doc. nr.	ISO/IEC JTC 1/SGFS N 430
date 1991-11-22	total pages
item nr.	supersedes document

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ISO/IEC JTC 1/SGFS
Title: ISO/IEC JTC 1 Special Group on Functional Standardization

Secretariat: NNI (Netherlands)

Title : Working Draft TR 10000-1.2:
Information Technology - Framework and Taxonomy of International Standardized Profiles - Part 1: Framework (version 2)

Source : Editor - Framework: ISO/IEC JTC1 Special Group on Functional Standardization (Mr. R.V.S. Lloyd)

Status : This document is submitted to the ISO/IEC JTC1/SGFS for a three months' review.

THE REVIEW PERIOD ENDS BY 1992-02-22

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Note : This is the first draft of the text of ISO/IEC TR 10000-1.2. It is a revision of the text of ISO/IEC TR 10000-1:1990(E) in accordance with Resolution 14 of the Berlin meeting of the SGFS, 18-21 June 1991.

In this document the results of the SGFS Authorised Subgroup Meeting, 30 October-1 November, 1991, in Brussels are not incorporated.

ISO/IEC

ISO/IEC /WDTR 10000-1.2 : xxxx		
date 1991-10-25	reference number ISO/IEC JTC1/SGFS N	430
supersedes document		

THIS DOCUMENT IS STILL UNDER STUDY AND SUBJECT TO CHANGE. IT SHOULD NOT BE USED FOR REFERENCE PURPOSES

work item number

ISO/IEC JTC1 / SGFS

Title Information Technology Special Group on Functional Standardization

Secretariat NNI

Circulated to P- and O-members of the JTC1, technical committees and organizations in liaison for:

- discussion at
- comments by — See Below
- voting by (P-members only)

Title

Information Technology - Framework and Taxonomy of International Standardized Profiles - Part 1: Framework

Reference Language Version: English ☒ French ☐

Introductory Note

SOURCE: Editor - Framework: ISO/IEC JTC 1 Special Group on Functional Standardization (Mr. R.V.S.Lloyd)

STATUS This is the first draft of ISO/IEC/TR 10000-1.2. It is provided to SGFS members for three months' review prior to its amendment and subsequent submission to JTC1 for ballot as an ISO/IEC Draft Technical Report Type 3.

This is a revision of the text of ISO/IEC TR 10000-1 : 1990 (E) in accordance with Resolution 14 of the Berlin meeting of the SGFS June 18-21 1991, see SGFS N411. Editing instructions are documented in SGFS N390. Remarks on the progression of TR 10000 are documented in SGFS N431. A list of outstanding issues is maintained - the current version is in SGFS N432.

Changes from TR 10000 : 1990 are shown by marginal bars for new text, with deleted text "struck through".

Table of Contents

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) together form a system for worldwide standardization as a whole. National bodies that are members of ISO or IEC participate in the development of International Standards and Technical Reports through technical committees established by the respecitive 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.

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

— 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, which is a Technical Report of type 3, was prepared by the Special Group on Functional Standardization of ISO/IEC JTC 1, *Information technology*.

The structure of ISO/IEC/TR 10000 is as follows:

- Part 1: Framework
- Part 2: Taxonomy of Profiles

Part 1 has four Annexes:

- Annex A is an integral part of the Technical Report, and is binding on submitters of ISPs.
- Annex B is illustrative, and has no binding significance.
- Annexes C and D are for information only, and have no binding significance.

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 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 "Directory of ISPs and Profiles contained therein" This is a factual record of which ISPs exist, or are in preparation, together with a summary description of the scope, scenario, and model for each Profile. It is subject to regular updating by the Secretariat of ISO/IEC JTC 1/SGFS.

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, ~~though this subject is still for further study~~. 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 ~~may ultimately~~ will be wider than that of ISO/IEC JTC1. Examples of other areas to which the concept may ~~eventually~~ 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/IEC 8613-1: 1989, *Information processing - Text and Office Systems; Office Document Architecture (ODA) and interchange fomat - Part 1: Introduction and General Principles . (Corresponds to CCITT T.411)*

IISO/IEC 9646-1: 1991, *Information technology - OSI conformance testing methodology and framework - Part 1: General Concepts . (Corresponds to CCITT X.290 Part 1)*

ISO/IEC 9646-2: 1991, *Information technology - OSI conformance testing methodology and framework - Part 2: Abstract test suite specification.*
(Corresponds to CCITT X.290 Part 2)

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.rrr)

ISO/IEC/TR 10000-2.2:199x, *Information technology - Framework and taxonomy of International Standardized Profiles - Part 2: Taxonomy.*

ISO/IEC TR 10183: 1989, *Information processing - Text and Office Systems; Office Document Architecture (ODA) and interchange format - Implementation Testing Methodology - Part 1: Framework*
Part 2 : Abstract Test Suites[2]
(Corresponds to CCITT T.xxx)

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, Technical Report or CCITT Recommendation which is used in the definition of a Profile.

NOTE - See also 6.1 for an indication of circumstances under which documents other than these may be referenced informatively in an ISP.

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 (PICS)

e) PICS proforma

f) Static conformance requirements

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 Connectionless-mode Transport Service)

1) To be published
2) 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 - ~~The development of~~ ISO/IEC 9646 ~~parts 1 and 2 and of this part of ISO/IEC/TR 10000~~ is under development in the area of protocol profile conformance testing concepts and methodology. ~~for ISPs is for further study~~ When this work is mature, it will be referenced from this Technical Report.

6.1 The relationship to base standards

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.

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

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 stand-

ards. 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.

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 of 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 accomodated 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 probablility 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.

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;

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 - ~~The subject of testing concepts and methodologies for ISPs is for further study~~. 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.

6.4.2 Profiles for Interchange Formats and Representation

The concept of static conformance (as given in 6.6) shall be applied to Interchange Format and Representation Profiles.

Interchange Format and Representation Profiles ~~shall~~ should if appropriate include an IPRL based on a PICS-style proforma, which may vary from the PICS defined in ISO/IEC 9646 Parts 1 and 2.

~~For example, Office Document Architecture (ISO 8613) includes the concept of Document Application Profiles (DAPs) which define different levels of functionality. Although specifying a subset of the base standard, the DAPs still leave some options open, and it is therefore relevant to include a PICS-style proforma to allow suppliers to specify the options that have been implemented.~~

~~NOTE - Work on defining the method of specifying this conformance is under way, and will be incorporated in ISO/IEC/TR 10000 when stable.~~

In the case of Profiles for Office Document Architecture, conformance centres on the requirements for valid ODA data streams. The conformance methodology for ODA data streams (defined in ISO/IEC 8613-1) is differentiated from the implementation testing methodology (defined in ISO/IEC/TR 10183), which deals with the way that data streams are generated and received.

Other sub-classes of Interchange Format and Representation Profiles will similarly have specific definitions of conformance methodology.

6.5 Conformance requirements of OSI Profiles

The conformance requirements of an OSI protocol Profile shall relate to the conformance requirements in the base standards in the following ways, based on the definitions in ISO/IEC 9646-2:

a) **Mandatory requirements in the base standards**: these shall remain mandatory in the Profile.

b) **Conditional requirements in the base standards**: these shall remain conditional in the Profile with the exception that if the condition always evaluates to True or False given the requirements of the Profile, then the status can be changed to the result obtained. (See clause C.4 for additional information).

c) **Optional requirements in the base standards**: these may be changed in various ways within the profile:

- Mandatory: support may be made mandatory.
- Optional: support may be remain optional.
- Out of Scope: optional requirements which are not relevant to the Profile. For example, functional units of layer (n-1) which are unused by layer (n) in the context of the Profile.
- Conditional: optional requirements may be made conditional within the Profile.
- Excluded: the use of an optional feature may be prohibited in the context of the Profile. This should only be used to restrict the dynamic behaviour in terms of the transmission of protocol elements.

NOTE - Exclusion of an optional feature in a base standard should be done only with great care. An example of an appropriate situation would be when use of an optional feature would lead directly to future interoperability problems.

d) **Non-applicable features in the base standards**: (i.e. those that are logically impossible, according to the base standard) these shall remain non-applicable in the Profile.

e) **Excluded requirements in the base standards**: these shall remain excluded in the Profile.

See 8.4 for the way in which these types of conformance requirements are handled in the ISP Implementation Conformance Statement (ISPICS).

NOTE - See also Annex C for further information about the way in which these concepts may be applied in writing ISPs.

6.6 Static Conformance

6.6.1 General

The choices of options made in a Profile's static conformance requirements are specific to that Profile and provide added value to the base standards.

