Linux Standard Base Core Specification
for PPC32 3.1
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Foreword

This is version 3.1 of the Linux Standard Base Core Specification for PPC32. This specification is part of a family of specifications under the general title "Linux Standard Base". Developers of applications or implementations interested in using the LSB trademark should see the Free Standards Group Certification Policy for details.
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 shall include 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 the 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.
I Introductory Elements
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") describing those parts of the interface that remain constant across all implementations of the LSB, and an architecture-specific supplement ("LSB-arch" or "archLSB") describing the parts of the interface that vary by processor architecture. Together, the LSB-generic and the architecture-specific supplement for a single hardware architecture provide a complete interface specification for compiled application programs on systems that share a common hardware architecture.

The LSB-generic document shall be used in conjunction with an architecture-specific supplement. Whenever a section of the LSB-generic specification shall be supplemented by architecture-specific information, the LSB-generic document includes a reference to the architecture supplement. Architecture supplements 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 shall provide 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 PPC32 architecture specific Core module of the Linux Standards Base (LSB). This module supplements the generic LSB Core module with those interfaces that differ between architectures.

Interfaces described in this module are mandatory except where explicitly listed otherwise. Core interfaces may be supplemented by other modules; all modules are built upon the core.
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>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filesystem Hierarchy</td>
<td>Filesystem Hierarchy Standard (FHS) 2.3</td>
<td><a href="http://www.pathname.com/fhs/">http://www.pathname.com/fhs/</a></td>
</tr>
<tr>
<td>Name</td>
<td>Title</td>
<td>URL</td>
</tr>
<tr>
<td>----------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVID Issue 4</td>
<td>System V Interface Definition,Fourth Edition</td>
<td></td>
</tr>
</tbody>
</table>
2 References

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>plus Corrigendum U018</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DWARF Debugging Information Format, Revision 2.0.0</td>
<td>DWARF Debugging Information Format, Revision 2.0.0 (July 27, 1993)</td>
<td><a href="http://refspecs.freestandards.org/dwarf/dwarf-2.0.0.pdf">http://refspecs.freestandards.org/dwarf/dwarf-2.0.0.pdf</a></td>
</tr>
<tr>
<td>DWARF Debugging Information Format, Revision 3.0.0 (Draft)</td>
<td>DWARF Debugging Information Format, Revision 3.0.0 (Draft)</td>
<td><a href="http://refspecs.freestandards.org/dwarf/">http://refspecs.freestandards.org/dwarf/</a></td>
</tr>
<tr>
<td>Linux Allocated Device Registry</td>
<td>LINUX ALLOCATED DEVICES</td>
<td><a href="http://www.lanana.org/docs/device-list/devices.txt">http://www.lanana.org/docs/device-list/devices.txt</a></td>
</tr>
<tr>
<td>PAM</td>
<td>Open Software Foundation, Request For Comments: 86.0, October 1995, V. Samar &amp; R.Schemers (SunSoft)</td>
<td><a href="http://www.opengroup.org/tech/rfc/mirror-rfc/rfc86.0.txt">http://www.opengroup.org/tech/rfc/mirror-rfc/rfc86.0.txt</a></td>
</tr>
<tr>
<td>Name</td>
<td>Title</td>
<td>URL</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>-----</td>
</tr>
<tr>
<td>RFC 1831/1832 RPC &amp; XDR</td>
<td>IETF RFC 1831 &amp; 1832</td>
<td><a href="http://www.ietf.org/">http://www.ietf.org/</a></td>
</tr>
</tbody>
</table>
3 Requirements

3.1 Relevant Libraries

The libraries listed in Table 3-1 shall be available on PPC32 Linux Standard Base systems, with the specified runtime names. These names override or supplement the names specified in the generic LSB specification. The specified program interpreter, referred to as progres in this table, shall be used to load the shared libraries specified by \texttt{DT\_NEEDED} entries at run time.

<table>
<thead>
<tr>
<th>Library</th>
<th>Runtime Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>libm</td>
<td>libm.so.6</td>
</tr>
<tr>
<td>libdl</td>
<td>libdl.so.2</td>
</tr>
<tr>
<td>libcrypt</td>
<td>libcrypt.so.1</td>
</tr>
<tr>
<td>libz</td>
<td>libz.so.1</td>
</tr>
<tr>
<td>libncurses</td>
<td>libncurses.so.5</td>
</tr>
<tr>
<td>libutil</td>
<td>libutil.so.1</td>
</tr>
<tr>
<td>libc</td>
<td>libc.so.6</td>
</tr>
<tr>
<td>libpthread</td>
<td>libpthread.so.0</td>
</tr>
<tr>
<td>progintref</td>
<td>/lib ld-1b-1b-ppc32.so.3</td>
</tr>
<tr>
<td>libgcc_s</td>
<td>libgcc_s.so.1</td>
</tr>
</tbody>
</table>

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 and its relevant architecture specific supplement.

\textbf{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 supplement to this specification for a given target processor architecture describes 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 these
3 Requirements

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 and its relevant architecture specific supplement.

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.
3 Requirements

- 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.
4 Definitions

For the purposes of this document, the following definitions, as specified in the ISO/IEC Directives, Part 2, 2001, 4th Edition, apply:

- **can**
  - be able to; there is a possibility of; it is possible to

- **cannot**
  - be unable to; there is no possibility 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
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.
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).
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 supplements only.
Il Executable And Linking Format (ELF)
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 System V Application Binary Interface PowerPC Processor Supplement, and is intended to document additions made since the publication of that document.
8 Low Level System Information

8.1 Machine Interface

8.1.1 Processor Architecture

The PowerPC Architecture is specified by the following documents:
• System V Application Binary Interface PowerPC Processor Supplement
• The PowerPC ™ Microprocessor Family

Only the features of the PowerPC 603 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.

Note: The presence of a hardware floating point unit is optional. However, applications requiring floating point arithmetic may experience substantial performance penalties on system without such a unit.

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 32-bit computation mode as described in The PowerPC ™ Microprocessor Family. Conforming applications shall not use instructions provided only for the 64-bit mode.

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 "Data Representation" section of the System V Application Binary Interface PowerPC Processor Supplement.

8.1.2.1 Byte Ordering

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

In addition to the fundamental types specified in Chapter 3 "Fundamental Types" section of the System V Application Binary Interface PowerPC Processor Supplement, a 64 bit data type is defined here.

Table 8-1 Scalar Types

<table>
<thead>
<tr>
<th>Type</th>
<th>C</th>
<th>sizeof</th>
<th>Alignment (bytes)</th>
<th>IntelI386 Architecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integral</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>long long</td>
<td></td>
<td>8</td>
<td>8</td>
<td>signed double word</td>
</tr>
<tr>
<td>signed long</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>unsigned long</td>
<td></td>
<td>8</td>
<td>8</td>
<td>unsigned double word</td>
</tr>
</tbody>
</table>

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

8.2 Function Calling Sequence

LSB-conforming applications shall use the function calling sequence as defined in Chapter 3, Section "Function Calling Sequence" of the System V Application Binary Interface PowerPC Processor Supplement.

8.2.1 CPU Registers

LSB-conforming applications shall use only the registers described in Chapter 3, Section "Function Calling Sequence", Subsection "Registers" of the System V Application Binary Interface PowerPC Processor Supplement.

8.2.2 Floating Point Registers

LSB-conforming applications shall use only the registers described in Chapter 3, Section "Function Calling Sequence", Subsection "Registers" of the System V Application Binary Interface PowerPC Processor Supplement.

8.2.3 Stack Frame

LSB-conforming applications shall use stack frames as described in Chapter 3, Section "Function Calling Sequence", Subsection "The Stack Frame" of the System V Application Binary Interface PowerPC Processor Supplement.

8.2.4 Arguments

LSB-conforming applications shall pass parameters to functions as described in Chapter 3, Section "Function Calling Sequence", Subsection "Parameter Passing" of the System V Application Binary Interface PowerPC Processor Supplement.

8.2.5 Return Values

LSB-conforming applications shall not return structures or unions in registers as described in Chapter 3, Section "Function Calling Sequence", Subsection "Return Values" of System V Application Binary Interface PowerPC Processor Supplement.
Instead they must use the alternative method of passing the address of a buffer in a register as shown in the same section.

### 8.3 Operating System Interface

LSB-conforming applications shall use the Operating System Interfaces as defined in Chapter 3, Section "Operating System Interface" of the System V Application Binary Interface PowerPC Processor Supplement.

#### 8.3.1 Exception Interface

LSB-conforming applications shall use the Exception Interfaces as defined in Chapter 3, Section "Exception Interface" of the System V Application Binary Interface PowerPC Processor Supplement.

##### 8.3.1.1 Debugging Support

The LSB does not specify debugging information, however, if the DWARF specification is implemented, see Chapter 3, Section "DWARF Definition" of the System V Application Binary Interface PowerPC Processor Supplement.

#### 8.3.2 Signal Delivery

LSB-conforming applications shall follow the guidelines defined in Chapter 3, Section "Exception Interface" of the System V Application Binary Interface PowerPC Processor Supplement.

### 8.4 Process Initialization

LSB-conforming applications shall use the Process initialization as defined in Chapter 3, Section "Process Initialization" of the System V Application Binary Interface PowerPC Processor Supplement.

#### 8.4.1 Special Registers

Contrary to what is stated in the Registers part of chapter 3 of the System V Application Binary Interface PowerPC Processor Supplement there are no values set in registers r3, r4, r5, r6 and r7. Instead the values specified to appear in all of those registers except r7 are placed on the stack. The value to be placed into register r7, the termination function pointer is not passed to the process.

#### 8.4.2 Process Stack (on entry)

Figure 3-31 in System V Application Binary Interface PowerPC Processor Supplement is incorrect. The initial stack must look like the following.
8 Low Level System Information

8.4.3 Auxiliary Vector

In addition to the types defined in Chapter 3, Section "Process Initialization", Subsection "Process Stack" of the System V Application Binary Interface PowerPC Processor Supplement the following are also supported:

Table 8-2 Extra Auxiliary Types

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT_NOTELF</td>
<td>10</td>
<td>Program is not ELF</td>
</tr>
<tr>
<td>AT_UID</td>
<td>11</td>
<td>Real uid</td>
</tr>
<tr>
<td>AT_EUID</td>
<td>12</td>
<td>Effective uid</td>
</tr>
</tbody>
</table>

85
86
87
88
89
90
<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT_GID</td>
<td>13</td>
<td>Real gid</td>
</tr>
<tr>
<td>AT_EGID</td>
<td>14</td>
<td>Effective gid</td>
</tr>
<tr>
<td>AT_PLATFORM</td>
<td>15</td>
<td>String identifying CPU for optimizations</td>
</tr>
<tr>
<td>AT_HWCAP</td>
<td>16</td>
<td>Arch dependent hints at CPU capabilities</td>
</tr>
<tr>
<td>AT_CLKTCK</td>
<td>17</td>
<td>Frequency at which times() increments</td>
</tr>
<tr>
<td>AT_DCACHEBSIZE</td>
<td>19</td>
<td>The a_val member of this entry gives the data cache block size for processors on the system on which this program is running. If the processors have unified caches, AT_DCACHEBSIZE is the same as AT_UCACHEBSIZE.</td>
</tr>
<tr>
<td>AT_ICACHEBSIZE</td>
<td>20</td>
<td>The a_val member of this entry gives the instruction cache block size for processors on the system on which this program is running. If the processors have unified caches, AT_DCACHEBSIZE is the same as AT_UCACHEBSIZE.</td>
</tr>
<tr>
<td>AT_UCACHEBSIZE</td>
<td>21</td>
<td>The a_val member of this entry is zero if the processors on the system on which this program is running do not have a unified instruction and data cache. Otherwise it gives the cache block size.</td>
</tr>
<tr>
<td>AT_IGNOREPPC</td>
<td>22</td>
<td>All entries of this type should be ignored.</td>
</tr>
</tbody>
</table>

The last three entries in the table above override the values specified in System V Application Binary Interface PowerPC Processor Supplement.

### 8.5 Coding Examples

LSB-conforming applications may use the coding examples given in Chapter 3, Section "Coding Examples" of the System V Application Binary Interface PowerPC.
Processor Supplement to guide implementation of fundamental operations in the following areas.

### 8.5.1 Code Model Overview/Architecture Constraints

LSB-Conforming applications may use any of the code models described in Chapter 3, Section "Coding Examples", Subsection "Code Model Overview" of the System V Application Binary Interface PowerPC Processor Supplement.

### 8.5.2 Position-Independent Function Prologue

LSB-Conforming applications may use examples described in Chapter 3, Section "Coding Examples", Subsection "Function Prologue and Epilogue" of the System V Application Binary Interface PowerPC Processor Supplement.

### 8.5.3 Data Objects

LSB-Conforming applications may use examples described in Chapter 3, Section "Coding Examples", Subsection "Data Objects" of the System V Application Binary Interface PowerPC Processor Supplement.

### 8.5.4 Function Calls

LSB-Conforming applications may use examples described in Chapter 3, Section "Coding Examples", Subsection "Function Calls" of the System V Application Binary Interface PowerPC Processor Supplement.

### 8.5.5 Branching

LSB-Conforming applications may use examples described in Chapter 3, Section "Coding Examples", Subsection "Branching" of the System V Application Binary Interface PowerPC Processor Supplement.

### 8.6 C Stack Frame

#### 8.6.1 Variable Argument List

LSB-Conforming applications shall only use variable arguments to functions in the manner described in Chapter 3, Section "Function Calling Sequence", Subsection "Variable Argument Lists" of the System V Application Binary Interface PowerPC Processor Supplement.

#### 8.6.2 Dynamic Allocation of Stack Space

LSB-Conforming applications shall follow guidelines discussed in in Chapter 3, Section "Coding Examples", Subsection "Dynamic Stack Space Allocation" of the System V Application Binary Interface PowerPC Processor Supplement.

### 8.7 Debug Information

The LSB does not currently specify the format of Debug information.
9 Object Format

9.1 Introduction

LSB-conforming implementations shall support an object file, called Executable and Linking Format (ELF) as defined by the System V Application Binary Interface PowerPC Processor 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

9.2.1 Machine Information

LSB-conforming applications shall use the Machine Information as defined in System V Application Binary Interface PowerPC Processor Supplement, Chapter 4, Section "ELF Header" Subsection "Machine Information".

9.3 Sections

9.3.1 Special Sections

The following sections are defined in the System V Application Binary Interface PowerPC Processor Supplement Chapter 4, Section "Section", Subsection "Special Sections".

Table 9-1 ELF Special Sections

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>.got</td>
<td>SHT_PROGBITS</td>
<td>SHF_ALLOC+SHF_WRITE+SHF_EXECINSTR</td>
</tr>
<tr>
<td>.plt</td>
<td>SHT_NOBITS</td>
<td>SHF_ALLOC+SHF_WRITE+SHF_EXECINSTR</td>
</tr>
<tr>
<td>.sdata</td>
<td>SHT_PROGBITS</td>
<td>SHF_ALLOC+SHF_WRITE</td>
</tr>
</tbody>
</table>

.got

This section holds the global offset table. See 'Coding Examples' in Chapter 3, 'Special Sections' in Chapter 4, and 'Global Offset Table' in Chapter 5 of the processor supplement for more information.

.plt

This section holds the Procedure Linkage Table

.sdata

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

Note that the .tags, .taglist and .tagsym sections described in Chapter 4, Section "Sections" System V Application Binary Interface PowerPC Processor Supplement are not supported.
### 9.3.2 Linux Special Sections

The following Linux PPC32 specific sections are defined here.

#### Table 9-2 Additional Special Sections

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>.got2</td>
<td>SHT_PROGBITS</td>
<td>SHF_ALLOC+SHF_WRITE</td>
</tr>
<tr>
<td>.rela.bss</td>
<td>SHT_RELA</td>
<td>SHF_ALLOC</td>
</tr>
<tr>
<td>.rela.dyn</td>
<td>SHT_RELA</td>
<td>SHF_ALLOC</td>
</tr>
<tr>
<td>.rela.got</td>
<td>SHT_RELA</td>
<td>SHF_ALLOC</td>
</tr>
<tr>
<td>.rela.got2</td>
<td>SHT_RELA</td>
<td>SHF_ALLOC</td>
</tr>
<tr>
<td>.rela.plt</td>
<td>SHT_RELA</td>
<td>SHF_ALLOC</td>
</tr>
<tr>
<td>.rela.sbss</td>
<td>SHT_RELA</td>
<td>SHF_ALLOC</td>
</tr>
<tr>
<td>.sbss</td>
<td>SHT_NOBITS</td>
<td>SHF_ALLOC+SHF_WRITE</td>
</tr>
<tr>
<td>.sdata2</td>
<td>SHT_PROGBITS</td>
<td>SHF_ALLOC</td>
</tr>
</tbody>
</table>

**.got2**
- This section holds the second level GOT

**.rela.bss**
- This section holds RELA type relocation information for the BSS section of a shared library or dynamically linked application

**.rela.dyn**
- This section holds RELA type relocation information for all sections of a shared library except the PLT

**.rela.got**
- This section holds RELA type relocation information for the GOT section of a shared library or dynamically linked application

**.rela.got2**
- This section holds RELA type relocation information for the second level GOT section of a shared library or dynamically linked application

**.rela.plt**
- This section holds RELA type relocation information for the PLT section of a shared library or dynamically linked application

**.rela.sbss**
- This section holds RELA type relocation information for the SBSS section of a shared library or dynamically linked application
9 Object Format

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.

This section holds the second level of initialized small data.

9.4 Symbol Table

LSB-conforming applications shall use the Symbol Table as defined in Chapter 4, Section "Symbol Table" of the System V Application Binary Interface PowerPC Processor Supplement.

9.5 Relocation

LSB-conforming applications shall use Relocations as defined in Chapter 4, Section "Relocation" of the System V Application Binary Interface PowerPC Processor Supplement.

