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Information technology — User interfaces — Universal remote console —

Part 2:
User interface socket description

Technologies de l'information — Interfaces utilisateur — Console à distance universelle —

Partie 2: Description de "socket" d'interface utilisateur

[Revision of first edition (ISO/IEC 24752-2:2008)]

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 24752-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 35, *User interfaces*.

ISO/IEC 24752 consists of the following parts, under the general title *Information technology — User interfaces — Universal remote console*:

— *Part 1: Framework*

— *Part 2: User interface socket description*

— *Part 4: Target description*

— *Part 5: Resource description*

— *Part 6: Web service integration*

Introduction

This is the second edition of this part of the International Standard. The main purpose of the revision is an alignment with recent developments in the Web service area, in particular with the new part 6 of this International Standard on Web service integration, along with an overall simplification of the specified technologies.

A user interface socket is an abstract concept that, when implemented, exposes the functionality and state of a target in a machine-interpretable manner. A user interface socket is independent of any specific implementation platform.

A user interface socket contains variables, commands and notifications, optionally structured in sets that may be nested in a hierarchical fashion. The variables include all of the dynamic data a user can perceive and/or manipulate, and may also include additional dynamic supporting data that is not presented to the user. Example variables include the volume of a television, the current floor of an elevator, or an internal variable representing the current state of a transaction that is used to control dynamic features of the interface. A command is a core function that a user can request a target to perform and that cannot be represented by a variable. The commands include all target functions that can be called by users. Examples include the 'search' command of an airline reservation system or the 'seek' command of a CD player. A user interface socket does not include commands for accessing the values of the variables. There are typically no commands that simply change the values of variables. An exception would be a 'reset' operation which puts the target into a specific state. The notifications are special states where normal operation is suspended, such as an exception state. Notifications are special states triggered by the target. Examples include an announcement made by a public address system in an airport, a clock alarm, or a response to invalid input for a field of a form.

A user interface socket specification is an XML document that uses the constructs defined in this part of ISO/IEC 24752 to describe a user interface socket.

See Annex A for an example user interface socket description.

NOTE Additional information is needed before the socket can be presented to a user, including natural language labels and help text associated with the elements of the user interface. This information is provided externally to the socket description. Resources reference socket elements using the socket's name (as given in the socket descriptions 'about' attribute value, see 6.2) and the element 'id' attribute (see sections 7.2, 9.2 and 10.2). Refer to part 5 of this International Standard for further details.

Information technology — User interfaces - Universal remote console — Part 2: User interface socket description

1 Scope

ISO/IEC 24752 is a multi-part International Standard to facilitate operation of information and electronic products through remote and alternative interfaces and intelligent agents.

A user interface socket is an abstract user interface that describes the functionality and state of a device or service (target) in a machine interpretable manner that is independent of presentation and input capabilities of a user interaction device. This part of ISO/IEC 24752 defines an Extensible Markup Language (XML) based language for describing a user interface socket. The purpose of the user interface socket is to expose the relevant information about a target so that a user can perceive its state and operate it. This includes data presented to the user, variables that can be manipulated by the user, commands that the user can activate, and exceptions that the user is notified about. The user interface socket specification is applicable to the construction and adaptation of user interfaces.

2 Conformance

An XML file conforms to this part of ISO/IEC 24752 (i.e. is a user interface socket description) if it fulfils all of the following requirements:

(1) it has a MIME type as specified in 6.1, if applicable;

(2) it is coded in UCS (see 6.1);

(3) its root element is the <uis:uiSocket> element (with uis representing the namespace "http://openurc.org/ns/uisocketdesc-2"), as specified in 6;

(4) it contains all required elements and attributes with their proper values, as specified in 6; and

(5) if it contains recommended or optional elements or attributes with their values, these are presented as specified in 6.

NOTE 1 Strict language conformance (i.e. no additional elements or attributes allowed) is not required because future versions of this part of ISO/IEC 24752 might add new elements, attributes and values. Therefore, URC manufacturers are encouraged to implement their URCs so that unrecognized markup is ignored without failing.

NOTE 2 Target manufacturers who want to add manufacturer-specific information to a socket description beyond the elements, attributes and values specified in this document can do so by externally providing (proprietary) resource descriptions that point into the structure of a socket description. Refer to part 5 of this International Standard for details.

