doc. nr.	ISO/IEC JTC 1/SGFS N 599	
date	1992-08-11	total pages
item nr.		supersedes document

Secretariat: Nederlands Normalisatie-instituut (NNI)
Kalfjeslaan 2 P.O. box 5059
2600 GB Delft
Netherlands
telephone: + 31 15 690390
telefax: + 31 15 690190
telex: 38144 nni nl
telegrams: Normalisatie Delft

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

Secretariat: NNI (Netherlands)

Title : Information technology - Framework and taxonomy of International Standardized Profiles - Part 2: Taxonomy of OSI Profiles

Source : Editor - Taxonomy of OSI Profiles: ISO/IEC JTC1 Special Group on Functional Standardization (W.Koch)

Status : This is a revision of ISO/IEC TR 10000-2, second edition, in accordance with resolution 14 of the Washington meeting of SGFS, June 15 to June 19, 1992, as documented in JTC1/SGFS N598, Editors Remarks on Progression of TR 10000-2.2.

Note :

ISO/IEC DTR 10000-2.3(E)

SGFS N 599

TITLE:

Information technology - Framework and taxonomy of International Standardized Profiles - Part 2: Taxonomy of OSI Profiles

Reference Language Version: English x French

Introductory Note

SOURCE: Editor - Taxonomy of OSI Profiles : ISO/IEC JTC 1 Special Group on Functional Standardization

STATUS: This is a revision of ISO/IEC TR 10000-2, second edition, in accordance with resolution 14 of the Washington meeting of SGFS, June 15 to June 19, 1992, as documented in JTC 1/ SGFS N 598, Editors Remarks on Progression of TR 10000-2.2.

It is provided to SGFS members for information. In parallel, it is submitted to ISO/IEC JTC 1 for voting as a draft ISO/IEC Technical Report Type 3.

EDITOR: W. Koch

Contents

Page

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) together form a system for worldwide standardization as a whole. National bodies that are members of ISO or IEC participate in the development of International Standards and Technical Reports through technical committees established by the 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. Draft International Standards or Draft Technical Reports adopted by the joint technical committee are circulated to national bodies for approval before their acceptance as International Standards or Technical Reports, respectively. Technical Reports are approved in accordance with procedures requiring at least 50 % approval by the national bodies voting.

The International Technical Report ISO/IEC TR 10000 was prepared by Technical Committee ISO/IEC JTC 1, *Information Technology*.

Users should note that all International Standards and Technical Reports undergo revision from time to time and that any reference made herein to any other International Standard or Technical Report implies its latest edition, unless otherwise stated.

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

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

Other parts will be added as necessary

Part 2 has one annex:

- Annex A is for information only, and has no binding significance.

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 addition to ISO/IEC TR 10000, the Secretariat of the Special Group on Functional Standardization maintains a "Directory of ISPs and Profiles contained therein". This is a factual record of which ISPs exist, or are in preparation, together with a summary description of the scope, scenario, and model for each Profile. It is subject to regular updating by the Secretariat.

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 base standards. However, it is recognized that the scope of the concept of Profiles may ultimately be wider than that of JTC 1.

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, currently under elaboration in 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 a SGFS standing document (see Annex A). For each Profile in the Taxonomy, 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 : 1988, *Information processing systems - Open Systems Interconnection - Connection oriented transport protocol specification*

ISO/IEC 8073 : 1988/Add.2 : 1989, *Information processing systems - Open Systems Interconnection - Connection oriented transport protocol specification - Addendum 2: Class four operation over connectionless network 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 8613, *Information processing - Text and office systems - Office document architecture (ODA) and interchange format*

ISO/IEC 9506, *Manufacturing Messaging Specification*

ISO/IEC TR 10000-1 : 1990[1], *Information technology - Framework and taxonomy of International Standardized Profiles Part 1: Framework*

[1] second edition to be published in 1992

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

ISO/IEC 10028, –[2] *Information processing systems - 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 Abbreviations

3.1 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
DAP	Directory Access Protocol
DSA	Directory Service Agent
DSP	Directory Service Protocol
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
MTS	Message Transfer System
P1	Message Transfer Protocol
P2	Interpersonal Messaging Protocol
P3	MTS Access Protocol
P7	MS Access Protocol
PSDN	Packet Switched Data Network
PSTN	Public Switched Telephonic 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

3.2 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

FCG	Computer Graphics Metafile Interchange Format

[2] to be published

FDI	Directory Data Definitions
FOD	Open Document Format
FSG	SGML Interchange Format
FVT	Virtual Terminal Registered Objects

4 The Taxonomy: Principles

4.1 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).