The choices are not, therefore, arbitrary but need to be consistent with the purpose of the Profile and consistent across all base standards referenced by it.

In order to avoid ambiguity between the Profiles and the base standards, the static conformance requirements of a Profile shall be specified, where possible, by reference to the conformance requirements of the referenced base standards (see 8.4.3).

6.6.2 Structure

The statement of static conformance requirements shall be structured as follows:

a) An overview of major subsets or implementation categories which provides an overall rationale for the more detailed selection of classes and options made in the Profile.

b) The major conformance requirements which relate to these subsets or implementation categories.

c) For each base standard selected in the Profile, a set of static conformance requirements referring both to the base standard static conformance requirements and to the choices made for the Profile (details as given in 6.5).

See clause 8, and especially figure 3, for the way in which these requirements are reflected in the ISPICS Requirements List.

6.6.3 Sending/Receiving Asymmetry

Static conformance requirements may be different in respect of sending and receiving, or initiating and responding. This asymmetry may apply at any level of detail, from the capability of an implementation to initiate or respond to a connection, to the capability of receiving and correctly interpreting a wider range of parameter encodings than those used for sending.

Many base standards specifically identify only the connection initiate-respond asymmetry under static conformance in the conformance clause. There is a need to make it clear in the Profile either that there is no asymmetry, or, if there are asymmetrical requirements, what they are.

6.7 Dynamic conformance

Given the implementation choices made in the ISP Implementation Conformance Statement, the dynamic conformance requirements for a system are mostly already specified by the referenced base standards. Hence, a Profile shall specify dynamic conformance requirements by reference to those base standards, together with any

further constraining requirements necessary to fulfil the stated purposes of the Profile.

Restrictions by a Profile on dynamic conformance requirements of a base standard are exceptions, and should only apply to transmission. Restrictions should not apply to reception. Consequently, it is possible that receipt of an excluded option may cause the receiving system to operate outside the Profile. Refer to clause C.2 for more information on a general categorization of conformance requirements.

7 Framework of the Taxonomy of Profiles

7.1 Nature and Purpose of the Taxonomy

The Taxonomy is the structure and classification within which Profiles will fit. It gives a first-level specification of Profiles, including any determined technical constraints due to their position in the structure, it classifies them and it specifies a number of relationships between them.

The process of drafting and approving ISPs requires a technical framework within which to operate. ISPs will, in general, be written, evaluated and used by experts in specific areas of standardization. There is therefore a prima facie case for identifying classes of Profiles which correspond to these main areas of expertise. It is also the case that the sub-committee structure of ISO/IEC JTC 1 provides some clear pointers to where the boundaries between classes of Profiles should be made. These conceptual boundaries often coincide with real boundaries within implementations of real systems. (For example, the Taxonomy of OSI Profiles makes a distinction between classes at the Transport Service Definition, a boundary which corresponds to that between the respective scopes of ISO/IEC JTC 1 SC6 and SC21).

Having defined such classes, there is then a need to make further subdivisions, related to the inherent real-world divisions of functionality which are supported by the base standards concerned. These sub-classes correspond to functional elements which are meaningful to both users and suppliers; they correspond to points where choices are made, such as whether or not to use/offer a particular subset of an application service, or which communications sub-network environment is to be accessed.

The Taxonomy therefore provides a structure within which these choices can be made and recorded, and the embodiment of the Taxonomy is the structured identifier system. ISO/IEC/TR 10000-2 provides the detail of this system; only the main principles and primary classifications as they relate to OSI are used in this clause for illustrative purposes.

7.2 Main Elements of the Taxonomy of OSI Profiles

In order to decouple representation of information or objects from communications protocol support, and application-related protocol from subnetwork types, OSI and OSI-related Profiles are currently divided into the following classes:

- F – Interchange Format and Representation Profiles.
- A – Application Profiles using Connection-mode Transport Service (i.e. using T-Profiles).
- B – Application Profiles using Connectionless-mode Transport Service (i.e. using U-Profiles).
- T – Connection-mode Transport Profiles, related to subnetwork type.
- U – Connectionless-mode Transport Profiles, related to subnetwork type.
- R – Relay functions between T-Profiles or between U-Profiles.

Other classes or sub-classes may be required, particularly when the Taxonomy is extended beyond the current OSI-orientation.

T- and U-Profiles are further subdivided into Groups. A Group is a set of Profiles that are identified by labels of the form YXnnn, where Y is the class identifier and X is a letter identifying the Group (see ISO/IEC/TR 10000-2 for detailed structures). These Profiles 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. This Group concept, though potentially of general applicability, is currently only used for defining sub-classes of T- and U-Profiles.

Groups for T- and U-Profiles are further defined in terms of the protocols and modes of transport and network service supported by members of a Group. Interworking may occur not only on an unrestricted basis between members of a Group, but also, under defined circumstances, between members of different Groups. These provisions are described in detail in ISO/IEC/TR 10000-2.

The distinction between A-/B-Profiles and F-Profiles is that of the difference between the communications protocol support, and the format characteristics and representation of the information which is communicated.

The granularity of the Taxonomy is important from the point of view of satisfying the requirement for common methods of interworking using Profiles; too many nearly-similar Profiles within a sub-class of the Taxonomy will increase the likelihood that users will be unable to agree on a single Profile choice to interwork successfully; too few Profiles may lead to the provision of so many options to a Profile that it accomplishes little in the way of selection and simplification.

7.3 Relationships between OSI Profiles

The schematic illustration in figure 1 brings together examples of the relationships which exist between OSI Profiles, particularly the three main subdivisions of the Taxonomy, and the combinations which can be made between Profiles from different classes.

