TECHNICAL REPORT

ISO/IEC TR 10000-2

Second edition
1992-12-15

Information technology — Framework and taxonomy of International Standardized Profiles —

Part 2:
Taxonomy of OSI Profiles

Technologies de l'information — Cadre et taxonomie des profils internationaux normalisés —

Partie 2: Taxonomie

Reference number
ISO/IEC TR 10000-2:1992(E)

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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

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

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

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

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

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 Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/IEC TR 10000-2, which is a Technical Report of type 3, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

This second edition cancels and replaces the first edition (ISO/IEC TR 10000-2:1990), which has been technically revised.

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

— *Part 1: Framework*

— *Part 2: Taxonomy of OSI Profiles*

Annex A of this part of ISO/IEC TR 10000 is for information only.

Introduction

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

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

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

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

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

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

Information technology – Framework and taxonomy of International Standardized Profiles

Part 2:
Taxonomy of OSI Profiles

1 Scope

The purpose of this part of ISO/IEC TR 10000 is to provide a classification for Profiles which may be or have been submitted for ratification as International Standardized Profiles (ISPs).

ISO/IEC TR 10000-1 defines the concept of Profiles, as documented in ISPs, and gives guidance to organizations making proposals for Draft ISPs, on the nature and content of the documents they are producing.

ISO/IEC TR 10000 is intended to be applied 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 which are expected to be used in conjunction with them. Nevertheless, it is also applicable to Profiles specifying the use of other JTC 1 and CCITT base standards.

The existence of a Profile classification in this part of ISO/IEC TR 10000 does not reflect a judgement by ISO/IEC JTC 1/SGFS 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.

Since Profiles will be proposed according to needs identified to SGFS and according to the progress of international base standardization, the Taxonomy will be periodically updated or have new parts added in order to reflect the progress reached. It is also recognized that there will be proposals for the extension of the Taxonomy to cover functions which were not identified during preparation of this edition of ISO/IEC TR 10000. These extensions may be identified by a variety of proposers and involve simple extensions to the existing Taxonomy or the addition of new functional areas not currently covered by ISO/IEC TR 10000. The inclusion of such extensions is administered following the procedures elaborated by SGFS.

A distinction has been made between a Profile and an ISP documenting one or more Profiles. The Taxonomy is only concerned with Profiles, but further information is given in the "Directory of ISPs and Profiles contained therein" as to which ISP contains the documentation of a Profile.

This *Directory* is maintained as an SGFS standing document SD-4 (see Annex A). For each draft Profile submitted to SGFS, it will also provide additional information, including the status of the identified Profiles.

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/IEC 8073 : 1992, *Information technology - Telecommunications and information exchange between systems - Open Systems Interconnection - Protocol for providing the connection-mode transport service.*

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

ISO/IEC 8602 : 1987, *Information processing systems - Open Systems Interconnection - Protocol for providing the connectionless-mode transport service.*

ISO/IEC 9506 : 1990, *Industrial automation systems - Manufacturing Messaging Specification.*

ISO/IEC TR 10000-1 : 1992, *Information technology - Framework and taxonomy of International Standardized Profiles Part 1: Framework.*

ISO/IEC 10021 : 1990, *Information technology - Text Communication - Message Oriented Text Interchange Systems (MOTIS).*

ISO/IEC 10028 : 1992, *Information technology - Telecommunications and information exchange between systems - Definition of the relaying functions of a Network Layer intermediate system.*

ISO/IEC TR 10029 : 1989, *Information technology - Telecommunications and information exchange between systems - Operation of an X.25 interworking unit.*

ISO/IEC TR 10172 : 1991, *Information technology - Telecommunications and information exchange between systems - Network/Transport Protocol interworking specification.*

CCITT Q.931 (1988), *Digital Subscriber Signalling System No. 1 (DSS 1), Network Layer, User-Network Management.*

CCITT X.3 (1988), *Packet Assembly/Diassembly Facility (PAD) in a Public Data Network.*

CCITT X.25 (1988), *Interface Between Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE) for Terminals Operating in the Packet Mode and Connected to Public Data Networks by Dedicated Circuit.*

CCITT X.224 (1988), *Transport Protocol Specification for Open Systems Interconnection for CCITT Applications.*

CCITT Recommendations *X.400-X.420 (1984), Message Handling Systems.*

CCITT Recommendations *X.400-X.420 (1988), Message Handling Systems.*

CCITT X.435 (1991) *Message Handling Systems, EDI Messaging System.*

3 Definitions

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

Group: A set of OSI 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 these Profiles.

