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Information technology — Participant identifiers

Technologies de l'information — Identificateurs de participant

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ISO/IEC 24703 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 36, *Information technology for learning, education and training*.

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Introduction

The purpose of this International Standard is to define the datatype of an identifier for the purposes of identifying participants in learning, education and training. Participants may be users, teachers, agents, groups, organizations, institutions, etc.

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Information technology — Participant identifiers

1 Scope

This International Standard specifies the datatype of participant identifiers in learning, education and training. Security and protection of personal data associated with the use of a participant identifier is not addressed in this standard. The naming policy, registration, and authentication of participant identifiers are outside the scope of this International Standard.

NOTE There is a risk of improper access and misuse of personal and private data facilitated by the use of a participant identifier. It is the responsibility of the implementer to ensure proper use of a participant identifier.

2 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 2382-1, *Information technology — Vocabulary — Part 1: Fundamental terms*

ISO/IEC 10646-1, *Information technology — Universal Multiple-Octet Coded Character Set (UCS) — Part 1: Architecture and Basic Multilingual Plane*

ISO/IEC TR 10176, *Information technology — Guidelines for the preparation of programming language standards*

ISO/IEC 11404, *Information technology — Programming languages, their environments and system software interfaces — Language-independent datatypes*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 2382-1 and the following apply.

3.1
abstract character
character of the ISO/IEC 10646-1 repertoire (UCS) that is independent of encoding

3.2
binding
application or mapping from one framework or specification to another

3.3
datatype
set of distinct values, characterized by properties of those values and by operations on those values

3.4
encoding
bit and byte format and representation of information

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3.5
implementation-defined behaviour
unspecified behaviour where each implementation documents how the choice is made

3.6
participant identifier
designation associated with a participant

NOTE A participant may have more than one participant identifier — a non-singular identifier. The policy of singularity or non-singularity of identifiers is outside the scope of this International Standard.

3.7
participant information
data that is primarily associated with, tracked by, tracked for, and about participants in information technology systems

3.8
smallest permitted maximum
SPM
smallest maximum value for a requirement provision

EXAMPLE The smallest permitted maximum length of field **X** shall be **25**.

3.9
UCS
universal character set
character set defined by ISO/IEC 10646-1

3.10
unspecified behaviour
implementation behaviour for which a standard provides two or more possibilities and imposes no further requirements on which possibility is chosen in any instance

4 Conformance

A conforming participant identifier shall conform to the requirements specified in: Clause 5, Clause 6, Clause 7, at least one binding of Clause 8 and Clause 9.

5 Functionality

A participant identifier shall represent a designator.

NOTE More than one participant identifier may be associated with an individual participant.

A participant identifier shall be a printable text string that should facilitate transcription by humans.

EXAMPLE A 10-character string of digits is easier to transcribe than a 256-character string of mixed-case Latin characters.

6 Conceptual model

A participant identifier is a string of abstract characters that is associated with a participant. Conceptually, the participant identifier is “opaque” in that the string contains no information itself, e.g., **"35267901"** has no particular meaning. Some implementations and administrators may choose participant identifiers that convey information, e.g., **"doe.john"**, and some participant identifiers may contain even more information, e.g., **"building2--doe.john"**.

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A participant identifier may be used in several contexts, such as being embedded into filenames, URLs, or E-mail addresses. Within information technology systems that manage participant information, participant identifiers may be used to link repositories to provide common and/or consolidated identification methods.

7 Semantics

7.1 Components of a participant identifier

A participant identifier shall consist of identifier segments separated by segment separators. An identifier segment shall consist of identifier characters from the abstract character set. A segment separator shall be implementation-defined, but the period character **"."** is recommended.

7.2 ISO/IEC 11404 datatype definition

The following datatype, given in ISO/IEC 11404 notation, defines the participant identifier:

```
characterstring(ISO/IEC-10646-1)
```

The smallest permitted maximum length of a participant identifier shall be 50 abstract characters.

NOTE The parameter **"ISO/IEC-10646-1"** identifies that abstract character repertoire, not its encoding.

7.3 Allowable abstract characters

The abstract characters of a participant identifier shall be limited to the following set. The characters are named by their 16-bit hexadecimal name within the Basic Multilingual Plane of UCS. This subset of abstract characters is based on ISO/IEC TR 10176.

