# Linux Standard Base Core Specification for IA64 3.2

**Linux Standard Base Core Specification for IA64 3.2**
ISO/IEC 23360 Part 3:2007(E)

# Contents



 

 

# List of Figures

# Foreword

This is version 3.2 of the Linux Standard Base Core Specification for IA64. 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 Linux Foundation 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"), ISO/IEC 23360 Part 1, describing those parts of the interface that remain constant across all implementations of the LSB, and an architecture-specific part ("LSB-arch" or "archLSB") describing the parts of the interface that vary by processor architecture. Together, the LSB-generic and the relevant architecture-specific part of ISO/IEC 23360 for a single hardware architecture provide a complete interface specification for compiled application programs on systems that share a common hardware architecture.

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

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

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

## 1.2 Module Specific Scope

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

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

 

# 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 Linux Foundation's Reference Specifications (http://refspecs.freestandards.org) site.

**Table 2-1 Normative References**

| Name | Title | URL |
|---|---|---|
| ISO/IEC 23360 Part 1 | ISO/IEC 23360:2005 Linux Standard Base - Part 1 Generic Specification | http://www.linuxbase.org/spec/ |
| Filesystem Hierarchy Standard | Filesystem Hierarchy Standard (FHS) 2.3 | http://www.pathname.com/fhs/ |
| Intel® Itanium™ Processor-specific Application Binary Interface | Intel® Itanium™ Processor-specific Application Binary Interface | http://refspecs.linux-foundation.org/elf/IA64-SysV-psABI.pdf |
| ISO C (1999) | ISO/IEC 9899: 1999, Programming Languages --C | |
| ISO POSIX (2003) | ISO/IEC 9945-1:2003 Information technology -- Portable Operating System Interface (POSIX) -- Part 1: Base Definitions<br>ISO/IEC 9945-2:2003 Information technology -- Portable Operating System Interface (POSIX) -- Part 2: System Interfaces<br>ISO/IEC 9945-3:2003 Information technology -- Portable Operating System Interface (POSIX) -- Part 3: Shell and Utilities<br>ISO/IEC 9945-4:2003 | http://www.unix.org/version3/ |

| Name | Title | URL |
|---|---|---|
| | Information technology -- Portable Operating System Interface (POSIX) -- Part 4: Rationale<br>Including Technical Cor. 1: 2004 | |
| Itanium™ Architecture Software Developer's Manual Volume 1 | Itanium™ Architecture Software Developer's Manual Volume 1: Application Architecture | http://refspecs.linux-foundation.org/IA64-softdevman-vol1.pdf |
| Itanium™ Architecture Software Developer's Manual Volume 2 | Itanium™ Architecture Software Developer's Manual Volume 2: System Architecture | http://refspecs.linux-foundation.org/IA64-softdevman-vol2.pdf |
| Itanium™ Architecture Software Developer's Manual Volume 3 | Itanium™ Architecture Software Developer's Manual Volume 3: Instruction Set Reference | http://refspecs.linux-foundation.org/IA64-softdevman-vol3.pdf |
| Itanium™ Architecture Software Developer's Manual Volume 4 | IA-64 Processor Reference: Intel® Itanium™ Processor Reference Manual for Software Development | http://refspecs.linux-foundation.org/IA64-softdevman-vol4.pdf |
| Itanium™ Software Conventions and Runtime Guide | Itanium™ Software Conventions & Runtime Architecture Guide, September 2000 | http://refspecs.linux-foundation.org/IA64conventions.pdf |
| Large File Support | Large File Support | http://www.UNIX-systems.org/version2/whatsnew/lfs20mar.html |
| SUSv2 | CAE Specification, January 1997, System Interfaces and Headers (XSH),Issue 5 (ISBN: 1-85912-181-0, C606) | http://www.opengroup.org/publications/catalog/un.htm |
| SVID Issue 3 | American Telephone and Telegraph Company, System V Interface Definition, Issue 3; Morristown, NJ, UNIX Press, 1989. (ISBN 0201566524) | |

| Name | Title | URL |
|---|---|---|
| SVID Issue 4 | System V Interface Definition, Fourth Edition | |
| System V ABI | System V Application Binary Interface, Edition 4.1 | http://www.caldera.com/developers/devspecs/gabi41.pdf |
| System V ABI Update | System V Application Binary Interface - DRAFT - 17 December 2003 | http://www.caldera.com/developers/gabi/2003-12-17/contents.html |
| X/Open Curses | CAE Specification, May 1996, X/Open Curses, Issue 4, Version 2 (ISBN: 1-85912-171-3, C610), plus Corrigendum U018 | http://www.opengroup.org/publications/catalog/un.htm |

## 2.2 Informative References/Bibliography

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

**Table 2-2 Other References**

| Name | Title | URL |
|---|---|---|
| DWARF Debugging Information Format, Revision 2.0.0 | DWARF Debugging Information Format, Revision 2.0.0 (July 27, 1993) | http://refspecs.linux-foundation.org/dwarf/dwarf-2.0.0.pdf |
| DWARF Debugging Information Format, Revision 3.0.0 (Draft) | DWARF Debugging Information Format, Revision 3.0.0 (Draft) | http://refspecs.linux-foundation.org/dwarf |
| IEC 60559/IEEE 754 Floating Point | IEC 60559:1989 Binary floating-point arithmetic for microprocessor systems | http://www.ieee.org/ |
| ISO/IEC TR14652 | ISO/IEC Technical Report 14652:2002 Specification method for cultural conventions | |
| ITU-T V.42 | International Telecommunication Union Recommendation V.42 (2002): Error-correcting procedures for DCEs using asynchronous-to-synchronous | http://www.itu.int/rec/recommendation.asp?type=folders&lang=e&parent=T-REC-V.42 |

 

| Name | Title | URL |
|---|---|---|
| | conversionITUV | |
| Li18nux Globalization Specification | LI18NUX 2000 Globalization Specification, Version 1.0 with Amendment 4 | http://www.openi18n.org/docs/html/LI18NUX-2000-amd4.htm |
| Linux Allocated Device Registry | LINUX ALLOCATED DEVICES | http://www.lanana.org/docs/device-list/devices.txt |
| PAM | Open Software Foundation, Request For Comments: 86.0 , October 1995, V. Samar & R.Schemers (SunSoft) | http://www.opengroup.org/tech/rfc/mirror-rfc/rfc86.0.txt |
| RFC 1321: The MD5 Message-Digest Algorithm | IETF RFC 1321: The MD5 Message-Digest Algorithm | http://www.ietf.org/rfc/rfc1321.txt |
| RFC 1831/1832 RPC & XDR | IETF RFC 1831 & 1832 | http://www.ietf.org/ |
| RFC 1833: Binding Protocols for ONC RPC Version 2 | IETF RFC 1833: Binding Protocols for ONC RPC Version 2 | http://www.ietf.org/rfc/rfc1833.txt |
| RFC 1950: ZLIB Compressed Data Format Specication | IETF RFC 1950: ZLIB Compressed Data Format Specification | http://www.ietf.org/rfc/rfc1950.txt |
| RFC 1951: DEFLATE Compressed Data Format Specification | IETF RFC 1951: DEFLATE Compressed Data Format Specification version 1.3 | http://www.ietf.org/rfc/rfc1951.txt |
| RFC 1952: GZIP File Format Specification | IETF RFC 1952: GZIP file format specification version 4.3 | http://www.ietf.org/rfc/rfc1952.txt |
| RFC 2440: OpenPGP Message Format | IETF RFC 2440: OpenPGP Message Format | http://www.ietf.org/rfc/rfc2440.txt |
| RFC 2821:Simple Mail Transfer Protocol | IETF RFC 2821: Simple Mail Transfer Protocol | http://www.ietf.org/rfc/rfc2821.txt |
| RFC 2822:Internet Message Format | IETF RFC 2822: Internet Message Format | http://www.ietf.org/rfc/rfc2822.txt |
| RFC 791:Internet Protocol | IETF RFC 791: Internet Protocol Specification | http://www.ietf.org/rfc/rfc791.txt |
| RPM Package Format | RPM Package Format V3.0 | http://www.rpm.org/max-rpm/s1-rpm-file-format-rpm-file-format.html |

| Name | Title | URL |
|---|---|---|
| SUSv2 Commands and Utilities | The Single UNIX Specification(SUS) Version 2, Commands and Utilities (XCU), Issue 5 (ISBN: 1-85912-191-8, C604) | http://www.opengroup.org/publications/catalog/un.htm |
| zlib Manual | zlib 1.2 Manual | http://www.gzip.org/zlib/ |

 

# 3 Requirements

## 3.1 Relevant Libraries

The libraries listed in Table 3-1 shall be available on IA64 Linux Standard Base systems, with the specified runtime names. These names override or supplement the names specified in the generic LSB (ISO/IEC 23360 Part 1) specification. The specified program interpreter, referred to as proginterp in this table, shall be used to load the shared libraries specified by `DT_NEEDED` entries at run time.

**Table 3-1 Standard Library Names**

| Library | Runtime Name |
|---|---|
| libm | libm.so.6.1 |
| libdl | libdl.so.2 |
| libcrypt | libcrypt.so.1 |
| libz | libz.so.1 |
| libncurses | libncurses.so.5 |
| libutil | libutil.so.1 |
| libc | libc.so.6.1 |
| libpthread | libpthread.so.0 |
| proginterp | /lib/ld-lsb-ia64.so.3 |
| libgcc_s | libgcc_s.so.1 |

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

## 3.2 LSB Implementation Conformance

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

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

A conforming implementation shall satisfy the following requirements:

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

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

## 3.3 LSB Application Conformance

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

A conforming application shall satisfy the following requirements:

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

 

  - If such an interface or data format is supplied by another application through direct invocation of that application during execution, that application shall be in turn an LSB conforming application.
  - 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 possibilty of; it is not possible to

may

is permitted; is allowed; is permissible

need not

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

shall

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

shall not

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

should

it is recommended that; ought to

should not

it is not recommended that; ought not to

 

# 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 parts of ISO/IEC 23360 only.

 

# II 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 Intel® Itanium™ Processor-specific Application Binary Interface, 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 Itanium™ Architecture is specified by the following documents

- Itanium™ Architecture Software Developer's Manual Volume 1
- Itanium™ Architecture Software Developer's Manual Volume 2
- Itanium™ Architecture Software Developer's Manual Volume 3
- Itanium™ Architecture Software Developer's Manual Volume 4
- Itanium™ Software Conventions and Runtime Guide
- Intel® Itanium™ Processor-specific Application Binary Interface

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

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

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

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

There are some features of the Itanium™ processor architecture that need not be supported by a conforming implementation. These are described in this chapter. A conforming application shall not rely on these features.

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

This specification describes only LP64 (i.e. 32-bit integers, 64-bit longs and pointers) based implementations. Implementations may also provide ILP32 (32-bit integers, longs, and pointers), but conforming applications shall not rely on support for ILP32. See section 1.2 of the Intel® Itanium™ Processor-specific Application Binary Interface for further information.

### 8.1.2 Data Representation

The following sections, in conjunction with section 4 of Itanium™ Software Conventions and Runtime Guide, define the size, alignment requirements, and hardware representation of the standard C data types.

Within this specification, the term `byte` refers to an 8-bit object, the term `halfword` refers to a 16-bit object, the term `word` refers to a 32-bit object, the

term `doubleword` refers to a 64-bit object, and the term `quadword` refers to a 128-bit object.

#### 8.1.2.1 Byte Ordering

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

#### 8.1.2.2 Fundamental Types

Table 8-1 describes how fundemental C language data types shall be represented:

**Table 8-1 Scalar Types**

| Type | C | `sizeof` | Alignment (bytes) | Hardware Representation |
|---|---|---|---|---|
| Integral | _Bool | 1 | 1 | byte (sign unspecified) |
| | char | 1 | 1 | signed byte |
| | signed char | | | |
| | unsigned char | | | signed byte |
| | short | 2 | 2 | signed halfword |
| | signed short | | | |
| | unsigned short | | | unsigned halfword |
| | int | 4 | 4 | signed word |
| | signed int | | | |
| | unsigned int | | | unsigned word |
| | long | 8 | 8 | signed doubleword |
| | signed long | | | |
| | unsigned long | | | unsigned doubleword |
| | long long | 8 | 8 | signed doubleword |
| | signed long long | | | |
| | unsigned long long | | | unsigned doubleword |
| Pointer | *any-type* * | 8 | 8 | unsigned doubleword |

| Type | C | sizeof | Alignment (bytes) | Hardware Representation |
|---|---|---|---|---|
| | *any-type* (*)() | | | |
| Floating-Point | float | 4 | 4 | IEEE Single-precision |
| | double | 8 | 8 | IEEE Double-precision |
| | long double | 16 | 16 | IEEE Double-extended |

A null pointer (for all types) shall have the value zero.

### 8.1.2.3 Aggregates and Unions

Aggregates (structures and arrays) and unions assume the alignment of their most strictly aligned component. The size of any object, including aggregates and unions, shall always be a multiple of the object's alignment. An array uses the same alignment as its elements. Structure and union objects may require padding to meet size and element constraints. The contents of such padding is undefined.

- An entire structure or union object shall be aligned on the same boundary as its most strictly aligned member.
- Each member shall be assigned to the lowest available offset with the appropriate alignment. This may require *internal padding*, depending on the previous member.
- A structure's size shall be increased, if necessary, to make it a multiple of the alignment. This may require *tail padding*, depending on the last member.

A conforming application shall not read padding.

```
struct {
    char c;
}
```

Byte aligned, `sizeof` is 1

| Offset | Byte 0 |
|---|---|
| 0 | $c^0$ |

**Figure 8-1 Structure Smaller Than A Word**

```
struct {
    char  c;
    char  d;
    short s;
    int   i;
    long  l;
}
```

Doubleword Aligned, `sizeof` is 16

 

| Offset | Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|---|
| 0 | $s^2$ | | $d^1$ | $c^0$ |
| 4 | $i^0$ | | | |
| 8 | $l^0$ | | | |
| 12 | | | | |

**Figure 8-2 No Padding**

```
struct {
    char  c;
    long  l;
    int   i;
    short s;
}
```

Doubleword Aligned, `sizeof` is 24

| Offset | Byte 3 | Byte 2 | Byte 1 | Byte 0 |
|---|---|---|---|---|
| 0 | $pad^1$ | | | $c^0$ |
| 4 | $pad^1$ | | | |
| 8 | $l^0$ | | | |
| 12 | | | | |
| 16 | $i^0$ | | | |
| 20 | $pad^2$ | | $s^0$ | |

**Figure 8-3 Internal and Tail Padding**

### 8.1.2.4 Bit Fields

C `struct` and `union` definitions may have *bit-fields*, which define integral objects with a specified number of bits.

Bit fields that are declared with neither `signed` nor `unsigned` specifier shall always be treated as `unsigned`. Bit fields obey the same size and alignment rules as other structure and union members, with the following additional properties:

- Bit-fields are allocated from right to left (least to most significant).
- A bit-field must entirely reside in a storage unit for its appropriate type. A bit field shall never cross its unit boundary.
- Bit-fields may share a storage unit with other `struct/union` members, including members that are not bit fields. Such other `struct/union` members shall occupy different parts of the storage unit.
- The type of unnamed bit-fields shall not affect the alignment of a structure or union, although individual bit-field member offsets shall obey the alignment constraints.

| Bit-field Type | Width *w* | Range |
|---|---|---|
| `signed char` | 1 to 8 | $-2^{w-1}$ to $2^{w-1}-1$ |

| Bit-field Type | Width *w* | Range |
|---|---|---|
| char<br>unsigned char | | 0 to $2^w$-1<br>0 to $2^w$-1 |
| signed short<br>short<br>unsigned short | 1 to 16 | $-2^{w-1}$ to $2^{w-1}$-1<br>0 to $2^w$-1<br>0 to $2^w$-1 |
| signed int<br>int<br>unsigned int | 1 to 32 | $-2^{w-1}$ to $2^{w-1}$-1<br>0 to $2^w$-1<br>0 to $2^w$-1 |
| signed long<br>long<br>unsigned long | 1 to 64 | $-2^{w-1}$ to $2^{w-1}$-1<br>0 to $2^w$-1<br>0 to $2^w$-1 |

**Figure 8-4 Bit-Field Ranges**

## 8.2 Function Calling Sequence

LSB-conforming applications shall use the procedure linkage and function calling sequence as defined in Chapter 8.4 of the Itanium™ Software Conventions and Runtime Guide.

### 8.2.1 Registers

The CPU general and other registers are as defined in the Itanium™ Architecture Software Developer's Manual Volume 1 Section 3.1.

### 8.2.2 Floating Point Registers

The floating point registers are as defined in the Itanium™ Architecture Software Developer's Manual Volume 1 Section 3.1.

### 8.2.3 Stack Frame

The stackframe layout is as described in the Itanium™ Software Conventions and Runtime Guide Chapter 8.4.

### 8.2.4 Arguments

#### 8.2.4.1 Introduction

The procedure parameter passing mechanism is as described in the Itanium™ Software Conventions and Runtime Guide Chapter 8.5. The following subsections provide additional information.

#### 8.2.4.2 Integral/Pointer

See Itanium™ Software Conventions and Runtime Guide Chapter 8.5.

#### 8.2.4.3 Floating Point

See Itanium™ Software Conventions and Runtime Guide Chapter 8.5.

#### 8.2.4.4 Struct and Union Point

See Itanium™ Software Conventions and Runtime Guide Chapter 8.5.

 

#### 8.2.4.5 Variable Arguments

See Itanium™ Software Conventions and Runtime Guide Chapter 8.5.4.

### 8.2.5 Return Values

#### 8.2.5.1 Introduction

Values are returned from functions as described in Itanium™ Software Conventions and Runtime Guide Chapter 8.6, and as further described here.

#### 8.2.5.2 Void

Functions that return no value (`void` functions) are not required to put any particular value in any general register.

#### 8.2.5.3 Integral/Pointer

See Itanium™ Software Conventions and Runtime Guide Chapter 8.6.

#### 8.2.5.4 Floating Point

See Itanium™ Software Conventions and Runtime Guide Chapter 8.6.

#### 8.2.5.5 Struct and Union

See Itanium™ Software Conventions and Runtime Guide Chapter 8.6 (aggregate return values). Depending on the size (including any padding), aggregate data types may be passed in one or more general registers, or in memory.

## 8.3 Operating System Interface

LSB-conforming applications shall use the Operating System Interfaces as defined in Chapter 3 of the Intel® Itanium™ Processor-specific Application Binary Interface.

### 8.3.1 Processor Execution Mode

Applications must assume that they will execute in the least privileged user mode (i.e. level 3). Other privilege levels are reserved for the Operating System.

### 8.3.2 Exception Interface

#### 8.3.2.1 Introduction

LSB-conforming implementations shall support the exception interface as specified in Intel® Itanium™ Processor-specific Application Binary Interface, section 3.3.1.

#### 8.3.2.2 Hardware Exception Types

See Intel® Itanium™ Processor-specific Application Binary Interface, section 3.3.1.

#### 8.3.2.3 Software Trap Types

See Intel® Itanium™ Processor-specific Application Binary Interface, section 3.3.1.

### 8.3.3 Signal Delivery

LSB-conforming systems shall deliver signals as specified in Intel® Itanium™ Processor-specific Application Binary Interface, section 3.3.2.

#### 8.3.3.1 Signal Handler Interface

The signal handler interface shall be as specified in Intel® Itanium™ Processor-specific Application Binary Interface, section 3.3.3.

### 8.3.4 Debugging Support

The LSB does not specify debugging information.

### 8.3.5 Process Startup

LSB-conforming systems shall initialize processes as specified in Intel® Itanium™ Processor-specific Application Binary Interface, section 3.3.5.

## 8.4 Process Initialization

LSB-conforming applications shall use the Process Startup as defined in Section 3.3.5 of the Intel® Itanium™ Processor-specific Application Binary Interface.

### 8.4.1 Special Registers

Intel® Itanium™ Processor-specific Application Binary Interface, section 3.3.5, defines required register initializations for process startup.

### 8.4.2 Process Stack (on entry)

As defined in Intel® Itanium™ Processor-specific Application Binary Interface, section 3.3.5, the return pointer register (rp) shall contain a valid return address, such that if the application program returns from the main entry routine, the implementation shall cause the application to exit normally, using the returned value as the exit status. Further, the unwind information for this "bottom of stack" routine in the implementation shall provide a mechanism for recognizing the bottom of the stack during a stack unwind.

### 8.4.3 Auxiliary Vector

The auxiliary vector conveys information from the operating system to the application. Only the terminating null auxiliary vector entry is required, but if any other entries are present, they shall be interpreted as follows. This vector is an array of the following structures.

```
typedef struct
{
  long int a_type;              /* Entry type */
  union
    {
      long int a_val;           /* Integer value */
      void *a_ptr;              /* Pointer value */
      void (*a_fcn) (void);     /* Function pointer value */
    } a_un;
} auxv_t;
```

The application shall interpret the `a_un` value according to the `a_type`. Other auxiliary vector types are reserved.

The `a_type` field shall contain one of the following values:

 

AT_NULL

The last entry in the array has type `AT_NULL`. The value in `a_un` is undefined.

AT_IGNORE

The value in `a_un` is undefined, and should be ignored.

AT_EXECFD

File descriptor of program

AT_PHDR

Program headers for program

AT_PHENT

Size of program header entry

AT_PHNUM

Number of program headers

AT_PAGESZ

System page size

AT_BASE

Base address of interpreter

AT_FLAGS

Flags

AT_ENTRY

Entry point of program

AT_NOTELF

Program is not ELF

AT_UID

Real uid

AT_EUID

Effective uid

AT_GID

Real gid

AT_EGID

Effective gid

AT_CLKTCK

Frequency of times()

AT_PLATFORM

String identifying platform.

AT_HWCAP

Machine dependent hints about processor capabilities.

AT_FPUCW

Used FPU control word

AT_DCACHEBSIZE

Data cache block size

AT_ICACHEBSIZE

Instruction cache block size

AT_UCACHEBSIZE

Unified cache block size

**Note:** The auxiliary vector is intended for passing information from the operating system to the program interpreter.

### 8.4.4 Environment

Although a pointer to the environment vector should be available as a third argument to the `main()` entry point, conforming applications should use `getenv()` to access the environment. (See ISO POSIX (2003), Section `exec()`).

## 8.5 Coding Examples

### 8.5.1 Introduction

LSB-conforming applications may implement fundamental operations using the Coding Examples as shown below.

Sample code sequences and coding conventions can be found in Itanium™ Software Conventions and Runtime Guide, Chapter 9.

### 8.5.2 Code Model Overview/Architecture Constraints

As defined in Intel® Itanium™ Processor-specific Application Binary Interface, relocatable files, executable files, and shared object files that are supplied as part of an application shall use Position Independent Code, as described in Itanium™ Software Conventions and Runtime Guide, Chapter 12.

### 8.5.3 Position-Independent Function Prologue

See Itanium™ Software Conventions and Runtime Guide, Chapter 8.4.

### 8.5.4 Data Objects

See Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.3.4, and Itanium™ Software Conventions and Runtime Guide, Chapter 12.3.

#### 8.5.4.1 Absolute Load & Store

Conforming applications shall not use absolute addressing.

 

#### 8.5.4.2 Position Relative Load & Store

See Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.3.4.

### 8.5.5 Function Calls

See Itanium™ Software Conventions and Runtime Guide, Chapter 8.4.

Four types of procedure call are defined in Itanium™ Software Conventions and Runtime Guide, Chapter 8.3. Although special calling conventions are permitted, provided that the compiler and runtime library agree on these conventions, none are defined for this standard. Consequently, no application shall depend on a type of procedure call other than Direct Calls, Direct Dynamically Linked Calls, or Indirect Calls, as defined in Itanium™ Software Conventions and Runtime Guide, Chapter 8.3.

#### 8.5.5.1 Absolute Direct Function Call

Conforming applications shall not use absolute addressing.

#### 8.5.5.2 Absolute Indirect Function Call

Conforming applications shall not use absolute addressing.

#### 8.5.5.3 Position-Independent Direct Function Call

See Itanium™ Software Conventions and Runtime Guide, Chapter 8.4.1.

#### 8.5.5.4 Position-Independent Indirect Function Call

See Itanium™ Software Conventions and Runtime Guide, Chapter 8.4.2.

### 8.5.6 Branching

Branching is described in Itanium™ Architecture Software Developer's Manual Volume 4, Chapter 4.5.

#### 8.5.6.1 Branch Instruction

See Itanium™ Architecture Software Developer's Manual Volume 4, Chapter 4.5.

#### 8.5.6.2 Absolute switch() code

Conforming applications shall not use absolute addressing.

#### 8.5.6.3 Position-Independent switch() code

Where there are several possible targets for a branch, the compiler may use a number of different code generation strategies. See Itanium™ Software Conventions and Runtime Guide, Chapter 9.1.7.

## 8.6 C Stack Frame

### 8.6.1 Variable Argument List

See Itanium™ Software Conventions and Runtime Guide, Chapter 8.5.2, and 8.5.4.

### 8.6.2 Dynamic Allocation of Stack Space

The C library `alloca()` function should be used to dynamically allocate stack space.

## 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 format, called Executable and Linking Format (ELF) as defined by the System V ABI, Intel® Itanium™ Processor-specific Application Binary Interface and as supplemented by the Linux Standard Base Specification and this document.

## 9.2 ELF Header

### 9.2.1 Machine Information

LSB-conforming applications shall use the Machine Information as defined in Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 4. Implementations shall support the LP64 model. It is unspecified whether or not the ILP32 model shall also be supported.

#### 9.2.1.1 File Class

For LP64 relocatable objects, the file class value in `e_ident[EI_CLASS]` may be either ELFCLASS32 or ELFCLASS64, and a conforming linker must be able to process either or both classes.

#### 9.2.1.2 Data Encoding

Implementations shall support 2's complement, little endian data encoding. The data encoding value in `e_ident[EI_DATA]` shall contain the value `ELFDATA2LSB`.

#### 9.2.1.3 OS Identification

The OS Identification field `e_ident[EI_OSABI]` shall contain the value `ELFOSABI_NONE`.

#### 9.2.1.4 Processor Identification

The processor identification value held in `e_machine` shall contain the value `EM_IA_64`.

#### 9.2.1.5 Processor Specific Flags

The flags field `e_flags` shall be as described in Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 4.1.1.6.

The following additional processor-specific flags are defined:

**Table 9-1 Additional Processor-Specific Flags**

| Name | Value |
|---|---|
| EF_IA_64_LINUX_EXECUTABLE_STACK | 0x00000001 |

EF_IA_64_LINUX_EXECUTABLE_STACK

The stack and heap sections are executable. If this flag is not set, code can not be executed from the stack or heap.

## 9.3 Sections

The Itanium™ architecture defines two processor-specific section types, as described in Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 4.

### 9.3.1 Special Sections

The following sections are defined in the Intel® Itanium™ Processor-specific Application Binary Interface.