9.5.1 Relocation Types

LSB-conforming applications shall support the relocation types as defined in the Chapter 4, Section "Relocation" Subsection "Relocation Types" except for the relocation type \texttt{R\_PPC\_ADDR30} as specified in Table 4-8 of System V Application Binary Interface PowerPC Processor Supplement.
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, System V Application Binary Interface PowerPC Processor Supplement Chapter 5 and as supplemented by the generic Linux Standard Base Specification and this document.

10.2 Program Header

LSB-conforming applications shall support the program header as defined in the System V Application Binary Interface PowerPC Processor Supplement Chapter 5, Section "Program Loading".

10.3 Program Loading

LSB-conforming implementations shall map file pages to virtual memory pages as described in Section "Program Loading" of the System V Application Binary Interface PowerPC Processor Supplement, Chapter 5.

10.4 Dynamic Linking

LSB-conforming implementations shall provide dynamic linking as specified in Section "Dynamic Linking" of the System V Application Binary Interface PowerPC Processor Supplement, Chapter 5.

10.4.1 Dynamic Section

The following dynamic entries are defined in the System V Application Binary Interface PowerPC Processor Supplement, Chapter 5, Section "Dynamic Linking".

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 addition the following dynamic entries are also supported:

DT_RELACOUNT

The number of relative relocations in .rela.dyn

10.4.2 Global Offset Table

LSB-conforming implementations shall support a Global Offset Table as described in Chapter 5, Section "Dynamic Linking" of the System V Application Binary Interface PowerPC Processor Supplement.
10.4.3 Function Addresses

Function addresses shall behave as described in Chapter 5, Section "Dynamic Linking", Subsection "Function Addresses" of the System V Application Binary Interface PowerPC Processor Supplement.

10.4.4 Procedure Linkage Table

LSB-conforming implementations shall support a Procedure Linkage Table as described in Chapter 5, Section "Dynamic Linking", Subsection "Procedure Linkage Table" of the System V Application Binary Interface PowerPC Processor Supplement.
III Base Libraries
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 32 platform are defined here.
This section should be used in conjunction with the corresponding section in the
generic Linux Standard Base Core Specification.

11.1 Program Interpreter/Dynamic Linker
The Program Interpreter shall be /lib/ld-1sb-ppc32.so.3.

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

<table>
<thead>
<tr>
<th>Library:</th>
<th>libc</th>
</tr>
</thead>
<tbody>
<tr>
<td>SONAME:</td>
<td>libc.so.6</td>
</tr>
</tbody>
</table>

The behavior of the interfaces in this library is specified by the following specifications:
[LFS] Large File Support
[LSB] This Specification
[SUSv2] SUSv2
[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>
<thead>
<tr>
<th>authnone_create(GLIBC_2.0) [SVID.4]</th>
<th>clnt_create(GLIBC_2.0) [SVID.4]</th>
<th>clnt_pcreateerror(GLIBC_2.0) [SVID.4]</th>
<th>clnt_errno(GLIBC_2.0) [SVID.4]</th>
</tr>
</thead>
<tbody>
<tr>
<td>clnt_perror(GLIBC_2.0) [SVID.4]</td>
<td>clnt_spcreateerror(GLIBC_2.0) [SVID.4]</td>
<td>clnt_sperror(GLIBC_2.0) [SVID.4]</td>
<td>clnt_sperror(GLIBC_2.0) [SVID.4]</td>
</tr>
<tr>
<td>key_decryptsession(GLIBC_2.0) [SVID.3]</td>
<td>pmap_getport(GLIBC_2.0) [LSB]</td>
<td>pmap_set(GLIBC_2.0) [LSB]</td>
<td>pmap_unset(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>svc_getreqset(GLIBC_2.0)</td>
<td>svc_register(GLIBC_2.0)</td>
<td>svc_run(GLIBC_2.0)</td>
<td>svc_sendreply(GLIBC_2.0)</td>
</tr>
</tbody>
</table>
### 11 Libraries

<table>
<thead>
<tr>
<th>BC_2.0) [SVID.3]</th>
<th>C_2.0) [LSB]</th>
<th>0) [LSB]</th>
<th>IBC_2.0) [LSB]</th>
</tr>
</thead>
<tbody>
<tr>
<td>svcerr_auth(GLIBC_2.0) [SVID.3]</td>
<td>svcerr_decode(GLIBC_2.0) [SVID.3]</td>
<td>svcerr_noproc(GLIBC_2.0) [SVID.3]</td>
<td>svcerr_noprog(GLIBC_2.0) [SVID.3]</td>
</tr>
<tr>
<td>svcerr_progvers(GLIBC_2.0) [SVID.3]</td>
<td>svcerr_systemerr(GLIBC_2.0) [SVID.3]</td>
<td>svcerr_weakauth(GLIBC_2.0) [SVID.3]</td>
<td>svtcp_create(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>svcudp_create(GLIBC_2.0) [LSB]</td>
<td>xdr_accepted_reply(GLIBC_2.0) [SVID.3]</td>
<td>xdr_array(GLIBC_2.0) [SVID.3]</td>
<td>xdr_bool(GLIBC_2.0) [SVID.3]</td>
</tr>
<tr>
<td>xdr_bytes(GLIBC_2.0) [SVID.3]</td>
<td>xdr_callhdr(GLIBC_2.0) [SVID.3]</td>
<td>xdr_callmsg(GLIBC_2.0) [SVID.3]</td>
<td>xdr_char(GLIBC_2.0) [SVID.3]</td>
</tr>
<tr>
<td>xdr_double(GLIBC_2.0) [SVID.3]</td>
<td>xdr_enum(GLIBC_2.0) [SVID.3]</td>
<td>xdr_float(GLIBC_2.0) [SVID.3]</td>
<td>xdr_free(GLIBC_2.0) [SVID.3]</td>
</tr>
<tr>
<td>xdr_int(GLIBC_2.0) [SVID.3]</td>
<td>xdr_long(GLIBC_2.0) [SVID.3]</td>
<td>xdrOpaque(GLIBC_2.0) [SVID.3]</td>
<td>xdr_opaque_auth(GLIBC_2.0) [SVID.3]</td>
</tr>
<tr>
<td>xdr_pointer(GLIBC_2.0) [SVID.3]</td>
<td>xdr_reference(GLIBC_2.0) [SVID.3]</td>
<td>xdr_rejected_reply(GLIBC_2.0) [SVID.3]</td>
<td>xdr_repllymsg(GLIBC_2.0) [SVID.3]</td>
</tr>
<tr>
<td>xdr_short(GLIBC_2.0) [SVID.3]</td>
<td>xdr_string(GLIBC_2.0) [SVID.3]</td>
<td>xdr_u_char(GLIBC_2.0) [SVID.3]</td>
<td>xdr_u_int(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>xdr_u_long(GLIBC_2.0) [SVID.3]</td>
<td>xdr_u_short(GLIBC_2.0) [SVID.3]</td>
<td>xdr_union(GLIBC_2.0) [SVID.3]</td>
<td>xdr_vector(GLIBC_2.0) [SVID.3]</td>
</tr>
<tr>
<td>xdr_void(GLIBC_2.0) [SVID.3]</td>
<td>xdr_wrapstring(GLIBC_2.0) [SVID.3]</td>
<td>xdrmem_create(GLIBC_2.0) [SVID.3]</td>
<td>xdrrec_create(GLIBC_2.0) [SVID.3]</td>
</tr>
<tr>
<td>xdrrec_eof(GLIBC_2.0) [SVID.3]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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>
<thead>
<tr>
<th>__fxstat(GLIBC_2.0) [LSB]</th>
<th>__getpgid(GLIBC_2.0) [LSB]</th>
<th>__lxstat(GLIBC_2.0) [SVID.3]</th>
<th>__xmknod(GLIBC_2.0) [LSB]</th>
</tr>
</thead>
<tbody>
<tr>
<td>__xstat(GLIBC_2.0) [LSB]</td>
<td>access(GLIBC_2.0) [SUSv3]</td>
<td>acct(GLIBC_2.0) [LSB]</td>
<td>alarm(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>brk(GLIBC_2.0) [SUSv2]</td>
<td>chdir(GLIBC_2.0) [SUSv3]</td>
<td>chmod(GLIBC_2.0) [SUSv3]</td>
<td>chown(GLIBC_2.1) [SUSv3]</td>
</tr>
<tr>
<td>chroot(GLIBC_2.0)</td>
<td>clock(GLIBC_2.0)</td>
<td>close(GLIBC_2.0)</td>
<td>closedir(GLIBC_2.0)</td>
</tr>
<tr>
<td>Function</td>
<td>SUSv2</td>
<td>SUSv3</td>
<td>SUSv3</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td><code>creat(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>execle(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>execvp(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>fchown(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>fork(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>ftruncate(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>getgid(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>getgroups(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>fchown(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>fork(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>ftruncate(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>gettimeofday(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>lchown(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>lockf(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>lockf(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>lchown(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>mkfifo(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
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<td></td>
<td>[SUSv3]</td>
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<td><code>mprotect(GLIBC_2.0)</code></td>
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<tr>
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<td>[SUSv3]</td>
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<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
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<td>[SUSv3]</td>
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<td>[SUSv3]</td>
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<td><code>mprotect(GLIBC_2.0)</code></td>
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<td>[SUSv3]</td>
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<td><code>mprotect(GLIBC_2.0)</code></td>
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<td>[SUSv3]</td>
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<td><code>mprotect(GLIBC_2.0)</code></td>
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<td>[SUSv3]</td>
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<td><code>mprotect(GLIBC_2.0)</code></td>
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<td></td>
<td>[SUSv3]</td>
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<td><code>mprotect(GLIBC_2.0)</code></td>
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<tr>
<td></td>
<td>[SUSv3]</td>
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<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
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<tr>
<td></td>
<td>[SUSv3]</td>
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<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
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<tr>
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<td>[SUSv3]</td>
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<td><code>mprotect(GLIBC_2.0)</code></td>
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<tr>
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<td>[SUSv3]</td>
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<td><code>mprotect(GLIBC_2.0)</code></td>
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<tr>
<td></td>
<td>[SUSv3]</td>
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</tr>
<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>mprotect(GLIBC_2.0)</code></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[SUSv3]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>Function</th>
<th>Libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>_IO_feof(GLIBC_2.0)</td>
<td>[LSB]</td>
</tr>
<tr>
<td>_IO_getc(GLIBC_2.0)</td>
<td>[LSB]</td>
</tr>
<tr>
<td>_IO_putc(GLIBC_2.0)</td>
<td>[LSB]</td>
</tr>
<tr>
<td>_IO_puts(GLIBC_2.0)</td>
<td>[LSB]</td>
</tr>
<tr>
<td>asprintf(GLIBC_2.0)</td>
<td>[LSB]</td>
</tr>
<tr>
<td>clearerr(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>ctermid(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fclose(GLIBC_2.1)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fflush(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fflush_unlocked(GLIBC_2.0)</td>
<td>[LSB]</td>
</tr>
<tr>
<td>fseek(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fgetpos(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fgetwc_unlocked(GLIBC_2.2)</td>
<td>[LSB]</td>
</tr>
<tr>
<td>flockfile(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fcntl(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fенн(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fgetwc_unlocked(GLIBC_2.2)</td>
<td>[LSB]</td>
</tr>
<tr>
<td>flockfile(GLIBC_2.2)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>faccess(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchmod(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchown(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchsize(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchmodat(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchownat(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchsizeat(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fdatasync(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fsync(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>flock(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>flockfile(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchmodat(GLIBC_2.1)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchownat(GLIBC_2.2)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchsizeat(GLIBC_2.2)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fdatasync(GLIBC_2.2)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fsyncat(GLIBC_2.2)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchmodat(GLIBC_2.3)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchownat(GLIBC_2.3)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchsizeat(GLIBC_2.3)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fdatasync(GLIBC_2.3)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fsyncat(GLIBC_2.3)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchmodat(GLIBC_2.4)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchownat(GLIBC_2.4)</td>
<td>[SUSv3]</td>
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<tr>
<td>fchsizeat(GLIBC_2.4)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fdatasync(GLIBC_2.4)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fsyncat(GLIBC_2.4)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchmodat(GLIBC_2.5)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchownat(GLIBC_2.5)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchsizeat(GLIBC_2.5)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fdatasync(GLIBC_2.5)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fsyncat(GLIBC_2.5)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchmodat(GLIBC_2.6)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchownat(GLIBC_2.6)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchsizeat(GLIBC_2.6)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fdatasync(GLIBC_2.6)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fsyncat(GLIBC_2.6)</td>
<td>[SUSv3]</td>
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<tr>
<td>fchmodat(GLIBC_2.7)</td>
<td>[SUSv3]</td>
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<tr>
<td>fchownat(GLIBC_2.7)</td>
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<tr>
<td>fchsizeat(GLIBC_2.7)</td>
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<tr>
<td>fdatasync(GLIBC_2.7)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fsyncat(GLIBC_2.7)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchmodat(GLIBC_2.8)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchownat(GLIBC_2.8)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchsizeat(GLIBC_2.8)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fdatasync(GLIBC_2.8)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fsyncat(GLIBC_2.8)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fchmodat(GLIBC_2.9)</td>
<td>[SUSv3]</td>
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<tr>
<td>fchownat(GLIBC_2.9)</td>
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<tr>
<td>fchsizeat(GLIBC_2.9)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fdatasync(GLIBC_2.9)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>fsyncat(GLIBC_2.9)</td>
<td>[SUSv3]</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Function</th>
<th>LSB</th>
<th>SUSv3</th>
</tr>
</thead>
<tbody>
<tr>
<td>stderr(GLIBC_2.0)</td>
<td>SUSv3</td>
<td>SUSv3</td>
</tr>
<tr>
<td>stdin(GLIBC_2.0)</td>
<td>SUSv3</td>
<td>SUSv3</td>
</tr>
<tr>
<td>stdout(GLIBC_2.0)</td>
<td>SUSv3</td>
<td>SUSv3</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>Function</th>
<th>LSB</th>
<th>SUSv3</th>
<th>SUSv3</th>
<th>SUSv3</th>
</tr>
</thead>
<tbody>
<tr>
<td>__libc_current_sig_rmax(GLIBC_2.1)</td>
<td>SUSv3</td>
<td>SUSv3</td>
<td>SUSv3</td>
<td>SUSv3</td>
</tr>
<tr>
<td>__libc_current_sig_rmin(GLIBC_2.1)</td>
<td>SUSv3</td>
<td>SUSv3</td>
<td>SUSv3</td>
<td>SUSv3</td>
</tr>
<tr>
<td>__sigsetjmp(GLIBC_2.3.4)</td>
<td>SUSv3</td>
<td>SUSv3</td>
<td>SUSv3</td>
<td>SUSv3</td>
</tr>
<tr>
<td>__sysv_signal(GLIBC_2.0)</td>
<td>SUSv3</td>
<td>SUSv3</td>
<td>SUSv3</td>
<td>SUSv3</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>_sys_siglist(GLIBC_2.3.3)</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bind_textdomain_codeset(GLIBC_2.2)</td>
<td></td>
</tr>
<tr>
<td>bindtextdomain(GLIBC_2.0)</td>
<td></td>
</tr>
<tr>
<td>catclose(GLIBC_2.0)</td>
<td></td>
</tr>
<tr>
<td>catgets(GLIBC_2.0)</td>
<td></td>
</tr>
<tr>
<td>catopen(GLIBC_2.0)</td>
<td></td>
</tr>
<tr>
<td>dcngettext(GLIBC_2.2)</td>
<td></td>
</tr>
<tr>
<td>dgettext(GLIBC_2.0)</td>
<td></td>
</tr>
<tr>
<td>dgettext(GLIBC_2.2)</td>
<td></td>
</tr>
<tr>
<td>gettext(GLIBC_2.0)</td>
<td></td>
</tr>
<tr>
<td>gettext(GLIBC_2.2)</td>
<td></td>
</tr>
<tr>
<td>iconv_open(GLIBC_2.1)</td>
<td></td>
</tr>
<tr>
<td>localeconv(GLIBC_2.2)</td>
<td></td>
</tr>
<tr>
<td>ngettext(GLIBC_2.0)</td>
<td></td>
</tr>
<tr>
<td>ngettext(GLIBC_2.2)</td>
<td></td>
</tr>
<tr>
<td>nl_langinfo(GLIBC_2.0)</td>
<td></td>
</tr>
<tr>
<td>setlocale(GLIBC_2.0)</td>
<td></td>
</tr>
<tr>
<td>textdomain(GLIBC_2.0)</td>
<td></td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>_nl_msg_cat_cntr(GLIBC_2.0) [LSB]</td>
</tr>
</tbody>
</table>

#### 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

<table>
<thead>
<tr>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>__h_errno_location(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>accept(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>bind(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>bindresvport(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>connect(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>gethostid(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>gethostname(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>getpeermaname(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>getsockname(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>getsockopt(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>if_freenameindex(GLIBC_2.1) [SUSv3]</td>
</tr>
<tr>
<td>if_indextoname(GLIBC_2.1) [SUSv3]</td>
</tr>
<tr>
<td>if_nameindex(GLIBC_2.1) [SUSv3]</td>
</tr>
<tr>
<td>if_nametoindex(GLIBC_2.1) [SUSv3]</td>
</tr>
<tr>
<td>listen(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>recv(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>recvfrom(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>recvmsg(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>send(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>sendmsg(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>sendto(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>socket(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>socketpair(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>shutdown(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>sockatmark(GLIBC_2.2.4) [SUSv3]</td>
</tr>
</tbody>
</table>