4.2 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

M - Managed-object Profiles[3]

Other classes may be required.

[3] the concept of Managed-object profiles, as proposed in SGFS N538 is subject for further discussion. See also SGFS N615.

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 4.4 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. Relays between T- and U-Profiles are not provided.

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 5.

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.

4.3 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.

4.3.1 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.

4.3.2 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 ba 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.

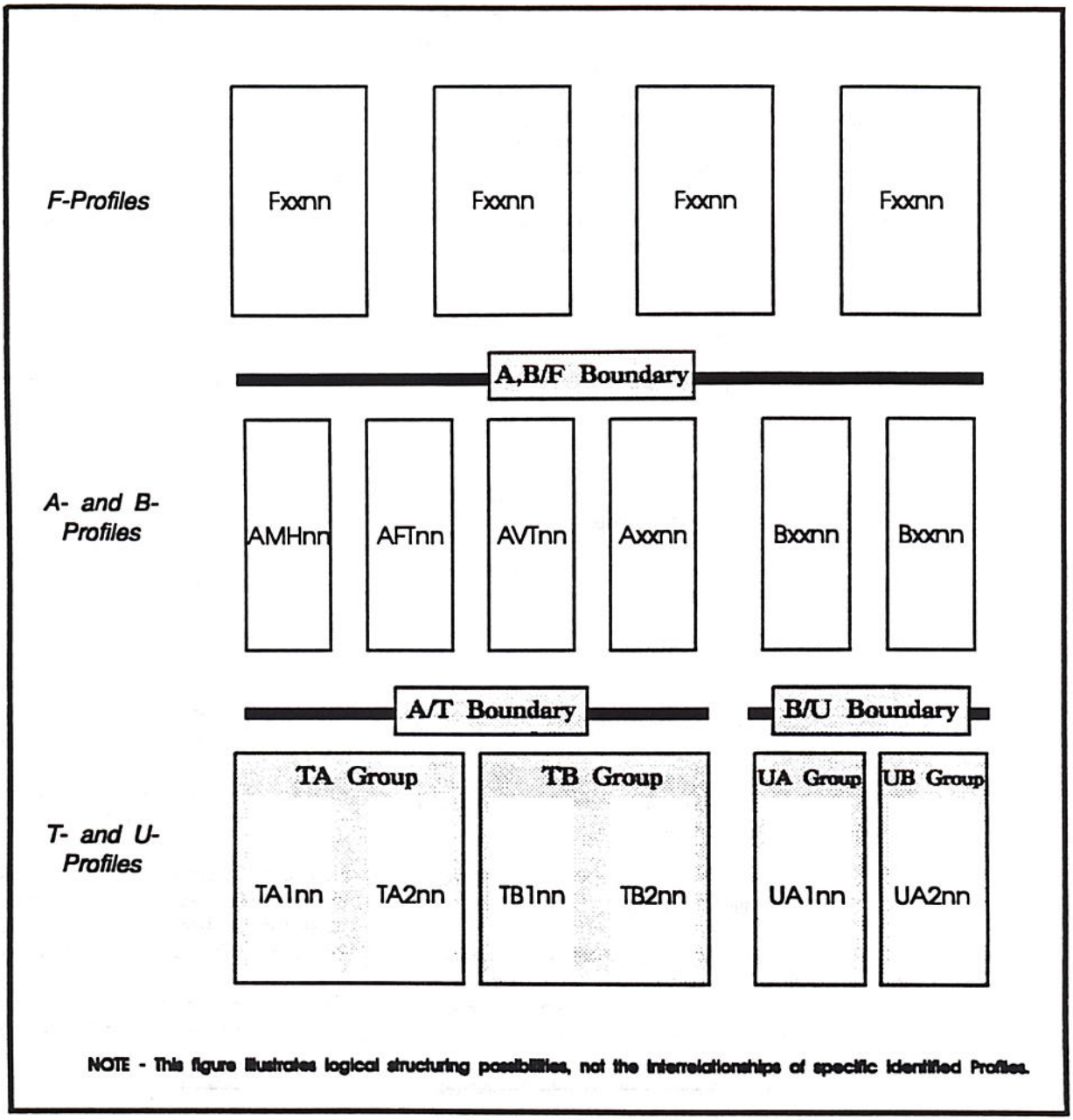

Figure 1: Examples of relationships between Profiles in the OSI Taxonomy

4.4 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.

A Group is identified by labels of the form YXnnn, where Y is the class identifier and X is a letter identifying the Group.

