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Information technology — Open Distributed Processing — Type Repository Function

Technologies de l'information — Traitement réparti ouvert — Fonction de répertoire de types

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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.

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In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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

International Standard ISO/IEC 14769 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 7, *Software engineering*, in collaboration with ITU-T. The identical text is published as ITU-T Recommendation X.960.

Annex A forms a normative part of this International Standard. Annexes B and C are for information only.

Introduction

This Recommendation | International Standard prescribes the ODP Type Repository Function (subclause 14.4 of ITU-T Rec. X.903 | ISO/IEC 10746-3) to support the storage, retrieval and management of type descriptions within an identified framework for type descriptions.

ITU-T Rec. X.902 | ISO/IEC 10746-2 provides a general definition of type in subclause 9.7; this definition allows the description of types using any predicate. ITU-T Rec. X.903 | ISO/IEC 10746-3 introduces a number of target concepts specific to particular viewpoints. This Recommendation | International Standard supports the establishment of type definitions based on the concepts defined in the ODP family of Recommendations | International Standards.

This Recommendation | International Standard enables type descriptions for use by the ODP functions outlined in ISO/IEC 10746-3. Type descriptions can occur in specifications from any viewpoint, e.g. enterprise specification can introduce enterprise types. This Recommendation | International Standard specifically addresses the needs of the ODP computational and engineering viewpoint types, but is capable of supporting type descriptions coming from other viewpoint languages.

This Recommendation | International Standard permits the use of multiple type description languages. There are a number of widely used and standardized languages for type description, for example CORBA IDL, ASN.1, LOTOS, GDMO and SDL, which fulfil some of the requirements of type descriptions in ODP-RM. This Recommendation | International Standard does not define a single all-encompassing type language. Users can use either existing languages or languages defined within other ODP Recommendations | International Standards. Annex B is an informative annex outlining languages that support large sets of target concepts.

This Recommendation | International Standard supports type systems with a type Type (e.g. pass type as parameters as in the ODP computational language).

ITU-T Rec. X.903 | ISO/IEC 10746-3 defines a subtype relationship between computational operational interface signature types. This Recommendation | International Standards supports a wider variety of relationships between types, which might include the analysis of behaviour and environment contracts, but the definition of such relationships is not within the scope of this Recommendation | International Standard. Relationships between types can either be asserted or deduced. It is recognized that not all relationships (including equivalence) can always be automatically deduced. However, automatic deduction should be encouraged whenever applicable.

The type repository function supports the allocation of identifiers to types in order to allow the transmission of these "shorthand" representations across domains (i.e. between objects using different type repositories).

The type repository function addresses interworking and federation to support the distribution of the type repository function by clarifying the notion of type domains. This function supports both federation of type domains handling equivalent type systems and federation of type domains handling different type systems.

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ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – OPEN DISTRIBUTED PROCESSING – TYPE REPOSITORY FUNCTION

1 Scope

The concept of "type" is fundamental to ODP systems; the interaction model of ODP-RM involves strongly-typed interactions.

This Recommendation | International Standard:

- defines a framework for describing types of interest in ODP systems by determining what entities need to be typed and what needs to be said about the identified types. The primary focus of this work is the computational interface type system;
- identifies and characterizes type languages sufficient to describe the types identified above in an informative annex;
- provides enterprise, information, and computational specifications of a generic type repository function within the type description framework which can be specialized to select a specific type system or type notation. The type repository function provides:
  - storage and retrieval of type descriptions;
  - management of type descriptions;
  - management of the relationship between types including matching of types;
  - naming of types (in a manner consistent with ODP Naming Framework);
  - interworking and federation of different type repositories.

This Recommendation | International Standard provides a standard method of accessing type descriptions used within open distributed processing systems, where the type descriptions can be in various concrete syntaxes and type languages used in these open distributed processing systems. This Recommendation | International Standard also facilitates the dynamic matching of types for interactions, binding and trading purposes.

2 Normative References

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and International Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of ITU maintains a list of the currently valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

- ITU-T Recommendations X.680-series (1997) | ISO/IEC 8824 (all parts):1998, *Information technology – Abstract Syntax Notation One (ASN.1)*.
- ITU-T Recommendation X.725 (1995) | ISO/IEC 10165-7:1996, *Information technology – Open Systems Interconnection – Structure of management information: General relationship model*.

- ITU-T Recommendation X.902 (1995) | ISO/IEC 10746-2:1996, *Information technology – Open Distributed Processing – Reference Model: Foundations*.
- ITU-T Recommendation X.903 (1995) | ISO/IEC 10746-3:1996, *Information technology – Open Distributed Processing – Reference Model: Architecture*.
- ITU-T Recommendation X.910 (1998) | ISO/IEC 14771:1999, *Information technology – Open Distributed Processing – Naming framework*.
- ITU-T Recommendation X.920 (1997) | ISO/IEC 14750:1999, *Information technology – Open Distributed Processing – Interface definition language*.
- ITU-T Recommendation X.930 (1998) | ISO/IEC 14753:1999, *Information technology – Open Distributed Processing – Interface references and binding*.
- ITU-T Recommendation X.950 (1997) | ISO/IEC 13235-1:1998, *Information technology – Open Distributed Processing – Trading function: Specification*.

2.2 Additional References

- ISO/IEC 10027:1990, *Information technology – Information Resource Dictionary System (IRDS) framework.*
- ISO/IEC 13719 (all parts):1998, *Information technology – Portable Common Tool Environment (PCTE).*
- ISO/IEC 15474 (all parts):....[1)], *Information technology – CDIF Framework.*

2.3 Specifications of the Object Management Group

This Recommendation | International Standard makes references to the following specifications:

- Object Management Group, ad/97-08-14 and ad/97-08-15, *Meta-Object Facility*, 1997.
- Object Management Group, ad/97-08-02 through ad/98-08-09, *Unified Modelling Language*, 1997.

Annex C identifies the clauses of this Recommendation | International Standard that reference text in the Meta-Object Facility.

1) To be published.