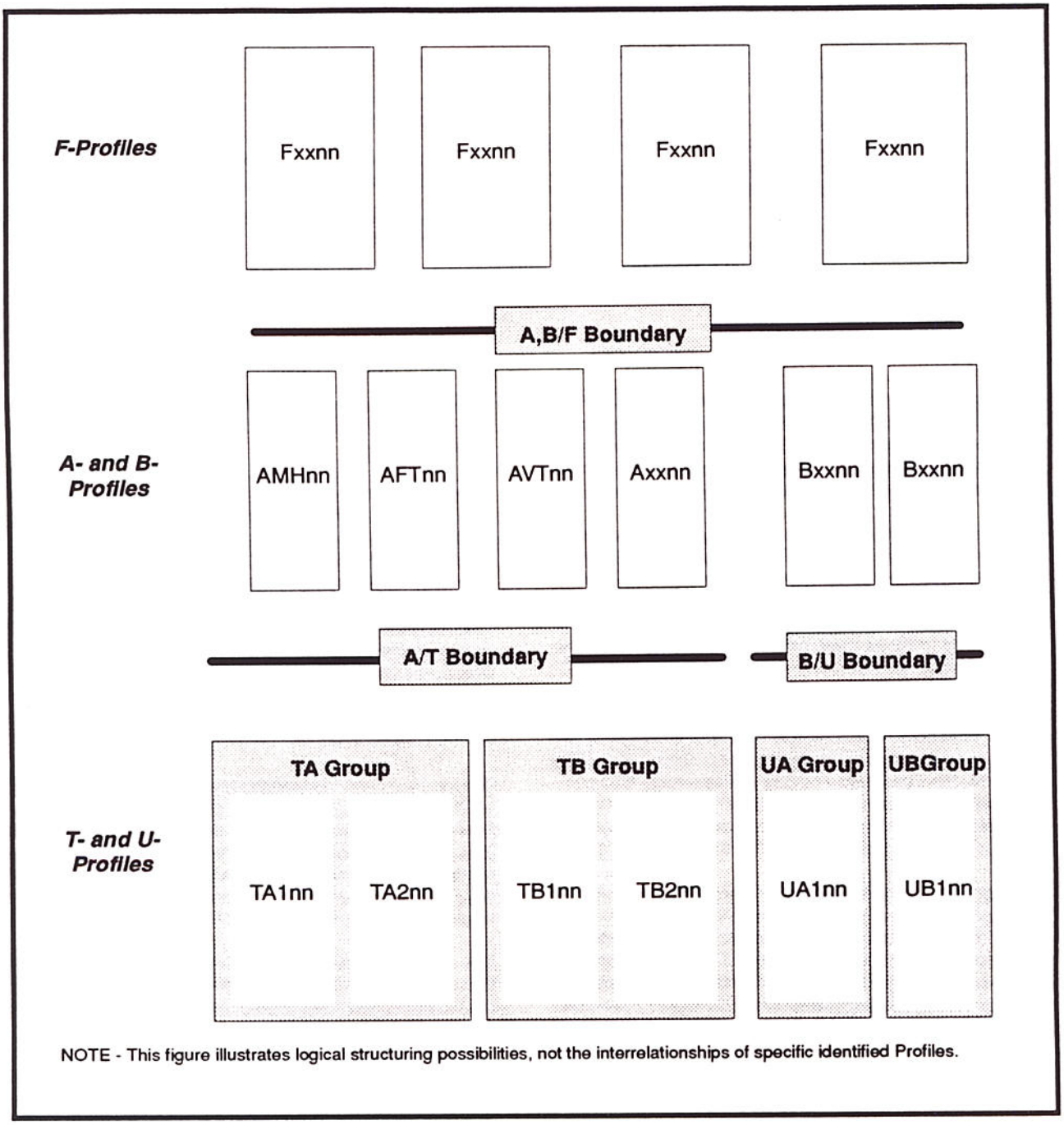


Figure 1 Examples of relationships between Profiles In the OSI Taxonomy

7.3.1 A/T and B/U Boundaries

Actual use of an A- or B-Profile requires that a system operate it in combination with a T- or U-Profile, in order to provide a particular application protocol over a particular subnetwork type. The separation of A- and B-Profiles from T- and U-Profiles, as detailed in 7.2 and in ISO/IEC/TR 10000-2, is represented by an A/T or B/U boundary. This relationship is illustrated vertically in figure 1. The location of a set of A-Profiles above a set of T-Profiles, separated by a common A/T boundary, represents the possibility of combining any pair of A- and T-Profiles, one from each of the two classes.

A similar situation exists for B- and U-Profiles.The A/T boundaries correspond to the OSI Connection-mode Transport Service, and the B/U boundaries to the OSI Connectionless-mode Transport Service. The possibility of making the combination arises from the fact that a T- or U-Profile is specified to provide the OSI Transport Service and an A- or B-Profile is specified to use the OSI Transport Service.

7.3.2 A/F and B/F Boundaries

The combination of an A- or B-Profile with one or more F-Profiles will be selected by the user to meet the functional requirements in each case. The various general possibilities are illustrated by the vertical relationships in Figure 1. The location of one or more F-Profiles above one or more A-/B-Profiles, represents the possibility of combining Profiles from each class.

Unlike the A/T and B/U boundaries, the A/F and B/F boundaries are not characterised by a single service definition.

The Application Layer base standards require, implicitly or explicitly, the structure of information carried or referenced by them to be specified for each instance of communication. The combination of A-/B-Profiles with one or more F-Profiles will be selected by the user to meet the functional requirements in each case. However, the choice may be subject to constraints which can be expressed within either A-/B-Profiles, F-Profiles, or both.

In other A-/B-Profiles, the Application Layer base standards themselves constrain the choice of presentation context.

Constraints may also exist within an F-Profile, arising either from its base standard, or as a result of Profile creation. These constraints will limit the A-/B-Profiles which can be used to transfer the information.

In summary, therefore, there are three forms of constraints affecting the combination of A-/B- and F-Profiles:

a) the choice of information to be transferred may be constrained by the Application Layer base standards, and possibily further constrained by the A-/B-Profile;

b) some interchange and representation base standards may limit transfer to particular Application base standards; this choice may be further constrained by the F-Profiles;

c) the combinations are not constrained by base standards, but may be constrained by either A-/B- or F-Profiles to achieve some general function.

Note that, as always, in making his choice of combination, a user must in practice take account not only of the constraints derived from Profiles, but also the capabilities implemented in the end systems involved in each instance of communication, to support the various Profiles.

8 Structure of Documentation for Profiles ~~for OSI (ISPs)~~

8.1 Principles

The requirements for content and format of ISPs are based on the following principles:

a) Profiles shall be directly related to base standards, and conformance to Profiles shall imply conformance to base standards.

b) ISPs shall follow the ISO/IEC Rules for the drafting and presentation of International Standards. See Annex A for relevant extracts from these rules, adapted for use in ISPs.

c) ISPs are intended to be concise documents, which do not repeat the text of the documents to which they refer. The reliance on references to base standards, their PICS proformas (in the case of OSI Profiles), and the use of registered names of objects, are thus essential for the production of concise ISPs.

d) Profiles making identical use of particular base standards shall be consistent, down to the level of identical wording in the ISPs for identical requirements.

8.2 Multi-part ISPs

Many Profiles will be documented and published as individual ISPs. However, where close relationships exist between two or more Profiles (for example those relationships documented in general terms in clause 7 of this part of ISO/IEC TR 10000, and in detail in Part 2), a more appropriate technique can be used.

The need for common text between related Profiles is essential to ensure consistency and interworking, to avoid unnecessary duplication of text, and to aid writers and reviewers of ISPs. Items of common text comprise the definition of a distinct section of a Profile, together with that part of the ISPICS Requirements List relating to the use of one or more base standards by that section of the Profile.

An ISP can be produced in a number of separate parts, on the analogy of multi-part International Standards, where each part is capable of being separately written, submitted to ISO/IEC JTC 1, and approved.

A single-part ISP shall not contain the definition of more than one Profile.

The following rules apply to multi-part ISPs:

a) A multi-part ISP shall contain the definition of a complete Profile or of a related set of Profiles.

b) A part of a multi-part ISP may contain a section of the definition of one or more Profiles.

c) Where a multi-part ISP covers more than one Profile, the part structure shall permit each Profile to be the subject of a separate ISP ballot; i.e. its constituent Profiles shall be clearly identifiable, and the multi-part structure shall ensure that this can be accomplished.

d) Wherever possible, the references made from one part to another should be to complete parts. However, controlled use of one-way references to clauses of other parts is permitted in order to obtain a reasonable multi-part structure.

~~This system of multi-part ISPs is particularly useful for documenting the set of Tx-Profiles which form a Group, since the common elements of each Profile, which ensure the interworking characteristics of the Group, can be written as a single part of such a multi-part ISP. Also,~~

~~where the Profiles defined in separate Groups include the same usage of certain base standards, there may be advantage in defining those Groups in a single ISP part.~~

This system of multi-part ISP's is particularly useful for defining:

- the set of Tx-profiles which form a Group, and thus make common use of standards for network-independent functions;
- the set of Rx-profiles which use common relay techniques;
- the Tx, Ux, and Rx-profiles which make common use of sub-network technologies.

In all these sets of cases, a single part of an ISP can be referenced several times from other parts of the same ISP or from other ISPs, to ensure the identical specification of this common functionality.

Because there may also be potential disadvantages from over-use of the multi-part ISP capability, such as difficulties in gaining approval for a complex linked set of parts, or reduction of the content of a part to a small amount of text, considerable care should be taken with its use.

See annex B for further more detailed illustrations of the way in which multi-part ISPs can be constructed and used.

NOTES

1 When a section of text appears in several Profiles, then possibilities exist for sharing the corresponding code (etc.) for the implementation of several Profiles, and the tests applicable to the use of the referenced base standards will be applicable to the testing of several Profiles.

2 It follows that it is in the interests of the implementers of OSI to promote the identification of common sections of text as parts of ISPs, but even more to promote, in future standardization and Profile work, the use of already defined parts of ISPs, so that Profiles fall into a few "common moulds". In particular, this allows implementation of a part of an ISP with confidence that it may be used in the implementation of Profiles as yet undefined, so that products are open to future development.

3 ~~Possibilities exist for a complete Profile to be referenced from within the definition of another Profile. However, it is for further study whether the Taxonomy will contain such partial Profiles as this possibility would require~~. The definition of one Profile may include a reference to the definition of another Profile in its totality.

8.3 Structure of ISPs

8.3.1 Structure of ISPs for OSI Profiles

The document structure of an ISP for an OSI Profile is as outlined in table 1. This structure represents the sum of the conceptual requirements for the definition of an individual Profile given in clause 6. Where an ISP is divided into several parts, each part shall follow the same format, but with appropriate variations in the contents of its clauses.

8.3.2 Structure of ISPs for ODA Profiles (Class FOD)

An ISP for an FOD Profile is in three parts:

- Part 1: The Document Application Profile
- Part 2: The Implementation Requirements
- Part 3: The Abstract Test Suite

The content and structure of Part 1 is jointly defined by ISO/IEC and CCITT, and is documented in ISO/IEC 8613-1 (X.411), and corresponds in general to Table 1, but without the IPRL, equivalent information for which is provided in Part 2.

