TECHNICAL REPORT

ISO/IEC TR 13066-6

First edition
2014-07-15

Information technology — Interoperability with assistive technology (AT) —

Part 6:
Java accessibility application programming interface (API)

Technologies de l'information — Interopérabilité avec les technologies d'assistance —

Partie 6: Interface de programmation d'applications (API) d'accessibilité Java

Reference number
ISO/IEC TR 13066-6:2014(E)

© ISO/IEC 2014



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2014

All rights reserved. Unless otherwise specified, 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
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Terms and Definitions 1

3 General Description 5
3.1 General Description 5
3.2 Architecture 5

4 Using the API 6
4.1 Overview 6
4.2 Package javax.accessibility* 7
4.2.1 The AccessibleContext class 7
4.2.2 The AccessibleAction interface 8
4.2.3 The AccessibleComponent and AccessibleExtendedComponent interfaces 8
4.2.4 The `AccessibleIcon` interface 10
4.2.5 The AccessibleSelection interface 10
4.2.6 The AccessibleStreamable interface 10
4.2.7 The AccessibleTable and AccessibleExtendedTable interfaces 11
4.2.8 The AccessibleText, AccessibleEditableText, AccessibleExtendedText, and AccessibleHypertextText interfaces 12
4.2.9 The `AccessibleValue` interface 13
4.3 Implementing the Java accessibility API 13
4.3.1 Using existing accessible user interface components 14
4.3.2 Subclassing existing accessible user interface components 16
4.3.3 Creating accessible user interface components “from scratch” 17

5 Exposing User Interface Element Information 18
5.1 Role, state(s), boundary, name, and description of the user interface element 18
5.1.1 Role information 19
5.1.2 State(s) information 19
5.1.3 Boundary information 20
5.1.4 Name information 21
5.1.5 Description information 21
5.2 Current value and any minimum or maximum values, if the user interface element represents one of a range of values 22
5.2.1 Additional value information: setting values 23
5.3 Text contents, text attributes, and the boundary of text rendered to the screen 23
5.4 The relationship of the user interface element to other user interface elements 24
5.4.1 in a single data value, whether this user interface element is a label for another user interface element or is labelled by another user interface element 24
5.4.2 in a table, the row and column that it is in, including headers of the row and column if present. 25
5.4.3 in a hierarchical relationship, any parent containing the user interface element, and any children contained by the user interface element 26

6 Exposing User Interface Element Actions 27

7 Keyboard Focus 28
7.1 Tracking (and modifying) focus 28
7.2 Tracking (and modifying) text insertion point 29
7.2.1 Tracking (and modifying) selection attributes 30

© ISO/IEC 2014 – All rights reserved

8 Events 31
8.1 changes in the user interface element value 31
8.2 changes in the name of the user interface element 31
8.3 changes in the description of the user interface element 31
8.4 changes in the boundary of the user interface element 31
8.5 changes in the hierarchy of the user interface element 32
8.6 changes in other accessibility aspects of user interface components 32

9 Programmatic Modifications of States, Properties, Values, and Text 33
9.1 Programmatic Modifications of States 33
9.2 Programmatic Modifications of Properties 34
9.3 Programmatic Modifications of Values 34
9.4 Programmatic Modifications of Text 34

10 Design Considerations 35
10.1 Java Access Bridge for Windows 35
10.2 Java Access Bridge for Linux / UNIX graphical environments 36

11 Further Information 38
11.1 Role extensibility 38
11.2 State extensibility 39
11.3 Relation extensibility 39
11.4 Interface extensibility 39

Bibliography 40

© ISO/IEC 2014 – All rights reserved

Foreword

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

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. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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).

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

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 35, *User interfaces*.

ISO/IEC 13066 consists of the following parts, under the general title *Information technology — Interoperability with assistive technology (AT)*:

— *Part 1: Requirements and recommendations for interoperability*

— *Part 2: Windows accessibility application programming interface (API)*

— *Part 3: IAccessible2 accessibility application programming interface (API)*

— *Part 4: Linux/UNIX graphical environments accessibility application programming interface (API)*

— *Part 6: Java accessibility application programming interface (API)*

© ISO/IEC 2014 – All rights reserved

Introduction

Assistive technology (AT) is specialized information technology (IT) hardware or software that is added to or incorporated within a system that increases accessibility for an individual. In other words, it is special purpose IT that interoperates with another IT product enabling a person with a disability to use the IT product.

Interoperability involves the ability to add or replace Assistive Technology (AT) to existing components of Information Technology (IT) systems. Interoperability between AT and IT is best facilitated via the use of standardized, public interfaces for all IT components.

This part of ISO/IEC 13066 describes the Java accessibility API that can be used as a framework to support software to software IT-AT interoperability on the multiple computing platforms. It also describes the Java Access Bridge for Windows – for enabling AT on Windows to interoperate with accessible Java applications on the Microsoft Windows platform – and the Java Access Bridge for GNOME – for enabling AT on UNIX and GNU/Linux platforms running the GNOME graphical desktop to interoperate with accessible Java applications on UNIX and GNU/Linux environments.

NOTE 1 GNOME is both a common and accessible graphical desktop for Linux / UNIX graphical environments, as well as an open source project delivering a collection of software libraries and applications. It was formerly an acronym meaning “GNU Network Object Model Environment”.

NOTE 2 The code examples contained in this document are illustrative in nature. With rare exception, they do not include error checking or exception handling, and should be treated more like pseudo-code than as cookbook templates that can use directly in applications or assistive technologies.

© ISO/IEC 2014 – All rights reserved

Information technology — Interoperability with assistive technology (AT) —

Part 6:
Java accessibility application programming interface (API)

1 Scope

This part of ISO/IEC 13066 provides an overview to the structure and terminology of the Java accessibility API

It will provide:

— A description of the overall architecture and terminology of the API;

— Further introductory explanations regarding the content and use of the API beyond those found in Annex A of ISO/IEC 13066-1;

— An overview of the main properties, including of:

  — user interface elements;

  — how to get and set focus;

  — of communication mechanisms in the API;

  — a discussion of design considerations for the API (e.g. pointers to external sources of information on accessibility guidance related to using the API);

  — information on extending the API (and where this is appropriate);

  — an introduction to the programming interface of the API (including pointers to external sources of information).

  — an introduction to the Java Access Bridge for Windows and the Java Access Bridge for GNOME

It will provide this information as an introduction to the Java API to assist:

— IT system level developers who create custom controls and/or interface to them;

— AT developers involved in programming "hardware to software" and "software to software" interactions

2 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

2.1
accessible object
a part of the user interface that is accessible by and exposes the Java accessibility API

Note 1 to entry An accessible object is represented by an object of the “AccessibleContext” Java class

© ISO/IEC 2014 – All rights reserved