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PROJECT

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STATUS: Second draft of a Technical Report, submitted for ballot as a Proposed Draft Technical Report Type 3, in accordance with resolution 2 of the Functional Standardization Taxonomy Group, Ottawa, November 1987.

This Taxonomy Framework and Directory of Profiles has been produced in response to Resolution 6 of the Special Group on Functional Standardization, Eindhoven, March 1987.

The first draft (TC 97/FSTG N 11 and N 12) was produced following the Washington meeting of the Taxonomy Group (June 1987). It was circulated in October/November 1987 for comments among various parties that in the opinion of SGFS might be interested in the work done on functional standardization in the OSI-field (Open Systems Interconnection). This second draft was created by amendment of TC 97/FSTG N 11 and N 12, according to comments received and editing instructions in Resolution 1 of the Taxonomy Group meeting, Ottawa, November 1987.

The report consists of two main components:
- the body of the report and all annexes, apart from Annex A, constitutes a description of the Framework for the Taxonomy of International Standardized Profiles;
- Annex A constitutes a Directory of the contents of that Taxonomy, in terms of Profile identifiers, and their actual or proposed embodiment in documentation as ISPs.

Concerning the role and contents of ISPs (International Standardized Profiles) we refer to resolution 17 of the ISO Council (document ISO Council 87, dated 1987-09-24), stating

Council,

noting the willingness of the OSI user groups to help ISO/IEC IT committees in planning and prioritizing their work programmes and to establish testing and validation systems, and being of the opinion that the most efficient communication possible should exist at the technical committee level between all interested parties,

decides to establish a new type of publication called "International Standardized Profile", with the status of an International Standard, under the following provisions:

- proposals for International Standardized Profiles may be put forward by any member body, or through a planning operation of JTC 1 acting cooperatively with OSI user groups and entrusted with the preparation of internationally harmonized proposals for draft international standardized profiles;

- the timing for the completion of ISO processing, member body approval, and publication is targeted at seven to ten months (shortening the six-month DIS letter ballot to three months, and including review by the planning group);

- a taxonomy group will maintain a classified catalogue of proposals for International Standardized Profiles, to be published as an ISO technical report. The taxonomy group will comprise experts from member bodies, originating organizations (OSI user groups) and liaison organizations (e.g. CCITT); and

invites the Secretary-General in consultation with relevant member bodies to establish a special type of liaison with the OSI user groups for the planning and coordination of International Standardized Profiles.

The ballot as a PDTR is on the complete document. However, comment from member bodies and liaison organizations is requested on the two components separately. This reflects the decision of the Special Group that the Directory in Annex A will be subject to regular review and update by the Special Group and its Taxonomy Group, while the Technical Report itself will be subject to amendment and ballot through normal procedures.

In reviewing these documents, and especially the Directory, member bodies and liaison organizations are requested to consider the attached memorandum from the Taxonomy Group.

MEMORANDUM

1. Introduction

In its discussion of the taxonomy of Transport Profiles, the Functional Standardization Taxonomy Group has paid particular attention to the substructure of Group B, which covers the provision of the connection-mode Transport service over the connection-mode Network service (Sections 2.3.1.2 and 3.1 of Annex A).

Ideally, Group B would specify just one selection from the menu of Tranport protocol classes. Considering that the goal of harmonization in this area is interoperability among the largest possibly community of systems, the Taxonomy Group attempted to reach agreement on a selection containing all three of the classes for which requirements had been expressed - 0, 2 and 4. However, consensus on this approach could not be reached. The Taxonomy Group therefore developed, and proposes to member bodies and liaison organizations for evaluation and comment, an alternative that involves the division of Group B into a number of related "subgroups", as described below.

2. Subdivision of Group B

The PDTR distinguishes three subgroups within Group B, which differ only in the specification of Transport protocol class:

Subgroup Identifier (See Note 1)	Mandatory Transport Protocol classes	Recognized optional Protocol classes (See Note 2)
BA *	0 + 2 + 4	- none -
BB	0 + 2	4
BC	2	4
BM (MHS Only)	0	

* Subgroup BA provides the broadest basis for interoperability, and will interwork with the other two subgroups. BA is therefore recognized and identified as the universal interworking subgroup for COTS over CONS.

Notes:

1. The Taxonomy Group believes that it is useful, at this stage, to refer to these subdivisions as "subgroups" of a single Group B, so as to emphasise the fact that they are closely related. The nature of a "Group", however, demands that each of these subdivisions eventually (after final agreements concerning their identity and configuration) be entered into the Directory as a distinct, separate group. The precise labelling technique has not been determined, either for the subgroups of Group B, or for the potential MHS group.

2. "Recognized" optional transport classes refers to those classes which Taxonomy Group representatives consider are significant requirements. The fact that the groupings include just classes 0, 2 and 4 has two implications:

   a) No requirements have been put forward for Transport classes 1 and 3, and thus these classes do not appear in any of the T-profiles.

   b) Although conformance testing for ISPs lies outside the scope of the Taxonomy Group, an important consequence for Transport layer conformance activity is worth noting. A body offering Transport layer conformance tests in the context of ISPs would need to be able to offer tests in classes 0, 2 and 4. An internationally harmo-

nized approach to the development of test suites in these classes is thus a prerequisite to the realization of effective ISP conformance testing.

3. Request for Member Body and Liaison Organization Comment

Member bodies and liaison organizations are asked to respond to this proposal by commenting on its acceptability in the context of the "Directory of Profiles and ISPs". The issue of Transport class selection has been debated within the OSI community for many years. The Taxonomy Group has taken careful account of this debate in developing the current proposal, which represents a compromise amomg competing interests. Given the difficulty of achieving agreement on this issue, member bodies and liaison organizations are asked to focus their comments on the proposal as it is presented above, recognizing that a large number of potential alternatives have already been proposed and discussed at length.

In addition to indicating their view as to the acceptability of the proposed Group B subdivision, member bodies and liaison organizations are asked to answer the following specific questions:

1. Could subgroup BC be removed from the list (leaving only BA and BB)?

2. Should there be a subgroup containing only class 0? If so, should it be a distinct subgroup within the Group B family, or part of a separate MHS-specific Profile?

3. Subgroups BB and BC identify recognized optional classes. How should this recognition be expressed in the directory?

CONTENTS

Annexes

A Directory of Profiles and ISPs
B ISO/IEC Rules adapted for ISPs
C Example of Multi-part ISP structure for a Group
D Additional Details

Foreword

This Technical Report is produced by the Special Group on Functional Standardization of ISO/IEC JTC 1. This Group includes ISO/IEC Member Bodies and a new category of S-liaison organizations. The S-liaison organizations are designated OSI User Groups who are concerned with the process of Functional Standardization, and have contributed to the production of this TechnicalReport. These are:

Corporation for Open Systems (COS)
MAP/TOP Worldwide Federation
OSITOP
Conference for Promoting OSI (POSI)
Standards Promotion and Application Group (SPAG)

Introduction

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

- Base Standards, defining fundamentals and generalized procedures and providing an infrastructure that can be used by a variety of applications. They provide a number of options to accomodate all of the applications.

- Profiles, defining combinations of base standards to provide specific functions. They standardize the use of particular options available in the base standards, and provide a basis for the development of uniform, internationally recognized, system tests.

- Registration Mechanisms, providing the means to specify detailed parameterization within the framework of the base standards.

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

1 Scope

This Technical Report defines the concept of Profiles, as documented in International Standardized Profiles, and gives guidance to Organizations making proposals for Draft International Standardized Profiles, on the nature and content of the documents they are producing.

The body of this Technical Report outlines concepts of Profiles, and the general Taxonomy (or Classification Scheme). Annex A is a detailed Directory of the contents of the Taxonomy, and provides outline definitions of the International Standardized Profiles that can exist within it. It distinguishes between approved, proposed and potential Profiles, and gives estimated timescales for their submission as Proposed Draft ISPs, where available. Other Annexes give guidance on the format and content of ISPs as required by JTC 1.

This Technical Report is applicable to Profiles in the area of competence of 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 expected to be used in conjunction with them.

However, it is recognized that the scope of the Taxonomy must ultimately be wider than that. Examples of other areas to which the concept and usage of Profiles may eventually be extended are:

- interchange formats defined for particular application areas (e.g. trade data interchange formats in TC 154);
- protocols used in particular application areas (e.g. banking protocolsin TC 68, industrial automation protocols in TC 184), which may specify particular uses of the more generic Profiles included in this version of the Taxonomy;
- the representation of information or objects on storage media, as opposed to the current limitation to use within communications protocols;
- logical and physical storage structures.

2 References

The following documents are referenced within this Technical Report, and provide additional background information.

2.1 Documents from ISO

ISO 7498 Information Processing Systems - Open Systems Interconnection - Basic Reference Model

ISO 9646-1 OSI Conformance Testing Methodology and Framework - Part 1: General Concepts

ISO 9646-2 OSI Conformance Testing Methodology and Framework - Part 2: Abstract Test Suite Specification

ISO: Rules for the drafting and presentation of International Standards
(ISBN 92-67-01042-5 First Edition 1986)

3 Definitions

3.1 Terms defined in this Technical Report

3.1.1 **Profile**: The statement of a function and the environment within which it is used, in terms of a set of one or more standards, and, where applicable, identification of the chosen classes, subsets, options and parameters of thosestandards.

3.1.2 **International Standardized Profile**: A document published by ISO/IEC defining one or more Profiles, which has been subject to a process of international harmonization.