**Table 9-2 ELF Special Sections**

| Name | Type | Attributes |
|---|---|---|
| .got | SHT_PROGBITS | SHF_ALLOC+SHF_WRITE+SHF_IA_64_SHORT |
| .IA_64.archext | SHT_IA_64_EXT | 0 |
| .IA_64.pltoff | SHT_PROGBITS | SHF_ALLOC+SHF_WRITE+SHF_IA_64_SHORT |
| .IA_64.unwind | SHT_IA_64_UNWIND | SHF_ALLOC+SHF_LINK_ORDER |
| .IA_64.unwind_info | SHT_PROGBITS | SHF_ALLOC |
| .plt | SHT_PROGBITS | SHF_ALLOC+SHF_EXECINSTR |
| .sbss | SHT_NOBITS | SHF_ALLOC+SHF_WRITE+SHF_IA_64_SHORT |
| .sdata | SHT_PROGBITS | SHF_ALLOC+SHF_WRITE+SHF_IA_64_SHORT |
| .sdata1 | SHT_PROGBITS | SHF_ALLOC+SHF_WRITE+SHF_IA_64_SHORT |

.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.

.IA_64.archext

This section holds product-specific extension bits. The link editor will perform a logical "or" of the extension bits of each object when creating an executable so that it creates only a single .IA_64.archext section in the executable.

.IA_64.pltoff

This section holds local function descriptor entries.

 

.IA_64.unwind

This section holds the unwind function table. The contents are described in the Intel (r) Itanium (tm) Processor Specific ABI.

.IA_64.unwind_info

This section holds stack unwind and and exception handling information. The exception handling information is programming language specific, and is unspecified.

.plt

This section holds the procedure linkage table.

.sbss

This section holds uninitialized data that contribute to the program's memory image. Data objects contained in this section are recommended to be eight bytes or less in size. The system initializes the data with zeroes when the program begins to run. The section occupies no file space, as indicated by the section type SHT_NOBITS. The .sbss section is placed so it may be accessed using short direct addressing (22 bit offset from gp).

.sdata

This section and the .sdata1 section hold initialized data that contribute to the program's memory image. Data objects contained in this section are recommended to be eight bytes or less in size. The .sdata and .sdata1 sections are placed so they may be accessed using short direct addressing (22 bit offset from gp).

.sdata1

See .sdata.

### 9.3.2 Linux Special Sections

The following Linux IA-64 specific sections are defined here.

**Table 9-3 Additional Special Sections**

| Name | Type | Attributes |
|---|---|---|
| .opd | SHT_PROGBITS | SHF_ALLOC |
| .rela.dyn | SHT_RELA | SHF_ALLOC |
| .rela.IA_64.pltoff | SHT_RELA | SHF_ALLOC |

.opd

This section holds function descriptors.

.rela.dyn

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

.rela.IA_64.pltoff

This section holds relocation information, as described in `Relocation' section in Chapter 4 of System V ABI Update. These relocations are applied to the .IA_64.pltoff section.

### 9.3.3 Section Types

Section Types are described in the Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 4.2. LSB conforming implementations are not required to use any sections in the range from `SHT_IA_64_LOPSREG` to `SHT_IA_64_HIPSREG`. Additionally, LSB conforming implementations are not required to support the `SHT_IA_64_PRIORITY_INIT` section, beyond the gABI requirements for the handling of unrecognized section types, linking them into a contiguous section in the object file created by the static linker.

### 9.3.4 Section Attribute Flags

LSB-conforming implementations shall support the section attribute flags specified in Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 4.2.2.

### 9.3.5 Special Section Types

The special section types `SHT_IA64_EXT` and `SHT_IA64_UNWIND` are defined in Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 4.2.1.

## 9.4 Symbol Table

If an executable file contains a reference to a function defined in one of its associated shared objects, the symbol table section for that file shall contain an entry for that symbol. The *st_shndx* member of that symbol table entry contains *SHN_UNDEF*. This signals to the dynamic linker that the symbol definition for that function is not contained in the executable file itself. If that symbol has been allocated a procedure linkage table entry in the executable file, and the *st_value* member for that symbol table entry is non-zero, the value shall contain the virtual address of the first instruction of that procedure linkage table entry. Otherwise, the *st_value* member contains zero. This procedure linkage table entry address is used by the dynamic linker in resolving references to the address of the function.

## 9.5 Relocation

### 9.5.1 Relocation Types

LSB-conforming systems shall support the relocation types described in Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 4.3.

 

# 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, Intel® Itanium™ Processor-specific Application Binary Interface and as supplemented by the Linux Standard Base Specification and this document.

## 10.2 Program Header

The program header shall be as defined in the Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.

### 10.2.1 Types

See Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.1.

### 10.2.2 Flags

See Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.1.

## 10.3 Program Loading

See Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.2.

## 10.4 Dynamic Linking

See Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.3.

### 10.4.1 Dynamic Entries

#### 10.4.1.1 ELF Dynamic Entries

The following dynamic entries are defined in the Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.3.2.

DT_PLTGOT

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

#### 10.4.1.2 Additional Dynamic Entries

The following dynamic entries are defined here.

DT_RELACOUNT

The number of relative relocations in .rela.dyn

### 10.4.2 Global Offset Table

See Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.3.4.

### 10.4.3 Shared Object Dependencies

See Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.3.3.

### 10.4.4 Function Addresses

See Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.3.5.

### 10.4.5 Procedure Linkage Table

See Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.3.6.

### 10.4.6 Initialization and Termination Functions

See Intel® Itanium™ Processor-specific Application Binary Interface, Chapter 5.3.7.

 

# 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 Itanium™ platform are defined here. This section should be used in conjunction with the corresponding section in the Linux Standard Base Specification.

## 11.1 Program Interpreter/Dynamic Linker

The Program Interpreter shall be `/lib/ld-lsb-ia64.so.3`.

## 11.2 Interfaces for libc

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

**Table 11-1 libc Definition**

| | |
|---|---|
| Library: | libc |
| SONAME: | libc.so.6.1 |

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

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

### 11.2.1 RPC

#### 11.2.1.1 Interfaces for RPC

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

**Table 11-2 libc - RPC Function Interfaces**

| | | | |
|---|---|---|---|
| authnone_create(GLIBC_2.2) [SVID.4] | clnt_create(GLIBC_2.2) [SVID.4] | clnt_pcreateerror(GLIBC_2.2) [SVID.4] | clnt_perrno(GLIBC_2.2) [SVID.4] |
| clnt_perror(GLIBC_2.2) [SVID.4] | clnt_spcreateerror(GLIBC_2.2) [SVID.4] | clnt_sperrno(GLIBC_2.2) [SVID.4] | clnt_sperror(GLIBC_2.2) [SVID.4] |
| key_decryptsession(GLIBC_2.2) [SVID.3] | pmap_getport(GLIBC_2.2) [LSB] | pmap_set(GLIBC_2.2) [LSB] | pmap_unset(GLIBC_2.2) [LSB] |
| svc_getreqset(GLIBC_2.2) [SVID.3] | svc_register(GLIBC_2.2) [LSB] | svc_run(GLIBC_2.2) [LSB] | svc_sendreply(GLIBC_2.2) [LSB] |

| | | | |
|---|---|---|---|
| svcerr_auth(GLIBC_2.2) [SVID.3] | svcerr_decode(GLIBC_2.2) [SVID.3] | svcerr_noproc(GLIBC_2.2) [SVID.3] | svcerr_noprog(GLIBC_2.2) [SVID.3] |
| svcerr_progvers(GLIBC_2.2) [SVID.3] | svcerr_systemerr(GLIBC_2.2) [SVID.3] | svcerr_weakauth(GLIBC_2.2) [SVID.3] | svctcp_create(GLIBC_2.2) [LSB] |
| svcudp_create(GLIBC_2.2) [LSB] | xdr_accepted_reply(GLIBC_2.2) [SVID.3] | xdr_array(GLIBC_2.2) [SVID.3] | xdr_bool(GLIBC_2.2) [SVID.3] |
| xdr_bytes(GLIBC_2.2) [SVID.3] | xdr_callhdr(GLIBC_2.2) [SVID.3] | xdr_callmsg(GLIBC_2.2) [SVID.3] | xdr_char(GLIBC_2.2) [SVID.3] |
| xdr_double(GLIBC_2.2) [SVID.3] | xdr_enum(GLIBC_2.2) [SVID.3] | xdr_float(GLIBC_2.2) [SVID.3] | xdr_free(GLIBC_2.2) [SVID.3] |
| xdr_int(GLIBC_2.2) [SVID.3] | xdr_long(GLIBC_2.2) [SVID.3] | xdr_opaque(GLIBC_2.2) [SVID.3] | xdr_opaque_auth(GLIBC_2.2) [SVID.3] |
| xdr_pointer(GLIBC_2.2) [SVID.3] | xdr_reference(GLIBC_2.2) [SVID.3] | xdr_rejected_reply(GLIBC_2.2) [SVID.3] | xdr_replymsg(GLIBC_2.2) [SVID.3] |
| xdr_short(GLIBC_2.2) [SVID.3] | xdr_string(GLIBC_2.2) [SVID.3] | xdr_u_char(GLIBC_2.2) [SVID.3] | xdr_u_int(GLIBC_2.2) [LSB] |
| xdr_u_long(GLIBC_2.2) [SVID.3] | xdr_u_short(GLIBC_2.2) [SVID.3] | xdr_union(GLIBC_2.2) [SVID.3] | xdr_vector(GLIBC_2.2) [SVID.3] |
| xdr_void(GLIBC_2.2) [SVID.3] | xdr_wrapstring(GLIBC_2.2) [SVID.3] | xdrmem_create(GLIBC_2.2) [SVID.3] | xdrrec_create(GLIBC_2.2) [SVID.3] |
| xdrrec_eof(GLIBC_2.2) [SVID.3] | xdrstdio_create(GLIBC_2.2) [LSB] | | |

## 11.2.2 System Calls

### 11.2.2.1 Interfaces for System Calls

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

**Table 11-3 libc - System Calls Function Interfaces**

| | | | |
|---|---|---|---|
| __fxstat(GLIBC_2.2) [LSB] | __getpgid(GLIBC_2.2) [LSB] | __lxstat(GLIBC_2.2) [LSB] | __xmknod(GLIBC_2.2) [LSB] |
| __xstat(GLIBC_2.2) [LSB] | access(GLIBC_2.2) [SUSv3] | acct(GLIBC_2.2) [LSB] | alarm(GLIBC_2.2) [SUSv3] |
| brk(GLIBC_2.2) [SUSv2] | chdir(GLIBC_2.2) [SUSv3] | chmod(GLIBC_2.2) [SUSv3] | chown(GLIBC_2.2) [SUSv3] |
| chroot(GLIBC_2.2) [SUSv2] | clock(GLIBC_2.2) [SUSv3] | close(GLIBC_2.2) [SUSv3] | closedir(GLIBC_2.2) [SUSv3] |

| | | | |
|---|---|---|---|
| creat(GLIBC_2.2) [SUSv3] | dup(GLIBC_2.2) [SUSv3] | dup2(GLIBC_2.2) [SUSv3] | execl(GLIBC_2.2) [SUSv3] |
| execle(GLIBC_2.2) [SUSv3] | execlp(GLIBC_2.2) [SUSv3] | execv(GLIBC_2.2) [SUSv3] | execve(GLIBC_2.2) [SUSv3] |
| execvp(GLIBC_2.2) [SUSv3] | exit(GLIBC_2.2) [SUSv3] | fchdir(GLIBC_2.2) [SUSv3] | fchmod(GLIBC_2.2) [SUSv3] |
| fchown(GLIBC_2.2) [SUSv3] | fcntl(GLIBC_2.2) [LSB] | fdatasync(GLIBC_2.2) [SUSv3] | flock(GLIBC_2.2) [LSB] |
| fork(GLIBC_2.2) [SUSv3] | fstatfs(GLIBC_2.2) [LSB] | fstatvfs(GLIBC_2.2) [SUSv3] | fsync(GLIBC_2.2) [SUSv3] |
| ftime(GLIBC_2.2) [SUSv3] | ftruncate(GLIBC_2.2) [SUSv3] | getcontext(GLIBC_2.2) [SUSv3] | getdtablesize(GLIBC_2.2) [LSB] |
| getegid(GLIBC_2.2) [SUSv3] | geteuid(GLIBC_2.2) [SUSv3] | getgid(GLIBC_2.2) [SUSv3] | getgroups(GLIBC_2.2) [SUSv3] |
| getitimer(GLIBC_2.2) [SUSv3] | getloadavg(GLIBC_2.2) [LSB] | getpagesize(GLIBC_2.2) [LSB] | getpgid(GLIBC_2.2) [SUSv3] |
| getpgrp(GLIBC_2.2) [SUSv3] | getpid(GLIBC_2.2) [SUSv3] | getppid(GLIBC_2.2) [SUSv3] | getpriority(GLIBC_2.2) [SUSv3] |
| getrlimit(GLIBC_2.2) [SUSv3] | getrusage(GLIBC_2.2) [SUSv3] | getsid(GLIBC_2.2) [SUSv3] | getuid(GLIBC_2.2) [SUSv3] |
| getwd(GLIBC_2.2) [SUSv3] | initgroups(GLIBC_2.2) [LSB] | ioctl(GLIBC_2.2) [LSB] | kill(GLIBC_2.2) [LSB] |
| killpg(GLIBC_2.2) [SUSv3] | lchown(GLIBC_2.2) [SUSv3] | link(GLIBC_2.2) [LSB] | lockf(GLIBC_2.2) [SUSv3] |
| lseek(GLIBC_2.2) [SUSv3] | mkdir(GLIBC_2.2) [SUSv3] | mkfifo(GLIBC_2.2) [SUSv3] | mlock(GLIBC_2.2) [SUSv3] |
| mlockall(GLIBC_2.2) [SUSv3] | mmap(GLIBC_2.2) [SUSv3] | mprotect(GLIBC_2.2) [SUSv3] | mremap(GLIBC_2.2) [LSB] |
| msync(GLIBC_2.2) [SUSv3] | munlock(GLIBC_2.2) [SUSv3] | munlockall(GLIBC_2.2) [SUSv3] | munmap(GLIBC_2.2) [SUSv3] |
| nanosleep(GLIBC_2.2) [SUSv3] | nice(GLIBC_2.2) [SUSv3] | open(GLIBC_2.2) [SUSv3] | opendir(GLIBC_2.2) [SUSv3] |
| pathconf(GLIBC_2.2) [SUSv3] | pause(GLIBC_2.2) [SUSv3] | pipe(GLIBC_2.2) [SUSv3] | poll(GLIBC_2.2) [SUSv3] |
| pselect(GLIBC_2.2) [SUSv3] | read(GLIBC_2.2) [SUSv3] | readdir(GLIBC_2.2) [SUSv3] | readdir_r(GLIBC_2.2) [SUSv3] |
| readlink(GLIBC_2.2) [SUSv3] | readv(GLIBC_2.2) [SUSv3] | rename(GLIBC_2.2) [SUSv3] | rmdir(GLIBC_2.2) [SUSv3] |
| sbrk(GLIBC_2.2) [SUSv2] | sched_get_priority_max(GLIBC_2.2) [SUSv3] | sched_get_priority_min(GLIBC_2.2) [SUSv3] | sched_getparam(GLIBC_2.2) [SUSv3] |
| sched_getscheduler(GLIBC_2.2) | sched_rr_get_interval(GLIBC_2.2) | sched_setparam(GLIBC_2.2) | sched_setscheduler(GLIBC_2.2) |

 

| | | | |
|---|---|---|---|
| [SUSv3] | [SUSv3] | [SUSv3] | [LSB] |
| sched_yield(GLIBC_2.2) [SUSv3] | select(GLIBC_2.2) [SUSv3] | setcontext(GLIBC_2.2) [SUSv3] | setegid(GLIBC_2.2) [SUSv3] |
| seteuid(GLIBC_2.2) [SUSv3] | setgid(GLIBC_2.2) [SUSv3] | setitimer(GLIBC_2.2) [SUSv3] | setpgid(GLIBC_2.2) [SUSv3] |
| setpgrp(GLIBC_2.2) [SUSv3] | setpriority(GLIBC_2.2) [SUSv3] | setregid(GLIBC_2.2) [SUSv3] | setreuid(GLIBC_2.2) [SUSv3] |
| setrlimit(GLIBC_2.2) [SUSv3] | setrlimit64(GLIBC_2.2) [LFS] | setsid(GLIBC_2.2) [SUSv3] | setuid(GLIBC_2.2) [SUSv3] |
| sleep(GLIBC_2.2) [SUSv3] | statfs(GLIBC_2.2) [LSB] | statvfs(GLIBC_2.2) [SUSv3] | stime(GLIBC_2.2) [LSB] |
| symlink(GLIBC_2.2) [SUSv3] | sync(GLIBC_2.2) [SUSv3] | sysconf(GLIBC_2.2) [LSB] | time(GLIBC_2.2) [SUSv3] |
| times(GLIBC_2.2) [SUSv3] | truncate(GLIBC_2.2) [SUSv3] | ulimit(GLIBC_2.2) [SUSv3] | umask(GLIBC_2.2) [SUSv3] |
| uname(GLIBC_2.2) [SUSv3] | unlink(GLIBC_2.2) [LSB] | utime(GLIBC_2.2) [SUSv3] | utimes(GLIBC_2.2) [SUSv3] |
| vfork(GLIBC_2.2) [SUSv3] | wait(GLIBC_2.2) [SUSv3] | wait4(GLIBC_2.2) [LSB] | waitid(GLIBC_2.2) [SUSv3] |
| waitpid(GLIBC_2.2) [LSB] | write(GLIBC_2.2) [SUSv3] | writev(GLIBC_2.2) [SUSv3] | |

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

**Note:** These interfaces are deprecated, and applications should avoid using them. These interfaces may be withdrawn in future releases of this specification.

**Table 11-4 libc - System Calls Deprecated Function Interfaces**

| | | | |
|---|---|---|---|
| fstatfs(GLIBC_2.2) [LSB] | getdtablesize(GLIBC_2.2) [LSB] | getpagesize(GLIBC_2.2) [LSB] | getwd(GLIBC_2.2) [SUSv3] |
| statfs(GLIBC_2.2) [LSB] | | | |

## 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 11-5, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-5 libc - Standard I/O Function Interfaces**

| | | | |
|---|---|---|---|
| _IO_feof(GLIBC_2.2) [LSB] | _IO_getc(GLIBC_2.2) [LSB] | _IO_putc(GLIBC_2.2) [LSB] | _IO_puts(GLIBC_2.2) [LSB] |
| asprintf(GLIBC_ | clearerr(GLIBC_2 | ctermid(GLIBC_ | fclose(GLIBC_2.2 |

| | | | |
|---|---|---|---|
| 2.2) [LSB] | .2) [SUSv3] | 2.2) [SUSv3] | ) [SUSv3] |
| fdopen(GLIBC_2.2) [SUSv3] | feof(GLIBC_2.2) [SUSv3] | ferror(GLIBC_2.2) [SUSv3] | fflush(GLIBC_2.2) [SUSv3] |
| fflush_unlocked(GLIBC_2.2) [LSB] | fgetc(GLIBC_2.2) [SUSv3] | fgetpos(GLIBC_2.2) [SUSv3] | fgets(GLIBC_2.2) [SUSv3] |
| fgetwc_unlocked(GLIBC_2.2) [LSB] | fileno(GLIBC_2.2) [SUSv3] | flockfile(GLIBC_2.2) [SUSv3] | fopen(GLIBC_2.2) [SUSv3] |
| fprintf(GLIBC_2.2) [SUSv3] | fputc(GLIBC_2.2) [SUSv3] | fputs(GLIBC_2.2) [SUSv3] | fread(GLIBC_2.2) [SUSv3] |
| freopen(GLIBC_2.2) [SUSv3] | fscanf(GLIBC_2.2) [LSB] | fseek(GLIBC_2.2) [SUSv3] | fseeko(GLIBC_2.2) [SUSv3] |
| fsetpos(GLIBC_2.2) [SUSv3] | ftell(GLIBC_2.2) [SUSv3] | ftello(GLIBC_2.2) [SUSv3] | fwrite(GLIBC_2.2) [SUSv3] |
| getc(GLIBC_2.2) [SUSv3] | getc_unlocked(GLIBC_2.2) [SUSv3] | getchar(GLIBC_2.2) [SUSv3] | getchar_unlocked(GLIBC_2.2) [SUSv3] |
| getw(GLIBC_2.2) [SUSv2] | pclose(GLIBC_2.2) [SUSv3] | popen(GLIBC_2.2) [SUSv3] | printf(GLIBC_2.2) [SUSv3] |
| putc(GLIBC_2.2) [SUSv3] | putc_unlocked(GLIBC_2.2) [SUSv3] | putchar(GLIBC_2.2) [SUSv3] | putchar_unlocked(GLIBC_2.2) [SUSv3] |
| puts(GLIBC_2.2) [SUSv3] | putw(GLIBC_2.2) [SUSv2] | remove(GLIBC_2.2) [SUSv3] | rewind(GLIBC_2.2) [SUSv3] |
| rewinddir(GLIBC_2.2) [SUSv3] | scanf(GLIBC_2.2) [LSB] | seekdir(GLIBC_2.2) [SUSv3] | setbuf(GLIBC_2.2) [SUSv3] |
| setbuffer(GLIBC_2.2) [LSB] | setvbuf(GLIBC_2.2) [SUSv3] | snprintf(GLIBC_2.2) [SUSv3] | sprintf(GLIBC_2.2) [SUSv3] |
| sscanf(GLIBC_2.2) [LSB] | telldir(GLIBC_2.2) [SUSv3] | tempnam(GLIBC_2.2) [SUSv3] | ungetc(GLIBC_2.2) [SUSv3] |
| vasprintf(GLIBC_2.2) [LSB] | vdprintf(GLIBC_2.2) [LSB] | vfprintf(GLIBC_2.2) [SUSv3] | vprintf(GLIBC_2.2) [SUSv3] |
| vsnprintf(GLIBC_2.2) [SUSv3] | vsprintf(GLIBC_2.2) [SUSv3] | | |

An LSB conforming implementation shall provide the architecture specific data interfaces for Standard I/O specified in Table 11-6, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-6 libc - Standard I/O Data Interfaces**

| | | | |
|---|---|---|---|
| stderr(GLIBC_2.2) [SUSv3] | stdin(GLIBC_2.2) [SUSv3] | stdout(GLIBC_2.2) [SUSv3] | |

 

## 11.2.4 Signal Handling

### 11.2.4.1 Interfaces for Signal Handling

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

**Table 11-7 libc - Signal Handling Function Interfaces**

| | | | |
|---|---|---|---|
| __libc_current_sigrtmax(GLIBC_2.2) [LSB] | __libc_current_sigrtmin(GLIBC_2.2) [LSB] | __sigsetjmp(GLIBC_2.2) [LSB] | __sysv_signal(GLIBC_2.2) [LSB] |
| __xpg_sigpause(GLIBC_2.2) [LSB] | bsd_signal(GLIBC_2.2) [SUSv3] | psignal(GLIBC_2.2) [LSB] | raise(GLIBC_2.2) [SUSv3] |
| sigaction(GLIBC_2.2) [SUSv3] | sigaddset(GLIBC_2.2) [SUSv3] | sigaltstack(GLIBC_2.2) [SUSv3] | sigandset(GLIBC_2.2) [LSB] |
| sigdelset(GLIBC_2.2) [SUSv3] | sigemptyset(GLIBC_2.2) [SUSv3] | sigfillset(GLIBC_2.2) [SUSv3] | sighold(GLIBC_2.2) [SUSv3] |
| sigignore(GLIBC_2.2) [SUSv3] | siginterrupt(GLIBC_2.2) [SUSv3] | sigisemptyset(GLIBC_2.2) [LSB] | sigismember(GLIBC_2.2) [SUSv3] |
| siglongjmp(GLIBC_2.2) [SUSv3] | signal(GLIBC_2.2) [SUSv3] | sigorset(GLIBC_2.2) [LSB] | sigpause(GLIBC_2.2) [LSB] |
| sigpending(GLIBC_2.2) [SUSv3] | sigprocmask(GLIBC_2.2) [SUSv3] | sigqueue(GLIBC_2.2) [SUSv3] | sigrelse(GLIBC_2.2) [SUSv3] |
| sigreturn(GLIBC_2.2) [LSB] | sigset(GLIBC_2.2) [SUSv3] | sigsuspend(GLIBC_2.2) [SUSv3] | sigtimedwait(GLIBC_2.2) [SUSv3] |
| sigwait(GLIBC_2.2) [SUSv3] | sigwaitinfo(GLIBC_2.2) [SUSv3] | | |

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

> **Note:** These interfaces are deprecated, and applications should avoid using them. These interfaces may be withdrawn in future releases of this specification.