NOTE - The details of the content and structure of Parts 2 and 3 are under development.

Table 1- Outline structure of an ISP

	FOREWORD
	INTRODUCTION
1.	SCOPE
2.	NORMATIVE REFERENCES
3.	DEFINITIONS
4.	ABBREVIATIONS
5.....	Clauses defining requirements related to each base standard (Note 2)
NORMATIVE ANNEX A. ISPICS Requirements List	
INFORMATIVE ANNEXES containing explanatory and/or tutorial material, as required.	

NOTES

1 Further information concerning the content of the sections listed above is given in annex A, which is based on the IEC/ISO Directives Part 3 - Drafting and presentation of International Standards.

2 Where possible, these details shall be presented in a tabular form, consistent with the layout of the referenced standard, and not duplicating the representation required by the ISPICS Requirements List.

8.4 The ISP Implementation Conformance Statement (ISPICS)

NOTE - This subclause is only normative with respect to Profiles referencing OSI Protocol standards, which have PICS Proformas defined in accordance with ISO/IEC 9646. However, its principles are relevant to any Profile, and should be so interpreted.

8.4.1 The PICS

It is essential that both the supplier and the user of an OSI product have clear and identical views of the properties of that product. For that reason (among others), a Protocol Implementation Conformance Statement (PICS) has been defined for use in the base standards (ISO 9646, Parts 1 and 2).

A PICS is a statement, made by the supplier, in which it is declared whether or not each permitted option has been implemented and, if a choice of values is offered, the values that are supported.

~~It is expected that a PICS proforma will be provided in all base standards specifying protocols, although a modified form of PICS may be required for base standards that do not define protocol procedures.~~

ISO/IEC 9646-2 Annex ~~C~~ A defines the requirements for, and provides guidance on, the production of PICS proformas. The body of each PICS proforma shall ~~will~~ consist of a set of tables, which in their most general form would be as in figure 2 (~~taken from~~ based on ISO/IEC 9646-2 Annex A.9 ~~C~~).

8.4.2 The ISPICS

The method of the supplier providing an implementation conformance statement shall also be used for Profiles, in which case it is called an ISP Implementation Conformance Statement (ISPICS).

An ISPICS Requirements List (IPRL) shall be provided for each Profile in an ISP. It shall follow the structure of the static conformance requirements, presenting

a) the general options of the Profile as a whole;

b) a list of the standards selected and combined in the Profile;

c) for each of these referenced base standards, a section of the IPRL, expressing the constraints upon allowable answers in the corresponding PICS proforma. This section of the IPRL shall be derived from the PICS proforma of the base standard in question, when available, with its entries enabled, disabled, or pre-selected according to the Profile's choices (see figure 3).

When a set of PICS is produced in accordance with the IPRL by the supplier of a system implementing the Profile, the set of PICS becomes an ISPICS, stating the system's conformance to the mandatory and optional features of the Profile, and, via them, its conformance to the selected features of the referenced base standards.

8.4.3 ISPICS Requirements List (IPRL)

It is the purpose of an IPRL to specify the Profile's constraints on what may appear in the "Support" and "Supported" (values etc) columns in the relevant PICS proformas.

The IPRL will, in some cases, be a simple list of constraints placed upon the appropriate answers in the relevant PICS. In other cases, it could be produced by copying selected tables from the relevant base standards' PICS proformas, removing the column(s) to be completed by the supplier, and adding a new set of columns giving the ISP requirements, both in terms of status and value ranges.

In the latter case, the constraints on what may appear in the "Support" column can be specified by a Profile "Status" column, stating whether the capability is mandatory, conditional (with predicates or conditional status expressions), optional, excluded, out of scope, or not applicable for the Profile.

Similarly, the constraints on what may appear in the "Type/Length/Values Supported" column can be specified by a Profile "Allowed" column, stating the values or range of values allowed for the item by the Profile.

In addition, ~~inter-relationships between answers may be specified by the use of a Profile "Predicates" column, and~~ references to relevant clauses in the ISP may be specified by the use of an "ISP References" column.

Thus, one possible form of the IPRL can be considered to be as in figure 3 for each PICS proforma, although it may be simpler. Non-applicable tables may be omitted and some tables may be replaced by textual statements of the constraints.

The specification in an ISP of an IPRL which is only constructed from explicit references to PICS proformas of base standards, is possible only if all the PICS proformas of the relevant base standards have been published as standards, and are in an adequate form to meet the needs of the ISP.

If any PICS proformas of the relevant base standards are not standardized in an adequate form, then the ISP shall include whatever is necessary to overcome this deficiency, pending production of an adequate PICS proforma for the base standard. This may involve simply specifying additional questions needed for the ISP but not yet covered by the PICS proforma, (e.g. a question on whether certain options are configurable or not). Alternatively, especially if no standard PICS proforma is yet available, the ISP shall contain an interim version of the relevant PICS proforma. Ideally, this should be kept separate from the Profile requirements, although by placing the Profile requirements alongside the PICS proforma, it will be possible to provide an integrated PICS proforma and IPRL.

Whenever this situation occurs, steps shall be taken to produce an adequate standard for the relevant PICS proforma. Once such a standard is published, then further steps shall be taken to update the ISP to replace the

PICS proforma material by an IPRL and the necessary reference to the standardized PICS proforma.

NOTE - This ensures that the primacy of the base standard is retained whenever possible, without delaying the publication of urgently needed ISPs.

In some exceptional cases, the Profile may specify additional Profile-specific conformance requirements which are wholly outside the scope of any of the base standards referenced. This may require additional questions/answers in the IPRL, for which the base standard PICS proformas are not appropriate to reflect this information. Care should be taken that the number of such statements is kept as small as possible.

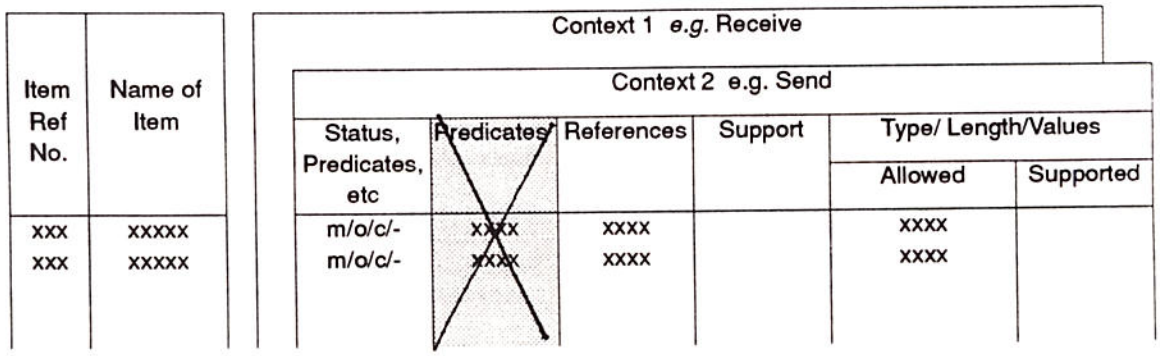


Figure 2 - Outline structure of Base Standard PICS Proforma

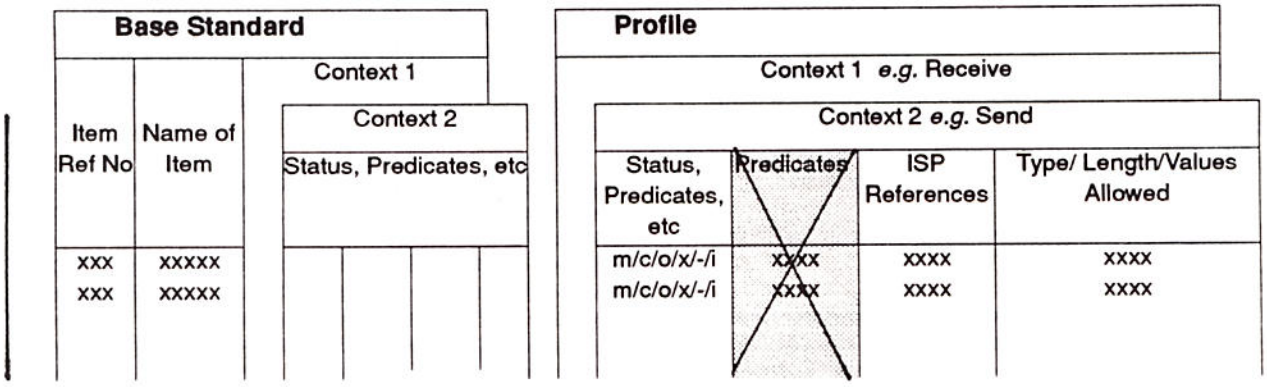


Figure 3 - Example of ISPICS Requirements List structure

Annex A

(normative)

Rules for the drafting and presentation of International Standardized Profiles

A.1 Introduction

The contents of this Annex are binding on the submitters of ISPs.

