INTERNATIONAL STANDARDIZED PROFILE

ISO/IEC ISP 11187-5

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Information technology — International Standardized Profiles AVT1n, AVT2n — Virtual Terminal Basic Class — Application Profiles —

Part 5:
AVT16 — A-mode Generalized Telnet Application Profile

Technologies de l'information — Profils normalisés internationaux AVT1n, AVT2n — Classe de base du terminal virtuel — Profils d'application —

Partie 5: AVT16 — Profil d'application mode A de téléréseau généralisé

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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. In addition to developing International Standards, ISO/IEC JTC 1 has created a Special Group on Functional Standardization for the elaboration of International Standardized Profiles.

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

Draft International Standards are circulated to national bodies for voting. Publication as an International Standardized Profile requires approval by at least 75% of the national bodies casting a vote.

International Standardized Profile ISO/IEC ISP 11187-5 was prepared with the collaboration of

— Asia-Oceania Workshop (AOW);

— European Workshop for Open Systems (EWOS);

— Open Systems Environment Implementors' Workshop (OIW).

ISO/IEC ISP 11187 consists of the following parts, under the general title *Information technology - International Standardized Profiles AVT1n, AVT2n - Virtual Terminal Basic Class - Application Profiles:*

— *Part 1:Common VT Protocol Requirements List*

— *Part 2:Common Supporting Layers Requirements List*

— *Part 3:AVT22 - S-mode Forms Application Profile*

— *Part 4:AVT23 - S-mode Paged Application Profile*

— *Part 5:AVT16 - A-mode Generalized Telnet Application Profile*

— *Part 6:AVT15 - A-mode Transparent Application Profile*

Annexes A, B and C form an integral part of this part of ISO/IEC ISP 11187. Annex D is for information only.

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Introduction

ISO/IEC ISP 11187 is defined within the context of Functional Standardization, in accordance with the principles specified in ISO/IEC TR 10000, "Framework and Taxonomy of International Standardized Profiles". The context of Functional Standardization is one part of the overall field of Information Technology (IT) standardization activities, covering base standards, profiles and registration mechanisms.

This International Standardized Profile contains Open Systems Interconnection (OSI) Application Profiles (A-profiles) defined within the framework of ISO/IEC TR 10000 for the Virtual Terminal Basic Class Service and Protocol that is specified in ISO 9040 and ISO 9041.

This part of ISO/IEC ISP 11187 was developed in close cooperation between the three Regional OSI Workshops, namely the OSE Implementors' Workshop (OIW) of the United States, the European Workshop for Open Systems (EWOS) and the Asia-Oceania Workshop (AOW). It was developed under the editorship of OIW from a functional standard specified in the OIW Stable Implementation Agreements Version 5. The text is harmonized between these three Workshops and it has been ratified by the plenary assemblies of each Workshop.

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Information technology - International Standardized Profiles AVT1n, AVT2n - Virtual Terminal Basic Class - Application Profiles -

Part 5
AVT16 - A-mode Generalized Telnet Application Profile

1 Scope

1.1 General

The concept of Profiles for OSI, and the structure of the International Standardized Profiles that document them, are defined in ISO/IEC TR 10000-1. Such Profiles are divided into a number of different classes and sub-classes. Two of these classes contain sub-classes comprising functions of the Virtual Terminal Basic Class Service and Protocol specified in the base standards ISO 9040 and ISO 9041. These are the Application Profiles (A-Profiles) and the Interchange Format and Representation Profiles (F-Profiles).

The relationship between A-Profiles and F-Profiles is described in 7.3.2 of ISO/IEC TR 10000-1 and is as follows. 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. It is the purpose of F-Profiles to specify such information structures. Particular functional requirements may then be met by the combination of an A-Profile with one or more F-Profiles.

Establishment of a VT-association involves the selection by negotiation of a particular Virtual Terminal Environment profile (VTE-profile), and of particular values for any arguments of that VTE-profile. The VTE-profile specification, and possibly also the values of certain VTE-profile arguments, may in turn reference the definitions of VT control object types and assignment types. These VTE-profiles, control object types and assignment types are therefore Information Objects that require explicit reference within the VT protocol.

Particular instances of these Information Objects are fully defined within the base standards, but the base standards also provide for further instances to be defined by registration. Each registered instance constitutes an F-Profile within the framework of ISO/IEC TR 10000.

The Virtual Terminal Basic Class Service and Protocol may be used to realize a wide range of distinct functions. Particular functions may be realized through the selection of appropriate VT functional units, F-Profiles and other VTE-profile argument values. The specification of the selection required to realize a particular function and to promote interoperability constitutes a Virtual Terminal A-Profile within the framework of ISO/IEC TR 10000.