**Table 11-8 libc - Signal Handling Deprecated Function Interfaces**

| | | | |
|---|---|---|---|
| sigpause(GLIBC_2.2) [LSB] | | | |

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

**Table 11-9 libc - Signal Handling Data Interfaces**

| | | | |
|---|---|---|---|
| _sys_siglist(GLIBC_2.3.3) [LSB] | | | |

## 11.2.5 Localization Functions

### 11.2.5.1 Interfaces for Localization Functions

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

**Table 11-10 libc - Localization Functions Function Interfaces**

| | | | |
|---|---|---|---|
| bind_textdomain_codeset(GLIBC_2.2) [LSB] | bindtextdomain(GLIBC_2.2) [LSB] | catclose(GLIBC_2.2) [SUSv3] | catgets(GLIBC_2.2) [SUSv3] |
| catopen(GLIBC_2.2) [SUSv3] | dcgettext(GLIBC_2.2) [LSB] | dcngettext(GLIBC_2.2) [LSB] | dgettext(GLIBC_2.2) [LSB] |
| dngettext(GLIBC_2.2) [LSB] | gettext(GLIBC_2.2) [LSB] | iconv(GLIBC_2.2) [SUSv3] | iconv_close(GLIBC_2.2) [SUSv3] |
| iconv_open(GLIBC_2.2) [SUSv3] | localeconv(GLIBC_2.2) [SUSv3] | ngettext(GLIBC_2.2) [LSB] | nl_langinfo(GLIBC_2.2) [SUSv3] |
| setlocale(GLIBC_2.2) [SUSv3] | textdomain(GLIBC_2.2) [LSB] | | |

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

**Table 11-11 libc - Localization Functions Data Interfaces**

| | | | |
|---|---|---|---|
| _nl_msg_cat_cntr (GLIBC_2.2) [LSB] | | | |

## 11.2.6 Posix Spawn Option

### 11.2.6.1 Interfaces for Posix Spawn Option

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

**Table 11-12 libc - Posix Spawn Option Function Interfaces**

| | | | |
|---|---|---|---|
| posix_spawn(GLIBC_2.2) [SUSv3] | posix_spawn_file_actions_addclose(GLIBC_2.2) [SUSv3] | posix_spawn_file_actions_adddup2(GLIBC_2.2) [SUSv3] | posix_spawn_file_actions_addopen(GLIBC_2.2) [SUSv3] |
| posix_spawn_file_actions_destroy (GLIBC_2.2) [SUSv3] | posix_spawn_file_actions_init(GLIBC_2.2) [SUSv3] | posix_spawnattr_destroy(GLIBC_2.2) [SUSv3] | posix_spawnattr_getflags(GLIBC_2.2) [SUSv3] |
| posix_spawnattr_getpgroup(GLIBC_2.2) [SUSv3] | posix_spawnattr_getschedparam(GLIBC_2.2) | posix_spawnattr_getschedpolicy(GLIBC_2.2) | posix_spawnattr_getsigdefault(GLIBC_2.2) |

 

| | | | |
|---|---|---|---|
| | [SUSv3] | [SUSv3] | [SUSv3] |
| posix_spawnattr_getsigmask(GLIBC_2.2) [SUSv3] | posix_spawnattr_init(GLIBC_2.2) [SUSv3] | posix_spawnattr_setflags(GLIBC_2.2) [SUSv3] | posix_spawnattr_setpgroup(GLIBC_2.2) [SUSv3] |
| posix_spawnattr_setschedparam(GLIBC_2.2) [SUSv3] | posix_spawnattr_setschedpolicy(GLIBC_2.2) [SUSv3] | posix_spawnattr_setsigdefault(GLIBC_2.2) [SUSv3] | posix_spawnattr_setsigmask(GLIBC_2.2) [SUSv3] |
| posix_spawnp(GLIBC_2.2) [SUSv3] | | | |

## 11.2.7 Posix Advisory Option

### 11.2.7.1 Interfaces for Posix Advisory Option

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

**Table 11-13 libc - Posix Advisory Option Function Interfaces**

| | | | |
|---|---|---|---|
| posix_fadvise(GLIBC_2.2) [SUSv3] | posix_fallocate(GLIBC_2.2) [SUSv3] | posix_madvise(GLIBC_2.2) [SUSv3] | posix_memalign(GLIBC_2.2) [SUSv3] |

## 11.2.8 Socket Interface

### 11.2.8.1 Interfaces for Socket Interface

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

**Table 11-14 libc - Socket Interface Function Interfaces**

| | | | |
|---|---|---|---|
| __h_errno_location(GLIBC_2.2) [LSB] | accept(GLIBC_2.2) [SUSv3] | bind(GLIBC_2.2) [SUSv3] | bindresvport(GLIBC_2.2) [LSB] |
| connect(GLIBC_2.2) [SUSv3] | gethostid(GLIBC_2.2) [SUSv3] | gethostname(GLIBC_2.2) [SUSv3] | getpeername(GLIBC_2.2) [SUSv3] |
| getsockname(GLIBC_2.2) [SUSv3] | getsockopt(GLIBC_2.2) [LSB] | if_freenameindex(GLIBC_2.2) [SUSv3] | if_indextoname(GLIBC_2.2) [SUSv3] |
| if_nameindex(GLIBC_2.2) [SUSv3] | if_nametoindex(GLIBC_2.2) [SUSv3] | listen(GLIBC_2.2) [SUSv3] | recv(GLIBC_2.2) [SUSv3] |
| recvfrom(GLIBC_2.2) [SUSv3] | recvmsg(GLIBC_2.2) [SUSv3] | send(GLIBC_2.2) [SUSv3] | sendmsg(GLIBC_2.2) [SUSv3] |
| sendto(GLIBC_2.2) [SUSv3] | setsockopt(GLIBC_2.2) [LSB] | shutdown(GLIBC_2.2) [SUSv3] | sockatmark(GLIBC_2.2.4) |

| | | | |
|---|---|---|---|
| | | | [SUSv3] |
| socket(GLIBC_2.2) [SUSv3] | socketpair(GLIBC_2.2) [SUSv3] | | |

An LSB conforming implementation shall provide the architecture specific data interfaces for Socket Interface specified in Table 11-15, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-15 libc - Socket Interface Data Interfaces**

| | | | |
|---|---|---|---|
| in6addr_any(GLIBC_2.2) [SUSv3] | in6addr_loopback(GLIBC_2.2) [SUSv3] | | |

## 11.2.9 Wide Characters

### 11.2.9.1 Interfaces for Wide Characters

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

**Table 11-16 libc - Wide Characters Function Interfaces**

| | | | |
|---|---|---|---|
| __wcstod_internal(GLIBC_2.2) [LSB] | __wcstof_internal(GLIBC_2.2) [LSB] | __wcstol_internal(GLIBC_2.2) [LSB] | __wcstold_internal(GLIBC_2.2) [LSB] |
| __wcstoul_internal(GLIBC_2.2) [LSB] | btowc(GLIBC_2.2) [SUSv3] | fgetwc(GLIBC_2.2) [SUSv3] | fgetws(GLIBC_2.2) [SUSv3] |
| fputwc(GLIBC_2.2) [SUSv3] | fputws(GLIBC_2.2) [SUSv3] | fwide(GLIBC_2.2) [SUSv3] | fwprintf(GLIBC_2.2) [SUSv3] |
| fwscanf(GLIBC_2.2) [LSB] | getwc(GLIBC_2.2) [SUSv3] | getwchar(GLIBC_2.2) [SUSv3] | mblen(GLIBC_2.2) [SUSv3] |
| mbrlen(GLIBC_2.2) [SUSv3] | mbrtowc(GLIBC_2.2) [SUSv3] | mbsinit(GLIBC_2.2) [SUSv3] | mbsnrtowcs(GLIBC_2.2) [LSB] |
| mbsrtowcs(GLIBC_2.2) [SUSv3] | mbstowcs(GLIBC_2.2) [SUSv3] | mbtowc(GLIBC_2.2) [SUSv3] | putwc(GLIBC_2.2) [SUSv3] |
| putwchar(GLIBC_2.2) [SUSv3] | swprintf(GLIBC_2.2) [SUSv3] | swscanf(GLIBC_2.2) [LSB] | towctrans(GLIBC_2.2) [SUSv3] |
| towlower(GLIBC_2.2) [SUSv3] | towupper(GLIBC_2.2) [SUSv3] | ungetwc(GLIBC_2.2) [SUSv3] | vfwprintf(GLIBC_2.2) [SUSv3] |
| vfwscanf(GLIBC_2.2) [LSB] | vswprintf(GLIBC_2.2) [SUSv3] | vswscanf(GLIBC_2.2) [LSB] | vwprintf(GLIBC_2.2) [SUSv3] |
| vwscanf(GLIBC_2.2) [LSB] | wcpcpy(GLIBC_2.2) [LSB] | wcpncpy(GLIBC_2.2) [LSB] | wcrtomb(GLIBC_2.2) [SUSv3] |
| wcscasecmp(GLIBC_2.2) [LSB] | wcscat(GLIBC_2.2) [SUSv3] | wcschr(GLIBC_2.2) [SUSv3] | wcscmp(GLIBC_2.2) [SUSv3] |
| wcscoll(GLIBC_2 | wcscpy(GLIBC_2 | wcscspn(GLIBC_ | wcsdup(GLIBC_ |

 

| | | | |
|---|---|---|---|
| .2) [SUSv3] | .2) [SUSv3] | 2.2) [SUSv3] | 2.2) [LSB] |
| wcsftime(GLIBC_2.2) [SUSv3] | wcslen(GLIBC_2.2) [SUSv3] | wcsncasecmp(GLIBC_2.2) [LSB] | wcsncat(GLIBC_2.2) [SUSv3] |
| wcsncmp(GLIBC_2.2) [SUSv3] | wcsncpy(GLIBC_2.2) [SUSv3] | wcsnlen(GLIBC_2.2) [LSB] | wcsnrtombs(GLIBC_2.2) [LSB] |
| wcspbrk(GLIBC_2.2) [SUSv3] | wcsrchr(GLIBC_2.2) [SUSv3] | wcsrtombs(GLIBC_2.2) [SUSv3] | wcsspn(GLIBC_2.2) [SUSv3] |
| wcsstr(GLIBC_2.2) [SUSv3] | wcstod(GLIBC_2.2) [SUSv3] | wcstof(GLIBC_2.2) [SUSv3] | wcstoimax(GLIBC_2.2) [SUSv3] |
| wcstok(GLIBC_2.2) [SUSv3] | wcstol(GLIBC_2.2) [SUSv3] | wcstold(GLIBC_2.2) [SUSv3] | wcstoll(GLIBC_2.2) [SUSv3] |
| wcstombs(GLIBC_2.2) [SUSv3] | wcstoq(GLIBC_2.2) [LSB] | wcstoul(GLIBC_2.2) [SUSv3] | wcstoull(GLIBC_2.2) [SUSv3] |
| wcstoumax(GLIBC_2.2) [SUSv3] | wcstouq(GLIBC_2.2) [LSB] | wcswcs(GLIBC_2.2) [SUSv3] | wcswidth(GLIBC_2.2) [SUSv3] |
| wcsxfrm(GLIBC_2.2) [SUSv3] | wctob(GLIBC_2.2) [SUSv3] | wctomb(GLIBC_2.2) [SUSv3] | wctrans(GLIBC_2.2) [SUSv3] |
| wctype(GLIBC_2.2) [SUSv3] | wcwidth(GLIBC_2.2) [SUSv3] | wmemchr(GLIBC_2.2) [SUSv3] | wmemcmp(GLIBC_2.2) [SUSv3] |
| wmemcpy(GLIBC_2.2) [SUSv3] | wmemmove(GLIBC_2.2) [SUSv3] | wmemset(GLIBC_2.2) [SUSv3] | wprintf(GLIBC_2.2) [SUSv3] |
| wscanf(GLIBC_2.2) [LSB] | | | |

## 11.2.10 String Functions

### 11.2.10.1 Interfaces for String Functions

An LSB conforming implementation shall provide the architecture specific functions for String Functions specified in Table 11-17, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-17 libc - String Functions Function Interfaces**

| | | | |
|---|---|---|---|
| __mempcpy(GLIBC_2.2) [LSB] | __rawmemchr(GLIBC_2.2) [LSB] | __stpcpy(GLIBC_2.2) [LSB] | __strdup(GLIBC_2.2) [LSB] |
| __strtod_internal(GLIBC_2.2) [LSB] | __strtof_internal(GLIBC_2.2) [LSB] | __strtok_r(GLIBC_2.2) [LSB] | __strtol_internal(GLIBC_2.2) [LSB] |
| __strtold_internal(GLIBC_2.2) [LSB] | __strtoll_internal(GLIBC_2.2) [LSB] | __strtoul_internal(GLIBC_2.2) [LSB] | __strtoull_internal(GLIBC_2.2) [LSB] |
| __xpg_strerror_r(GLIBC_2.3.4) [LSB] | bcmp(GLIBC_2.2) [SUSv3] | bcopy(GLIBC_2.2) [SUSv3] | bzero(GLIBC_2.2) [SUSv3] |
| ffs(GLIBC_2.2) | index(GLIBC_2.2 | memccpy(GLIBC | memchr(GLIBC_ |

| | | | |
|---|---|---|---|
| [SUSv3] | ) [SUSv3] | _2.2) [SUSv3] | 2.2) [SUSv3] |
| memcmp(GLIBC_2.2) [SUSv3] | memcpy(GLIBC_2.2) [SUSv3] | memmove(GLIBC_2.2) [SUSv3] | memrchr(GLIBC_2.2) [LSB] |
| memset(GLIBC_2.2) [SUSv3] | rindex(GLIBC_2.2) [SUSv3] | stpcpy(GLIBC_2.2) [LSB] | stpncpy(GLIBC_2.2) [LSB] |
| strcasecmp(GLIBC_2.2) [SUSv3] | strcasestr(GLIBC_2.2) [LSB] | strcat(GLIBC_2.2) [SUSv3] | strchr(GLIBC_2.2) [SUSv3] |
| strcmp(GLIBC_2.2) [SUSv3] | strcoll(GLIBC_2.2) [SUSv3] | strcpy(GLIBC_2.2) [SUSv3] | strcspn(GLIBC_2.2) [SUSv3] |
| strdup(GLIBC_2.2) [SUSv3] | strerror(GLIBC_2.2) [SUSv3] | strerror_r(GLIBC_2.2) [LSB] | strfmon(GLIBC_2.2) [SUSv3] |
| strftime(GLIBC_2.2) [SUSv3] | strlen(GLIBC_2.2) [SUSv3] | strncasecmp(GLIBC_2.2) [SUSv3] | strncat(GLIBC_2.2) [SUSv3] |
| strncmp(GLIBC_2.2) [SUSv3] | strncpy(GLIBC_2.2) [SUSv3] | strndup(GLIBC_2.2) [LSB] | strnlen(GLIBC_2.2) [LSB] |
| strpbrk(GLIBC_2.2) [SUSv3] | strptime(GLIBC_2.2) [LSB] | strrchr(GLIBC_2.2) [SUSv3] | strsep(GLIBC_2.2) [LSB] |
| strsignal(GLIBC_2.2) [LSB] | strspn(GLIBC_2.2) [SUSv3] | strstr(GLIBC_2.2) [SUSv3] | strtof(GLIBC_2.2) [SUSv3] |
| strtoimax(GLIBC_2.2) [SUSv3] | strtok(GLIBC_2.2) [SUSv3] | strtok_r(GLIBC_2.2) [SUSv3] | strtold(GLIBC_2.2) [SUSv3] |
| strtoll(GLIBC_2.2) [SUSv3] | strtoq(GLIBC_2.2) [LSB] | strtoull(GLIBC_2.2) [SUSv3] | strtoumax(GLIBC_2.2) [SUSv3] |
| strtouq(GLIBC_2.2) [LSB] | strxfrm(GLIBC_2.2) [SUSv3] | swab(GLIBC_2.2) [SUSv3] | |

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

**Note:** These interfaces are deprecated, and applications should avoid using them. These interfaces may be withdrawn in future releases of this specification.

**Table 11-18 libc - String Functions Deprecated Function Interfaces**

| | | | |
|---|---|---|---|
| strerror_r(GLIBC_2.2) [LSB] | | | |

## 11.2.11 IPC Functions

### 11.2.11.1 Interfaces for IPC Functions

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

**Table 11-19 libc - IPC Functions Function Interfaces**

| | | | |
|---|---|---|---|
| ftok(GLIBC_2.2) | msgctl(GLIBC_2. | msgget(GLIBC_2 | msgrcv(GLIBC_2 |

| | | | |
|---|---|---|---|
| [SUSv3] | 2) [SUSv3] | .2) [SUSv3] | .2) [SUSv3] |
| msgsnd(GLIBC_2.2) [SUSv3] | semctl(GLIBC_2.2) [SUSv3] | semget(GLIBC_2.2) [SUSv3] | semop(GLIBC_2.2) [SUSv3] |
| shmat(GLIBC_2.2) [SUSv3] | shmctl(GLIBC_2.2) [SUSv3] | shmdt(GLIBC_2.2) [SUSv3] | shmget(GLIBC_2.2) [SUSv3] |

## 11.2.12 Regular Expressions

### 11.2.12.1 Interfaces for Regular Expressions

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

**Table 11-20 libc - Regular Expressions Function Interfaces**

| | | | |
|---|---|---|---|
| regcomp(GLIBC_2.2) [SUSv3] | regerror(GLIBC_2.2) [SUSv3] | regexec(GLIBC_2.3.4) [LSB] | regfree(GLIBC_2.2) [SUSv3] |

## 11.2.13 Character Type Functions

### 11.2.13.1 Interfaces for Character Type Functions

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

**Table 11-21 libc - Character Type Functions Function Interfaces**

| | | | |
|---|---|---|---|
| __ctype_get_mb_cur_max(GLIBC_2.2) [LSB] | _tolower(GLIBC_2.2) [SUSv3] | _toupper(GLIBC_2.2) [SUSv3] | isalnum(GLIBC_2.2) [SUSv3] |
| isalpha(GLIBC_2.2) [SUSv3] | isascii(GLIBC_2.2) [SUSv3] | iscntrl(GLIBC_2.2) [SUSv3] | isdigit(GLIBC_2.2) [SUSv3] |
| isgraph(GLIBC_2.2) [SUSv3] | islower(GLIBC_2.2) [SUSv3] | isprint(GLIBC_2.2) [SUSv3] | ispunct(GLIBC_2.2) [SUSv3] |
| isspace(GLIBC_2.2) [SUSv3] | isupper(GLIBC_2.2) [SUSv3] | iswalnum(GLIBC_2.2) [SUSv3] | iswalpha(GLIBC_2.2) [SUSv3] |
| iswblank(GLIBC_2.2) [SUSv3] | iswcntrl(GLIBC_2.2) [SUSv3] | iswctype(GLIBC_2.2) [SUSv3] | iswdigit(GLIBC_2.2) [SUSv3] |
| iswgraph(GLIBC_2.2) [SUSv3] | iswlower(GLIBC_2.2) [SUSv3] | iswprint(GLIBC_2.2) [SUSv3] | iswpunct(GLIBC_2.2) [SUSv3] |
| iswspace(GLIBC_2.2) [SUSv3] | iswupper(GLIBC_2.2) [SUSv3] | iswxdigit(GLIBC_2.2) [SUSv3] | isxdigit(GLIBC_2.2) [SUSv3] |
| toascii(GLIBC_2.2) [SUSv3] | tolower(GLIBC_2.2) [SUSv3] | toupper(GLIBC_2.2) [SUSv3] | |

## 11.2.14 Time Manipulation

### 11.2.14.1 Interfaces for Time Manipulation

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

**Table 11-22 libc - Time Manipulation Function Interfaces**

| | | | |
|---|---|---|---|
| adjtime(GLIBC_2.2) [LSB] | asctime(GLIBC_2.2) [SUSv3] | asctime_r(GLIBC_2.2) [SUSv3] | ctime(GLIBC_2.2) [SUSv3] |
| ctime_r(GLIBC_2.2) [SUSv3] | difftime(GLIBC_2.2) [SUSv3] | gmtime(GLIBC_2.2) [SUSv3] | gmtime_r(GLIBC_2.2) [SUSv3] |
| localtime(GLIBC_2.2) [SUSv3] | localtime_r(GLIBC_2.2) [SUSv3] | mktime(GLIBC_2.2) [SUSv3] | tzset(GLIBC_2.2) [SUSv3] |
| ualarm(GLIBC_2.2) [SUSv3] | | | |

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

**Table 11-23 libc - Time Manipulation Data Interfaces**

| | | | |
|---|---|---|---|
| __daylight(GLIBC_2.2) [LSB] | __timezone(GLIBC_2.2) [LSB] | __tzname(GLIBC_2.2) [LSB] | daylight(GLIBC_2.2) [SUSv3] |
| timezone(GLIBC_2.2) [SUSv3] | tzname(GLIBC_2.2) [SUSv3] | | |

## 11.2.15 Terminal Interface Functions

### 11.2.15.1 Interfaces for Terminal Interface Functions

An LSB conforming implementation shall provide the architecture specific functions for Terminal Interface Functions specified in Table 11-24, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-24 libc - Terminal Interface Functions Function Interfaces**

| | | | |
|---|---|---|---|
| cfgetispeed(GLIBC_2.2) [SUSv3] | cfgetospeed(GLIBC_2.2) [SUSv3] | cfmakeraw(GLIBC_2.2) [LSB] | cfsetispeed(GLIBC_2.2) [SUSv3] |
| cfsetospeed(GLIBC_2.2) [SUSv3] | cfsetspeed(GLIBC_2.2) [LSB] | tcdrain(GLIBC_2.2) [SUSv3] | tcflow(GLIBC_2.2) [SUSv3] |
| tcflush(GLIBC_2.2) [SUSv3] | tcgetattr(GLIBC_2.2) [SUSv3] | tcgetpgrp(GLIBC_2.2) [SUSv3] | tcgetsid(GLIBC_2.2) [SUSv3] |
| tcsendbreak(GLIBC_2.2) [SUSv3] | tcsetattr(GLIBC_2.2) [SUSv3] | tcsetpgrp(GLIBC_2.2) [SUSv3] | |

 

## 11.2.16 System Database Interface

### 11.2.16.1 Interfaces for System Database Interface

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

**Table 11-25 libc - System Database Interface Function Interfaces**

| | | | |
|---|---|---|---|
| endgrent(GLIBC_2.2) [SUSv3] | endprotoent(GLIBC_2.2) [SUSv3] | endpwent(GLIBC_2.2) [SUSv3] | endservent(GLIBC_2.2) [SUSv3] |
| endutent(GLIBC_2.2) [LSB] | endutxent(GLIBC_2.2) [SUSv3] | getgrent(GLIBC_2.2) [SUSv3] | getgrgid(GLIBC_2.2) [SUSv3] |
| getgrgid_r(GLIBC_2.2) [SUSv3] | getgrnam(GLIBC_2.2) [SUSv3] | getgrnam_r(GLIBC_2.2) [SUSv3] | getgrouplist(GLIBC_2.2.4) [LSB] |
| gethostbyaddr(GLIBC_2.2) [SUSv3] | gethostbyaddr_r(GLIBC_2.2) [LSB] | gethostbyname(GLIBC_2.2) [SUSv3] | gethostbyname2(GLIBC_2.2) [LSB] |
| gethostbyname2_r(GLIBC_2.2) [LSB] | gethostbyname_r(GLIBC_2.2) [LSB] | getprotobyname(GLIBC_2.2) [SUSv3] | getprotobynumber(GLIBC_2.2) [SUSv3] |
| getprotoent(GLIBC_2.2) [SUSv3] | getpwent(GLIBC_2.2) [SUSv3] | getpwnam(GLIBC_2.2) [SUSv3] | getpwnam_r(GLIBC_2.2) [SUSv3] |
| getpwuid(GLIBC_2.2) [SUSv3] | getpwuid_r(GLIBC_2.2) [SUSv3] | getservbyname(GLIBC_2.2) [SUSv3] | getservbyport(GLIBC_2.2) [SUSv3] |
| getservent(GLIBC_2.2) [SUSv3] | getutent(GLIBC_2.2) [LSB] | getutent_r(GLIBC_2.2) [LSB] | getutxent(GLIBC_2.2) [SUSv3] |
| getutxid(GLIBC_2.2) [SUSv3] | getutxline(GLIBC_2.2) [SUSv3] | pututxline(GLIBC_2.2) [SUSv3] | setgrent(GLIBC_2.2) [SUSv3] |
| setgroups(GLIBC_2.2) [LSB] | setprotoent(GLIBC_2.2) [SUSv3] | setpwent(GLIBC_2.2) [SUSv3] | setservent(GLIBC_2.2) [SUSv3] |
| setutent(GLIBC_2.2) [LSB] | setutxent(GLIBC_2.2) [SUSv3] | utmpname(GLIBC_2.2) [LSB] | |

An LSB conforming implementation shall provide the architecture specific deprecated functions for System Database Interface specified in Table 11-26, with the full mandatory functionality as described in the referenced underlying specification.

> **Note:** These interfaces are deprecated, and applications should avoid using them. These interfaces may be withdrawn in future releases of this specification.

**Table 11-26 libc - System Database Interface Deprecated Function Interfaces**

| | | | |
|---|---|---|---|
| gethostbyaddr(GLIBC_2.2) [SUSv3] | gethostbyaddr_r(GLIBC_2.2) [LSB] | gethostbyname(GLIBC_2.2) [SUSv3] | gethostbyname2(GLIBC_2.2) [LSB] |
| gethostbyname2 | gethostbyname_r | | |

| | | | |
|---|---|---|---|
| _r(GLIBC_2.2) [LSB] | (GLIBC_2.2) [LSB] | | |

## 11.2.17 Language Support

### 11.2.17.1 Interfaces for Language Support

An LSB conforming implementation shall provide the architecture specific functions for Language Support specified in Table 11-27, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-27 libc - Language Support Function Interfaces**

| | | | |
|---|---|---|---|
| __libc_start_main(GLIBC_2.2) [LSB] | | | |

## 11.2.18 Large File Support

### 11.2.18.1 Interfaces for Large File Support

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

**Table 11-28 libc - Large File Support Function Interfaces**

| | | | |
|---|---|---|---|
| __fxstat64(GLIBC_2.2) [LSB] | __lxstat64(GLIBC_2.2) [LSB] | __xstat64(GLIBC_2.2) [LSB] | creat64(GLIBC_2.2) [LFS] |
| fgetpos64(GLIBC_2.2) [LFS] | fopen64(GLIBC_2.2) [LFS] | freopen64(GLIBC_2.2) [LFS] | fseeko64(GLIBC_2.2) [LFS] |
| fsetpos64(GLIBC_2.2) [LFS] | fstatfs64(GLIBC_2.2) [LSB] | fstatvfs64(GLIBC_2.2) [LFS] | ftello64(GLIBC_2.2) [LFS] |
| ftruncate64(GLIBC_2.2) [LFS] | ftw64(GLIBC_2.2) [LFS] | getrlimit64(GLIBC_2.2) [LFS] | lockf64(GLIBC_2.2) [LFS] |
| mkstemp64(GLIBC_2.2) [LFS] | mmap64(GLIBC_2.2) [LFS] | nftw64(GLIBC_2.3.3) [LFS] | posix_fadvise64(GLIBC_2.2) [LSB] |
| posix_fallocate64(GLIBC_2.2) [LSB] | readdir64(GLIBC_2.2) [LFS] | readdir64_r(GLIBC_2.2) [LSB] | statfs64(GLIBC_2.2) [LSB] |
| statvfs64(GLIBC_2.2) [LFS] | tmpfile64(GLIBC_2.2) [LFS] | truncate64(GLIBC_2.2) [LFS] | |

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

**Note:** These interfaces are deprecated, and applications should avoid using them. These interfaces may be withdrawn in future releases of this specification.