#### 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

<table>
<thead>
<tr>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>__wcstod_internal(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>__wcstof_internal(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>__wcstol_internal(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>__wcstold_internal(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>_btowc(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>_fgetwc(GLIBC_2.2) [SUSv3]</td>
</tr>
<tr>
<td>_fgetws(GLIBC_2.2) [SUSv3]</td>
</tr>
<tr>
<td>_fgetws(GLIBC_2.2) [SUSv3]</td>
</tr>
<tr>
<td>Library Function</td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>fputwc(GLIBC_2.2)</td>
</tr>
<tr>
<td>fputws(GLIBC_2.2)</td>
</tr>
<tr>
<td>fwrite(GLIBC_2.2)</td>
</tr>
<tr>
<td>fwprintf(GLIBC_2.2)</td>
</tr>
<tr>
<td>putwc(GLIBC_2.2)</td>
</tr>
<tr>
<td>getwc(GLIBC_2.2)</td>
</tr>
<tr>
<td>mbrlen(GLIBC_2.0)</td>
</tr>
<tr>
<td>mbrtowc(GLIBC_2.0)</td>
</tr>
<tr>
<td>mbsinit(GLIBC_2.0)</td>
</tr>
<tr>
<td>mbsrtowcs(GLIBC_2.0)</td>
</tr>
<tr>
<td>putwchar(GLIBC_2.2)</td>
</tr>
<tr>
<td>swprintf(GLIBC_2.2)</td>
</tr>
<tr>
<td>swscanf(GLIBC_2.2)</td>
</tr>
<tr>
<td>towtrans(GLIBC_2.0)</td>
</tr>
<tr>
<td>vfwscanf(GLIBC_2.2)</td>
</tr>
<tr>
<td>vswprintf(GLIBC_2.2)</td>
</tr>
<tr>
<td>wcpcpy(GLIBC_2.2)</td>
</tr>
<tr>
<td>wcpcpy(GLIBC_2.2)</td>
</tr>
<tr>
<td>wcscasemp(GLIBC_2.1)</td>
</tr>
<tr>
<td>wcscat(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcscbc(str)</td>
</tr>
<tr>
<td>wcscspn(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcscspn(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcsftime(GLIBC_2.2)</td>
</tr>
<tr>
<td>wcsftime(GLIBC_2.2)</td>
</tr>
<tr>
<td>wcsntomb(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcscmp(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcscmp(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcscpy(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcscpy(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcstrchr(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcstrchr(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcstombs(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcstombs(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcctype(GLIBC_2.0)</td>
</tr>
<tr>
<td>wcctype(GLIBC_2.0)</td>
</tr>
<tr>
<td>wmemchr(GLIBC_2.0)</td>
</tr>
<tr>
<td>wmemchr(GLIBC_2.0)</td>
</tr>
<tr>
<td>wmemcpy(GLIBC_2.0)</td>
</tr>
<tr>
<td>wmemcpy(GLIBC_2.0)</td>
</tr>
<tr>
<td>wmemmove(GLIBC_2.0)</td>
</tr>
<tr>
<td>wmemmove(GLIBC_2.0)</td>
</tr>
<tr>
<td>wmemset(GLIBC_2.0)</td>
</tr>
<tr>
<td>wmemset(GLIBC_2.0)</td>
</tr>
<tr>
<td>wprintf(GLIBC_2.2)</td>
</tr>
</tbody>
</table>
### 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

<table>
<thead>
<tr>
<th>Function</th>
<th>__mempcpy(GLIBC_2.0) [LSB]</th>
<th>__rawmemchr(GLIBC_2.1) [LSB]</th>
<th>__stpcpy(GLIBC_2.0) [LSB]</th>
<th>__strdup(GLIBC_2.0) [LSB]</th>
</tr>
</thead>
<tbody>
<tr>
<td>__strtod_internal(GLIBC_2.0) [LSB]</td>
<td>__strtof_internal(GLIBC_2.0) [LSB]</td>
<td>__strtok_r(GLIBC_2.0) [LSB]</td>
<td>__strtol_internal(GLIBC_2.0) [LSB]</td>
<td>__strtold_internal(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>__strtof_internal(GLIBC_2.0) [LSB]</td>
<td>__strtof_internal(GLIBC_2.0) [LSB]</td>
<td>__strtok_r(GLIBC_2.0) [LSB]</td>
<td>__strtol_internal(GLIBC_2.0) [LSB]</td>
<td>__strtoull_internal(GLIBC_2.0)</td>
</tr>
<tr>
<td>__strtok_r(GLIBC_2.0) [LSB]</td>
<td>__strtok_r(GLIBC_2.0) [LSB]</td>
<td>__strtol_internal(GLIBC_2.0) [LSB]</td>
<td>__strtoq(GLIBC_2.0) [LSB]</td>
<td>__strtotime(GLIBC_2.0)</td>
</tr>
<tr>
<td>__strtol_internal(GLIBC_2.0) [LSB]</td>
<td>__strtol_internal(GLIBC_2.0) [LSB]</td>
<td>__strtoq(GLIBC_2.0) [LSB]</td>
<td>__strtotime(GLIBC_2.0) [LSB]</td>
<td>__strtoq(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>__strtoull_internal(GLIBC_2.0)</td>
<td>__strtoull_internal(GLIBC_2.0) [LSB]</td>
<td>__strtoq(GLIBC_2.0) [LSB]</td>
<td>__strtotime(GLIBC_2.0) [LSB]</td>
<td>__strtoq(GLIBC_2.0) [LSB]</td>
</tr>
</tbody>
</table>

- bcmp(GLIBC_2.0) [SUSv3]
- bcopy(GLIBC_2.0) [SUSv3]
- bzero(GLIBC_2.0) [SUSv3]
- ffs(GLIBC_2.0) [SUSv3]
- index(GLIBC_2.0) [SUSv3]
- memccpy(GLIBC_2.0) [SUSv3]
- memchr(GLIBC_2.0) [SUSv3]
- memmove(GLIBC_2.0) [SUSv3]
- memchr(GLIBC_2.2) [LSB]
- memset(GLIBC_2.0) [SUSv3]
- strlen(GLIBC_2.0) [SUSv3]
- strcat(GLIBC_2.0) [SUSv3]
- strchr(GLIBC_2.0) [SUSv3]
- strcmp(GLIBC_2.0) [SUSv3]
- strcoll(GLIBC_2.0) [SUSv3]
- strftime(GLIBC_2.0) [SUSv3]
- strptime(GLIBC_2.0) [LSB]
- strstr(GLIBC_2.0) [SUSv3]
- strstr(GLIBC_2.0) [SUSv3]
- strpbrk(GLIBC_2.0) [SUSv3]
- strspn(GLIBC_2.0) [SUSv3]
- strstr(GLIBC_2.0) [SUSv3]
- strtok(GLIBC_2.0) [SUSv3]
- strtok(GLIBC_2.0) [SUSv3]
- strtok(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
- strtok_r(GLIBC_2.0) [SUSv3]
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>
<thead>
<tr>
<th>Function</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>ftok(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>msgctl(GLIBC_2.2)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>msgget(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>msgsnd(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>semctl(GLIBC_2.2)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>semget(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>shmat(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>shmdt(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>shmat(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>shmdt(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
</tbody>
</table>

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>
<thead>
<tr>
<th>Function</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>regcomp(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>regerror(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>regexec(GLIBC_2.3.4)</td>
<td>[LSB]</td>
</tr>
<tr>
<td>regfree(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
</tbody>
</table>

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>
<thead>
<tr>
<th>Function</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>__ctype_get_mb_cur_max(GLIBC_2.0)</td>
<td>[LSB]</td>
</tr>
<tr>
<td>_tolower(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>_toupper(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>isalnum(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>isalpha(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>isascii(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>iscntrl(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>isdigit(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>isgraph(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>islower(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>isprint(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>ispunct(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>isspace(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>isupper(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>iswalnum(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>iswalpha(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>adjtime(GLIBC_2.0) [LSB]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>asctime(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>asctime_r(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ctime(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ctime_r(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>difftime(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gmtime(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gmtime_r(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>localtime(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>localtime_r(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mktime(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ularm(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>__daylight(GLIBC_2.0) [LSB]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>__timezone(GLIBC_2.0) [LSB]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>__tzname(GLIBC_2.0) [LSB]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>daylight(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>timezone(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tzname(GLIBC_2.0) [SUSv3]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfgetispeed(GLIBC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cfgetospeed(GLIBC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cfmakeraw(GLIBC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cfsetspeed(GLIBC)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>C_2.0) [SUSv3]</th>
<th>C_2.0) [SUSv3]</th>
<th>C_2.0) [LSB]</th>
<th>C_2.0) [SUSv3]</th>
</tr>
</thead>
<tbody>
<tr>
<td>cfsetospeed(GLIBC_2.0) [SUSv3]</td>
<td>cfsetospeed(GLIBC_2.0) [SUSv3]</td>
<td>tcdrain(GLIBC_2.0) [LSB]</td>
<td>tcflow(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>tcflush(GLIBC_2.0) [SUSv3]</td>
<td>tcgetattr(GLIBC_2.0) [SUSv3]</td>
<td>tcgetpgrp(GLIBC_2.0) [SUSv3]</td>
<td>tcgetsid(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>tcsendbreak(GLIBC_2.0) [SUSv3]</td>
<td>tcgetattr(GLIBC_2.0) [SUSv3]</td>
<td>tcsetpgrp(GLIBC_2.0) [SUSv3]</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>endgrent(GLIBC_2.0) [SUSv3]</th>
<th>endprotoent(GLIBC_2.0) [SUSv3]</th>
<th>endpwent(GLIBC_2.0) [SUSv3]</th>
<th>endservent(GLIBC_2.0) [SUSv3]</th>
</tr>
</thead>
<tbody>
<tr>
<td>endutent(GLIBC_2.0) [SUSv2]</td>
<td>endutxent(GLIBC_2.1) [SUSv3]</td>
<td>getgrent(GLIBC_2.0) [SUSv3]</td>
<td>getgrgid(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>getgrgid_r(GLIBC_2.1.2) [SUSv3]</td>
<td>getgrnam(GLIBC_2.0) [SUSv3]</td>
<td>getgrnam_r(GLIBC_2.1.2) [SUSv3]</td>
<td>getgrouplist(GLIBC_2.2.4) [LSB]</td>
</tr>
<tr>
<td>gethostbyaddr(GLIBC_2.0) [SUSv3]</td>
<td>gethostbyname(GLIBC_2.0) [SUSv3]</td>
<td>getprotobyname(GLIBC_2.0) [SUSv3]</td>
<td>getprotobyname_r(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>getpwuid(GLIBC_2.0) [SUSv3]</td>
<td>getpwuid_r(GLIBC_2.1.2) [SUSv3]</td>
<td>getpwuid_r(GLIBC_2.1.2) [SUSv3]</td>
<td>getservbyport(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>getservent(GLIBC_2.0) [SUSv3]</td>
<td>getutent(GLIBC_2.0) [SUSv3]</td>
<td>getutent_r(GLIBC_2.0) [LSB]</td>
<td>getutxent(GLIBC_2.1) [SUSv3]</td>
</tr>
<tr>
<td>getutxid(GLIBC_2.1) [SUSv3]</td>
<td>getutxline(GLIBC_2.1) [SUSv3]</td>
<td>pututxline(GLIBC_2.1) [SUSv3]</td>
<td>setgrent(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>setgroups(GLIBC_2.0) [LSB]</td>
<td>setprotoent(GLIBC_2.0) [SUSv3]</td>
<td>setpwent(GLIBC_2.0) [SUSv3]</td>
<td>setservent(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>setutent(GLIBC_2.1) [SUSv3]</td>
<td>setutxent(GLIBC_2.1) [SUSv3]</td>
<td>utmpname(GLIBC_C_2.0) [LSB]</td>
<td></td>
</tr>
</tbody>
</table>

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.
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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

<table>
<thead>
<tr>
<th>Function</th>
<th>LSB</th>
<th>LFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>__fxstat64(GLIBC_2.2)</td>
<td>__lxstat64(GLIBC_2.2)</td>
<td>__xstat64(GLIBC_2.2)</td>
</tr>
<tr>
<td>getpos64(GLIBC_2.2)</td>
<td>fopen64(GLIBC_2.1)</td>
<td>freopen64(GLIBC_2.1)</td>
</tr>
<tr>
<td>__fstat64(GLIBC_2.2)</td>
<td>fstatvfs64(GLIBC_2.1)</td>
<td>ftello64(GLIBC_2.1)</td>
</tr>
<tr>
<td>fsetpos64(GLIBC_2.2)</td>
<td>fstatvfs64(GLIBC_2.1)</td>
<td>ftello64(GLIBC_2.1)</td>
</tr>
<tr>
<td>ftw64(GLIBC_2.1)</td>
<td>getrlimit64(GLIBC_2.2)</td>
<td>lockf64(GLIBC_2.1)</td>
</tr>
<tr>
<td>mmap64(GLIBC_2.1)</td>
<td>nftw64(GLIBC_2.3)</td>
<td>readdir64(GLIBC_2.2)</td>
</tr>
<tr>
<td>tmpfile64(GLIBC_2.1)</td>
<td>truncate64(GLIBC_2.1)</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Function</th>
<th>LSB</th>
<th>SUSv3</th>
</tr>
</thead>
<tbody>
<tr>
<td>_Exit(GLIBC_2.1) (SUSv3)</td>
<td>__assert_fail(GLIBC_2.0) (SUSv3)</td>
<td>__setjmp(GLIBC_2.3.4) [SUSv3]</td>
</tr>
<tr>
<td>__fpending(GLIBC_2.2)</td>
<td>__getpagesize(GLIBC_2.0) [SUSv3]</td>
<td>__setjmp(GLIBC_2.3.4) [SUSv3]</td>
</tr>
<tr>
<td>__isinf(GLIBC_2.0)</td>
<td>__isnanf(GLIBC_2.2)</td>
<td>__isnannl(GLIBC_2.2)</td>
</tr>
<tr>
<td>__sysconf(GLIBC_2.2)</td>
<td>exit(GLIBC_2.0)</td>
<td>longjmp(GLIBC_2.3.4)</td>
</tr>
<tr>
<td>a64l(GLIBC_2.0)</td>
<td>abort(GLIBC_2.0)</td>
<td>abs(GLIBC_2.0)</td>
</tr>
<tr>
<td>atoi(GLIBC_2.0)</td>
<td>atol(GLIBC_2.0)</td>
<td>atoll(GLIBC_2.0)</td>
</tr>
<tr>
<td>basename(GLIBC_2.0)</td>
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<tr>
<td>[SUSv3]</td>
<td>[SUSv3]</td>
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<tr>
<td>bsearch(GLIBC_2.0) [SUSv3]</td>
<td>calloc(GLIBC_2.0) [SUSv3]</td>
<td>closelog(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>cuserid(GLIBC_2.0) [SUSv2]</td>
<td>daemon(GLIBC_2.0) [LSB]</td>
<td>dirname(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>drand48(GLIBC_2.0) [SUSv3]</td>
<td>ecvt(GLIBC_2.0) [SUSv3]</td>
<td>erand48(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>error(GLIBC_2.0) [LSB]</td>
<td>errox(GLIBC_2.0) [SUSv3]</td>
<td>fcvt(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>fnmatch(GLIBC_2.3) [SUSv3]</td>
<td>fpathconf(GLIBC_2.0) [SUSv3]</td>
<td>free(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>ftw(GLIBC_2.0) [SUSv3]</td>
<td>ftwv(GLIBC_2.0) [SUSv3]</td>
<td>funlockfile(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>gcvt(GLIBC_2.0) [SUSv3]</td>
<td>getaddrinfo(GLIBC_2.0) [SUSv3]</td>
<td>getcwd(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>getenv(GLIBC_2.0) [SUSv3]</td>
<td>getlogin(GLIBC_2.0) [SUSv3]</td>
<td>getlogin_r(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>getopt(GLIBC_2.0) [LSB]</td>
<td>getopt_long(GLIBC_2.0) [LSB]</td>
<td>getopt_long_only(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>gettimeofday(GLIBC_2.0) [SUSv3]</td>
<td>grantpt(GLIBC_2.1) [SUSv3]</td>
<td>hcreate(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>glob(GLIBC_2.0) [SUSv3]</td>
<td>glob64(GLIBC_2.2) [LSB]</td>
<td>globfree(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>hsearch(GLIBC_2.0) [SUSv3]</td>
<td>htonl(GLIBC_2.0) [SUSv3]</td>
<td>htons(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>imaxdiv(GLIBC_2.0) [SUSv3]</td>
<td>inet_addr(GLIBC_2.0) [SUSv3]</td>
<td>inet_ntoa(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>inet_ppton(GLIBC_2.0) [SUSv3]</td>
<td>initstate(GLIBC_2.0) [SUSv3]</td>
<td>insque(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>isblank(GLIBC_2.0) [SUSv3]</td>
<td>jrand48(GLIBC_2.0) [SUSv3]</td>
<td>l64a(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>lcong48(GLIBC_2.0) [SUSv3]</td>
<td>lddiv(GLIBC_2.0) [SUSv3]</td>
<td>lfind(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>lldiv(GLIBC_2.0) [SUSv3]</td>
<td>longjmp(GLIBC_2.0) [SUSv3]</td>
<td>lrand48(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>makecontext(GLIBC_2.3.4) [SUSv3]</td>
<td>malloc(GLIBC_2.0) [SUSv3]</td>
<td>memmem(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>mktemp(GLIBC_2.0) [SUSv3]</td>
<td>mrand48(GLIBC_2.0) [SUSv3]</td>
<td>nftw(GLIBC_2.3.3) [SUSv3]</td>
</tr>
<tr>
<td>nttbl(GLIBC_2.0) [SUSv3]</td>
<td>nttbs(GLIBC_2.0) [SUSv3]</td>
<td>openlog(GLIBC_2.0) [SUSv3]</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Function</th>
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</thead>
<tbody>
<tr>
<td>__environ(GLIBC_2.0) [LSB]</td>
<td>__environ(GLIBC_2.0) [LSB]</td>
<td>__sys_errlist(GLIBC_C_2.0) [LSB]</td>
<td>environ(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>getdate_err(GLIBC_C_2.0) [SUSv3]</td>
<td>optarg(GLIBC_2.0) [SUSv3]</td>
<td>opterr(GLIBC_2.0) [SUSv3]</td>
<td>optind(GLIBC_2.0) [SUSv3]</td>
</tr>
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<td>optarg(GLIBC_2.0) [SUSv3]</td>
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<td>optind(GLIBC_2.0) [SUSv3]</td>
</tr>
</tbody>
</table>