Clause 8 of this part of ISO/IEC/TR 10000 gives a general specification of the structure required for a Profile definition. It follows the IEC/ISO Directives for drafting and presentation of International Standards as far as is relevant, and this annex contains extracts from the appropriate clauses of that document with modification and comment relating to their use in ISPs. References to clauses of the IEC/ISO Directives are of the form "Rules x.y.z" .

Throughout this annex, which is concerned strictly with documentation content and layout, reference is made to ISPs. As is made clear in clause 8, an ISP, or part thereof, may contain a whole Profile definition, or part of one or more Profile definitions. The wording of this annex assumes that it is describing an undivided ISP which defines one Profile in its entirety. Its application to the other cases is easily deduced. Note however that each part of a multi-part ISP shall use the same format as far as is appropriate.

A.2 General Arrangement (Rules 2.1)

The elements which together form an ISP are classified into three groups:

- preliminary elements are those elements that identify the ISP, introduce its content, and explain its background, its development and its relationship with other standards and ISPs;
- normative elements are those elements setting out the provisions with which it is necessary to comply in order to be able to claim conformity with the ISP;
- supplementary elements are those elements that provide additional information intended to assist the understanding or use of the ISP.

These groups of elements are described in the following clauses.

Notes integrated in the text (see A.6.3) may be part of any element except the title page, the title and footnotes.

A.3 Preliminary Elements

A.3.1 Title Page (Rules 2.2.1)

The title page is prepared in a standard format by the office of the Information Technology Task Force.

The reference number is allocated by the office of the Information Technology Task Force.

A.3.2 Contents (Rules 2.2.2)

The contents is an optional preliminary element, but is necessary if it enables an overall view of the ISP to be obtained, and facilitates its consultation. The contents should normally list only the clauses and the annexes. All the elements listed shall be cited with their full titles.

A.3.3 Foreword (Rules 2.2.3)

The foreword shall appear in every ISP; it consists of a general part giving information relating to the organization responsible, and to International Standards in general, and a specific part giving as many of the following as are appropriate:

- an indication of the organization or committee which prepared the ISP; information regarding the approval of the ISP;
- a statement that the ISP cancels or replaces other documents in whole or in part;
- a statement of significant technical changes from the previous edition;
- a statement of which annexes are normative and which are informative.

A.3.4 Introduction (Rules 2.2.4)

The introduction shall appear in every ISP; it gives specific information about the process used to draft the ISP, and about the degree of international harmonization that it has received. It contains material similar to that in the "Explanatory Report" provided by the originating organization when it submits the proposed draft ISP (PDISP) for approval.

A.4 General Normative Elements

A.4.1 Title (Rules 2.3.1)

The wording of the title shall be established with the greatest care; while being as concise as possible, it shall indicate, without ambiguity, the subject matter of the ISP in such a way as to distinguish it from that of any other ISP or International Standard, without going into unnecessary detail. Any necessary additional particulars shall be given in the Scope.

The title shall be composed of the following three elements:

a) **an introductory element:**

Information technology

indicating ISO/IEC JTC 1 as the originating Technical Committee.

b) **an identification element:**

International Standardized Profile(s) XXXnnn

indicating by the identifier *XXXnnn* the place in the Taxonomy which this Profile occupies.

NOTE - If ~~a multi-part~~ an ISP defines more than one Profile, or only defines common section(s) of a number of Profiles, this element may either enumerate all Profile Identifiers, or use the convention of "X" for a variable letter, and "n" for a variable number; e.g. "TXnnn" or "AFT1n".

c) **a main element** indicating the subject matter of the ISP, as recorded in the Taxonomy (ISO/IEC/TR 10000-2). For a multi-part ISP, this element shall be subdivided into a general title element common to all parts, and a specific title element for each part; where necessary, this specific element may include the identifier of an individual Profile.

Example:

Information technology - International Standardized Profiles AFTnn - File Transfer, Access and Management - Part 3: AFT11 - Simple File Transfer (Unstructured) .

A.4.2 Scope (Rules 2.3.2)

This element contains three subclauses as follows:

a) **General**
This element shall appear at the beginning of the ISP or ISP part, to define without ambiguity the purpose and subject matter of the document, thereby indicating the limits of its applicability. It shall not contain requirements.

b) **Position within the Taxonomy**
If the ISP or ISP part defines a Profile, it shall relate the Profile it defines to the Taxonomy, published as ISO/IEC/TR 10000-2. The element shall include the identifier(s) and title(s) of the Profile(s) defined within the ISP.

c) **Scenario**
If the ISP, or ISP part, defines a Profile, it shall include (where appropriate) the "scenario" of the Profile - an illustration of the environment within which it is applicable. In the case of Profiles using OSI base standards, this shows in a simplified graphic form the OSI system which is covered by this Profile, and other typical systems/subnetworks with which this OSI system shall be capable of interworking (see also clause 6.3.3(b)).

A.4.3 Normative References (Rules 2.3.3)

This element shall give a list of normative documents (approved International Standards, Technical Reports, ISPs, or CCITT Recommendations) with their titles and publication dates, to which reference is made in the text in such a way as to make them indispensable for the application of the ISP. Where published amendments or technical corrigenda (errata) to base standards are relevant to the definition of the Profile in such a way as to have a potential impact on interworking, then they shall be explicitly referenced here.

Where a referenced document is published jointly by both ISO/IEC and CCITT, then the identity of the corresponding CCITT Recommendation shall also be given.

Reference shall also be made to ISO/IEC/TR10000 on the Framework and taxonomy of International Standardized Profiles.

For a multi-part ISP, documents shall be listed only in the parts in which they are referenced.

The list shall be introduced by the following wording:

The following documents contain provisions which, through reference in this text, constitute provisions of this International Standardized Profile. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this International Standardized Profile are warned against automatically applying any more recent editions of the documents listed below, since the nature of references made by ISPs to such documents is that they may be specific to a particular edition. Members of IEC and ISO maintain registers of currently valid International Standards and ISPs, and CCITT maintains published editions of its current Recommendations.

The list shall not include the following:

- documents that are not publicly available;
- documents to which only informative reference is made;
- documents which have merely served as references in the preparation of the ISP.

Such documents can be listed in an informative annex (see A.6.1) entitled "Bibliography". In the case of documents which are not publicly available, full details shall be given there of their source organization, and of how defect reporting and error notification shall be performed.

A.5 Technical Normative Elements

A.5.1 Definitions (Rules 2.4.1)

This is an optional element giving definitions necessary for the understanding of certain terms used in the ISP. The definitions shall be introduced by the following wording:

For the purposes of this International Standardized Profile, the following definitions apply.

Rules for the drafting and presentation of terms and definitions are given in IEC/ISO Directives Part 3, Annex B.

In most cases, an ISP can indicate that all terms used are defined in the referenced base standards, and in such a case, they shall not be repeated within the ISP.

A.5.2 Symbols and Abbreviations (Rules 2.4.2)

This is an optional element giving a list of the symbols and abbreviations necessary for the understanding of the ISP.

In most cases, an ISP can indicate that all abbreviations used are defined in the referenced base standards, and in such a case, they shall not be repeated within the ISP.

A.5.3 Requirements

This element includes clauses relating to the use made of each of the main base standards referenced in the Profile definition. The content and layout of these clauses is not defined, but can be tailored to the type of material which has to be specified in each case.

The information given shall not repeat the text of the base standards, but shall define the choices made in the Profile of classes, subsets, options and ranges of parameter values. It shall be in the form of static and dynamic conformance requirements, and may where appropriate be given in tabular form. Preference shall be given to recording as much as possible of this information once and once only in the ISPICS Requirements List in an annex to the ISP.

See clauses 6 and 8 for more detail concerning the nature of the content required in this element of an ISP.

A.5.4 Test Methods (Rules 2.4.5)

The possibility of including detail of testing methods and test cases for ISPs is for further study.

A.5.5 Normative Annexes (Rules 2.4.8)

Normative annexes are integral sections of the ISP which, for reasons of convenience, are placed after all other normative elements. The fact that an annex is normative (as opposed to informative - see A.6.1) shall be made clear by the way in which it is referred to in the text, by a statement to this effect in the foreword (see A.3.3), and by an indication at the head of the annex itself.

