

INTERNATIONAL
STANDARD

ISO/IEC
23360-1-4

First edition
2021-08

Linux Standard Base (LSB) —
Part 1-4:
Languages specification

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC PRF 23360-1-4](https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4)

<https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4>



Reference number
ISO/IEC 23360-1-4:2021(E)

© ISO/IEC 2021

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC PRF 23360-1-4](https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4)
<https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4>



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Foreword

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

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see patents.iec.ch).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by the Linux Foundation [as Linux Standard Base (LSB): Languages specification] and drafted in accordance with its editorial rules. It was assigned to Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 22, *Programming languages, their environments and system software interfaces*, and adopted by National Bodies.

This first edition of ISO/IEC 23360-1-4 cancels and replaces ISO/IEC 23360-1:2006, which has been technically revised.

A list of all parts in the ISO/IEC 23660 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

Contents

Foreword	iii
Introduction	v
I Introductory Elements	1
1 Scope	2
2 Normative References.....	3
3 Requirements	4
3.1 Relevant Libraries	4
4 Terms and Definitions	5
5 Documentation Conventions	7
II Python Interpreter	8
6 Python Interpreter	9
6.1 Introduction.....	9
6.2 Python Interpreter Location.....	9
6.3 Python Interpreter Version.....	9
6.4 Operators and Functions.....	9
6.5 Python Modules	9
6.6 Python Interpreter Command	9
III Perl Interpreter	15
7 Perl Interpreter.....	16
7.1 Introduction.....	16
7.2 Perl Interpreter Location	16
7.3 Perl Interpreter Version	16
7.4 Perl Operators and Functions	16
7.5 Perl Modules	16
7.6 Perl Interpreter Command	19
IV XML2 library	20
8 Libraries.....	21
8.1 Interfaces for libxml2.....	21
8.2 Data Definitions for libxml2.....	49
V XSLT library	126
9 Libraries.....	127
9.1 Interfaces for libxslt.....	127
9.2 Data Definitions for libxslt.....	132
VI Package Format and Installation	151
10 Software Installation.....	152
10.1 Package Dependencies	152
Annex A Alphabetical Listing of Interfaces by Library	153
A.1 libxml2.....	153
A.2 libxslt.....	181

Introduction

The LSB defines a binary interface for application programs that are compiled and packaged for LSB-conforming implementations on many different hardware architectures. A binary specification must include information specific to the computer processor architecture for which it is intended. To avoid the complexity of conditional descriptions, the specification has instead been divided into generic parts which are augmented by one of several architecture-specific parts, depending on the target processor architecture; the generic part will indicate when reference must be made to the architecture part, and vice versa.

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:

1. The first number (x) is the major version number. Versions sharing the same major version number shall be compatible in a backwards direction; that is, a newer version shall be compatible with an older version. Any deletion of a library results in a new major version number. Interfaces marked as deprecated may be removed from the specification at a major version change.
2. The second number (y) is the minor version number. Libraries and individual interfaces may be added, but not removed. Interfaces may be marked as deprecated at a minor version change. Other minor changes may be permitted at the discretion of the LSB workgroup.
3. 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.

LSB is a trademark of the Linux Foundation. Developers of applications or implementations interested in using the trademark should see the Linux Foundation Certification Policy for details.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/IEC PRF 23360-1-4

<https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4>

I Introductory Elements

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC PRF 23360-1-4](https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4)
<https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4>

1 Scope

The LSB Languages specification defines components for runtime languages which are found on an LSB conforming system.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC PRF 23360-1-4](https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4)

<https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4>

2 Normative References

The specifications listed below are referenced in whole or in part by the LSB Languages specification. Such references may be normative or informative; a reference to specification shall only be considered normative if it is explicitly cited as such. The LSB Languages specification may make normative references to a portion of these specifications (that is, to define a specific function or group of functions); in such cases, only the explicitly referenced portion of the specification is to be considered normative.

Table 2-1 Informative References

Name	Title	URL
ISO C (1999)	ISO/IEC 9899:1999 - Programming Languages -- C	
Perl Core Modules	Perl 5.8.8 Core Modules	http://perldoc.perl.org/5.8.8/index-modules-A.html
Perl Functions	Perl 5.8.8 Functions	http://perldoc.perl.org/5.8.8/perlfunc.html
Perl Language Reference	Perl 5.8.8 Language Reference	http://perldoc.perl.org/5.8.8/index-language.html
Perl Manual	Perl 5.8.8 Manual Page	http://perldoc.perl.org/5.8.8/perlrun.html
Perl Operators	Perl 5.8.8 Operators and Precedence	http://perldoc.perl.org/5.8.8/perlpop.html
Perl Syntax	Perl 5.8.8 Syntax	http://perldoc.perl.org/5.8.8/perl SYN.html
Python Library Reference	Python Library Reference Release 2.4.2	http://www.python.org/doc/2.4.2/lib/lib.html
Python Reference Manual	Python Reference Manual Release 2.4.2	http://www.python.org/doc/2.4.2/ref/ref.html
Reference Manual for libxml2	Reference Manual for libxml2	http://xmlsoft.org/html/index.html
Reference Manual for libxslt	Reference Manual for libxslt	http://xmlsoft.org/xslt/html/index.html