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

11.3.1 arpa/inet.h

extern uint32_t htonl(uint32_t);
extern uint16_t htons(uint16_t);
extern in_addr_t inet_addr(const char *);
extern char *inet_ntoa(struct in_addr);
extern const char *inet_ntop(int, const void *, char *, socklen_t);
extern int inet_pton(int, const char *, void *);
extern uint32_t ntohl(uint32_t);
extern uint16_t ntohs(uint16_t);

11.3.2 assert.h

extern void __assert_fail(const char *, const char *, unsigned int,
const char *);

11.3.3 ctype.h

extern int _tolower(int);
extern int _toupper(int);
extern int isalnum(int);
extern int isalpha(int);
extern int isascii(int);
extern int iscntrl(int);
extern int isdigit(int);
extern int isgraph(int);
extern int islower(int);
extern int isprint(int);
extern int ispunct(int);
extern int isspace(int);
extern int isupper(int);
extern int isxdigit(int);
extern int toascii(int);
extern int tolower(int);
extern int toupper(int);
extern int isblank(int);
extern const unsigned short **__ctype_b_loc(void);
extern const int32_t **__ctype_toupper_loc(void);
extern const int32_t **__ctype_tolower_loc(void);

11.3.4 dirent.h

extern void rewinddir(DIR *);
extern void seekdir(DIR *, long int);
extern long int telldir(DIR *);
extern int closedir(DIR *);
extern DIR *opendir(const char *);
extern struct dirent *readdir(DIR *);
extern struct dirent64 *readdir64(DIR *);
extern int readdir_r(DIR *, struct dirent *, struct dirent **);

11.3.5 err.h

extern void err(int, const char *, ...);
extern void errx(int, const char *, ...);
extern void warn(const char *, ...);
extern void warnx(const char *, ...);
extern void error(int, int, const char *, ...);

11.3.6 errno.h

#define EDEADLOCK 58
extern int *__errno_location(void);

11.3.7 fcntl.h

#define F_GETLK64 12
#define F_SETLK64 13
#define F_SETLKW64 14
extern int lockf64(int, int, off64_t);
extern int fcntl(int, int, ...);

11.3.8 fmtmsg.h

extern int fmtmsg(long int, const char *, int, const char *, const char *, const char *);

11.3.9 fnmatch.h

extern int fnmatch(const char *, const char *, int);

11.3.10 ftw.h

extern int ftw(const char *, __ftw_func_t, int);
extern int ftw64(const char *, __ftw64_func_t, int);
extern int nftw(const char *, __nftw_func_t, int, int);
extern int nftw64(const char *, __nftw64_func_t, int, int);

11.3.11 getopt.h

extern int getopt_long(int, char *const, const char *,
const struct option *, int *);
extern int getopt_long_only(int, char *const, const char *,
const struct option *, int *);
11 Libraries

11.3.12 glob.h

extern int glob(const char *, int,
   int (*__errfunc) (const char *p1, int p2)
   , glob_t *);
extern int glob64(const char *, int,
   int (*__errfunc) (const char *p1, int p2)
   , glob64_t *);
extern void globfree(glob_t *);
extern void globfree64(glob64_t *);

11.3.13 grp.h

extern void endgrent(void);
extern struct group *getgrent(void);
extern struct group *getgrgid(gid_t);
extern struct group *getgrnam(char *);
extern int initgroups(const char *, gid_t);
extern void setgrent(void);
extern int setgroups(size_t, const gid_t *);
extern int getgrgid_r(gid_t, struct group *, char *, size_t,
   struct group **);
extern int getgrnam_r(const char *, struct group *, char *, size_t,
   struct group **);
extern int getgrouplist(const char *, gid_t, gid_t *, int *);

11.3.14 iconv.h

extern size_t iconv(iconv_t, char **, size_t *, char **, size_t *);
extern int iconv_close(iconv_t);
extern iconv_t iconv_open(char *, char *);

11.3.15 inttypes.h

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

extern intmax_t strtoimax(const char *, char **, int);
extern uintmax_t strtouimax(const char *, char **, int);
extern intmax_t wcstoiimax(const wchar_t *, wchar_t **, int);
extern uintmax_t wcstouimax(const wchar_t *, wchar_t **, int);
extern intmax_t imaxabs(intmax_t);
extern imaxdiv_t imaxdiv(intmax_t, intmax_t);

11.3.16 langinfo.h

extern char *nl_langinfo(nl_item);

11.3.17 libgen.h

extern char *basename(const char *);
extern char *dirname(char *);
11.3.18 libintl.h

extern char *bindtextdomain(const char *, const char *);
extern char *dcgettext(const char *, const char *, int);
extern char *dgettext(const char *, const char *);
extern char *gettext(const char *);
extern char *textdomain(const char *);
extern char *bind_textdomain_codeset(const char *, const char *);
extern char *dcngettext(const char *, const char *, const char *,
    unsigned long int, int);
extern char *dngettext(const char *, const char *, const char *,
    unsigned long int);
extern char *ngettext(const char *, const char *, unsigned long int);

11.3.19 limits.h

#define ULONG_MAX       0xFFFFFFFFUL
#define LONG_MAX        2147483647L
#define CHAR_MIN        0
#define CHAR_MAX        255
#define PTHREAD_STACK_MIN       16384

11.3.20 locale.h

extern struct lconv *localeconv(void);
extern char *setlocale(int, const char *);
extern locale_t uselocale(locale_t);
extern void freelocale(locale_t);
extern locale_t duplocale(locale_t);
extern locale_t newlocale(int, const char *, locale_t);

11.3.21 monetary.h

extern ssize_t strfmon(char *, size_t, const char *, ...);

11.3.22 net/if.h

extern void if_freenameindex(struct if_nameindex *);
extern char *if_indextoname(unsigned int, char *);
extern locale_t uselocale(locale_t);
extern void freeloacle(locale_t);
extern locale_t duplocale(locale_t);
extern locale_t newlocale(int, const char *, locale_t);

11.3.23 netdb.h

extern void endprotoent(void);
extern void endservent(void);
extern void freeaddrinfo(struct addrinfo *);
extern const char *gai_strerror(int);
extern int getaddrinfo(const char *, const char *, const struct addrinfo *
    , struct addrinfo **);
extern struct hostent *gethostbyaddr(const void *, socklen_t, int);
extern struct hostent *gethostbyname(const char *);
extern struct protoent *getprotobyname(const char *);
extern struct protoent *getprotobynumber(int);
extern struct protoent *getprotoent(void);
extern struct servent *getservbyname(const char *, const char *);
extern struct servent *getservbyport(int, const char *);
extern struct servent *getservent(void);
extern void setprotoent(int);
extern void setservent(int);
extern int *__h_errno_location(void);

11.3.24 netinet/in.h

extern int bindresvport(int, struct sockaddr_in *);

11.3.25 netinet/ip.h

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

11.3.26 netinet/tcp.h

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

11.3.27 netinet/udp.h

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

11.3.28 nl_types.h

extern int catclose(nl_catd);
extern char *catgets(nl_catd, int, int, const char *);
extern nl_catd catopen(const char *, int);

11.3.29 poll.h

extern int poll(struct pollfd *, nfds_t, int);

11.3.30 pty.h

extern int openpty(int *, int *, char *, struct termios *,
                  struct winsize *);
extern int forkpty(int *, char *, struct termios *, struct winsize *);

11.3.31 pwd.h

extern void endpwent(void);
extern struct passwd *getpwent(void);
extern struct passwd *getpwnam(char *);
extern struct passwd *getpwuid(uid_t);
extern void setpwent(void);
extern int getpwnam_r(char *, struct passwd *, char *, size_t, struct passwd **);
extern int getpwuid_r(uid_t, struct passwd *, char *, size_t, struct passwd **);

11.3.32 regex.h

extern int regcomp(regex_t *, const char *, int);
extern size_t regerror(int, const regex_t *, char *, size_t);
extern int regexec(const regex_t *, const char *, size_t, regmatch_t, int);
extern void regfree(regex_t *);

11.3.33 rpc/auth.h

extern struct AUTH *authnone_create(void);
extern int key_decryptsession(char *, union des_block *);
extern bool_t xdr_opaque_auth(XDR *, struct opaque_auth *);

11.3.34 rpc/clnt.h

extern struct CLIENT *clnt_create(const char *, const u_long, const u_long, const char *);
extern void clnt_pcreateerror(const char *);
extern void clnt_perror(enum clnt_stat);
extern char *clnt_spcreateerror(const char *);
extern char *clnt_sperror(struct CLIENT *, const char *);

11.3.35 rpc/pmap_clnt.h

extern u_short pmap_getport(struct sockaddr_in *, const u_long, const u_long, u_int);
extern bool_t pmap_set(const u_long, const u_long, int, u_short);
extern bool_t pmap_unset(u_long, u_long);

11.3.36 rpc/rpc_msg.h

extern bool_t xdr_callhdr(XDR *, struct rpc_msg *);

11.3.37 rpc/svc.h

extern void svc_getreqset(fd_set *);
extern bool_t svc_register(SVCXPRT *, rpcprog_t, rpcvers_t, __dispatch_fn_t, rpcprot_t);
extern void svc_run(void);
extern bool_t svc_sendreply(SVCXPRT *, xdrproc_t, caddr_t);
extern void svcerr_auth(SVCXPRT *, enum auth_stat);
extern void svcerr_decode(SVCXPRT *);
extern void svcerr_noproc(SVCXPRT *);
extern void svcerr_noprog(SVCXPRT *);
11.3.38 rpc/types.h

extern void svcerr_progvers(SVCXPRT *, rpcvers_t, rpcvers_t);
extern void svcerr_systemerr(SVCXPRT *);
extern void svcerr_weakauth(SVCXPRT *);
extern SVCXPRT *svctcp_create(int, u_int, u_int);
extern SVCXPRT *svcudp_create(int);

11.3.39 rpc/xdr.h

extern bool_t xdr_array(XDR *, caddr_t *, u_int *, u_int, xdrproc_t);
extern bool_t xdr_bool(XDR *, bool_t *);
extern bool_t xdr_bytes(XDR *, char **, u_int *, u_int);
extern bool_t xdr_char(XDR *, char *);
extern bool_t xdr_double(XDR *, double *);
extern bool_t xdr_enum(XDR *, enum_t *);
extern bool_t xdr_float(XDR *, float *);
extern void xdr_free(xdrproc_t, char *);
extern bool_t xdr_int(XDR *, int *);
extern bool_t xdr_long(XDR *, long int *);
extern bool_t xdr_opaque(XDR *, caddr_t, u_int);
extern bool_t xdr_pointer(XDR *, char **, u_int, xdrproc_t);
extern bool_t xdr_reference(XDR *, caddr_t *, u_int, xdrproc_t);
extern bool_t xdr_short(XDR *, short *);
extern bool_t xdr_string(XDR *, char **, u_int);
extern bool_t xdr_u_char(XDR *, u_char *);
extern bool_t xdr_u_int(XDR *, u_int *);
extern bool_t xdr_u_long(XDR *, u_long *);
extern bool_t xdr_u_short(XDR *, u_short *);
extern bool_t xdr_union(XDR *, enum_t *, char *,
const struct xdr_discrim *, xdrproc_t);
extern bool_t xdr_vector(XDR *, char *, u_int, u_int, xdrproc_t);
extern bool_t xdr_void(void);
extern bool_t xdr_wrapstring(XDR *, char *);
extern void xdrmem_create(XDR *, caddr_t, u_int, enum xdr_op);
extern void xdrrec_create(XDR *, u_int, u_int, caddr_t,
int (*__readit) (char *p1, char *p2, int p3),
int (*__writeit) (char *p1, char *p2, int p3);
extern typedef int bool_t xdrrec_eof(XDR *);

11.3.40 sched.h

extern int sched_get_priority_max(int);
extern int sched_get_priority_min(int);
extern int sched_getparam(pid_t, struct sched_param *);
extern int sched_setscheduler(pid_t);
extern int sched_rr_get_interval(pid_t, struct timespec *);
extern int sched_setparam(pid_t, const struct sched_param *);
extern int sched_setscheduler(pid_t, int, const struct sched_param *);
extern int sched_yield(void);
11 Libraries

11.3.41 search.h

extern int hcreate(size_t);
extern ENTRY *hsearch(ENTRY, ACTION);
extern void insque(void *, void *);
extern void *lfind(const void *, const void *, size_t *, size_t, __compar_fn_t);
extern void *lsearch(const void *, void *, size_t *, size_t, __compar_fn_t);
extern void remque(void *);
extern void hdestroy(void);
extern void *tdelete(const void *, void **, __compar_fn_t);
extern void *tfind(const void *, void *const *, __compar_fn_t);
extern void *tsearch(const void *, void **, __compar_fn_t);
extern void twalk(const void *, __action_fn_t);

11.3.42 setjmp.h

typedef long int __jmp_buf[112] __attribute__((aligned(16)));
extern int __sigsetjmp(jmp_buf, int);
extern void longjmp(jmp_buf, int);
extern void siglongjmp(sigjmp_buf, int);
extern void _longjmp(jmp_buf, int);
extern int _setjmp(jmp_buf);

11.3.43 signal.h

#define SIGEV_PAD_SIZE ((SIGEV_MAX_SIZE/sizeof(int))-3)
#define SI_PAD_SIZE     ((SI_MAX_SIZE/sizeof(int))-3)

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

#define MINSIGSTKSZ     2048
#define SIGSTKSZ        8192

struct sigcontext {
    long int _unused[4];
    int signal;
    unsigned long int handler;
    unsigned long int oldmask;
    struct pt_regs *regs;
};
extern int __libc_current_sigrtmax(void);
extern int __libc_current_sigrtmin(void);
extern sighandler_t __sysv_signal(int, sighandler_t);
extern char *const _sys_siglist(void);
extern int killpg(pid_t, int);
extern void psignal(int, const char *);
extern int raise(int);
extern int sigaddset(sigset_t *, int);
11.3.44 stddef.h

typedef unsigned int size_t;
typedef int ptrdiff_t;

11.3.45 stdio.h

#define __IO_FILE_SIZE 152

extern char *const _sys_errlist(void);
extern void clearerr(FILE *);
extern FILE *fclose(FILE *);
extern FILE *fdopen(int, const char *);
extern int fflush_unlocked(FILE *);
extern int fileno(FILE *);
extern FILE *fopen(const char *, const char *);
extern int fprintf(FILE *, const char *, ...);
extern int fputc(int, FILE *);
extern FILE *freopen(const char *, const char *, FILE *);
extern FILE *freopen64(const char *, const char *, FILE *);
extern int fscanf(FILE *, const char *, ...);
extern int fseek(FILE *, long int, int);
extern int fseeko(FILE *, off_t, int);
extern int fseeko64(FILE *, loff_t, int);
extern off_t ftello(FILE *);
extern loff_t ftello64(FILE *);
extern int getc(void);
extern int getchar(void);
extern int getc_unlocked(void);
extern int getw(FILE *);
extern int pclose(FILE *);
extern void perror(const char *);
extern FILE *popen(const char *, const char *);
extern int printf(const char *, ...);
extern int putc_unlocked(int, FILE *);
extern int putchar(int);
extern int putchar_unlocked(int);
extern int putw(int, FILE *);
extern int remove(const char *);
extern void rewind(FILE *);
extern int scanf(const char *, ...);
extern void setbuf(FILE *, char *);
extern int sprintf(char *, const char *, ...);
extern int sscanf(const char *, const char *, ...);
extern FILE *stderr(void);
extern FILE *stdin(void);
extern FILE *stdout(void);
extern char *tempnam(const char *, const char *);
extern FILE *tmpfile64(void);
extern FILE *tmpfile(void);
extern char *tmpnam(char *);
extern int vfprintf(FILE *, const char *, va_list);
extern int vprintf(const char *, va_list);
extern int feof(FILE *);
extern int ferror(FILE *);
extern int fflush(FILE *);
extern int fgetc(FILE *);
extern int fgetpos(FILE *, fpos_t *);
extern char *fgets(char *, int, FILE *);
extern int fputs(const char *, FILE *);
extern size_t fread(void *, size_t, size_t, FILE *);
extern int fsetpos(FILE *, const fpos_t *);
extern long int ftell(FILE *);
extern size_t fwrite(const void *, size_t, size_t, FILE *);
extern int getc(FILE *);
extern int putc(int, FILE *);
extern int puts(const char *);
extern int setvbuf(FILE *, char *, int, size_t);
extern int ungetc(int, FILE *);
extern int vsprintf(char *, const char *, va_list);
extern int vsprintf(char *, const char *, va_list);
extern void flockfile(FILE *);
extern int asprintf(char **, const char *, ...);
extern int fgetpos64(FILE *, fpos64_t *);
extern int fopen64(const char *, const char *);
extern int fsetpos64(FILE *, const fpos64_t *);
extern int ftrylockfile(FILE *);
extern void funlockfile(FILE *);
extern int getc_unlocked(FILE *);
extern void setbuffer(FILE *, char *, size_t);
extern void init_sprintf(char *, const char *, va_list);
extern void init_vprintf(int, const char *, va_list);
extern void init_vscanf(FILE *, const char *, va_list);
extern void init_vsscanf(const char *, const char *, va_list);
extern size_t __fpending(FILE *);
extern double __strtod_internal(const char *, char **, int);
extern float __strtof_internal(const char *, char **, int);
extern long int __strtol_internal(const char *, char **, int);
extern long double __strtold_internal(const char *, char **, int);
extern long long int __strtoll_internal(const char *, char **, int, int);
extern unsigned long int __strtoul_internal(const char *, char **, int, int);
extern unsigned long long int __strtoull_internal(const char *, char **, int, int);
extern long int a64l(const char *);
extern void abort(void);
extern int abs(int);
extern double atof(const char *);
extern int atoi(char *);
extern long int atol(char *);
extern long long int atoll(const char *);
extern void *bsearch(const void *, const void *, size_t, size_t, __compar_fn_t);
extern div_t div(int, int);
extern double drand48(void);
extern char *ecvt(double, int, int *, int *);
extern double erand48(unsigned short);
extern void exit(int);
extern char *fcvt(double, int, int *, int *);
extern char *gcvt(double, int, char *);
extern char *getenv(const char *);
extern int getsubopt(char **, char *const *, char **);
extern int grantpt(int);
extern long int jrand48(unsigned short);
extern char *l64a(long int);
extern long int labs(long int);
extern void lcong48(unsigned short);
extern ldiv_t ldiv(long int, long int);
extern long int llabs(long long int);
extern lldiv_t lldiv(long long int, long long int);
extern long int lrand48(void);
extern int mblen(const char *, size_t);
extern size_t mbstowcs(wchar_t *, const char *, size_t);
extern int mbtowc(wchar_t *, const char *, size_t);
extern char *mktemp(char *);
extern long int mrand48(void);
extern long int nrand48(unsigned short);
extern char *ptsname(int);
extern int putenv(char *);
extern void *calloc(size_t, size_t);
extern void free(void *);
extern char *initstate(unsigned int, char *, size_t);
extern void *malloc(size_t);
extern long int random(void);
extern void *realloc(void *, size_t);
extern char *setstate(char *);
extern void *srand48(long int);
extern void *srandom(unsigned int);
extern double strtod(char *, char **);
extern float strtof(const char *, char **);
extern long int strtol(char *, char **, int);
extern long double strtold(const char *, char **);
extern long long int strtoll(const char *, char **, int);
extern long long int strtoq(const char *, char **, int);
extern unsigned long int strtoul(const char *, char **, int);
extern unsigned long long int strtoull(const char *, char **, int);
extern unsigned long long int strtouq(const char *, char **, int);
extern void _Exit(int);
extern size_t __ctype_get_mb_cur_max(void);
extern char **environ(void);
extern char *realpath(const char *, char *);
extern int setenv(const char *, const char *, int);
extern int unsetenv(const char *);
extern int getloadavg(double, int);
extern int mkstemp64(char *);
extern int posix_memalign(void **, size_t, size_t);
extern int posix_openpt(int);