 

**Table 11-29 libc - Large File Support Deprecated Function Interfaces**

| | | | |
|---|---|---|---|
| fstatfs64(GLIBC_2.2) [LSB] | statfs64(GLIBC_2.2) [LSB] | | |

## 11.2.19 Standard Library

### 11.2.19.1 Interfaces for Standard Library

An LSB conforming implementation shall provide the architecture specific functions for Standard Library specified in Table 11-30, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-30 libc - Standard Library Function Interfaces**

| | | | |
|---|---|---|---|
| _Exit(GLIBC_2.2) [SUSv3] | __assert_fail(GLIBC_2.2) [LSB] | __cxa_atexit(GLIBC_2.2) [LSB] | __cxa_finalize(GLIBC_2.2) [LSB] |
| __errno_location(GLIBC_2.2) [LSB] | __fpending(GLIBC_2.2) [LSB] | __getpagesize(GLIBC_2.2) [LSB] | __isinf(GLIBC_2.2) [LSB] |
| __isinff(GLIBC_2.2) [LSB] | __isinfl(GLIBC_2.2) [LSB] | __isnan(GLIBC_2.2) [LSB] | __isnanf(GLIBC_2.2) [LSB] |
| __isnanl(GLIBC_2.2) [LSB] | __sysconf(GLIBC_2.2) [LSB] | __xpg_basename(GLIBC_2.2) [LSB] | _exit(GLIBC_2.2) [SUSv3] |
| _longjmp(GLIBC_2.2) [SUSv3] | _setjmp(GLIBC_2.2) [SUSv3] | a64l(GLIBC_2.2) [SUSv3] | abort(GLIBC_2.2) [SUSv3] |
| abs(GLIBC_2.2) [SUSv3] | atof(GLIBC_2.2) [SUSv3] | atoi(GLIBC_2.2) [SUSv3] | atol(GLIBC_2.2) [SUSv3] |
| atoll(GLIBC_2.2) [SUSv3] | basename(GLIBC_2.2) [LSB] | bsearch(GLIBC_2.2) [SUSv3] | calloc(GLIBC_2.2) [SUSv3] |
| closelog(GLIBC_2.2) [SUSv3] | confstr(GLIBC_2.2) [SUSv3] | cuserid(GLIBC_2.2) [SUSv2] | daemon(GLIBC_2.2) [LSB] |
| dirname(GLIBC_2.2) [SUSv3] | div(GLIBC_2.2) [SUSv3] | drand48(GLIBC_2.2) [SUSv3] | ecvt(GLIBC_2.2) [SUSv3] |
| erand48(GLIBC_2.2) [SUSv3] | err(GLIBC_2.2) [LSB] | error(GLIBC_2.2) [LSB] | errx(GLIBC_2.2) [LSB] |
| fcvt(GLIBC_2.2) [SUSv3] | fmtmsg(GLIBC_2.2) [SUSv3] | fnmatch(GLIBC_2.2.3) [SUSv3] | fpathconf(GLIBC_2.2) [SUSv3] |
| free(GLIBC_2.2) [SUSv3] | freeaddrinfo(GLIBC_2.2) [SUSv3] | ftrylockfile(GLIBC_2.2) [SUSv3] | ftw(GLIBC_2.2) [SUSv3] |
| funlockfile(GLIBC_2.2) [SUSv3] | gai_strerror(GLIBC_2.2) [SUSv3] | gcvt(GLIBC_2.2) [SUSv3] | getaddrinfo(GLIBC_2.2) [SUSv3] |
| getcwd(GLIBC_2.2) [SUSv3] | getdate(GLIBC_2.2) [SUSv3] | getdomainname(GLIBC_2.2) [LSB] | getenv(GLIBC_2.2) [SUSv3] |
| getlogin(GLIBC_2.2) [SUSv3] | getlogin_r(GLIBC_2.2) [SUSv3] | getnameinfo(GLIBC_2.2) [SUSv3] | getopt(GLIBC_2.2) [LSB] |
| getopt_long(GLI | getopt_long_onl | getsubopt(GLIBC | gettimeofday(GL |

| | | | |
|---|---|---|---|
| BC_2.2) [LSB] | y(GLIBC_2.2) [LSB] | _2.2) [SUSv3] | IBC_2.2) [SUSv3] |
| glob(GLIBC_2.2) [SUSv3] | glob64(GLIBC_2.2) [LSB] | globfree(GLIBC_2.2) [SUSv3] | globfree64(GLIBC_2.2) [LSB] |
| grantpt(GLIBC_2.2) [SUSv3] | hcreate(GLIBC_2.2) [SUSv3] | hdestroy(GLIBC_2.2) [SUSv3] | hsearch(GLIBC_2.2) [SUSv3] |
| htonl(GLIBC_2.2) [SUSv3] | htons(GLIBC_2.2) [SUSv3] | imaxabs(GLIBC_2.2) [SUSv3] | imaxdiv(GLIBC_2.2) [SUSv3] |
| inet_addr(GLIBC_2.2) [SUSv3] | inet_aton(GLIBC_2.2) [LSB] | inet_ntoa(GLIBC_2.2) [SUSv3] | inet_ntop(GLIBC_2.2) [SUSv3] |
| inet_pton(GLIBC_2.2) [SUSv3] | initstate(GLIBC_2.2) [SUSv3] | insque(GLIBC_2.2) [SUSv3] | isatty(GLIBC_2.2) [SUSv3] |
| isblank(GLIBC_2.2) [SUSv3] | jrand48(GLIBC_2.2) [SUSv3] | l64a(GLIBC_2.2) [SUSv3] | labs(GLIBC_2.2) [SUSv3] |
| lcong48(GLIBC_2.2) [SUSv3] | ldiv(GLIBC_2.2) [SUSv3] | lfind(GLIBC_2.2) [SUSv3] | llabs(GLIBC_2.2) [SUSv3] |
| lldiv(GLIBC_2.2) [SUSv3] | longjmp(GLIBC_2.2) [SUSv3] | lrand48(GLIBC_2.2) [SUSv3] | lsearch(GLIBC_2.2) [SUSv3] |
| makecontext(GLIBC_2.2) [SUSv3] | malloc(GLIBC_2.2) [SUSv3] | memmem(GLIBC_2.2) [LSB] | mkstemp(GLIBC_2.2) [SUSv3] |
| mktemp(GLIBC_2.2) [SUSv3] | mrand48(GLIBC_2.2) [SUSv3] | nftw(GLIBC_2.3.3) [SUSv3] | nrand48(GLIBC_2.2) [SUSv3] |
| ntohl(GLIBC_2.2) [SUSv3] | ntohs(GLIBC_2.2) [SUSv3] | openlog(GLIBC_2.2) [SUSv3] | perror(GLIBC_2.2) [SUSv3] |
| posix_openpt(GLIBC_2.2.1) [SUSv3] | ptsname(GLIBC_2.2) [SUSv3] | putenv(GLIBC_2.2) [SUSv3] | qsort(GLIBC_2.2) [SUSv3] |
| rand(GLIBC_2.2) [SUSv3] | rand_r(GLIBC_2.2) [SUSv3] | random(GLIBC_2.2) [SUSv3] | realloc(GLIBC_2.2) [SUSv3] |
| realpath(GLIBC_2.3) [SUSv3] | remque(GLIBC_2.2) [SUSv3] | seed48(GLIBC_2.2) [SUSv3] | setenv(GLIBC_2.2) [SUSv3] |
| sethostname(GLIBC_2.2) [LSB] | setlogmask(GLIBC_2.2) [SUSv3] | setstate(GLIBC_2.2) [SUSv3] | srand(GLIBC_2.2) [SUSv3] |
| srand48(GLIBC_2.2) [SUSv3] | srandom(GLIBC_2.2) [SUSv3] | strtod(GLIBC_2.2) [SUSv3] | strtol(GLIBC_2.2) [SUSv3] |
| strtoul(GLIBC_2.2) [SUSv3] | swapcontext(GLIBC_2.2) [SUSv3] | syslog(GLIBC_2.2) [SUSv3] | system(GLIBC_2.2) [LSB] |
| tdelete(GLIBC_2.2) [SUSv3] | tfind(GLIBC_2.2) [SUSv3] | tmpfile(GLIBC_2.2) [SUSv3] | tmpnam(GLIBC_2.2) [SUSv3] |
| tsearch(GLIBC_2.2) [SUSv3] | ttyname(GLIBC_2.2) [SUSv3] | ttyname_r(GLIBC_2.2) [SUSv3] | twalk(GLIBC_2.2) [SUSv3] |
| unlockpt(GLIBC_2.2) [SUSv3] | unsetenv(GLIBC_2.2) [SUSv3] | usleep(GLIBC_2.2) [SUSv3] | verrx(GLIBC_2.2) [LSB] |

 

| | | | |
|---|---|---|---|
| vfscanf(GLIBC_2.2) [LSB] | vscanf(GLIBC_2.2) [LSB] | vsscanf(GLIBC_2.2) [LSB] | vsyslog(GLIBC_2.2) [LSB] |
| warn(GLIBC_2.2) [LSB] | warnx(GLIBC_2.2) [LSB] | wordexp(GLIBC_2.2.2) [SUSv3] | wordfree(GLIBC_2.2) [SUSv3] |

An LSB conforming implementation shall provide the architecture specific deprecated functions for Standard Library specified in Table 11-31, with the full mandatory functionality as described in the referenced underlying specification.

**Note:** These interfaces are deprecated, and applications should avoid using them. These interfaces may be withdrawn in future releases of this specification.

**Table 11-31 libc - Standard Library Deprecated Function Interfaces**

| | | | |
|---|---|---|---|
| basename(GLIBC_2.2) [LSB] | getdomainname(GLIBC_2.2) [LSB] | inet_aton(GLIBC_2.2) [LSB] | |

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

**Table 11-32 libc - Standard Library Data Interfaces**

| | | | |
|---|---|---|---|
| __environ(GLIBC_2.2) [LSB] | _environ(GLIBC_2.2) [LSB] | _sys_errlist(GLIBC_2.3) [LSB] | environ(GLIBC_2.2) [SUSv3] |
| getdate_err(GLIBC_2.2) [SUSv3] | optarg(GLIBC_2.2) [SUSv3] | opterr(GLIBC_2.2) [SUSv3] | optind(GLIBC_2.2) [SUSv3] |
| optopt(GLIBC_2.2) [SUSv3] | | | |

## 11.3 Data Definitions for libc

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

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

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

### 11.3.1 ctype.h

```
enum {
    _ISupper = 256,
    _ISlower = 512,
```

```
    _ISalpha = 1024,
    _ISdigit = 2048,
    _ISxdigit = 4096,
    _ISspace = 8192,
    _ISprint = 16384,
    _ISgraph = 32768,
    _ISblank = 1,
    _IScntrl = 2,
    _ISpunct = 4,
    _ISalnum = 8
};
```

### 11.3.2 dirent.h

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

### 11.3.3 errno.h

```
#define EDEADLOCK       EDEADLK
```

### 11.3.4 fcntl.h

```
#define O_LARGEFILE     0

#define F_GETLK64       5
#define F_SETLK64       6
#define F_SETLKW64      7
```

### 11.3.5 fnmatch.h

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

### 11.3.6 ftw.h

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

### 11.3.7 getopt.h

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

### 11.3.8 glob.h

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

 

```
 */
```

### 11.3.9 iconv.h

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

### 11.3.10 langinfo.h

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

### 11.3.11 limits.h

```
#define LONG_MAX        0x7FFFFFFFFFFFFFFFL
#define ULONG_MAX       0xFFFFFFFFFFFFFFFFUL

#define CHAR_MAX        SCHAR_MAX
#define CHAR_MIN        SCHAR_MIN

#define PTHREAD_STACK_MIN       196608
```

### 11.3.12 locale.h

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

### 11.3.13 net/if.h

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

### 11.3.14 netdb.h

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

### 11.3.15 netinet/in.h

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

### 11.3.16 netinet/ip.h

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

### 11.3.17 netinet/tcp.h

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

### 11.3.18 netinet/udp.h

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

### 11.3.19 nl_types.h

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

### 11.3.20 pwd.h

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

### 11.3.21 regex.h

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

### 11.3.22 rpc/auth.h

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

### 11.3.23 rpc/clnt.h

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

### 11.3.24 rpc/rpc_msg.h

 

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

### 11.3.25 rpc/svc.h

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

### 11.3.26 rpc/types.h

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

### 11.3.27 rpc/xdr.h

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

### 11.3.28 sched.h

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

### 11.3.29 search.h

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

### 11.3.30 setjmp.h

```
typedef long int __jmp_buf[70] __attribute__ ((aligned(16)));
```

### 11.3.31 signal.h

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

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

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

```
};

#define MINSIGSTKSZ     131027
#define SIGSTKSZ        262144

struct ia64_fpreg {
    union {
        unsigned long int bits[2];
        long double __dummy;
    } u;
};

struct sigcontext {
    unsigned long int sc_flags;
    unsigned long int sc_nat;
    stack_t sc_stack;
    unsigned long int sc_ip;
    unsigned long int sc_cfm;
    unsigned long int sc_um;
    unsigned long int sc_ar_rsc;
    unsigned long int sc_ar_bsp;
    unsigned long int sc_ar_rnat;
    unsigned long int sc_ar_ccv;
    unsigned long int sc_ar_unat;
    unsigned long int sc_ar_fpsr;
    unsigned long int sc_ar_pfs;
    unsigned long int sc_ar_lc;
    unsigned long int sc_pr;
    unsigned long int sc_br[8];
    unsigned long int sc_gr[32];
    struct ia64_fpreg sc_fr[128];
    unsigned long int sc_rbs_base;
    unsigned long int sc_loadrs;
    unsigned long int sc_ar25;
    unsigned long int sc_ar26;
    unsigned long int sc_rsvd[12];
    unsigned long int sc_mask;
};
```

### 11.3.32 spawn.h

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

### 11.3.33 stddef.h

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

### 11.3.34 stdint.h

```
#define INT64_C(c)      c ## L
#define INTMAX_C(c)     c ## L
#define __INT64_C(c)    c ## L
#define UINT64_C(c)     c ## UL
#define UINTMAX_C(c)    c ## UL
#define __UINT64_C(c)   c ## UL

#define INTPTR_MIN      (-9223372036854775807L-1)
```

 

```
#define INT_FAST16_MIN  (-9223372036854775807L-1)
#define INT_FAST32_MIN  (-9223372036854775807L-1)
#define PTRDIFF_MIN     (-9223372036854775807L-1)
#define SIZE_MAX        (18446744073709551615UL)
#define UINTPTR_MAX     (18446744073709551615UL)
#define UINT_FAST16_MAX (18446744073709551615UL)
#define UINT_FAST32_MAX (18446744073709551615UL)
#define INTPTR_MAX      (9223372036854775807L)
#define INT_FAST16_MAX  (9223372036854775807L)
#define INT_FAST32_MAX  (9223372036854775807L)
#define PTRDIFF_MAX     (9223372036854775807L)

typedef long int int64_t;
typedef long int intmax_t;
typedef unsigned long int uintmax_t;
typedef long int intptr_t;
typedef unsigned long int uintptr_t;
typedef unsigned long int uint64_t;
typedef long int int_least64_t;
typedef unsigned long int uint_least64_t;
typedef long int int_fast16_t;
typedef long int int_fast32_t;
typedef long int int_fast64_t;
typedef unsigned long int uint_fast16_t;
typedef unsigned long int uint_fast32_t;
typedef unsigned long int uint_fast64_t;
```

### 11.3.35 stdio.h

```
#define __IO_FILE_SIZE  216
```

### 11.3.36 stdlib.h

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

### 11.3.37 sys/file.h

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

### 11.3.38 sys/ioctl.h

```
#define TIOCGWINSZ      0x5413
#define FIONREAD        0x541B
#define TIOCNOTTY       0x5422
```

### 11.3.39 sys/ipc.h

```
struct ipc_perm {
    key_t __key;
    uid_t uid;
    gid_t gid;
    uid_t cuid;
    uid_t cgid;
    mode_t mode;
```

```
    unsigned short __seq;
    unsigned short __pad1;
    unsigned long int __unused1;
    unsigned long int __unused2;
};
```

### 11.3.40 sys/mman.h

```
#define MCL_CURRENT     1
#define MCL_FUTURE      2
```

### 11.3.41 sys/msg.h

```
struct msqid_ds {
    struct ipc_perm msg_perm;
    time_t msg_stime;
    time_t msg_rtime;
    time_t msg_ctime;
    unsigned long int __msg_cbytes;
    unsigned long int msg_qnum;
    unsigned long int msg_qbytes;
    pid_t msg_lspid;
    pid_t msg_lrpid;
    unsigned long int __unused1;
    unsigned long int __unused2;
};
```

### 11.3.42 sys/param.h

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

### 11.3.43 sys/poll.h

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

### 11.3.44 sys/resource.h

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

### 11.3.45 sys/sem.h

```
struct semid_ds {
    struct ipc_perm sem_perm;
    time_t sem_otime;
    time_t sem_ctime;
    unsigned long int sem_nsems;
    unsigned long int __unused1;
    unsigned long int __unused2;
};
```

 

### 11.3.46 sys/shm.h

```
#define SHMLBA  (1024*1024)

struct shmid_ds {
    struct ipc_perm shm_perm;
    size_t shm_segsz;
    time_t shm_atime;
    time_t shm_dtime;
    time_t shm_ctime;
    pid_t shm_cpid;
    pid_t shm_lpid;
    unsigned long int shm_nattch;
    unsigned long int __unused1;
    unsigned long int __unused2;
};
```

### 11.3.47 sys/socket.h

```
typedef uint64_t __ss_aligntype;

#define SO_RCVLOWAT     18
#define SO_SNDLOWAT     19
#define SO_RCVTIMEO     20
#define SO_SNDTIMEO     21
```

### 11.3.48 sys/stat.h

```
#define _STAT_VER       1

struct stat {
    dev_t st_dev;
    ino_t st_ino;
    nlink_t st_nlink;
    mode_t st_mode;
    uid_t st_uid;
    gid_t st_gid;
    unsigned int pad0;
    dev_t st_rdev;
    off_t st_size;
    struct timespec st_atim;
    struct timespec st_mtim;
    struct timespec st_ctim;
    blksize_t st_blksize;
    blkcnt_t st_blocks;
    unsigned long int __unused[3];
};
struct stat64 {
    dev_t st_dev;
    ino64_t st_ino;
    nlink_t st_nlink;
    mode_t st_mode;
    uid_t st_uid;
    gid_t st_gid;
    unsigned int pad0;
    dev_t st_rdev;
    off_t st_size;
    struct timespec st_atim;
    struct timespec st_mtim;
    struct timespec st_ctim;
    blksize_t st_blksize;
    blkcnt64_t st_blocks;
```

 

```
    unsigned long int __unused[3];
};
```

### 11.3.49 sys/statfs.h

```
struct statfs {
    long int f_type;
    long int f_bsize;
    fsblkcnt_t f_blocks;
    fsblkcnt_t f_bfree;
    fsblkcnt_t f_bavail;
    fsfilcnt_t f_files;
    fsfilcnt_t f_ffree;
    fsid_t f_fsid;
    long int f_namelen;
    long int f_frsize;
    long int f_spare[5];
};
struct statfs64 {
    long int f_type;
    long int f_bsize;
    fsblkcnt64_t f_blocks;
    fsblkcnt64_t f_bfree;
    fsblkcnt64_t f_bavail;
    fsfilcnt64_t f_files;
    fsfilcnt64_t f_ffree;
    fsid_t f_fsid;
    long int f_namelen;
    long int f_frsize;
    long int f_spare[5];
};
```

### 11.3.50 sys/statvfs.h

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

 

### 11.3.51 sys/time.h

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

### 11.3.52 sys/timeb.h

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

### 11.3.53 sys/times.h

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

### 11.3.54 sys/types.h

```
typedef int64_t ssize_t;

#define __FDSET_LONGS   16
```

### 11.3.55 sys/un.h

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

### 11.3.56 sys/utsname.h

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

### 11.3.57 sys/wait.h

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

### 11.3.58 syslog.h

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

 

### 11.3.59 termios.h

```
#define OLCUC   0000002
#define ONLCR   0000004
#define XCASE   0000004
#define NLDLY   0000400
#define CR1     0001000
#define IUCLC   0001000
#define CR2     0002000
#define CR3     0003000
#define CRDLY   0003000
#define TAB1    0004000
#define TAB2    0010000
#define TAB3    0014000
#define TABDLY  0014000
#define BS1     0020000
#define BSDLY   0020000
#define VT1     0040000
#define VTDLY   0040000
#define FF1     0100000
#define FFDLY   0100000

#define VSUSP   10
#define VEOL    11
#define VREPRINT        12
#define VDISCARD        13
#define VWERASE 14
#define VEOL2   16
#define VMIN    6
#define VSWTC   7
#define VSTART  8
#define VSTOP   9

#define IXON    0002000
#define IXOFF   0010000

#define CS6     0000020
#define CS7     0000040
#define CS8     0000060
#define CSIZE   0000060
#define CSTOPB  0000100
#define CREAD   0000200
#define PARENB  0000400
#define PARODD  0001000
#define HUPCL   0002000
#define CLOCAL  0004000
#define VTIME   5

#define ISIG    0000001
#define ICANON  0000002
#define ECHOE   0000020
#define ECHOK   0000040
#define ECHONL  0000100
#define NOFLSH  0000200
#define TOSTOP  0000400
#define ECHOCTL 0001000
#define ECHOPRT 0002000
#define ECHOKE  0004000
#define FLUSHO  0010000
#define PENDIN  0040000
#define IEXTEN  0100000
```

### 11.3.60 ucontext.h

 

```
#define _SC_GR0_OFFSET  \
        (((char *) &((struct sigcontext *) 0)->sc_gr[0]) - (char
*) 0)

typedef struct sigcontext mcontext_t;

typedef struct ucontext {
    union {
        mcontext_t _mc;
        struct {
            unsigned long int _pad[_SC_GR0_OFFSET / 8];
            struct ucontext *_link;
        } _uc;
    } _u;
} ucontext_t;
```

### 11.3.61 ulimit.h

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

### 11.3.62 unistd.h

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

### 11.3.63 utime.h

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

### 11.3.64 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];
};
```

 

### 11.3.65 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];
};
```

### 11.3.66 wctype.h

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

### 11.3.67 wordexp.h

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

## 11.4 Interfaces for libm

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

**Table 11-33 libm Definition**

| | |
|---|---|
| Library: | libm |
| SONAME: | libm.so.6.1 |

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

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

### 11.4.1 Math

#### 11.4.1.1 Interfaces for Math

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

**Table 11-34 libm - Math Function Interfaces**

| | | | |
|---|---|---|---|
| __finite(GLIBC_2 | __finitef(GLIBC_ | __finitel(GLIBC_ | __fpclassify(GLI |

 

| | | | |
|---|---|---|---|
| .2) [LSB] | 2.2) [LSB] | 2.2) [LSB] | BC_2.2) [LSB] |
| __fpclassifyf(GLIBC_2.2) [LSB] | __fpclassifyl(GLIBC_2.2) [LSB] | __signbit(GLIBC_2.2) [LSB] | __signbitf(GLIBC_2.2) [LSB] |
| __signbitl(GLIBC_2.2) [ISOC99] | acos(GLIBC_2.2) [SUSv3] | acosf(GLIBC_2.2) [SUSv3] | acosh(GLIBC_2.2) [SUSv3] |
| acoshf(GLIBC_2.2) [SUSv3] | acoshl(GLIBC_2.2) [SUSv3] | acosl(GLIBC_2.2) [SUSv3] | asin(GLIBC_2.2) [SUSv3] |
| asinf(GLIBC_2.2) [SUSv3] | asinh(GLIBC_2.2) [SUSv3] | asinhf(GLIBC_2.2) [SUSv3] | asinhl(GLIBC_2.2) [SUSv3] |
| asinl(GLIBC_2.2) [SUSv3] | atan(GLIBC_2.2) [SUSv3] | atan2(GLIBC_2.2) [SUSv3] | atan2f(GLIBC_2.2) [SUSv3] |
| atan2l(GLIBC_2.2) [SUSv3] | atanf(GLIBC_2.2) [SUSv3] | atanh(GLIBC_2.2) [SUSv3] | atanhf(GLIBC_2.2) [SUSv3] |
| atanhl(GLIBC_2.2) [SUSv3] | atanl(GLIBC_2.2) [SUSv3] | cabs(GLIBC_2.2) [SUSv3] | cabsf(GLIBC_2.2) [SUSv3] |
| cabsl(GLIBC_2.2) [SUSv3] | cacos(GLIBC_2.2) [SUSv3] | cacosf(GLIBC_2.2) [SUSv3] | cacosh(GLIBC_2.2) [SUSv3] |
| cacoshf(GLIBC_2.2) [SUSv3] | cacoshl(GLIBC_2.2) [SUSv3] | cacosl(GLIBC_2.2) [SUSv3] | carg(GLIBC_2.2) [SUSv3] |
| cargf(GLIBC_2.2) [SUSv3] | cargl(GLIBC_2.2) [SUSv3] | casin(GLIBC_2.2) [SUSv3] | casinf(GLIBC_2.2) [SUSv3] |
| casinh(GLIBC_2.2) [SUSv3] | casinhf(GLIBC_2.2) [SUSv3] | casinhl(GLIBC_2.2) [SUSv3] | casinl(GLIBC_2.2) [SUSv3] |
| catan(GLIBC_2.2) [SUSv3] | catanf(GLIBC_2.2) [SUSv3] | catanh(GLIBC_2.2) [SUSv3] | catanhf(GLIBC_2.2) [SUSv3] |
| catanhl(GLIBC_2.2) [SUSv3] | catanl(GLIBC_2.2) [SUSv3] | cbrt(GLIBC_2.2) [SUSv3] | cbrtf(GLIBC_2.2) [SUSv3] |
| cbrtl(GLIBC_2.2) [SUSv3] | ccos(GLIBC_2.2) [SUSv3] | ccosf(GLIBC_2.2) [SUSv3] | ccosh(GLIBC_2.2) [SUSv3] |
| ccoshf(GLIBC_2.2) [SUSv3] | ccoshl(GLIBC_2.2) [SUSv3] | ccosl(GLIBC_2.2) [SUSv3] | ceil(GLIBC_2.2) [SUSv3] |
| ceilf(GLIBC_2.2) [SUSv3] | ceill(GLIBC_2.2) [SUSv3] | cexp(GLIBC_2.2) [SUSv3] | cexpf(GLIBC_2.2) [SUSv3] |
| cexpl(GLIBC_2.2) [SUSv3] | cimag(GLIBC_2.2) [SUSv3] | cimagf(GLIBC_2.2) [SUSv3] | cimagl(GLIBC_2.2) [SUSv3] |
| clog(GLIBC_2.2) [SUSv3] | clog10(GLIBC_2.2) [LSB] | clog10f(GLIBC_2.2) [LSB] | clog10l(GLIBC_2.2) [LSB] |
| clogf(GLIBC_2.2) [SUSv3] | clogl(GLIBC_2.2) [SUSv3] | conj(GLIBC_2.2) [SUSv3] | conjf(GLIBC_2.2) [SUSv3] |
| conjl(GLIBC_2.2) [SUSv3] | copysign(GLIBC_2.2) [SUSv3] | copysignf(GLIBC_2.2) [SUSv3] | copysignl(GLIBC_2.2) [SUSv3] |
| cos(GLIBC_2.2) | cosf(GLIBC_2.2) | cosh(GLIBC_2.2) | coshf(GLIBC_2.2) |

| | | | |
|---|---|---|---|
| [SUSv3] | [SUSv3] | [SUSv3] | [SUSv3] |
| coshl(GLIBC_2.2) [SUSv3] | cosl(GLIBC_2.2) [SUSv3] | cpow(GLIBC_2.2 ) [SUSv3] | cpowf(GLIBC_2. 2) [SUSv3] |
| cpowl(GLIBC_2. 2) [SUSv3] | cproj(GLIBC_2.2) [SUSv3] | cprojf(GLIBC_2.2 ) [SUSv3] | cprojl(GLIBC_2.2 ) [SUSv3] |
| creal(GLIBC_2.2) [SUSv3] | crealf(GLIBC_2.2 ) [SUSv3] | creall(GLIBC_2.2 ) [SUSv3] | csin(GLIBC_2.2) [SUSv3] |
| csinf(GLIBC_2.2) [SUSv3] | csinh(GLIBC_2.2) [SUSv3] | csinhf(GLIBC_2.2 ) [SUSv3] | csinhl(GLIBC_2.2 ) [SUSv3] |
| csinl(GLIBC_2.2) [SUSv3] | csqrt(GLIBC_2.2) [SUSv3] | csqrtf(GLIBC_2.2 ) [SUSv3] | csqrtl(GLIBC_2.2 ) [SUSv3] |
| ctan(GLIBC_2.2) [SUSv3] | ctanf(GLIBC_2.2) [SUSv3] | ctanh(GLIBC_2.2 ) [SUSv3] | ctanhf(GLIBC_2. 2) [SUSv3] |
| ctanhl(GLIBC_2. 2) [SUSv3] | ctanl(GLIBC_2.2) [SUSv3] | drem(GLIBC_2.2 ) [LSB] | dremf(GLIBC_2. 2) [LSB] |
| dreml(GLIBC_2.2 ) [LSB] | erf(GLIBC_2.2) [SUSv3] | erfc(GLIBC_2.2) [SUSv3] | erfcf(GLIBC_2.2) [SUSv3] |
| erfcl(GLIBC_2.2) [SUSv3] | erff(GLIBC_2.2) [SUSv3] | erfl(GLIBC_2.2) [SUSv3] | exp(GLIBC_2.2) [SUSv3] |
| exp10(GLIBC_2.2 ) [LSB] | exp10f(GLIBC_2. 2) [LSB] | exp10l(GLIBC_2. 2) [LSB] | exp2(GLIBC_2.2) [SUSv3] |
| exp2f(GLIBC_2.2 ) [SUSv3] | exp2l(GLIBC_2.2 ) [SUSv3] | expf(GLIBC_2.2) [SUSv3] | expl(GLIBC_2.2) [SUSv3] |
| expm1(GLIBC_2. 2) [SUSv3] | expm1f(GLIBC_2 .2) [SUSv3] | expm1l(GLIBC_2 .2) [SUSv3] | fabs(GLIBC_2.2) [SUSv3] |
| fabsf(GLIBC_2.2) [SUSv3] | fabsl(GLIBC_2.2) [SUSv3] | fdim(GLIBC_2.2) [SUSv3] | fdimf(GLIBC_2.2 ) [SUSv3] |
| fdiml(GLIBC_2.2 ) [SUSv3] | feclearexcept(GL IBC_2.2) [SUSv3] | fedisableexcept( GLIBC_2.2) [LSB] | feenableexcept(G LIBC_2.2) [LSB] |
| fegetenv(GLIBC_ 2.2) [SUSv3] | fegetexcept(GLIB C_2.2) [LSB] | fegetexceptflag( GLIBC_2.2) [SUSv3] | fegetround(GLIB C_2.2) [SUSv3] |
| feholdexcept(GLI BC_2.2) [SUSv3] | feraiseexcept(GL IBC_2.2) [SUSv3] | fesetenv(GLIBC_ 2.2) [SUSv3] | fesetexceptflag(G LIBC_2.2) [SUSv3] |
| fesetround(GLIB C_2.2) [SUSv3] | fetestexcept(GLI BC_2.2) [SUSv3] | feupdateenv(GLI BC_2.2) [SUSv3] | finite(GLIBC_2.2) [LSB] |
| finitef(GLIBC_2.2 ) [LSB] | finitel(GLIBC_2.2 ) [LSB] | floor(GLIBC_2.2) [SUSv3] | floorf(GLIBC_2.2 ) [SUSv3] |
| floorl(GLIBC_2.2 ) [SUSv3] | fma(GLIBC_2.2) [SUSv3] | fmaf(GLIBC_2.2) [SUSv3] | fmal(GLIBC_2.2) [SUSv3] |
| fmax(GLIBC_2.2) [SUSv3] | fmaxf(GLIBC_2.2 ) [SUSv3] | fmaxl(GLIBC_2.2 ) [SUSv3] | fmin(GLIBC_2.2) [SUSv3] |