3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 24752-1, *Information technology — User interfaces — Universal remote console — Part 1: Framework*

ISO/IEC 10646:2011, *Information technology — Universal Multiple-Octet Coded Character Set (UCS)*

ISO/IEC 14977:1996, *Information technology — Syntactic metalanguage — Extended BNF*

ISO 15836:2009, *Information and documentation — The Dublin Core metadata element set*

DCMI Metadata Terms, http://dublincore.org/documents/dcmi-terms/

IETF RFC 2046, Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types, November 1996, http://www.ietf.org/rfc/rfc2046.txt

IETF RFC 3023, XML Media Types, January 2001, http://www.ietf.org/rfc/rfc3023.txt

IETF RFC 3986, Uniform Resource Identifier (URI): Generic Syntax, January 2005, http://www.ietf.org/rfc/rfc3986.txt

W3C Recommendation: Extensible Markup Language (XML) 1.0 (Fifth Edition), W3C Recommendation 26 November 2008, http://www.w3.org/TR/2008/REC-xml-20081126/

W3C Recommendation: Namespaces in XML 1.0 (Third Edition), W3C Recommendation 8 December 2009, http://www.w3.org/TR/2009/REC-xml-names-20091208/

W3C Recommendation: XML Path Language (XPath) 2.0 (Second Edition), W3C Recommendation 14 December 2010 (Link errors corrected 3 January 2011), http://www.w3.org/TR/2010/REC-xpath20-20101214/

W3C Recommendation: XQuery 1.0 and XPath 2.0 Functions and Operators (Second Edition), W3C Recommendation 14 December 2010, http://www.w3.org/TR/2010/REC-xpath-functions-20101214/

W3C Recommendation: XML Schema Part 1: Structures Second Edition, W3C Recommendation 28 October 2004, http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/

W3C Recommendation: XML Schema Part 2: Datatypes Second Edition, W3C Recommendation 28 October 2004, http://www.w3.org/TR/2004/REC-xmlschema-2-20041028/

4 Terms and definitions

For the purposes of this document, the terms and definitions given in part 1 of this International Standard and the following apply.

4.1
context element
element to which a dependency pertains

5 Relation to other standards

5.1 Relation to XML

This specification defines an extensible Markup Language (XML) based language. Markup in XML is case sensitive.

Tag names, and attribute names and values are not localizable, i.e. they are identical for all international languages. However, the text content between tags can be language specific. As with all XML based languages, white space characters immediately surrounding tags are non-significant.

This specification makes use of the XML namespaces concept to enable the import of element and attribute names defined elsewhere.

All element and attribute names used in this document with no namespace prefix are defined by this International Standard and are part of the namespace with URI reference http://openurc.org/ns/uisocketdesc-2. If not defined as the default namespace, the namespace identifier 'uis' should be used.

Throughout this document, the following namespace prefixes and corresponding namespace identifiers are used for referencing foreign namespaces:

— dc: The Dublin Core Metadata Element Set namespace (http://purl.org/dc/elements/1.1/) (Element Set defined by ISO 15836);

— dcterms: The DCMI Metadata Terms namespace (http://purl.org/dc/terms);

— xsd: The XML Schema namespace (http://www.w3.org/2001/XMLSchema);

— xsi: The XML Schema Instance namespace (http://www.w3.org/2001/XMLSchema-instance).

For an XML Schema definition for the user interface socket description see Annex A.

5.2 XPath expressions

5.2.1 General

This specification uses XML Path Language (XPath) Version 2.0 for addressing elements within the socket. Specifically, XPath is used in describing dependencies between the elements of the socket.

XPath 2.0 syntax is used without XPath 1.0 compatibility.

5.2.2 Use of XPath 2.0 syntax and semantics

This International Standard uses the syntax and semantics of XPath 2.0, with the following additions and exceptions:

— The XPath expressions shall be coded in UCS.

— The static expression context (see section 2.1.1 in XPath 2.0) shall be initialized with the following components:

  — “XPath 1.0 compatibility mode” shall be false.

  — The “statically known namespaces” are the namespace declarations that are in scope for he XML element that contains the XPath expression.

  - The “default element/type namespace” shall be the null namespace (which refers to types that are defined in the socket description, see 11).
  - The “default function namespace” shall be the standard function namespace of XPath 2.0: http://www.w3.org/2005/xpath-functions.
  - The “in-scope schema definitions” shall only contain “in-scope schema types” with the following content: All types of namespace http://www.w3.org/2001/XMLSchema, as specified in section 2.5.1 of XPath 2.0; and the local types defined in a socket description’s <xsd:schema> part (see 11).
  - NOTE 1 XPath 2.0 adds the following pre-defined types to the pre-defined types of XML Schema Definition Part 2: xsd:untyped, xsd:untypedAtomic, xsd:anyAtomicType, xsd:dayTimeDuration, xsd:yearMonthDuration.
  - The “in-scope variables” shall be empty.
  - The “function signatures” shall be the functions of the namespace http://www.w3.org/2005/xpath-functions, as defined in XQuery 1.0 and XPath 2.0 Functions and Operators, with exceptions as specified in 5.2.4 ; the constructor functions for all the atomic types in the “in-scope schema definitions”; and the additional functions defined in 5.2.5.

