIBC_2.3) [SUSv3]	hcreate(GLIBC_2.3) [SUSv3]	hdestroy(GLIBC_2.3) [SUSv3]	hsearch(GLIBC_2.3) [SUSv3]
htonl(GLIBC_2.3) [SUSv3]	htons(GLIBC_2.3) [SUSv3]	imaxabs(GLIBC_2.3) [SUSv3]	imaxdiv(GLIBC_2.3) [SUSv3]
inet_addr(GLIBC_2.3) [SUSv3]	inet_ntoa(GLIBC_2.3) [SUSv3]	inet_ntop(GLIBC_2.3) [SUSv3]	inet_pton(GLIBC_2.3) [SUSv3]
initstate(GLIBC_2.3) [SUSv3]	insque(GLIBC_2.3) [SUSv3]	isatty(GLIBC_2.3) [SUSv3]	isblank(GLIBC_2.3) [SUSv3]
jrand48(GLIBC_2.3) [SUSv3]	l64a(GLIBC_2.3) [SUSv3]	labs(GLIBC_2.3) [SUSv3]	lcong48(GLIBC_2.3) [SUSv3]
ldiv(GLIBC_2.3) [SUSv3]	lfind(GLIBC_2.3) [SUSv3]	llabs(GLIBC_2.3) [SUSv3]	lldiv(GLIBC_2.3) [SUSv3]
longjmp(GLIBC_2.3.4) [SUSv3]	lrand48(GLIBC_2.3) [SUSv3]	lsearch(GLIBC_2.3) [SUSv3]	makecontext(GLIBC_2.3) [SUSv3]
malloc(GLIBC_2.3) [SUSv3]	memmem(GLIBC_2.3) [LSB]	mkstemp(GLIBC_2.3) [SUSv3]	mktemp(GLIBC_2.3) [SUSv3]
mrand48(GLIBC_2.3) [SUSv3]	nftw(GLIBC_2.3.3) [SUSv3]	nrand48(GLIBC_2.3) [SUSv3]	ntohl(GLIBC_2.3) [SUSv3]
ntohs(GLIBC_2.3) [SUSv3]	openlog(GLIBC_2.3) [SUSv3]	perror(GLIBC_2.3) [SUSv3]	posix_memalign(GLIBC_2.3) [SUSv3]
posix_openpt(GLIBC_2.3) [SUSv3]	ptsname(GLIBC_2.3) [SUSv3]	putenv(GLIBC_2.3) [SUSv3]	qsort(GLIBC_2.3) [SUSv3]
rand(GLIBC_2.3) [SUSv3]	rand_r(GLIBC_2.3) [SUSv3]	random(GLIBC_2.3) [SUSv3]	realloc(GLIBC_2.3) [SUSv3]
realpath(GLIBC_	remque(GLIBC_2	seed48(GLIBC_2.	setenv(GLIBC_2.

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2.3) [SUSv3]	.3) [SUSv3]	3) [SUSv3]	3) [SUSv3]
sethostname(GLIBC_2.3) [LSB]	setlogmask(GLIBC_2.3) [SUSv3]	setstate(GLIBC_2.3) [SUSv3]	srand(GLIBC_2.3) [SUSv3]
srand48(GLIBC_2.3) [SUSv3]	srandom(GLIBC_2.3) [SUSv3]	strtod(GLIBC_2.3) [SUSv3]	strtol(GLIBC_2.3) [SUSv3]
strtoul(GLIBC_2.3) [SUSv3]	swapcontext(GLIBC_2.3.4) [SUSv3]	syslog(GLIBC_2.3) [SUSv3]	system(GLIBC_2.3) [LSB]
tdelete(GLIBC_2.3) [SUSv3]	tfind(GLIBC_2.3) [SUSv3]	tmpfile(GLIBC_2.3) [SUSv3]	tmpnam(GLIBC_2.3) [SUSv3]
tsearch(GLIBC_2.3) [SUSv3]	ttyname(GLIBC_2.3) [SUSv3]	ttyname_r(GLIBC_2.3) [SUSv3]	twalk(GLIBC_2.3) [SUSv3]
unlockpt(GLIBC_2.3) [SUSv3]	unsetenv(GLIBC_2.3) [SUSv3]	usleep(GLIBC_2.3) [SUSv3]	verrx(GLIBC_2.3) [LSB]
vfscanf(GLIBC_2.3) [LSB]	vscanf(GLIBC_2.3) [LSB]	vsscanf(GLIBC_2.3) [LSB]	vsyslog(GLIBC_2.3) [LSB]
warn(GLIBC_2.3) [LSB]	warnx(GLIBC_2.3) [LSB]	wordexp(GLIBC_2.3) [SUSv3]	wordfree(GLIBC_2.3) [SUSv3]

An LSB conforming implementation shall provide the architecture specific data interfaces for Standard Library specified in Table 11-23, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-23 libc - Standard Library Data Interfaces

__environ(GLIBC_2.3) [LSB]	_environ(GLIBC_2.3) [LSB]	_sys_errlist(GLIBC_2.3) [LSB]	environ(GLIBC_2.3) [SUSv3]
getdate_err(GLIBC_2.3) [SUSv3]	optarg(GLIBC_2.3) [SUSv3]	opterr(GLIBC_2.3) [SUSv3]	optind(GLIBC_2.3) [SUSv3]
optopt(GLIBC_2.3) [SUSv3]			

11.3 Data Definitions for libc

This section defines global identifiers and their values that are associated with interfaces contained in libc. These definitions are organized into groups that correspond to system headers. This convention is used as a convenience for the reader, and does not imply the existence of these headers, or their content. Where an interface is defined as requiring a particular system header file all of the data definitions for that system header file presented here shall be in effect.

This section gives data definitions to promote binary application portability, not to repeat source interface definitions available elsewhere. System providers and application developers should use this ABI to supplement - not to replace - source interface definition specifications.

This specification uses the ISO C (1999) C Language as the reference programming language, and data definitions are specified in ISO C format. The C language is used here as a convenient notation. Using a C language

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description of these data objects does not preclude their use by other programming languages.

11.3.1 ctype.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.2 dirent.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.3 errno.h

```
#define EDEADLOCK       58
```

11.3.4 fcntl.h

```
#define F_GETLK64       12
#define F_SETLK64       13
#define F_SETLKW64      14
```

11.3.5 fnmatch.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.6 ftw.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.7 getopt.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.8 glob.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

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11.3.9 iconv.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.10 inttypes.h

```
typedef long int intmax_t;
typedef unsigned long int uintmax_t;
typedef unsigned long int uintptr_t;
typedef unsigned long int uint64_t;
```

11.3.11 langinfo.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.12 limits.h

```
#define ULONG_MAX       0xFFFFFFFFFFFFFFFFUL
#define LONG_MAX        9223372036854775807L

#define CHAR_MIN        0
#define CHAR_MAX        255

#define PTHREAD_STACK_MIN       16384
```

11.3.13 locale.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.14 net/if.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.15 netdb.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.16 netinet/in.h

```
/*
 * This header is architecture neutral
```


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```
 * Please refer to the generic specification for details
 */
```

11.3.17 netinet/ip.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.18 netinet/tcp.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.19 netinet/udp.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.20 nl_types.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.21 pwd.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.22 regex.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.23 rpc/auth.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.24 rpc/clnt.h

```
/*
 * This header is architecture neutral
```

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```
 * Please refer to the generic specification for details
 */
```

11.3.25 rpc/rpc_msg.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.26 rpc/svc.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.27 rpc/types.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.28 rpc/xdr.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.29 sched.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.30 search.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.31 setjmp.h

```
typedef long int __jmp_buf[64] __attribute__ ((aligned(16)));
```

11.3.32 signal.h

```
struct pt_regs {
    unsigned long int gpr[32];
    unsigned long int nip;
    unsigned long int msr;
    unsigned long int orig_gpr3;
```


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```
    unsigned long int ctr;
    unsigned long int link;
    unsigned long int xer;
    unsigned long int ccr;
    unsigned long int softe;
    unsigned long int trap;
    unsigned long int dar;
    unsigned long int dsisr;
    unsigned long int result;
};