4.5 Profile classes

4.5.1 Transport Profiles

4.5.1.1 Principles

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

A primary distinction is made between Transport Profiles, based on the mode of Transport Service offered:

- Connection-mode Transport Service:
  Profile class T

- Connectionless-mode Transport Service:
  Profile class U

For the Transport Profile classification within each class, the following methodology is applied:

a) As a first level distinction the Group concept (see 4.4) is used in the following way:

   A lower layer Group is a collection of Profiles which:

   - support the same combination of modes of Transport and Network Service;

   - support the same Transport Protocol Class(es);

   The notion of a Group is incorporated in the classification.

b) The second level distinction between Profiles, i.e. within a Group, is made according to the subnetwork type supported.
   (See 5.1.1 for examples of subnetwork types).

c) Further subdivisions are made according to the characteristics of a particular subnetwork, e.g., switched versus leased line.
   (See 5.1.1 for examples of such characteristics).

4.5.1.2 Transport Profile identifier

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

YXabcd

where:

Y = class designator, indicating the Transport Service mode:

T for Connection-mode
U for Connectionless-mode

X = one letter indicating the lower-layer Group within the class, as defined in 4.5.1.3 and 4.5.1.4 below.

abcd = the structured numerical identifier indicating th 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.

The identifier structure is not meant to capture the variety of details and options of OSI layer 1 such as attachment speeds and connectors. However, it is recognized that this issue must be covered by the appropriate Profile specification.

4.5.1.3 Connection-mode Transport Service: Profile class T

Based on functional standardization already under way in organizations represented in SGFS and on standards already developed, the following lower layer Groups are identified as being of value. They are characterized as follows:

a) Connection-mode Transport Service over Connectionless-mode Network Service

Group TA

The Connection-mode Transport Service (COTS) is provided over the Connectionless-mode Network Service (CLNS) by requiring the use of the Class 4 Transport Protocol as defined in ISO/IEC 8073/Add.2.

NOTE - A system implementing Group TA and claiming conformance to ISO/IEC 8073 also has to implement the mandatory transport protocol classes for operation over CONS as required by ISO/IEC 8073.

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

The Connection-mode Transport Service (COTS) is provided over the Connection-mode Network Service (CONS).

Profiles of this characteristic are further grouped according to their required support of Transport Protocol class(es):

mandatory (see note 1)
transport protocol classes

Group TB:	0 and 2 and 4 (see note 2)
Group TC:	0 and 2 (see note 2)
Group TD:	0
Group TE:	2 (see note 3)

NOTES

1 'Mandatory' means those Transport Protocol classes made mandatory by the base standard, ISO/IEC 8073, plus any class required for Group membership

2 The class negotiation rules to be employed are those in CCITT Recommendation X.224 (1988).

3 A system implementing Group TE and claiming conformance to CCITT Recommendation X.224 (1988) also has to implement transport protocol class 0.

4.5.1.4 Connectionless-mode Transport Service: Profile class U

a) Connectionless-mode Transport Service over Connectionless-mode Network Service:

Group UA

The Connectionless-mode Transport Service (CLTS) is provided using the ISO/IEC 8602 Connectionless-mode Transport Protocol. This Group supports the mandatory operation of ISO/IEC 8602, over Connectionless-mode Network Service.

b) Connectionless-mode Transport Service over Connection-mode Network Service:

Group UB

The Connectionless-mode Transport Service (CLTS) is provided using the ISO/IEC 8602 Connectionless-mode Transport Protocol. This Group supports the option of ISO/IEC 8602 that operates over Connection-mode Network Service.

NOTE - A system implementing Group UB and claiming conformance to ISO/IEC 8602 also has to implement the mandatory operation over CLNS as required by ISO/IEC 8602.

4.5.1.5 Interworking between Transport Profile Groups

The following tables 1 and 2 show the interworking capabilities between Profiles. Table 1 shows the interworking between Profiles in Profile class T, and table 2 shows the interworking among Profiles in Profile class U. Successful establishment of a Transport Connection is dependent upon successful negotiation of parameters, some of which are not considered in the following tables.

No interworking is possible between Groups in class T and U because of the different mode of Transport Service provided.

Entries in the tables have the following meaning:

Full: Full OSI interworking (an OSI relay may be required (see 5.2))

Restricted: Interworking capabilities are restricted in the sense that the choice of Transport Protocol classes may be restricted by the static capability of the responder. Successful interworking is dependent on the satisfactory outcome of class negotiation.