11.3.47 string.h

extern void *__mempcpy(void *, const void *, size_t);
extern char *__stpcpy(char *, const char *);
extern char *__strtok_r(char *, const char *, char **);
extern void bcopy(void *, void *, size_t);
extern void *memchr(void *, int, size_t);
extern int memcmp(void *, void *, size_t);
extern void *memcpy(void *, void *, size_t);
extern void *memmem(const void *, size_t, const void *, size_t);
extern void *memmove(void *, const void *, size_t);
extern void *memset(void *, int, size_t);
extern char *strcat(char *, const char *);
extern char * strchr(char *, int);
extern int strcmp(char *, char *);
extern int strcoll(const char *, const char *);
extern char * strcpy(char *, char *);
extern size_t strcspn(const char *, const char *);
extern char * strerror(int);
extern size_t strlen(char *);
extern char *strncat(char *, char *, size_t);
extern int strncmp(char *, char *, size_t);
extern char * strncpy(char *, char *, size_t);
extern char *strpbrk(const char *, const char *);
extern char * strrchr(char *, int);
extern char *strsignal(int);
extern size_t strspn(const char *, const char *);
extern char *strstr(char *, char *);
extern char * strtok(char *, const char *);
extern size_t strxfrm(char *, const char *, size_t);
extern int bcmp(void *, void *, size_t);
extern void *memccpy(void *, const void *, int, size_t);
extern char *rindex(char *, int);
extern int strcasecmp(char *, char *);
extern char * strdup(char *);
extern int strncasecmp(char *, char *, size_t);
extern char *strndup(const char *, size_t);
extern size_t strnlen(const char *, size_t);
extern char *strsep(char **, const char *);
extern char *strerror_r(int, char *, size_t);
extern char *strtok_r(char *, const char *, char **);
extern char *strcasestr(const char *, const char *);
11 Libraries

11.3.48 sys/file.h

extern int flock(int, int);

11.3.49 sys/ioctl.h

#define TIOCGWINSZ 0x40087468
#define TIOCNOTTY 0x5422
#define FIONREAD 1074030207
extern int ioctl(int, unsigned long int, ...);

11.3.50 sys/ipc.h

struct ipc_perm {
    key_t __key;
    uid_t uid;
    gid_t gid;
    uid_t cuid;
    uid_t cgid;
    mode_t mode;
    long int __seq;
    int __pad1;
    unsigned long long int __unused1;
    unsigned long long int __unused2;
};
extern key_t ftok(char *, int);

11.3.51 sys/mman.h

#define MCL_FUTURE 16384
#define MCL_CURRENT 8192
extern int msync(void *, size_t, int);
extern int mlock(const void *, size_t);
extern int mlockall(int);
extern void *mmap(void *, size_t, int, int, int, off_t);
extern int mprotect(void *, size_t, int);
extern int munlock(const void *, size_t);
extern int munlockall(void);
extern int munmap(void *, size_t);
extern void *mmap64(void *, size_t, int, int, int, off64_t);
extern int shm_open(const char *, int, mode_t);
extern int shm_unlink(const char *);

11.3.52 sys/msg.h

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

struct msqid_ds {
    struct ipc_perm msg_perm;
    unsigned int __unused1;
    time_t msg_stime;
    unsigned int __unused2;
    time_t msg_rtime;
    unsigned int __unused3;
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;
};

extern int msgctl(int, int, struct msqid_ds *);
extern int msgget(key_t, int);
extern int msgrcv(int, void *, size_t, long int, int);
extern int msgsnd(int, const void *, size_t, int);

11.3.53 sys/param.h

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

11.3.54 sys/poll.h

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

11.3.55 sys/resource.h

extern int getpriority(__priority_which_t, id_t);
extern int getrlimit64(id_t, struct rlimit64 *);
extern int setpriority(__priority_which_t, id_t, int);
extern int setrlimit(__rlimit_resource_t, const struct rlimit *);
extern int setrlimit64(__rlimit_resource_t, const struct rlimit64 *);
extern int getrlimit(__rlimit_resource_t, struct rlimit *);
extern int getrusage(int, struct rusage *);

11.3.56 sys/sem.h

struct semid_ds {
    struct ipc_perm sem_perm;
    unsigned int __unused1;
    time_t sem_otime;
    unsigned int __unused2;
    time_t sem_ctime;
    unsigned long int sem_nsems;
    unsigned long int __unused3;
    unsigned long int __unused4;
};
extern int semctl(int, int, int, ...);
extern int semget(key_t, int, int);
extern int semop(int, struct sembuf *, size_t);

11.3.57 sys/shm.h

#define SHMLBA (__getpagesize())
11 Libraries

typedef unsigned long int shmat_t;

struct shmid_ds {
    struct ipc_perm shm_perm;
    unsigned int __unused1;
    time_t shm_atime;
    unsigned int __unused2;
    time_t shm_dtime;
    unsigned int __unused3;
    time_t shm_ctime;
    unsigned int __unused4;
    size_t shm_segsz;
    pid_t shm_cpid;
    pid_t shm_lpid;
    shmat_t shm_nattch;
    unsigned long int __unused5;
    unsigned long int __unused6;
};

extern int __getpagesize(void);
extern void *shmat(int, const void *, int);
extern int shmctl(int, int, struct shmid_ds *);
extern int shmdt(const void *);
extern int shmget(key_t, size_t, int);

11.3.58 sys/socket.h

typedef uint32_t __ss_align_type;

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

extern int bind(int, const struct sockaddr *, socklen_t);
extern int getnameinfo(const struct sockaddr *, socklen_t, char *,
    socklen_t, char *, socklen_t, unsigned int);
extern int listen(int, int);
extern int setsockopt(int, int, int, const void *, socklen_t);
extern int accept(int, struct sockaddr *, socklen_t *);
extern ssize_t recv(int, void *, size_t, int);
extern ssize_t recvfrom(int, void *, size_t, int, struct sockaddr *,
    socklen_t *);
extern ssize_t recvmsg(int, struct msghdr *, int);
extern ssize_t send(int, const void *, size_t, int,
    const struct sockaddr *, socklen_t);
extern ssize_t sendto(int, const void *, size_t, int,
    const struct sockaddr *, socklen_t);
extern int getpeername(int, struct sockaddr *, socklen_t *);
extern int getssockopt(int, int, int, void *, socklen_t *);
extern int shutdown(int, int);
extern int socket(int, int, int);
extern int socketpair(int, int, int);
extern int sockatmark(int);

11.3.59 sys/stat.h

#define _STAT_VER 3

struct stat64 {
    dev_t st_dev;
struct stat {
  dev_t st_dev;
  unsigned short __pad1;
  ino_t st_ino;
  mode_t st_mode;
  nlink_t st_nlink;
  uid_t st_uid;
  gid_t st_gid;
  dev_t st_rdev;
  unsigned short __pad2;
  off_t st_size;
 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;
};

extern int __fxstat(int, int, struct stat *);
extern int __fxstat64(int, int, struct stat64 *);
extern int __lxstat(int, char *, struct stat *);
extern int __lxstat64(int, const char *, struct stat64 *);
extern int __xmknod(int, const char *, mode_t, dev_t *);
extern int __xstat(int, const char *, struct stat *);
extern int __xstat64(int, const char *, struct stat64 *);
extern int mkfifo(const char *, mode_t);
extern int chmod(const char *, mode_t);
extern int fchmod(int, mode_t);
extern mode_t umask(mode_t);

11.3.60 sys/statvfs.h

struct statvfs {
  unsigned long int f_bsize;
  unsigned long int f_frsize;
  fsblkcnt_t f_blocks;
  fsblkcnt_t f_bfree;
  fsblksz_t f_bavail;
  fsfilcnt_t f_files;
  fsfilcnt_t f_ffree;
  fsfilcnt_t f_favail;
  unsigned long int f_fsid;
  int __f_unused;
  unsigned long int f_flag;
  unsigned long int f_namemax;
11 Libraries

```c
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;
    int __f_unused;
    unsigned long int f_flag;
    unsigned long int f_namemax;
    int __f_spare[6];
};
```

extern int fstatvfs(int, struct statvfs *);
extern int fstatvfs64(int, struct statvfs64 *);
extern int statvfs(const char *, struct statvfs *);
extern int statvfs64(const char *, struct statvfs64 *);

11.3.61 sys/time.h

```c
extern int getitimer(__itimer_which_t, struct itimerval *);
extern int setitimer(__itimer_which_t, const struct itimerval *,
                      struct itimerval *);
extern int adjtime(const struct timeval *, struct timeval *);
extern int gettimeofday(struct timeval *, struct timezone *);
extern int utimes(const char *, const struct timeval *);
```

11.3.62 sys/timeb.h

```c
extern int ftime(struct timeb *);
```

11.3.63 sys/times.h

```c
extern clock_t times(struct tms *);
```

11.3.64 sys/types.h

```c
typedef long long int int64_t;
typedef int32_t ssize_t;
#define __FD_SET_LONGS 32
```

11.3.65 sys/uio.h

```c
extern ssize_t readv(int, const struct iovec *, int);
extern ssize_t writev(int, const struct iovec *, int);
```

11.3.66 sys/un.h

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

11.3.67 sys/utsname.h

extern int uname(struct utsname *);

11.3.68 sys/wait.h

extern pid_t wait(int *);
extern pid_t waitpid(pid_t, int *, int);
extern pid_t wait4(pid_t, int *, int, struct rusage *);

11.3.69 syslog.h

extern void closelog(void);
extern void openlog(const char *, int, int);
extern int setlogmask(int);
extern void syslog(int, const char *, ...);
extern void vsyslog(int, const char *, va_list);

11.3.70 termios.h

#define TAB1    1024
#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 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

extern speed_t cfgetispeed(const struct termios *);
extern speed_t cfgetospeed(const struct termios *);
extern void cfmakeraw(struct termios *);
extern int cfsetispeed(struct termios *, speed_t);
extern int cfsetospeed(struct termios *, speed_t);
extern int cfsetspeed(struct termios *, speed_t);
extern int tcflow(int, int);
extern int tcflush(int, int);
extern pid_t tcgetsid(int);
extern int tcsendbreak(int, int);
extern int tcsetattr(int, int, const struct termios *);
extern int tcdrain(int);
extern int tcgetattr(int, struct termios *);

11.3.71 time.h

extern int __daylight(void);
extern long int __timezone(void);
extern char *__tzname(void);
extern char *asctime(const struct tm *);
extern clock_t clock(void);
extern char *ctime(const time_t *);
extern char *ctime_r(const time_t *, char *);
extern double difftime(time_t, time_t);
extern struct tm *getdate(const char *);
extern int getdate_err(void);
extern struct tm *gmtime(const time_t *);
extern struct tm *localtime(const time_t *);
extern time_t mktime(struct tm *);
extern int stime(const time_t *);
extern size_t strftime(char *, size_t, const char *, const struct tm *);
extern char *strptime(const char *, const char *, struct tm *);
extern time_t time(time_t *);
extern int nanosleep(const struct timespec *, struct timespec *);
extern int daylight(void);
extern long int timezone(void);
extern char *tzname(void);
extern void tzset(void);
extern char *asctime_r(const struct tm *, char *);
`extern struct tm *gmtime_r(const time_t *, struct tm *);`

`extern struct tm *localtime_r(const time_t *, struct tm *);`

`extern int clock_getcpuclockid(pid_t, clockid_t *);`

`extern int clock_getres(clockid_t, struct timespec *);`

`extern int clock_gettime(clockid_t, struct timespec *);`

`extern int clock_nanosleep(clockid_t, int, const struct timespec *,
                             struct timespec *);`

`extern int clock_settime(clockid_t, const struct timespec *);`

`extern int timer_create(clockid_t, struct sigevent *, timer_t *);`

`extern int timer_delete(timer_t);`

`extern int timer_getoverrun(timer_t);`

`extern int timer_gettime(timer_t, struct itimerspec *);`

`extern int timer_settime(timer_t, int, const struct itimerspec *,
                          struct itimerspec *);`

### 11.3.72 ucontext.h

```c
struct pt_regs {
    unsigned long int gpr[32];
    unsigned long int nip;
    unsigned long int msr;
    unsigned long int orig_gpr3;
    unsigned long int ctr;
    unsigned long int link;
    unsigned long int xer;
    unsigned long int ccr;
    unsigned long int mq;
    unsigned long int trap;
    unsigned long int dar;
    unsigned long int dsisr;
    unsigned long int result;
};

typedef struct __libc_vrstate {
    unsigned int vrregs[128];
    unsigned int vrsave;
    unsigned int _pad[2];
    unsigned int vscr;
} vrregset_t __attribute__((__aligned__(16)));

#define NGREG 48

typedef unsigned long int gregset_t[48];

typedef struct __libc_fpstate {
    double fregs[32];
    double fp0;
    int _pad[2];
} fpregset_t;

typedef union {
    struct pt_regs *regs;
    gregset_t gregs;
    fpregset_t fregs;
    vrregset_t vrregs;
} mcontext_t;

union uc_regs_ptr {
    struct pt_regs *regs;
    mcontext_t *uc_regs;
};

typedef struct ucontext {
    unsigned long int uc_flags;
    struct ucontext *uc_link;
};
```
11 Libraries

stack_t uc_stack;
int uc_pad[?];
union uc_regs_ptr uc_mcontext;
sigset_t uc_sigmask;
char uc_reg_space[sizeof(mcontext_t) + 12];
} ucontext_t;
extern int getcontext(ucontext_t *);
extern int makecontext(ucontext_t *, void (*func) (void)
, int, ...);
extern int setcontext(const struct ucontext *);
extern int swapcontext(ucontext_t *, const struct ucontext *);

11.3.73 ulimit.h

extern long int ulimit(int, ...);