#define SIGEV_PAD_SIZE  ((SIGEV_MAX_SIZE/sizeof(int))-4)

#define SI_PAD_SIZE     ((SI_MAX_SIZE/sizeof(int))-4)

struct sigaction {
    union {
        sighandler_t _sa_handler;
        void (*sa_sigaction) (int, siginfo_t *, void *);
    } __sigaction_handler;
    sigset_t sa_mask;
    int sa_flags;
    void (*sa_restorer) (void);
};

#define MINSIGSTKSZ     2048
#define SIGSTKSZ        8192

struct sigcontext {
    unsigned long int _unused[4];
    int signal;
    unsigned long int handler;
    unsigned long int oldmask;
    struct pt_regs *regs;
    unsigned long int gp_regs[48];
    double fp_regs[33];
};
```

11.3.33 stddef.h

```
typedef unsigned long int size_t;
typedef long int ptrdiff_t;
```

11.3.34 stdio.h

```
#define __IO_FILE_SIZE  216
```

11.3.35 stdlib.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.36 sys/file.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

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11.3.37 sys/ioctl.h

```
#define TIOCGWINSZ      0x40087468
#define FIONREAD        1074030207
#define TIOCNOTTY       21538
```

11.3.38 sys/ipc.h

```
struct ipc_perm {
    key_t __key;
    uid_t uid;
    gid_t gid;
    uid_t cuid;
    gid_t cgid;
    mode_t mode;
    unsigned int __seq;
    unsigned int __pad1;
    unsigned long int __unused1;
    unsigned long int __unused2;
};
```

11.3.39 sys/mman.h

```
#define MCL_FUTURE      16384
#define MCL_CURRENT     8192
```

11.3.40 sys/msg.h

```
typedef unsigned long int msglen_t;
typedef unsigned long int msgqnum_t;

struct msqid_ds {
    struct ipc_perm msg_perm;
    time_t msg_stime;
    time_t msg_rtime;
    time_t msg_ctime;
    unsigned long int __msg_cbytes;
    msgqnum_t msg_qnum;
    msglen_t msg_qbytes;
    pid_t msg_lspid;
    pid_t msg_lrpid;
    unsigned long int __unused4;
    unsigned long int __unused5;
};
```

11.3.41 sys/param.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.42 sys/poll.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

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11.3.43 sys/resource.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.44 sys/sem.h

```
struct semid_ds {
    struct ipc_perm sem_perm;
    time_t sem_otime;
    time_t sem_ctime;
    unsigned long int sem_nsems;
    unsigned long int __unused3;
    unsigned long int __unused4;
};
```

11.3.45 sys/shm.h

```
#define SHMLBA  (__getpagesize())

typedef unsigned long int shmatt_t;

struct shmid_ds {
    struct ipc_perm shm_perm;
    time_t shm_atime;
    time_t shm_dtime;
    time_t shm_ctime;
    size_t shm_segsz;
    pid_t shm_cpid;
    pid_t shm_lpid;
    shmatt_t shm_nattch;
    unsigned long int __unused5;
    unsigned long int __unused6;
};
```

11.3.46 sys/socket.h

```
typedef uint64_t __ss_aligntype;

#define SO_RCVLOWAT     16
#define SO_SNDLOWAT     17
#define SO_RCVTIMEO     18
#define SO_SNDTIMEO     19
```

11.3.47 sys/stat.h

```
#define _STAT_VER       1

struct stat {
    dev_t st_dev;
    ino_t st_ino;
    nlink_t st_nlink;
    mode_t st_mode;
    uid_t st_uid;
    gid_t st_gid;
    int __pad2;
    dev_t st_rdev;
    off_t st_size;
```

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```
    blksize_t st_blksize;
    blkcnt_t st_blocks;
    struct timespec st_atim;
    struct timespec st_mtim;
    struct timespec st_ctim;
    unsigned long int __unused4;
    unsigned long int __unused5;
    unsigned long int __unused6;
};
struct stat64 {
    dev_t st_dev;
    ino64_t st_ino;
    nlink_t st_nlink;
    mode_t st_mode;
    uid_t st_uid;
    gid_t st_gid;
    int __pad2;
    dev_t st_rdev;
    off64_t st_size;
    blksize_t st_blksize;
    blkcnt64_t st_blocks;
    struct timespec st_atim;
    struct timespec st_mtim;
    struct timespec st_ctim;
    unsigned long int __unused4;
    unsigned long int __unused5;
    unsigned long int __unused6;
};
```

11.3.48 sys/statvfs.h

```
struct statvfs {
    unsigned long int f_bsize;
    unsigned long int f_frsize;
    fsblkcnt_t f_blocks;
    fsblkcnt_t f_bfree;
    fsblkcnt_t f_bavail;
    fsfilcnt_t f_files;
    fsfilcnt_t f_ffree;
    fsfilcnt_t f_favail;
    unsigned long int f_fsid;
    unsigned long int f_flag;
    unsigned long int f_namemax;
    int __f_spare[6];
};
struct statvfs64 {
    unsigned long int f_bsize;
    unsigned long int f_frsize;
    fsblkcnt64_t f_blocks;
    fsblkcnt64_t f_bfree;
    fsblkcnt64_t f_bavail;
    fsfilcnt64_t f_files;
    fsfilcnt64_t f_ffree;
    fsfilcnt64_t f_favail;
    unsigned long int f_fsid;
    unsigned long int f_flag;
    unsigned long int f_namemax;
    int __f_spare[6];
};
```

11.3.49 sys/time.h

```
/*
 * This header is architecture neutral
```

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```
 * Please refer to the generic specification for details
 */
```

11.3.50 sys/timeb.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.51 sys/times.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.52 sys/types.h

```
typedef long int int64_t;

typedef int64_t ssize_t;

#define __FDSET_LONGS   16
```

11.3.53 sys/un.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.54 sys/utsname.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.55 sys/wait.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.56 syslog.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.57 termios.h

```
#define TAB1    1024
```

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```
#define CR3     12288
#define CRDLY   12288
#define FF1     16384
#define FFDLY   16384
#define XCASE   16384
#define ONLCR   2
#define TAB2    2048
#define TAB3    3072
#define TABDLY  3072
#define BS1     32768
#define BSDLY   32768
#define OLCUC   4
#define CR1     4096
#define IUCLC   4096
#define VT1     65536
#define VTDLY   65536
#define NLDLY   768
#define CR2     8192

#define VWERASE 10
#define VREPRINT        11
#define VSUSP   12
#define VSTART  13
#define VSTOP   14
#define VDISCARD        16
#define VMIN    5
#define VEOL    6
#define VEOL2   8
#define VSWTC   9

#define IXOFF   1024
#define IXON    512

#define CSTOPB  1024
#define HUPCL   16384
#define CREAD   2048
#define CS6     256
#define CLOCAL  32768
#define PARENB  4096
#define CS7     512
#define VTIME   7
#define CS8     768
#define CSIZE   768
#define PARODD  8192

#define NOFLSH  0x80000000
#define ECHOKE  1
#define IEXTEN  1024
#define ISIG    128
#define ECHONL  16
#define ECHOE   2
#define ICANON  256
#define ECHOPRT 32
#define ECHOK   4
#define TOSTOP  4194304
#define PENDIN  536870912
#define ECHOCTL 64
#define FLUSHO  8388608
```

11.3.58 ucontext.h

```
typedef struct _libc_vscr {
    int __pad[3];
    int vscr_word;
} vscr_t;
```


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```
typedef struct _libc_vrstate {
    unsigned int vrregs[128];
    vscr_t vscr;
    unsigned int vrsave;
    unsigned int __pad[3];
} vrregset_t __attribute__ ((__aligned__(16)));

#define NGREG   48

typedef unsigned long int gregset_t[48];

typedef double fpregset_t[33];

typedef struct {
    unsigned long int __unused[4];
    int signal;
    int pad0;
    unsigned long int handler;
    unsigned long int oldmask;
    struct pt_regs *regs;
    gregset_t gp_regs;
    fpregset_t fp_regs;
    vrregset_t *v_regs;
    long int vmx_reserve[69];
} mcontext_t;

typedef struct ucontext {
    unsigned long int uc_flags;
    struct ucontext *uc_link;
    stack_t uc_stack;
    sigset_t uc_sigmask;
    mcontext_t uc_mcontext;
} ucontext_t;
```

11.3.59 ulimit.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.60 unistd.h