The first normative annex shall be the ISPICS Requirements List (IPRL) - see clause 8.4.

A.6 Supplementary Elements

A.6.1 Informative Annexes (Rules 2.5.1)

Informative annexes give additional information, and are placed after the normative elements of an ISP. They shall not contain requirements. The fact that an annex is informative (as opposed to normative - see A.5.5) shall be made clear by the way in which it is referred to in the text, by a statement to this effect in the foreword (see A.3.3) and by an indication at the head of the annex itself.

The details of any references to National or Regional standards shall be placed in such an informative annex (see also clause 6.1 and A.4.3)

A.6.2 Footnotes (Rules 2.5.2)

Footnotes give additional information, but their use shall be kept to a minimum. They shall not contain requirements.

A.6.3 Notes integrated in the text (Rules 2.5.3)

Notes integrated in the text of an ISP may be used only for giving information which is essential to the understanding of the document. They shall not contain requirements.

A.6.4 Notes to tables and figures (Rules 2.5.4)

Notes to tables and to figures shall be treated independently from footnotes (see A.6.2) and notes integrated in the text (see A.6.3). They shall be located within the frame of the relevant table or immediately above the title of the relevant figure. A separate numbering sequence shall be used for each table and each figure. Such notes may contain requirements.

A.7 Editorial and Layout Information

Further information on layout of text, tables, figures, and footnotes is given in other sections of the Rules, which shall be applied by editors of ISPs. Information is also given in Rules Annex C on verbal forms to be used in drafting statements of requirements, recommendations, permissions, and possibilities, which shall also apply to ISPs.

Annex B.

(informative)

Examples of Multi-part ISP Structure

B.1 Introduction

This annex illustrates first, the general concept of multi-part ISPs, as defined in 8.2, secondly, how the concept can be applied to the definition of A-, B-, and F-Profiles, and finally how it can be applied to T-, U-, and R-Profiles, demonstrating its relevance not only to the structure of an ISP for Profiles which make up a Group, but also to the definition of Profiles based on the same subnetwork or technology, but in different Groups.

NOTE - The examples in this annex are drawn from the currently defined Taxonomy, and from existing ISPs. ~~work on ISPs either in progress of anticipated to be started soon.~~

B.2 General example of multi-part ISPs

The rules given in 8.2 result in the situation which is illustrated in general terms in figure B.1.

Assume that multi-part ISP 999 is to cover the definition of Profiles ***X*** and ***Y*** and ***Z***, each of which refers to the same base standards ***p*** and ***q*** in exactly the same way, but in combination with different base standards.

ISP 999-1 references base standards ***p*** and ***q***, and contains text which is common to the definition of all three Profiles ***X***, ***Y*** and ***Z***.

ISP 999-2 references base standards ***r*** and ***s***, and contains text which is common to Profiles ***X*** and ***Y***.

ISP 999-3 references base standard ***t***, as used in Profile ***Z*** and another Profile, defined in ISP 888-9 (a part of some other ISP not described in this example).

ISP 999-4 defines Profile ***X*** by reference to ISP 999-1 and ISP 999-2.

ISP 999-5 defines Profile ***Y*** by reference to ISP 999-1, ISP 999-2, and with additional reference to base standard ***u*** which is only used in this way by this Profile.

ISP 999-6 defines Profile ***Z*** by reference to ISP 999-1, ISP 999-3, and ISP 777-9 (a part of some other ISP not described in this example).

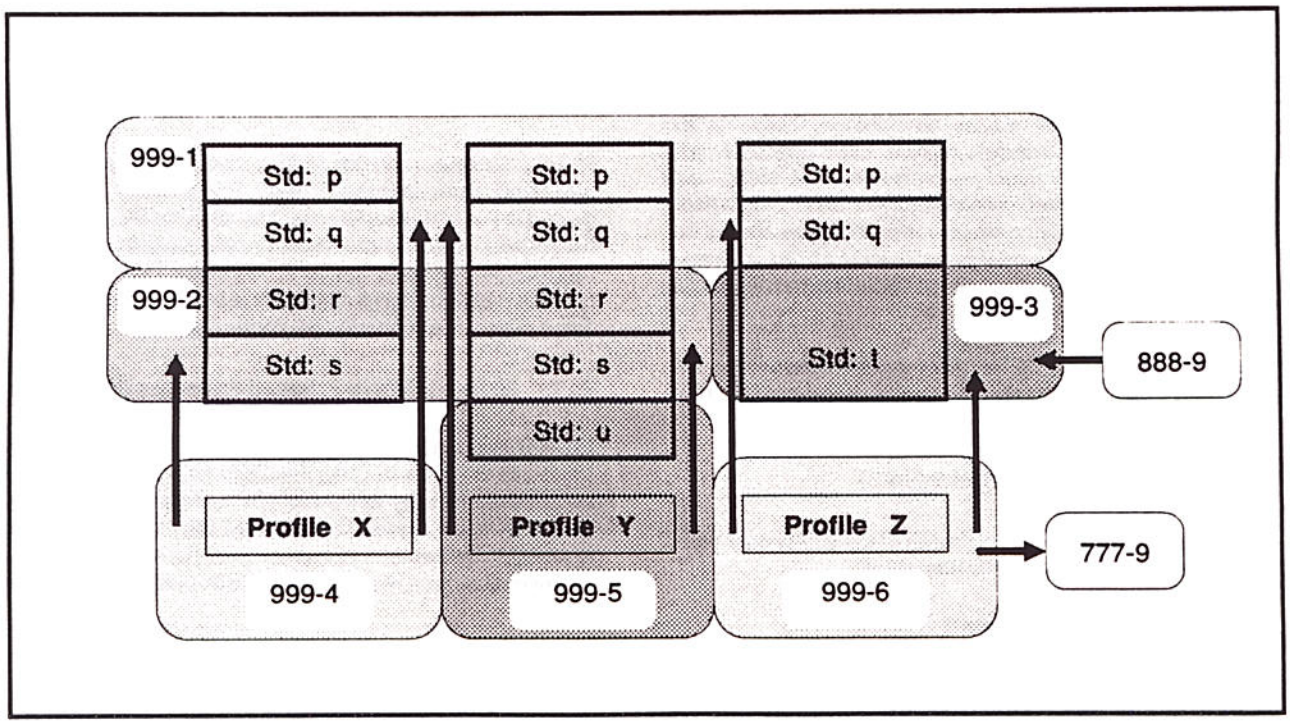


Figure B.1 - Examples of multi-part ISPs

B.3 Examples for A-/B- and F-Profiles

B.3.1 Use with the A-/B-Profiles

In the present stage of development of application standards, a very few "paradigms" permit generation of a very rich set of Profiles covering the vast majority of current needs for OSI-based applications.

B.3.1.1 AMH - MHS Profiles

No advantage has been taken of the use of common text sections in the MHS (1984) Profiles so far created in regional work. But MHS (1988) Profiles will be better integrated with the OSI upper layer standards (use of ACSE, true Presentation, etc) so opportunities exist for identifying such common text. However there are significant differences between MHS usage and usage by other applications (e.g. in its selection of Session functional units) so these opportunities are limited.

B.3.1.2 AFT - FTAM Profiles

~~It seems that at least considerable parts of~~ The use of "lower Upper Layers" (Session, Presentation, ACSE) ~~will be~~ is common to all the AFT Profiles in ISP 10607, which all make reference to common text in ISP 10607-1. ~~should be built upon a common basis. There will also be commonality between different AFT Profiles in their use of ISO 8571 which will be recognized by the creation of separate parts of ISPs.~~

B.3.1.3 "Remote Operations" Profiles

All applications which use the "Remote Operations Services", notably Directory, "P3" and "P7", could be supported by a common usage of Session, Presentation, ACSE and ROSE. This paradigm is proposed by ISO/IEC JTC 1/SC18 and ECMA for the support for office services, and is used for OSI Common Management Information Protocol.

It seems therefore not only that such a common ISP part may be used with advantage to define the common elements of several Profiles, but also that a number of future applications may be built on the same platform. For such applications, the "Remote Operations Services" described by the ISP part would play an analogous role, vis-a-vis the supported applications, as does the Connection-mode Transport service as the basis for the A-Profiles.

B.3.1.4 ATP - Transaction Processing Profiles

The situation is similar to the above in that the "lower Upper Layers" offer a well-defined service to higher "applications". In this case it is explicit that the applications may be "user-defined", i.e. not defined by ISO. This would give rise to "user defined" Profiles all based on the unique TP ISP part. However the TP service is also available for standard OSI application development.

