TECHNICAL REPORT

ISO/IEC TR 10000-1

Information technology — Framework and taxonomy of International Standardized Profiles —

Part 1:
Framework

*Technologies de l'information — Cadre et taxonomie des profils
internationaux normalisés —*
Partie 1: Cadre

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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.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The main task of technical committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

— type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;

— type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;

— type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/IEC TR 10000-1, which is a Technical Report of type 3, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology.*

This second edition cancels and replaces the first edition (ISO/IEC TR 10000-1:1990), which has been technically revised.

ISO/IEC TR 10000 consists of the following parts, under the general title *Information technology — Framework and taxonomy of International Standardized Profiles:*

— *Part 1: Framework*

— *Part 2: Taxonomy of Profiles*

Annex A forms an integral part of this part of ISO/IEC TR 10000. Annexes B, C and D are for information only.

Introduction

The context of Functional Standardization is one part of the overall field of IT standardization activities covering

• Base Standards, which define fundamentals and generalized procedures. They provide an infrastructure that can be used by a variety of applications, each of which can make its own selection from the options offered by them.

• Profiles, which define conforming subsets or combinations of base standards used to provide specific functions. Profiles identify the use of particular options available in the base standards, and provide a basis for the development of uniform, internationally recognized, conformance tests.

• Registration Mechanisms, which provide the means to specify detailed parameterization within the framework of the base standards or Profiles.

Within ISO/IEC JTC 1, the process of Functional Standardization is concerned with the methodology of defining Profiles, and their publication in documents called "International Standardized Profiles" (ISPs).

In addition to ISO/IEC/TR 10000, the secretariat of the Special Group on Functional Standardization maintains a standing document (SD-4) entitled: "Directory of ISPs and Profiles contained therein" This is a factual record of which ISPs exist, or are in preparation, together with an executive summary of each Profile. It is subject to regular updating by the Secretariat of ISO/IEC JTC 1/SGFS.

ISO/IEC TR 10000-1:1992
https://standards.iteh.ai/catalog/standards/sist/827e2e7d-14bc-4f86-b1d5-
9166dfc366b1/iso-iec-tr-10000-1-1992

Information technology - Framework and taxonomy of International Standardized Profiles -

Part 1:
Framework

1 Scope

This part of ISO/IEC/TR 10000 defines the concept of Profiles, and the way in which they are documented in International Standardized Profiles. It gives guidance to organizations making proposals for Draft International Standardized Profiles, on the nature and content of the documents they are producing.

This part of ISO/IEC/TR 10000 outlines concepts of Profiles, the general Taxonomy (or Classification Scheme), and the format and content of ISPs. Annex A gives details of the format and content of ISPs as required by ISO/IEC JTC 1. Annex B gives examples of the ways in which Profile definitions are incorporated in ISPs for publication. Annex C gives guidance on conformance aspects of Profiles, and indicates the direction in which ISO/IEC/TR 10000 may be developed in the future. Annex D lists those ISO/IEC Standards and CCITT Recommendations which are quoted in examples.

ISO/IEC/TR 10000-2 provides a full classification for Profiles which may be or have been submitted for ratification as International Standardized Profiles.

ISO/IEC/TR 10000 is applicable to Profiles in the area of competence of ISO/IEC JTC 1, and within this, priority consideration has been given to Profiles in the OSI area, i.e. those which specify OSI base standards, and those concerned with interchange formats and data representation which are expected to be used in conjunction with them. In addition, as a lower priority, it is also applicable to Profiles specifying the use of other ISO/IEC JTC 1 base standards, for example:

• Open Distributed Processing;

• the representation of information or objects on storage media (as opposed to the current limitation to use with communications protocols);

• logical and physical storage structures.