```
typedef long int intptr_t;
```

11.3.61 utime.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.62 utmp.h

```
struct lastlog {
    int32_t ll_time;
    char ll_line[UT_LINESIZE];
    char ll_host[UT_HOSTSIZE];
};

struct utmp {
```

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```
    short ut_type;
    pid_t ut_pid;
    char ut_line[UT_LINESIZE];
    char ut_id[4];
    char ut_user[UT_NAMESIZE];
    char ut_host[UT_HOSTSIZE];
    struct exit_status ut_exit;
    int32_t ut_session;
    struct {
        int32_t tv_sec;
        int32_t tv_usec;
    } ut_tv;
    int32_t ut_addr_v6[4];
    char __unused[20];
};
```

11.3.63 utmpx.h

```
struct utmpx {
    short ut_type;
    pid_t ut_pid;
    char ut_line[UT_LINESIZE];
    char ut_id[4];
    char ut_user[UT_NAMESIZE];
    char ut_host[UT_HOSTSIZE];
    struct exit_status ut_exit;
    int32_t ut_session;
    struct {
        int32_t tv_sec;
        int32_t tv_usec;
    } ut_tv;
    int32_t ut_addr_v6[4];
    char __unused[20];
};
```

11.3.64 wctype.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.3.65 wordexp.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.4 Interfaces for libm

Table 11-24 defines the library name and shared object name for the libm library

Table 11-24 libm Definition

Library:	libm
SONAME:	libm.so.6

The behavior of the interfaces in this library is specified by the following specifications:

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[ISOC99] ISO C (1999)
[LSB] ISO/IEC 23360-1
[SUSv2] SUSv2
[SUSv3] ISO POSIX (2003)
[SVID.3] SVID Issue 3

11.4.1 Math

11.4.1.1 Interfaces for Math

An LSB conforming implementation shall provide the architecture specific functions for Math specified in Table 11-25, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-25 libm - Math Function Interfaces

__finite(GLIBC_2.3) [ISOC99]	__finitef(GLIBC_2.3) [ISOC99]	__finitel(GLIBC_2.3) [ISOC99]	__fpclassify(GLIBC_2.3) [LSB]
__fpclassifyf(GLIBC_2.3) [LSB]	__signbit(GLIBC_2.3) [ISOC99]	__signbitf(GLIBC_2.3) [ISOC99]	acos(GLIBC_2.3) [SUSv3]
acosf(GLIBC_2.3) [SUSv3]	acosh(GLIBC_2.3) [SUSv3]	acoshf(GLIBC_2.3) [SUSv3]	acoshl(GLIBC_2.3) [SUSv3]
acosl(GLIBC_2.3) [SUSv3]	asin(GLIBC_2.3) [SUSv3]	asinf(GLIBC_2.3) [SUSv3]	asinh(GLIBC_2.3) [SUSv3]
asinhf(GLIBC_2.3) [SUSv3]	asinhl(GLIBC_2.3) [SUSv3]	asinl(GLIBC_2.3) [SUSv3]	atan(GLIBC_2.3) [SUSv3]
atan2(GLIBC_2.3) [SUSv3]	atan2f(GLIBC_2.3) [SUSv3]	atan2l(GLIBC_2.3) [SUSv3]	atanf(GLIBC_2.3) [SUSv3]
atanh(GLIBC_2.3) [SUSv3]	atanhf(GLIBC_2.3) [SUSv3]	atanhl(GLIBC_2.3) [SUSv3]	atanl(GLIBC_2.3) [SUSv3]
cabs(GLIBC_2.3) [SUSv3]	cabsf(GLIBC_2.3) [SUSv3]	cabsl(GLIBC_2.3) [SUSv3]	cacos(GLIBC_2.3) [SUSv3]
cacosf(GLIBC_2.3) [SUSv3]	cacosh(GLIBC_2.3) [SUSv3]	cacoshf(GLIBC_2.3) [SUSv3]	cacoshl(GLIBC_2.3) [SUSv3]
cacosl(GLIBC_2.3) [SUSv3]	carg(GLIBC_2.3) [SUSv3]	cargf(GLIBC_2.3) [SUSv3]	cargl(GLIBC_2.3) [SUSv3]
casin(GLIBC_2.3) [SUSv3]	casinf(GLIBC_2.3) [SUSv3]	casinh(GLIBC_2.3) [SUSv3]	casinhf(GLIBC_2.3) [SUSv3]
casinhl(GLIBC_2.3) [SUSv3]	casinl(GLIBC_2.3) [SUSv3]	catan(GLIBC_2.3) [SUSv3]	catanf(GLIBC_2.3) [SUSv3]
catanh(GLIBC_2.3) [SUSv3]	catanhf(GLIBC_2.3) [SUSv3]	catanhl(GLIBC_2.3) [SUSv3]	catanl(GLIBC_2.3) [SUSv3]
cbrt(GLIBC_2.3) [SUSv3]	cbrtf(GLIBC_2.3) [SUSv3]	cbrtl(GLIBC_2.3) [SUSv3]	ccos(GLIBC_2.3) [SUSv3]
ccosf(GLIBC_2.3) [SUSv3]	ccosh(GLIBC_2.3) [SUSv3]	ccoshf(GLIBC_2.3) [SUSv3]	ccoshl(GLIBC_2.3) [SUSv3]
ccosl(GLIBC_2.3)	ceil(GLIBC_2.3)	ceilf(GLIBC_2.3)	ceill(GLIBC_2.3)

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[SUSv3]	[SUSv3]	[SUSv3]	[SUSv3]
cexp(GLIBC_2.3) [SUSv3]	cexpf(GLIBC_2.3) [SUSv3]	cexpl(GLIBC_2.3) [SUSv3]	cimag(GLIBC_2.3) [SUSv3]
cimagf(GLIBC_2.3) [SUSv3]	cimagl(GLIBC_2.3) [SUSv3]	clog(GLIBC_2.3) [SUSv3]	clog10(GLIBC_2.3) [ISOC99]
clog10f(GLIBC_2.3) [ISOC99]	clog10l(GLIBC_2.3) [ISOC99]	clogf(GLIBC_2.3) [SUSv3]	clogl(GLIBC_2.3) [SUSv3]
conj(GLIBC_2.3) [SUSv3]	conjf(GLIBC_2.3) [SUSv3]	conjl(GLIBC_2.3) [SUSv3]	copysign(GLIBC_2.3) [SUSv3]
copysignf(GLIBC_2.3) [SUSv3]	copysignl(GLIBC_2.3) [SUSv3]	cos(GLIBC_2.3) [SUSv3]	cosf(GLIBC_2.3) [SUSv3]
cosh(GLIBC_2.3) [SUSv3]	coshf(GLIBC_2.3) [SUSv3]	coshl(GLIBC_2.3) [SUSv3]	cosl(GLIBC_2.3) [SUSv3]
cpow(GLIBC_2.3) [SUSv3]	cpowf(GLIBC_2.3) [SUSv3]	cpowl(GLIBC_2.3) [SUSv3]	cproj(GLIBC_2.3) [SUSv3]
cprojf(GLIBC_2.3) [SUSv3]	cprojl(GLIBC_2.3) [SUSv3]	creal(GLIBC_2.3) [SUSv3]	crealf(GLIBC_2.3) [SUSv3]
creall(GLIBC_2.3) [SUSv3]	csin(GLIBC_2.3) [SUSv3]	csinf(GLIBC_2.3) [SUSv3]	csinh(GLIBC_2.3) [SUSv3]
csinhf(GLIBC_2.3) [SUSv3]	csinhl(GLIBC_2.3) [SUSv3]	csinl(GLIBC_2.3) [SUSv3]	csqrt(GLIBC_2.3) [SUSv3]
csqrtf(GLIBC_2.3) [SUSv3]	csqrtl(GLIBC_2.3) [SUSv3]	ctan(GLIBC_2.3) [SUSv3]	ctanf(GLIBC_2.3) [SUSv3]
ctanh(GLIBC_2.3) [SUSv3]	ctanhf(GLIBC_2.3) [SUSv3]	ctanhl(GLIBC_2.3) [SUSv3]	ctanl(GLIBC_2.3) [SUSv3]
dremf(GLIBC_2.3) [ISOC99]	dreml(GLIBC_2.3) [ISOC99]	erf(GLIBC_2.3) [SUSv3]	erfc(GLIBC_2.3) [SUSv3]
erfcf(GLIBC_2.3) [SUSv3]	erfcl(GLIBC_2.3) [SUSv3]	erff(GLIBC_2.3) [SUSv3]	erfl(GLIBC_2.3) [SUSv3]
exp(GLIBC_2.3) [SUSv3]	exp2(GLIBC_2.3) [SUSv3]	exp2f(GLIBC_2.3) [SUSv3]	expf(GLIBC_2.3) [SUSv3]
expl(GLIBC_2.3) [SUSv3]	expm1(GLIBC_2.3) [SUSv3]	expm1f(GLIBC_2.3) [SUSv3]	expm1l(GLIBC_2.3) [SUSv3]
fabs(GLIBC_2.3) [SUSv3]	fabsf(GLIBC_2.3) [SUSv3]	fabsl(GLIBC_2.3) [SUSv3]	fdim(GLIBC_2.3) [SUSv3]
fdimf(GLIBC_2.3) [SUSv3]	fdiml(GLIBC_2.3) [SUSv3]	feclearexcept(GLIBC_2.3) [SUSv3]	fegetenv(GLIBC_2.3) [SUSv3]
fegetexceptflag(GLIBC_2.3) [SUSv3]	fegetround(GLIBC_2.3) [SUSv3]	feholdexcept(GLIBC_2.3) [SUSv3]	feraiseexcept(GLIBC_2.3) [SUSv3]
fesetenv(GLIBC_2.3) [SUSv3]	fesetexceptflag(GLIBC_2.3) [SUSv3]	fesetround(GLIBC_2.3) [SUSv3]	fetestexcept(GLIBC_2.3) [SUSv3]