Special: Non-OSI relay required for interworking (see also 4.5.2.1)

Special 1: Special restrictions for interworking exist (see 5.2.4).

Special 2: Interworking between these Profile types is not contemplated in any JTC 1 work.

NOTE - Successful interworking depends not only on the satisfactory outcome of the transport protocol class negotiation but also on dynamic responses during transport initiation. Such dynamic responses can include, amongst others, responder reactions to the offered Quality of Service (QOS) or to the specific options requested by the initiator.

Table 1 - Interworking amongst Groups in class T

Responder in Group	Network Service mode	Initiator in Group				
		TA	TB	TC	TD	TE
TA	CL	full	special 1	special 1	special 1	special 1
TB	CO	special 1	full	full	full	full
TC	CO	special 1	restricted	full	full	full
TD	CO	special 1	restricted	restricted	full	special 2
TE	CO	special 1	restricted	restricted	special 2	full

Table 2 - Interworking amongst Groups in class U

Responder in Group	Initiator in Group	
	UA	UB
UA	full	special 2
UB	special 2	full

4.5.1.6 Principles for the Taxonomy of Subnetwork Profiles

4.5.1.6.1 Packet Switched Data Network

(to be supplied)

4.5.1.6.2 Digital Data Circuit

(to be supplied)

4.5.1.6.3 Analogue Telephone Circuit

(to be supplied)

4.5.1.6.4 Integrated Services Digital Network

(to be supplied)

4.5.1.6.5 Local Area Networks

(to be supplied)

4.5.2 Relay Profiles

4.5.2.1 Principles

Relay Profiles define the use of standards from OSI layers 1 to 4, to provide relaying functions between OSI Transport Profiles.

No relays exist between different Profiles of different Transport Profile classes (T, U).

Relays may operate at various layers up to layer 4. However, relays operating at layer 4 are not OSI relays and hence some restrictions or limitations may be expected in their operation. Many proposals for such relays 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.

4.5.2.2 Relay Profile identifier

The identifier for a Relay Profile is of the form

RXp.q

where

R = relay function

X = relay type identifier

This identifier will cover

- the layer at which the relay operates

- the service mode being supported

- the type of relay

p, q= subnetwork identifier

p and q may each take the value of the abcd-structured numerical identifier defined for Transport Profiles. The fully qualified structure need only be used where ne-

cessary (e.g., for circumstances where a distinction must be made between LANs).

RXp.q represents a relay of type X between subnetwork type p and subnetwork type q.

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

4.5.3 Application Profiles

4.5.3.1 Principles

Application Profiles define the use of protocol standards from OSI layers 5 to 7, to provide for the structured transfer of information between end systems.

Each Application Profile is a complete definition of the use of protocol standards from OSI layers 5 to 7, though it may share one or more common definitions of some part of its content with other Application Profiles.

In analogy with the primary distinction made between Transport Profiles, a primary distinction is made between Application Profiles, based on the mode of Transport Service they require:

Profile class A: Application Profiles requiring Connection-mode Transport Service, i.e., using T-Profiles

Profile class B: Application Profiles requiring Connectionless-mode Transport Service, i.e., using U-Profiles

A further distinction is based on Application categories, related to Application Layer standards defined by JTC 1/SC18, and SC21.

In addition, Application categories have been identified related to the use of OSI protocols by other Technical Committees such as ISO TC 184 (Manufacturing Messaging) and TC 46 (Library and Documentation).

4.5.3.2 Common Upper Layer Requirements

Profile specifications on Common Upper Layer Requirements (CULR) describe sets of upper layer elements for common use by several Application profiles.

CULR define the common use of OSI standards for the session layer, presentation layer and part of the application layer.

An ISP defining an Application profile may reference the CULR as the common basis for the selection of options for the upper layers, supplemented by a statement of its own, specific upper layer requirements for the use of these same protocol standards.

CULR do not specify a complete profile, and therefore have no entry within the taxonomy of this Technical Report and no profile identifier will be assigned.

4.5.3.3 Application Profile identifier

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

CXYabc

where:

C = Application Profile class designator:

- A for Profiles requiring Connection-mode Transport Service
- B for Profiles requiring Connectionless-mode Transport Service

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 JTC 1.

abc = the structured numerical identifier for the member(s) of the subdivision. It is possible that a further level of subdivision may become necessary. Only that level of identifier will be used hich is necessary for uniqueness. This level may vary among application functions.