 

| | | | |
|---|---|---|---|
| fminf(GLIBC_2.2) [SUSv3] | fminl(GLIBC_2.2) [SUSv3] | fmod(GLIBC_2.2) [SUSv3] | fmodf(GLIBC_2.2) [SUSv3] |
| fmodl(GLIBC_2.2) [SUSv3] | frexp(GLIBC_2.2) [SUSv3] | frexpf(GLIBC_2.2) [SUSv3] | frexpl(GLIBC_2.2) [SUSv3] |
| gamma(GLIBC_2.2) [LSB] | gammaf(GLIBC_2.2) [LSB] | gammal(GLIBC_2.2) [LSB] | hypot(GLIBC_2.2) [SUSv3] |
| hypotf(GLIBC_2.2) [SUSv3] | hypotl(GLIBC_2.2) [SUSv3] | ilogb(GLIBC_2.2) [SUSv3] | ilogbf(GLIBC_2.2) [SUSv3] |
| ilogbl(GLIBC_2.2) [SUSv3] | j0(GLIBC_2.2) [SUSv3] | j0f(GLIBC_2.2) [LSB] | j0l(GLIBC_2.2) [LSB] |
| j1(GLIBC_2.2) [SUSv3] | j1f(GLIBC_2.2) [LSB] | j1l(GLIBC_2.2) [LSB] | jn(GLIBC_2.2) [SUSv3] |
| jnf(GLIBC_2.2) [LSB] | jnl(GLIBC_2.2) [LSB] | ldexp(GLIBC_2.2) [SUSv3] | ldexpf(GLIBC_2.2) [SUSv3] |
| ldexpl(GLIBC_2.2) [SUSv3] | lgamma(GLIBC_2.2) [SUSv3] | lgamma_r(GLIBC_2.2) [LSB] | lgammaf(GLIBC_2.2) [SUSv3] |
| lgammaf_r(GLIBC_2.2) [LSB] | lgammal(GLIBC_2.2) [SUSv3] | lgammal_r(GLIBC_2.2) [LSB] | llrint(GLIBC_2.2) [SUSv3] |
| llrintf(GLIBC_2.2) [SUSv3] | llrintl(GLIBC_2.2) [SUSv3] | llround(GLIBC_2.2) [SUSv3] | llroundf(GLIBC_2.2) [SUSv3] |
| llroundl(GLIBC_2.2) [SUSv3] | log(GLIBC_2.2) [SUSv3] | log10(GLIBC_2.2) [SUSv3] | log10f(GLIBC_2.2) [SUSv3] |
| log10l(GLIBC_2.2) [SUSv3] | log1p(GLIBC_2.2) [SUSv3] | log1pf(GLIBC_2.2) [SUSv3] | log1pl(GLIBC_2.2) [SUSv3] |
| log2(GLIBC_2.2) [SUSv3] | log2f(GLIBC_2.2) [SUSv3] | log2l(GLIBC_2.2) [SUSv3] | logb(GLIBC_2.2) [SUSv3] |
| logbf(GLIBC_2.2) [SUSv3] | logbl(GLIBC_2.2) [SUSv3] | logf(GLIBC_2.2) [SUSv3] | logl(GLIBC_2.2) [SUSv3] |
| lrint(GLIBC_2.2) [SUSv3] | lrintf(GLIBC_2.2) [SUSv3] | lrintl(GLIBC_2.2) [SUSv3] | lround(GLIBC_2.2) [SUSv3] |
| lroundf(GLIBC_2.2) [SUSv3] | lroundl(GLIBC_2.2) [SUSv3] | matherr(GLIBC_2.2) [SVID.3] | modf(GLIBC_2.2) [SUSv3] |
| modff(GLIBC_2.2) [SUSv3] | modfl(GLIBC_2.2) [SUSv3] | nan(GLIBC_2.2) [SUSv3] | nanf(GLIBC_2.2) [SUSv3] |
| nanl(GLIBC_2.2) [SUSv3] | nearbyint(GLIBC_2.2) [SUSv3] | nearbyintf(GLIBC_2.2) [SUSv3] | nearbyintl(GLIBC_2.2) [SUSv3] |
| nextafter(GLIBC_2.2) [SUSv3] | nextafterf(GLIBC_2.2) [SUSv3] | nextafterl(GLIBC_2.2) [SUSv3] | nexttoward(GLIBC_2.2) [SUSv3] |
| nexttowardf(GLIBC_2.2) [SUSv3] | nexttowardl(GLIBC_2.2) [SUSv3] | pow(GLIBC_2.2) [SUSv3] | pow10(GLIBC_2.2) [LSB] |
| pow10f(GLIBC_2.2) [LSB] | pow10l(GLIBC_2.2) [LSB] | powf(GLIBC_2.2) [SUSv3] | powl(GLIBC_2.2) [SUSv3] |

| | | | |
|---|---|---|---|
| remainder(GLIBC_2.2) [SUSv3] | remainderf(GLIBC_2.2) [SUSv3] | remainderl(GLIBC_2.2) [SUSv3] | remquo(GLIBC_2.2) [SUSv3] |
| remquof(GLIBC_2.2) [SUSv3] | remquol(GLIBC_2.2) [SUSv3] | rint(GLIBC_2.2) [SUSv3] | rintf(GLIBC_2.2) [SUSv3] |
| rintl(GLIBC_2.2) [SUSv3] | round(GLIBC_2.2) [SUSv3] | roundf(GLIBC_2.2) [SUSv3] | roundl(GLIBC_2.2) [SUSv3] |
| scalb(GLIBC_2.2) [SUSv3] | scalbf(GLIBC_2.2) [ISOC99] | scalbl(GLIBC_2.2) [ISOC99] | scalbln(GLIBC_2.2) [SUSv3] |
| scalblnf(GLIBC_2.2) [SUSv3] | scalblnl(GLIBC_2.2) [SUSv3] | scalbn(GLIBC_2.2) [SUSv3] | scalbnf(GLIBC_2.2) [SUSv3] |
| scalbnl(GLIBC_2.2) [SUSv3] | significand(GLIBC_2.2) [LSB] | significandf(GLIBC_2.2) [LSB] | significandl(GLIBC_2.2) [LSB] |
| sin(GLIBC_2.2) [SUSv3] | sincos(GLIBC_2.2) [LSB] | sincosf(GLIBC_2.2) [LSB] | sincosl(GLIBC_2.2) [LSB] |
| sinf(GLIBC_2.2) [SUSv3] | sinh(GLIBC_2.2) [SUSv3] | sinhf(GLIBC_2.2) [SUSv3] | sinhl(GLIBC_2.2) [SUSv3] |
| sinl(GLIBC_2.2) [SUSv3] | sqrt(GLIBC_2.2) [SUSv3] | sqrtf(GLIBC_2.2) [SUSv3] | sqrtl(GLIBC_2.2) [SUSv3] |
| tan(GLIBC_2.2) [SUSv3] | tanf(GLIBC_2.2) [SUSv3] | tanh(GLIBC_2.2) [SUSv3] | tanhf(GLIBC_2.2) [SUSv3] |
| tanhl(GLIBC_2.2) [SUSv3] | tanl(GLIBC_2.2) [SUSv3] | tgamma(GLIBC_2.2) [SUSv3] | tgammaf(GLIBC_2.2) [SUSv3] |
| tgammal(GLIBC_2.2) [SUSv3] | trunc(GLIBC_2.2) [SUSv3] | truncf(GLIBC_2.2) [SUSv3] | truncl(GLIBC_2.2) [SUSv3] |
| y0(GLIBC_2.2) [SUSv3] | y0f(GLIBC_2.2) [LSB] | y0l(GLIBC_2.2) [LSB] | y1(GLIBC_2.2) [SUSv3] |
| y1f(GLIBC_2.2) [LSB] | y1l(GLIBC_2.2) [LSB] | yn(GLIBC_2.2) [SUSv3] | ynf(GLIBC_2.2) [LSB] |
| ynl(GLIBC_2.2) [LSB] | | | |

An LSB conforming implementation shall provide the architecture specific deprecated functions for Math specified in Table 11-35, with the full mandatory functionality as described in the referenced underlying specification.

**Note:** These interfaces are deprecated, and applications should avoid using them. These interfaces may be withdrawn in future releases of this specification.

**Table 11-35 libm - Math Deprecated Function Interfaces**

| | | | |
|---|---|---|---|
| drem(GLIBC_2.2) [LSB] | dremf(GLIBC_2.2) [LSB] | dreml(GLIBC_2.2) [LSB] | finite(GLIBC_2.2) [LSB] |
| finitef(GLIBC_2.2) [LSB] | finitel(GLIBC_2.2) [LSB] | gamma(GLIBC_2.2) [LSB] | gammaf(GLIBC_2.2) [LSB] |
| gammal(GLIBC_ | matherr(GLIBC_ | | |

 

| | | | |
|---|---|---|---|
| 2.2) [LSB] | 2.2) [SVID.3] | | |

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

**Table 11-36 libm - Math Data Interfaces**

| | | | |
|---|---|---|---|
| signgam(GLIBC_ 2.2) [SUSv3] | | | |

## 11.5 Data Definitions for libm

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

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

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

### 11.5.1 complex.h

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

### 11.5.2 fenv.h

```
#define FE_INVALID      (1UL << 0)
#define FE_DIVBYZERO    (1UL << 2)
#define FE_OVERFLOW     (1UL << 3)
#define FE_UNDERFLOW    (1UL << 4)
#define FE_INEXACT      (1UL << 5)
#define FE_UNNORMAL     1UL << 1

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

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

typedef unsigned long int fexcept_t;

typedef unsigned long int fenv_t;
```

```
#define FE_DFL_ENV      ((__const fenv_t *) 0xc009804c0270033fUL)
```

### 11.5.3 math.h

```
#define fpclassify(x)   \
        (sizeof (x) == sizeof (float) ? __fpclassifyf (x) :sizeof
(x) == sizeof (double) ? __fpclassify (x) : __fpclassifyl (x))
#define signbit(x)      \
        (sizeof (x) == sizeof (float)? __signbitf (x): sizeof (x)
== sizeof (double)? __signbit (x) : __signbitl (x))
#define isfinite(x)     \
     (sizeof (x) == sizeof (float) ? __finitef (x) : sizeof (x)
== sizeof (double)? __finite (x) : __finitel (x))
#define isinf(x)        \
     (sizeof (x) == sizeof (float) ? __isinff (x): sizeof (x) ==
sizeof (double) ? __isinf (x) : __isinfl (x))
#define isnan(x)        \
     (sizeof (x) == sizeof (float) ? __isnanf (x)  : sizeof (x)
== sizeof (double) ? __isnan (x) : __isnanl (x))

#define HUGE_VALL       0x1.0p32767L

#define FP_ILOGB0       -2147483648
#define FP_ILOGBNAN     2147483647

extern int __fpclassifyl(long double);
extern long double exp2l(long double);
extern int __signbitl(long double);
```

## 11.6 Interface Definitions for libm

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

Other interfaces listed in Section 11.4 shall behave as described in the referenced base document. For interfaces referencing LSB and not listed below, please see the generic part of the specification.

## __fpclassifyl

### Name

`__fpclassifyl` — Classify real floating type

### Synopsis

```
int __fpclassifyl(long double arg);
```

### Description

`__fpclassifyl()` has the same specification as `fpclassify()` in ISO POSIX (2003), except that the argument type for `__fpclassifyl()` is known to be long double.

`__fpclassifyl()` is not in the source standard; it is only in the binary standard.

## 11.7 Interfaces for libpthread

Table 11-37 defines the library name and shared object name for the libpthread library

 

**Table 11-37 libpthread Definition**

| | |
|---|---|
| Library: | libpthread |
| SONAME: | libpthread.so.0 |

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

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

## 11.7.1 Realtime Threads

### 11.7.1.1 Interfaces for Realtime Threads

An LSB conforming implementation shall provide the architecture specific functions for Realtime Threads specified in Table 11-38, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-38 libpthread - Realtime Threads Function Interfaces**

| | | | |
|---|---|---|---|
| pthread_attr_getinheritsched(GLIBC_2.2) [SUSv3] | pthread_attr_getschedpolicy(GLIBC_2.2) [SUSv3] | pthread_attr_getscope(GLIBC_2.2) [SUSv3] | pthread_attr_setinheritsched(GLIBC_2.2) [SUSv3] |
| pthread_attr_setschedpolicy(GLIBC_2.2) [SUSv3] | pthread_attr_setscope(GLIBC_2.2) [SUSv3] | pthread_getschedparam(GLIBC_2.2) [SUSv3] | pthread_setschedparam(GLIBC_2.2) [SUSv3] |

## 11.7.2 Advanced Realtime Threads

### 11.7.2.1 Interfaces for Advanced Realtime Threads

An LSB conforming implementation shall provide the architecture specific functions for Advanced Realtime Threads specified in Table 11-39, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-39 libpthread - Advanced Realtime Threads Function Interfaces**

| | | | |
|---|---|---|---|
| pthread_barrier_destroy(GLIBC_2.2) [SUSv3] | pthread_barrier_init(GLIBC_2.2) [SUSv3] | pthread_barrier_wait(GLIBC_2.2) [SUSv3] | pthread_barrierattr_destroy(GLIBC_2.2) [SUSv3] |
| pthread_barrierattr_init(GLIBC_2.2) [SUSv3] | pthread_barrierattr_setpshared(GLIBC_2.2) [SUSv3] | pthread_getcpuclockid(GLIBC_2.2) [SUSv3] | pthread_spin_destroy(GLIBC_2.2) [SUSv3] |
| pthread_spin_init(GLIBC_2.2) [SUSv3] | pthread_spin_lock(GLIBC_2.2) [SUSv3] | pthread_spin_trylock(GLIBC_2.2) [SUSv3] | pthread_spin_unlock(GLIBC_2.2) [SUSv3] |

## 11.7.3 Posix Threads

### 11.7.3.1 Interfaces for Posix Threads

An LSB conforming implementation shall provide the architecture specific functions for Posix Threads specified in Table 11-40, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-40 libpthread - Posix Threads Function Interfaces**

| | | | |
|---|---|---|---|
| _pthread_cleanup_pop(GLIBC_2.2) [LSB] | _pthread_cleanup_push(GLIBC_2.2) [LSB] | pthread_attr_destroy(GLIBC_2.2) [SUSv3] | pthread_attr_getdetachstate(GLIBC_2.2) [SUSv3] |
| pthread_attr_getguardsize(GLIBC_2.2) [SUSv3] | pthread_attr_getschedparam(GLIBC_2.2) [SUSv3] | pthread_attr_getstack(GLIBC_2.2) [SUSv3] | pthread_attr_getstackaddr(GLIBC_2.2) [SUSv3] |
| pthread_attr_getstacksize(GLIBC_2.2) [SUSv3] | pthread_attr_init(GLIBC_2.2) [SUSv3] | pthread_attr_setdetachstate(GLIBC_2.2) [SUSv3] | pthread_attr_setguardsize(GLIBC_2.2) [SUSv3] |
| pthread_attr_setschedparam(GLIBC_2.2) [SUSv3] | pthread_attr_setstackaddr(GLIBC_2.2) [SUSv3] | pthread_attr_setstacksize(GLIBC_2.3.3) [SUSv3] | pthread_cancel(GLIBC_2.2) [SUSv3] |
| pthread_cond_broadcast(GLIBC_2.3.2) [SUSv3] | pthread_cond_destroy(GLIBC_2.3.2) [SUSv3] | pthread_cond_init(GLIBC_2.3.2) [SUSv3] | pthread_cond_signal(GLIBC_2.3.2) [SUSv3] |
| pthread_cond_timedwait(GLIBC_2.3.2) [SUSv3] | pthread_cond_wait(GLIBC_2.3.2) [SUSv3] | pthread_condattr_destroy(GLIBC_2.2) [SUSv3] | pthread_condattr_getpshared(GLIBC_2.2) [SUSv3] |
| pthread_condattr_init(GLIBC_2.2) [SUSv3] | pthread_condattr_setpshared(GLIBC_2.2) [SUSv3] | pthread_create(GLIBC_2.2) [SUSv3] | pthread_detach(GLIBC_2.2) [SUSv3] |
| pthread_equal(GLIBC_2.2) [SUSv3] | pthread_exit(GLIBC_2.2) [SUSv3] | pthread_getconcurrency(GLIBC_2.2) [SUSv3] | pthread_getspecific(GLIBC_2.2) [SUSv3] |
| pthread_join(GLIBC_2.2) [SUSv3] | pthread_key_create(GLIBC_2.2) [SUSv3] | pthread_key_delete(GLIBC_2.2) [SUSv3] | pthread_kill(GLIBC_2.2) [SUSv3] |
| pthread_mutex_destroy(GLIBC_2.2) [SUSv3] | pthread_mutex_init(GLIBC_2.2) [SUSv3] | pthread_mutex_lock(GLIBC_2.2) [SUSv3] | pthread_mutex_timedlock(GLIBC_2.2) [SUSv3] |
| pthread_mutex_trylock(GLIBC_2.2) [SUSv3] | pthread_mutex_unlock(GLIBC_2.2) [SUSv3] | pthread_mutexattr_destroy(GLIBC_2.2) [SUSv3] | pthread_mutexattr_getpshared(GLIBC_2.2) [SUSv3] |
| pthread_mutexattr_gettype(GLIBC_2.2) [SUSv3] | pthread_mutexattr_init(GLIBC_2.2) [SUSv3] | pthread_mutexattr_setpshared(GLIBC_2.2) [SUSv3] | pthread_mutexattr_settype(GLIBC_2.2) [SUSv3] |
| pthread_once(GL | pthread_rwlock_ | pthread_rwlock_ | pthread_rwlock_ |

 

| | | | |
|---|---|---|---|
| IBC_2.2) [SUSv3] | destroy(GLIBC_2.2) [SUSv3] | init(GLIBC_2.2) [SUSv3] | rdlock(GLIBC_2.2) [SUSv3] |
| pthread_rwlock_timedrdlock(GLIBC_2.2) [SUSv3] | pthread_rwlock_timedwrlock(GLIBC_2.2) [SUSv3] | pthread_rwlock_tryrdlock(GLIBC_2.2) [SUSv3] | pthread_rwlock_trywrlock(GLIBC_2.2) [SUSv3] |
| pthread_rwlock_unlock(GLIBC_2.2) [SUSv3] | pthread_rwlock_wrlock(GLIBC_2.2) [SUSv3] | pthread_rwlockattr_destroy(GLIBC_2.2) [SUSv3] | pthread_rwlockattr_getpshared(GLIBC_2.2) [SUSv3] |
| pthread_rwlockattr_init(GLIBC_2.2) [SUSv3] | pthread_rwlockattr_setpshared(GLIBC_2.2) [SUSv3] | pthread_self(GLIBC_2.2) [SUSv3] | pthread_setcancelstate(GLIBC_2.2) [SUSv3] |
| pthread_setcanceltype(GLIBC_2.2) [SUSv3] | pthread_setconcurrency(GLIBC_2.2) [SUSv3] | pthread_setspecific(GLIBC_2.2) [SUSv3] | pthread_sigmask(GLIBC_2.2) [SUSv3] |
| pthread_testcancel(GLIBC_2.2) [SUSv3] | sem_close(GLIBC_2.2) [SUSv3] | sem_destroy(GLIBC_2.2) [SUSv3] | sem_getvalue(GLIBC_2.2) [SUSv3] |
| sem_init(GLIBC_2.2) [SUSv3] | sem_open(GLIBC_2.2) [SUSv3] | sem_post(GLIBC_2.2) [SUSv3] | sem_timedwait(GLIBC_2.2) [SUSv3] |
| sem_trywait(GLIBC_2.2) [SUSv3] | sem_unlink(GLIBC_2.2) [SUSv3] | sem_wait(GLIBC_2.2) [SUSv3] | |

An LSB conforming implementation shall provide the architecture specific deprecated functions for Posix Threads specified in Table 11-41, with the full mandatory functionality as described in the referenced underlying specification.

**Note:** These interfaces are deprecated, and applications should avoid using them. These interfaces may be withdrawn in future releases of this specification.

**Table 11-41 libpthread - Posix Threads Deprecated Function Interfaces**

| | | | |
|---|---|---|---|
| pthread_attr_getstackaddr(GLIBC_2.2) [SUSv3] | pthread_attr_setstackaddr(GLIBC_2.2) [SUSv3] | | |

## 11.7.4 Thread aware versions of libc interfaces

### 11.7.4.1 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 11-42, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-42 libpthread - Thread aware versions of libc interfaces Function Interfaces**

| | | | |
|---|---|---|---|
| lseek64(GLIBC_2.2) [LFS] | open64(GLIBC_2.2) [LFS] | pread(GLIBC_2.2) [SUSv3] | pread64(GLIBC_2.2) [LFS] |

| | | | |
|---|---|---|---|
| pwrite(GLIBC_2.2) [SUSv3] | pwrite64(GLIBC_2.2) [LFS] | | |

## 11.8 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.

### 11.8.1 pthread.h

```
#define __SIZEOF_PTHREAD_BARRIER_T      32

typedef union {
    char __size[__SIZEOF_PTHREAD_BARRIER_T];
    long int __align;
} pthread_barrier_t;
```

### 11.8.2 semaphore.h

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

## 11.9 Interfaces for libgcc_s

Table 11-43 defines the library name and shared object name for the libgcc_s library

**Table 11-43 libgcc_s Definition**

| | |
|---|---|
| Library: | libgcc_s |
| SONAME: | libgcc_s.so.1 |

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

[LSB] ISO/IEC 23360 Part 1

 

### 11.9.1 Unwind Library

#### 11.9.1.1 Interfaces for Unwind Library

An LSB conforming implementation shall provide the architecture specific functions for Unwind Library specified in Table 11-44, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-44 libgcc_s - Unwind Library Function Interfaces**

| | | | |
|---|---|---|---|
| _Unwind_Backtrace(GCC_3.3) [LSB] | _Unwind_DeleteException(GCC_3.0) [LSB] | _Unwind_FindEnclosingFunction(GCC_3.3) [LSB] | _Unwind_ForcedUnwind(GCC_3.0) [LSB] |
| _Unwind_GetBSP(GCC_3.3.2) [LSB] | _Unwind_GetCFA(GCC_3.3) [LSB] | _Unwind_GetGR(GCC_3.0) [LSB] | _Unwind_GetIP(GCC_3.0) [LSB] |
| _Unwind_GetLanguageSpecificData(GCC_3.0) [LSB] | _Unwind_GetRegionStart(GCC_3.0) [LSB] | _Unwind_RaiseException(GCC_3.0) [LSB] | _Unwind_Resume(GCC_3.0) [LSB] |
| _Unwind_Resume_or_Rethrow(GCC_3.3) [LSB] | _Unwind_SetGR(GCC_3.0) [LSB] | _Unwind_SetIP(GCC_3.0) [LSB] | |

## 11.10 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.

### 11.10.1 unwind.h

```
typedef _Unwind_Reason_Code(*_Unwind_Stop_Fn) (int version,
                                               _Unwind_Action
actions,

_Unwind_Exception_Class
                                               exceptionClass,
                                               struct
_Unwind_Exception *
                                               exceptionObject,
```

```
                                                    struct
_Unwind_Context *
                                                    context,
                                                    void
*stop_parameter);

typedef       _Unwind_Reason_Code(*_Unwind_Trace_Fn)       (struct
_Unwind_Context *,
                                                     void *);
extern void _Unwind_DeleteException(struct _Unwind_Exception *);
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
                                                      *,     unsigned
int);
extern  _Unwind_Ptr  _Unwind_GetRegionStart(struct  _Unwind_Context
*);
extern      _Unwind_Reason_Code      _Unwind_RaiseException(struct
_Unwind_Exception
                                                     *);
extern  void  _Unwind_SetIP(struct  _Unwind_Context  *,  unsigned
int);
extern void _Unwind_Resume(struct _Unwind_Exception *);
extern   void   _Unwind_SetGR(struct   _Unwind_Context   *,   int,
u_int64_t);
extern  _Unwind_Ptr  _Unwind_ForcedUnwind(struct  _Unwind_Exception
*,
                                          _Unwind_Stop_Fn, void *);
extern   _Unwind_Reason_Code   _Unwind_Backtrace(_Unwind_Trace_Fn,
void *);
extern  _Unwind_Reason_Code  _Unwind_GetCFA(struct  _Unwind_Context
*);
extern _Unwind_Reason_Code _Unwind_Resume_or_Rethrow(struct

_Unwind_Exception *);
extern void *_Unwind_FindEnclosingFunction(void *);
extern _Unwind_Word _Unwind_GetBSP(struct _Unwind_Context *);
```

## 11.11 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 11.9 shall behave as described in the referenced base document. For interfaces referencing LSB and not listed below, please see the generic part of the specification.