B.3.2 Naming and Addressing

As it is particularly important that the rules for Naming and Addressing be homogeneous for all application Profiles (from ACSE down), it is proposed that this be another area where the use of common ISP parts might be appropriate, and should be the subject of further study.

B.3.3 ~~Office Document Format Profiles~~

~~FOD Profiles will reference content types which are defined in other F-Profiles. There is thus a possibility for the use of common ISP parts in these cases.~~

~~FOD Profiles will specify the use of ODIF (Office Document Interchange Format). However, certain ODA Documents may be interchanged by using ODL (Office Document Language) or SDIF (SGML Document Interchange Format). ODL/SDIF Profiles could reference the appropriate sections of text (ISP parts) in FOD Profiles.~~

B.4 Example of T-Profiles

This section is based on ~~current proposals for the creation of~~ ISPs 10608 and 10609 for the Tx-Profile Groups. (See ISO/IEC/TR 10000-2 for detailed structures)

Figure B.2 shows a number of ISP parts which form elements of these Groups. This illustration shows how the Group structure used for identifying T-Profiles leads to a modular structure for the definition of the Profiles within a Group, with references to common elements of text. Most of these referenced sections of text are included within the same multi-part ISP, but one case is shown - TA11x1 - where reference is made to a part of another ISP (ISP10608-5 refers to ISP10609-9)

The distinctions between the Groups TB, TC, TD and TE (which all use the connection-mode Network Service) are confined to different selections of classes of the Transport Protocol. However, in order to follow the rules of 8.2, a structure as illustrated is being used. This exemplifies a number of aspects of multi-part ISPs.

B.4.1 Specifications unique to individual Profiles

Some base standards are used in a unique manner in a Profile (in addition to common usage of other base standards). An example of this type of usage is the specification of ISO 8802-2 and ISO 8802-3 for CSMA/CD access in the connectionless-mode network service in Profile TA51 (ISP10608-2)

NOTE - This uniqueness will not remain when RA-profiles for relaying the connectionless-mode network service are defined, and make reference to this ISP-part.

B.4.2 Basic Component of Multi-part ISP for a Group

One type of common ISP part is represented by the definition of Layers 3 and 4, which contains all the

information that is common to the Group of TA-Profiles. Thus, ISP10608-1 for TA-Profiles defines the Transport and Network Service being provided, the specification (selection of classes and options supported) of the Transport Protocol being used, and the specification of the protocol that is used to provide the Network Service. Similarly, ISP10609-1 does the same for the Transport layer component of Group TB-Profiles, ISP10609-2 for Group TC-Profiles, etc.

B.4.3 Selective References to ISP Parts

Each of ISP10609-2 through -4 makes reference to ISP10609-1 for the definition of its IPRL; these references are selective, as permitted in clause 8.2 (d), to avoid the need for separate specification of four IPRLs which differ only in their selection of Transport Protocol Classes.

B.4.4 ISP Parts common to more than one Group

The definition of an IPRL may be applicable to Profiles in more than one Group. An example of this occurs with ISP10609-9, which specifies the IPRL for layers 1, 2 and 3 for X.25 PSDN access, and is referenced by ISP10608-5 for TA11x1, as well as by ISP10609-5 through 8 for TB11x1 - TE11x1.

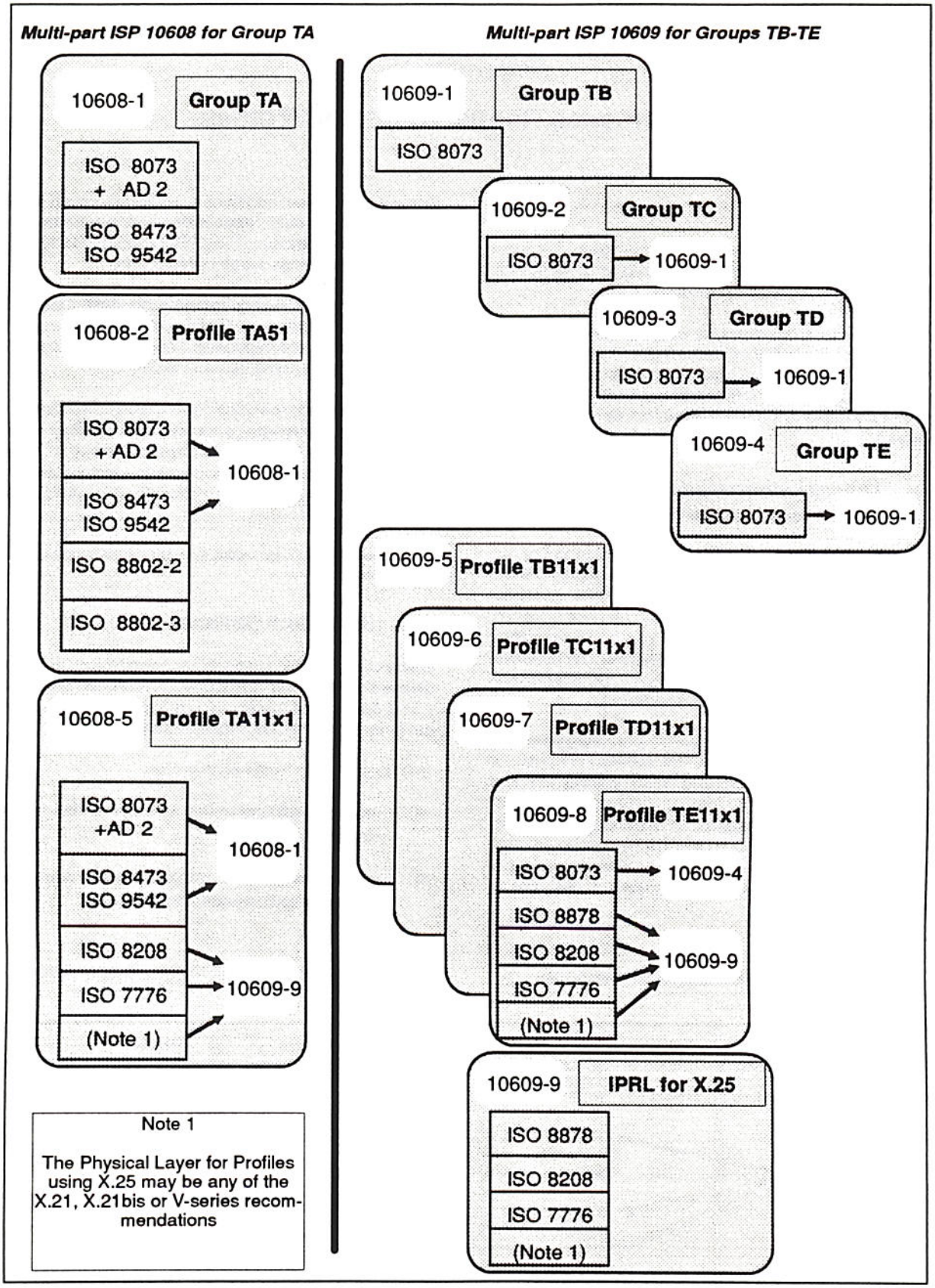


Figure B.2 - Example of Multi-part ISPs for T-Profiles

Annex C.

(informative)

Conformance Requirements of Profiles

C.1 Introduction

This annex contains guidance that expands on the material in clause 6. It is included here to give guidance to the writers of proposed draft ISPs.

This material is being used as a basis for further work to expand the applicability of ISO 9646 to cover protocol testing and guidance on protocol profile conformance statements and IPRLs. When the work on ISO 9646 is sufficiently mature, the requirement for this annex will be reviewed.

C.2 General categorization of conformance requirements

ISO 9646 identifies four categories of conformance requirements for base standards (i.e. Mandatory, Conditional, Optional and Not Applicable) and gives guidance on the way that a base standard's requirements on an implementation's static capabilities can be represented using these categories in PICS proformas. The dynamic requirements of a base standard are not specifically identified in the associated PICS proforma.

The list of categories used in a PICS is extensible and ISO/IEC JTC 1/SC21/WG1 is maintaining a register of labels. This should be consulted when drafting IPRLs to obtain the current list of categories. One example of such extensibility is the category "x" meaning "excluded" which is already in use in some PICS Proforma developments; this is relevant to Profile conformance, and is therefore included in relevant clauses of this part of ISO/IEC/TR 10000.

Profiles can place additional requirements on an implementation's static capabilities, and requirements on its dynamic behaviour. The IPRL should clearly distinguish between these types of requirement.