4.5.3.4 Principles for the Taxonomy of Application Profiles

4.5.3.4.1 File Transfer, Access and Management

(to be supplied)

4.5.3.4.2 Message Handling

The Message Handling profiles are based on ISO/IEC 10021 (MOTIS) and the equivalent CCITT X.400 Recommendations. The AMH1 and AMH2 profiles will initially reference the current versions of MOTIS and the 1988 CCITT Recommendations, whereas the AMH3 profiles will be based in the first instance on the CCITT X.435 (1991) Recommendation only (pending inclusion in MOTIS).

The content type-specific profiles (AMH2, AMH3 and further content types to be defined in the future) cover both end-to-end UA-to-UA communication (the content protocol and associated

UA functionality) and use of Message Handling services (by requiring conformance to the appropriate AMH1 profile(s) plus any additional content type-specific requirements).

4.5.3.4.3 Directory

(to be supplied)

4.5.3.4.4 Virtual Terminal

(to be supplied)

4.5.3.4.5 OSI Management

(to be supplied)

4.5.3.4.6 Transaction Processing

The first level of the Taxonomy substructure corresponds to the definition of the three conformance classes defined in the OSI TP standard. The second level corresponds to the selection between Polarized Control and Shared Control for each of the conformance classes.

4.5.3.4.7 Remote Database Access

(to be supplied)

4.5.3.4.8 Manufacturing Messaging

The Manufacturing Message Specification allows interworking of various equipment such as computers and programmable devices within the manufacturing environment. It resides in the Application Layer of the OSI Reference Model and uses an object modelling approach for the description of manufacturing applications. MMS defines a set of messages suitable for the manipulation of the real devices in the manufacturing environment.

MMS has evolved into a multi-part ISO/IEC standard, ISO/IEC 9506. Parts 1 and 2, known as the core, describe the modelling approach, the syntax and semantics of the service and protocol. Additional parts, known as the companion standards, describe the extensions of the core for specific application areas, for example numerical controllers, robot controllers and process control systems.

4.5.3.4.9 Library and Documentation

(to be supplied)

4.5.4 Interchange Format and Representation Profiles

4.5.4.1 Principles

Interchange Format and Representation Profiles define the structure and/or content of the information being interchanged by Application Profiles. Hence, the main feature which distinguishes them from Application Profiles is the absence of a transfer function.

Currently, only interchange formats defined by JTC 1/SC18, SC21, and SC24 are included.

4.5.4.2 Interchange Format and Representation Profile identifier

The identifier for a Profile in the Interchange Format and Representation class is of the form:

FXYabc

where:

F = Interchange Format

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

abc = the structured numerical identifier for the member(s) of the subdivision. It is possible that a further level of subdivision may become necessary. Only that level of identifier will be used which is necessary for uniqueness. This level may vary among the primary subdivisions.

4.5.4.3 Principles for the Taxonomy of Format and Representation Profiles

4.5.4.3.1 Open Document Format

The Open Document Format (FOD) Profiles consist of hierarchy of related ODA Document Application Profiles supporting formatted, as well as, processable documents.

The structure of the Open Document Format (FOD) Profile Taxonomy consists of two levels of subdivision a and b.

- Level a reflects the hierarchically related, increasing complexity and functionality of the document structures supported by the Profile. Three types of complexity are provided for:

  1. Simple Document Structure
  2. Enhanced Document Structure
  3. Extended Document Structure

  The Simple Document Structure is intended to address the general requirements of current word processing applications. The Enhanced Document Structure is

intended to address the general requirements of emerging word processing applications that have been enhanced from the earlier, simple document structures supported by current word processing applications. The Extended Document Structure is intended to address the general requirements of emerging personal publishing, document processing applications.

Level b reflects the particular combination of content architectures supported in the Profile. Three such content architectures are specified in ISO/IEC 8613. Six combinations of content architectures are provided for:

1. Character Content Architecture only.
2. Raster Graphics Content Architecture only.
3. Geometric Graphics Content Architecture only.
4. Character and Raster Graphics Content Architecture.
5. Character and Geometric Graphics Content Architecture.
6. Character, Raster Graphics and Geometric Graphics Content Architecture.

NOTES

1 For a given Profile both levels should be specified.

2 Further levels of subdivision may be identified in the future.

4.5.4.3.2 Computer Graphics Metafile Interchange Format

(for further study)

4.5.4.3.3 SGML Interchange Format

(for further study)

4.5.4.3.4 Directory Data Definitions

The Directory Data Definition Format (FDI) Profiles specify the properties of Object Classes, Attribute Types, and Attribute Syntaxes related to the use of the Directory Application Profiles. Two types of usage are covered - common usage relevant to all such cases, and specific usage relevant to particular Application Profiles.