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feupdateenv(GLIBC_2.3) [SUSv3]	finite(GLIBC_2.3) [SUSv2]	finitef(GLIBC_2.3) [ISOC99]	finitel(GLIBC_2.3) [ISOC99]
floor(GLIBC_2.3) [SUSv3]	floorf(GLIBC_2.3) [SUSv3]	floorl(GLIBC_2.3) [SUSv3]	fma(GLIBC_2.3) [SUSv3]
fmaf(GLIBC_2.3) [SUSv3]	fmal(GLIBC_2.3) [SUSv3]	fmax(GLIBC_2.3) [SUSv3]	fmaxf(GLIBC_2.3) [SUSv3]
fmaxl(GLIBC_2.3) [SUSv3]	fmin(GLIBC_2.3) [SUSv3]	fminf(GLIBC_2.3) [SUSv3]	fminl(GLIBC_2.3) [SUSv3]
fmod(GLIBC_2.3) [SUSv3]	fmodf(GLIBC_2.3) [SUSv3]	fmodl(GLIBC_2.3) [SUSv3]	frexp(GLIBC_2.3) [SUSv3]
frexpf(GLIBC_2.3) [SUSv3]	frexpl(GLIBC_2.3) [SUSv3]	gamma(GLIBC_2.3) [SUSv2]	gammaf(GLIBC_2.3) [ISOC99]
gammal(GLIBC_2.3) [ISOC99]	hypot(GLIBC_2.3) [SUSv3]	hypotf(GLIBC_2.3) [SUSv3]	hypotl(GLIBC_2.3) [SUSv3]
ilogb(GLIBC_2.3) [SUSv3]	ilogbf(GLIBC_2.3) [SUSv3]	ilogbl(GLIBC_2.3) [SUSv3]	j0(GLIBC_2.3) [SUSv3]
j0f(GLIBC_2.3) [ISOC99]	j0l(GLIBC_2.3) [ISOC99]	j1(GLIBC_2.3) [SUSv3]	j1f(GLIBC_2.3) [ISOC99]
j1l(GLIBC_2.3) [ISOC99]	jn(GLIBC_2.3) [SUSv3]	jnf(GLIBC_2.3) [ISOC99]	jnl(GLIBC_2.3) [ISOC99]
ldexp(GLIBC_2.3) [SUSv3]	ldexpf(GLIBC_2.3) [SUSv3]	ldexpl(GLIBC_2.3) [SUSv3]	lgamma(GLIBC_2.3) [SUSv3]
lgamma_r(GLIBC_2.3) [ISOC99]	lgammaf(GLIBC_2.3) [SUSv3]	lgammaf_r(GLIBC_2.3) [ISOC99]	lgammal(GLIBC_2.3) [SUSv3]
lgammal_r(GLIBC_2.3) [ISOC99]	llrint(GLIBC_2.3) [SUSv3]	llrintf(GLIBC_2.3) [SUSv3]	llrintl(GLIBC_2.3) [SUSv3]
llround(GLIBC_2.3) [SUSv3]	llroundf(GLIBC_2.3) [SUSv3]	llroundl(GLIBC_2.3) [SUSv3]	log(GLIBC_2.3) [SUSv3]
log10(GLIBC_2.3) [SUSv3]	log10f(GLIBC_2.3) [SUSv3]	log10l(GLIBC_2.3) [SUSv3]	log1p(GLIBC_2.3) [SUSv3]
log1pf(GLIBC_2.3) [SUSv3]	log1pl(GLIBC_2.3) [SUSv3]	log2(GLIBC_2.3) [SUSv3]	log2f(GLIBC_2.3) [SUSv3]
log2l(GLIBC_2.3) [SUSv3]	logb(GLIBC_2.3) [SUSv3]	logbf(GLIBC_2.3) [SUSv3]	logbl(GLIBC_2.3) [SUSv3]
logf(GLIBC_2.3) [SUSv3]	logl(GLIBC_2.3) [SUSv3]	lrint(GLIBC_2.3) [SUSv3]	lrintf(GLIBC_2.3) [SUSv3]
lrintl(GLIBC_2.3) [SUSv3]	lround(GLIBC_2.3) [SUSv3]	lroundf(GLIBC_2.3) [SUSv3]	lroundl(GLIBC_2.3) [SUSv3]
matherr(GLIBC_2.3) [SVID.3]	modf(GLIBC_2.3) [SUSv3]	modff(GLIBC_2.3) [SUSv3]	modfl(GLIBC_2.3) [SUSv3]
nan(GLIBC_2.3) [SUSv3]	nanf(GLIBC_2.3) [SUSv3]	nanl(GLIBC_2.3) [SUSv3]	nearbyint(GLIBC_2.3) [SUSv3]