11.3.74 unistd.h

typedef int intptr_t;

extern char **__environ(void);
extern pid_t __getpgid(pid_t);
extern void _exit(int);
extern int acct(const char *);
extern unsigned int alarm(unsigned int);
extern int chown(const char *, uid_t, gid_t);
extern int chroot(const char *);
extern size_t confstr(int, char *, size_t);
extern int creat(const char *, mode_t);
extern int creat64(const char *, mode_t);
extern char *ctermid(char *);
extern char *cuserid(char *);
extern int daemon(int, int);
extern int execl(const char *, const char *, ...);
extern int execle(const char *, const char *, ...);
extern int execlp(const char *, const char *, ...);
extern int execv(const char *, char *const);
extern int execvp(const char *, char *const);
extern int fdatasync(int);
extern int ftruncate64(int, off64_t);
extern long int gethostid(void);
extern char *getlogin(void);
extern int getlogin_r(char *, size_t);
extern int getopt(int, char *const, const char *);
extern pid_t getpgrp(void);
extern pid_t getsid(pid_t);
extern char *getwd(char *);
extern int lockf(int, int, off_t);
extern int mkstemp(char *);
extern int nice(int);
extern char *optarg(void);
extern int opterr(void);
extern int optind(void);
extern int optopt(void);
extern int rename(const char *, const char *);
extern int setegid(gid_t);
extern int seteuid(uid_t);
extern int sethostname(const char *, size_t);
extern int setpgrp(void);
extern void swab(const void *, void *, ssize_t);
extern void sync(void);
extern pid_t tcgetpgrp(int);
extern int tcsetpgrp(int, pid_t);
extern int truncate(const char *, off_t);
extern int truncate64(const char *, off64_t);
extern char *ttyname(int);
extern unsigned int ualarm(useconds_t, useconds_t);
extern int usleep(useconds_t);
extern int close(int);
extern int fsync(int);
extern off_t lseek(int, off_t, int);
extern int open(const char *, int, ...);
extern int pause(void);
extern ssize_t read(int, void *, size_t);
extern ssize_t write(int, const void *, size_t);
extern char *crypt(char *, char *);
extern void encrypt(char *, int);
extern void setkey(const char *);
extern int access(const char *, int);
extern int brk(void *);
extern int chdir(const char *);
extern int dup(int);
extern int dup2(int, int);
extern int execve(const char *, char *const, char *const);
extern int fchdir(int);
extern int fchown(int, uid_t, gid_t);
extern int pid_t fork(void);
extern int getegid(void);
extern int geteuid(void);
extern gid_t getgid(void);
extern int getgroups(int, gid_t);
extern int gethostname(char *, size_t);
extern int gethostbyname(char *, size_t);
extern int pid_t getpgid(pid_t);
extern int pid_t getpid(void);
extern int lchown(const char *, uid_t, gid_t);
extern int link(const char *, const char *);
extern int mkdir(const char *, mode_t);
extern long int pathconf(const char *, int);
extern int pipe(int);
extern int readdir(const char *);
extern void *sbrk(ptrdiff_t);
extern int select(int, fd_set *, fd_set *, fd_set *, struct timeval *);
extern int setgid(gid_t);
extern int setpgid(pid_t, pid_t);
extern int setregid(gid_t, gid_t);
extern int setreuid(uid_t, uid_t);
extern int lseek(const char *, int, ...);
extern unsigned int sleep(unsigned int);
extern int symlink(const char *, const char *);
extern long int sysconf(int);
extern int unlink(const char *);
extern pid_t vfork(void);
extern ssize_t pread(int, void *, size_t, off_t);
extern ssize_t pwrite(int, const void *, size_t, off_t);
extern char **_environ(void);
extern long int fpathconf(int, int);
extern int ftruncate(int, off_t);
extern int isatty(int);
extern loff_t lseek64(int, loff_t, int);
extern int open64(const char *, int, ...);
extern ssize_t pread64(int, void *, size_t, off64_t);
extern ssize_t pwrite64(int, const void *, size_t, off64_t);
extern int ttyname_r(int, char *, size_t);

11.3.75 utime.h

extern int utime(const char *, const struct utimbuf *);

11.3.76 utmp.h

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

struct utmp {
    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;
    long int ut_session;
    struct timeval ut_tv;
    int32_t ut_addr_v6[4];
    char __unused[20];
};

extern void endutent(void);
extern struct utmp *getutent(void);
extern void setutent(void);
extern int getutent_r(struct utmp *, struct utmp **);
extern int utmpname(const char *);
extern int login_tty(int);
extern void login(const struct utmp *);
extern int logout(const char *);
extern void logwtmp(const char *, const char *, const char *);

11.3.77 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;
    long int ut_session;
    struct timeval ut_tv;
    int32_t ut_addr_v6[4];
    char __unused[20];
};

extern void endutxent(void);
extern struct utmpx *getutxent(void);
extern struct utmpx *getutxid(const struct utmpx *);
extern struct utmpx *getutxline(const struct utmpx *);
extern struct utmpx *pututxline(const struct utmpx *);
extern void setutxent(void);

11.3.78 wchar.h

extern double __wcstod_internal(const wchar_t *, wchar_t *, int);
extern float __wcstof_internal(const wchar_t *, wchar_t *, int);
extern long int __wcstol_internal(const wchar_t *, wchar_t *, int, int);
extern long double __wcstold_internal(const wchar_t *, wchar_t *, int);
extern unsigned long int __wcstoul_internal(const wchar_t *, wchar_t *, int, int);

extern wchar_t *wcscat(wchar_t *, const wchar_t *);
extern wchar_t *wcschr(const wchar_t *, wchar_t);
extern int wcscmp(const wchar_t *, const wchar_t *);
extern int wcscoll(const wchar_t *, const wchar_t *);
extern wchar_t *wcsncpy(const wchar_t *, const wchar_t *);
extern size_t wcsxfrm(wchar_t *, const wchar_t *, size_t);
extern int wcswidth(const wchar_t *, size_t);
extern int wcwidth(wchar_t);
extern wchar_t *wmemchr(const wchar_t *, wchar_t, size_t);
extern int wmemcmp(const wchar_t *, const wchar_t *, size_t);
extern wchar_t *wmemcpy(wchar_t *, const wchar_t *, size_t);
extern wchar_t *wmemmove(wchar_t *, const wchar_t *, size_t);
extern wchar_t *wmemset(wchar_t *, wchar_t, size_t);
extern size_t mbrlen(const char *, size_t, mbstate_t *);
extern size_t mbrtowc(wchar_t *, const char *, size_t, mbstate_t *);
extern int mbsinit(const mbstate_t *);
extern size_t mbsnrtowcs(wchar_t *, const char **, size_t, size_t, mbstate_t *);
extern size_t wcsrtombs(char *, const wchar_t **, size_t, mbstate_t *);
extern wchar_t *wcswcs(const wchar_t *, const wchar_t *);
extern int wcscasecmp(const wchar_t *, const wchar_t *);
extern size_t wcsnlen(const wchar_t *, size_t);
extern long long int wcstoll(const wchar_t *, wchar_t **, int);
extern unsigned long long int wcstoull(const wchar_t *, wchar_t **, int);
extern wchar_t *wcswcs(const wchar_t *, const wchar_t *);
extern int wcscasecmp(const wchar_t *, const wchar_t *, size_t);
extern size_t wcslnlen(const wchar_t *, size_t);
extern long long int wcsctoll(const wchar_t *, wchar_t **, int);
extern unsigned long long int wcsctoull(const wchar_t *, wchar_t **, int);
11 Libraries

extern wint_t btowc(int);
extern wint_t fgetwc(FILE *);
extern wint_t fgetwc_unlocked(FILE *);
extern wchar_t *fgetws(wchar_t *, int, FILE *);
extern wint_t fputwc(wchar_t, FILE *);
extern int fputws(const wchar_t *, FILE *);
extern int fwide(FILE *, int);
extern int fwprintf(FILE *, const wchar_t *, ...);
extern int fwscanf(FILE *, const wchar_t *, ...);
extern wchar_t *fgetwc(FILE *);
extern wchar_t *getwchar(void);
extern wchar_t *putwc(wchar_t, FILE *);
extern wchar_t *putwchar(wchar_t);
extern int swprintf(wchar_t *, size_t, const wchar_t *, ...);
extern int swscanf(const wchar_t *, const wchar_t *, ...);
extern wint_t ungetwc(wint_t, FILE *);
extern int vfwprintf(FILE *, const wchar_t *, va_list);
extern int vfwscanf(FILE *, const wchar_t *, va_list);
extern int vswprintf(wchar_t *, size_t, const wchar_t *, va_list);
extern int vswscanf(const wchar_t *, const wchar_t *, va_list);
extern int vwprintf(const wchar_t *, va_list);
extern int vwscanf(const wchar_t *, va_list);
extern size_t wcsftime(wchar_t *, size_t, const wchar_t *,
const struct tm *);
extern int wprintf(const wchar_t *, ...);
extern int wscanf(const wchar_t *, ...);

11.3.79 wctype.h

extern int iswblank(wint_t);
extern int towlower(wint_t);
extern int towupper(wint_t);
extern wchar_t *wctrans(const char *);
extern int iswalnum(wint_t);
extern int iswalpha(wint_t);
extern int iswcntrl(wint_t);
extern int iswctype(wint_t, wctype_t);
extern int iswdigit(wint_t);
extern int iswgraph(wint_t);
extern int iswlower(wint_t);
extern int iswprint(wint_t);
extern int iswpunct(wint_t);
extern int iswspace(wint_t);
extern int iswupper(wint_t);
extern int iswxdigit(wint_t);
extern wctype_t wctype(const char *);
extern wint_t towctrans(wint_t, wctrans_t);

11.3.80 wordexp.h

extern int wordexp(const char *, wordexp_t *, int);
extern void wordfree(wordexp_t *);

11.4 Interfaces for libm

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

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

[LSB] This Specification
[SUSv2] SUSv2

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

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<th>Function</th>
<th>Description</th>
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<td>__finitef(GLIBC_2.1)</td>
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<tr>
<td>pow10l(GLIBC_2.1)</td>
<td>[ISOC99]</td>
</tr>
<tr>
<td>powf(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>powl(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>remainder(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>remquo(GLIBC_2.1)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>remquof(GLIBC_2.1)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>remquol(GLIBC_2.1)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>rint(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>rintf(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>rintl(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>round(GLIBC_2.1)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>roundf(GLIBC_2.1)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>scalb(GLIBC_2.0)</td>
<td>[ISOC99]</td>
</tr>
<tr>
<td>scalbn(GLIBC_2.0)</td>
<td>[ISOC99]</td>
</tr>
<tr>
<td>significandf(GLIBC_2.0)</td>
<td>[ISOC99]</td>
</tr>
<tr>
<td>significandl(GLIBC_2.0)</td>
<td>[ISOC99]</td>
</tr>
<tr>
<td>sincosf(GLIBC_2.1)</td>
<td>[ISOC99]</td>
</tr>
<tr>
<td>sinf(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>sinh(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>sinhf(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>sqrt(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>sqrtf(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>tanh(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>tanhf(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>tanhl(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>tgamma(GLIBC_2.1)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>tgammaf(GLIBC_2.1)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>truncf(GLIBC_2.1)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>y0e(GLIBC_2.0)</td>
<td>[ISOC99]</td>
</tr>
<tr>
<td>y0f(GLIBC_2.0)</td>
<td>[ISOC99]</td>
</tr>
<tr>
<td>y1(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>y1f(GLIBC_2.0)</td>
<td>[ISOC99]</td>
</tr>
<tr>
<td>ynl(GLIBC_2.0)</td>
<td>[SUSv3]</td>
</tr>
<tr>
<td>yn1(GLIBC_2.0)</td>
<td>[ISOC99]</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>signgam(GLIBC_2.0)</td>
<td>SUSv3</td>
<td></td>
</tr>
</tbody>
</table>

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

```c
extern double cabs(double complex);
extern float cabsf(float complex);
extern long double cabsl(long double complex);
extern double complex carg(double complex);
extern float complex cargf(float complex);
extern long double complex cargl(long double complex);
extern double complex casin(double complex);
extern float complex casinf(float complex);
extern long double complex casinl(long double complex);
extern double complex catan(double complex);
extern float complex catanf(float complex);
extern long double complex catanl(long double complex);
extern double complex ccosh(double complex);
extern float complex ccoshf(float complex);
extern long double complex ccoshl(long double complex);
```
extern long double complex ccosl(long double complex);
extern double complex cexp(double complex);
extern float complex cexpf(float complex);
extern long double complex cexpl(long double complex);
extern double cimag(double complex);
extern float cimagf(float complex);
extern long double cimagl(long double complex);
extern double complex clog(double complex);
extern float complex clog10f(float complex);
extern long double complex clog10l(long double complex);
extern double complex conj(double complex);
extern float complex conjf(float complex);
extern long double complex conjl(long double complex);
extern double complex cpow(double complex, double complex);
extern float complex cpowf(float complex, float complex);
extern long double complex cpowl(long double complex, long double complex);
extern double complex cproj(double complex);
extern float complex cprojf(float complex);
extern long double complex cprojl(long double complex);
extern double creal(double complex);
extern float crealf(float complex);
extern long double creall(long double complex);
extern double complex csin(double complex);
extern float complex csinf(float complex);
extern double complex csinh(double complex);
extern float complex csinhf(float complex);
extern long double complex csinhl(long double complex);
extern long double complex csinl(long double complex);
extern double complex csqrt(double complex);
extern float complex csqrtf(float complex);
extern long double complex csqrtl(long double complex);
extern double complex ctan(double complex);
extern float complex ctanf(float complex);
extern double complex ctanh(double complex);
extern float complex ctanhf(float complex);
extern long double complex ctanhl(long double complex);
extern long double complex ctanl(long double complex);

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 (&__fe_dfl_env)
11 Libraries

extern int feclarexcept(int);
extern int fegetenv(fenv_t *);
extern int fegetexceptflag(fexcept_t *, int);
extern int fegetround(void);
extern int feholdexcept(fenv_t *);
extern int feraiseexcept(int);
extern int fesetenv(const fenv_t *);
extern int fesetexceptflag(const fexcept_t *, int);
extern int fesetround(int);
extern int fetestexcept(int);
extern int feupdateenv(const fenv_t *);

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))
#define FP_ILOGB0       -2147483647
#define FP_ILOGBNAN     2147483647
extern int __finite(double);
extern int __finitef(float);
extern int __finitel(long double);
extern int __isinf(double);
extern int __isinff(float);
extern int __isinfl(long double);
extern int __isnan(double);
extern int __isnanf(float);
extern int __isnanl(long double);
extern int __signbit(double);
extern int __signbitf(float);
extern int __fpclassify(double);
extern int __fpclassifyf(float);
extern int __fpclassifyl(long double);
extern int signgam(void);
extern double copysign(double, double);
extern int finite(double);
extern double frexp(double, int *);
extern double ldexp(double, int);
extern double modf(double, double *);
extern double acos(double);
extern double acosh(double);
extern double asinh(double);
extern double atanh(double);
extern double asin(double);
extern double atan(double);
extern double atan2(double, double);
extern double cbrt(double);
extern double ceil(double);
extern double cos(double);
extern double cosh(double);
extern double erf(double);
extern double erfc(double);
extern double exp(double);
extern double expm1(double);
extern double fabs(double);
extern double floor(double);
extern double fmod(double, double);
extern double gamma(double);
11 Libraries

extern double hypot(double, double);
extern int ilogb(double);
extern double j0(double);
extern double j1(double);
extern double jn(int, double);
extern double lgamma(double);
extern double log(double);
extern double log10(double);
extern double log1p(double);
extern double logb(double);
extern double nextafter(double, double);
extern double pow(double, double);
extern double remainder(double, double);
extern double rint(double);
extern double scalb(double, double);
extern double sin(double);
extern double sinh(double);
extern double sqrt(double);
extern double tan(double);
extern double tanh(double);
extern double y0(double);
extern double y1(double);
extern double yn(int, double);
extern float copysignf(float, float);
extern long double copysignl(long double, long double);
extern int finitef(float);
extern int finitel(long double);
extern float frexpf(float, int *);
extern long double frexpl(long double, int *);
extern float ldexpf(float, int);
extern long double ldexpl(long double, int);
extern float modff(float, float *);
extern long double modfl(long double, long double *);
extern float scalbln(double, long int);
extern float scalblnf(float, long int);
extern float scalbn(double, int);
extern float scalbnf(float, int);
extern float acosf(float);
extern float acoshf(float);
extern float acosl(double);
extern float asinf(float);
extern float asinhf(float);
extern float asinl(double);
extern float atan2f(float, float);
extern float atan2l(long double, long double);
extern float atanf(float);
extern float atanhf(float);
extern float atanhf(float);
extern float cbrf(float);
extern float cbrtf(float);
extern float ceilf(float);
extern float ceill(float);
extern float cosf(float);
extern float coshf(float);
extern float coshl(long double);
extern float dremf(float, float);
extern float dreml(long double, long double);
extern float erf(float);
extern float erfc(float);
extern float erfcf(float);
extern float erfcl(float);
extern long double erfcl(long double);
extern float erff(float);
extern long double erfl(long double);
extern double exp2(double);
extern float exp2f(float);
extern long double exp2l(long double);
extern float expf(float);
extern long double expfl(long double);
extern float expm1f(float);
extern long double expl(long double);
extern float expm1l(long double);
extern float fabsf(float);
extern long double fabsl(long double);
extern double fdim(double, double);
extern float fdimf(float, float);
extern long double fdiml(long double, long double);
extern float floorf(float);
extern long double floorl(long double);
extern double fma(double, double, double);
extern float fmaf(float, float, float);
extern long double fmal(long double, long double, long double);
extern double fmax(double, double);
extern float fmaxf(float, float);
extern long double fmaxl(long double, long double);
extern double fmin(double, double);
extern float fminf(float, float);
extern long double fminl(long double, long double);
extern float fmodf(float, float);
extern long double fmodl(long double, long double);
extern float gammaf(float);
extern long double gammal(long double);
extern float hypotf(float, float);
extern long double hypotl(long double, long double);
extern int ilogbf(float);
extern int ilogbl(long double);
extern float j0f(float);
extern long double j0l(long double);
extern float j1f(float);
extern long double j1l(long double);
extern float jnf(int, float);
extern long double jnl(int, long double);
extern float lgammaf(float);
extern float lgammaf_r(float, int *);
extern long double lgammal(long double);
extern float lgammal_r(float, int *);
extern long double lgammal(long double, int *);
extern long int llrint(int);
extern long int llrintf(float);
extern long int llrintl(long double);
extern long int llround(int);
extern long int llroundf(float);
extern long int llroundl(long double);
extern float log10f(float);
extern long double log10l(long double);
extern float loglpf(float);
extern long double loglpl(long double);
extern double log2(double);
extern float log2f(float);
extern long double log2l(long double);
extern float logbf(float);
extern long double logbl(long double);
extern float logf(float);
extern long double logfl(long double);
extern long int lrint(int);
extern long int lrintf(float);
extern long int lrintl(long double);
extern long int lround(double);
extern long int lroundf(float);
extern long int lroundl(long double);
extern int matherr(struct exception *);
extern double nan(const char *);
extern float nanf(const char *);
extern long double nanl(const char *);
extern double nearbyint(double);
extern float nearbyintf(float);
extern long double nearbyintl(long double);
extern float nextafterf(float, float);
extern long double nextafterl(long double, long double);
extern double nexttoward(double, long double);
extern float nexttowardf(float, long double);
extern long double nexttowardl(long double, long double);
extern double pow10(double);
extern float pow10f(float);
extern long double pow10l(long double);
extern float powf(float, float);
extern long double powl(long double, long double);
extern float remainderf(float, float);
extern long double remainderl(long double, long double);
extern double remquod(double, double, int *);
extern float remquoaf(float, float, int *);
extern long double remquoll(long double, long double, int *);
extern float rintf(float);
extern long double rintl(long double);
extern double round(double);
extern float roundf(float);
extern long double roundl(long double);
extern float scalbf(float, float);
extern long double scalbl(long double, long double);
extern double significand(double);
extern float significandf(float);
extern long double significandl(long double);
extern void sincos(double, double *, double *);
extern void sincosf(float, float *, float *);
extern void sincosl(long double, long double *, long double *);
extern float sinf(float);
extern float sinhf(float);
extern long double sinhl(long double);
extern long double sinl(long double);
extern float sqrtf(float);
extern long double sqrtl(long double);
extern float tanhf(float);
extern long double tanhl(long double);
extern long double tanl(long double);
extern double tgamma(double);
extern float tgammaf(float);
extern long double tgammal(long double);
extern double trunc(double);
extern float truncf(float);
extern long double truncl(long double);
extern float y0f(float);
extern long double y0l(long double);
extern float ylf(float);
extern long double y1l(long double);
extern float ynf(int, float);
extern long double ynl(int, long double);
extern int __fpclassifyl(long double);
extern int __fpclassifyl(long double);
extern int __signbitl(long double);
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