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

NOTE - The abbreviation for this term is ISPICS, not PICS. This is to distinguish it from the abbreviation for Protocol Implementation Conformance Statement defined in ISO 9646-1. (It does not stand for "ISP Implementation Conformance Statement"; implementations conform to a Profile as defined in an ISP, not to the ISP itself).

3.1.4 **Group**: A set of profiles that are compatible, in the sense that a system implementing one Profile from a Group can interoperate, 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 **Common Textual Component**: A section of an ISP which is known to be (actually or potentially) common to the definition of more than one Profile.

3.1.6 **Base Standard**: A published International Standard or CCITT Recommendation which is referenced within an ISP.

3.2 Terms defined in ISO 9646-1

This Technical Report uses the following terms defined in ISO 9646-1:

a) Conformance testing
b) Conforming implementation
c) Dynamic conformance requirements
d) PICS proforma
e) Protocol Implementation Conformance Statement (PICS)
f) Static conformance requirements

4 Abbreviations

CTC	Common Textual Component
ISP	International Standardized Profile
ISPICS	Profile Implementation Conformance Statement
PDISP	Proposed Draft ISP
PICS	Protocol Implementation Conformance Statement
A-Profile	Application Profile
F-Profile	Interchange Format Profile
T-Profile	Transport Profile

5 Purpose of Profiles

Profiles define combinations of standards for the purpose of:

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

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

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

- promoting uniformity in the development of 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 as identified by the above objectives. There are various names given to their work (such as Profiles, Functional Standards, Implementation Agreements, Specifications) and various approaches to the scope of the profiles and to the style in which they are documented. This Taxonomy of International Standardized Profiles is being developed by ISO/IEC JTC 1 in order to create a common classification scheme, and documentation scope and style, into which the work of regional Functional Standardization bodies can be submitted.

It is not sufficient, however, just to create a framework of this sort, and to accept into it any Profiles from such contributors. Interoperability, and product development and procurement, need to be seen on a global, and not just on a regional or sectional scale. The role of JTC 1 is therefore to create the climate for the production of Harmonized Profiles, where agreement is reached in the contributory bodies before proposals reach JTC 1.

One of the most important roles for an International Standardized Profile is to serve as the basis for the development (by organizations other than ISO/IEC) of internationally recognized tests and test centres. 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 tests based on ISPs is crucial to the successful realization of this goal.

NOTE - The remainder of this Technical Report is currently concerned primarily with the concepts and structures of Profiles as they apply to Open Systems Interconnection. This means:

- Profiles for the use of protocol standards for systems interoperability, which correspond to the seven layers of the Basic Reference Model for OSI (ISO 7498);

- 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.

However, it is intended that the scope of Functional Standardization should not be limited to the field of OSI, and it is expected that much of the material in this Technical Report will be relevant to other fields, especially those indicated in Clause 1.

6 Concept of a Profile for OSI

In considering the concept of a Profile, as related to its purpose as defined in clause 5, it is necessary to consider it in an abstract sense, divorced from practical considerations of the structure and style of the documentation which will be used when it is published as an ISP. But the ways in which Profiles will be used, in order to fulfil the defined purposes, require that there exists an identifiable concept of an individual Profile, related to its place in the Taxonomy. Clauses 6 and 7 therefore concentrate on defining the concept and taxonomy of the Profiles, independently of the way they are documented in ISPs. Clause 8 shows how the actual documentation scheme proposed is not necessarily one separate document (ISP) for each Profile definition.

In the Introduction to this Technical Report, it is stated that 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 sub-clauses, some of which specify requirements that must be satisfied by Profiles defined in ISPs.

6.1 The relationship to base standards

Base standards specify single layer or multilayer procedures and formats that allow communication between systems. They provide options, anticipating the needs of a variety of applications and taking into account different capabilities of real networks.

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

Profiles shall not modify base standards but shall only make specific choices where options and ranges of values are available. As few as possible of these base standard options shall remain as options of a Profile, and interoperability shall be preserved between systems implementing different selections of such options.

If the development of a Profile leads to the identification of a need for requirements not currently in the base standards, it is necessary to submit defect reports and to liaise with the relevant subcommittee in order to correct the deficiency. Regional or sectional bodies may in these circumstances make use of interim, or preliminary-draft versions of Profiles in their own controlled environment, which precede the completion and stabilization of base standards. But ISPs shall only be approved where no recourse to such measures is required.

6.2 The relationship to Registration Authorities

Profiles may need to make reference to objects such as abstract syntaxes, document types, VTE-profiles and control objects, etc, which consist of lists of parameters and their values. The specifications of such objects are intended to be maintained by Registration Authorities under agreed registration mechanisms. Profiles shall reference these objects by their registered identifiers where they exist, and shall not attempt to list individual parameters.

Where registration mechanisms are not yet set up, objects of this kind shall in the meantime be maintained in an informative annex to either the base standard or the ISP which defines the Profile.

Where a Profile corresponds to an object type which is capable of being registered, then the Profile identifier should be so registered. The ability to use one Profile in conjunction with another (for example, an F-profile in conjunction with an A-profile) may depend on the registered identifier of the Profile being known. The process of gaining approval for an ISP confers a higher degree of international acceptability on the object than that given by simple registration.

6.3 General principles of Profile content

A Profile specifies the application of one or more OSI standards in support of a specific requirement for communication between computer systems.

A Profile does not specify requirements that would cause non-conformance to the standards to which it refers, but it makes explicit the relationships among a set of standards used together (relationships which are implicit in the definitions of the standards themselves), and may also specify particular details of each standard being used.

It follows that a Profile:

a) does not require any departure from the structure defined by the Basic Reference Model for OSI;

b) does not define the total OSI functionality of a system, but only that part relevant to the function being defined;

c) leaves open as few as possible of the options in the base standards to which it refers, in order to maximise the probability that implementations of the Profile can interoperate;

d) contains conformance requirements which may be more specific and limited in scope than those of the base standard(s) 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 capabilities and 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.

6.4 Definition of a Profile

The definition of a Profile therefore comprises the following elements :

a) a simple definition of the scope of the function for which the Profile is defined;

b) an illustration of the scenario within which the function is applicable; where a Profile is a member of a Group (clause 7.3.3), the scenario includes reference to the possibilities for interoperation that this provides;

c) a single working set of standards, including precise references to the actual texts of the standards being used, and to any other relevant source documents;

d) specifications of the application of each referenced 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;

e) a statement defining the requirements to be observed by systems claiming conformance, including any remaining permitted options of the referenced 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 options of the Profile.

6.5 The meaning of conformance to Profiles for OSI

Conformance in the context of OSI is concerned only with the conformance of implementations and real systems to those OSI standards which specify applicable requirements. Such standards include protocol standards (both single- layer and multi-layer) and transfer syntax standards. OSI Service Definition standards, however, specify no conformance requirements, while transfer syntax standards specify dynamic but not static conformance requirements.

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.

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

The relationship to base standards implies that profiles are mostly concerned with static conformance, dynamic conformance being mostly defined by the base standards.

The conformance requirements in each Profile shall specify the minimum capabilities required by a system for it to conform to that Profile. Users and suppliers must be left the freedom to specify additional capabilities of such a system, provided that these capabilities do not violate the conformance requirements of either the Profile or the base standards to which it refers.

A Profile shall be defined in such a way that testing of an implementation of it can be effectively carried out. This includes the testing of any options of the Profile which are claimed to be included in the implementation.

6.6 The structure of Profiles with respect to conformance requirements

A Profile shall address the following three topics:

- static conformance requirements (details as given in 6.7);
- dynamic conformance requirements (details as given in 6.8);
- the preparation of a Profile Implementation Conformance Statement (ISPICS), using an ISPICS Proforma (details as given in 8.4)

6.7 Static conformance

6.7.1 General

The choices of OSI protocol options made in a Profile's static conformance requirements define a pathway through the layers of the Reference Model, and it is these choices which are specific to a Profile and provide added value to the base standards.

They are not, therefore, arbitrary but need to be consistent with the purpose of the Profile and consistent across all layers referenced by it.

In order to avoid ambiguity between the Profiles and the base standards, the static conformance requirements shall be specified in full in the ISP.

The selection of permitted options in a Profile shall be given in the form of static conformance requirements. These relate to the static conformance requirements in the base standards in the following ways, as described in ISO 9646-2:

a) Mandatory requirements: these are mandatory in the base standards and shall be observed in all cases.

b) Conditional requirements: these shall be observed when the conditions set out in the relevant base standard apply.

   NOTE - Negotiable requirements are also described in ISO 9646-2, but no difference from optionally supported requirements can be seen in the context of Profile definitions.

c) Supported requirements: these are options in the base standards, but the Profile makes them mandatory.

d) Optionally supported requirements: these are options in the base standard which remain optional in the Profile; they may be selected to suit the implementation so long as any requirements on which the options depend or which depend on the option are observed. It is left to each implementation whether to support them or not, and no implementation should expect that other implementations will support them.

e) Excluded requirements: these are options in the base standards that the Profile clearly states shall not be supported.

f) Not applicable requirements: these are options in the base standards that the Profile categorizes as being not pertinent to its scope.

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

NOTE - Where options in the base standard are declared to be "excluded" or "not applicable" in a Profile, it is possible that an implementing system supports them in the context of some other Profile. This has no effect on the completion of the ISPICS, which is defined to relate to the implementation of the Profile, and not to the implementation of the whole referenced Base Standard.

6.7.2 Structure

The 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 protocol 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 6.7.1).

See clause 8, and especially Figure 2, for the way in which these requirements are reflected in the ISPICS Proforma. 6.7.3 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.