4.5.4.3.5 Virtual Terminal Environment

The Virtual Terminal Registered Objects (FVT) Profiles define a number of types of information objects used by Virtual Terminal Application Profiles, which are subject to registration.

5 Taxonomy of Profiles

The inclusion of a Profile in this clause is purely for the purpose of assigning a unique, meaningful identifier. It should not be assumed that the inclusion of a Profile in this clause implies that a requirement for that Profile has been identified to SGFS. For such information, see the "Directory of ISPs and Profiles contained therein".

5.1 Transport Profiles

5.1.1 Taxonomy of Subnetworks

The following Taxonomy classifies subnetworks and, where existing, different modes of operation over a particular subnetwork, to provide the OSI Network Service. The Taxonomy is used in all Transport Profile Groups, unless otherwise stated.

a b c d e	Subnetwork Type
1	PACKET SWITCHED DATA NETWORK (PSDN)
11	Permanent Access to a PSDN
111	PSTN leased line
1111	Virtual Call (VC)
1112	Permanent Virtual Circuit (PVC)
112	Digital data circuit / CSDN leased line
1121	Virtual Call (VC)
1122	Permanent Virtual Circuit (PVC)
113	ISDN B-channel, permanent[4]
1131	Virtual Call (VC)
1132	Permanent Virtual Circuit (PVC)
12	Switched Access to a PSDN
121	PSTN Case
1211	Virtual Call (VC)
122	CSDN Case
1221	Virtual Call (VC)
123	ISDN B-channel Case
1231	Virtual Call (VC)
2	DIGITAL DATA CIRCUIT
21	Leased (Permanent) Service
22	Dial-up (CSDN)
3	ANALOGUE TELEPHONE CIRCUIT
31	Leased (Permanent) Service
32	Dial-up (PSTN)
4	INTEGRATED SERVICES DIGITAL NETWORK (ISDN)
41	Permanent Service[4]
411	B-channel
4111	X.25 DTE to DTE operation
42	Circuit-mode Service
421	B-channel
4211	X.25 DTE to DTE operation
43	Packet-mode Service
431	D-channel access
4311	Virtual Call (VC)
43111	without use of Q.931
43112	with use of Q.931
4312	Permanent Virtual Circuit (PVC)
432	B-channel permanent access[4]
4321	Virtual Call (VC)
43211	without use of Q.931
43212	with use of Q.931
4322	Permanent Virtual Circuit (PVC)
433	B-channel demand access
4331	Virtual Call (VC)
5	LOCAL AREA NETWORKS
51	CSMA/CD
52	Token Bus
53	Token Ring
54	FDDI

[4] also includes the semi-permanent case

5.1.2 Transport Groups

TA Group TA: COTS over CLNS

For the detailed subnetwork Taxonomy see 5.1.1.

TB Group TB: COTS over CONS :
with mandatory Transport Protocol
Classes: 0 and 2 and 4

For the detailed subnetwork Taxonomy see 5.1.1.

TC Group TC: COTS over CONS :
with mandatory Transport Protocol
Classes: 0 and 2

For the detailed subnetwork Taxonomy see 5.1.1.

TD Group TD: COTS over CONS :
with mandatory Transport Protocol
Class: 0

For the detailed subnetwork Taxonomy see 5.1.1.

TE Group TE: COTS over CONS :
with mandatory Transport Protocol
Class: 2

For the detailed subnetwork Taxonomy see 5.1.1.

UA Group UA: CLTS over CLNS

For the detailed subnetwork Taxonomy see 5.1.1.

UB Group UB: CLTS over CONS

For the detailed subnetwork Taxonomy see 5.1.1.

5.2 Relay Profiles

5.2.1 Relaying the Network Internal Layer Service, as defined in ISO/IEC 10028

RA Relaying the Connectionless-mode Network Service

For the subnetwork identifiers p, q (as defined in 4.5.2.2) see the detailed subnetwork Taxonomy in 5.1.1.

RB Relaying the Connection-mode Network Service

For the subnetwork identifiers p, q (as defined in 4.5.2.2) see the detailed subnetwork Taxonomy in 5.1.1.

5.2.2 Network Layer Protocol Relaying

RC X.25 Protocol Relaying

An approach for this type of relay could be as suggested in ISO/IEC TR 10029.

For the subnetwork identifiers p, q (as defined in 4.5.2.2) see the detailed subnetwork Taxonomy in 5.1.1.