7.3.1 Identifier characters

The following are non-digit, non-special abstract characters:

— Latin: 0041-005A, 0061-007A, 00AA, 00BA, 00C0-00D6, 00D8-00F6, 00F8-01F5, 01FA-0217, 0250-02A8, 1E00-1E9B, 1EA0-1EF9, 207F

— Greek: 0386, 0388-038A, 038C, 038E-03A1, 03A3-03CE, 03D0-03D6, 03DA, 03DC, 03DE, 03E0, 03E2-03F3, 1F00-1F15, 1F18-1F1D, 1F20-1F45, 1F48-1F4D, 1F50-1F57, 1F59, 1F5B, 1F5D, 1F5F-1F7D, 1F80-1FB4, 1FB6-1FBC, 1FC2-1FC4, 1FC6-1FCC, 1FD0-1FD3, 1FD6-1FDB, 1FE0-1FEC, 1FF2-1FF4, 1FF6-1FFC

— Cyrillic: 0401-040C, 040E-044F, 0451-045C, 045E-0481, 0490-04C4, 04C7-04C8, 04CB-04CC, 04D0-04EB, 04EE-04F5, 04F8-04F9

— Armenian: 0531-0556, 0561-0587

— Hebrew: 05B0-05B9, 05BB-05BD, 05BF, 05C1-05C2, 05D0-05EA, 05F0-05F2

— Arabic: 0621-063A, 0640-0652, 0670-06B7, 06BA-06BE, 06C0-06CE, 06D0-06DC, 06E5-06E8, 06EA-06ED

— Devanagari: 0901-0903, 0905-0939, 093E-094D, 0950-0952, 0958-0963

— Bengali: 0981-0983, 0985-098C, 098F-0990, 0993-09A8, 09AA-09B0, 09B2, 09B6-09B9, 09BE-09C4, 09C7-09C8, 09CB-09CD, 09DC-09DD, 09DF-09E3, 09F0-09F1

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— Gurmukhi: 0A02, 0A05-0A0A, 0A0F-0A10, 0A13-0A28, 0A2A-0A30, 0A32-0A33, 0A35-0A36, 0A38-0A39, 0A3E-0A42, 0A47-0A48, 0A4B-0A4D, 0A59-0A5C, 0A5E, 0A74

— Gujarati: 0A81-0A83, 0A85-0A8B, 0A8D, 0A8F-0A91, 0A93-0AA8, 0AAA-0AB0, 0AB2-0AB3, 0AB5-0AB9, 0ABD-0AC5, 0AC7-0AC9, 0ACB-0ACD, 0AD0, 0AE0

— Oriya: 0B01-0B03, 0B05-0B0C, 0B0F-0B10, 0B13-0B28, 0B2A-0B30, 0B32-0B33, 0B36-0B39, 0B3E-0B43, 0B47-0B48, 0B4B-0B4D, 0B5C-0B5D, 0B5F-0B61

— Tamil: 0B82-0B83, 0B85-0B8A, 0B8E-0B90, 0B92-0B95, 0B99-0B9A, 0B9C, 0B9E-0B9F, 0BA3-0BA4, 0BA8-0BAA, 0BAE-0BB5, 0BB7-0BB9, 0BBE-0BC2, 0BC6-0BC8, 0BCA-0BCD

— Telugu: 0C01-0C03, 0C05-0C0C, 0C0E-0C10, 0C12-0C28, 0C2A-0C33, 0C35-0C39, 0C3E-0C44, 0C46-0C48, 0C4A-0C4D, 0C60-0C61

— Kannada: 0C82-0C83, 0C85-0C8C, 0C8E-0C90, 0C92-0CA8, 0CAA-0CB3, 0CB5-0CB9, 0CBE-0CC4, 0CC6-0CC8, 0CCA-0CCD, 0CDE, 0CE0-0CE1

— Malayalam: 0D02-0D03, 0D05-0D0C, 0D0E-0D10, 0D12-0D28, 0D2A-0D39, 0D3E-0D43, 0D46-0D48, 0D4A-0D4D, 0D60-0D61

— Thai: 0E01-0E3A, 0E40-0E5B

— Lao: 0E81-0E82, 0E84, 0E87-0E88, 0E8A, 0E8D, 0E94-0E97, 0E99-0E9F, 0EA1-0EA3, 0EA5, 0EA7, 0EAA-0EAB, 0EAD-0EAE, 0EB0-0EB9, 0EBB-0EBD, 0EC0-0EC4, 0EC6, 0EC8-0ECD, 0EDC-0EDD