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nearbyintf(GLIBC_2.3) [SUSv3]	nearbyintl(GLIBC_2.3) [SUSv3]	nextafter(GLIBC_2.3) [SUSv3]	nextafterf(GLIBC_2.3) [SUSv3]
nextafterl(GLIBC_2.3) [SUSv3]	nexttoward(GLIBC_2.3) [SUSv3]	nexttowardf(GLIBC_2.3) [SUSv3]	nexttowardl(GLIBC_2.3) [SUSv3]
pow(GLIBC_2.3) [SUSv3]	pow10(GLIBC_2.3) [ISOC99]	pow10f(GLIBC_2.3) [ISOC99]	pow10l(GLIBC_2.3) [ISOC99]
powf(GLIBC_2.3) [SUSv3]	powl(GLIBC_2.3) [SUSv3]	remainder(GLIBC_2.3) [SUSv3]	remainderf(GLIBC_2.3) [SUSv3]
remainderl(GLIBC_2.3) [SUSv3]	remquo(GLIBC_2.3) [SUSv3]	remquof(GLIBC_2.3) [SUSv3]	remquol(GLIBC_2.3) [SUSv3]
rint(GLIBC_2.3) [SUSv3]	rintf(GLIBC_2.3) [SUSv3]	rintl(GLIBC_2.3) [SUSv3]	round(GLIBC_2.3) [SUSv3]
roundf(GLIBC_2.3) [SUSv3]	roundl(GLIBC_2.3) [SUSv3]	scalb(GLIBC_2.3) [SUSv3]	scalbf(GLIBC_2.3) [ISOC99]
scalbl(GLIBC_2.3) [ISOC99]	scalbln(GLIBC_2.3) [SUSv3]	scalblnf(GLIBC_2.3) [SUSv3]	scalblnl(GLIBC_2.3) [SUSv3]
scalbn(GLIBC_2.3) [SUSv3]	scalbnf(GLIBC_2.3) [SUSv3]	scalbnl(GLIBC_2.3) [SUSv3]	significand(GLIBC_2.3) [ISOC99]
significandf(GLIBC_2.3) [ISOC99]	significandl(GLIBC_2.3) [ISOC99]	sin(GLIBC_2.3) [SUSv3]	sincos(GLIBC_2.3) [ISOC99]
sincosf(GLIBC_2.3) [ISOC99]	sincosl(GLIBC_2.3) [ISOC99]	sinf(GLIBC_2.3) [SUSv3]	sinh(GLIBC_2.3) [SUSv3]
sinhf(GLIBC_2.3) [SUSv3]	sinhl(GLIBC_2.3) [SUSv3]	sinl(GLIBC_2.3) [SUSv3]	sqrt(GLIBC_2.3) [SUSv3]
sqrtf(GLIBC_2.3) [SUSv3]	sqrtl(GLIBC_2.3) [SUSv3]	tan(GLIBC_2.3) [SUSv3]	tanf(GLIBC_2.3) [SUSv3]
tanh(GLIBC_2.3) [SUSv3]	tanhf(GLIBC_2.3) [SUSv3]	tanhl(GLIBC_2.3) [SUSv3]	tanl(GLIBC_2.3) [SUSv3]
tgamma(GLIBC_2.3) [SUSv3]	tgammaf(GLIBC_2.3) [SUSv3]	tgammal(GLIBC_2.3) [SUSv3]	trunc(GLIBC_2.3) [SUSv3]
truncf(GLIBC_2.3) [SUSv3]	truncl(GLIBC_2.3) [SUSv3]	y0(GLIBC_2.3) [SUSv3]	y0f(GLIBC_2.3) [ISOC99]
y0l(GLIBC_2.3) [ISOC99]	y1(GLIBC_2.3) [SUSv3]	y1f(GLIBC_2.3) [ISOC99]	y1l(GLIBC_2.3) [ISOC99]
yn(GLIBC_2.3) [SUSv3]	ynf(GLIBC_2.3) [ISOC99]	ynl(GLIBC_2.3) [ISOC99]	

An LSB conforming implementation shall provide the architecture specific data interfaces for Math specified in Table 11-26, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-26 libm - Math Data Interfaces

signgam(GLIBC_			

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2.3) [SUSv3]			

11.5 Data Definitions for libm

This section defines global identifiers and their values that are associated with interfaces contained in libm. These definitions are organized into groups that correspond to system headers. This convention is used as a convenience for the reader, and does not imply the existence of these headers, or their content. Where an interface is defined as requiring a particular system header file all of the data definitions for that system header file presented here shall be in effect.

This section gives data definitions to promote binary application portability, not to repeat source interface definitions available elsewhere. System providers and application developers should use this ABI to supplement - not to replace - source interface definition specifications.

This specification uses the ISO C (1999) C Language as the reference programming language, and data definitions are specified in ISO C format. The C language is used here as a convenient notation. Using a C language description of these data objects does not preclude their use by other programming languages.

11.5.1 complex.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.5.2 fenv.h

```
#define FE_INVALID      (1 << (31 - 2))
#define FE_OVERFLOW     (1 << (31 - 3))
#define FE_UNDERFLOW    (1 << (31 - 4))
#define FE_DIVBYZERO    (1 << (31 - 5))
#define FE_INEXACT      (1 << (31 - 6))

#define FE_ALL_EXCEPT   \
        (FE_INEXACT | FE_DIVBYZERO | FE_UNDERFLOW | FE_OVERFLOW |
FE_INVALID)

#define FE_TONEAREST    0
#define FE_TOWARDZERO   1
#define FE_UPWARD       2
#define FE_DOWNWARD     3

typedef unsigned int fexcept_t;

typedef double fenv_t;

#define FE_DFL_ENV      (&amp;__fe_dfl_env)
```

11.5.3 math.h

```
#define fpclassify(x)   \
        (sizeof (x) == sizeof (float) ? __fpclassifyf (x) :
__fpclassify (x) )
#define signbit(x)      \
        (sizeof (x) == sizeof (float)? __signbitf (x): __signbit (x))
```