The three International Registers of VT information structures and the specifications of VT Application Profiles are each published as a separate multi-part ISP as follows:

— ISO/IEC ISP 11184 is the Register of VTE-profiles;

— ISO/IEC ISP 11185 is the Register of control object type definitions;

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— ISO/IEC ISP 11186 is the Register of assignment-type definitions;

— ISO/IEC ISP 11187 contains the specifications of VT Application Profiles.

This part of ISO/IEC ISP 11187 is applicable to environments in which a terminal population requires access to application packages running on a variety of computers. It may be used where the connection between the terminal and the computer that hosts the application package is local, is made across a Local or Wide Area Network, or is made across a concatenation of such networks.

This part of ISO/IEC ISP 11187 contains the specification of the A-mode Generalized Telnet Application Profile. Virtual Terminal implementations that operate in accordance with this A-profile provide powerful general-purpose terminal capabilities which are suitable in particular for TELNET emulation. This A-profile specifies a mode of operation of, and a selection of options for use with, the A-mode Generalized Telnet VTE-profile FVT115. These are together designed to provide versatility and to promote interoperability between Virtual Terminal implementations which support that VTE-profile.

This part of ISO/IEC ISP 11187 also specifies a Profile ICS proforma for the A-mode Generalized Telnet Application Profile specified herein in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ISO/IEC [DIS] 9646-7. The supplier of an implementation which is claimed to conform to ISO/IEC ISP 11187-5 is required to complete a copy of the Profile ICS proforma as specified in 5.2 and is required to provide the information necessary to identify both the supplier and the implementation.

1.2 Position within the taxonomy

The taxonomy of International Standardized Profiles for OSI is laid down in ISO/IEC TR 10000-2. Within the classification scheme of this taxonomy, the OSI Profiles specified in this International Standardized Profile are in the Virtual Terminal sub-class of the class of Application Profiles.

A Profile within this subclass has a Profile identifier of the form AVTab, where ab is a structured numerical identifier that identifies the position of the Profile within two levels of subdivision of the subclass. The value of a is a single digit but b is an integer that is not necessarily a single digit.

In principle the ISO Virtual Terminal model allows for multiple classes of operation, although at the time of publication of this International Standardized Profile only the Basic Class has been defined. The value of the identifier component a distinguishes between the permitted modes of operation of the Virtual Terminal Service as follows:

— a = 1 for Basic Class A-mode (asynchronous mode);

— a = 2 for Basic Class S-mode (synchronous mode).

Values greater than 2 are reserved for future developments.

ISO/IEC ISP 11187 contains the specifications of the Profiles with identifiers of the form AVT1b and AVT2b. The component b distinguishes between different Application Profiles that make use of the same mode of operation.

This part of ISO/IEC ISP 11187 contains the specification of the Application Profile with the Profile identifier:

AVT16 - A-mode Generalized Telnet Application Profile.

1.3 Scenario

The VT Basic Class Service is defined in ISO 9040. It operates within the OSI Reference Model defined in ISO/IEC 7498-1 to provide facilities for interactive terminal-oriented communication between two application-processes. The aspects of an application-process that make use of these facilities constitute a VT-user as defined in ISO 9040. Figure 1 illustrates the elements of the OSI model that are concerned with communication between two VT-users in accordance with a VT Application Profile.

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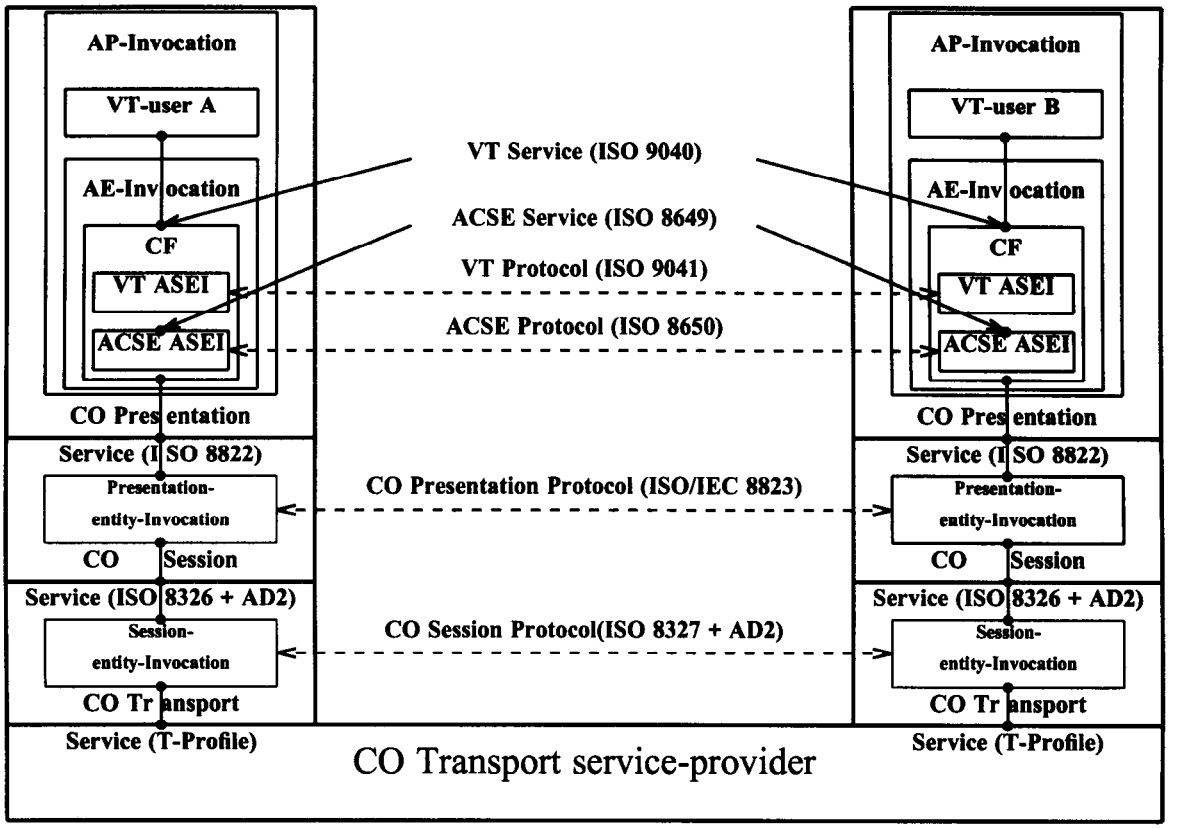