<table>
<thead>
<tr>
<th>Library:</th>
<th>libpthread</th>
</tr>
</thead>
<tbody>
<tr>
<td>SONAME:</td>
<td>libpthread.so.0</td>
</tr>
</tbody>
</table>

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

[LFS] Large File Support
[LSB] This Specification

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

<table>
<thead>
<tr>
<th>pthread_attr_getinheritsched(GLIBC_2.0) [SUSv3]</th>
<th>pthread_attr_getschedpolicy(GLIBC_2.0) [SUSv3]</th>
<th>pthread_attr_getscope(GLIBC_2.0) [SUSv3]</th>
<th>pthread_attr_setinheritsched(GLIBC_2.0) [SUSv3]</th>
</tr>
</thead>
<tbody>
<tr>
<td>pthread_attr_setschedpolicy(GLIBC_2.0) [SUSv3]</td>
<td>pthread_attr_setscope(GLIBC_2.0) [SUSv3]</td>
<td>pthread_getschedparam(GLIBC_2.0) [SUSv3]</td>
<td>pthread_setschedparam(GLIBC_2.0) [SUSv3]</td>
</tr>
</tbody>
</table>

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.

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

<p>| _pthread_cleanup | _pthread_cleanup | pthread_attr_dest | pthread_attr_getd |</p>
<table>
<thead>
<tr>
<th>Function</th>
<th>Library</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>_pop(GLIBC_2.0)</code></td>
<td>[LSB]</td>
</tr>
<tr>
<td><code>_push(GLIBC_2.0)</code></td>
<td>[LSB]</td>
</tr>
<tr>
<td><code>roy(GLIBC_2.0)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>etachstate(GLIBC_2.0)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_attr_getguardsize(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_attr_getschedparam(GLIBC_2.0)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_attr_getstack(GLIBC_2.2)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_attr_getstackaddr(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_attr_getstacksize(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_attr_init(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_attr_setdetachstate(GLIBC_2.0)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_attr_setguardsize(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_attr_setschedparam(GLIBC_2.0)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_attr_setstackaddr(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_attr_setstacksize(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_cancel(GLIBC_2.0)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_cond_broadcast(GLIBC_2.3.2)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_cond_destroy(GLIBC_2.3.2)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_cond_init(GLIBC_2.3.2)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_cond_signal(GLIBC_2.3.2)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_cond_timedwait(GLIBC_2.3.2)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_cond_wait(GLIBC_2.3.2)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_condattr_destroy(GLIBC_2.0)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_condattr_getpshared(GLIBC_2.2)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_condattr_gettype(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_condattr_init(GLIBC_2.0)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_condattr_setpshared(GLIBC_2.2)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_condattr_settype(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_one(GLIBC_2.0)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_rwlock_destroy(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_rwlock_init(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_rwlock_rdlock(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_rwlock_timedrdlock(GLIBC_2.2)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_rwlock_rwlockinit(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_rwlock_rwlockinit(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_rwlock_rwlockinit(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
<tr>
<td><code>pthread_rwlock_rwlockinit(GLIBC_2.1)</code></td>
<td>[SUSv3]</td>
</tr>
</tbody>
</table>
11 Libraries

<table>
<thead>
<tr>
<th>Function</th>
<th>Function</th>
<th>Function</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>pthread_rwlockattr_setpshared(GLIBC_2.1) [SUSv3]</td>
<td>pthread_self(GLIBC_2.0) [SUSv3]</td>
<td>pthread_setcancelstate(GLIBC_2.0) [SUSv3]</td>
<td>pthread_setcanceltype(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>pthread_setconcurrency(GLIBC_2.1) [SUSv3]</td>
<td>pthread_setspecific(GLIBC_2.0) [SUSv3]</td>
<td>pthread_setsigmask(GLIBC_2.0) [SUSv3]</td>
<td>pthread_testcancel(GLIBC_2.0) [SUSv3]</td>
</tr>
<tr>
<td>sem_close(GLIBC_2.1) [SUSv3]</td>
<td>sem_destroy(GLIBC_2.1) [SUSv3]</td>
<td>sem_getvalue(GLIBC_2.1) [SUSv3]</td>
<td>sem_init(GLIBC_2.1) [SUSv3]</td>
</tr>
<tr>
<td>sem_open(GLIBC_2.1) [SUSv3]</td>
<td>sem_post(GLIBC_2.1) [SUSv3]</td>
<td>sem_timedwait(GLIBC_2.2) [SUSv3]</td>
<td>sem_trywait(GLIBC_2.1) [SUSv3]</td>
</tr>
<tr>
<td>sem_unlink(GLIBC_2.1) [SUSv3]</td>
<td>sem_wait(GLIBC_2.1) [SUSv3]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>lseek64(GLIBC_2.2) [LFS]</td>
</tr>
<tr>
<td>open64(GLIBC_2.2) [LFS]</td>
</tr>
<tr>
<td>pread(GLIBC_2.2) [SUSv3]</td>
</tr>
<tr>
<td>pread64(GLIBC_2.2) [LFS]</td>
</tr>
<tr>
<td>pwrite(GLIBC_2.2) [SUSv3]</td>
</tr>
<tr>
<td>pwrite64(GLIBC_2.2) [LFS]</td>
</tr>
</tbody>
</table>

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

extern void _pthread_cleanup_pop(struct _pthread_cleanup_buffer *, int);
extern void _pthread_cleanup_push(struct _pthread_cleanup_buffer *,
    void (*__routine) (void *))
extern int pthread_attr_destroy(pthread_attr_t *);
extern int pthread_attr_getdetachstate(const typedef struct {
    int __detachstate;
    int __schedpolicy;
    struct sched_param __schedparam;
    int __inheritsched;
    int __scope;
    size_t __guardsize;
    int __stackaddr_set;
    void *__stackaddr;
    unsigned long int __stacksize;}
    pthread_attr_t *, int *);
extern int pthread_attr_getinheritsched(const typedef struct {
    int __detachstate;
    int ___schedpolicy;
    struct sched_param __schedparam;
    int __inheritsched;
    int __scope;
    size_t __guardsize;
    int __stackaddr_set;
    void *__stackaddr;
    unsigned long int __stacksize;}
    pthread_attr_t *, int *);
extern int pthread_attr_getschedparam(const typedef struct {
    int __detachstate;
    int __schedpolicy;
    struct sched_param __schedparam;
    int __inheritsched;
    int __scope;
    size_t __guardsize;
    int __stackaddr_set;
    void *__stackaddr;
    unsigned long int __stacksize;}
    pthread_attr_t *, struct sched_param {
    int sched_priority;})
extern int pthread_attr_getschedpolicy(const typedef struct {
    int __detachstate;
    int __schedpolicy;
    struct sched_param __schedparam;
    int __inheritsched;
    int __scope;
    size_t __guardsize;
    int __stackaddr_set;
    void *__stackaddr;
    unsigned long int __stacksize;}
    pthread_attr_t *, int *);
extern int pthread_attr_getscope(const typedef struct {
    int __detachstate;
    int __schedpolicy;
    struct sched_param __schedparam;
    int __inheritsched;
    int __scope;
    size_t __guardsize;
    int __stackaddr_set;
    void *__stackaddr;
    unsigned long int __stacksize;}
    pthread_attr_t *, int *)

int __stackaddr_set;
void *__stackaddr;
unsigned long int __stacksize;

pthread_attr_t *, int *);

extern int pthread_attr_init(pthread_attr_t *);
extern int pthread_attr_setdetachstate(pthread_attr_t *, int);
extern int pthread_attr_setinheritsched(pthread_attr_t *, int);
extern int pthread_attr_setschedparam(pthread_attr_t *, const struct
sched_param {
    int sched_priority;}
);
extern int pthread_attr_setpolicy(pthread_attr_t *, int);
extern int pthread_attr_setscope(pthread_attr_t *, int);
extern int pthread_cancel(pthread_attr_t *, int);
extern int pthread_cond_broadcast(pthread_cond_t *);
extern int pthread_cond_destroy(pthread_cond_t *);
extern int pthread_cond_init(pthread_cond_t *, const typedef struct {
    int __dummy;}

pthread_condattr_t *);
extern int pthread_cond_signal(pthread_cond_t *);
extern int pthread_cond_timedwait(pthread_cond_t *, pthread_mutex_t *,
const struct timespec {
    time_t tv_sec; long int tv_nsec;}

 pthread_cond_wait(pthread_cond_t *, pthread_mutex_t *);
 extern int pthread_condattr_destroy(pthread_condattr_t *);
 extern int pthread_condattr_init(pthread_condattr_t *);
 extern int pthread_create(pthread_t *, const typedef struct {
    int __detachstate;
    int __schedpolicy;
    struct sched_param __schedparam;
    int __inheritsched;
    int __scope;
    size_t __guardsize;
    int __stackaddr_set;
    void *__stackaddr;
    unsigned long int __stacksize;}
pthread_attr_t *,
    void *(*__start_routine) (void *
, void *
);
extern int pthread_detach(pthread_attr_t *,
extern int pthread_equal(pthread_attr_t *,
extern int pthread_equal(pthread_t *,
extern int pthread_getcontext(pthread_attr_t *, struct sched_param {
    int sched_priority;}

 pthread_exit(void *);
 extern int pthread_getspecific(pthread_key_t);
extern int pthread_getspecific(pthread_key_t);
extern int pthread_key_delete(pthread_key_t);
extern int pthread_mutex_destroy(pthread_mutex_t *);
extern int pthread_mutex_init(pthread_mutex_t *, const typedef struct {
    int __mutexkind;}

 pthread_mutexattr_t *);

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extern int pthread_mutex_lock(pthread_mutex_t *);
extern int pthread_mutex_trylock(pthread_mutex_t *);
extern int pthread_mutex_unlock(pthread_mutex_t *);
extern int pthread_mutexattr_destroy(pthread_mutexattr_t *);
extern int pthread_mutexattr_init(pthread_mutexattr_t *);
extern int pthread_once(pthread_once_t *, void (*init_routine) (void));
extern int pthread_rwlock_destroy(pthread_rwlock_t *);
extern int pthread_rwlock_init(pthread_rwlock_t *,
    pthread_rwlockattr_t *);
extern int pthread_rwlock_rdlock(pthread_rwlock_t *);
extern int pthread_rwlock_tryrdlock(pthread_rwlock_t *);
extern int pthread_rwlock_unlock(pthread_rwlock_t *);
extern int pthread_rwlock_wrlock(pthread_rwlock_t *);
extern int pthread_rwlockattr_destroy(pthread_rwlockattr_t *);
extern int pthread_rwlockattr_getpshared(const typedef struct {
    int __lockkind; int __pshared;}
    pthread_rwlockattr_t *, int *);
extern int pthread_rwlockattr_init(pthread_rwlockattr_t *);
extern int pthread_rwlock_setpshared(pthread_rwlockattr_t *, int);
extern typedef unsigned long int int pthread_self(void);
extern int pthread_setcancelstate(int, int *);
extern int pthread_setcanceltype(int, int *);
extern int pthread_setschedparam(typedef unsigned long int pthread_t,
    int, const struct sched_param {
    int sched_priority;}
    *);
extern int pthread_setspecific(typedef unsigned int pthread_key_t,
    const void *);
extern void pthread_testcancel(void);
extern int pthread_attr_getguardsize(const typedef struct {
    int __detachstate;
    int __schedpolicy;
    struct sched_param __schedparam;
    int __inheritsched;
    int __scope;
    size_t __guardsize;
    int __stackaddr_set;
    void *__stackaddr;
    unsigned long int __stacksize;}
    pthread_attr_t *, size_t *);
extern int pthread_attr_getstackaddr(const typedef struct {
    int __detachstate;
    int __schedpolicy;
    struct sched_param __schedparam;
    int __inheritsched;
    int __scope;
    size_t __guardsize;
    int __stackaddr_set;
    void *__stackaddr;
    unsigned long int __stacksize;}
    pthread_attr_t *, void *);
extern int pthread_attr_setguardsize(pthread_attr_t *,
    typedef unsigned long int size_t);
extern int pthread_attr_setstackaddr(pthread_attr_t *, void *);
extern int pthread_attr_getstackaddr(const typedef struct {
    int __detachstate;
    int __schedpolicy;
    struct sched_param __schedparam;
    int __inheritsched;
    int __scope;
    size_t __guardsize;
    int __stackaddr_set;
    void *__stackaddr;
    unsigned long int __stacksize;}
    pthread_attr_t *, size_t *);
extern int pthread_attr_setstacksize(pthread_attr_t *,
    typedef unsigned long int size_t);
extern int pthread_attr_getstacksize(const typedef struct {
    int __detachstate;
    int __schedpolicy;
    struct sched_param __schedparam;
    int __inheritsched;
    int __scope;
    size_t __guardsize;
    int __stackaddr_set;
    void *__stackaddr;
    unsigned long int __stacksize;}
    pthread_attr_t *, size_t *);
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int __detachstate;
int __schedpolicy;
struct sched_param __schedparam;
int __inheritsched;
int __scope;
size_t __guardsizes;
int __stackaddr_set;
void *__stackaddr;
unsigned long int __stacksize;

extern int pthread_mutexattr_gettype(const typedef struct {
    int __mutexkind;
} pthread_mutexattr_t *, int *);

extern int pthread_mutexattr_settype(pthread_mutexattr_t *, int);

extern int pthread_getconcurrency(void);
extern int pthread_setconcurrency(int);

extern int pthread_attr_getstack(const typedef struct {
    int __detachstate;
    int __schedpolicy;
    struct sched_param __schedparam;
    int __inheritsched;
    int __scope;
    size_t __guardsizes;
    int __stackaddr_set;
    void *__stackaddr;
    unsigned long int __stacksize;
} pthread_attr_t *, void **, size_t *);

extern int pthread_attr_setstack(pthread_attr_t *, void *, size_t *);

11.7.2 semaphore.h

extern int sem_close(sem_t *);
extern int sem_destroy(sem_t *);
extern int sem_getvalue(sem_t *, int *);
extern int sem_init(sem_t *, int, unsigned int);
extern sem_t *sem_open(const char *, int, ...);

11.7.2 semaphore.h

extern int pthread_rwlock_timedrdlock(pthread_rwlock_t *, const struct
timespec {
    time_t tv_sec; long int
tv_nsec;}
)*);

extern int pthread_rwlock_timedwrlock(pthread_rwlock_t *, const struct
timespec {
    time_t tv_sec; long int
tv_nsec;}
)*);

extern int __register_atfork(void (*prepare) (void)
    , void (*parent) (void)
    , void (*child) (void)
    , void *);

extern int pthread_setschedprio(pthread_t, int);

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```c
extern int sem_post(sem_t *);
extern int sem_trywait(sem_t *);
extern int sem_unlink(const char *);
extern int sem_wait(sem_t *);
extern int sem_timedwait(sem_t *, const struct timespec *);
```

### 11.8 Interfaces for libgcc_s

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

<table>
<thead>
<tr>
<th>Library:</th>
<th>libgcc_s</th>
</tr>
</thead>
<tbody>
<tr>
<td>SONAME:</td>
<td>libgcc_s.so.1</td>
</tr>
</tbody>
</table>

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

[LSB] This Specification

#### 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>
<thead>
<tr>
<th>_Unwind_Backtrace(GCC_3.3) [LSB]</th>
<th>_Unwind_DeleteException(GCC_3.0) [LSB]</th>
<th>_Unwind_FindFunctionClosingFunction(GCC_3.3) [LSB]</th>
<th>_Unwind_FindFrame(GCC_3.0) [LSB]</th>
</tr>
</thead>
<tbody>
<tr>
<td>_Unwind_ForceUnwind(GCC_3.0) [LSB]</td>
<td>_Unwind_GetCFA(GCC_3.3) [LSB]</td>
<td>_Unwind_GetDataRelBase(GCC_3.0) [LSB]</td>
<td>_Unwind_GetGR(GCC_3.0) [LSB]</td>
</tr>
<tr>
<td>_Unwind_GetIP(GCC_3.0) [LSB]</td>
<td>_Unwind_GetLanguageSpecificData(GCC_3.0) [LSB]</td>
<td>_Unwind_GetRegionStart(GCC_3.0) [LSB]</td>
<td>_Unwind_GetTextRelBase(GCC_3.0) [LSB]</td>
</tr>
<tr>
<td>_Unwind_RaiseException(GCC_3.0) [LSB]</td>
<td>_Unwind_ReturnRegionData(GCC_3.0) [LSB]</td>
<td>_Unwind_ResumeOrRetrace(GCC_3.3) [LSB]</td>
<td>_Unwind_SetIP(GCC_3.0) [LSB]</td>
</tr>
</tbody>
</table>

#### 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

```c
extern void _Unwind_DeleteException(struct _Unwind_Exception *);
extern fde * _Unwind_Find_FDE(void *, struct dwarf_eh_base *);
extern void _Unwind_DeleteException(struct _Unwind_Exception *);
extern _Unwind_Ptr _Unwind_ForceUnwind(struct _Unwind_Exception *,
    _Unwind_Stop_Fn, void *);
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_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 void _Unwind_DeleteException(struct _Unwind_Exception *,
    _Unwind_Stop_Fn, void *);
extern _Unwind_Ptr _Unwind_GetDataRelBase(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 void _Unwind_DeleteException(struct _Unwind_Exception *,
    _Unwind_Stop_Fn, void *);
extern _Unwind_Ptr _Unwind_GetDataRelBase(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 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 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(void);
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 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(void);
extern _Unwind_Ptr _Unwind_GetRegionStart(struct _Unwind_Context *
);
extern _Unwind_Ptr _Unwind_GetTextRelBase(struct _Unwind_Context *
);
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.