6.8 Dynamic conformance

Given the implementation choices made in the Profile 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.

7 The Taxonomy of International Standardized Profiles for OSI

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 OSI and related subjects. There is therefore a prima facie case for identifying classes of Profiles which correspond to these main areas of expertise. It also is the case that the sub-committee structure of JTC 1 provides some clear pointers to the positions within the Basic Reference Model for OSI where the boundaries between these classes should be made, conceptual boundaries which often coincide with real boundaries within implementations of real systems.

Having defined such classes and primary subclasses, 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 secondary 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. Annex A provides the detail of this system; only the main principles and primary classifications are outlined in this Clause.

7.2 Main elements of the Taxonomy of 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 divided into the following classes:

T - Transport, relating to subnetwork type

A - Application support

F - Interchange format and information characteristics.

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

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 of inability for users 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.
Each Profile is identified by a character string commencing with one of the above letters, and continuing with as many further letters or digits as are necessary to reflect its position within the hierarchic structure of the class.

- **T-Profiles** specify how the OSI Transport Service is provided over specific subnetwork types, such as CSMA/CD LANs, other LANs, PSDNs, etc. In this way they isolate the A-profiles and F-profiles from network technology.

- **A-Profiles** specify communications protocol support for particular application types over the OSI Transport Service.

- **F-Profiles** specify the characteristics and representation of various types of information.

The objective of A- and F-profiles is to specify, in combination, particular realisations of services which support interworking between applications in end systems.

7.3 Relationships between Profiles

The following subclauses describe three important types of relationship between Profiles, under the headings: boundaries, bindings, and groups. The schematic illustration in Figure 1 brings together examples of these relationships.

7.3.1 A/T Boundaries

Actual use of an A-profile requires that a system operate it in combination with a T-profile, in order to provide a particular mode of an application protocol over a particular subnetwork type. The separation of A-profiles and T-profiles, as detailed in 7.2, is represented by an A/T 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/T-Profiles, one from each of the two classes.

The A/T boundaries correspond to the OSI Transport Service. The possibility of making the combination arises from the fact that a T-profile is specified to provide the OSI Transport Service and an A-profile is specified to use the OSI Transport Service. Figure 1 shows two A/T boundaries. These correspond to the two modes of Transport Service, namely connection-mode and connectionless-mode (CO and CL). A-profiles and T-profiles shall contain a statement as to which mode of Transport Service they use or provide, and this characteristic may be represented in the Profile identifier structure.

NOTE - Current practice is to represent the mode of Transport Service in the Group element of the identifiers of T-profiles, but not in the identifiers of A-profiles.

7.3.2 F/A Bindings

The Application Layer base standards include, implicitly or explicitly, the requirement to specify the structure of data carried or referenced in an instance of communication using them. The binding between an A-profile and one or more F-profiles specifies the set of F-profiles which may be referenced in the use of that A-profile to describe the structure of the data carried or referenced. This relationship is also illustrated vertically in Figure 1. The location of one or more F-profiles above one or more A-profiles, separated by a common F/A Binding, represents the possibility of combining any pair of F/A-Profiles, one from each of the two classes. Each separate F/A

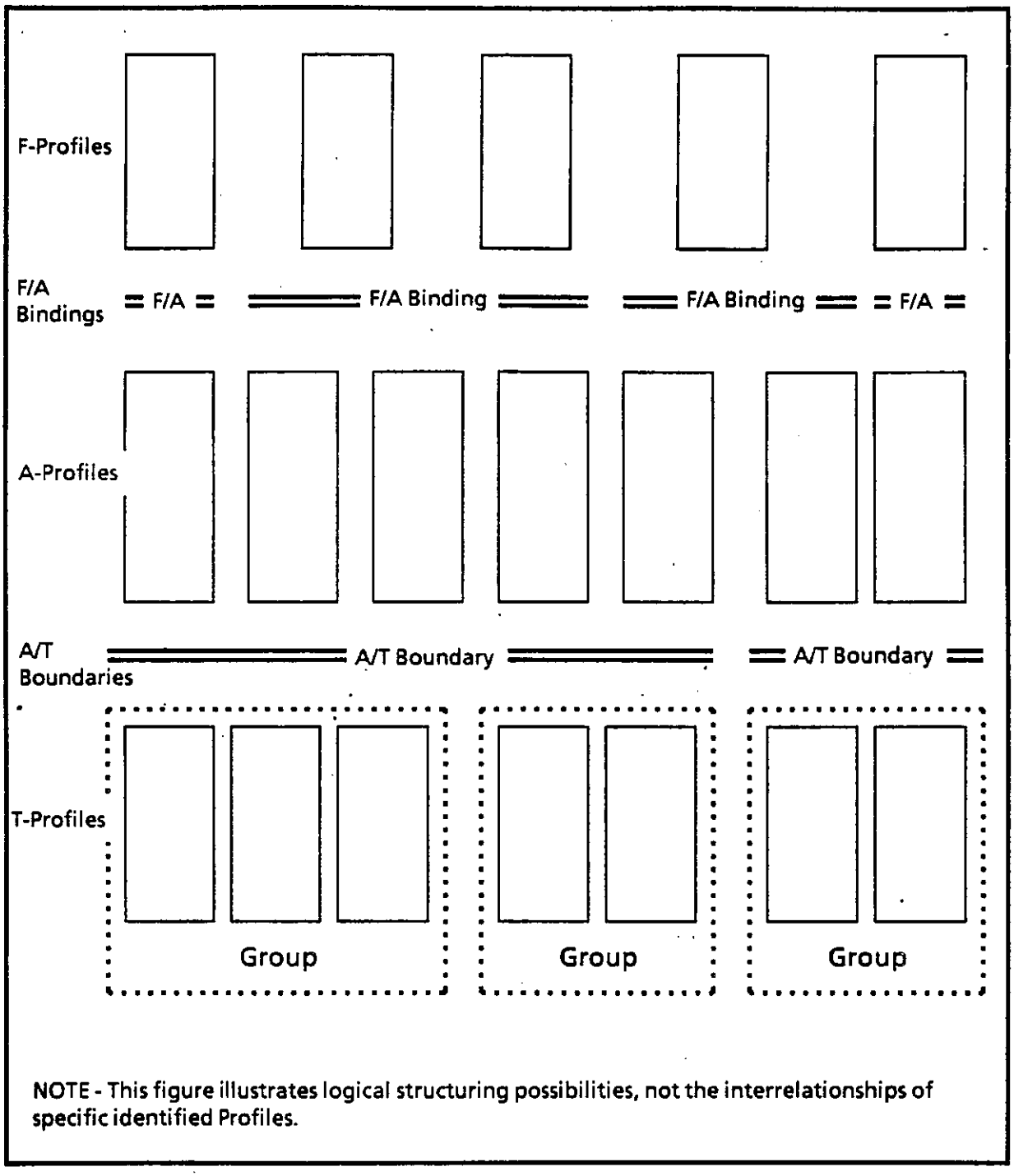


Figure 1. Examples of Relationships between Profiles in the Taxonomy

Binding represents some different method of specifying and achieving the possible combinations.

The possibilities for bindings between A-profiles and F-profiles depend upon the use of the Presentation Layer facilities by the Application Layer base standards. Where these base standards make provision for the specification of Presentation Contexts for user data, then any format of data can be used, subject to registration of a (public or private) definition of the format. Hence, in such cases, there need be no constraints on the F-profiles which may be called up by a given A-

profile. Where the base standards themselves specify the Presentation Context, then the choice of F-profile is constrained as a result, and may be further constrained by any related A-profile.

It follows that there are two possible levels of binding between A-profiles andF-profiles:

a) The bindings may already be specified by the base standards, but may befurther constrained by the A-profile;

b) The bindings are not constrained by either the base standard or the A-profile.

When combinations of profiles are selected by a user to achieve a specific interworking function, then the number of F-profiles usable in combination with a given A-profile may be further constrained according to his choice.

7.3.3 Groups

A Group is a set of T-profiles that are compatible in the sense that a system implementing one Profile from a Group can interoperate, 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. (Clearly an incompatible choice of A-profiles could make interoperation impossible even if the T-profiles are compatible, or even identical). Interoperation "according to OSI" means end-to-end operation across a single subnetwork, or across multiple subnetworks linked by means of Network (or lower) Layer relays.

An example of a Group is the set of T-profiles that provide the Connection-mode Transport Service, using Class 4 Transport Protocol over the Connectionless-mode Network Service, provided by ISO 8473. This Group has members that correspond to different network technologies (CSMA/CD and other LANs, WANs) but interoperability between systems conforming to them is made possible by LAN bridges and/or Network Layer relays. A different Group, incompatible with that one, is one whose Profiles use the Connection-mode Network Service provided by ISO 8208. Three sample T-profile Groups are shown in Figure 1, but the actual T-profile taxonomy is given in Annex A. The inter-relationship of the definitions of Profiles within a Group, including any Relay profiles, is described in 8.2.

Interoperability between systems using Profiles in different groups may be possible through non-OSI relays - e.g. Transport or Application layer relays. The interoperability that is achievable will be part of the definition of any Profile for a non-OSI relay. (See also Annex A)

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 B 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, and the use of registered names of objects, are thus essential for the production of concise ISPs. With the exception of static conformance requirements (clause 6.7) it is not necessary to reproduce the content of such referenced documents within an ISP.

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 Relationships between Profiles

Relationships between Profiles are documented in this Technical Report, in general terms in Clause 7, and in detail in Annex A, the Directory of Profiles and ISPs. This Annex shall be referenced by individual ISPs in order to define the place of the Profile(s) within the Taxonomy.