4 Abbreviations

4.1 General abbreviations

CL	Connectionless-mode
CLNS	Connectionless-mode Network Service
CLTS	Connectionless-mode Transport Service
CO	Connection-mode
CONS	Connection-mode Network Service
COTS	Connection-mode Transport Service
CSDN	Circuit Switched Data Network
CSMA/CD	Carrier Sense, Multiple Access / Collision Detection
CULR	Common Upper Layer Requirements
DSA	Directory Service Agent
DTE	Data Terminal Equipment
DUA	Directory User Agent
EDI	Electronic Data Interchange
EDIM	EDI Messaging
FDDI	Fibre Distributed Data Interface
IPM	Interpersonal Message
ISDN	Integrated Services Digital Network
ISP	International Standardized Profile
LAN	Local Area Network
MAC	Media Access Control
MMS	Manufacturing Message Specification
MOTIS	Message Oriented Text Interchange System
MS	Message Store
MTA	Message Transfer Agent
MTS	Message Transfer System
ODA	Open Document Architecture
P1	Message Transfer Protocol
P2	Interpersonal Messaging Protocol
P3	MTS Access Protocol
P7	MS Access Protocol
PSDN	Packet Switched Data Network
PSTN	Public Switched Telephonie Network
PVC	Permanent Virtual Circuit
QOS	Quality of Service
SGFS	ISO/IEC JTC 1/Special Group on Functional Standardization
SGML	Standardized General Markup Language
TP	Transaction Processing
UA	User Agent
VC	Virtual Call
VT	Virtual Terminal

4.2 Abbreviations used in Profile identifiers

Abbr.	Profile sub-class
ADI	Directory
AFT	File Transfer, Access and Management
ALD	Library, Documentation
AMH	Message Handling
AMM	Manufacturing Messaging
AOM	OSI Management
ARD	Remote Database Access
ATP	Transaction Processing
AVT	Virtual Terminal

Abbr.	Profile sub-class
FCG	Computer Graphics Metafile Interchange Format
FDI	Directory Data Definitions
FOD	Open Document Format
FSG	SGML Interchange Format
FVT	Virtual Terminal Registered Objects

5 The Taxonomy: Principles

5.1 General

Profiles are primarily arranged into classes, each class representing a category of functionality of reasonable independence from other classes. The different classes of profile correspond to the major divisions of the taxonomy. ISO/IEC TR 10000-1 provides some further information about the principles used in this primary classification.

Within each class, a class-specific subdivision will be used.

Profile identifiers have been introduced such that each Profile is identified by a character string commencing with one letter (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).

5.2 The Class concept for OSI Profiles

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 providing connection-mode Transport Service

U - Transport Profiles providing connectionless-mode Transport Service

R - Relay Profiles

A - Application Profiles requiring connection-mode Transport Service

B - Application Profiles requiring connectionless-mode Transport Service

F - Interchange format and representation Profiles

Other classes may be required.

Transport Profiles of classes T and U specify how the two modes of OSI Transport Service are provided over the two modes of OSI Network Service, and over specific subnetwork types, such as individual types of LANs, PSDNs, etc. In this way they isolate the A/B-Profiles and F-Profiles from network technology.

T- and U-Profiles are further subdivided into Groups. See 5.4 for details.

Application Profiles of classes A and B specify communications protocol support for particular application types over the two modes of OSI Transport Service, respectively.

F-Profiles specify the characteristics and representation of various types of information interchanged by A- and B-Profiles.

R-Profiles specify Relay functionality needed to enable systems using different T- or U-Profiles to interwork. Interworking between T- and U-Profiles is not contemplated in any JTC 1 work.

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 ISO/IEC TR 10000-1. This leads to a hierarchical structure of Profile (sub-)classes which is given in full in clause 6.

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.