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```
#define FP_ILOGB0       -2147483647
#define FP_ILOGBNAN     2147483647
```

11.6 Interfaces for libpthread

Table 11-27 defines the library name and shared object name for the libpthread library

Table 11-27 libpthread Definition

Library:	libpthread
SONAME:	libpthread.so.0

The behavior of the interfaces in this library is specified by the following specifications:

[LFS] Large File Support
[LSB] ISO/IEC 23360-1
[SUSv3] ISO POSIX (2003)

11.6.1 Realtime Threads

11.6.1.1 Interfaces for Realtime Threads

An LSB conforming implementation shall provide the architecture specific functions for Realtime Threads specified in Table 11-28, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-28 libpthread - Realtime Threads Function Interfaces

pthread_attr_getinheritsched(GLIBC_2.3) [SUSv3]	pthread_attr_getschedpolicy(GLIBC_2.3) [SUSv3]	pthread_attr_getscope(GLIBC_2.3) [SUSv3]	pthread_attr_setinheritsched(GLIBC_2.3) [SUSv3]
pthread_attr_setschedpolicy(GLIBC_2.3) [SUSv3]	pthread_attr_setscope(GLIBC_2.3) [SUSv3]	pthread_getschedparam(GLIBC_2.3) [SUSv3]	pthread_setschedparam(GLIBC_2.3) [SUSv3]

11.6.2 Advanced Realtime Threads

11.6.2.1 Interfaces for Advanced Realtime Threads

No external functions are defined for libpthread - Advanced Realtime Threads in this part of the specification. See also the generic specification, ISO/IEC 23360-1.

11.6.3 Posix Threads

11.6.3.1 Interfaces for Posix Threads

An LSB conforming implementation shall provide the architecture specific functions for Posix Threads specified in Table 11-29, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-29 libpthread - Posix Threads Function Interfaces

_pthread_cleanup_pop(GLIBC_2.3) [LSB]	_pthread_cleanup_push(GLIBC_2.3) [LSB]	pthread_attr_destroy(GLIBC_2.3) [SUSv3]	pthread_attr_getdetachstate(GLIBC_2.3) [SUSv3]

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pthread_attr_getguardsize(GLIBC_2.3) [SUSv3]	pthread_attr_getschedparam(GLIBC_2.3) [SUSv3]	pthread_attr_getstack(GLIBC_2.3) [SUSv3]	pthread_attr_getstackaddr(GLIBC_2.3) [SUSv3]
pthread_attr_getstacksize(GLIBC_2.3) [SUSv3]	pthread_attr_init(GLIBC_2.3) [SUSv3]	pthread_attr_setdetachstate(GLIBC_2.3) [SUSv3]	pthread_attr_setguardsize(GLIBC_2.3) [SUSv3]
pthread_attr_setschedparam(GLIBC_2.3) [SUSv3]	pthread_attr_setstackaddr(GLIBC_2.3) [SUSv3]	pthread_attr_setstacksize(GLIBC_2.3) [SUSv3]	pthread_cancel(GLIBC_2.3) [SUSv3]
pthread_cond_broadcast(GLIBC_2.3.2) [SUSv3]	pthread_cond_destroy(GLIBC_2.3.2) [SUSv3]	pthread_cond_init(GLIBC_2.3.2) [SUSv3]	pthread_cond_signal(GLIBC_2.3.2) [SUSv3]
pthread_cond_timedwait(GLIBC_2.3.2) [SUSv3]	pthread_cond_wait(GLIBC_2.3.2) [SUSv3]	pthread_condattr_destroy(GLIBC_2.3) [SUSv3]	pthread_condattr_getpshared(GLIBC_2.3) [SUSv3]
pthread_condattr_init(GLIBC_2.3) [SUSv3]	pthread_condattr_setpshared(GLIBC_2.3) [SUSv3]	pthread_create(GLIBC_2.3) [SUSv3]	pthread_detach(GLIBC_2.3) [SUSv3]
pthread_equal(GLIBC_2.3) [SUSv3]	pthread_exit(GLIBC_2.3) [SUSv3]	pthread_getconcurrency(GLIBC_2.3) [SUSv3]	pthread_getspecific(GLIBC_2.3) [SUSv3]
pthread_join(GLIBC_2.3) [SUSv3]	pthread_key_create(GLIBC_2.3) [SUSv3]	pthread_key_delete(GLIBC_2.3) [SUSv3]	pthread_kill(GLIBC_2.3) [SUSv3]
pthread_mutex_destroy(GLIBC_2.3) [SUSv3]	pthread_mutex_init(GLIBC_2.3) [SUSv3]	pthread_mutex_lock(GLIBC_2.3) [SUSv3]	pthread_mutex_trylock(GLIBC_2.3) [SUSv3]
pthread_mutex_unlock(GLIBC_2.3) [SUSv3]	pthread_mutexattr_destroy(GLIBC_2.3) [SUSv3]	pthread_mutexattr_getpshared(GLIBC_2.3) [SUSv3]	pthread_mutexattr_gettype(GLIBC_2.3) [SUSv3]
pthread_mutexattr_init(GLIBC_2.3) [SUSv3]	pthread_mutexattr_setpshared(GLIBC_2.3) [SUSv3]	pthread_mutexattr_settype(GLIBC_2.3) [SUSv3]	pthread_once(GLIBC_2.3) [SUSv3]
pthread_rwlock_destroy(GLIBC_2.3) [SUSv3]	pthread_rwlock_init(GLIBC_2.3) [SUSv3]	pthread_rwlock_rdlock(GLIBC_2.3) [SUSv3]	pthread_rwlock_timedrdlock(GLIBC_2.3) [SUSv3]
pthread_rwlock_timedwrlock(GLIBC_2.3) [SUSv3]	pthread_rwlock_tryrdlock(GLIBC_2.3) [SUSv3]	pthread_rwlock_trywrlock(GLIBC_2.3) [SUSv3]	pthread_rwlock_unlock(GLIBC_2.3) [SUSv3]
pthread_rwlock_wrlock(GLIBC_2.3) [SUSv3]	pthread_rwlockattr_destroy(GLIBC_2.3) [SUSv3]	pthread_rwlockattr_getpshared(GLIBC_2.3) [SUSv3]	pthread_rwlockattr_init(GLIBC_2.3) [SUSv3]
pthread_rwlockattr_setpshared(G	pthread_self(GLIBC_2.3) [SUSv3]	pthread_setcancelstate(GLIBC_2.3	pthread_setcanceltype(GLIBC_2.3)

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LIBC_2.3) [SUSv3]		) [SUSv3]	[SUSv3]
pthread_setconcurrency(GLIBC_2.3) [SUSv3]	pthread_setspecific(GLIBC_2.3) [SUSv3]	pthread_sigmask(GLIBC_2.3) [SUSv3]	pthread_testcancel(GLIBC_2.3) [SUSv3]
sem_close(GLIBC_2.3) [SUSv3]	sem_destroy(GLIBC_2.3) [SUSv3]	sem_getvalue(GLIBC_2.3) [SUSv3]	sem_init(GLIBC_2.3) [SUSv3]
sem_open(GLIBC_2.3) [SUSv3]	sem_post(GLIBC_2.3) [SUSv3]	sem_timedwait(GLIBC_2.3) [SUSv3]	sem_trywait(GLIBC_2.3) [SUSv3]
sem_unlink(GLIBC_2.3) [SUSv3]	sem_wait(GLIBC_2.3) [SUSv3]		

11.6.4 Thread aware versions of libc interfaces

11.6.4.1 Interfaces for Thread aware versions of libc interfaces

An LSB conforming implementation shall provide the architecture specific functions for Thread aware versions of libc interfaces specified in Table 11-30, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-30 libpthread - Thread aware versions of libc interfaces Function Interfaces

lseek64(GLIBC_2.3) [LFS]	open64(GLIBC_2.3) [LFS]	pread(GLIBC_2.3) [SUSv3]	pread64(GLIBC_2.3) [LFS]
pwrite(GLIBC_2.3) [SUSv3]	pwrite64(GLIBC_2.3) [LFS]		

11.7 Data Definitions for libpthread

This section defines global identifiers and their values that are associated with interfaces contained in libpthread. These definitions are organized into groups that correspond to system headers. This convention is used as a convenience for the reader, and does not imply the existence of these headers, or their content. Where an interface is defined as requiring a particular system header file all of the data definitions for that system header file presented here shall be in effect.

This section gives data definitions to promote binary application portability, not to repeat source interface definitions available elsewhere. System providers and application developers should use this ABI to supplement - not to replace - source interface definition specifications.

This specification uses the ISO C (1999) C Language as the reference programming language, and data definitions are specified in ISO C format. The C language is used here as a convenient notation. Using a C language description of these data objects does not preclude their use by other programming languages.

11.7.1 pthread.h

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```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.7.2 semaphore.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.8 Interfaces for libgcc_s

Table 11-31 defines the library name and shared object name for the libgcc_s library

Table 11-31 libgcc_s Definition

Library:	libgcc_s
SONAME:	libgcc_s.so.1

The behavior of the interfaces in this library is specified by the following specifications:

[LSB] ISO/IEC 23360-1

11.8.1 Unwind Library

11.8.1.1 Interfaces for Unwind Library

An LSB conforming implementation shall provide the architecture specific functions for Unwind Library specified in Table 11-32, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-32 libgcc_s - Unwind Library Function Interfaces

_Unwind_Backtrace(GCC_3.3) [LSB]	_Unwind_DeleteException(GCC_3.0) [LSB]	_Unwind_FindEnclosingFunction(GCC_3.3) [LSB]	_Unwind_Find_FDE(GCC_3.0) [LSB]
_Unwind_ForcedUnwind(GCC_3.0) [LSB]	_Unwind_GetCFA(GCC_3.3) [LSB]	_Unwind_GetDataRelBase(GCC_3.0) [LSB]	_Unwind_GetGR(GCC_3.0) [LSB]
_Unwind_GetIP(GCC_3.0) [LSB]	_Unwind_GetLanguageSpecificData(GCC_3.0) [LSB]	_Unwind_GetRegionStart(GCC_3.0) [LSB]	_Unwind_GetTextRelBase(GCC_3.0) [LSB]
_Unwind_RaiseException(GCC_3.0) [LSB]	_Unwind_Resume(GCC_3.0) [LSB]	_Unwind_Resume_or_Rethrow(GCC_3.3) [LSB]	_Unwind_SetGR(GCC_3.0) [LSB]
_Unwind_SetIP(GCC_3.0) [LSB]			

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11.9 Data Definitions for libgcc_s

This section defines global identifiers and their values that are associated with interfaces contained in libgcc_s. These definitions are organized into groups that correspond to system headers. This convention is used as a convenience for the reader, and does not imply the existence of these headers, or their content. Where an interface is defined as requiring a particular system header file all of the data definitions for that system header file presented here shall be in effect.

This section gives data definitions to promote binary application portability, not to repeat source interface definitions available elsewhere. System providers and application developers should use this ABI to supplement - not to replace - source interface definition specifications.

This specification uses the ISO C (1999) C Language as the reference programming language, and data definitions are specified in ISO C format. The C language is used here as a convenient notation. Using a C language description of these data objects does not preclude their use by other programming languages.

11.9.1 unwind.h