Many Profiles will be documented and published as individual ISPs. However, where close relationships exist between two or more Profiles, another possibility exists. A Multi-part ISP can be produced, on the analogy of Multi-part Standards, where each part is separately written, submitted to JTC 1, and approved. This method is particularly useful for documenting the set of T-profiles which form a Group, since the common elements of each Profile which ensure the interoperability characteristics of the Group can be written as a single Part of such a Multi-part ISP. It is also likely that some Profiles within a Group will have a similar structure, an example of which is given in Annex C.

Intra-group Relays will be defined as part of the ISP for the Group. Inter-group relays will be separate ISPs.

8.3 Structure of ISPs

The document structure for the definition of an individual Profile is as outlined in Table 1.

This structure represents the sum of the conceptual requirements given in clause 6, but without consideration of possible use of common textual components, or of its division into separate parts of a Multi-part ISP.

FOREWORD INTRODUCTION 1. SCOPE 2. REFERENCES 3. DEFINITIONS 4. ABBREVIATIONS 5. POSITION OF PROFILE WITHIN THE TAXONOMY 6 Clauses defining requirements related to each base standard (Note 2) NORMATIVE ANNEX A. PROFILE IMPLEMENTATION CONFORMANCE STATEMENT PROFORMA 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 the annotated extract from the ISO/IEC Rules for the Drafting and Presentation of International Standards, provided as Annex B. 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 Proforma.

Table 1. Outline Structure of an ISP

8.4 The Profile Implementation Conformance Statement (ISPICS) Proforma

8.4.1 The PICS Concept

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), the concept of a Protocol Implementation Conformance Statement (PICS) has been created for use in the base standards (ISO 9646, Parts 1 and 2).

A PICS (Protocol Implementation Conformance Statement) is a statement by which the supplier is required to state 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 PICS proformas will be provided in all base standards.

8.4.2 The ISPICS concept

The concept of an implementation conformance statement shall also be used for Profiles, and a Profile Implementation Conformance Statement (ISPICS) proforma 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 protocols selected and combined in the Profile;

c) for each of these protocols, a section of the ISPICS proforma, based on the PICS proforma of the referenced base standard in question, with its entries enabled, disabled, or pre-selected according to the Profile's choices (see Figure 2). An ISPICS proforma shall contain no tutorial or explanatory material.

NOTE - If no PICS proforma is available in a base standard, an interim section of the proforma should be provided in an urgently-needed ISP. As soon as a proforma is published by ISO or CCITT, the interim proforma should be replaced by the published proforma.

When filled in by the supplier of a system implementing the Profile, the ISPICS proforma 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 Proforma contents

Detailed practical advice on how to specify conformance requirements is given in ISO 9646 Parts 1 and 2. In particular, Part 2 gives requirements and guidance for writers of protocol standards, including information on how to deal with incomplete static conformance requirements in base standards.

The following list of items to be included, derived from ISO 9646-2, is as relevant to an ISPICS Proforma as to a PICS Proforma:

a) definitions of special symbols, abbreviations, special terms and appropriate references;

b) explicit instructions for completing and interpreting the ISPICS proforma;

c) clear indication of the preferred data types for responses (e.g. number bases, string types, octets, bits, seconds, minutes, etc);

d) provision for mentioning any mandatory feature that has not been implemented, with the appropriate rationale;

e) one or more tables (or other kinds of form as necessary) to be completed to state the capabilities of the implementation in detail, including:

- name of the feature, PDU type, timer, parameter, and other capabilities;

- wherever feasible, a column giving the relevant clause references to the ISP;

- a column stating whether each feature is mandatory, conditional, or optional in the base standard, and the permitted range of values, if appropriate;

- a similar column stating the choices made in the profile definition, including whether the feature is excluded or not applicable;

- a column to be filled in to state whether and with what values each feature has been implemented.

NOTE - In completing the ISPICS proforma for a particular Profile, an implementor is not making statements about the total capability of the system concerned, only about that part of it involved in supporting operation according to the Profile. Thus, features of a referenced base standard which are recorded as "excluded" or "not applicable" in the context of one Profile, may in fact be supportable by the system, but in the context of another Profile.

8.4.4 ISPICS Proforma Structure

The resulting schematic structure of an ISPICS Proforma is as illustrated in Figure 2. The precise layout of the columns for each component PICS Proforma will be derived from the referenced Base Standards, and further examples are given in ISO 9646-2 Annex C. See 6.7.1 in this Technical Report for further information about the permitted relationships between feature types in base standard PICS, and in Profile Implementation Conformance Statements.

8.5 Common Textual Components

8.5.1 Within each of the classes of the Taxonomy, there are sets of Profiles identified which have some characteristics in common. Some examples of these are as follows:

a) T-profiles which are members of a Group and specify use of the same class(es) of Transport Protocol and of the same Network Protocol, to ensure their interworking capability;

b) T-profiles which specify the same class of Logical Link Control over the same LAN technology;

c) A-profiles which specify the same use of a group of upper layer standards;

d) A-profiles which provide hierarchically ranked subsets of the same Application Layer protocol and service;

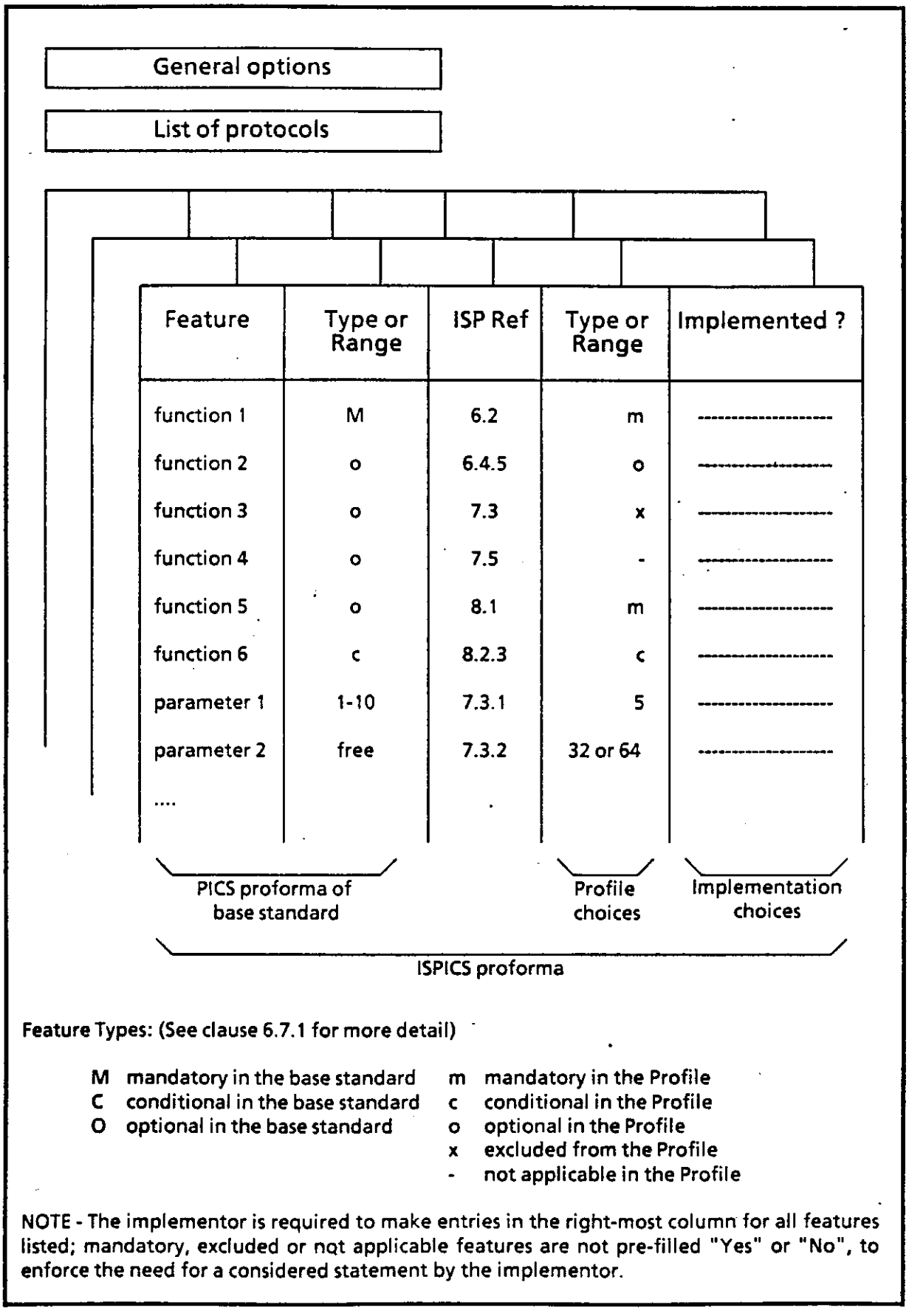
e) F-profiles which provide hierarchically ranked subsets of the same Interchange Format definition.

These examples make it clear that there needs to be a means of constructing ISPs from Commom Textual Components (CTCs), in order to avoid inadvertent differences in the definition of profiles which are intended to be identical in particular respects.

