

This is a preview - [click here to buy the full publication](#)

**INTERNATIONAL
STANDARD**

**ISO/IEC
23360-2-3**

First edition
2021-10

**Linux Standard Base (LSB) —
Part 2-3:
Desktop specification for X86-32
architecture**



Reference number
ISO/IEC 23360-2-3:2021(E)

© ISO/IEC 2021



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): Desktop specification for X86-32 architecture 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 23360-2-3 cancels and replaces ISO/IEC 23360-2:2006, which has been technically revised.

This document is based on “The GNU Free Documentation License, version 1.1”. The license is available at <https://www.gnu.org/licenses/old-licenses/fdl-1.1.html>.

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 | vi |
| I Introductory Elements | 1 |
| 1 Scope..... | 2 |
| 2 References..... | 3 |
| 2.1 Normative References | 3 |
| 2.2 Informative References/Bibliography..... | 6 |
| 3 Requirements | 7 |
| 3.1 Relevant Libraries | 7 |
| 4 Terms and Definitions..... | 8 |
| 5 Documentation Conventions | 10 |
| II GTK+ Stack Libraries | 11 |
| 6 Libraries..... | 12 |
| 6.1 Introduction..... | 12 |
| 6.2 Interfaces for libglib-2.0 | 13 |
| 6.3 Data Definitions for libglib-2.0 | 20 |
| 6.4 Interfaces for libgmodule-2.0..... | 21 |
| 6.5 Data Definitions for libgmodule-2.0..... | 21 |
| 6.6 Interfaces for libgobject-2.0..... | 22 |
| 6.7 Data Definitions for libgobject-2.0..... | 23 |
| 6.8 Interfaces for libgthread-2.0..... | 24 |
| 6.9 Interfaces for libgio-2.0 | 24 |
| 6.10 Data Definitions for libgio-2.0..... | 25 |
| 6.11 Interfaces for libatk-1.0..... | 42 |
| 6.12 Data Definitions for libatk-1.0..... | 42 |
| 6.13 Interfaces for libpango-1.0 | 43 |
| 6.14 Data Definitions for libpango-1.0 | 43 |
| 6.15 Interfaces for libpangocairo-1.0..... | 44 |
| 6.16 Data Definitions for libpangocairo-1.0..... | 44 |
| 6.17 Interfaces for libpangoft2-1.0..... | 45 |
| 6.18 Data Definitions for libpangoft2-1.0..... | 45 |
| 6.19 Interfaces for libpangoft2-1.0 | 46 |
| 6.20 Data Definitions for libpangoft2-1.0 | 46 |
| 6.21 Interfaces for libgdk_pixbuf-2.0 | 47 |
| 6.22 Data Definitions for libgdk_pixbuf-2.0 | 47 |
| 6.23 Interfaces for libgdk_pixbuf_xlib-2.0..... | 48 |
| 6.24 Data Definitions for libgdk_pixbuf_xlib-2.0..... | 48 |
| 6.25 Interfaces for libgdk-x11-2.0 | 48 |
| 6.26 Data Definitions for libgdk-x11-2.0 | 49 |
| 6.27 Interfaces for libgtk-x11-2.0 | 49 |
| 6.28 Data Definitions for libgtk-x11-2.0 | 50 |
| III Qt Libraries | 53 |
| 7 Libraries..... | 54 |
| 7.1 Introduction..... | 54 |
| 7.2 Interfaces for libQtCore | 55 |
| 7.3 Data Definitions for libQtCore | 69 |
| 7.4 Interface Definitions for libQtCore | 78 |
| 7.5 Interfaces for libQtGui..... | 79 |
| 7.6 Data Definitions for libQtGui..... | 355 |
| 7.7 Interfaces for libQtXml..... | 375 |
| 7.8 Data Definitions for libQtXml..... | 384 |
| 7.9 Interfaces for libQtOpenGL | 385 |
| 7.10 Data Definitions for libQtOpenGL..... | 390 |
| 7.11 Interfaces for libQtSql..... | 390 |

| | |
|---|------------|
| 7.12 Data Definitions for libQtSql..... | 394 |
| 7.13 Interfaces for libQtSvg..... | 396 |
| 7.14 Data Definitions for libQtSvg..... | 400 |
| 7.15 Interfaces for libQtNetwork..... | 400 |
| 7.16 Data Definitions for libQtNetwork..... | 403 |
| IV Package Format and Installation | 406 |
| 8 Software Installation..... | 407 |
| 8.1 Package Dependencies..... | 407 |
| Annex A Alphabetical Listing of Interfaces by Library..... | 408 |
| A.1 libGL..... | 408 |
| A.2 libGLU..... | 418 |
| A.3 libICE..... | 419 |
| A.4 libSM..... | 420 |
| A.5 libX11..... | 421 |
| A.6 libXext..... | 432 |
| A.7 libXft..... | 434 |
| A.8 libXi..... | 435 |
| A.9 libXrender..... | 436 |
| A.10 libXt..... | 437 |
| A.11 libXtst..... | 442 |
| A.12 libcairo..... | 442 |
| A.13 libcairo-gobject..... | 449 |
| A.14 libcairo-script-interpreter..... | 450 |
| A.15 libfontconfig..... | 450 |
| A.16 libfreetype..... | 453 |
| A.17 libjpeg..... | 455 |
| A.18 libpng12..... | 456 |
| A.19 libtiff..... | 459 |
| A.20 libxcb..... | 461 |
| A.21 libQtCore..... | 470 |
| A.22 libQtGui..... | 470 |
| A.23 libQtOpenGL..... | 476 |
| A.24 libQtSql..... | 476 |
| A.25 libQtSvg..... | 476 |
| A.26 libQtXml..... | 477 |
| A.27 libasound..... | 477 |

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.

