
**Health Informatics — Messages and
communication — Format of length
limited globally unique string identifiers**

*Informatique de santé — Messages et communication — Format des
identifiants uniques universels codés en caractère et limités en longueur*

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Published in Switzerland

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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 18232 was prepared by Technical Committee ISO/TC 215, *Health informatics*.

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Introduction

Data objects used in medicine include reports and results of diagnostic procedures which are stored and exchanged in electronic form, and objects such as templates. Applications must be able to find the location and the identification of such objects. Object identifiers are often numeric in form. This International Standard provides a means of exchanging globally unique identifiers expressed as character strings. It is not concerned with the specification of the location from which a data object may be retrieved.

A healthcare service for a patient is delivered in identifiable parts which may be termed healthcare service items. A healthcare service item can be performed for a patient by a healthcare professional, or a healthcare professional may request a healthcare service item to be performed by another healthcare professional or by a healthcare service department such as a medical imaging service department.

Healthcare service item results arise from numerical measurement or assessment by a healthcare professional. Individual numerical results may be included within report text, perhaps in a table. Sets of numerical results may be presented visually e.g. waveform (graph) or image (picture).

Results that consist of a large number of measured values such as a waveform or digital image are known as data objects.

To allow safe use in medicine, all data objects must be identified by a globally unique identifier (GUI), such as an ISO OID or binary MS GUI. The GUI allocated to a data object is attached to the data object (e.g. by including it within a computer file header section). The reference to a data object includes the GUI of the data object as well as the path to the data object. The application that retrieves the data object can verify that the correct data have been retrieved by matching the GUI in the reference to the GUI attached to the data object. See Annex A for relevant scenarios.

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It may be noted that:

- a) the issue of the location of a data object is separate from the issue of its identity; indeed several identical copies of the object may exist;
- b) a globally unique data object identifier is intended for machine use and may be quite large;
- c) a short, user-friendly, locally unique identifier is often required in addition to the globally unique identifier for human use. (This is outside the scope of this International Standard.)

Globally unique identifiers are already specified in various standards and the intention of this International Standard is to provide a specification for a common format for the exchange of commonly used globally unique identifiers expressed as alphanumeric strings.

A logical data format for globally unique identifiers constructed from a sequence of integers is defined by ISO/IEC 8824-1. Identifiers based on ISO/IEC 8824-1 are widely used in medical imaging. 128 bit universal unique identifiers (UUIs) are widely used in the MS Windows environment. This International Standard specifies the format of alphanumeric string fields for the exchange of globally unique string identifiers (GUSI)

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Health Informatics — Messages and communication — Format of length limited globally unique string identifiers

1 Scope

This International Standard specifies the encoding and length for globally unique identifiers for data objects used in healthcare exchanged as alphanumeric strings.

The technologies used for data storage, location and communication are outside the scope of this International Standard.

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 646, *Information technology — ISO 7-bit coded character set for information interchange*

ISO/IEC 8824-1:2002, *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation — Part 1* <https://standards.iteh.ai/catalog/standards/sist/d0725731-cb3c-48d9-9f68-80fc362b9037/iso-18232-2006>

ISO/IEC 9834 (all parts), *Information Technology — Open Systems Interconnection — Procedures for the operation of OSI Registration Authorities*

DICOM PS 3.3, *Digital Imaging and Communications in Medicine — Part 3: Information Object Definitions*

DICOM PS 3.4, *Digital Imaging and Communications in Medicine — Part 4: Service Class Specifications*

DICOM PS 3.5, *Digital Imaging and Communications in Medicine — Part 5: Data Structures and Encoding*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

3.1.1

information object

well-defined piece of information, definition, or specification which requires a name in order to identify its use in communication

NOTE Adapted from ISO/IEC 8824-1.

3.1.2

object identifier

OID

value (distinguishable from all other such values) that is associated with an information object

NOTE Adapted from ISO/IEC 8824-1.

3.1.3

data object identifier

sequence of integer components constructed as specified in ISO/IEC 8824-1, having a root sequence of components issued by a national standards body and sequence of following integer components whose uniqueness is guaranteed by the organization that defined it

NOTE Which is guaranteed to be globally unique by that national body registered as specified by ISO 9834.

3.1.4

unique identifier

identifier that is different from any other such identifier within a given namespace

3.1.5

globally unique identifier

identifier that is different from any other such identifier in any domain namespace

3.1.6

globally unique string identifier

alphanumeric string of maximum length 64 characters, which is different from any other alphanumeric string that has been or will be exchanged according to the provisions of this International Standard

3.2 Abbreviated terms

GUI globally unique identifier

OID object identifier

UID unique identifier (DICOM)

GUSI globally unique string identifier

UUID universal unique identifier

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4 Globally unique string identifier field

When communicated by means of electronic data exchange the field containing the GUSI shall conform to the following:

a) length: 64 octets;

b) type: alphanumeric.

NOTE The object identifier field might be included as part of the data object metadata or might be part of a “wrapper” containing the data object. However this issue is outside the scope of this International Standard.

5 ISO/IEC data object identifier GUSI exchange format

5.1 General

Applications that conform to this clause shall support the use of object identifiers (OIDs) as specified by ISO/IEC 8824-1 and shall be constructed and encoded according to 5.2 to 5.7.

5.2 Logical data format

Data object identifiers shall be constructed from a sequence of integer components in accordance with the provisions of ISO/IEC 8824-1 and ISO/IEC 9834-7.

5.3 Character representation

Data object identifier integer components shall be represented as a character string using the following characters:

"0", "1", "2", "3", "4", "5", "6", "7", "8", "9", "."

NOTE See Annex A for an example.

5.4 Encoding

A data object identifier shall be encoded as an alphanumeric string of 8 bit octets as specified by ISO/IEC 646.

5.5 Integer component representation

An integer component shall not start with a zero character unless the component consists of a single zero.

5.6 Integer component separator

A single full stop (2E hexadecimal) character shall separate sequential components.

NOTE There is no leading or trailing full stop.

5.7 Interpretation of the data object identifier string

The root components allocated by a national body for use by an organization as the leading components of all data object identifiers created by that organization may carry meaning for the national body. However, applications shall not infer any semantic information from any component of the data object identifier.

6 128 bit globally unique string identifier format

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6.1 General

The alphanumeric field specified in Clause 4 may also be used to hold a 128 bit binary number encoded using hexadecimal notation constructed as an alphanumeric string as specified in 6.2 to 6.5. See Annex C.3. Applications that conform to this International Standard and exchange 128 bit identifiers shall conform to the indications given in 6.2 to 6.5.

6.2 Logical data format

The logical data format shall be a 128 bit binary number.

6.3 Character representation

128 bit data object identifiers shall be represented by a sequence of octets using the following characters:

"0", "1", "2", "3", "4", "5", "6", "7", "8", "9", "a", "b", "c", "d", "e", "f", "-"

6.4 UUID components

The character string shall consist of a sequence of 5 components of lengths 8, 4, 4, 4 and 12 octets respectively, separated by a hyphen octet (2D hexadecimal)

6.5 Encoding

A data object identifier shall be encoded as an alphanumeric string of 8 bit octets as specified by ISO/IEC 646.

NOTE This clause supports the identifiers as given in the specifications of universal unique identifiers (UUIDs). See Annex B.