 

# _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_ForcedUnwind

## Name

_Unwind_ForcedUnwind — private C++ error handling method

## Synopsis

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

## Description

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

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

## Return Value

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

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

_URC_NO_REASON

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

_URC_END_OF_STACK

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

_URC_FATAL_PHASE2_ERROR

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

 

## _Unwind_GetGR

### Name

_Unwind_GetGR — private C++ error handling method

### Synopsis

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

### Description

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

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

## _Unwind_GetIP

### Name

_Unwind_GetIP — private C++ error handling method

### Synopsis

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

### Description

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

## _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_RaiseException

### Name

_Unwind_RaiseException — private C++ error handling method

### Synopsis

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

### Description

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

### Return Value

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

_URC_END_OF_STACK

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

_URC_FATAL_PHASE1_ERROR

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

_URC_FATAL_PHASE2_ERROR

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

 

## _Unwind_Resume

### Name

_Unwind_Resume — private C++ error handling method

### Synopsis

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

### Description

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

## _Unwind_SetGR

### Name

_Unwind_SetGR — private C++ error handling method

### Synopsis

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

### Description

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

## _Unwind_SetIP

### Name

_Unwind_SetIP — private C++ error handling method

### Synopsis

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

### Description

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

## 11.12 Interfaces for libdl

Table 11-45 defines the library name and shared object name for the libdl library

**Table 11-45 libdl Definition**

| | |
|---|---|
| Library: | libdl |
| SONAME: | libdl.so.2 |

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

[LSB] ISO/IEC 23360 Part 1

[SUSv3] ISO POSIX (2003)

### 11.12.1 Dynamic Loader

#### 11.12.1.1 Interfaces for Dynamic Loader

An LSB conforming implementation shall provide the architecture specific functions for Dynamic Loader specified in Table 11-46, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-46 libdl - Dynamic Loader Function Interfaces**

| | | | |
|---|---|---|---|
| dladdr(GLIBC_2.0) [LSB] | dlclose(GLIBC_2.0) [SUSv3] | dlerror(GLIBC_2.0) [SUSv3] | dlopen(GLIBC_2.1) [LSB] |
| dlsym(GLIBC_2.0) [LSB] | | | |

## 11.13 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.

### 11.13.1 dlfcn.h

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

## 11.14 Interfaces for libcrypt

Table 11-47 defines the library name and shared object name for the libcrypt library

**Table 11-47 libcrypt Definition**

| | |
|---|---|
| Library: | libcrypt |
| SONAME: | libcrypt.so.1 |

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

 

[SUSv3] ISO POSIX (2003)

## 11.14.1 Encryption

### 11.14.1.1 Interfaces for Encryption

An LSB conforming implementation shall provide the architecture specific functions for Encryption specified in Table 11-48, with the full mandatory functionality as described in the referenced underlying specification.

**Table 11-48 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 12-1 libz Definition**

| | |
|---|---|
| Library: | libz |
| SONAME: | libz.so.1 |

### 12.1.1 Compression Library

#### 12.1.1.1 Interfaces for Compression Library

No external functions are defined for libz - Compression Library in this part of the specification. See also the generic specification.

## 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 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.

### 12.2.1 zlib.h

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

## 12.3 Interfaces for libncurses

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

**Table 12-2 libncurses Definition**

| | |
|---|---|
| Library: | libncurses |
| SONAME: | libncurses.so.5 |

### 12.3.1 Curses

#### 12.3.1.1 Interfaces for Curses

No external functions are defined for libncurses - Curses in this part of the specification. See also the generic specification.

## 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 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.

### 12.4.1 curses.h

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

## 12.5 Interfaces for libutil

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

**Table 12-3 libutil Definition**

| | |
|---|---|
| Library: | libutil |
| SONAME: | libutil.so.1 |

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

[LSB] ISO/IEC 23360 Part 1

 

## 12.5.1 Utility Functions

### 12.5.1.1 Interfaces for Utility Functions

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

**Table 12-4 libutil - Utility Functions Function Interfaces**

| | | | |
|---|---|---|---|
| forkpty(GLIBC_2.0) [LSB] | login(GLIBC_2.0) [LSB] | login_tty(GLIBC_2.0) [LSB] | logout(GLIBC_2.0) [LSB] |
| logwtmp(GLIBC_2.0) [LSB] | openpty(GLIBC_2.0) [LSB] | | |

# V Package Format and Installation

# 13 Software Installation

## 13.1 Package Dependencies

The LSB runtime environment shall provde the following dependencies.

lsb-core-ia64

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

This dependency shall have a version of 3.0.

Other LSB modules may add additional dependencies; such dependencies shall have the format `lsb-`*`module`*`-ia64`.

## 13.2 Package Architecture Considerations

All packages must specify an architecture of `IA64`. A LSB runtime environment must accept an architecture of `ia64` even if the native architecture is different.

The `archnum` value in the Lead Section shall be 0x0009.

# Annex A Alphabetical Listing of Interfaces

## A.1 libc

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

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

**Table A-1 libc Function Interfaces**

| | | |
|---|---|---|
| _Exit(GLIBC_2.2)[SUSv3] | getsid(GLIBC_2.2)[SUSv3] | setutent(GLIBC_2.2)[LSB] |
| _IO_feof(GLIBC_2.2)[LSB] | getsockname(GLIBC_2.2)[SUSv3] | setutxent(GLIBC_2.2)[SUSv3] |
| _IO_getc(GLIBC_2.2)[LSB] | getsockopt(GLIBC_2.2)[LSB] | setvbuf(GLIBC_2.2)[SUSv3] |
| _IO_putc(GLIBC_2.2)[LSB] | getsubopt(GLIBC_2.2)[SUSv3] | shmat(GLIBC_2.2)[SUSv3] |
| _IO_puts(GLIBC_2.2)[LSB] | gettext(GLIBC_2.2)[LSB] | shmctl(GLIBC_2.2)[SUSv3] |
| __assert_fail(GLIBC_2.2)[LSB] | gettimeofday(GLIBC_2.2)[SUSv3] | shmdt(GLIBC_2.2)[SUSv3] |
| __ctype_get_mb_cur_max(GLIBC_2.2)[LSB] | getuid(GLIBC_2.2)[SUSv3] | shmget(GLIBC_2.2)[SUSv3] |
| __cxa_atexit(GLIBC_2.2)[LSB] | getutent(GLIBC_2.2)[LSB] | shutdown(GLIBC_2.2)[SUSv3] |
| __cxa_finalize(GLIBC_2.2)[LSB] | getutent_r(GLIBC_2.2)[LSB] | sigaction(GLIBC_2.2)[SUSv3] |
| __errno_location(GLIBC_2.2)[LSB] | getutxent(GLIBC_2.2)[SUSv3] | sigaddset(GLIBC_2.2)[SUSv3] |
| __fpending(GLIBC_2.2)[LSB] | getutxid(GLIBC_2.2)[SUSv3] | sigaltstack(GLIBC_2.2)[SUSv3] |
| __fxstat(GLIBC_2.2)[LSB] | getutxline(GLIBC_2.2)[SUSv3] | sigandset(GLIBC_2.2)[LSB] |
| __fxstat64(GLIBC_2.2)[LSB] | getw(GLIBC_2.2)[SUSv2] | sigdelset(GLIBC_2.2)[SUSv3] |
| __getpagesize(GLIBC_2.2)[LSB] | getwc(GLIBC_2.2)[SUSv3] | sigemptyset(GLIBC_2.2)[SUSv3] |
| __getpgid(GLIBC_2.2)[LSB] | getwchar(GLIBC_2.2)[SUSv3] | sigfillset(GLIBC_2.2)[SUSv3] |

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| __h_errno_location(GLIBC_2.2)[LSB] | getwd(GLIBC_2.2)[SUSv3] | sighold(GLIBC_2.2)[SUSv3] |
| __isinf(GLIBC_2.2)[LSB] | glob(GLIBC_2.2)[SUSv3] | sigignore(GLIBC_2.2)[SUSv3] |
| __isinff(GLIBC_2.2)[LSB] | glob64(GLIBC_2.2)[LSB] | siginterrupt(GLIBC_2.2)[SUSv3] |
| __isinfl(GLIBC_2.2)[LSB] | globfree(GLIBC_2.2)[SUSv3] | sigisemptyset(GLIBC_2.2)[LSB] |
| __isnan(GLIBC_2.2)[LSB] | globfree64(GLIBC_2.2)[LSB] | sigismember(GLIBC_2.2)[SUSv3] |
| __isnanf(GLIBC_2.2)[LSB] | gmtime(GLIBC_2.2)[SUSv3] | siglongjmp(GLIBC_2.2)[SUSv3] |
| __isnanl(GLIBC_2.2)[LSB] | gmtime_r(GLIBC_2.2)[SUSv3] | signal(GLIBC_2.2)[SUSv3] |
| __libc_current_sigrtmax(GLIBC_2.2)[LSB] | grantpt(GLIBC_2.2)[SUSv3] | sigorset(GLIBC_2.2)[LSB] |
| __libc_current_sigrtmin(GLIBC_2.2)[LSB] | hcreate(GLIBC_2.2)[SUSv3] | sigpause(GLIBC_2.2)[LSB] |
| __libc_start_main(GLIBC_2.2)[LSB] | hdestroy(GLIBC_2.2)[SUSv3] | sigpending(GLIBC_2.2)[SUSv3] |
| __lxstat(GLIBC_2.2)[LSB] | hsearch(GLIBC_2.2)[SUSv3] | sigprocmask(GLIBC_2.2)[SUSv3] |
| __lxstat64(GLIBC_2.2)[LSB] | htonl(GLIBC_2.2)[SUSv3] | sigqueue(GLIBC_2.2)[SUSv3] |
| __mempcpy(GLIBC_2.2)[LSB] | htons(GLIBC_2.2)[SUSv3] | sigrelse(GLIBC_2.2)[SUSv3] |
| __rawmemchr(GLIBC_2.2)[LSB] | iconv(GLIBC_2.2)[SUSv3] | sigreturn(GLIBC_2.2)[LSB] |
| __sigsetjmp(GLIBC_2.2)[LSB] | iconv_close(GLIBC_2.2)[SUSv3] | sigset(GLIBC_2.2)[SUSv3] |
| __stpcpy(GLIBC_2.2)[LSB] | iconv_open(GLIBC_2.2)[SUSv3] | sigsuspend(GLIBC_2.2)[SUSv3] |
| __strdup(GLIBC_2.2)[LSB] | if_freenameindex(GLIBC_2.2)[SUSv3] | sigtimedwait(GLIBC_2.2)[SUSv3] |
| __strtod_internal(GLIBC_2.2)[LSB] | if_indextoname(GLIBC_2.2)[SUSv3] | sigwait(GLIBC_2.2)[SUSv3] |
| __strtof_internal(GLIBC_2.2)[LSB] | if_nameindex(GLIBC_2.2)[SUSv3] | sigwaitinfo(GLIBC_2.2)[SUSv3] |
| __strtok_r(GLIBC_2.2)[LSB] | if_nametoindex(GLIBC_2.2)[SUSv3] | sleep(GLIBC_2.2)[SUSv3] |
| __strtol_internal(GLIBC_2.2)[LSB] | imaxabs(GLIBC_2.2)[SUSv3] | snprintf(GLIBC_2.2)[SUSv3] |

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| __strtold_internal(GLIBC_2.2)[LSB] | imaxdiv(GLIBC_2.2)[SUSv3] | sockatmark(GLIBC_2.2.4)[SUSv3] |
| __strtoll_internal(GLIBC_2.2)[LSB] | index(GLIBC_2.2)[SUSv3] | socket(GLIBC_2.2)[SUSv3] |
| __strtoul_internal(GLIBC_2.2)[LSB] | inet_addr(GLIBC_2.2)[SUSv3] | socketpair(GLIBC_2.2)[SUSv3] |
| __strtoull_internal(GLIBC_2.2)[LSB] | inet_aton(GLIBC_2.2)[LSB] | sprintf(GLIBC_2.2)[SUSv3] |
| __sysconf(GLIBC_2.2)[LSB] | inet_ntoa(GLIBC_2.2)[SUSv3] | srand(GLIBC_2.2)[SUSv3] |
| __sysv_signal(GLIBC_2.2)[LSB] | inet_ntop(GLIBC_2.2)[SUSv3] | srand48(GLIBC_2.2)[SUSv3] |
| __wcstod_internal(GLIBC_2.2)[LSB] | inet_pton(GLIBC_2.2)[SUSv3] | srandom(GLIBC_2.2)[SUSv3] |
| __wcstof_internal(GLIBC_2.2)[LSB] | initgroups(GLIBC_2.2)[LSB] | sscanf(GLIBC_2.2)[LSB] |
| __wcstol_internal(GLIBC_2.2)[LSB] | initstate(GLIBC_2.2)[SUSv3] | statfs(GLIBC_2.2)[LSB] |
| __wcstold_internal(GLIBC_2.2)[LSB] | insque(GLIBC_2.2)[SUSv3] | statfs64(GLIBC_2.2)[LSB] |
| __wcstoul_internal(GLIBC_2.2)[LSB] | ioctl(GLIBC_2.2)[LSB] | statvfs(GLIBC_2.2)[SUSv3] |
| __xmknod(GLIBC_2.2)[LSB] | isalnum(GLIBC_2.2)[SUSv3] | statvfs64(GLIBC_2.2)[LFS] |
| __xpg_basename(GLIBC_2.2)[LSB] | isalpha(GLIBC_2.2)[SUSv3] | stime(GLIBC_2.2)[LSB] |
| __xpg_sigpause(GLIBC_2.2)[LSB] | isascii(GLIBC_2.2)[SUSv3] | stpcpy(GLIBC_2.2)[LSB] |
| __xpg_strerror_r(GLIBC_2.3.4)[LSB] | isatty(GLIBC_2.2)[SUSv3] | stpncpy(GLIBC_2.2)[LSB] |
| __xstat(GLIBC_2.2)[LSB] | isblank(GLIBC_2.2)[SUSv3] | strcasecmp(GLIBC_2.2)[SUSv3] |
| __xstat64(GLIBC_2.2)[LSB] | iscntrl(GLIBC_2.2)[SUSv3] | strcasestr(GLIBC_2.2)[LSB] |
| _exit(GLIBC_2.2)[SUSv3] | isdigit(GLIBC_2.2)[SUSv3] | strcat(GLIBC_2.2)[SUSv3] |
| _longjmp(GLIBC_2.2)[SUSv3] | isgraph(GLIBC_2.2)[SUSv3] | strchr(GLIBC_2.2)[SUSv3] |
| _setjmp(GLIBC_2.2)[SUSv3] | islower(GLIBC_2.2)[SUSv3] | strcmp(GLIBC_2.2)[SUSv3] |
| _tolower(GLIBC_2.2)[SUSv3] | isprint(GLIBC_2.2)[SUSv3] | strcoll(GLIBC_2.2)[SUSv3] |

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| _toupper(GLIBC_2.2)[SUSv3] | ispunct(GLIBC_2.2)[SUSv3] | strcpy(GLIBC_2.2)[SUSv3] |
| a64l(GLIBC_2.2)[SUSv3] | isspace(GLIBC_2.2)[SUSv3] | strcspn(GLIBC_2.2)[SUSv3] |
| abort(GLIBC_2.2)[SUSv3] | isupper(GLIBC_2.2)[SUSv3] | strdup(GLIBC_2.2)[SUSv3] |
| abs(GLIBC_2.2)[SUSv3] | iswalnum(GLIBC_2.2)[SUSv3] | strerror(GLIBC_2.2)[SUSv3] |
| accept(GLIBC_2.2)[SUSv3] | iswalpha(GLIBC_2.2)[SUSv3] | strerror_r(GLIBC_2.2)[LSB] |
| access(GLIBC_2.2)[SUSv3] | iswblank(GLIBC_2.2)[SUSv3] | strfmon(GLIBC_2.2)[SUSv3] |
| acct(GLIBC_2.2)[LSB] | iswcntrl(GLIBC_2.2)[SUSv3] | strftime(GLIBC_2.2)[SUSv3] |
| adjtime(GLIBC_2.2)[LSB] | iswctype(GLIBC_2.2)[SUSv3] | strlen(GLIBC_2.2)[SUSv3] |
| alarm(GLIBC_2.2)[SUSv3] | iswdigit(GLIBC_2.2)[SUSv3] | strncasecmp(GLIBC_2.2)[SUSv3] |
| asctime(GLIBC_2.2)[SUSv3] | iswgraph(GLIBC_2.2)[SUSv3] | strncat(GLIBC_2.2)[SUSv3] |
| asctime_r(GLIBC_2.2)[SUSv3] | iswlower(GLIBC_2.2)[SUSv3] | strncmp(GLIBC_2.2)[SUSv3] |
| asprintf(GLIBC_2.2)[LSB] | iswprint(GLIBC_2.2)[SUSv3] | strncpy(GLIBC_2.2)[SUSv3] |
| atof(GLIBC_2.2)[SUSv3] | iswpunct(GLIBC_2.2)[SUSv3] | strndup(GLIBC_2.2)[LSB] |
| atoi(GLIBC_2.2)[SUSv3] | iswspace(GLIBC_2.2)[SUSv3] | strnlen(GLIBC_2.2)[LSB] |
| atol(GLIBC_2.2)[SUSv3] | iswupper(GLIBC_2.2)[SUSv3] | strpbrk(GLIBC_2.2)[SUSv3] |
| atoll(GLIBC_2.2)[SUSv3] | iswxdigit(GLIBC_2.2)[SUSv3] | strptime(GLIBC_2.2)[LSB] |
| authnone_create(GLIBC_2.2)[SVID.4] | isxdigit(GLIBC_2.2)[SUSv3] | strrchr(GLIBC_2.2)[SUSv3] |
| basename(GLIBC_2.2)[LSB] | jrand48(GLIBC_2.2)[SUSv3] | strsep(GLIBC_2.2)[LSB] |
| bcmp(GLIBC_2.2)[SUSv3] | key_decryptsession(GLIBC_2.2)[SVID.3] | strsignal(GLIBC_2.2)[LSB] |
| bcopy(GLIBC_2.2)[SUSv3] | kill(GLIBC_2.2)[LSB] | strspn(GLIBC_2.2)[SUSv3] |
| bind(GLIBC_2.2)[SUSv3] | killpg(GLIBC_2.2)[SUSv3] | strstr(GLIBC_2.2)[SUSv3] |

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| bind_textdomain_codeset(GLIBC_2.2)[LSB] | l64a(GLIBC_2.2)[SUSv3] | strtod(GLIBC_2.2)[SUSv3] |
| bindresvport(GLIBC_2.2)[LSB] | labs(GLIBC_2.2)[SUSv3] | strtof(GLIBC_2.2)[SUSv3] |
| bindtextdomain(GLIBC_2.2)[LSB] | lchown(GLIBC_2.2)[SUSv3] | strtoimax(GLIBC_2.2)[SUSv3] |
| brk(GLIBC_2.2)[SUSv2] | lcong48(GLIBC_2.2)[SUSv3] | strtok(GLIBC_2.2)[SUSv3] |
| bsd_signal(GLIBC_2.2)[SUSv3] | ldiv(GLIBC_2.2)[SUSv3] | strtok_r(GLIBC_2.2)[SUSv3] |
| bsearch(GLIBC_2.2)[SUSv3] | lfind(GLIBC_2.2)[SUSv3] | strtol(GLIBC_2.2)[SUSv3] |
| btowc(GLIBC_2.2)[SUSv3] | link(GLIBC_2.2)[LSB] | strtold(GLIBC_2.2)[SUSv3] |
| bzero(GLIBC_2.2)[SUSv3] | listen(GLIBC_2.2)[SUSv3] | strtoll(GLIBC_2.2)[SUSv3] |
| calloc(GLIBC_2.2)[SUSv3] | llabs(GLIBC_2.2)[SUSv3] | strtoq(GLIBC_2.2)[LSB] |
| catclose(GLIBC_2.2)[SUSv3] | lldiv(GLIBC_2.2)[SUSv3] | strtoul(GLIBC_2.2)[SUSv3] |
| catgets(GLIBC_2.2)[SUSv3] | localeconv(GLIBC_2.2)[SUSv3] | strtoull(GLIBC_2.2)[SUSv3] |
| catopen(GLIBC_2.2)[SUSv3] | localtime(GLIBC_2.2)[SUSv3] | strtoumax(GLIBC_2.2)[SUSv3] |
| cfgetispeed(GLIBC_2.2)[SUSv3] | localtime_r(GLIBC_2.2)[SUSv3] | strtouq(GLIBC_2.2)[LSB] |
| cfgetospeed(GLIBC_2.2)[SUSv3] | lockf(GLIBC_2.2)[SUSv3] | strxfrm(GLIBC_2.2)[SUSv3] |
| cfmakeraw(GLIBC_2.2)[LSB] | lockf64(GLIBC_2.2)[LFS] | svc_getreqset(GLIBC_2.2)[SVID.3] |
| cfsetispeed(GLIBC_2.2)[SUSv3] | longjmp(GLIBC_2.2)[SUSv3] | svc_register(GLIBC_2.2)[LSB] |
| cfsetospeed(GLIBC_2.2)[SUSv3] | lrand48(GLIBC_2.2)[SUSv3] | svc_run(GLIBC_2.2)[LSB] |
| cfsetspeed(GLIBC_2.2)[LSB] | lsearch(GLIBC_2.2)[SUSv3] | svc_sendreply(GLIBC_2.2)[LSB] |
| chdir(GLIBC_2.2)[SUSv3] | lseek(GLIBC_2.2)[SUSv3] | svcerr_auth(GLIBC_2.2)[SVID.3] |
| chmod(GLIBC_2.2)[SUSv3] | makecontext(GLIBC_2.2)[SUSv3] | svcerr_decode(GLIBC_2.2)[SVID.3] |
| chown(GLIBC_2.2)[SUSv3] | malloc(GLIBC_2.2)[SUSv3] | svcerr_noproc(GLIBC_2.2)[SVID.3] |

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| chroot(GLIBC_2.2)[SUSv2] | mblen(GLIBC_2.2)[SUSv3] | svcerr_noprog(GLIBC_2.2)[SVID.3] |
| clearerr(GLIBC_2.2)[SUSv3] | mbrlen(GLIBC_2.2)[SUSv3] | svcerr_progvers(GLIBC_2.2)[SVID.3] |
| clnt_create(GLIBC_2.2)[SVID.4] | mbrtowc(GLIBC_2.2)[SUSv3] | svcerr_systemerr(GLIBC_2.2)[SVID.3] |
| clnt_pcreateerror(GLIBC_2.2)[SVID.4] | mbsinit(GLIBC_2.2)[SUSv3] | svcerr_weakauth(GLIBC_2.2)[SVID.3] |
| clnt_perrno(GLIBC_2.2)[SVID.4] | mbsnrtowcs(GLIBC_2.2)[LSB] | svctcp_create(GLIBC_2.2)[LSB] |
| clnt_perror(GLIBC_2.2)[SVID.4] | mbsrtowcs(GLIBC_2.2)[SUSv3] | svcudp_create(GLIBC_2.2)[LSB] |
| clnt_spcreateerror(GLIBC_2.2)[SVID.4] | mbstowcs(GLIBC_2.2)[SUSv3] | swab(GLIBC_2.2)[SUSv3] |
| clnt_sperrno(GLIBC_2.2)[SVID.4] | mbtowc(GLIBC_2.2)[SUSv3] | swapcontext(GLIBC_2.2)[SUSv3] |
| clnt_sperror(GLIBC_2.2)[SVID.4] | memccpy(GLIBC_2.2)[SUSv3] | swprintf(GLIBC_2.2)[SUSv3] |
| clock(GLIBC_2.2)[SUSv3] | memchr(GLIBC_2.2)[SUSv3] | swscanf(GLIBC_2.2)[LSB] |
| close(GLIBC_2.2)[SUSv3] | memcmp(GLIBC_2.2)[SUSv3] | symlink(GLIBC_2.2)[SUSv3] |
| closedir(GLIBC_2.2)[SUSv3] | memcpy(GLIBC_2.2)[SUSv3] | sync(GLIBC_2.2)[SUSv3] |
| closelog(GLIBC_2.2)[SUSv3] | memmem(GLIBC_2.2)[LSB] | sysconf(GLIBC_2.2)[LSB] |
| confstr(GLIBC_2.2)[SUSv3] | memmove(GLIBC_2.2)[SUSv3] | syslog(GLIBC_2.2)[SUSv3] |
| connect(GLIBC_2.2)[SUSv3] | memrchr(GLIBC_2.2)[LSB] | system(GLIBC_2.2)[LSB] |
| creat(GLIBC_2.2)[SUSv3] | memset(GLIBC_2.2)[SUSv3] | tcdrain(GLIBC_2.2)[SUSv3] |
| creat64(GLIBC_2.2)[LFS] | mkdir(GLIBC_2.2)[SUSv3] | tcflow(GLIBC_2.2)[SUSv3] |
| ctermid(GLIBC_2.2)[SUSv3] | mkfifo(GLIBC_2.2)[SUSv3] | tcflush(GLIBC_2.2)[SUSv3] |
| ctime(GLIBC_2.2)[SUSv3] | mkstemp(GLIBC_2.2)[SUSv3] | tcgetattr(GLIBC_2.2)[SUSv3] |
| ctime_r(GLIBC_2.2)[SUSv3] | mkstemp64(GLIBC_2.2)[LFS] | tcgetpgrp(GLIBC_2.2)[SUSv3] |
| cuserid(GLIBC_2.2)[SUSv2] | mktemp(GLIBC_2.2)[SUSv3] | tcgetsid(GLIBC_2.2)[SUSv3] |

