TECHNICAL REPORT

ISO/IEC TR 30109

First edition
2015-11-01

Information technology — User interfaces — Worldwide availability of personalized computer environments

Technoloies de l'information — Interfaces utilisateurs — Disponibilité mondiale des environnements informatiques personnalisé

Reference number
ISO/IEC TR 30109:2015(E)

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

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*.

Introduction

In today's world, people are getting more and more mobile and access to the Internet is becoming ever more important. When moving around, people are encountering different kinds of hardware, all capable of communicating with the Internet, but having different user interfaces, such as computers with different national keyboards, mobile telephones and TV sets. The purpose of this Technical Report is to provide a way to make access as uniform as possible in a culturally and linguistically acceptable way so that users can have the almost the same personal user interface to their environments on the Internet wherever they go. Some areas of concern are the different keyboards or other inputting devices, different protocols for accessing the personal user environment via the Internet, and having uniform access to different Internet hosting environments.

The data in this Technical Report is meant for a general audience and is not specifically meant for research/engineering.

Information technology — User interfaces — Worldwide availability of personalized computer environments

1 Scope

This Technical Report describes methods to enable access to a personal computing environment via the Internet, with a culturally and linguistically convenient and uniform personal user interface, on different types of hardware.

2 Terms and definitions

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

2.1
user
individual interacting with the system

[SOURCE: ISO 1503:2008, 3.11]

2.2
user requirements
description of the set of user needs for the software

[SOURCE: ISO/IEC 14143-1:2007, 3.12, modified]

2.3
(open system) environment
comprehensive set of interfaces, services, and supporting formats, plus user aspects, for interoperability and/or portability of applications, data, or information, as specified by information technology International Standards and profiles

[SOURCE: ISO/IEC/TR 10000-1:1998, 3.2.2, modified]

2.4
server
in a computer network, a functional unit that provides services to workstations, to personal computers or to other functional units

[SOURCE: ISO/IEC 2382:2015, 2120558]

2.5
program
prepared sequence of instructions to the system to accomplish a defined task

[SOURCE: ISO/IEC/IEEE 9945:2009, 3.300, modified]

2.6
application program interface
API
definition of syntax and semantics for providing computer system services

[SOURCE: ISO/IEC/IEEE 9945:2009, 3.19, modified]

2.7
service
software program that provides responses to requests from other software programs, which are frequently on other remotely connected computers

3 Technology

3.1 Purpose

The problem at hand is to match the preferences of a user to the system at hand, including hardware and software. The user preferences are specified as a preference bundle. The preference bundle is specifying all preferences of the user, including cultural preferences, accessibility preferences, and personal preferences. A specification of a preference bundle format is given in Clause 4. There can be multiple preferences for the same job, so a way to weight the multiple preferences is needed. The system is specified with its hardware and software capabilities. Finding a solution would then be a matter of capability matching to the user preferences. The user can be presented to a way to modify the selected choice of settings.

The scenario is that a user can use systems everywhere in the world, in a way that best fits the user's preferences. An example is people on a journey, who use equipment like a keyboard suited for a foreign culture, for example, at a net café or at a hotel. The user would then be able to run programs in a language of choice of the user and with input possibilities fitted to make the user able to operate conveniently in the language of choice. This could possibly be run as a service over the Internet.

3.2 User preferences

The user preferences are specified as a number of personal preferences, and a number of more general preferences, such as cultural preferences on language and cultural conventions. The user preferences would be extensible and with alternate possibilities with preference weights attached. The user preferences would be able to reference other user preferences, including more generically specified preferences such as cultural and linguistic preferences. The user is able to obtain the preferences over the network everywhere in the world. The data could also be obtained from a local source, such as a usb stick.

3.3 System capabilities

The system capabilities is specifiable in an extensible format, and able to include other system capabilities, such as hardware and software capabilities of an accessing system, in combination with services obtained via the net.

3.4 Technology and standards

To accomplish this, it is necessary to have a specific standardized format for user preferences and for system capabilities, plus a method to access such information over the net in a personalized way. A way to do this is with XML formatted files and access protected file retrieval over an https connection.

Several information service providers, including the user's own services, could provide the preferences information, possibly via a user-id (email) or profile id and optionally a passcode or other identification mechanisms.

The specialized software could be easy to install but could also for convenience be part of the operating system environment.

The algorithm for capability matching to preferences could be standardized. The capability matching could use existing matching algorithms and be implementation defined.

4 APIs, services and file formats

4.1 User preference settings program

This subclause specifies formats and contents of user preferences and system capabilities. It also specifies services to obtain such information.