However, it is recognized that the scope of the concept of Profiles will be wider than that of ISO/IEC JTC 1. Examples of other areas to which the concept may be extended by other Technical Committees are:

• interchange formats defined for particular application areas (e.g. trade data interchange formats in ISO/TC 154);

• protocols used in particular application areas (e.g. documentation (bibliographic) protocols in ISO/TC 46, banking protocols in ISO/TC 68, industrial automation protocols in ISO/TC 184), which may also specify particular uses of the more generic Profiles included in this Taxonomy.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC/TR 10000. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC/TR 10000 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7498:1984, *Information processing systems - Open Systems Interconnection - Basic Reference Model.* (Corresponds to CCITT X.200)

ISO 8613-1: 1989, *Information processing - Text and office systems - Office Document Architecture (ODA) and interchange format - Part 1: Introduction and general principles.* (Corresponds to CCITT T.411)

ISO/IEC 9545: 1989, *Information technology - Open Systems Interconnection - Application Layer structure.*

ISO/IEC 9646-1: 1991, *Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General Concepts.* (Corresponds to CCITT X.290)

ISO/IEC 9646-2: 1991, *Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification.* (Corresponds to CCITT X.291)

ISO/IEC 9646-6: ....[1], *Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol Profile test specifications.*

ISO/IEC 9646-7: ....[1], *Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation conformance statements.*

ISO/IEC 9834-1: ....[1], *Information technology - Open Systems Interconnection - Procedures for the operation of OSI registration authorities - Part 1: General procedures.*
(Corresponds to CCITT X.660)

ISO/IEC/TR 10000-2:1992, *Information technology - Framework and taxonomy of International Standardized Profiles - Part 2: Taxonomy of profiles.*

ISO/IEC/TR 10183: .... [1], *Information processing - Text and Office Systems - Office Document Architecture (ODA) and interchange format - Technical Report on ISO 8613 Implementation testing -*
Part 1: Testing Methodology
Part 2 : Framework for Abstract Test Cases

IEC/ISO Directives Part 3:1989, *Drafting and presentation of International Standards*

A number of other ISO Standards and CCITT Recommendations are quoted in examples which do not constitute provisions of this part of ISO/IEC/TR 10000. They are listed in annex D.

3   Definitions

For the purposes of this part of ISO/IEC/TR 10000, the following definitions apply:-

3.1   Terms defined in this part of ISO/IEC/TR 10000

3.1.1 International Standardized Profile: An internationally agreed-to, harmonized document which identifies a standard or group of standards, together with options and parameters, necessary to accomplish a function or set of functions.

3.1.2 Profile: A set of one or more base standards, and, where applicable, the identification of chosen classes, subsets, options and parameters of those base standards, necessary for accomplishing a particular function.

NOTE - An International Standardized Profile includes the specification of one or more Profiles.

3.1.3 ISP Implementation Conformance Statement: A statement made by the supplier of a system which claims to conform to an ISP, stating the capabilities and options which have been implemented, and all optional features which have been omitted.

3.1.4 Group: A set of Profiles that are compatible, in the sense that a system implementing one Profile from a Group can interwork, according to OSI, with another system implementing a different Profile from the same Group, in terms of the operation of the protocols specified within those Profiles.

3.1.5 Base Standard: An approved International Standard or CCITT Recommendation which is used in the definition of a Profile.

3.2   Terms defined in ISO/IEC 9646-1

This part of ISO/IEC/TR 10000 uses the following terms defined in ISO/IEC 9646-1:

a)   Conformance testing

b)   Conforming implementation

c)   Dynamic conformance requirements

d)   Protocol Implementation Conformance Statement

e)   PICS proforma

f)   Static conformance requirements

3.3   Terms defined in ISO 8613-1

This part of ISO/IEC/TR 10000 uses the following term defined in ISO 8613-1:

a)   Document Application Profile

4   Abbreviations

ISP	International Standardized Profile
IPRL	ISPICS Requirements List
ISPICS	ISP Implementation Conformance Statement
PICS	Protocol Implementation Conformance Statement
A-Profile	Application Profile (requiring Connection-mode Transport Service)
B-Profile	Application Profile (requiring Connectionless-mode Transport Service)
F-Profile	Interchange Format and Representation Profile
R-Profile	Relay Profile
T-Profile	Transport Profile (providing Connection-mode Transport Service)
U-Profile	Transport Profile (providing Connection-less-mode Transport Service)

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1)   To be published.