8.5.2 The benefits of a system of CTCs can be classified under a number of headings:

a) for the JTC 1 Special Group on Functional Standardization: by shortening the approval process and easing maintenance, since a CTC only needs to be examined in detail on the first occasion it is submitted.

b) for the Taxonomy Group: by ensuring that the objectives of interoperability are achieved by means of consistent definitions of Profiles within a Group;



Feature Types: (See clause 6.7.1 for more detail)

M	mandatory in the base standard	m	mandatory in the Profile
C	conditional in the base standard	c	conditional in the Profile
O	optional in the base standard	o	optional in the Profile
		x	excluded from the Profile
		-	not applicable in the Profile

NOTE - The implementor is required to make entries in the right-most column for all features listed; mandatory, excluded or not applicable features are not pre-filled "Yes" or "No", to enforce the need for a considered statement by the implementor.

Figure 2. The construction of a Profile Implementation Conformance Statement proforma.

c) for ISP originators and editors: by permitting the writing of concise specifications with fewer errors, leading to a shorter approval process and an overall reduction in cost of ISP production;

d) for Profile implementors: by ensuring the intended consistency between closely related profiles, leading to reduced implementation costs;

e) for Testing Organizations: by ensuring the intended consistency between closely related profiles, leading to reduced costs for the production of test cases.

8.5.3 To meet these objectives, a CTC is defined as a section of an ISP which is known to be (actually or potentially) common to the definition of more than one profile. This means that the first appearance of a new CTC will be as a section, sometimes a formal part, of the definition of a profile documented in an ISP. Procedures will be defined by the Special Group on Functional Standardization for establishing and promoting the use of CTCs; it is sufficient to note here that CTCs will initially be identified as a by-product of the definition of a Profile, and will then be made available for subsequent use in the context of other Profiles. A Catalogue of CTCs will be maintained as part of the Directory of Profiles and ISPs in Annex A of this Report.

8.5.4 A CTC shall consist of one or more complete clauses in order to facilitate precise description of it in the catalogue, and precise reference to it when it is reused. Use of existing CTCs in the context of a new Profile can be achieved in a number of ways, and choice of method is left to the discretion of originators of ISPs. Currently identified methods are as follows:

a) cross-reference to text in another ISP, by means of clause number(s); this aids conciseness and accuracy;

b) inclusion of text in full; this avoids potential confusion for the user of the ISP, especially for short CTCs, and where internal cross-references in an ISP are made to material within the CTC.

c) separate publication as an "auxiliary ISP"; this would be useful for major elements of an ISP which could be of relevance to developers or users of profiles outside the current scope of JTC 1 as specified for this Technical Report.

NOTE - The need for this third method, and the mechanisms required to control its use, are for further study.

8.5.5 Additional points of clarification on identification and use of CTCs are as follows:

a) Where a CTC is used, it shall be without any change to the wording or semantics. If text is included in full, then section numbering may be adapted to suit its new location.

b) Where a CTC defines explicit options, exactly the same options shall occur in its new location.

c) A CTC should normally be defined and used only where it covers a significant proportion of a Profile definition, preferably covering the use of more than one base standard (e.g. several OSI layer protocols).

d) Nesting of CTCs (i.e. referring to one CTC from within the text of another) is possible, but is not recommended, especially where inclusion is by cross reference.

8.5.6 Illustration of CTCs in relation to the Taxonomy of Profiles in Figure 1, the logical relationships between Profiles are illustrated in terms of Boundaries, Bindings, and Groups. Figure 3 adds to that illustration examples of CTCs which represent common elements of

those Profiles.

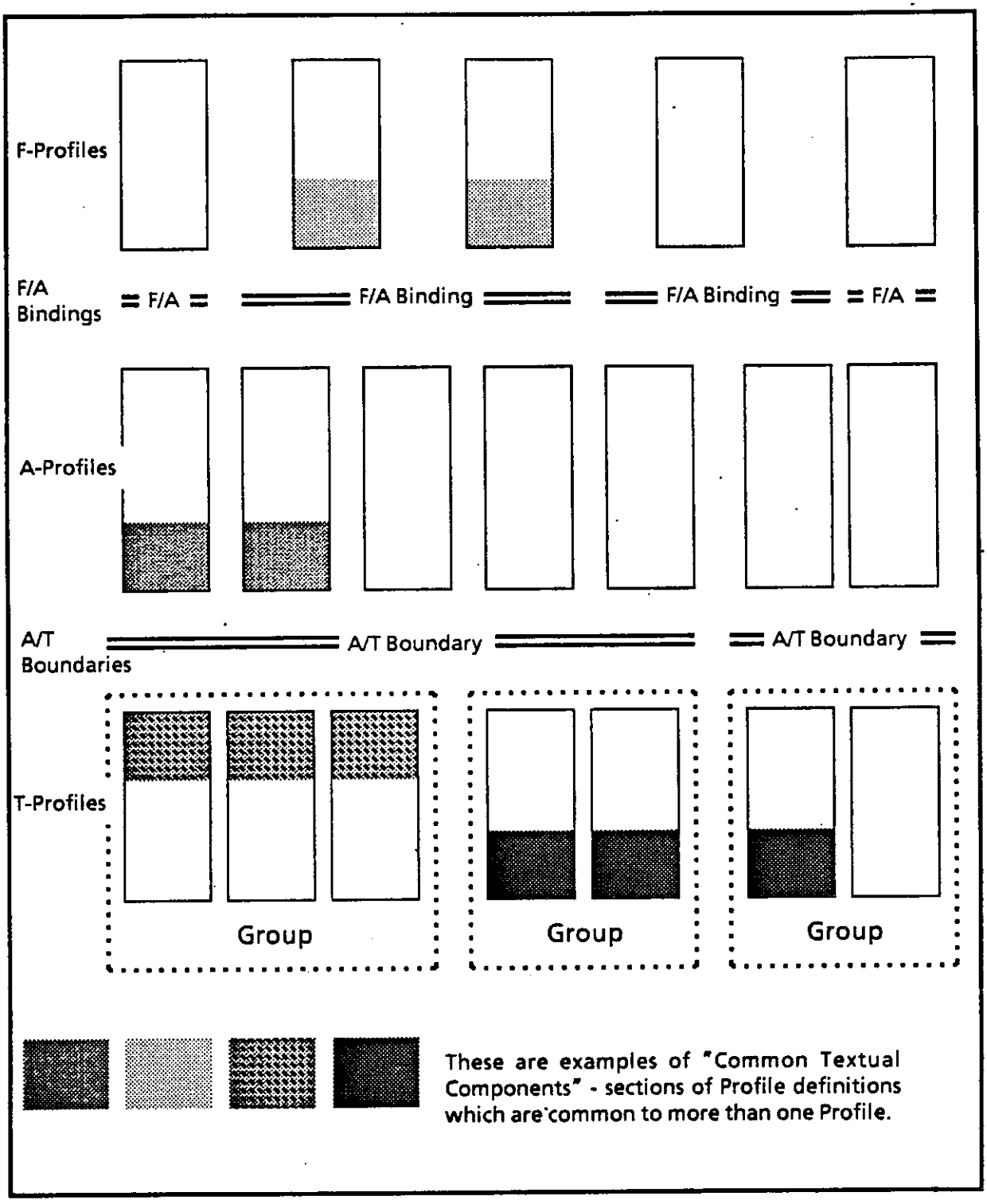


Figure 3. Example of CTCs in relation to the Profile Taxonomy

NOTE - A worked example of CTCs in the context of Groups of T-Profiles is given in Annex C.

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ISO/IEC JTC 1/SG-FS
Title: ISO/IEC JTC 1 Special Group on Functional Standardization

Secretariat: NNI (Netherlands)

TITLE: Information Processing Systems - International Standardized Profiles - Taxonomy Framework
Annex A: Directory of Profiles and ISPs

SOURCE: Editor-Directory: ISO/IEC JTC 1 Special Group on Functional Standardization, Working Group on Taxonomy

PROJECT

STATUS: Second Draft Annex to draft TR yyy which is currently presented as document SG-FS N 27: Both documents are submitted for ballot in accordance with resolution 2 of the Functional Standardization Taxonomy Group, Ottawa, November 12th, 1987

This draft Annex A was created by amendment of ISO/TC 97/FSTG N 12 according to resolution 1 of the same meeting.

This draft Annex A is currently published as a separate document, but will later be included into the Technical Report.

Editor's temporary comments are included in italics.

CONTENTS

1 Scope

The purpose of the 'Directory of Profiles and ISPs' is

- to provide a register of existing or proposed Profiles
- to provide a general classification for Profiles in order to ease the evaluation of proposed Profiles
- to provide a register of proposed or published ISPs and CTCs

For each Profile in the directory, status information is provided as to whether the Profile is ratified, proposed, recognized by OSI User Groups or mentioned only for classification purposes.

Note that the existence of a Profile classification does not reflect a judgement by the SG/FS Taxonomy Group that a Profile is required for such capability. It merely provides a capability to identify uniquely such a function and to enable evaluation of PDISPs.

A distinction has been made between a Profile and an ISP documenting one or more Profiles. Though the Directory is primarily concerned with Profiles, information is given as to in which ISP a Profile is documented.

In addition, the Directory of Profiles and ISPs may serve as a guidebook for users of Profiles, namely product planners, developers and procurers who are interested to get an overview of available Profiles. Therefore, for Profiles proposed or ratified, outline definitions are provided in section 4.

Since Profiles will be proposed according to the needs of OSI User Groups and according to the progress of international base standardization, the Directory will be periodically updated in order to reflect the progress reached.

Throughout this document reference is made by 'TR yyy' to the body of the Technical Report to which this Annex A belongs. This is currently documented as FSTG N38.