For the local system to obtain and set the user's preferences, a program needs to be available on the local system responsible for the inputting and outputting for the user that can retrieve a file with the user preferences and set preferences accordingly. The user's preferences settings program will need to contact a preferences server for the user's preferences information. A preference server is a web (https) server that is capable of delivering a file with a personalized profile, given the profile identification and optionally a passcode. Info on servers can be found on the SC 35 web site at http://www.open-std.org/jtc1/sc35/wg5/. The user's preferences settings program could have one preferred user information settings server, and a possibility to choose amongst other information servers, plus a possibility for the user to type in a self-chosen user information server.

The user's preferences retrieval program lets the identification and retrieval services identify the user and deliver a file with the user's preferences. The communication could preferably be done on a secure protocol such as the https. From the information retrieved, the user's preferences settings program determines the best match from available resources and taking into account available permissions, updates system and application settings accordingly, including installed applications, installed accessibility functionality, menus, application preferences, and cultural and language settings including input method choice.

If the user's preferences are elaborate, the settings update processing could be time consuming and error prone, for example, when installing new applications or installing new language versions or when direct matches are not possible. For selected generic settings such as language and culture profiles and for simpler settings like keyboard settings, matching of the user profile to the system capabilities could in many cases be not too demanding on local system resources. Also, for systems where most processing is done in the powerful cloud and the local system only handles the graphical environments and the inputting environment including a keyboard, this would be not too demanding on local system resources.

4.2 User preference delivery service

The user preference delivery service has the duty to identify the user's preferences and deliver a user's preferences file to the user preference settings program.

The identifying of the user preferences could be allowed to be done in multiple ways, including a specific userid/passcode identification scheme local to the system, use of one or more certificate based identifications schemes such as Verisign, CAcert, OpenID, pgp or gpg, use of one or more other external identification schemes such as those provided by vendors (for instance, Google, Facebook or Microsoft) and a generic identification of culture and language profiles, the latter most likely without a passcode.

A common way of identifying a user is using the email address of the user. An email address includes a '@' which can be difficult to find on a foreign keyboard. The first occurrence of the sequence '..', two period characters, can be used instead of the '@' character to facilitate easier typing of this form of identification.

Once the user identification has been established, the user preference delivery service sends a file with the user preferences corresponding to the identified requirement.

It is the responsibility of the user preference delivery service provider to provide a means of registering user preferences and/or generic profiles and storing such information. The service could allow a possibility to incorporate and edit other duly obtained preference profiles. Users could be allowed to indicate if their profile could be read without restrictions by other users. This could be presented to the user in a culturally and linguistically adequate way.

4.3 User preferences information file format

The user preference information file could be an XML formatted file. The encoding of the file is UTF-8. The XML could allow incorporating of other preferences. Specific mark-up includes the following:

— tag “locale” with parameters “name” and “weight”;

— tag “keyboard” with parameters “name”, “data” and “weight”;

— tag “input_method” with parameters “name”, “data” and “weight”. Names here can be various identifications for Japanese, Chinese or Korean IMs, or more general IMs like the ones specified in ISO/IEC 9995, ISO/IEC 14775, the mnemonic IM in RFC 1345, or the Global-IM described in 4.5;

— tag “system” with parameters “name”, “data” and “weight”;

— tag “application” with parameters “category”, “name”, “data” and “weight”.

NOTE 1 The “data” parameter is able to contain arbitrary data in any format so that, for example, all kinds of preferences files for all kinds of applications can be applied.

NOTE 2 Tags with the same name in the user preference information file and in the system capabilities file match each other and the parameters are for matching the user preferences against the system capabilities.

EXAMPLE <locale name=”da” weight=”99” /><locale name=”en” weight=”85” /> <locale name=”nb” weight=”90”/>

4.4 System capabilities file format

The system capabilities file is mostly needed when the user interfaces system and the system doing the user preferences settings are different, such as an X11 system on a TV set servicing a cloud service.

The system capabilities file is an XML formatted file. Specific mark-up includes the following:

— tag “locale” with parameters “name” and “weight”;

NOTE ”name” values could come out of the ISO/IEC 15897 registry;

— tag “keyboard” with parameters “name” and “weight”;

— tag “system” with parameters “name” and “weight”;

— the “name” values here could be like “Windows8”, “X11”, “Mac OS X”, “KDE-4”, “Android”, “IOS”;

— tag “application” with parameters “category”, “name”, and “weight”.

EXAMPLE The values for “category” could be “browser”, “email client”, “video viewer”.

Tag “quality” with parameters “application”, “attribute”, “locale” and “weight”, where “application” is a “name” value of the “application” tag, “attribute” is an attribute according to ISO/IEC/TR 19764, 4.3 to 4.6 clause titles or ISO/IEC 15897, clause titles in Clause 11 with spaces in names converted to underscores and no preceding clause numbers; “locale” is a “name” value of the “locale” tag and “weight” is the quality of the attribute identified with the parameters. A default quality of 1 is assumed if no tag is available for the desired quality.