```
extern void _Unwind_DeleteException(struct _Unwind_Exception *);
extern fde *_Unwind_Find_FDE(void *, struct dwarf_eh_base *);
extern _Unwind_Ptr _Unwind_ForcedUnwind(struct _Unwind_Exception *,
                                        _Unwind_Stop_Fn, void *);
extern  _Unwind_Ptr  _Unwind_GetDataRelBase(struct  _Unwind_Context
*);
extern _Unwind_Word _Unwind_GetGR(struct _Unwind_Context *, int);
extern _Unwind_Ptr _Unwind_GetIP(struct _Unwind_Context *);
extern     _Unwind_Ptr     _Unwind_GetLanguageSpecificData(struct
_Unwind_Context
                                                          *);
extern  _Unwind_Ptr  _Unwind_GetRegionStart(struct  _Unwind_Context
*);
extern  _Unwind_Ptr  _Unwind_GetTextRelBase(struct  _Unwind_Context
*);
extern      _Unwind_Reason_Code      _Unwind_RaiseException(struct
_Unwind_Exception
                                                         *);
extern void _Unwind_Resume(struct _Unwind_Exception *);
extern void _Unwind_SetGR(struct _Unwind_Context *, int, u_int64_t);
extern void _Unwind_SetIP(struct _Unwind_Context *, _Unwind_Ptr);
extern _Unwind_Reason_Code _Unwind_Backtrace(_Unwind_Trace_Fn, void
*);
extern  _Unwind_Reason_Code  _Unwind_GetCFA(struct  _Unwind_Context
*);
extern _Unwind_Reason_Code _Unwind_Resume_or_Rethrow(struct

_Unwind_Exception *);
extern void *_Unwind_FindEnclosingFunction(void *);
```

11.10 Interface Definitions for libgcc_s

The interfaces defined on the following pages are included in libgcc_s and are defined by this specification. Unless otherwise noted, these interfaces shall be included in the source standard.

Other interfaces listed in Section 11.8 shall behave as described in the referenced base document.

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_Unwind_DeleteException

Name

`_Unwind_DeleteException` — private C++ error handling method

Synopsis

```
void _Unwind_DeleteException(struct _Unwind_Exception * object);
```

Description

`_Unwind_DeleteException()` deletes the given exception *`object`*. If a given runtime resumes normal execution after catching a foreign exception, it will not know how to delete that exception. Such an exception shall be deleted by calling `_Unwind_DeleteException()`. This is a convenience function that calls the function pointed to by the *exception_cleanup* field of the exception header.

_Unwind_Find_FDE

Name

`_Unwind_Find_FDE` — private C++ error handling method

Synopsis

```
fde * _Unwind_Find_FDE(void * pc, struct dwarf_eh_bases * bases);
```

Description

`_Unwind_Find_FDE()` looks for the object containing *`pc`*, then inserts into *`bases`*.

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_Unwind_ForcedUnwind

Name

_Unwind_ForcedUnwind — private C++ error handling method

Synopsis

```
_Unwind_Reason_Code _Unwind_ForcedUnwind(struct _Unwind_Exception *
object, _Unwind_Stop_Fn stop, void * stop_parameter);
```

Description

_Unwind_ForcedUnwind() raises an exception for forced unwinding, passing along the given exception *object*, which should have its *exception_class* and *exception_cleanup* fields set. The exception *object* has been allocated by the language-specific runtime, and has a language-specific format, except that it shall contain an _Unwind_Exception struct.

Forced unwinding is a single-phase process. *stop* and *stop_parameter* control the termination of the unwind process instead of the usual personality routine query. *stop* is called for each unwind frame, with the parameteres described for the usual personality routine below, plus an additional *stop_parameter*.

Return Value

When *stop* identifies the destination frame, it transfers control to the user code as appropriate without returning, normally after calling _Unwind_DeleteException(). If not, then it should return an _Unwind_Reason_Code value.

If *stop* returns any reason code other than _URC_NO_REASON, then the stack state is indeterminate from the point of view of the caller of _Unwind_ForcedUnwind(). Rather than attempt to return, therefore, the unwind library should use the *exception_cleanup* entry in the exception, and then call abort().

_URC_NO_REASON

> This is not the destination from. The unwind runtime will call frame's personality routine with the _UA_FORCE_UNWIND and _UA_CLEANUP_PHASE flag set in *actions*, and then unwind to the next frame and call the stop() function again.

_URC_END_OF_STACK

> In order to allow _Unwind_ForcedUnwind() to perform special processing when it reaches the end of the stack, the unwind runtime will call it after the last frame is rejected, with a NULL stack pointer in the context, and the stop() function shall catch this condition. It may return this code if it cannot handle end-of-stack.

_URC_FATAL_PHASE2_ERROR

> The stop() function may return this code for other fatal conditions like stack corruption.

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_Unwind_GetDataRelBase

Name

`_Unwind_GetDataRelBase` — private IA64 C++ error handling method

Synopsis

```
_Unwind_Ptr _Unwind_GetDataRelBase(struct _Unwind_Context * context);
```

Description

`_Unwind_GetDataRelBase()` returns the global pointer in register one for *`context`*.

_Unwind_GetGR

Name

`_Unwind_GetGR` — private C++ error handling method

Synopsis

```
_Unwind_Word _Unwind_GetGR(struct _Unwind_Context * context, int index);
```

Description

`_Unwind_GetGR()` returns data at *`index`* found in *`context`*. The register is identified by its index: `0` to `31` are for the fixed registers, and `32` to `127` are for the stacked registers.

During the two phases of unwinding, only GR1 has a guaranteed value, which is the global pointer of the frame referenced by the unwind *`context`*. If the register has its NAT bit set, the behavior is unspecified.

_Unwind_GetIP

Name

`_Unwind_GetIP` — private C++ error handling method

Synopsis

```
_Unwind_Ptr _Unwind_GetIP(struct _Unwind_Context * context);
```

Description

`_Unwind_GetIP()` returns the instruction pointer value for the routine identified by the unwind *`context`*.

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_Unwind_GetLanguageSpecificData

Name

_Unwind_GetLanguageSpecificData — private C++ error handling method

Synopsis

```
_Unwind_Ptr _Unwind_GetLanguageSpecificData(struct _Unwind_Context * context, uint value);
```

Description

_Unwind_GetLanguageSpecificData() returns the address of the language specific data area for the current stack frame.

_Unwind_GetRegionStart

Name

_Unwind_GetRegionStart — private C++ error handling method

Synopsis

```
_Unwind_Ptr _Unwind_GetRegionStart(struct _Unwind_Context * context);
```

Description

_Unwind_GetRegionStart() routine returns the address (i.e., 0) of the beginning of the procedure or code fragment described by the current unwind descriptor block.

_Unwind_GetTextRelBase

Name

_Unwind_GetTextRelBase — private IA64 C++ error handling method

Synopsis

```
_Unwind_Ptr _Unwind_GetTextRelBase(struct _Unwind_Context * context);
```

Description

_Unwind_GetTextRelBase() calls the abort method, then returns.

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_Unwind_RaiseException

Name

`_Unwind_RaiseException` — private C++ error handling method

Synopsis

```
_Unwind_Reason_Code _Unwind_RaiseException(struct _Unwind_Exception *
object);
```

Description

`_Unwind_RaiseException()` raises an exception, passing along the given exception *`object`*, which should have its *`exception_class`* and *`exception_cleanup`* fields set. The exception object has been allocated by the language-specific runtime, and has a language-specific format, exception that it shall contain an `_Unwind_Exception`.

Return Value

`_Unwind_RaiseException()` does not return unless an error condition is found. If an error condition occurs, an `_Unwind_Reason_Code` is returnd:

_URC_END_OF_STACK

The unwinder encountered the end of the stack during phase one without finding a handler. The unwind runtime will not have modified the stack. The C++ runtime will normally call `uncaught_exception()` in this case.

_URC_FATAL_PHASE1_ERROR

The unwinder encountered an unexpected error during phase one, because of something like stack corruption. The unwind runtime will not have modified the stack. The C++ runtime will normally call `terminate()` in this case.

_URC_FATAL_PHASE2_ERROR

The unwinder encountered an unexpected error during phase two. This is usually a *throw*, which will call `terminate()`.

_Unwind_Resume

Name

`_Unwind_Resume` — private C++ error handling method

Synopsis