2 The Taxonomy

2.1 Main elements of the Taxonomy

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

T - Transport Profiles
A - Application Profiles
F - Interchange format and information characteristics Profiles

Other classes may be required.

T-Profiles specify how the OSI Transport Service is provided over specific subnetwork types, such as CSMA/CD LANs, other LANs, PSDNs, etc. In this way they isolate the A-Profiles and F-Profiles from network technology. A-Profiles specify communications protocol support for particular application types over OSI Transport Service. F-Profiles specify the characteristics and representation of various types of information.

Within each of these classes, sub-classes of Profiles are identified which, again, may require further subdivision such that the granularity of the Taxonomy meets the requirements outlined in TR yyyy. This leads to a hierarchical structure of Profile (sub-)classes which is in full given in sect. 6 of this annex.

For the identification of sub-classes and a further subdivision within a given class, a class-dependent methodology is applied. This is explained in the subsequent class-individual sections. TR yyy identifies some basic concepts which will be used in this Taxonomy:

Group concept:

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

Currently, the group concept is only applied to the Transport Profile taxonomy. Its use for A- and F-Profiles is for further study.

Common Textual Component (CTC):

A Common Textual Component is a section of an ISP which is known to be (actually or potentially) common to more than one Profile.

Binding:

The combined operation of A- and F-Profiles is called 'binding'.

A distinction needs to be made between 'concrete binding' as it is implemented in a particular product (e.g. File Transfer over a Local Area Network) and 'potential binding' which only indicates the technical possibility for combined operation of Profiles, without evaluating the commercial suitability of such operation. While concrete binding is outside the scope of this Technical Report, potential bindings can be found in section 5.

2.2 Profile identifiers

Each Profile is identified by a character string commencing with one of the above letters (indicating the primary class of the Profile), and continuing with as many further letters or digits as are necessary to reflect its position within the hierarchic structure of the class. The syntax of all but the first letter is subject to individual definitions for each class (see below).

2.3 Profile classes

2.3.1 Transport Profiles

2.3.1.1 Principles

Transport Profiles define the use of standards from OSI layers 1 to 4, to provide the OSI Transport Service.

For the T-Profile classification, the concept of lower layer groups is applied in the following way:

a) Lower Layer Groups

A lower layer group is a collection of Profiles which:

- support the same combination of modes of Transport and Network Service;
- support the same (or can negotiate a common) Transport Protocol Class;
- can interwork via OSI relays.

The notion of a group is incorporated in the classification and is used as a first level distinction between Profiles.

b) Within a group, a primary distinction between Profiles is made according to the subnetwork type supported. Further subdivisions are made according to the characteristics of a particular subnetwork, eg switched vs leased line/virtual connection

2.3.1.2 The lower layer groups in the Taxonomy

Based on functional standardization already under way in organizations represented in the Taxonomy Group and on standards already developed in ISO, the following lower layer groups are identified as being of value. They can be characterized as follows:

a) **Connection-mode Transport Service over Connectionless-mode Network Service: Group A**

The Connection-mode Transport Service (CO-TS) is provided over the Connectionless-mode Network Service (CL-NS) using the Class 4 Transport Protocol as defined in ISO 8073/DAD2.

b) **Connection-mode Transport Service over Connection-mode Network Service**

The Connection-mode Transport Service (CO-TS) is provided over the Connection-mode Network Service (CO-NS).

Profiles of this characteristic are further grouped according to their support of transport protocol class(es):

	mandatory transport protocol classes	**recognized optional protocol classes**
Group BA:	0 and 2 and 4	-none-
Group BB:	0 and 2	4
Group BC:	2	4
Group BM: (MHS only)	0	

Group BA provides the broadest basis for interoperability, and will interwork with the other two subgroups BB and BC. It is therefore recognized and identified as the universal interworking group for CO-TS over CO-NS.

Note 1: For further information about issues related to Groups Bx refer to accompanying letter

Note 2: The labelling of the above groups is not final.

Note 3: The inclusion of Group BM in this class of Profiles and also its labelling are not final and, its current positioning does not prejudge any decision of the Member Bodies on related questions raised in the accompanying letter.

Table 1 provides further information about interoperability among the various groups Bx. This information, however, is only preliminary. It needs further review once the Transport Protocol Class negotiation rules for groups BA and BB are known.

	BA	BB	BC	BM
BA	yes	yes	yes	yes
BB	restricted	yes	yes	yes
BC	restricted	restricted	yes	no
BM	restricted	restricted	no	yes

Table 1: Interoperability among Groups Bx

c) **Connectionless-mode Transport Service over Connectionless-mode Network Service: Group C**

The Connectionless-mode Transport Service (CL-TS) is provided using the ISO 8602 Transport Protocol. This group supports the default operation of ISO 8602, over connectionless-mode Network Service.

d) **Connectionless-mode Transport Service over Connection-mode Network Service: Group D**

The Connectionless-mode Transport Service (CL-TS) is provided using the ISO 8602 Transport Protocol. This group supports the option of ISO 8602 that operates over connection-mode Network Service.

2.3.1.3 Transport Taxonomy

The identifier for a Profile in the lower layers is of the form:

TXabc

where:

T = Transport Function

X = where one or two letters indicate the lower-layer group defined in 2.3.1.2 above.

abc = the structured numerical identifier indicating the subnetwork type supported in this Profile. It is possible that a further level of identifier may become necessary. In general, when referencing a Profile, only that level of identifier which is necessary for uniqueness needs to be used.

2.3.1.4 Relays

Two types of relays are defined

a) INTRA-GROUP RELAYS - TXRp.q

T and X have the same meaning and values as above. R denotes a relay function. p and q may each take the value of the abc-structured numerical identifier defined for regular T-Profiles. The fully qualified structure need only be used where necessary (e.g. for circumstances where a distinction must be made between LANs). TXRp.q represents a relay between subnetwork type p and subnetwork type q within the group identified by the value of X.

A relay TXRp.q is considered to provide the same functionality as TXRq.p unless otherwise stated.

b) INTER-GROUP RELAYS - TIRX(mmm).Y(nnn)

TIR indicates a T-level Inter-Group Relay Profile. Inter-Group relays are considered only between groups exhibiting the same mode of transport service, i.e. connection-mode or connectionless-mode. X and Y may take any value satisfying this requirement and mmm and nnn are identifiers within the appropriate groups.

An inter-group relay TIRX(mmm).Y(nnn) is considered to provide the same functionality as TIRY(nnn).X(mmm) unless otherwise stated.

Although inter-group relays are related to OSI systems some of them are not OSI relays, and hence some restrictions or limitations may be expected in their operation. Many proposals for inter-group relays between groups A and Bx have significant architectural issues associated with them relating to integrity, security, QoS, etc., and the fact that an identifier has been allocated to them does not indicate that such issues have been resolved.

2.3.2 Application Profiles

2.3.2.1 Principles

These define the use of standards from OSI layers 5 to 7, to provide for the structured transfer of information betwen end systems.

Only application layer services defined by JTC1/SC18 and SC21 are included.

Each Application Profile is a complete definition of the upper layer protocols, though it may share one or more common definitions of some part of its content with other A-Profiles ("Common Textual Components").

2.3.2.2 Application Profile Taxonomy

The identifier for a Profile in the Application Class is of the form:

AXYab

where:

A = Application Function
XY = two letters corresponding to the names of the primary subdivisions. These subdivisions are taken from the main categories of application functions and OSI management, as identified as main projects in JTC1.
ab = the structured numerical identifier for the member(s) of the subdivision. It is possible that a further level of subdivision may become necessary.

2.3.3 Interchange Format Profiles

2.3.3.1 Principles

These define the structure and/or content of the information being interchanged by A-Profiles. Hence, the main feature which distinguishes them from A-Profiles is the absence of a transfer function.

Currently, only interchange formats defined by JTC1/SC18 and SC21 are included.

2.3.3.2 Interchange Format Taxonomy

The identifier for a Profile in the Interchange Format Class is of the form:

FXYab

where:

F = Interchange Format

XY = two letters corresponding to the names of the primary subdivisions.

ab = the structured numerical identifier for the member(s) of the subdivision. It is possible that a further level of subdivision may become necessary.

3 Index of Profiles

3.1 Transport Profiles

3.1.1 Group index

TA Group A: CO-TS over CL-NS

a b c Subnetwork Type

1 PACKET SWITCHED DATA NETWORK (PSDN)
1 1 Permanent Access to a PSDN
1 1 1 Permanent Virtual Circuit (PVC)
1 1 2 Switched Virtual Circuit (SVC)
1 2 Switched Access to a PSDN
1 2 1 PSTN Case
1 2 2 CSDN Case

2 DIGITAL DATA CIRCUIT
2 1 Leased (Permanent) Service
2 2 Dial-up (CSDN)

3 ANALOGUE TELEPHONE CIRCUIT
3 1 Leased (Permanent) Service
3 2 Dial-up (PSTN)

4 INTEGRATED SERVICES DIGITAL NETWORK (ISDN)
4 1 Circuit-switched bearer service for basic access at S or T reference point
4 1 1 Port access to a PSDN
4 1 2 B-channel end-to-end
4 2 Packet-switched bearer service for basic access at S or T reference point
4 2 1 Access using D-channel
4 2 2 Access using B-channel

5 LOCAL AREA NETWORKS
5 1 CSMA/CD
5 2 Token Bus
5 3 Token Ring

R: Relays within group A

substructure: p.q
where p, q may each take any value of abc above, but see also 2.3.1.4

TBA Group BA: CO-TS over CO-NS : mandatory Transport Protocol Classes: 0 and 2 and 4

substructure as in group A

R: Relays within group BA

substructure: p.q
where p, q may each take any value of abc above, but see also 2.3.1.4

TBB Group BB: CO-TS over CO-NS : mandatory Transport Protocol Classes: 0 and 2

substructure as in group BA

R: Relays within group BB

substructure: p.q
where p, q may each take any value of abc above, but see also 2.3.1.4

TBC Group BC: CO-TS over CO-NS : mandatory Transport Protocol Class: 2

substructure as in group BA

R: Relays within group BC

substructure: p.q
where p, q may each take any value of abc above, but see also 2.3.1.4

TBM Group BM: CO-TS over CO-NS : mandatory Transport Protocol Class: 0
Usage of Profiles in this group is restricted to AMH Profiles

substructure as in group BA

R: Relays within group BM

substructure: p.q
where p, q may each take any value of abc above, but see also 2.3.1.4

TC Group C: CL-TS over CL-NS

substructure as in group A

R: Relays within group C

substructure: p.q
where p, q may each take any value of abc above, but see also 2.3.1.4

TD Group D: CL-TS over CO-NS

substructure as in group C

R: Relays within group D

substructure: p.q
where p, q may each take any value of abc above, but see also 2.3.1.4

3.1.2 Inter-Group Relay index

t.b.p.