When modifying the requirements on static capabilities of a base standard, a Profile should not in general exclude a permitted capability. Thus, the PICS proforma status changes should be as in table C.1.

A base standard specifies the dynamic behaviour requirements. These are generally not explicitly reflected in the PICS proforma of the base standard. A Profile's additional requirements on dynamic behaviour, if any, are reflected in the IPRL and modifications are possible as in table C.2

Note: See clause C.4 for a detailed consideration of Conditional requirements

C.3 Selectable Options

Some base standards specify constraints on the choices allowed within a set of options. A common example of this is the idea of "selectable options": at least one of a set of options shall be implemented.

In this case, the Profile shall either

a) make at least one of the options mandatory for the Profile; or

b) specify that at least two of the items forma set of selectable optione within the Profile; or

Table C.1 - Static Profile Requirements

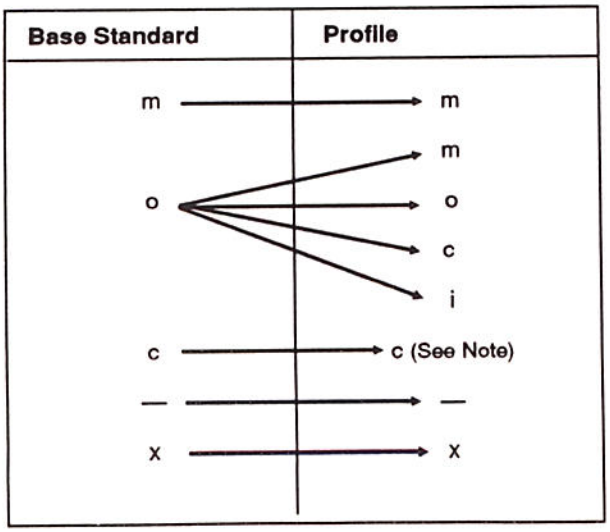
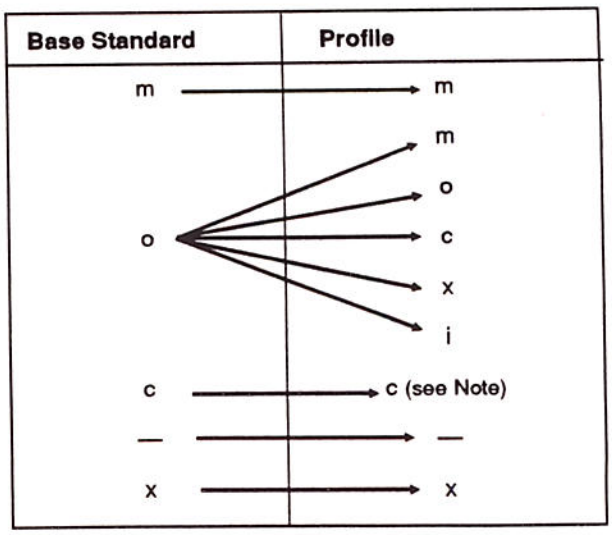


Table C.2 - Dynamic Profile Requirements



c) both (a) and (b)

The remainder of the options in the original set can be changed in the Profile as if they were ordinary options in the base standard.

The effect on the Profile of other kinds of constraints on choices allowed within a set of options in the base standard (e.g. mutually exclusive options) can be worked out in a similar way.

C.4 Conditional Requirements

Any conformance requirement in a base standard or Profile may be made conditional upon some predicate. In such cases, it is necessary to specify both the requirement that applies if the predicate evaluates to True, and the requirement that applies if it evaluates to False. For example, "if True then mandatory" could be accompanied by "if False then not applicable".

If a base standard includes a conditional requirement, then the Profile shall use the same predicate, but it may be possible partially or fully to evaluate it, given the conditions that are known to apply in the Profile. If such a predicate is fully evaluated in a Profile (to True or False) then the requirement becomes unconditional and may be transformed by the Profile according to the general rules given above.

For example, if the base standard contains:

if P then A else B

(where P represents the predicate to be evaluated, and A and B each represent a category m, o, x, - or i) and P evaluates to True in the Profile, then the Profile may treat it as if the base standard requirement were simply:

A.

On the other hand, if a base standard requirement is optional, then because the Profile has a choice of which category to transform it to, the Profile is permitted to make it into a conditional requirement:

if P then A else B

provided that both A and B are in accordance with the general rules (i.e. m, o, x, - or i)

C.5 Guidance on notation in IPRLs

Consideration of the representation of dynamic requirements in PICS proformas confirms that PICS proformas in base standards are primarily concerned with static conformance requirements - what capabiliites have to be or are allowed to be implemented in a conforming system.

Profiles are more concerned with the use of implemented capabilities in order to meet requirements for interworking.

It is recommended that a clear separation of these requirements be made, either by using two "status" and two "supported" columns for those questions that need them, or by using a specialized notation to express the compound requirements in a way that does not conflict with the common notation normally used for simple static requirements. For example, given the following three notional requirements,

- optional to be implemented, optional to be used if implemented;
- mandatory to be implemented, optional to be used;
- optional to be implemented, prohibited to be used;

a two character notation arranged in four or two columns could be employed, as illustrated in table C.3 below:

Table C.3 - Dynamic Profile Requirements

	Status Static	Support	Status Dynamic	Use
a)	o	y	o	n
b)	m	y	o	y
c)	o	y	x	-

	Status	Support
a)	oo	yn
b)	mo	yy
c)	ox	y-

Such a two character notation can make a clear distinction between the two types of requirement while maintaining as far as possible commonality of notation with other PICS proformas.

The exact meaning of the dynamic requirements in all relevant cases should be explicitly defined in each PICS proforma, for instance: to be used as the preferred option in the role of sender, to be handled as an error in the role of receiver, etc. In that way, the general notation (m, o, x, c, -, i) chould be given a more specific meaning for each protocol standard.

NOTE - The two character notation is currently in use in a number of ISPs, in particular those for Tx-profiles. However, ISO/IEC JTC1/SC21/WG1 has expressed reservations, and it is expected that the valid circumstances for its use will be clarified in future parts of ISO/IEC 9646.

Annex D.

(informative)

Bibliography of Referenced (Non-normative) International Standards and CCITT Recommendations

D.1 Introduction

This annex identifies those International Standards and CCITT Recommendations referenced in examples in this part of ISO/IEC/TR 10000.

D.2 List of referenced International Standards

ISO 7776:1986, *Information processing systems - Data communications - High-level data link control procedures - Description of the X.25 LAPB-compatible DTE data link procedures.*

ISO/IEC 8073:1988, *Information processing systems - Open Systems Interconnection - Connection oriented transport protocol specification.*

ISO/IEC 8073 Add.2:1989, *Information processing systems - Open Systems Interconnection - Connection oriented transport protocol specification - Addendum 2: Class 4 operation over connectionless network service.*

ISO 8208:1987, *Information processing systems - Data communications - X.25 Packet Level Protocol for Data Terminal Equipment.*

ISO 8473:1988, *Information processing systems - Data communications - Protocol for providing the connectionless-mode network service.*

~~ISO 8613: 1989, *Information processing - Text and office systems - Office Document Architecture (ODA) and interchange format.*~~

ISO 8802-2:1987, *Information processing systems - Local Area Networks - Logical Link Control.*

ISO 8802-3:1988, *Information processing systems - Data communications - Local Area Networks - Carrier Sense, Multiple Access with Collision Detection (CSMA/CD) access method and physical layer specifications.*

ISO 8878:1987, *Information processing systems - Data communications - Use of X.25 to provide the OSI Connection-mode network service.*

ISO 9542:1988, *Information processing systems - Telecommunications and information exchange between systems - End system to Intermediate system routeing exchange protocol for use in conjunction with the Protocol for providing the connectionless-mode network service (ISO 8473).*

D.3 List of referenced International Standardized Profiles

ISP10608[1)] *.....Information technology - International Standardized Profile TAnnn - Connection-mode transport service over connectionless network service.*

ISP10609 [1)] *.....Information technology - International Standardized Profile TBnnn, TCnnn, TDnnn, TEnnn - Connection-mode transport service over connection-mode network service.*

D.4 List of referenced CCITT Recommendations

CCITT X.21:1988 *Interface between Data Terminal Equipment and Data Circuit-terminating Equipment for synchronous operation on Public Data Networks.*

CCITT X.21bis:1988 *Use on Public Data Networks of Data Terminal Equipment which is designed for interfacing to synchronous V-series modems.*

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1) To be published.