Only the following subnetwork type identifiers are valid: 11n, 21n, 31n, 41n, 43111, 4312, 43211, 4322, 5n.

5.2.3 Relaying the MAC Service

RD Relaying the MAC Service using transparent bridging

For the subnetwork identifiers p, q (as defined in 4.5.2.2) see the detailed subnetwork Taxonomy in 5.1.1.

Only subnetwork type identifiers of the form 5n are valid for use with RD relays.

RE Relaying the MAC Service using source routing

For the subnetwork identifiers p, q (as defined in 4.5.2.2) see the detailed subnetwork Taxonomy in 5.1.1.

Only subnetwork type identifiers of the form 53 and 54 are valid for use with RE relays.

5.2.4 CO/CL Interworking

RZ Relaying between Connectionless-mode Network Service and Connection-mode Network Service

The final position in the Taxonomy and the substructure of this relay type is for further study.

An approach for this type of relay could be as suggested in ISO/IEC TR 10172.

5.3 Application Profiles

5.3.1 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

4	FILESTORE MANAGEMENT SERVICE

5.3.2 Message Handling

AMH Message Handling

a b c	Substructure
1	COMMON MESSAGING
1 1	Message Transfer (P1)
1 1 1	Normal mode
1 1 2	X.410(1984) mode
1 2	MTS Access (P3)
1 3	MS Access (P7)
2	INTERPERSONAL MESSAGING (IPM)
2 1	IPM Content Protocol
2 2	IPM Requirements for Message Transfer (P1)
2 3	IPM Requirements for MTS Access (P3)
2 4	IPM Requirements for MS Access (P7)
3	EDI MESSAGING (EDIM)
3 1	EDIM Content Protocol
3 2	EDIM Requirements for Message Transfer (P1)
3 3	EDIM Requirements for MTS Access (P3)
3 4	EDIM Requirements for MS Access (P7)

5.3.3 Directory

ADI Directory

a b	Substructure
1	DIRECTORY ACCESS
1 1	DUA Support of Directory Access
1 2	DSA Support of Directory Access
2	DIRECTORY SYSTEM
2 1	DSA Responder Role
2 2	DSA Initiator Role
3	DISTRIBUTED OPERATIONS
3 1	DUA Support of Distributed Operations
3 2	DSA Support of Distributed Operations
4	DIRECTORY USE OF STRONG AUTHENTICATION
4 1	Specific Digital Signature Schemes
4 x	for further study (see note)

NOTE - the use of strong authentication in distributed operations is for further study

5.3.4 Virtual Terminal

AVT Virtual Terminal

a b	Substructure
1	BASIC CLASS (A-MODE)
1 1	A-mode Default
1 2	Telnet
1 3	Scroll
1 4	CCITT X.3 PAD Interworking
1 5	Transparent
1 6	Generalized Telnet
2	BASIC CLASS (S-MODE)
2 1	S-mode Default
2 2	Forms
2 3	Paged
2 4	Enhanced Forms
2 5	Enhanced Paged

NOTE - The "enhanced" entries are placeholders for the addition of facilities which will be specified in the forthcoming second addenda to the Basic Class Virtual Terminal standards. These include specifically "ripple" editing functions.

5.3.5 OSI Management

AOM OSI Management

a b	Substructure
1	MANAGEMENT COMMUNICATIONS
1 1	Basic Management Communications
1 2	Enhanced Management Communications
2	MANAGEMENT FUNCTIONS
2 1	Management Capabilities
2 1 1	General Management Capabilities
2 1 2	Alarm Reporting and State Management Capabilities
2 1 3	Alarm Reporting Capabilities
2 2	Event Report Management
2 2 1	General Event Report Management
2 3	Log Control

231 General Log Control

5.3.6 Transaction Processing

ATP Transaction Processing

a b Substructure

1 APPLICATION SUPPORTED TRANSACTIONS

11 Polarized Control
12 Shared Control

2 PROVIDER SUPPORTED UNCHAINED TRANSACTIONS

21 Polarized Control
22 Shared Control

3 PROVIDER SUPPORTED CHAINED TRANSACTIONS

31 Polarized Control
32 Shared Control

5.3.7 Remote Database Access

ARD Remote Database Access

a b Substructure

(to be studied)

5.3.8 Manufacturing Messaging

AMM Manufacturing Messaging

a b Substructure

1 GENERAL APPLICATIONS
2 ROBOT CONTROLLER APPLICATIONS
3 NUMERICAL CONTROLLER APPLICATIONS
4 PROGRAMMABLE LOGIC CONTROLLER APPLICATIONS
5 PROCESS INDUSTRIES APPLICATIONS
6 PRODUCTION MANAGEMENT APPLICATIONS

NOTE - Further refinement of the substructure, beneath this level, to increase the granularity of the profile classification, is for further study.