```
void _Unwind_Resume(struct _Unwind_Exception * object);
```

Description

`_Unwind_Resume()` resumes propagation of an existing exception *`object`*. A call to this routine is inserted as the end of a landing pad that performs cleanup, but does not resume normal execution. It causes unwinding to proceed further.

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_Unwind_SetGR

Name

_Unwind_SetGR — private C++ error handling method

Synopsis

```
void _Unwind_SetGR(struct _Unwind_Context * context, int index, uint value);
```

Description

_Unwind_SetGR() sets the *value* of the register *index*ed for the routine identified by the unwind *context*.

_Unwind_SetIP

Name

_Unwind_SetIP — private C++ error handling method

Synopsis

```
void _Unwind_SetIP(struct _Unwind_Context * context, uint value);
```

Description

_Unwind_SetIP() sets the *value* of the instruction pointer for the routine identified by the unwind *context*

11.11 Interfaces for libdl

Table 11-33 defines the library name and shared object name for the libdl library

Table 11-33 libdl Definition

Library:	libdl
SONAME:	libdl.so.2

The behavior of the interfaces in this library is specified by the following specifications:

[LSB] ISO/IEC 23360-1
[SUSv3] ISO POSIX (2003)

11.11.1 Dynamic Loader

11.11.1.1 Interfaces for Dynamic Loader

An LSB conforming implementation shall provide the architecture specific functions for Dynamic Loader specified in Table 11-34, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-34 libdl - Dynamic Loader Function Interfaces

dladdr(GLIBC_2.3) [LSB]	dlclose(GLIBC_2.3) [SUSv3]	dlerror(GLIBC_2.3) [SUSv3]	dlopen(GLIBC_2.3) [LSB]
dlsym(GLIBC_2.			

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3) [LSB]			

11.12 Data Definitions for libdl

This section defines global identifiers and their values that are associated with interfaces contained in libdl. These definitions are organized into groups that correspond to system headers. This convention is used as a convenience for the reader, and does not imply the existence of these headers, or their content. Where an interface is defined as requiring a particular system header file all of the data definitions for that system header file presented here shall be in effect.

This section gives data definitions to promote binary application portability, not to repeat source interface definitions available elsewhere. System providers and application developers should use this ABI to supplement - not to replace - source interface definition specifications.

This specification uses the ISO C (1999) C Language as the reference programming language, and data definitions are specified in ISO C format. The C language is used here as a convenient notation. Using a C language description of these data objects does not preclude their use by other programming languages.

11.12.1 dlfcn.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

11.13 Interfaces for libcrypt

Table 11-35 defines the library name and shared object name for the libcrypt library

Table 11-35 libcrypt Definition

Library:	libcrypt
SONAME:	libcrypt.so.1

The behavior of the interfaces in this library is specified by the following specifications:

[SUSv3] ISO POSIX (2003)

11.13.1 Encryption

11.13.1.1 Interfaces for Encryption

An LSB conforming implementation shall provide the architecture specific functions for Encryption specified in Table 11-36, with the full mandatory functionality as described in the referenced underlying specification.

Table 11-36 libcrypt - Encryption Function Interfaces

crypt(GLIBC_2.3) [SUSv3]	encrypt(GLIBC_2.3) [SUSv3]	setkey(GLIBC_2.3) [SUSv3]	

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IV Utility Libraries

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12 Libraries

An LSB-conforming implementation shall also support some utility libraries which are built on top of the interfaces provided by the base libraries. These libraries implement common functionality, and hide additional system dependent information such as file formats and device names.

12.1 Interfaces for libz

Table 12-1 defines the library name and shared object name for the libz library

Table 12-1 libz Definition

Library:	libz
SONAME:	libz.so.1

12.1.1 Compression Library

12.1.1.1 Interfaces for Compression Library

No external functions are defined for libz - Compression Library in this part of the specification. See also the generic specification, ISO/IEC 23360-1.

12.2 Data Definitions for libz

This section defines global identifiers and their values that are associated with interfaces contained in libz. These definitions are organized into groups that correspond to system headers. This convention is used as a convenience for the reader, and does not imply the existence of these headers, or their content. Where an interface is defined as requiring a particular system header file all of the data definitions for that system header file presented here shall be in effect.

This section gives data definitions to promote binary application portability, not to repeat source interface definitions available elsewhere. System providers and application developers should use this ABI to supplement - not to replace - source interface definition specifications.

This specification uses the ISO C (1999) C Language as the reference programming language, and data definitions are specified in ISO C . The C language is used here as a convenient notation. Using a C language description of these data objects does not preclude their use by other programming languages.

12.2.1 zlib.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

12.3 Interfaces for libncurses

Table 12-2 defines the library name and shared object name for the libncurses library

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Table 12-2 libncurses Definition

Library:	libncurses
SONAME:	libncurses.so.5

12.3.1 Curses

12.3.1.1 Interfaces for Curses

No external functions are defined for libncurses - Curses in this part of the specification. See also the generic specification, ISO/IEC 23360-1.

12.4 Data Definitions for libncurses

This section defines global identifiers and their values that are associated with interfaces contained in libncurses. These definitions are organized into groups that correspond to system headers. This convention is used as a convenience for the reader, and does not imply the existence of these headers, or their content. Where an interface is defined as requiring a particular system header file all of the data definitions for that system header file presented here shall be in effect.

This section gives data definitions to promote binary application portability, not to repeat source interface definitions available elsewhere. System providers and application developers should use this ABI to supplement - not to replace - source interface definition specifications.

This specification uses the ISO C (1999) C Language as the reference programming language, and data definitions are specified in ISO C . The C language is used here as a convenient notation. Using a C language description of these data objects does not preclude their use by other programming languages.

12.4.1 curses.h

```
/*
 * This header is architecture neutral
 * Please refer to the generic specification for details
 */
```

12.5 Interfaces for libutil

Table 12-3 defines the library name and shared object name for the libutil library

Table 12-3 libutil Definition

Library:	libutil
SONAME:	libutil.so.1

The behavior of the interfaces in this library is specified by the following specifications:

[LSB] ISO/IEC 23360-1

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12.5.1 Utility Functions

12.5.1.1 Interfaces for Utility Functions

An LSB conforming implementation shall provide the architecture specific functions for Utility Functions specified in Table 12-4, with the full mandatory functionality as described in the referenced underlying specification.

Table 12-4 libutil - Utility Functions Function Interfaces

forkpty(GLIBC_2.3) [LSB]	login(GLIBC_2.3) [LSB]	login_tty(GLIBC_2.3) [LSB]	logout(GLIBC_2.3) [LSB]
logwtmp(GLIBC_2.3) [LSB]	openpty(GLIBC_2.3) [LSB]		

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V Package Format and Installation

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13 Software Installation

13.1 Package Dependencies

The LSB runtime environment shall provde the following dependencies.

lsb-core-ppc64

This dependency is used to indicate that the application is dependent on features contained in the LSB-Core specification.

These dependencies shall have a version of 3.0.

Other LSB modules may add additional dependencies; such dependencies shall have the format `lsb-`*`module`*`-ppc64`.

13.2 Package Architecture Considerations

All packages must specify an architecture of `ppc64`. A LSB runtime environment must accept an architecture of `ppc64` even if the native architecture is different.

The `archnum` value in the Lead Section shall be 0x0010.

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Annex A Alphabetical Listing of Interfaces

A.1 libgcc_s

The behavior of the interfaces in this library is specified by the following Standards.

ISO/IEC 23360-1 [LSB]

Table A-1 libgcc_s Function Interfaces

_Unwind_Backtrace[LSB]	_Unwind_GetDataRelBase[LSB]	_Unwind_RaiseException[LSB]
_Unwind_DeleteException[LSB]	_Unwind_GetGR[LSB]	_Unwind_Resume[LSB]
_Unwind_FindEnclosingFunction[LSB]	_Unwind_GetIP[LSB]	_Unwind_Resume_or_Rethrow[LSB]
_Unwind_Find_FDE[LSB]	_Unwind_GetLanguageSpecificData[LSB]	_Unwind_SetGR[LSB]
_Unwind_ForcedUnwind[LSB]	_Unwind_GetRegionStart[LSB]	_Unwind_SetIP[LSB]
_Unwind_GetCFA[LSB]	_Unwind_GetTextRelBase[LSB]	

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