5   Purpose of Profiles

Profiles define combinations of base standards for the purpose of

- identifying the base standards, together with appropriate classes, subsets, options and parameters, which are necessary to accomplish identified functions for purposes such as interoperability;

- providing a system of referencing the various uses of base standards which is meaningful to both users and suppliers;

- providing a means to enhance the availability for procurement of consistent implementations of functionally defined groups of base standards, which are expected to be the major components of real application systems;

- promoting uniformity in the development of conformance tests for systems that implement the functions associated with the Profiles.

Various bodies throughout the world are undertaking work, in either regional or topic-oriented groups, in the area of Functional Standardization. Various names are given to the results of this work (such as Profiles, Functional Standards, Implementation Agreements, Specifications) and various approaches are being taken to the scope of the Profiles and to the style in which they are documented. This Taxonomy of International Standardized Profiles has been developed by ISO/IEC JTC 1 in order to create a common classification scheme, and documentation scope and style, into which the work of Functional Standardization bodies can be submitted, along with corresponding work from the members and subcommittees of ISO/IEC JTC 1.

It is not sufficient, however, just to create a framework of this sort. Interoperability, and product development and procurement, need to be seen on a global, and not just on a regional or sectional scale. Therefore an objective of ISO/IEC JTC 1 is to create the climate for the production of harmonized Profiles, where a wide measure of agreement is reached before proposals are submitted to ISO/IEC JTC 1.

One of the most important roles for an International Standardized Profile is to serve as the basis for the establishment of internationally recognized conformance test suites and test laboratories. ISPs are produced not simply to "legitimize" a particular choice of base standards and options, but to promote real system interoperability. The development and widespread acceptance of conformance testing based on ISPs is crucial to the successful realization of this goal.

NOTE - The remainder of this part of ISO/IEC/TR 10000 is concerned with the concepts and structures of Profiles as they apply to the use of standards in the area of competence of ISO/IEC JTC 1, and primarily as they apply to the use of OSI and OSI-related standards. This means:

- Profiles for the use of OSI protocol standards for systems interoperability;

- Profiles for the use of standards which define the format and content of the data that is carried between end systems by means of the OSI protocols.

6   Concept of a Profile

The concept of a Profile, which fulfils the purposes defined in clause 5, is considered first in an abstract sense, with particular emphasis on the significance of the claim of conformance to a Profile. This concept of an individual Profile is then extended to include defining its relationship to other Profiles, i.e. the concept of a Taxonomy of Profiles, and its place within it. Finally, since a Profile has to have a concrete existence in order for it to be used effectively, these conceptual aspects are related to a formal documentation system.

Clauses 6 and 7 concentrate on defining the concept and taxonomy of the Profiles, independently of the way they are documented in ISPs. Clause 8 defines the actual documentation scheme and shows how there is not necessarily one separate document (ISP) for each Profile definition.

Profiles are related to Base Standards, to Registration Mechanisms, and to Conformance Tests of the systems which implement them. The practical implications of these relationships are developed in the following subclauses, some of which specify requirements that shall be satisfied by Profiles defined in ISPs.

NOTE - ISO/IEC 9646 is under development in the area of protocol profile conformance testing concepts and methodology. When this work is mature, it will be referenced from this Technical Report.

6.1   The relationship to base standards

6.1.1   Reduction of options

Base standards specify procedures and formats that facilitate the exchange of information between systems. They provide options, anticipating the needs of a variety of applications and taking into account different capabilities of real systems and networks.

Profiles promote interoperability by defining how to use a combination of base standards for a given function and environment. In addition to the selection of base standards, a choice is made of permitted options for each base standard and of suitable values for parameters left unspecified in the base standard.

Profiles shall not contradict base standards but shall make specific choices where options and ranges of values are available. The choice of the base standard options should be restricted so as to maximise the probability of interworking between systems implementing different selections of such Profile options, consistent with achieving the objective of the Profile.