5.3.9 Library and Documentation

ALD Library, Documentation

a b Substructure

1 SEARCH AND RETRIEVE (SR)

11 Connection-mode
12 Store-and-Forward (IPMS) (see note 1)
13 Store-and-Forward (P_{SR} over P1) (see note 1)
19 Application Relay (see note 2)

2 INTERLIBRARY LOAN (ILL) (see note 3)
21 Connection-mode
22 Store-and-Forward (IPMS)
23 Store-and-Forward (P_{ILL} over P1)
24 FTAM
25 Mixed Mode (see note 3)
251 Connection-mode and Store-and-Forward (IPMS)
252 Connection-mode and Store-and-Forward (P_{ILL} over P1)
29 Application Relay (see note 2)

3 COMBINED SR AND ILL (see note 3)
31 Connection-mode
32 Mixed Mode
321 SR Connection-mode; ILL Connection-mode and Store-and-Forward (IPMS)
322 SR Connection-mode; ILL Connection-mode and Store-and-Forward (P_{ILL} over P1)

33 Combined SR and ILL, Store-and Forward
331 SR and ILL; Store-and-Forward (IPMS)
332 SR and ILL; Store-and-Forward (P_{SR} and P_{ILL} over P1)

39 Combined SR and ILL, Application Relay (see note 2)

NOTES
1 No base standard (SR over IPMS or P_{SR})
2 Provisional and for further study
3 ILL base standard does not specify mapping to supporting services.

5.4 Interchange Format and Representation Profiles

5.4.1 Open Document Format

FOD Open Document Format

a b Substructure

1 SIMPLE DOCUMENT STRUCTURE

11 Character content architecture only

2 ENHANCED DOCUMENT STRUCTURE

26 Character, Raster Graphics and Geometric Graphics content architecture

3 EXTENDED DOCUMENT STRUCTURE

36 Character, Raster Graphics and Geometric Graphics content architecture

5.4.2 Computer Graphics Metafile Interchange Format

FCG Computer Graphics Metafile Interchange Format

a b Substructure

(to be studied)

5.4.3 SGML Interchange Format

FSG SGML Document Interchange Format

a b Substructure

(to be studied)

5.4.4 Directory Data Definitions

FDI Directory Data Definitions

a b Substructure

1 COMMON DIRECTORY USE

11 Normal
12 Strong Authentication (see note)

2 MHS USE OF THE DIRECTORY

3 FTAM USE OF THE DIRECTORY

NOTE - The use of strong authentication in distributed operations is for further study

5.4.5 Virtual Terminal Environment

FVT Virtual Terminal Registered Objects

a b c Substructure

1 BASIC CLASS VTE-PROFILES

11 A-mode

111 Telnet
112 Scroll
113 CCITT X.3 PAD Interworking
114 Transparent
115 Generalized Telnet

12 S-mode

121 Forms
122 Paged
123 Enhanced Forms
124 Enhanced Paged

2 BASIC CLASS CONTROL OBJECTS

21 Miscellaneous

211 Sequenced Application
212 Unsequenced Application
213 Sequenced Terminal
214 Unsequenced Terminal
215 Application RIO Record Loading
216 Terminal RIO Record Notification
217 Horizontal Tabulation
218 Logical Image
219 Status Message
2110 Entry Control
2111 Waiting Time
2112 Printer
2113 Field Definition Management
2114 Terminal Signal Titles
2115 Form Help Text

22 Field Entry Instruction Control Object (FEICO) (see note)

221 Forms FEICO No.1
222 Paged FEICO No.1

23 Field Entry Pilot Control Object (FEPCO) (see note)

231 Forms FEPCO No.1
232 Paged FEPCO No.1

24 Reference Information Object (RIO) (see note)

25 Termination Conditions Control Objects (TCCO)

251 TCCO No.1

3 BASIC CLASS ASSIGNMENT TYPES

31 Repertoire (see note)

32 Font

3 2 1	Font Assignment Type No.1
3 3	Colour (see note)

NOTE - Entries in this classification are subject to registration.

Annex A (informative).

Bibliography of other referenced documents.

This annex is for information only.

SGFS Standing Document 2. [5] *Directory of ISPs and Profiles contained therein.*

[5] updated and published regularly by the SGFS Secretariat as an ISO/IEC JTC 1 SGFS N-numbered document.