    NOTE 2 The following components of the XPath 2.0 static expression context are not used in this International Standard: “context item static type”, “statically known collations”, “default collation”, “base URI”, “statically known documents”, “statically known collections”, “statically known default collection type”.

- The dynamic expression context (see section 2.1.2 in XPath 2.0) shall be initialized with the following components:
  - The “context item” shall be the socket set or element that the XPath expression is specified for as dependency.
  - The “variable values” shall be empty.
  - The “function implementations” shall include implementations of the functions of the namespace http://www.w3.org/2005/xpath-functions, as defined in XQuery 1.0 and XPath 2.0 Functions and Operators; the constructor functions for all the atomic types in the “in-scope schema definitions”; and the additional functions as defined in 5.2.5.
  - The “current dateTime” shall be the current time with local timezone of the URC, represented as a value of type xsd:dateTime.
  - The “implicit timezone” shall be the local timezone of the URC.

    NOTE 3 The following components of the XPath 2.0 dynamic expression context are not used in this International Standard: “context item”, “context position”, “context size”, “Available documents”, “Available collections”, “Default collection”.

- There is no Data Model (XDM instance). Expressions and functions that refer to a data model instance shall not be used in socket descriptions. The context item expression (see section 3.1.4 in XPath 2.0) shall not be used. Path expressions (see section 3.2 in XPath 2.0) shall not be used. Node operations such as node comparison (see section 3.5.3 in XPath 2.0), and the union, intersect and except operators (see section 3.3.3 in XPath 2.0) shall not be used.
- The evaluation of logical expressions (AND/OR) shall be strictly from left to right, and shall not evaluate the right operand if the result is already determined by the left operand. I.e. with an expression of the form “A and B”, B shall not be evaluated if A is false; and in the case of “A or B”, B shall not be evaluated if A is true. In addition, Boolean operations shall respect the “undefined” value (see 5.2.3).

— The XPath 2.0 implementation shall be based on XML 1.0 and Namespaces in XML.

— The XPath 2.0 implementation may support the namespace axis.

5.2.3 The undefined value

This International Standard adds the “undefined” value as a special value for all types from XPath 2.0 (see 5.2.2) and locally defined types (see 11).

If any part of an XPath expression is undefined, the whole expression shall be undefined. This rule shall not apply, if, based on evaluation logic, the result of an expression is determined without evaluating any undefined part of it.

EXAMPLE The following expression will never evaluate to an undefined result. It yields true if the element with id ‘myvar’ is available and has the value 4, otherwise it yields false.

uis:hasDefinedValue(‘myvar’) and uis:value(‘myvar’) eq 4

NOTE Implementations may vary as long as the described effect is warranted. For example, an error exception could be internally raised to signal that an XPath expression yields “undefined”.

5.2.4 XPath functions

The following XPath functions may be used:

— Functions of the namespace http://www.w3.org/2005/xpath-functions, as defined in XQuery 1.0 and XPath 2.0 Functions and Operators

— The constructor functions for all atomic types in the “in-scope schema definitions”

with the following exceptions:

— The function string() shall only be used with one argument.

— The function resolve-uri() shall not be used.

— The functions related to QName (section 11 of XQuery 1.0 and XPath 2.0 Functions and Operators), operators on NOTATION (section 13) and Functions and Operators on Nodes (section 14) shall not be used.

— The following context functions (section 13 of XQuery 1.0 and XPath 2.0 Functions and Operators) shall not be used: position, last, default-collation, static-base-uri.

The XPath 2.0 specific rules for implicit conversion between types apply.

5.2.5 Additional functions

5.2.5.1 General

This International Standard defines the following additional functions that may be used in expressing socket dependencies.

NOTE These functions are defined in the namespace "http://openurc.org/ns/uisocketdesc-2". A namespace prefix for this namespace (e.g. “uis”) needs to be declared on any one of the XML elements containing the XPath expression. Note that the namespace prefix for "http://openurc.org/ns/uisocketdesc-2" must always be used for these functions since the default function namespace is "http://www.w3.org/2005/xpath-functions" (XPath 2.0 function namespace). Using the ‘xmlns’ attribute to declare a default XML namespace does not change the default function namespace.