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Information technology — Interoperability with assistive technology (AT)

Part 4: Linux/UNIX graphical environments accessibility API

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National foreword

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Part 4: Linux/UNIX graphical environments accessibility API

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

Partie 4: Accessibilité API des environnements graphiques lInux/UNIX

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Foreword

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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).

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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)* [Technical Report]

— *Part 3: IAccessible2 accessibility application programming interface (API)* [Technical Report]

— *Part 4: Linux/UNIX graphical environments accessibility API* [Technical Report]

— *Part 6: Java accessibility application programming interface (API)* [Technical Report]

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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 following.

AT-SPI

The Assistive Technology Service Provider Interface (AT-SPI) API, which can be used as a toolkit agnostic framework to support software to software IT-AT interoperability on Linux and UNIX graphical desktop environments.

ATK

The Accessibility Toolkit (ATK) library provides a set of interfaces in support of AT-SPI on the GUI application side. The interfaces are toolkit-independent implementations could be written for any widget set, such as GTK, Motif, or Qt.

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Information technology — Interoperability with assistive technology (AT) —

Part 4: Linux/UNIX graphical environments accessibility API

1 Scope

This part of ISO/IEC 13066 provides an overview to the structure and terminology of the Linux/UNIX graphical environments accessibility API.

It will provide the following:

— 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 ISO/IEC 13066-1:2011, Annex A;

— an overview of the main properties, including

  — of user interface elements,

  — of how to get and set focus, and

  — 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).

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

— 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
A11Y
short form of “accessibility” or of “accessible”

2.2
accessible object
part of the *user interface* (2.21) 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.

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2.3
application programming interface
API
collection of invocation methods and associated parameters used by one piece of software to request actions from another piece of software

2.4
application software
software that is specific to the solution of an application problem

EXAMPLE A spreadsheet program is application software.

2.5
assistive technology
AT
hardware or software that is added to or incorporated within a system that increases accessibility for an individual

EXAMPLE Braille displays, screen readers, screen magnification software, and eye tracking devices are assistive technologies.

[SOURCE: ISO 9241-171:2008, 3.5]

Note 1 to entry: Within this part of ISO/IEC 13066, where Assistive Technology (AT) is used, it is to be considered as both singular and plural, without distinction. If it is to be used in the singular only, it will be preceded by the article "an" (i.e. an Assistive Technology). If it is to be used in the plural only, it will be preceded by the adjective "multiple" (i.e. multiple AT).

2.6
ATK
The Accessibility Toolkit
library which describes a set of interfaces that support the AT-SPI on the GUI application side

Note 1 to entry: The ATK interfaces are toolkit-independent - implementations could be written for any widget set, such as GTK, Motif or Qt.

2.7
AtkObject
base object class for the Accessibility Toolkit API

Note 1 to entry: This is the ATK analog of MSAA's and IAccessible2's "accessible object". The AtkObject structure is not accessed directly.

2.8
AT-SPI
The Assistive Technology Service Provider Interface
API that can be used as a toolkit agnostic framework to support software to software IT-AT interoperability on Linux and UNIX graphical desktop environments

2.9
clients
components that use the services of another component

Note 1 to entry: In this part of ISO/IEC 13066, client refers more specifically to a component that uses the services of either or both AT-SPI and/or ATK to access, identify, or manipulate the UI elements of an application.

2.10
daemon
software application that is not invoked explicitly, but lies dormant waiting for some condition(s) to occur

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2.11
embedded device
embedded system
computer system designed to perform one or a few dedicated functions often with real-time computing constraints

Note 1 to entry: It is embedded as part of a complete device often including hardware and mechanical parts. By contrast, a general-purpose computer, such as a personal computer (PC), is designed to be flexible and to meet a wide range of end-user needs. Embedded systems control many devices in common use today.

Note 2 to entry: In general, "embedded system" is not a strictly definable term, as most systems have some element of extensibility or programmability, e.g. hand-held computers share some elements with embedded systems such as the operating systems and microprocessors which power them, but they allow different applications to be loaded and peripherals to be connected. Moreover, even systems which don't expose programmability as a primary feature generally need to support software updates. On a continuum from "general purpose" to "embedded," large application systems will have subcomponents at most points even if the system as a whole is "designed to perform one or a few dedicated functions," and is thus appropriate to call "embedded."

2.12
function
defined objective or characteristic action of a system or component, e.g. a system has inventory control as its primary function

[SOURCE: IEEE Std. 610.12-1990]

2.13
interface
shared boundary between two functional units, defined by various characteristics pertaining to the functions, physical interconnections, signal exchanges, and other characteristics, as appropriate

2.14
interoperability
capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units

2.15
inter-process communication
IPC
mechanism by which different software processes communicate with each other – across process boundaries, runtime environments, and sometimes also computers and *operating systems* (2.16)

2.16
operating system
OS
software that controls the execution of programs and that may provide services such as resource allocation, scheduling, input-output control, and data management

Note 1 to entry: Although operating systems are predominantly software, partial hardware implementations are possible.

2.17
servers
in the context of this part of ISO/IEC 13066 and of assistive technology, servers are components (applications, libraries, etc.) that have UI and expose information about the UI and/or allow it to be manipulated

2.18
service
functionality made available to a user electronically, e.g. airline reservation service, currency translation services, weather forecasting, restaurant recommendations are all services

[SOURCE: ISO/IEC 24752-1:2014, 4.27]

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