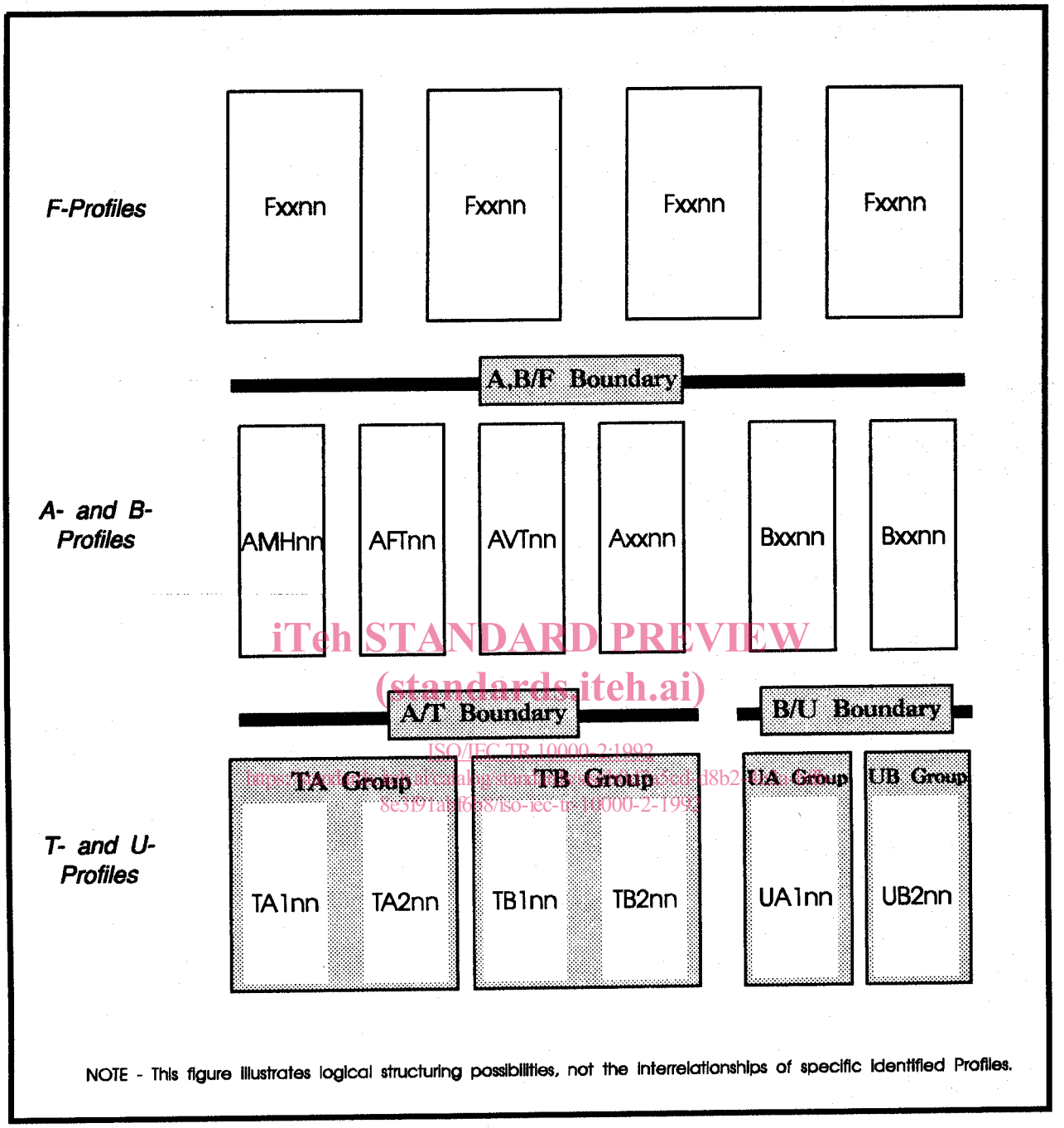

Figure 1: Examples of relationships between Profiles in the OSI Taxonomy

5.3 Relationship 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.

5.3.1 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 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 the 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.

5.3.2 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 relationsships 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 possibly 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.

5.4 The Group concept for OSI Lower Layer Profiles

The Group concept is used in the Taxonomy as follows:

A Group is a set of T- or U-Profiles that are compatible in the sense that a system implementing one Profile from the Group and another system implementing a Profile from the same Group can be expected to interwork, according to OSI, to some minimum level which is determined by the mandatory features of the Profiles in the Group.

Interworking 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/IEC 8473. This Group has members which correspond to different subnetwork technologies but interworking between systems conforming to them is made possible by LAN bridges and/or Network Layer relays.