3.2 Application Profiles

3.2.1 File Transfer, Access and Management

AFT File Transfer, Access and Management

a b Substructure

1 FILE TRANSFER SERVICE
1 1 Simple (Unstructured)
1 2 Positional (Flat)
1 3 Full (Hierarchical)

2 FILE ACCESS SERVICE
2 2 Positional (Flat)
2 3 Full (Hierarchical)

3 FILE MANAGEMENT SERVICE

3.2.2 Message Handling - Interpersonal Messaging

AMH Message Handling - Interpersonal Messaging

a b Substructure

1 PUBLIC DOMAIN ACCESS
1 1 UA + MTA (P1 and P2)
1 2 UA + SDE (P2 and P3 +)
2 PRIVATE DOMAIN ACCESS
2 1 UA + MTA (P1 and P2)
2 2 Mailbox Access (P7)
2 3 MTA - Intra-PRMD (P1)

3.2.3 Virtual Terminal

AVT Virtual Terminal

a b Substructure

1 BASIC CLASS (A-mode)
1 1 A-mode Default
1 2 TELNET
1 3 Page Scroll
1 4 CCITT X.3 PAD compatible
1 5 Transparent

2 BASIC CLASS (S-mode)
2 1 S-mode Default
2 2 Forms
2 3 Line Scroll

3.2.4 Transaction Processing

ATP Transaction Processing

a b Substructure

(to be studied)

3.2.5 Remote Database Access

ARD Remote Database Access

a b Substructure

(to be studied)

3.2.6 OSI Management

AOM OSI Management

a b Substructure

(to be studied)

3.2.7 Directory Access

ADI Directory Access

a b Substructure

(to be studied)

3.3 Interchange Format Profiles

3.3.1 Office Document Format

FOD Office Document Format

a b Substructure

1 CHARACTER CONTENT
1 1 Character Processable
1 2 Advanced Character Processable

2 MIXED CONTENTS (character/raster/geometric)
2 1 Mixed Processable

3.3.2 Computer Graphics Metafile Interchange Format

FCG Computer Graphics Metafile Interchange Format

a b Substructure

(to be studied)

3.3.3 SGML Document Interchange Format

FSG SGML Document Interchange Format

a b Substructure

(to be studied)

4 Profile summary descriptions

This section will contain for each Profile identified and in existence (either ratified or proposed) a summary definition.

5 Combinations of Profiles

5.1 Combinations of A-Profiles and T-Profiles

In reviewing the vertical couplings between A-Profiles and T-Profiles (the possible bindings), it was observed that an A-Profile has visibility as to the Transport Service type, and hence an A-Profile should identify the type of Transport Service it requires. Further distinctions between groups of the same Transport Service type should not be of concern to A-Profiles. Consequently there should be no technical reason why upper-layer groupings should distinguish between groups A and Bx for the purpose of combinations with T-Profiles.

However, the usage of a Profile belonging to Group BM is restricted to AMH application Profiles. Any other usage of BM is not supported in this taxonomy.

5.2 Binding possibilities for A-Profiles and F-Profiles

More study is required to make definitive statements about the relationships between A-Profiles and F-Profiles (i.e. A/F binding). However, the following matrix (Table 2) has been drawn up to make a first estimate of these relationships, and to provide a basis for raising issues about them. In the matrix, the significance of the marks is as follows:

/ : A binding possibility exists

/? : It is thought that a binding possibility exists

x? : It is thought that a binding possibility does not exist

x : A binding possibility does not exist.

Numbers associated with these marks refer to the notes which follow the table.

Notes:

1) No mechanism exists within these A-Profiles to indicate the use of a particular subdivision of F-Profiles. Note that FTAM Document Types are not identified as a subdivision of F-Profiles. It is considered that the limitations, imposed by the lowest level of AFT subdivision (unstructured, flat, hierarchical) implicitly constrain which document types are permissible, and that the Registration of document types will take place, thus simplifying the reference process.

2) The VTP Standard is complete in that it includes definition of the information content, and the AVT Profiles do not therefore need to be supplemented with an F-Profile. However, in some cases, F-Profiles may be used in addition to specify the format of the information content.

3) The combination of FCG and the TP service is not thought to have any relevance, whereas all other F-Profiles are expected to be capable of use over the ATP Profiles.

4) OSI Management Profiles are expected to include their own data content definitions, tailored to the required management functions. Hence no A/F bindings are identified.

A \ F	FOD	FCG (5)	FSG
AFT (1)	/	/	/
AMH	/	/	/
AVT (2)	/?	/?	/?
ATP	/?	x?	/?
ARD	/?	x?	x?
AOM (4)	x?	x	x
ADI	x?	x	x

Table 2: Matrix of Binding Possibilities at the A/F Boundary

6 Profile status information

The following table shows information about the status of Profiles and where they are document in ISPs. Profiles not contained in this table, but identified in the taxonomy (section 3) have the implicit status 'T' [1].

Profile ID	Status [1]	Originator	Schedule	ISP Identifier
TA 11	R	COS	PDISP: late 1988 [2]	not yet available, will be assigned by CS after ratification
TA 51	R	MAP/TOP	PDISP: late 1988 [2]	not yet available
TBx11	R	POSI	PDISP: late 1988 [2]	not yet available
TA 52	R			
TB 51	R			
AFT 11	R	SPAG	PDISP: late 1988 [2]	not yet available
AMH 11	R			
AMH 21	R			
FOD xx	R			

1) Status: T profile identified in taxonomy only
R profile positively recognized by an OSI User Group
P profile proposed as PDISP, review in progress
A profile approved and published

2) Note that the date given by the identified originator is only tentative.

7 Information about Common Textual Components

This section is meant to take information about common textual components: a catalogue of those and cross-references between Profiles and common textual components. Information will be included into this section to the extent it is provided by submitters of Profiles.

ANNEX B. EXTRACT FROM THE ISO/IEC RULES FOR THE DRAFTING AND PRESENTATION OF INTERNATIONAL STANDARDS, WITH COMMENTS RELATING TO ISPS.

B.1 Introduction

Clause 8 of this Technical Report gives a general specification of the structure required for a Profile Definition. It follows the ISO/IEC Rules for the 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 ISO/IEC Rules document 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 may contain a whole Profile definition, several Profile definitions, or part of one or more Profile Definitions. The wording of this Annex assumes that it is describing an ISP which defines one Profile. Its application to the other cases is easily deduced.

B.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 B.6.3) may be part of any element except the title page, the title and footnotes.

B.3 Preliminary elements

B.3.1 Title page (Rules 2.2.1)

The title page is prepared in a standard format by the Central Office of the IEC or the Central Secretariat of the ISO as appropriate.

The reference number is allocated by the Central Office of the IEC or the Central Secretariat of ths ISO as appropriate.

B.3.2 Contents (Rules 2.2.2)

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

B.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.

B.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 to ensure that it has been internationally harmonized. It is based on the Explanatory Report provided by the originating organization when it submits the draft ISP for approval.

B.4 General normative elements

B.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 of 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 Processing Systems" 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 an ISP (single or multi-part) defines more than one Profile, this element may either enumerate all Profile Identifiers, or use the convention of "n" for a variable number; e.g. "TBAnn" or "AFTnn". (No need for a variable letter "X" is foreseen)

c) a main element indicating the subject matter of the ISP, as recorded in the Directory of ISPs in Annex A. 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 Processing Systems - International Standardized Profiles AFT1xx - File Transfer, Access and Management - Part 1: AFT11 - Simple File Transfer.

B.4.2 Scope (Rules 2.3.2)

This element shall appear at the beginning of every ISP, to define without ambiguity the subject matter of the Profile(s) and the aspect(s) covered, thereby indicating the limits of applicability of the ISP or particular parts of it. It shall not contain requirements.

This element shall include (where appropriate) the "scenario" of the Profile - an illustration of the environment within which it is applicable. (See clause 6.4 (b)).

B.4.3 Normative references (Rules 2.3.3)

This element shall give a list of normative documents (in most cases standards, 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. Reference shall also be made to this Technical Report on the Taxonomy Framework and Directory of Profiles.

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 B.6.1) entitled "Bibliography".

B.5 Technical normative elements

B.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 Rules, 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.

B.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.