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| daemon(GLIBC_2.2)[LSB] | mktime(GLIBC_2.2)[SUSv3] | tcsendbreak(GLIBC_2.2)[SUSv3] |
| dcgettext(GLIBC_2.2)[LSB] | mlock(GLIBC_2.2)[SUSv3] | tcsetattr(GLIBC_2.2)[SUSv3] |
| dcngettext(GLIBC_2.2)[LSB] | mlockall(GLIBC_2.2)[SUSv3] | tcsetpgrp(GLIBC_2.2)[SUSv3] |
| dgettext(GLIBC_2.2)[LSB] | mmap(GLIBC_2.2)[SUSv3] | tdelete(GLIBC_2.2)[SUSv3] |
| difftime(GLIBC_2.2)[SUSv3] | mmap64(GLIBC_2.2)[LFS] | telldir(GLIBC_2.2)[SUSv3] |
| dirname(GLIBC_2.2)[SUSv3] | mprotect(GLIBC_2.2)[SUSv3] | tempnam(GLIBC_2.2)[SUSv3] |
| div(GLIBC_2.2)[SUSv3] | mrand48(GLIBC_2.2)[SUSv3] | textdomain(GLIBC_2.2)[LSB] |
| dngettext(GLIBC_2.2)[LSB] | mremap(GLIBC_2.2)[LSB] | tfind(GLIBC_2.2)[SUSv3] |
| drand48(GLIBC_2.2)[SUSv3] | msgctl(GLIBC_2.2)[SUSv3] | time(GLIBC_2.2)[SUSv3] |
| dup(GLIBC_2.2)[SUSv3] | msgget(GLIBC_2.2)[SUSv3] | times(GLIBC_2.2)[SUSv3] |
| dup2(GLIBC_2.2)[SUSv3] | msgrcv(GLIBC_2.2)[SUSv3] | tmpfile(GLIBC_2.2)[SUSv3] |
| ecvt(GLIBC_2.2)[SUSv3] | msgsnd(GLIBC_2.2)[SUSv3] | tmpfile64(GLIBC_2.2)[LFS] |
| endgrent(GLIBC_2.2)[SUSv3] | msync(GLIBC_2.2)[SUSv3] | tmpnam(GLIBC_2.2)[SUSv3] |
| endprotoent(GLIBC_2.2)[SUSv3] | munlock(GLIBC_2.2)[SUSv3] | toascii(GLIBC_2.2)[SUSv3] |
| endpwent(GLIBC_2.2)[SUSv3] | munlockall(GLIBC_2.2)[SUSv3] | tolower(GLIBC_2.2)[SUSv3] |
| endservent(GLIBC_2.2)[SUSv3] | munmap(GLIBC_2.2)[SUSv3] | toupper(GLIBC_2.2)[SUSv3] |
| endutent(GLIBC_2.2)[LSB] | nanosleep(GLIBC_2.2)[SUSv3] | towctrans(GLIBC_2.2)[SUSv3] |
| endutxent(GLIBC_2.2)[SUSv3] | nftw(GLIBC_2.3.3)[SUSv3] | towlower(GLIBC_2.2)[SUSv3] |
| erand48(GLIBC_2.2)[SUSv3] | nftw64(GLIBC_2.3.3)[LFS] | towupper(GLIBC_2.2)[SUSv3] |
| err(GLIBC_2.2)[LSB] | ngettext(GLIBC_2.2)[LSB] | truncate(GLIBC_2.2)[SUSv3] |
| error(GLIBC_2.2)[LSB] | nice(GLIBC_2.2)[SUSv3] | truncate64(GLIBC_2.2)[LFS] |

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| errx(GLIBC_2.2)[LSB] | nl_langinfo(GLIBC_2.2)[SUSv3] | tsearch(GLIBC_2.2)[SUSv3] |
| execl(GLIBC_2.2)[SUSv3] | nrand48(GLIBC_2.2)[SUSv3] | ttyname(GLIBC_2.2)[SUSv3] |
| execle(GLIBC_2.2)[SUSv3] | ntohl(GLIBC_2.2)[SUSv3] | ttyname_r(GLIBC_2.2)[SUSv3] |
| execlp(GLIBC_2.2)[SUSv3] | ntohs(GLIBC_2.2)[SUSv3] | twalk(GLIBC_2.2)[SUSv3] |
| execv(GLIBC_2.2)[SUSv3] | open(GLIBC_2.2)[SUSv3] | tzset(GLIBC_2.2)[SUSv3] |
| execve(GLIBC_2.2)[SUSv3] | opendir(GLIBC_2.2)[SUSv3] | ualarm(GLIBC_2.2)[SUSv3] |
| execvp(GLIBC_2.2)[SUSv3] | openlog(GLIBC_2.2)[SUSv3] | ulimit(GLIBC_2.2)[SUSv3] |
| exit(GLIBC_2.2)[SUSv3] | pathconf(GLIBC_2.2)[SUSv3] | umask(GLIBC_2.2)[SUSv3] |
| fchdir(GLIBC_2.2)[SUSv3] | pause(GLIBC_2.2)[SUSv3] | uname(GLIBC_2.2)[SUSv3] |
| fchmod(GLIBC_2.2)[SUSv3] | pclose(GLIBC_2.2)[SUSv3] | ungetc(GLIBC_2.2)[SUSv3] |
| fchown(GLIBC_2.2)[SUSv3] | perror(GLIBC_2.2)[SUSv3] | ungetwc(GLIBC_2.2)[SUSv3] |
| fclose(GLIBC_2.2)[SUSv3] | pipe(GLIBC_2.2)[SUSv3] | unlink(GLIBC_2.2)[LSB] |
| fcntl(GLIBC_2.2)[LSB] | pmap_getport(GLIBC_2.2)[LSB] | unlockpt(GLIBC_2.2)[SUSv3] |
| fcvt(GLIBC_2.2)[SUSv3] | pmap_set(GLIBC_2.2)[LSB] | unsetenv(GLIBC_2.2)[SUSv3] |
| fdatasync(GLIBC_2.2)[SUSv3] | pmap_unset(GLIBC_2.2)[LSB] | usleep(GLIBC_2.2)[SUSv3] |
| fdopen(GLIBC_2.2)[SUSv3] | poll(GLIBC_2.2)[SUSv3] | utime(GLIBC_2.2)[SUSv3] |
| feof(GLIBC_2.2)[SUSv3] | popen(GLIBC_2.2)[SUSv3] | utimes(GLIBC_2.2)[SUSv3] |
| ferror(GLIBC_2.2)[SUSv3] | posix_fadvise(GLIBC_2.2)[SUSv3] | utmpname(GLIBC_2.2)[LSB] |
| fflush(GLIBC_2.2)[SUSv3] | posix_fadvise64(GLIBC_2.2)[LSB] | vasprintf(GLIBC_2.2)[LSB] |
| fflush_unlocked(GLIBC_2.2)[LSB] | posix_fallocate(GLIBC_2.2)[SUSv3] | vdprintf(GLIBC_2.2)[LSB] |
| ffs(GLIBC_2.2)[SUSv3] | posix_fallocate64(GLIBC_2.2)[LSB] | verrx(GLIBC_2.2)[LSB] |

| | | |
|---|---|---|
| fgetc(GLIBC_2.2)[SUSv3] | posix_madvise(GLIBC_2.2)[SUSv3] | vfork(GLIBC_2.2)[SUSv3] |
| fgetpos(GLIBC_2.2)[SUSv3] | posix_memalign(GLIBC_2.2)[SUSv3] | vfprintf(GLIBC_2.2)[SUSv3] |
| fgetpos64(GLIBC_2.2)[LFS] | posix_openpt(GLIBC_2.2.1)[SUSv3] | vfscanf(GLIBC_2.2)[LSB] |
| fgets(GLIBC_2.2)[SUSv3] | posix_spawn(GLIBC_2.2)[SUSv3] | vfwprintf(GLIBC_2.2)[SUSv3] |
| fgetwc(GLIBC_2.2)[SUSv3] | posix_spawn_file_actions_addclose(GLIBC_2.2)[SUSv3] | vfwscanf(GLIBC_2.2)[LSB] |
| fgetwc_unlocked(GLIBC_2.2)[LSB] | posix_spawn_file_actions_adddup2(GLIBC_2.2)[SUSv3] | vprintf(GLIBC_2.2)[SUSv3] |
| fgetws(GLIBC_2.2)[SUSv3] | posix_spawn_file_actions_addopen(GLIBC_2.2)[SUSv3] | vscanf(GLIBC_2.2)[LSB] |
| fileno(GLIBC_2.2)[SUSv3] | posix_spawn_file_actions_destroy(GLIBC_2.2)[SUSv3] | vsnprintf(GLIBC_2.2)[SUSv3] |
| flock(GLIBC_2.2)[LSB] | posix_spawn_file_actions_init(GLIBC_2.2)[SUSv3] | vsprintf(GLIBC_2.2)[SUSv3] |
| flockfile(GLIBC_2.2)[SUSv3] | posix_spawnattr_destroy(GLIBC_2.2)[SUSv3] | vsscanf(GLIBC_2.2)[LSB] |
| fmtmsg(GLIBC_2.2)[SUSv3] | posix_spawnattr_getflags(GLIBC_2.2)[SUSv3] | vswprintf(GLIBC_2.2)[SUSv3] |
| fnmatch(GLIBC_2.2.3)[SUSv3] | posix_spawnattr_getpgroup(GLIBC_2.2)[SUSv3] | vswscanf(GLIBC_2.2)[LSB] |
| fopen(GLIBC_2.2)[SUSv3] | posix_spawnattr_getschedparam(GLIBC_2.2)[SUSv3] | vsyslog(GLIBC_2.2)[LSB] |
| fopen64(GLIBC_2.2)[LFS] | posix_spawnattr_getschedpolicy(GLIBC_2.2)[SUSv3] | vwprintf(GLIBC_2.2)[SUSv3] |
| fork(GLIBC_2.2)[SUSv3] | posix_spawnattr_getsigdefault(GLIBC_2.2)[SUSv3] | vwscanf(GLIBC_2.2)[LSB] |
| fpathconf(GLIBC_2.2)[SUSv3] | posix_spawnattr_getsigmask(GLIBC_2.2)[SUSv3] | wait(GLIBC_2.2)[SUSv3] |
| fprintf(GLIBC_2.2)[SUSv3] | posix_spawnattr_init(GLIBC_2.2)[SUSv3] | wait4(GLIBC_2.2)[LSB] |

 

| | | |
|---|---|---|
| fputc(GLIBC_2.2)[SUSv3] | posix_spawnattr_setflags(GLIBC_2.2)[SUSv3] | waitid(GLIBC_2.2)[SUSv3] |
| fputs(GLIBC_2.2)[SUSv3] | posix_spawnattr_setpgroup(GLIBC_2.2)[SUSv3] | waitpid(GLIBC_2.2)[LSB] |
| fputwc(GLIBC_2.2)[SUSv3] | posix_spawnattr_setschedparam(GLIBC_2.2)[SUSv3] | warn(GLIBC_2.2)[LSB] |
| fputws(GLIBC_2.2)[SUSv3] | posix_spawnattr_setschedpolicy(GLIBC_2.2)[SUSv3] | warnx(GLIBC_2.2)[LSB] |
| fread(GLIBC_2.2)[SUSv3] | posix_spawnattr_setsigdefault(GLIBC_2.2)[SUSv3] | wcpcpy(GLIBC_2.2)[LSB] |
| free(GLIBC_2.2)[SUSv3] | posix_spawnattr_setsigmask(GLIBC_2.2)[SUSv3] | wcpncpy(GLIBC_2.2)[LSB] |
| freeaddrinfo(GLIBC_2.2)[SUSv3] | posix_spawnp(GLIBC_2.2)[SUSv3] | wcrtomb(GLIBC_2.2)[SUSv3] |
| freopen(GLIBC_2.2)[SUSv3] | printf(GLIBC_2.2)[SUSv3] | wcscasecmp(GLIBC_2.2)[LSB] |
| freopen64(GLIBC_2.2)[LFS] | pselect(GLIBC_2.2)[SUSv3] | wcscat(GLIBC_2.2)[SUSv3] |
| fscanf(GLIBC_2.2)[LSB] | psignal(GLIBC_2.2)[LSB] | wcschr(GLIBC_2.2)[SUSv3] |
| fseek(GLIBC_2.2)[SUSv3] | ptsname(GLIBC_2.2)[SUSv3] | wcscmp(GLIBC_2.2)[SUSv3] |
| fseeko(GLIBC_2.2)[SUSv3] | putc(GLIBC_2.2)[SUSv3] | wcscoll(GLIBC_2.2)[SUSv3] |
| fseeko64(GLIBC_2.2)[LFS] | putc_unlocked(GLIBC_2.2)[SUSv3] | wcscpy(GLIBC_2.2)[SUSv3] |
| fsetpos(GLIBC_2.2)[SUSv3] | putchar(GLIBC_2.2)[SUSv3] | wcscspn(GLIBC_2.2)[SUSv3] |
| fsetpos64(GLIBC_2.2)[LFS] | putchar_unlocked(GLIBC_2.2)[SUSv3] | wcsdup(GLIBC_2.2)[LSB] |
| fstatfs(GLIBC_2.2)[LSB] | putenv(GLIBC_2.2)[SUSv3] | wcsftime(GLIBC_2.2)[SUSv3] |
| fstatfs64(GLIBC_2.2)[LSB] | puts(GLIBC_2.2)[SUSv3] | wcslen(GLIBC_2.2)[SUSv3] |
| fstatvfs(GLIBC_2.2)[SUSv3] | pututxline(GLIBC_2.2)[SUSv3] | wcsncasecmp(GLIBC_2.2)[LSB] |
| fstatvfs64(GLIBC_2.2)[LFS] | putw(GLIBC_2.2)[SUSv2] | wcsncat(GLIBC_2.2)[SUSv3] |

| | | |
|---|---|---|
| fsync(GLIBC_2.2)[SUSv3] | putwc(GLIBC_2.2)[SUSv3] | wcsncmp(GLIBC_2.2)[SUSv3] |
| ftell(GLIBC_2.2)[SUSv3] | putwchar(GLIBC_2.2)[SUSv3] | wcsncpy(GLIBC_2.2)[SUSv3] |
| ftello(GLIBC_2.2)[SUSv3] | qsort(GLIBC_2.2)[SUSv3] | wcsnlen(GLIBC_2.2)[LSB] |
| ftello64(GLIBC_2.2)[LFS] | raise(GLIBC_2.2)[SUSv3] | wcsnrtombs(GLIBC_2.2)[LSB] |
| ftime(GLIBC_2.2)[SUSv3] | rand(GLIBC_2.2)[SUSv3] | wcspbrk(GLIBC_2.2)[SUSv3] |
| ftok(GLIBC_2.2)[SUSv3] | rand_r(GLIBC_2.2)[SUSv3] | wcsrchr(GLIBC_2.2)[SUSv3] |
| ftruncate(GLIBC_2.2)[SUSv3] | random(GLIBC_2.2)[SUSv3] | wcsrtombs(GLIBC_2.2)[SUSv3] |
| ftruncate64(GLIBC_2.2)[LFS] | read(GLIBC_2.2)[SUSv3] | wcsspn(GLIBC_2.2)[SUSv3] |
| ftrylockfile(GLIBC_2.2)[SUSv3] | readdir(GLIBC_2.2)[SUSv3] | wcsstr(GLIBC_2.2)[SUSv3] |
| ftw(GLIBC_2.2)[SUSv3] | readdir64(GLIBC_2.2)[LFS] | wcstod(GLIBC_2.2)[SUSv3] |
| ftw64(GLIBC_2.2)[LFS] | readdir64_r(GLIBC_2.2)[LSB] | wcstof(GLIBC_2.2)[SUSv3] |
| funlockfile(GLIBC_2.2)[SUSv3] | readdir_r(GLIBC_2.2)[SUSv3] | wcstoimax(GLIBC_2.2)[SUSv3] |
| fwide(GLIBC_2.2)[SUSv3] | readlink(GLIBC_2.2)[SUSv3] | wcstok(GLIBC_2.2)[SUSv3] |
| fwprintf(GLIBC_2.2)[SUSv3] | readv(GLIBC_2.2)[SUSv3] | wcstol(GLIBC_2.2)[SUSv3] |
| fwrite(GLIBC_2.2)[SUSv3] | realloc(GLIBC_2.2)[SUSv3] | wcstold(GLIBC_2.2)[SUSv3] |
| fwscanf(GLIBC_2.2)[LSB] | realpath(GLIBC_2.3)[SUSv3] | wcstoll(GLIBC_2.2)[SUSv3] |
| gai_strerror(GLIBC_2.2)[SUSv3] | recv(GLIBC_2.2)[SUSv3] | wcstombs(GLIBC_2.2)[SUSv3] |
| gcvt(GLIBC_2.2)[SUSv3] | recvfrom(GLIBC_2.2)[SUSv3] | wcstoq(GLIBC_2.2)[LSB] |
| getaddrinfo(GLIBC_2.2)[SUSv3] | recvmsg(GLIBC_2.2)[SUSv3] | wcstoul(GLIBC_2.2)[SUSv3] |
| getc(GLIBC_2.2)[SUSv3] | regcomp(GLIBC_2.2)[SUSv3] | wcstoull(GLIBC_2.2)[SUSv3] |
| getc_unlocked(GLIBC_2.2)[SUSv3] | regerror(GLIBC_2.2)[SUSv3] | wcstoumax(GLIBC_2.2)[SUSv3] |

 

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|---|---|---|
| getchar(GLIBC_2.2)[SUSv3] | regexec(GLIBC_2.3.4)[LSB] | wcstouq(GLIBC_2.2)[LSB] |
| getchar_unlocked(GLIBC_2.2)[SUSv3] | regfree(GLIBC_2.2)[SUSv3] | wcswcs(GLIBC_2.2)[SUSv3] |
| getcontext(GLIBC_2.2)[SUSv3] | remove(GLIBC_2.2)[SUSv3] | wcswidth(GLIBC_2.2)[SUSv3] |
| getcwd(GLIBC_2.2)[SUSv3] | remque(GLIBC_2.2)[SUSv3] | wcsxfrm(GLIBC_2.2)[SUSv3] |
| getdate(GLIBC_2.2)[SUSv3] | rename(GLIBC_2.2)[SUSv3] | wctob(GLIBC_2.2)[SUSv3] |
| getdomainname(GLIBC_2.2)[LSB] | rewind(GLIBC_2.2)[SUSv3] | wctomb(GLIBC_2.2)[SUSv3] |
| getdtablesize(GLIBC_2.2)[LSB] | rewinddir(GLIBC_2.2)[SUSv3] | wctrans(GLIBC_2.2)[SUSv3] |
| getegid(GLIBC_2.2)[SUSv3] | rindex(GLIBC_2.2)[SUSv3] | wctype(GLIBC_2.2)[SUSv3] |
| getenv(GLIBC_2.2)[SUSv3] | rmdir(GLIBC_2.2)[SUSv3] | wcwidth(GLIBC_2.2)[SUSv3] |
| geteuid(GLIBC_2.2)[SUSv3] | sbrk(GLIBC_2.2)[SUSv2] | wmemchr(GLIBC_2.2)[SUSv3] |
| getgid(GLIBC_2.2)[SUSv3] | scanf(GLIBC_2.2)[LSB] | wmemcmp(GLIBC_2.2)[SUSv3] |
| getgrent(GLIBC_2.2)[SUSv3] | sched_get_priority_max(GLIBC_2.2)[SUSv3] | wmemcpy(GLIBC_2.2)[SUSv3] |
| getgrgid(GLIBC_2.2)[SUSv3] | sched_get_priority_min(GLIBC_2.2)[SUSv3] | wmemmove(GLIBC_2.2)[SUSv3] |
| getgrgid_r(GLIBC_2.2)[SUSv3] | sched_getparam(GLIBC_2.2)[SUSv3] | wmemset(GLIBC_2.2)[SUSv3] |
| getgrnam(GLIBC_2.2)[SUSv3] | sched_getscheduler(GLIBC_2.2)[SUSv3] | wordexp(GLIBC_2.2.2)[SUSv3] |
| getgrnam_r(GLIBC_2.2)[SUSv3] | sched_rr_get_interval(GLIBC_2.2)[SUSv3] | wordfree(GLIBC_2.2)[SUSv3] |
| getgrouplist(GLIBC_2.2.4)[LSB] | sched_setparam(GLIBC_2.2)[SUSv3] | wprintf(GLIBC_2.2)[SUSv3] |
| getgroups(GLIBC_2.2)[SUSv3] | sched_setscheduler(GLIBC_2.2)[LSB] | write(GLIBC_2.2)[SUSv3] |
| gethostbyaddr(GLIBC_2.2)[SUSv3] | sched_yield(GLIBC_2.2)[SUSv3] | writev(GLIBC_2.2)[SUSv3] |
| gethostbyaddr_r(GLIBC_2.2)[LSB] | seed48(GLIBC_2.2)[SUSv3] | wscanf(GLIBC_2.2)[LSB] |
| gethostbyname(GLIBC_2.2)[SUSv3] | seekdir(GLIBC_2.2)[SUSv3] | xdr_accepted_reply(GLIBC_2.2)[SVID.3] |

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|---|---|---|
| gethostbyname2(GLIBC_2.2)[LSB] | select(GLIBC_2.2)[SUSv3] | xdr_array(GLIBC_2.2)[SVID.3] |
| gethostbyname2_r(GLIBC_2.2)[LSB] | semctl(GLIBC_2.2)[SUSv3] | xdr_bool(GLIBC_2.2)[SVID.3] |
| gethostbyname_r(GLIBC_2.2)[LSB] | semget(GLIBC_2.2)[SUSv3] | xdr_bytes(GLIBC_2.2)[SVID.3] |
| gethostid(GLIBC_2.2)[SUSv3] | semop(GLIBC_2.2)[SUSv3] | xdr_callhdr(GLIBC_2.2)[SVID.3] |
| gethostname(GLIBC_2.2)[SUSv3] | send(GLIBC_2.2)[SUSv3] | xdr_callmsg(GLIBC_2.2)[SVID.3] |
| getitimer(GLIBC_2.2)[SUSv3] | sendmsg(GLIBC_2.2)[SUSv3] | xdr_char(GLIBC_2.2)[SVID.3] |
| getloadavg(GLIBC_2.2)[LSB] | sendto(GLIBC_2.2)[SUSv3] | xdr_double(GLIBC_2.2)[SVID.3] |
| getlogin(GLIBC_2.2)[SUSv3] | setbuf(GLIBC_2.2)[SUSv3] | xdr_enum(GLIBC_2.2)[SVID.3] |
| getlogin_r(GLIBC_2.2)[SUSv3] | setbuffer(GLIBC_2.2)[LSB] | xdr_float(GLIBC_2.2)[SVID.3] |
| getnameinfo(GLIBC_2.2)[SUSv3] | setcontext(GLIBC_2.2)[SUSv3] | xdr_free(GLIBC_2.2)[SVID.3] |
| getopt(GLIBC_2.2)[LSB] | setegid(GLIBC_2.2)[SUSv3] | xdr_int(GLIBC_2.2)[SVID.3] |
| getopt_long(GLIBC_2.2)[LSB] | setenv(GLIBC_2.2)[SUSv3] | xdr_long(GLIBC_2.2)[SVID.3] |
| getopt_long_only(GLIBC_2.2)[LSB] | seteuid(GLIBC_2.2)[SUSv3] | xdr_opaque(GLIBC_2.2)[SVID.3] |
| getpagesize(GLIBC_2.2)[LSB] | setgid(GLIBC_2.2)[SUSv3] | xdr_opaque_auth(GLIBC_2.2)[SVID.3] |
| getpeername(GLIBC_2.2)[SUSv3] | setgrent(GLIBC_2.2)[SUSv3] | xdr_pointer(GLIBC_2.2)[SVID.3] |
| getpgid(GLIBC_2.2)[SUSv3] | setgroups(GLIBC_2.2)[LSB] | xdr_reference(GLIBC_2.2)[SVID.3] |
| getpgrp(GLIBC_2.2)[SUSv3] | sethostname(GLIBC_2.2)[LSB] | xdr_rejected_reply(GLIBC_2.2)[SVID.3] |
| getpid(GLIBC_2.2)[SUSv3] | setitimer(GLIBC_2.2)[SUSv3] | xdr_replymsg(GLIBC_2.2)[SVID.3] |
| getppid(GLIBC_2.2)[SUSv3] | setlocale(GLIBC_2.2)[SUSv3] | xdr_short(GLIBC_2.2)[SVID.3] |
| getpriority(GLIBC_2.2)[SUSv3] | setlogmask(GLIBC_2.2)[SUSv3] | xdr_string(GLIBC_2.2)[SVID.3] |
| getprotobyname(GLIBC_2.2)[SUSv3] | setpgid(GLIBC_2.2)[SUSv3] | xdr_u_char(GLIBC_2.2)[SVID.3] |

 

| | | |
|---|---|---|
| getprotobynumber(GLIBC_2.2)[SUSv3] | setpgrp(GLIBC_2.2)[SUSv3] | xdr_u_int(GLIBC_2.2)[LSB] |
| getprotoent(GLIBC_2.2)[SUSv3] | setpriority(GLIBC_2.2)[SUSv3] | xdr_u_long(GLIBC_2.2)[SVID.3] |
| getpwent(GLIBC_2.2)[SUSv3] | setprotoent(GLIBC_2.2)[SUSv3] | xdr_u_short(GLIBC_2.2)[SVID.3] |
| getpwnam(GLIBC_2.2)[SUSv3] | setpwent(GLIBC_2.2)[SUSv3] | xdr_union(GLIBC_2.2)[SVID.3] |
| getpwnam_r(GLIBC_2.2)[SUSv3] | setregid(GLIBC_2.2)[SUSv3] | xdr_vector(GLIBC_2.2)[SVID.3] |
| getpwuid(GLIBC_2.2)[SUSv3] | setreuid(GLIBC_2.2)[SUSv3] | xdr_void(GLIBC_2.2)[SVID.3] |
| getpwuid_r(GLIBC_2.2)[SUSv3] | setrlimit(GLIBC_2.2)[SUSv3] | xdr_wrapstring(GLIBC_2.2)[SVID.3] |
| getrlimit(GLIBC_2.2)[SUSv3] | setrlimit64(GLIBC_2.2)[LFS] | xdrmem_create(GLIBC_2.2)[SVID.3] |
| getrlimit64(GLIBC_2.2)[LFS] | setservent(GLIBC_2.2)[SUSv3] | xdrrec_create(GLIBC_2.2)[SVID.3] |
| getrusage(GLIBC_2.2)[SUSv3] | setsid(GLIBC_2.2)[SUSv3] | xdrrec_eof(GLIBC_2.2)[SVID.3] |
| getservbyname(GLIBC_2.2)[SUSv3] | setsockopt(GLIBC_2.2)[LSB] | xdrstdio_create(GLIBC_2.2)[LSB] |
| getservbyport(GLIBC_2.2)[SUSv3] | setstate(GLIBC_2.2)[SUSv3] | |
| getservent(GLIBC_2.2)[SUSv3] | setuid(GLIBC_2.2)[SUSv3] | |

**Table A-2 libc Data Interfaces**

| | | |
|---|---|---|
| __daylight[LSB] | __tzname[LSB] | in6addr_loopback[SUSv3] |
| __environ[LSB] | _sys_errlist[LSB] | |
| __timezone[LSB] | in6addr_any[SUSv3] | |

## A.2 libcrypt

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

ISO POSIX (2003) [SUSv3]

**Table A-3 libcrypt Function Interfaces**

| | | |
|---|---|---|
| crypt(GLIBC_2.0)[SUSv3] | encrypt(GLIBC_2.0)[SUSv3] | setkey(GLIBC_2.0)[SUSv3] |

## A.3 libdl

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

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

**Table A-4 libdl Function Interfaces**

| | | |
|---|---|---|
| dladdr(GLIBC_2.0)[LSB] | dlerror(GLIBC_2.0)[SUSv3] | dlsym(GLIBC_2.0)[LSB] |
| dlclose(GLIBC_2.0)[SUSv3] | dlopen(GLIBC_2.1)[LSB] | |

## A.4 libgcc_s

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

ISO/IEC 23360 Part 1 [LSB]

**Table A-5 libgcc_s Function Interfaces**

| | | |
|---|---|---|
| _Unwind_Backtrace(GCC_3.3)[LSB] | _Unwind_GetCFA(GCC_3.3)[LSB] | _Unwind_RaiseException(GCC_3.0)[LSB] |
| _Unwind_DeleteException(GCC_3.0)[LSB] | _Unwind_GetGR(GCC_3.0)[LSB] | _Unwind_Resume(GCC_3.0)[LSB] |
| _Unwind_FindEnclosingFunction(GCC_3.3)[LSB] | _Unwind_GetIP(GCC_3.0)[LSB] | _Unwind_Resume_or_Rethrow(GCC_3.3)[LSB] |
| _Unwind_ForcedUnwind(GCC_3.0)[LSB] | _Unwind_GetLanguageSpecificData(GCC_3.0)[LSB] | _Unwind_SetGR(GCC_3.0)[LSB] |
| _Unwind_GetBSP(GCC_3.3.2)[LSB] | _Unwind_GetRegionStart(GCC_3.0)[LSB] | _Unwind_SetIP(GCC_3.0)[LSB] |