_ 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.
_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 parameters 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.
**_Unwind_GetDataRelBase**

**Name**

_Unwind_GetDataRelBase — private IA64 C++ error handling method

**Synopsis**

```c
_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**

```c
_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 GRI 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**

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

**Description**

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

Name

_Unwind_RaiseException — private C++ error handling method

Synopsis

_Unwind__Reason_Code _Unwind Rais esException(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, exceptio n 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 returned:

_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.
11 Libraries

_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 indexed 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

<table>
<thead>
<tr>
<th>Library:</th>
<th>libdl</th>
</tr>
</thead>
<tbody>
<tr>
<td>SONAME:</td>
<td>libdl.so.2</td>
</tr>
</tbody>
</table>

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

[LSB] This Specification

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_2.0) [LSB] | dlclose(GLIBC_2.0) [SUSv3] | dleerror(GLIBC_2.0) [SUSv3] | dlopen(GLIBC_2.1) [LSB] |
11 Libraries

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

extern int dladdr(const void *, Dl_info *);
extern int dlclose( void *);
extern char *dlerror( void *);
extern void *dlopen( char *, int);
extern void *dlsym( void *, char *);

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

<table>
<thead>
<tr>
<th>Library:</th>
<th>libcrypt</th>
</tr>
</thead>
<tbody>
<tr>
<td>SONAME:</td>
<td>libcrypt.so.1</td>
</tr>
</tbody>
</table>

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


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_2.0) [SUSv3] | encrypt(GLIBC_2.0) [SUSv3] | setkey(GLIBC_2.0) [SUSv3] |
IV Utility Libraries
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>
<thead>
<tr>
<th>Library:</th>
<th>libz</th>
</tr>
</thead>
<tbody>
<tr>
<td>SONAME:</td>
<td>libz.so.1</td>
</tr>
</tbody>
</table>

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.

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

```
extern int gzread(gzFile, voidp, unsigned int);
extern int gzclose(gzFile);
extern gzFile gzopen(const char *, const char *);
extern gzFile gzdopen(int, const char *);
extern int gzwrite(gzFile, voidpc, unsigned int);
extern int gzflush(gzFile, int);
extern const char *gzerror(gzFile, int *);
extern uLong adler32(uLong, const Bytef *, uInt);
extern int compress(Bytef *, uLongf *, const Bytef *, uLong);
extern int compress2(Bytef *, uLongf *, const Bytef *, uLong, int);
extern uLong crc32(uLong, const Bytef *, uInt);
extern int deflate(z_streamp, int);
```
12.3 Interfaces for libncurses

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

Table 12-2 libncurses Definition

<table>
<thead>
<tr>
<th>Library:</th>
<th>libncurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>SONAME:</td>
<td>libncurses.so.5</td>
</tr>
</tbody>
</table>

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.

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

extern int addch(const chtype);
extern int addchnstr(const chtype *, int);
extern int addchstr(const chtype *);
extern int addnstr(const char *, int);
extern int addstr(const char *);
extern int attroff(int);
extern int attron(int);
extern int attrset(int);
extern int attr_get(attr_t *, short *, void *);
extern int attr_off(attr_t, void *);
extern int attr_on(attr_t, void *);
extern int attr_set(attr_t, short, void *);
extern int baudrate(void);
extern int beep(void);
extern int bkgd(chtype);
extern void bkgdset(chtype);
extern int border(chtype, chtype, chtype, chtype, chtype, chtype,
                   chtype);
extern int box(WINDOW *, chtype, chtype);
extern bool can_change_color(void);
extern int cbreak(void);
extern int chgat(int, attr_t, short, const void *);
extern int clear(void);
extern int clearok(WINDOW *, bool);
extern int clrtoeol(void);
extern int clrtoeol(void);
extern int color_content(short, short *, short *, short *);
extern int color_set(short, void *);
extern int copywin(const WINDOW *, WINDOW *, int, int, int, int,
                   int);
extern int curs_set(int);
extern int def_prog_mode(void);
extern int delay_output(int);
extern int delc(int);
extern void delscreen(SCREEN *);
extern int delwin(WINDOW *);
extern int dele1n(void);
extern WINDOW *derwin(WINDOW *, int, int, int, int);
extern int dupupdate(void);
extern WINDOW *dupwin(WINDOW *);
extern int echo(void);
extern int echochar(const chtype);
extern int erase(void);
extern int endwin(void);
extern char erasechar(void);
extern void filter(void);
extern int flash(void);
12 Libraries

extern int flushinp(void);
extern chtype getbkgd(WINDOW *);
extern int getch(void);
extern int getnstr(char *, int);
extern int getstr(char *);
extern WINDOW *getwin(FILE *);
extern int halfdelay(int);
extern bool has_colors(void);
extern bool has_ic(void);
extern bool has_il(void);
extern int hline(chtype, int);
extern void idcok(WINDOW *, bool);
extern int idlok(WINDOW *, bool);
extern void immedok(WINDOW *, bool);
extern chtype inch(void);
extern int inchnstr(chtype *, int);
extern int inchstr(chtype *);
extern WINDOW *initscr(void);
extern int init_color(short, short, short, short);
extern int init_pair(short, short, short);
extern int innstr(char *, int);
extern int insch(chtype);
extern int insdelln(int);
extern int insertln(void);
extern int insnstr(const char *, int);
extern int insstr(const char *);
extern int instr(char *);
extern int intrflush(WINDOW *, bool);
extern bool isendwin(void);
extern bool is_linetouched(WINDOW *, int);
extern bool is_wintouched(WINDOW *);
extern const char *keyname(int);
extern int keypad(WINDOW *, bool);
extern char killchar(void);
extern int leaveok(WINDOW *, bool);
extern char *longname(void);
extern int meta(WINDOW *, bool);
extern int move(int, int);
extern int mvaddch(int, int, const chtype);
extern int mvaddchnstr(int, int, const chtype *, int);
extern int mvaddchstr(int, int, const chtype *);
extern int mvaddnstr(int, int, const char *, int);
extern int mvaddstr(int, int, const char *);
extern int mvchgat(int, int, int, attr_t, short, const void *);
extern int mvcur(int, int, int, int);
extern int mvdelch(int, int);
extern int mvderwin(WINDOW *, int, int);
extern int mvgetnstr(int, int, char *, int);
extern int mvgetstr(int, int, char *);
extern int mvhline(int, int, chtype, int);
extern chtype mvinch(int, int);
extern int mvinchnstr(int, int, chtype *, int);
extern int mvinchstr(int, int, chtype *);
extern int mvinnstr(int, int, char *, int);
extern int mvinsch(int, int, chtype);
extern int mvinsnstr(int, int, const char *, int);
extern int mvinnstr(int, int, const char *);
extern int mvinsstr(int, int, const char *);
extern int mvinsstr(int, int, const char *, int);
extern int mvinsstr(int, int, const char *, ...);
extern int mvprintw(int, int, const char *, ...);
extern int mvvline(int, int, chtype, int);
extern int mvwaddch(WINDOW *, int, int, const chtype);
extern int mvwaddchnstr(WINDOW *, int, int, const chtype *, int);
extern int mvwaddchstr(WINDOW *, int, int, const chtype *);
extern int mvwaddnstr(WINDOW *, int, int, const char *, int);
extern int mvwaddstr(WINDOW *, int, int, const char *);
extern int mvwchgat(WINDOW *, int, int, int, attr_t, short, const void *);
extern int mvwdelch(WINDOW *, int, int);
extern int mvwgetch(WINDOW *, int, int);
extern int mvwgetnstr(WINDOW *, int, int, char *, int);
extern int mvwgetstr(WINDOW *, int, int, char *);
extern int mvwhline(WINDOW *, int, int, chtype, int);
extern int mvwin(WINDOW *, int, int);
extern chtype mvwinch(WINDOW *, int, int);
extern int mvwinchnstr(WINDOW *, int, int, chtype *, int);
extern int mvwinchstr(WINDOW *, int, int, chtype *);
extern int mvwinnstr(WINDOW *, int, int, char *, int);
extern int mvwinsch(WINDOW *, int, int, chtype);
extern int mvwinsnstr(WINDOW *, int, int, const char *, int);
extern int mvwinnstr(WINDOW *, int, int, char *, int);
extern int mvwinnstr(WINDOW *, int, int, const char *, int);
extern int mvwprintw(WINDOW *, int, int, char *, ...);
extern int mvwscanw(WINDOW *, int, int, const char *, ...);
extern int mvwvline(WINDOW *, int, int, chtype, int);

extern int napms(int);
extern WINDOW *newpad(int, int);
extern SCREEN *newterm(const char *, FILE *, FILE *);
extern WINDOW *newwin(int, int, int, int);
extern int nl(void);
extern int nocbreak(void);
extern int nodelay(WINDOW *, bool);
extern int noecho(void);
extern int nonl(void);
extern void noqiflush(void);
extern int noraw(void);
extern int notimeout(WINDOW *, bool);
extern int overlay(const WINDOW *, WINDOW *);
extern int overwrite(const WINDOW *, WINDOW *);
extern int pair_content(short, short *, short *);
extern int pechochar(WINDOW *, chtype);
extern int prefresh(WINDOW *, int, int, int, int, int);
extern int printw(char *, ...);
extern int putwin(WINDOW *, FILE *);
extern void qiflush(void);
extern int raw(void);
extern int redrawwin(WINDOW *);
extern int refresh(void);
extern int resetty(void);
extern int reset_prog_mode(void);
extern int reset_shell_mode(void);
extern int ripoffline(int, int (*init) (WINDOW *, int));
extern int savetty(void);
extern int scanw(const char *, ...);
extern int scr_dump(const char *);
extern int scr_init(const char *);
extern int scrl(int);
extern int scroll(WINDOW *);
extern int scrollok(WINDOW *, typedef unsigned char bool);
extern int scr_restore(const char *);
extern int scr_set(const char *);
extern int setscrreg(int, int);
extern SCREEN *set_term(SCREEN *);
extern int slk_attroff(const typedef unsigned long int chtype);
extern int slk_attron(const typedef unsigned long int chtype);
extern int slk_attrset(const typedef unsigned long int chtype);
extern int slk_attr_set(const typedef chtype attr_t, short, void *);
extern int slk_clear(void);
extern int slk_color(short);
extern int slk_init(int);
extern char *slk_label(int);
extern int slk_noutrefresh(void);
extern int slk_refresh(void);
extern int slk_restore(void);
extern int slk_set(int, const char *, int);
extern int slk_touch(void);
extern int standout(void);
extern int standend(void);
extern int start_color(void);
extern WINDOW *subpad(WINDOW *, int, int, int, int);
extern WINDOW *subwin(WINDOW *, int, int, int, int);
extern int syncok(WINDOW *, typedef unsigned char bool);
extern typedef unsigned long int chtype termattrs(void);
extern char *termname(void);
extern void timeout(int);
extern int typeahead(int);
extern int ungetch(int);
extern int untouchwin(WINDOW *);
extern typedef unsigned char bool use_env();
extern int vidattr(typedef unsigned long int chtype);
extern int vidputs(typedef unsigned long int chtype,
extern int vline(void);
extern int vwprintw(WINDOW *, char *, typedef void *va_list);
extern int vw_printx(WINDOW *, const char *, typedef void *va_list);
extern int vwscanw(WINDOW *, const char *, typedef void *va_list);
extern int vw_scanw(WINDOW *, const char *, typedef void *va_list);
extern int waddch(WINDOW *, const typedef unsigned long int chtype);
extern int waddchnstr(WINDOW *, const typedef unsigned long int chtype *
extern int waddchstr(WINDOW *, const typedef unsigned long int chtype *
extern int waddnstr(WINDOW *, const char *, int);
extern int waddstr(WINDOW *, const char *);
extern int wattroff(WINDOW *, int);
extern int wattrset(WINDOW *, int);
extern int wattr_get(WINDOW *, attr_t *, short *, void *);
extern int wattr_on(WINDOW *, typedef chtype attr_t, void *);
extern int wattr_off(WINDOW *, typedef chtype attr_t, void *
extern int wattr_set(WINDOW *, typedef chtype attr_t, short, void *);
extern int wbkgd(WINDOW *, typedef unsigned long int chtype);
extern int wbkgdset(WINDOW *, typedef unsigned long int chtype);
extern int wborder(WINDOW *, typedef unsigned long int chtype,
typedef unsigned long int chtype,
typedef unsigned long int chtype,
typedef unsigned long int chtype,
typedef unsigned long int chtype,
typedef unsigned long int chtype,
extern int wchgt(WINDOW *, int, typedef chtype attr_t, short,
const void *);
extern void wcursyncup(WINDOW *);
extern int wdelch(WINDOW *);
extern int wechochar(WINDOW *, const typedef unsigned long int chtype);
extern int werase(WINDOW *);
extern int wgetch(WINDOW *);
extern int wgetnstr(WINDOW *, char *, int);
extern int wgetstr(WINDOW *, char *);
extern int whline(WINDOW *, typedef unsigned long int chtype, int);
extern int winchnstr(WINDOW *, chtype *, int);
extern int winchstr(WINDOW *, chtype *);
extern int winsdelln(WINDOW *, int);
extern int winsertln(WINDOW *);
extern int winsnstr(WINDOW *, const char *, int);
extern int winsstr(WINDOW *, const char *);
extern int wmove(WINDOW *, int, int);
extern int wnoutrefresh(WINDOW *);
extern int wprintw(WINDOW *, char *, ...);
extern int wrefresh(WINDOW *);
extern int wscrl(WINDOW *, int);
extern int wsetscrreg(WINDOW *, int, int);
extern int wstandout(WINDOW *);
extern int wstandend(WINDOW *);
extern void wsyncdown(WINDOW *);
extern void wsyncup(WINDOW *);
extern void wtimeout(WINDOW *, int);
extern int wtouchln(WINDOW *, int, int, int);
extern int wvline(WINDOW *, typedef unsigned long int chtype, int);

12.4.2 term.h

extern int putp(const char *);
extern int tigetflag(const char *);
extern int tigetnum(const char *);
extern char *tigetstr(const char *);
extern char *tparm(const char *, ...);
extern TERMINAL *set_curterm(TERMINAL *);
extern int del_curterm(TERMINAL *);
extern int restartterm(char *, int, int *);
extern int setupterm(char *, int, int *);
extern int tgetstr(char *, char **);
extern char *tgoto(const char *, int, int);
extern int tgetent(char *, const char *);
extern int tgetflag(char *);
extern int tgetnum(char *);
extern int tputs(const char *, int, int (*putcproc) (int) );
12 Libraries

12.5 Interfaces for libutil

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

<table>
<thead>
<tr>
<th>Library:</th>
<th>libutil</th>
</tr>
</thead>
<tbody>
<tr>
<td>SONAME:</td>
<td>libutil.so.1</td>
</tr>
</tbody>
</table>

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

[LSB] This Specification

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>
<thead>
<tr>
<th>Function</th>
<th>Interfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>forkpty(GLIBC_2.0) [LSB]</td>
<td></td>
</tr>
<tr>
<td>login(GLIBC_2.0) [LSB]</td>
<td>login_tty(GLIBC_2.0) [LSB]</td>
</tr>
<tr>
<td>logwtmp(GLIBC_2.0) [LSB]</td>
<td>openpty(GLIBC_2.0) [LSB]</td>
</tr>
</tbody>
</table>
V Package Format and Installation
13 Software Installation

13.1 Package Dependencies

The LSB runtime environment shall provide the following dependencies.

1 lsb-core-ppc32

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-ppc32.

13.2 Package Architecture Considerations

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

The archnum value in the Lead Section shall be 0x0005.
Annex A Alphabetical Listing of Interfaces

A.1 libgcc_s

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

This Specification [LSB]

Table A-1 libgcc_s Function Interfaces

<table>
<thead>
<tr>
<th>Unwind_Backtrace[LSB]</th>
<th>Unwind_GetDataRelBase[LSB]</th>
<th>Unwind_RaiseException[LSB]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unwind_FindEnclosingFunction[LSB]</td>
<td>Unwind_GetIP[LSB]</td>
<td>Unwind_Reload_or_Rethrow[LSB]</td>
</tr>
<tr>
<td>Unwind_Find_FDE[LSB]</td>
<td>Unwind_GetLanguageSpecificData[LSB]</td>
<td>Unwind_SetGR[LSB]</td>
</tr>
<tr>
<td>Unwind_GetCFA[LSB]</td>
<td>Unwind_GetTextRelBase[LSB]</td>
<td></td>
</tr>
</tbody>
</table>
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