B.5.3 Position within the Taxonomy

This element shall appear in every ISP or Part of an ISP, to relate the Profile(s) it defines to the Directory of Profiles published as Annex A of this

Technical Report. The element shall include the following:

- the identifier(s) and title(s) of the Profile(s) defined within the ISP;
- the label(s) and title(s) of any Common Textual Component(s) used in the formation of the Profile Definition(s)
- the label(s) and title(s) of any Common Textual Component(s) contained within the ISP;
- the identifiers and titles of other Profiles with which the Profile(s) defined in the ISP may be combined at an A/T boundary (see 7.3.1) or bound as F/A Bindings (see 7.3.2). These combinations or binding possibilities can be represented in terms of a Class, Subclass, or Group of Profiles.

B.5.4 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 Proforma.

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

B.5.5 Test methods (Rules 2.4.5)

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

B.5.6 Normative annexes (Rules 2.4.8)

Normative annexes are integral parts 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 B.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 B.3.3) and by an indication at the head of the annex itself.

The first normative annex shall be the Profile Implementation Conformance Statement (ISPICS) Proforma - see clause 8.4. If the ISP contains definitions of more than one Profile, then each ISPICS proforma shall be contained in a separate normative annex.

B.6 Supplementary elements

B.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 B.5.6) 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 B.3.3) and by an indication at the head of the annex itself.

B.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.

B.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.

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

Notes to tables and to figures shall be treated independently from footnotes (see B.6.2) and notes integrated in the text (see B.6.3). They shall be located within the frame of the relevant table of 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.

B.7 Editorial and layout information

Further information on layout of text, tables, figures, footnotes, and tables 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 C. EXAMPLE OF MULTI-PART ISP STRUCTURE FOR A GROUP

C.1 Introduction

This Annex illustrates how the concept of Common Textual Components (CTCs) can be applied to the definition of T-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.

C.2 Example

Figure C.1 shows a number of Common Textual Components, grouped to form elements of two Groups.

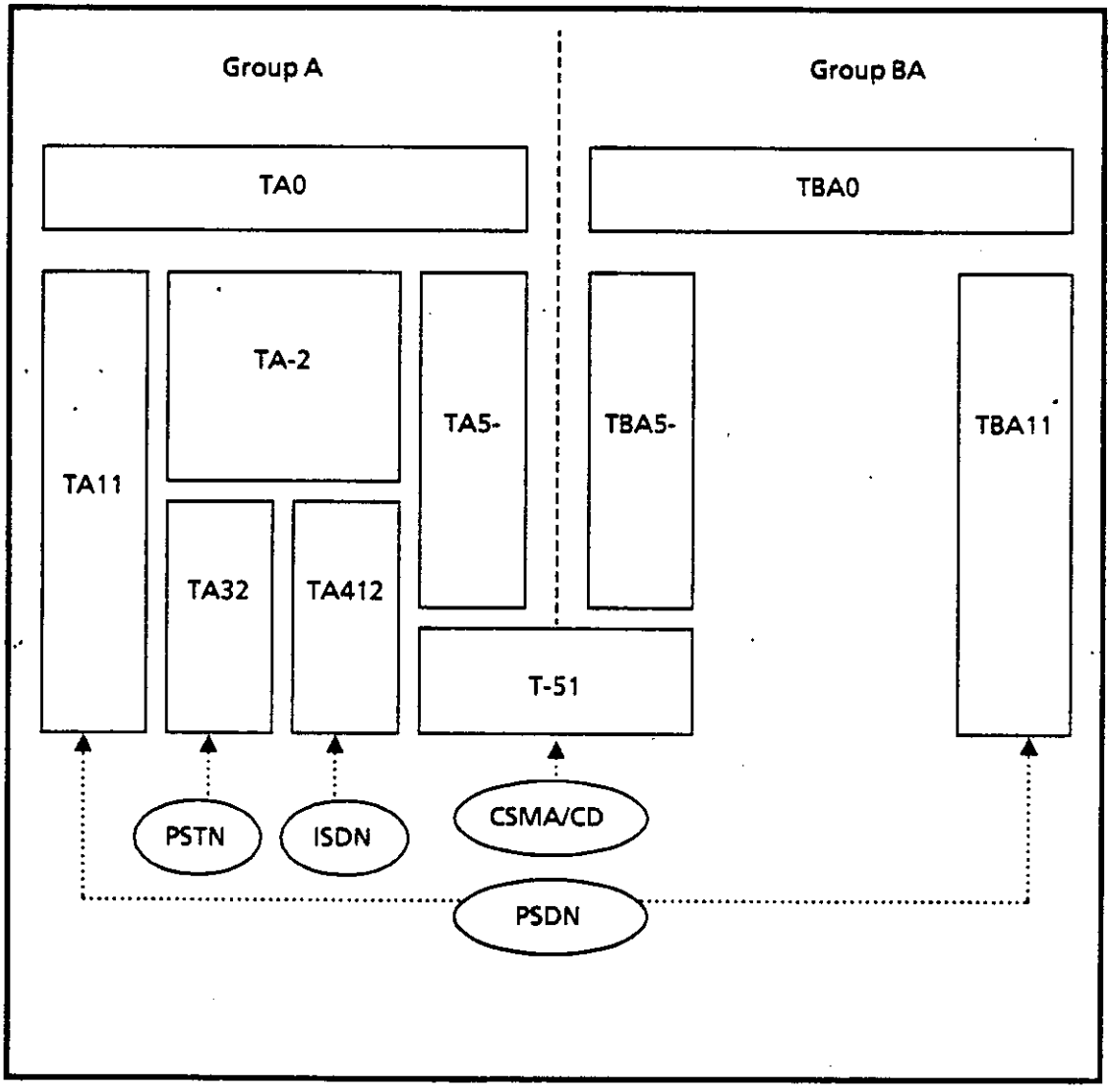

Figure C.1 Illustration of Common Textual Components of two T-Profile Groups

NOTE - The labelling of the elements in the figure derives from the Profile Identifiers in the Directory of Profiles and ISPs in Annex A, in order to facilitate description of the combinations of CTCs to form Profiles in this example. However, a separate scheme for CTC labels is for further study, and will be documented in Annex A.

C.3 Explanation

C.3.1 Basic component of multi-part ISP for a Group

One type of CTC is represented by TA0 and TBA0. This contains all the information that is common to a Group of T-profiles. Such a CTC would define 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. The number of CTCs that need to be combined to form a specific profile within a Group is then dependent on the network technology.

C.3.2 Common CTCs within a Group

Some technologies would lend themselves to being defined in individual CTCs, each of which is common to a number of Profiles within a Group. An example of this could be technologies that provide circuits between the systems. This is illustrated in Figure C.1 by TA-2, which is a CTC which specifies, in conjunction with TA0, the use of an end-to-end circuit by profiles in Group TA, and can be used with either of the CTCs TA412 or TA32, depending on whether the circuit switched connection is provided by ISDN or PSTN technology respectively.

C.3.3 CTCs common to more than one Group

In other technologies, the 'natural' CTCs that are subnetwork-specific are applicable to Profiles in more than one Group. An example of this occurs with LANs, where a single CTC specifies the use of a LAN up to the MAC service. This is illustrated in Figure C.1 by T-51.

C.3.4 CTCs specific to individual Profiles

Finally, still other technologies do not naturally lend themselves to the concept of CTCs, and would be specified in a single CTC (in addition to the Group Basic Component T-0). An example of this type of subnetwork may be leased line access to a Packet Switched Data Network, and this is illustrated in Figure C.1 by TA11 and TBA11. Although TA11 and TBA11 are concerned with the same network technologies, and thus refer to the same base standards as shown in Figure C.1, the Profiles would be different specifications of the use of those standards.

C.4 Summary of structure of illustrated Profiles

Table C.1 summarises the way in which the Profiles illustrated in Figure C.1 are constructed out of CTCs:

Profile Identifier	Components Of Profile
TA11	TA0, TA11
TA32	TA0, TA-2, TA32
TA412	TA0, TA-2, TA412
TA51	TA0, TA5-, T-51
TBA11	TBA0, TBA11
TBA51	TBA0, TBA5-, T-51

Table C.1 Example of use of CTCs in Profile definitions

C.5 Summary of structure of illustrated ISPs

Table C.2 summarises the way in which the definitions of the Profiles in Figure C.1, constructed out of CTCs, are formed into multi-part ISPs:

ISP Number	ISP Part Number	CTC Label	Refers to other CTCs
nnn	nnn-1	TA0	
	nnn-2	TA-2	
	nnn-3	TA5-	TA0, T-51
	nnn-4	TA11	TA0
	nnn-5	TA32	TA0, TA-2
	nnn-6	TA412	TA0, TA-2
	nnn-7	T-51	TA5-, TBA5-
ppp	ppp-1	TBA0	
	ppp-2	TBA5	TBA0, T-51
	ppp-3	TBA11	TBA0

Table C.2 Example of Parts of ISPs related to Profiles and CTCs

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 CTCs are documented within the same multi-part ISP, but one case is shown - TBA51 - where reference is made to a part of another ISP (ISP ppp-2 refers to ISP nnn-7).

ANNEX D. ADDITIONAL DETAILS

This Annex provides a place to record items of technical detail which have been decided by the Functional Standardization Taxonomy Group during the process of drafting this PDTR. It is expected that they will be useful for the originators of proposals for Draft ISPs. They will be removed from this Annex when they have been incorporated into published ISPs.

D.1 Length of TSAP-identifier

An overall length restriction of 32 octets for the TSAP-ID field in the Transport Layer Protocol should be documented in ISPs for T-profiles.