I Introductory Elements

1 Scope

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 part describing those parts of the interface that remain constant across all implementations of the LSB, and an architecture-specific part describing the parts of the interface that vary by processor architecture. Together, the common part and the relevant architecture-specific part for a single hardware architecture provide a complete interface specification for compiled application programs on systems that share a common hardware architecture.

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.

This is the X86 architecture specific part of the Desktop module of the Linux Standard Base (LSB). This part supplements the common part of the LSB Desktop module with those interfaces that differ between architectures.

This part should be used in conjunction with the common part of LSB Desktop. Whenever a section of the common part is supplemented by architecture-specific information, the common part includes a reference to the architecture-specific part. This part may also contain additional information that is not referenced in the common part.

Interfaces described in this part of LSB Desktop are mandatory except where explicitly listed otherwise. Interfaces described in the LSB Desktop module supplement those described in the LSB Core module. They do not depend on other LSB modules.

2 References

2.1 Normative References

The specifications listed below are referenced in whole or in part by the LSB Desktop 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 Desktop 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 Normative References

| Name | Title | URL |
|------------------------------------|--|---|
| ATK 2.2.0 Reference Manual | ATK 2.2.0 Reference Manual | http://developer.gnome.org/atk/2.2/index.html |
| Double Buffer Extension Library | Double Buffer Extension Library - Protocol Version 1.0 | http://refspecs.linuxfoundation.org/X11/dbelib.pdf |
| Fontconfig Developers Reference | Fontconfig Developers Reference, Version 2.6.0 | http://refspecs.linuxfoundation.org/fontconfig-2.6.0 |
| Gdk 2.10.14 Reference Manual | Gdk 2.10.14 Reference Manual | http://library.gnome.org/devel/gdk/2.10/ |
| Gdk-pixbuf 2.26.0 Reference Manual | Gdk-pixbuf 2.26.0 Reference Manual | http://developer.gnome.org/gdk-pixbuf/2.26 |
| Gio 2.32 Reference Manual | Gio 2.32 Reference Manual | http://developer.gnome.org/gio/2.32 |
| Glib 2.32 Reference Manual | Glib 2.32 Reference Manual | http://developer.gnome.org/glib/2.32 |
| Gobject 2.32 Reference Manual | Gobject 2.32 Reference Manual | http://developer.gnome.org/gobject/2.32 |
| Gtk+ 2.10.14 Reference Manual | Gtk+ 2.10.14 Reference Manual | http://library.gnome.org/devel/gtk/2.10/ |
| ISO C (1999) | ISO/IEC 9899:1999 - Programming Languages -- C | |
| ISO/IEC 14882: 2003 C++ Language | ISO/IEC 14882: 2003 Programming languages --C++ | |
| Itanium™ C++ ABI | Itanium™ C++ ABI (Revision 1.86) | http://refspecs.linuxfoundation.org/cxxabi-1.86.html |
| Libtiff 4.0.2 Reference Manual | Libtiff 4.0.2 Reference Manual | http://www.libtiff.org/man/index.html |

| Name | Title | URL |
|---------------------------------------|--|---|
| Libxcb API | Libxcb API | http://xcb.freedesktop.org/XcbApi/ |
| OpenGL 2.1 | The OpenGL® Graphics System: A Specification (Version 2.1) | http://www.opengl.org/registry/doc/glspec21.20061201.pdf |
| OpenGL ABI | OpenGL® Application Binary Interface for Linux | http://www.opengl.org/registry/ABI/ |
| OpenGL Extensions | OpenGL® Graphics with the X Window System® (Version 1.3) | http://opengl.org/doc/umentation/specs/glx/glx1.3.pdf |
| OpenGL Utilities | The OpenGL Graphics System Utility Library (Version 1.3) | http://www.opengl.org/documentation/specs/glu/glu1_3.pdf |
| Pango 1.30.1 Reference Manual | Pango 1.30.1 Reference Manual | http://developer.gnome.org/pango/1.30/index.html |
| POSIX 1003.1-2008 (ISO/IEC 9945-2009) | Portable Operating System Interface (POSIX®) 2008 Edition / The Open Group Technical Standard Base Specifications, Issue 7 | http://www.unix.org/version4/ |
| QtCore 4.2.0 | Qt 4.2.0 Reference Manual | http://doc.qt.digia.com/4.2/qtcore.html |
| QtGui 4.2.0 | Qt 4.2.0 Reference Manual | http://doc.qt.digia.com/4.2/qtgui.html |
| QtNetwork 4.2.0 | Qt 4.2.0 Reference Manual | http://doc.qt.digia.com/4.2/qtnetwork.html |
| QtOpenGL 4.2.0 | Qt 4.2.0 Reference Manual | http://doc.qt.digia.com/4.2/qtopengl.html |
| QtSql 4.2.0 | Qt 4.2.0 Reference Manual | http://doc.qt.digia.com/4.2/qtsql.html |
| QtSvg 4.2.0 | Qt 4.2.0 Reference Manual | http://doc.qt.digia.com/4.2/qtsvg.html |
| QtXml 4.2.0 | Qt 4.2.0 Reference Manual | http://doc.qt.digia.com/4.2/qtxml.html |
| The MIT Shared Memory Extension | MIT-SHM - The MIT Shared Memory Extension - X version 11, Release 5 | http://refspecs.linux-foundation.org/X11/mit-shm.pdf |