6.1.2   Normative References

An approved ISP shall make normative reference only to base standards or other ISPs (see 3.1.5).

In exceptional circumstances, described below, normative reference may be made to ISO/IEC Technical Reports. Such reference, which requires that the following conditions are met, shall be justified on a case-by-case basis:

- no base standard addressing the requirements is available, but a Technical Report is;

- the use is identified and discussed in the Explanatory Report which accompanies the proposed draft for an ISP, justifying that use;

- the JTC 1 body responsible for that Technical Report agrees that a normative reference is an appropriate use of that Technical Report,;

- the National Bodies approve this usage in the draft ISP ballot.

NOTE - In this Technical Report, any text which describes the relationship of an ISP to a base standard, shall be taken to be referring also to its relationship to any Technical Reports which have been accepted according to the criteria given above.

6.1.3 Informative References

When it is useful to make informative reference to other documents in the process of defining a Profile, reference may be made to applicable regional or national standards. Examples of the functionality which may require the use of this expedient are:-

- physical connectors

- electrical characteristics

- safety requirements

- character repertoires

Such reference to regional or national standards shall be placed in an informative annex to the ISP, or in a separate, non-normative, part of a multi-part ISP. Such usage shall be justified on a case-by-case basis, either as a consequence of the lack of appropriate functionality in International Standards, or because of the existence of national or regional regulatory requirements. It shall be accompanied by details of the body responsible for the distribution and maintenance of the standard.

6.1.4 Other Factors

Approval of an ISP by ISO/IEC members does not change the status of any documents referenced by it.

The development of an ISP may indicate the need to modify or to add to the requirements specified in a base standard. In this case, it is necessary for the ISP developer to liaise with the standards group responsible for that base standard so that the required changes may be made through established methods such as defect reporting, amendment procedures, or the introduction of new work.

Entry of a Profile into the Taxonomy may occur before the referenced base standards are all stable and approved. In these circumstances, regional or sectional bodies may make use of interim or preliminary draft versions of Profiles in their own controlled environment.

6.2 The relationship to Registration Authorities

The base standards referenced in Profiles may include objects such as abstract syntaxes, document types, Virtual Terminal Environments and control objects, which require a Registration Authority to administer them. Profiles should specifically define the use of such objects (i.e. indicate whether they are included in the Profile or not) and shall refer to the objects using the registered name in the base standard. Profiles may, in addition to the registered name, define particular registered values associated with the name for use in the Profile.

When a type of information object requires a registration agent with a technical rôle as defined in ISO/IEC 9834-1, and the type of information object concerned falls within the scope of one of the classes of Profile defined in clause 7, a multi-part ISP may be used as the registration agent concerned. In this case, the provisions of this part of ISO/IEC TR 10000, of ISO/IEC 9834-1, and of any other part or parts of ISO/IEC 9834 that concern this type of information object, shall all be applicable.

Where registration mechanisms are not yet set up, objects of this kind shall in the meantime be maintained in an informative annex to the ISP which defines the Profile. Entry of an object into such an annex does not imply registration.

NOTE - It is for further study whether a Profile could create the requirement to register a type of object that is not already accommodated by the Registration Authority mechanism for the base standards referenced.

6.3 Principles of Profile Content

6.3.1 General Principles

A Profile makes explicit the relationships between a set of base standards used together (relationships which are implicit in the definitions of the base standards themselves), and may also specify particular details of each base standard being used.

It follows that a Profile

a)   shall restrict the choice of base standard options to the extent necessary to maximise the probability of interworking between systems implementing the Profile; thus a Profile may retain base standard options as options of the Profile provided that they do not affect interworking;

b)   shall not specify any requirements that would contradict or cause non-conformance to the base standards to which it refers;

c)   may contain conformance requirements which are more specific and limited in scope than those of the base standards to which it refers. Whilst the capabilities and behaviour specified in a Profile will always be valid in terms of the base standards, a Profile may exclude some valid optional capabilities and optional behaviour permitted in those base standards.