All of the tags and parameters and values of ISO/IEC 24751 have spaces in names converted to underscores.

4.5 Example input methods

One example of an input method is “Global-IM”. This is specified via the “name” parameter in the “input_method” tag. The “data” parameter then specifies lines with specifications of the method. It is started with a “<pre>” tag and then there are records describing the binding of keys. Anything after ‘;’ is a comment until the next newline.

Each record contains a left hand side identifying the input characters (one or more) and a right hand side with one or more characters, separated by a colon (':'). The sequences SHIFT, CTRL, ALTGR and ALT identify the respective special keyboard keys. The sequence CTRL+'.' switches forth and back between the native keyboard layout and the global-im layout. The sequence CTRL+',' takes one character from the non-active IM and continues in the active IM. Care could be taken with which characters to allow both the left hand and the right hand side; this could be checked by a program assisting the user in creating and modifying the IM. Keys, that are not defined in the Global-IM specification of the user default to the value of the native keyboard.

Other methods exist, for example, Japanese, Korean and Chinese input methods.

EXAMPLE

```
<input_method name="global-im" Data="
<pre>
ñ : U+00E4 ;ä
ñ SHIFT : U+00C4 ;Ä
b ALTGR : U+0024 U+0031 U+0030 U+0030 ; $100
</pre>"
weight=99> <input_method />
```

The syntax in augmented BNF:

```
record := 1*key *("SHIFT" / "CTRL" / "ALTGR" / "ALT") ":" code *(space / code) *comment
code := "U+" 2*<ASCII CHARS IN THE RANGE [0-9a-fA-F]>
comment := ";" *uchar
uchar := <ANY UCS CHARACTER EXCEPT CR,LF AND CONTROL CHARACTERS>
key := <ANY CHARACTER WHICH CAN BE GENERATED BY A KEYBOARD EVENT>
ws := "\r" / "\n" / space
space := " " / "\t"
```

If a Finnish user uses the above specification on a Spanish keyboard, she would press the latch key and then the key for letter 'ñ' in order to produce the character 'ä' (U+00E4). The latch key, followed by the key for 'ñ', with shift down, would produce the 'Ä' character. Using switching, the user would switch to the Global-IM layout and then just press the key for 'ñ' when she needed 'ä' and 'ñ' + shift when she needed 'Ä'. Since the Global-IM layout is superimposed on the national layout, she would not have to switch back, unless she needed the 'ñ' character from the Spanish layout. If she pressed AltGr and 'b', the string "$100" would be the output.

Annex A
(informative)

Guides to various actors for solving the issues

A.1 Manufacturers of systems and software developers

There could be a service to provide the system capabilities of the hardware and the software. This could be done for the hardware mainly with the DMI info (dmidecode on some systems) and for the software mainly via the software registry or the installed packages registry.

A.2 Manufacturers of keyboards

For manufacturers of keyboards, a specification of the keyboard with key assignments and layout could be done, preferably according to ISO/IEC 24757.

A.3 Manufacturers of TV sets

Many modern TV sets today include an embedded operating system, capable of doing all of the required items to fulfil the functionality suggested in this Technical Report. TV sets can also act as a full system to access services over the Internet, for example, implementing an X11 server in a POSIX conforming environment.

A.4 Service providers

A.4.1 Service providers of accommodation like hotels

Internet access is commonly offered by many accommodation providers so that customers can come along with their own equipment, say a portable computer or a mobile telephone and hook up. It is recommended that also Internet TCP/IP port 22 (ssh) be open. Also, accommodation providers commonly offer a TV set and this could be accessible from the equipment of the costumer, for example, to provide a bigger screen than what is brought along by the customer. Business service installations with PCs, printer and other facilities could be equipped with the software outlined in this Technical Report for preferences and capabilities fetching and matching. Keyboards with a layout conforming to ISO/IEC 9995 such as ASCII keyboards could be a help to foreign customers.

A.4.2 Service providers of network access

This includes Internet cafés, airport lounges or tourist information centres. Such providers could be equipped with the software outlined in this Technical Report for preferences and capabilities fetching and matching. Providers could also provide a rich environment of many popular programs and with many language versions. Disk space is cheap enough that this is very feasible, and, for example, much open source software comes with support of many languages without any additional cost.

A.5 User possibilities

Users can do a number of things to improve their computing environment when in a foreign place.

A user can bring along equipment, for example, in the form of a portable computer, or a mobile telephone and then connect to the Internet via cable, wifi, wimax, telephone protocols or other network connection technology. This can be paid or free access.