| Name | Title | URL |
|---|---|---|
| X Display Power Management Signaling | X Display Power Management Signaling (DPMS) Extension - Library Specification - Version 1.0 | http://refspecs.linux-foundation.org/X11/DPMSlib.pdf |
| X Extended Visual Interface Extension | Extended Visual Information Extension - Version 1.0 | http://refspecs.linux-foundation.org/X11/evi.pdf |
| X Nonrectangular Window Shape Extension Library | X Nonrectangular Window Shape Extension Library - Version 1.0 | http://refspecs.linux-foundation.org/X11/shapelib.pdf |
| X Record Extension Library | X Record Extension Library - Version 1.13 | http://refspecs.linux-foundation.org/X11/recordlib.pdf |
| X Security Extension Specification | Security Extension Specification - Version 7.1 | http://refspecs.linux-foundation.org/X11/security.pdf |
| X Synchronization Extension Library | X Synchronization Extension Library - Version 3.0 | http://refspecs.linux-foundation.org/X11/syncnlib.pdf |
| X11 C Library | Xlib - C Language X Interface - X Version 11 Release 6.4 | http://refspecs.linux-foundation.org/X11/xlib.pdf |
| X11 Input Library | X Input Device Extension Library - X Version 11, Release 6.4 | http://refspecs.linux-foundation.org/X11/Xinput.pdf |
| X11 Inter-Client Exchange | Inter-Client Exchange Library - Version 1.0 | http://refspecs.linux-foundation.org/X11/ICElib.pdf |
| X11 Keyboard Extension | X Keyboard Extension Library Specification - X Version 11, Release 6.4 | http://refspecs.linux-foundation.org/X11/XKBlib.pdf |
| X11 Session Management | X Session Management Library - Version 1.0 | http://refspecs.linux-foundation.org/X11/SMlib.pdf |
| X11 Toolkit Intrinsic | X Toolkit Intrinsic - C Language Interface - X Version 11, Release 6.4 | http://refspecs.linux-foundation.org/X11/intrinsic.pdf |
| Xft Placeholder | Xft Specification Placeholder | |
| Xrender Placeholder | Xrender Specification Placeholder | http://refspecs.linux-foundation.org/X11/XRenderProtocol.html |

| Name | Title | URL |
|-------------------------|---------------------------------------|---|
| XTEST Extension Library | XTEST Extension Library - Version 2.2 | http://refspecs.linux-foundation.org/X11/xtestlib.pdf |

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 |
|---|--|---|
| A description on how to use and modify libpng | A description on how to use and modify libpng | http://www.libpng.org/pub/png/libpng-1.2.5-manual.html |
| ALSA Library API Reference | ALSA Library API Reference | http://www.alsa-project.org/alsa-doc/alsa-lib/ |
| Base Directory Spec | XDG Base Directory Specification Version 0.6 | http://standards.freedesktop.org/basedir-spec/basedir-spec-0.6.html |
| Cairo API Reference | Cairo Vector Graphics API Specification for 1.12.4 | http://cairographics.org/manual-1.12.4 |
| Desktop Entry Spec | Desktop Entry Specification Version 1.0 | http://standards.freedesktop.org/desktop-entry-spec/desktop-entry-spec-1.0.html |
| Desktop Menu Spec | Desktop Menu Specification Version 1.0 | http://standards.freedesktop.org/menu-spec/menu-spec-1.0.html |
| FreeType 2.2 Reference | FreeType 2.2.1 API Reference | http://refspecs.linuxfoundation.org/freetype/freetype-doc-2.2.1/docs/reference/ft2-toc.html |
| Icon Theme Spec | Icon Theme Specification Version 0.11 | http://standards.freedesktop.org/icon-theme-spec/icon-theme-spec-0.11.html |
| Independent JPEG Group | Independent JPEG Group | http://www.iijg.org/ |
| xdg-utils reference | Portland Project XDG Utilities Reference 1.0 | http://portland.freedesktop.org/xdg-utils-1.0/ |