Thus conformance to a Profile implies by definition conformance to the set of base standards which it references. However, conformance to that set of base standards does not necessarily imply conformance to the Profile.

6.3.2 Principles of OSI Profile Content

An OSI Profile specifies the application of one or more OSI base standards in support of a specific requirement for interworking between systems. While it adheres to the structure defined by the Basic Reference Model for OSI, it does not define the total OSI functionality of a system, but only that part relevant to the function being defined.

In the case of Profiles which reference a standard or standards from the Application Layer (Layer 7) of the Basic Reference Model for OSI (known as A- or B-Profiles - see clause 7), there may also exist a complementary element of definition known as an Application Context (see ISO/IEC 9545). This defines the relationship among referenced base standards in Layer 7, together with the rules for their combined operation. An A- or B-Profile may reference a published Application Context (or Application Context Proforma), thus obviating the need for the Profile to document explicitly the rules for cooperation of Application Service Entities.

6.3.3 Main elements of a Profile Definition

The definition of a Profile shall comprise the following elements:

a) a concise definition of the scope of the function for which the Profile is defined, and of its purpose;

b) an illustration of the scenario within which the function is applicable; where a Profile is a member of a Group (7.2 and ISO/IEC/TR 10000-2, subclause 4.3), the scenario includes reference to the possibilities for interoperation that this provides (see also A.4.2);

c) normative reference to a single set of base standards, including precise identification of the actual texts of the base standards being used and of any approved amendments and technical corrigenda (errata), conformance to which is identified as potentially having an impact on achieving interoperation using the Profile;

d) informative reference to any other relevant source documents;

e) specifications of the application of each referenced base standard, covering recommendations on the choice of classes or subsets, and on the selection of options, ranges of parameter values, etc, and reference to registered objects or application contexts where appropriate;

f) a statement defining the requirements to be observed by systems claiming conformance to the Profile, including any remaining permitted options of the referenced base standards, which thus become options of the Profile.

Interoperable systems can perform different but complementary roles (e.g. an initiator-responder or a master-slave relationship). In such a situation the Profile shall identify the separate roles which may be adopted by a system, and these shall be stated as either mandatory requirements or options of the Profile, as appropriate.

NOTE - Clause 8 and annex A provide information on the way in which a Profile shall be defined in an ISP.

6.4 The meaning of conformance to a Profile

6.4.1 OSI Profiles

The concepts of static conformance, dynamic conformance and Protocol Implementation Conformance Statements (see ISO/IEC 9646 parts 1 and 2) are incorporated in the concept of Profiles.

In the context of OSI, a real system is said to exhibit conformance if it complies with the requirements of applicable OSI standards in its communication with other real systems.

Since OSI standards form a set of inter-related standards which combine to define behaviour of open systems in their communication, it is necessary to express conformance of real systems with reference to this set.

A Profile shall address the following two topics:

• static conformance requirements (details as given in 6.6);

• dynamic conformance requirements (details as given in 6.7);

These requirements are stated in an ISP Implementation Conformance Statement (ISPICS), using the PICS Proformas of the referenced base standards and an ISPICS Requirements List (IPRL - details as given in 8.4).

In order to conform to a Profile, a system shall perform correctly all the capabilities defined in the ISPICS as mandatory and also any options of the ISP which it claims to include. Conformance to a base standard in this context is conformance to a particular identified publication of a referenced base standard as defined in 6.3.3 (c), irrespective of however many additional technical corrigenda to it may have been published.

But a system may have the ability to operate according to several Profiles which make use of different capabilities of the same base standards, and either to negotiate between such different uses, or to be configured appropriately.

A Profile shall be defined in such a way that testing of an implementation of it can be carried out in the most complete way possible, given the available testing methodologies.

NOTE - ISO/IEC 9646 is under development to include the subject of testing concepts and methodology for such Profiles, and will be referenced from this Technical Report when these extensions have been completed. In the mean time, nothing in this Technical Report shall be taken to contradict statements made in subsequently published ISO/IEC standards.