## A.5 libm

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

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

**Table A-6 libm Function Interfaces**

| | | |
|---|---|---|
| __finite(GLIBC_2.2)[LSB] | csinhl(GLIBC_2.2)[SUSv3] | llround(GLIBC_2.2)[SUSv3] |
| __finitef(GLIBC_2.2)[LSB] | csinl(GLIBC_2.2)[SUSv3] | llroundf(GLIBC_2.2)[SUSv3] |
| __finitel(GLIBC_2.2)[LS | csqrt(GLIBC_2.2)[SUSv | llroundl(GLIBC_2.2)[SU |

 

| | | |
|---|---|---|
| B] | 3] | Sv3] |
| __fpclassify(GLIBC_2.2)[LSB] | csqrtf(GLIBC_2.2)[SUSv3] | log(GLIBC_2.2)[SUSv3] |
| __fpclassifyf(GLIBC_2.2)[LSB] | csqrtl(GLIBC_2.2)[SUSv3] | log10(GLIBC_2.2)[SUSv3] |
| __fpclassifyl(GLIBC_2.2)[LSB] | ctan(GLIBC_2.2)[SUSv3] | log10f(GLIBC_2.2)[SUSv3] |
| __signbit(GLIBC_2.2)[LSB] | ctanf(GLIBC_2.2)[SUSv3] | log10l(GLIBC_2.2)[SUSv3] |
| __signbitf(GLIBC_2.2)[LSB] | ctanh(GLIBC_2.2)[SUSv3] | log1p(GLIBC_2.2)[SUSv3] |
| __signbitl(GLIBC_2.2)[ISOC99] | ctanhf(GLIBC_2.2)[SUSv3] | log1pf(GLIBC_2.2)[SUSv3] |
| acos(GLIBC_2.2)[SUSv3] | ctanhl(GLIBC_2.2)[SUSv3] | log1pl(GLIBC_2.2)[SUSv3] |
| acosf(GLIBC_2.2)[SUSv3] | ctanl(GLIBC_2.2)[SUSv3] | log2(GLIBC_2.2)[SUSv3] |
| acosh(GLIBC_2.2)[SUSv3] | drem(GLIBC_2.2)[LSB] | log2f(GLIBC_2.2)[SUSv3] |
| acoshf(GLIBC_2.2)[SUSv3] | dremf(GLIBC_2.2)[LSB] | log2l(GLIBC_2.2)[SUSv3] |
| acoshl(GLIBC_2.2)[SUSv3] | dreml(GLIBC_2.2)[LSB] | logb(GLIBC_2.2)[SUSv3] |
| acosl(GLIBC_2.2)[SUSv3] | erf(GLIBC_2.2)[SUSv3] | logbf(GLIBC_2.2)[SUSv3] |
| asin(GLIBC_2.2)[SUSv3] | erfc(GLIBC_2.2)[SUSv3] | logbl(GLIBC_2.2)[SUSv3] |
| asinf(GLIBC_2.2)[SUSv3] | erfcf(GLIBC_2.2)[SUSv3] | logf(GLIBC_2.2)[SUSv3] |
| asinh(GLIBC_2.2)[SUSv3] | erfcl(GLIBC_2.2)[SUSv3] | logl(GLIBC_2.2)[SUSv3] |
| asinhf(GLIBC_2.2)[SUSv3] | erff(GLIBC_2.2)[SUSv3] | lrint(GLIBC_2.2)[SUSv3] |
| asinhl(GLIBC_2.2)[SUSv3] | erfl(GLIBC_2.2)[SUSv3] | lrintf(GLIBC_2.2)[SUSv3] |
| asinl(GLIBC_2.2)[SUSv3] | exp(GLIBC_2.2)[SUSv3] | lrintl(GLIBC_2.2)[SUSv3] |
| atan(GLIBC_2.2)[SUSv3] | exp10(GLIBC_2.2)[LSB] | lround(GLIBC_2.2)[SUSv3] |
| atan2(GLIBC_2.2)[SUSv3] | exp10f(GLIBC_2.2)[LSB] | lroundf(GLIBC_2.2)[SUSv3] |
| atan2f(GLIBC_2.2)[SUS | exp10l(GLIBC_2.2)[LSB | lroundl(GLIBC_2.2)[SU |

| | | |
|---|---|---|
| v3] | ] | Sv3] |
| atan2l(GLIBC_2.2)[SUSv3] | exp2(GLIBC_2.2)[SUSv3] | matherr(GLIBC_2.2)[SVID.3] |
| atanf(GLIBC_2.2)[SUSv3] | exp2f(GLIBC_2.2)[SUSv3] | modf(GLIBC_2.2)[SUSv3] |
| atanh(GLIBC_2.2)[SUSv3] | exp2l(GLIBC_2.2)[SUSv3] | modff(GLIBC_2.2)[SUSv3] |
| atanhf(GLIBC_2.2)[SUSv3] | expf(GLIBC_2.2)[SUSv3] | modfl(GLIBC_2.2)[SUSv3] |
| atanhl(GLIBC_2.2)[SUSv3] | expl(GLIBC_2.2)[SUSv3] | nan(GLIBC_2.2)[SUSv3] |
| atanl(GLIBC_2.2)[SUSv3] | expm1(GLIBC_2.2)[SUSv3] | nanf(GLIBC_2.2)[SUSv3] |
| cabs(GLIBC_2.2)[SUSv3] | expm1f(GLIBC_2.2)[SUSv3] | nanl(GLIBC_2.2)[SUSv3] |
| cabsf(GLIBC_2.2)[SUSv3] | expm1l(GLIBC_2.2)[SUSv3] | nearbyint(GLIBC_2.2)[SUSv3] |
| cabsl(GLIBC_2.2)[SUSv3] | fabs(GLIBC_2.2)[SUSv3] | nearbyintf(GLIBC_2.2)[SUSv3] |
| cacos(GLIBC_2.2)[SUSv3] | fabsf(GLIBC_2.2)[SUSv3] | nearbyintl(GLIBC_2.2)[SUSv3] |
| cacosf(GLIBC_2.2)[SUSv3] | fabsl(GLIBC_2.2)[SUSv3] | nextafter(GLIBC_2.2)[SUSv3] |
| cacosh(GLIBC_2.2)[SUSv3] | fdim(GLIBC_2.2)[SUSv3] | nextafterf(GLIBC_2.2)[SUSv3] |
| cacoshf(GLIBC_2.2)[SUSv3] | fdimf(GLIBC_2.2)[SUSv3] | nextafterl(GLIBC_2.2)[SUSv3] |
| cacoshl(GLIBC_2.2)[SUSv3] | fdiml(GLIBC_2.2)[SUSv3] | nexttoward(GLIBC_2.2)[SUSv3] |
| cacosl(GLIBC_2.2)[SUSv3] | feclearexcept(GLIBC_2.2)[SUSv3] | nexttowardf(GLIBC_2.2)[SUSv3] |
| carg(GLIBC_2.2)[SUSv3] | fedisableexcept(GLIBC_2.2)[LSB] | nexttowardl(GLIBC_2.2)[SUSv3] |
| cargf(GLIBC_2.2)[SUSv3] | feenableexcept(GLIBC_2.2)[LSB] | pow(GLIBC_2.2)[SUSv3] |
| cargl(GLIBC_2.2)[SUSv3] | fegetenv(GLIBC_2.2)[SUSv3] | pow10(GLIBC_2.2)[LSB] |
| casin(GLIBC_2.2)[SUSv3] | fegetexcept(GLIBC_2.2)[LSB] | pow10f(GLIBC_2.2)[LSB] |
| casinf(GLIBC_2.2)[SUSv3] | fegetexceptflag(GLIBC_2.2)[SUSv3] | pow10l(GLIBC_2.2)[LSB] |
| casinh(GLIBC_2.2)[SUS | fegetround(GLIBC_2.2)[ | powf(GLIBC_2.2)[SUSv |

 

| | | |
|---|---|---|
| v3] | SUSv3] | 3] |
| casinhf(GLIBC_2.2)[SUSv3] | feholdexcept(GLIBC_2.2)[SUSv3] | powl(GLIBC_2.2)[SUSv3] |
| casinhl(GLIBC_2.2)[SUSv3] | feraiseexcept(GLIBC_2.2)[SUSv3] | remainder(GLIBC_2.2)[SUSv3] |
| casinl(GLIBC_2.2)[SUSv3] | fesetenv(GLIBC_2.2)[SUSv3] | remainderf(GLIBC_2.2)[SUSv3] |
| catan(GLIBC_2.2)[SUSv3] | fesetexceptflag(GLIBC_2.2)[SUSv3] | remainderl(GLIBC_2.2)[SUSv3] |
| catanf(GLIBC_2.2)[SUSv3] | fesetround(GLIBC_2.2)[SUSv3] | remquo(GLIBC_2.2)[SUSv3] |
| catanh(GLIBC_2.2)[SUSv3] | fetestexcept(GLIBC_2.2)[SUSv3] | remquof(GLIBC_2.2)[SUSv3] |
| catanhf(GLIBC_2.2)[SUSv3] | feupdateenv(GLIBC_2.2)[SUSv3] | remquol(GLIBC_2.2)[SUSv3] |
| catanhl(GLIBC_2.2)[SUSv3] | finite(GLIBC_2.2)[LSB] | rint(GLIBC_2.2)[SUSv3] |
| catanl(GLIBC_2.2)[SUSv3] | finitef(GLIBC_2.2)[LSB] | rintf(GLIBC_2.2)[SUSv3] |
| cbrt(GLIBC_2.2)[SUSv3] | finitel(GLIBC_2.2)[LSB] | rintl(GLIBC_2.2)[SUSv3] |
| cbrtf(GLIBC_2.2)[SUSv3] | floor(GLIBC_2.2)[SUSv3] | round(GLIBC_2.2)[SUSv3] |
| cbrtl(GLIBC_2.2)[SUSv3] | floorf(GLIBC_2.2)[SUSv3] | roundf(GLIBC_2.2)[SUSv3] |
| ccos(GLIBC_2.2)[SUSv3] | floorl(GLIBC_2.2)[SUSv3] | roundl(GLIBC_2.2)[SUSv3] |
| ccosf(GLIBC_2.2)[SUSv3] | fma(GLIBC_2.2)[SUSv3] | scalb(GLIBC_2.2)[SUSv3] |
| ccosh(GLIBC_2.2)[SUSv3] | fmaf(GLIBC_2.2)[SUSv3] | scalbf(GLIBC_2.2)[ISOC99] |
| ccoshf(GLIBC_2.2)[SUSv3] | fmal(GLIBC_2.2)[SUSv3] | scalbl(GLIBC_2.2)[ISOC99] |
| ccoshl(GLIBC_2.2)[SUSv3] | fmax(GLIBC_2.2)[SUSv3] | scalbln(GLIBC_2.2)[SUSv3] |
| ccosl(GLIBC_2.2)[SUSv3] | fmaxf(GLIBC_2.2)[SUSv3] | scalblnf(GLIBC_2.2)[SUSv3] |
| ceil(GLIBC_2.2)[SUSv3] | fmaxl(GLIBC_2.2)[SUSv3] | scalblnl(GLIBC_2.2)[SUSv3] |
| ceilf(GLIBC_2.2)[SUSv3] | fmin(GLIBC_2.2)[SUSv3] | scalbn(GLIBC_2.2)[SUSv3] |
| ceill(GLIBC_2.2)[SUSv3 | fminf(GLIBC_2.2)[SUSv | scalbnf(GLIBC_2.2)[SUS |

| | | |
|---|---|---|
| ] | 3] | v3] |
| cexp(GLIBC_2.2)[SUSv3] | fminl(GLIBC_2.2)[SUSv3] | scalbnl(GLIBC_2.2)[SUSv3] |
| cexpf(GLIBC_2.2)[SUSv3] | fmod(GLIBC_2.2)[SUSv3] | significand(GLIBC_2.2)[LSB] |
| cexpl(GLIBC_2.2)[SUSv3] | fmodf(GLIBC_2.2)[SUSv3] | significandf(GLIBC_2.2)[LSB] |
| cimag(GLIBC_2.2)[SUSv3] | fmodl(GLIBC_2.2)[SUSv3] | significandl(GLIBC_2.2)[LSB] |
| cimagf(GLIBC_2.2)[SUSv3] | frexp(GLIBC_2.2)[SUSv3] | sin(GLIBC_2.2)[SUSv3] |
| cimagl(GLIBC_2.2)[SUSv3] | frexpf(GLIBC_2.2)[SUSv3] | sincos(GLIBC_2.2)[LSB] |
| clog(GLIBC_2.2)[SUSv3] | frexpl(GLIBC_2.2)[SUSv3] | sincosf(GLIBC_2.2)[LSB] |
| clog10(GLIBC_2.2)[LSB] | gamma(GLIBC_2.2)[LSB] | sincosl(GLIBC_2.2)[LSB] |
| clog10f(GLIBC_2.2)[LSB] | gammaf(GLIBC_2.2)[LSB] | sinf(GLIBC_2.2)[SUSv3] |
| clog10l(GLIBC_2.2)[LSB] | gammal(GLIBC_2.2)[LSB] | sinh(GLIBC_2.2)[SUSv3] |
| clogf(GLIBC_2.2)[SUSv3] | hypot(GLIBC_2.2)[SUSv3] | sinhf(GLIBC_2.2)[SUSv3] |
| clogl(GLIBC_2.2)[SUSv3] | hypotf(GLIBC_2.2)[SUSv3] | sinhl(GLIBC_2.2)[SUSv3] |
| conj(GLIBC_2.2)[SUSv3] | hypotl(GLIBC_2.2)[SUSv3] | sinl(GLIBC_2.2)[SUSv3] |
| conjf(GLIBC_2.2)[SUSv3] | ilogb(GLIBC_2.2)[SUSv3] | sqrt(GLIBC_2.2)[SUSv3] |
| conjl(GLIBC_2.2)[SUSv3] | ilogbf(GLIBC_2.2)[SUSv3] | sqrtf(GLIBC_2.2)[SUSv3] |
| copysign(GLIBC_2.2)[SUSv3] | ilogbl(GLIBC_2.2)[SUSv3] | sqrtl(GLIBC_2.2)[SUSv3] |
| copysignf(GLIBC_2.2)[SUSv3] | j0(GLIBC_2.2)[SUSv3] | tan(GLIBC_2.2)[SUSv3] |
| copysignl(GLIBC_2.2)[SUSv3] | j0f(GLIBC_2.2)[LSB] | tanf(GLIBC_2.2)[SUSv3] |
| cos(GLIBC_2.2)[SUSv3] | j0l(GLIBC_2.2)[LSB] | tanh(GLIBC_2.2)[SUSv3] |
| cosf(GLIBC_2.2)[SUSv3] | j1(GLIBC_2.2)[SUSv3] | tanhf(GLIBC_2.2)[SUSv3] |
| cosh(GLIBC_2.2)[SUSv3 | j1f(GLIBC_2.2)[LSB] | tanhl(GLIBC_2.2)[SUSv |

 

| | | |
|---|---|---|
| ] | | 3] |
| coshf(GLIBC_2.2)[SUSv3] | j1l(GLIBC_2.2)[LSB] | tanl(GLIBC_2.2)[SUSv3] |
| coshl(GLIBC_2.2)[SUSv3] | jn(GLIBC_2.2)[SUSv3] | tgamma(GLIBC_2.2)[SUSv3] |
| cosl(GLIBC_2.2)[SUSv3] | jnf(GLIBC_2.2)[LSB] | tgammaf(GLIBC_2.2)[SUSv3] |
| cpow(GLIBC_2.2)[SUSv3] | jnl(GLIBC_2.2)[LSB] | tgammal(GLIBC_2.2)[SUSv3] |
| cpowf(GLIBC_2.2)[SUSv3] | ldexp(GLIBC_2.2)[SUSv3] | trunc(GLIBC_2.2)[SUSv3] |
| cpowl(GLIBC_2.2)[SUSv3] | ldexpf(GLIBC_2.2)[SUSv3] | truncf(GLIBC_2.2)[SUSv3] |
| cproj(GLIBC_2.2)[SUSv3] | ldexpl(GLIBC_2.2)[SUSv3] | truncl(GLIBC_2.2)[SUSv3] |
| cprojf(GLIBC_2.2)[SUSv3] | lgamma(GLIBC_2.2)[SUSv3] | y0(GLIBC_2.2)[SUSv3] |
| cprojl(GLIBC_2.2)[SUSv3] | lgamma_r(GLIBC_2.2)[LSB] | y0f(GLIBC_2.2)[LSB] |
| creal(GLIBC_2.2)[SUSv3] | lgammaf(GLIBC_2.2)[SUSv3] | y0l(GLIBC_2.2)[LSB] |
| crealf(GLIBC_2.2)[SUSv3] | lgammaf_r(GLIBC_2.2)[LSB] | y1(GLIBC_2.2)[SUSv3] |
| creall(GLIBC_2.2)[SUSv3] | lgammal(GLIBC_2.2)[SUSv3] | y1f(GLIBC_2.2)[LSB] |
| csin(GLIBC_2.2)[SUSv3] | lgammal_r(GLIBC_2.2)[LSB] | y1l(GLIBC_2.2)[LSB] |
| csinf(GLIBC_2.2)[SUSv3] | llrint(GLIBC_2.2)[SUSv3] | yn(GLIBC_2.2)[SUSv3] |
| csinh(GLIBC_2.2)[SUSv3] | llrintf(GLIBC_2.2)[SUSv3] | ynf(GLIBC_2.2)[LSB] |
| csinhf(GLIBC_2.2)[SUSv3] | llrintl(GLIBC_2.2)[SUSv3] | ynl(GLIBC_2.2)[LSB] |

**Table A-7 libm Data Interfaces**

| | | |
|---|---|---|
| signgam[SUSv3] | | |

## A.6 libpthread

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

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

**Table A-8 libpthread Function Interfaces**

| | | |
|---|---|---|
| _pthread_cleanup_pop(GLIBC_2.2)[LSB] | pthread_cond_signal(GLIBC_2.3.2)[SUSv3] | pthread_rwlock_timedrdlock(GLIBC_2.2)[SUSv3] |
| _pthread_cleanup_push(GLIBC_2.2)[LSB] | pthread_cond_timedwait(GLIBC_2.3.2)[SUSv3] | pthread_rwlock_timedwrlock(GLIBC_2.2)[SUSv3] |
| lseek64(GLIBC_2.2)[LFS] | pthread_cond_wait(GLIBC_2.3.2)[SUSv3] | pthread_rwlock_tryrdlock(GLIBC_2.2)[SUSv3] |
| open64(GLIBC_2.2)[LFS] | pthread_condattr_destroy(GLIBC_2.2)[SUSv3] | pthread_rwlock_trywrlock(GLIBC_2.2)[SUSv3] |
| pread(GLIBC_2.2)[SUSv3] | pthread_condattr_getpshared(GLIBC_2.2)[SUSv3] | pthread_rwlock_unlock(GLIBC_2.2)[SUSv3] |
| pread64(GLIBC_2.2)[LFS] | pthread_condattr_init(GLIBC_2.2)[SUSv3] | pthread_rwlock_wrlock(GLIBC_2.2)[SUSv3] |
| pthread_attr_destroy(GLIBC_2.2)[SUSv3] | pthread_condattr_setpshared(GLIBC_2.2)[SUSv3] | pthread_rwlockattr_destroy(GLIBC_2.2)[SUSv3] |
| pthread_attr_getdetachstate(GLIBC_2.2)[SUSv3] | pthread_create(GLIBC_2.2)[SUSv3] | pthread_rwlockattr_getpshared(GLIBC_2.2)[SUSv3] |
| pthread_attr_getguardsize(GLIBC_2.2)[SUSv3] | pthread_detach(GLIBC_2.2)[SUSv3] | pthread_rwlockattr_init(GLIBC_2.2)[SUSv3] |
| pthread_attr_getinheritsched(GLIBC_2.2)[SUSv3] | pthread_equal(GLIBC_2.2)[SUSv3] | pthread_rwlockattr_setpshared(GLIBC_2.2)[SUSv3] |
| pthread_attr_getschedparam(GLIBC_2.2)[SUSv3] | pthread_exit(GLIBC_2.2)[SUSv3] | pthread_self(GLIBC_2.2)[SUSv3] |
| pthread_attr_getschedpolicy(GLIBC_2.2)[SUSv3] | pthread_getconcurrency(GLIBC_2.2)[SUSv3] | pthread_setcancelstate(GLIBC_2.2)[SUSv3] |
| pthread_attr_getscope(GLIBC_2.2)[SUSv3] | pthread_getcpuclockid(GLIBC_2.2)[SUSv3] | pthread_setcanceltype(GLIBC_2.2)[SUSv3] |
| pthread_attr_getstack(GLIBC_2.2)[SUSv3] | pthread_getschedparam(GLIBC_2.2)[SUSv3] | pthread_setconcurrency(GLIBC_2.2)[SUSv3] |
| pthread_attr_getstackaddr(GLIBC_2.2)[SUSv3] | pthread_getspecific(GLIBC_2.2)[SUSv3] | pthread_setschedparam(GLIBC_2.2)[SUSv3] |
| pthread_attr_getstacksize(GLIBC_2.2)[SUSv3] | pthread_join(GLIBC_2.2)[SUSv3] | pthread_setspecific(GLIBC_2.2)[SUSv3] |
| pthread_attr_init(GLIBC_2.2)[SUSv3] | pthread_key_create(GLIBC_2.2)[SUSv3] | pthread_sigmask(GLIBC_2.2)[SUSv3] |
| pthread_attr_setdetachs | pthread_key_delete(GL | pthread_spin_destroy( |

 

| | | |
|---|---|---|
| tate(GLIBC_2.2)[SUSv3] | IBC_2.2)[SUSv3] | GLIBC_2.2)[SUSv3] |
| pthread_attr_setguardsize(GLIBC_2.2)[SUSv3] | pthread_kill(GLIBC_2.2)[SUSv3] | pthread_spin_init(GLIBC_2.2)[SUSv3] |
| pthread_attr_setinheritsched(GLIBC_2.2)[SUSv3] | pthread_mutex_destroy(GLIBC_2.2)[SUSv3] | pthread_spin_lock(GLIBC_2.2)[SUSv3] |
| pthread_attr_setschedparam(GLIBC_2.2)[SUSv3] | pthread_mutex_init(GLIBC_2.2)[SUSv3] | pthread_spin_trylock(GLIBC_2.2)[SUSv3] |
| pthread_attr_setschedpolicy(GLIBC_2.2)[SUSv3] | pthread_mutex_lock(GLIBC_2.2)[SUSv3] | pthread_spin_unlock(GLIBC_2.2)[SUSv3] |
| pthread_attr_setscope(GLIBC_2.2)[SUSv3] | pthread_mutex_timedlock(GLIBC_2.2)[SUSv3] | pthread_testcancel(GLIBC_2.2)[SUSv3] |
| pthread_attr_setstackaddr(GLIBC_2.2)[SUSv3] | pthread_mutex_trylock(GLIBC_2.2)[SUSv3] | pwrite(GLIBC_2.2)[SUSv3] |
| pthread_attr_setstacksize(GLIBC_2.3.3)[SUSv3] | pthread_mutex_unlock(GLIBC_2.2)[SUSv3] | pwrite64(GLIBC_2.2)[LFS] |
| pthread_barrier_destroy(GLIBC_2.2)[SUSv3] | pthread_mutexattr_destroy(GLIBC_2.2)[SUSv3] | sem_close(GLIBC_2.2)[SUSv3] |
| pthread_barrier_init(GLIBC_2.2)[SUSv3] | pthread_mutexattr_getpshared(GLIBC_2.2)[SUSv3] | sem_destroy(GLIBC_2.2)[SUSv3] |
| pthread_barrier_wait(GLIBC_2.2)[SUSv3] | pthread_mutexattr_gettype(GLIBC_2.2)[SUSv3] | sem_getvalue(GLIBC_2.2)[SUSv3] |
| pthread_barrierattr_destroy(GLIBC_2.2)[SUSv3] | pthread_mutexattr_init(GLIBC_2.2)[SUSv3] | sem_init(GLIBC_2.2)[SUSv3] |
| pthread_barrierattr_init(GLIBC_2.2)[SUSv3] | pthread_mutexattr_setpshared(GLIBC_2.2)[SUSv3] | sem_open(GLIBC_2.2)[SUSv3] |
| pthread_barrierattr_setpshared(GLIBC_2.2)[SUSv3] | pthread_mutexattr_settype(GLIBC_2.2)[SUSv3] | sem_post(GLIBC_2.2)[SUSv3] |
| pthread_cancel(GLIBC_2.2)[SUSv3] | pthread_once(GLIBC_2.2)[SUSv3] | sem_timedwait(GLIBC_2.2)[SUSv3] |
| pthread_cond_broadcast(GLIBC_2.3.2)[SUSv3] | pthread_rwlock_destroy(GLIBC_2.2)[SUSv3] | sem_trywait(GLIBC_2.2)[SUSv3] |
| pthread_cond_destroy(GLIBC_2.3.2)[SUSv3] | pthread_rwlock_init(GLIBC_2.2)[SUSv3] | sem_unlink(GLIBC_2.2)[SUSv3] |
| pthread_cond_init(GLIBC_2.3.2)[SUSv3] | pthread_rwlock_rdlock(GLIBC_2.2)[SUSv3] | sem_wait(GLIBC_2.2)[SUSv3] |

## A.7 librt

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

ISO POSIX (2003) [SUSv3]

**Table A-9 librt Function Interfaces**

| | | |
|---|---|---|
| clock_getcpuclockid(GLIBC_2.2)[SUSv3] | clock_settime(GLIBC_2.2)[SUSv3] | timer_delete(GLIBC_2.3.3)[SUSv3] |
| clock_getres(GLIBC_2.2)[SUSv3] | shm_open(GLIBC_2.2)[SUSv3] | timer_getoverrun(GLIBC_2.3.3)[SUSv3] |
| clock_gettime(GLIBC_2.2)[SUSv3] | shm_unlink(GLIBC_2.2)[SUSv3] | timer_gettime(GLIBC_2.3.3)[SUSv3] |
| clock_nanosleep(GLIBC_2.2)[SUSv3] | timer_create(GLIBC_2.3.3)[SUSv3] | timer_settime(GLIBC_2.3.3)[SUSv3] |

## A.8 libutil

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

ISO/IEC 23360 Part 1 [LSB]

**Table A-10 libutil Function Interfaces**

| | | |
|---|---|---|
| forkpty(GLIBC_2.0)[LSB] | login_tty(GLIBC_2.0)[LSB] | logwtmp(GLIBC_2.0)[LSB] |
| login(GLIBC_2.0)[LSB] | logout(GLIBC_2.0)[LSB] | openpty(GLIBC_2.0)[LSB] |

 

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