3 Requirements

This specification describes runtime language interpreters which shall be found in specified locations. It also defines a number of runtime modules which shall be in an implementation-defined directory which the interpreters shall search by default.

3.1 Relevant Libraries

The libraries listed in Table 3-1 shall be available on a Linux Standard Base system, with the specified runtime names. This list may be supplemented or amended by the architecture-specific specification.

Table 3-1 Standard Library Names

Library	Runtime Name
libxml2	libxml2.so.2
libxslt	libxslt.so.1

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC PRF 23360-1-4](https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4)

<https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4>

4 Terms and Definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 2382, ISO 80000-2, and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4.1

archLSB

Some LSB specification documents have both a generic, architecture-neutral part and an architecture-specific part. The latter describes elements whose definitions may be unique to a particular processor architecture. The term archLSB may be used in the generic part to refer to the corresponding section of the architecture-specific part.

4.2

Binary Standard, ABI

The total set of interfaces that are available to be used in the compiled binary code of a conforming application, including the run-time details such as calling conventions, binary format, C++ name mangling, etc.

4.3

[ISO/IEC PRF 23360-1-4](https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-237d7a9d15f9/iso-iec-prf-23360-1-4)

[https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-](https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-237d7a9d15f9/iso-iec-prf-23360-1-4)

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.

4.4

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.

4.5

Source Standard, API

The total set of interfaces that are available to be used in the source code of a conforming application. Due to translations, the Binary Standard and the Source Standard may contain some different interfaces.

4.6

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.

4.7

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.

In addition, for the portions of this specification which build on IEEE Std 1003.1-2001, the definitions given in *IEEE Std 1003.1-2001, Base Definitions, Chapter 3* apply.

5 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) [SUSv4]

refers to the interface named `forkpty()` with symbol version `GLIBC_2.0` that is defined in the reference indicated by the tag `SUSv4`.

Note: For symbols with versions which differ between architectures, the symbol versions are defined in the architecture specific parts of of this module specification only. In the generic part, they will appear without symbol versions.

II Python Interpreter

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC PRF 23360-1-4](https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4)

<https://standards.iteh.ai/catalog/standards/sist/d4da284e-7d06-426b-8391-377d7e9d15f9/iso-iec-prf-23360-1-4>

6 Python Interpreter

6.1 Introduction

The Python interpreter API is described in the Python Library Reference, with the following requirements for an LSB conforming runtime.

6.2 Python Interpreter Location

The Python interpreter binary, or a link to the binary, shall exist at `/usr/bin/python`.

6.3 Python Interpreter Version

The default installed Python version shall be 2.4.2 or greater.

6.4 Operators and Functions

Core Python operators, subroutines, and built-in functions shall be present and shall operate as defined in Python Reference Manual.

6.5 Python Modules

An LSB conforming implementation shall provide the Python modules as described in Table 6-1 with at least the behavior described as mandatory in the referenced underlying specification. Some Python modules may be marked as deprecated, and applications should avoid using these as they may be withdrawn in future releases of this specification.

Table 6-1 Python Modules

array [1]	csv [1]	imp [1]	posix [1]	sys [1]
binascii [1]	datetime [1]	itertools [1]	pwd [1]	syslog [1]
bisect [1]	errno [1]	locale [1]	random [1]	termios [1]
cPickle [1]	exceptions [1]	marshal [1]	re [1]	thread [1]
cStringIO [1]	fcntl [1]	mmap [1]	resource [1]	time [1]
cmath [1]	gc [1]	operator [1]	select [1]	unicodedata [1]
codecs [1]	grp [1]	os [1]	signal [1]	weakref [1]
collections [1]	heapq [1]	ossaudiodev [1]	socket [1]	zipimport [1]
crypt [1]	hotshot [1]	parser [1]	string [1]	zlib [1]

Referenced Specification(s)

[1]. Python Reference Manual

6.6 Python Interpreter Command

This section contains a description of the `python` command.