— Tibetan: 0F00, 0F18-0F19, 0F35, 0F37, 0F39, 0F3E-0F47, 0F49-0F69, 0F71-0F84, 0F86-0F8B, 0F90-0F95, 0F97, 0F99-0FAD, 0FB1-0FB7, 0FB9

— Georgian: 10A0-10C5, 10D0-10F6

— Hiragana: 3041-3093, 309B-309C

— Katakana: 30A1-30F6, 30FB-30FC

— Bopomofo: 3105-312C

— CJK Unified Ideographs: 4E00-9FA5

— Hangul: AC00-D7A3

7.3.2 Identifier digits

The following are digit characters:

— Digits: 0030-0039, 0660-0669, 06F0-06F9, 0966-096F, 09E6-09EF, 0A66-0A6F, 0AE6-0AEF, 0B66-0B6F, 0BE7-0BEF, 0C66-0C6F, 0CE6-0CEF, 0D66-0D6F, 0E50-0E59, 0ED0-0ED9, 0F20-0F33

7.3.3 Identifier special characters

The following are special characters:

— Special characters: 005F, 00B5, 00B7, 02B0-02B8, 02BB, 02BD-02C1, 02D0-02D1, 02E0-02E4, 037A, 0559, 093D, 0B3D, 1FBE, 203F-2040, 2102, 2107, 210A-2113, 2115, 2118-211D, 2124, 2126, 2128, 212A-2131, 2133-2138, 2160-2182, 3005-3007, 3021-3029

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7.4 Encoding characters

The following characters define the set of encoding characters.

```
A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m
n o p q r s t u v w x y z
0 1 2 3 4 5 6 7 8 9 _ -
```

NOTE 1 The selection of characters is intended to be harmonized with IETF RFC 2396.

NOTE 2 The percent character **"%"** is used in the encoding of a participant identifier, but it is not part of the "encoding character set".

8 Bindings

8.1 Data instance

An instance of a participant identifier shall be encoded as an array of octets.

8.2 C, C++ binding

Applications and environments that claim conformance within a C/C++ language translation system shall use the **"char"** base type (or compatible) for structures, pointers, arrays, and function parameters that store a participant identifier.

NOTE If the 7-bit encoding is used for the C/C++ translation environment, the smallest permitted maximum requirement implies that the participant identifier must be at least 501 chars long: (**"%U"** + 8 hex digits) * 50 + 1 terminating null character.

An instance of a participant identifier shall be encoded as an array of octets.

8.3 Java binding

Applications and environments that claim conformance within a Java language translation system shall use the “string” type (or compatible) for classes, arrays, and method parameters that store a participant identifier.

8.4 ECMAScript (JavaScript) binding

Applications and environments that claim conformance within an ECMAScript (JavaScript) language translation system shall use the "string" type (or compatible) for arrays and function parameters that store a participant identifier.

9 Encodings

All bindings shall use the encodings specified in this clause.

NOTE 1 Applications and user interfaces may allow entry and display of these participant identifiers in forms that are more natural to humans, e.g., a login screen for a Japanese user might only show Kanji characters, meanwhile the application converts these Kanji characters to/from the participant identifier encoding format.

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A participant identifier shall use one of the following conventions for encoding characters for each abstract character to be encoded. The symbol **"h"** represents 4 bits of information represented as a hexadecimal character (**0-9**, **A-F**, case-insensitive).

— Abstract characters that are within the encoding character set may represent themselves.

— Abstract characters in the range of **0000** to **00FF** of the UCS may use the encoding:

%hh

where **"h"** represents a single hexadecimal character.

— Abstract characters in the range of **0000** to **FFFF** of the UCS may use the encoding:

%uhhhh

where **"h"** represents a single hexadecimal character and **"u"** is in lowercase.

— Abstract characters in the range of **00000000** to **FFFFFFFF** of the UCS may use the encoding:

%Uhhhhhhhh

where **"h"** represents a single hexadecimal character and **"U"** is in uppercase.

NOTE 2 These encoding conventions are harmonized with existing C, C++, Java, and IETF standards and specifications.

NOTE 3 This encoding scheme permits a participant identifier, based on the UCS character repertoire, to be encoded in a 7-bit data format. Implementations may make private arrangements to avoid **"%"**-escaping and use more direct methods if their character sets permit it, e.g., Unicode characters may be used directly (no transformation with **"%uhhhh"**) if UCS-2 is used for data interchange.

NOTE 4 This International Standard does not give preference to any encoding scheme. Implementers may choose an encoding scheme relevant to their intended use of a participant identifier.

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