Figure 1 - Interactive VT communication between two end systems

The VT-user component of an application-process (AP) communicates by invoking an application-entity (AE) to establish a VT-association with an application-entity of a peer application-process. In order to provide the VT Basic Class Service to their VT-users, two AE-invocations (AEIs) exchange information by means of both the VT Basic Class Protocol specified in ISO 9041-1 and the ACSE Protocol specified in ISO 8650. The VT Basic Class Service enables the VT-users to exchange data that may include control information related to virtual terminal functions and to real devices.

In the model of the OSI Application Layer given in ISO/IEC 9545 the AE is a composition of two application-service-elements (ASEs)and a Control Function (CF). It is the CF that provides the VT Service to the VT-user. The ASEs are the VT ASE and the ACSE. In an AEI the CF provides the functions of the VT Service by making coordinated use of the services provided to it by invocations of each of the two ASEs. Each ASE-invocation (ASEI) in turn provides its services by an exchange of APDUs with its peer, for which it requires the use of the Connection-oriented Presentation Service. These requirements of the two ASEIs are passed to the CF, which coordinates them and makes the actual use of the Presentation Service.

An AEI operates in accordance with rules determined by an application-context. The definition of the application-context for a VT-association is provided by clause 11 of ISO 9041-1.

A VT Application Profile specifies constraints on the operation of an AEI within the application-context defined in ISO 9041-1. It also specifies constraints on the use of the Presentation Layer by such an AEI and on the consequent use of the Session Layer by the Presentation Layer. A VT Application Profile is intended to be used in conjunction with any Transport Profile (T-Profile) of ISO/IEC TR 10000-2 that provides a

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connection-mode Transport Service for use by the Session Layer.

A VT Application Profile may also specify constraints on the exchange of control information between the VT-users and on the behavior of a VT-user in response to information exchanged.

An AP-invocation may make concurrent or consecutive use of more than one AE-invocation. An AE-invocation may be a partner in one or more application-associations, either concurrently or consecutively. A VT-association is an application-association capable of supporting communication between two VT ASEs.

The VT Application Profiles specified in ISO/IEC ISP 11187 are concerned solely with the operation of a VT- association. They place no constraint on any other application-associations of the AE-invocation concerned or on any other AE-invocation belonging to the AP-invocation concerned.

The VT Application Profile specified in this part of ISO/IEC ISP 11187 assumes a relationship between the two communicating end systems described below. One end system (the keyboard side) assumes an initiator function and the other side assumes the responder function (the application side). These two devices form part of the VT-user component of that end system and are modelled within the data structures of the VT Service.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC ISP 11187. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this part of ISO/IEC 11187 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 ITU-T maintains published editions of its current Recommendations.

ISO/IEC 646:1991, *Information technology - ISO 7-bit coded character set for information interchange.*

ISO/IEC 2022:1994, *Information technology - Character code structure and extension techniques.*

ISO 2375:1985, *Data processing - Procedure for registration of escape sequences.*[1)]

ISO/IEC 7498-1:1994, *Information technology - Open Systems Interconnection - Basic Reference Model: The Basic Model.* (See also ITU-T Recommendation X.200.)

ISO 8326:1987[2)], *Information processing systems - Open Systems Interconnection - Basic connection oriented session service definition.* (See also CCITT Recommendation X.215.)

ISO 8327:1987[2)], *Information processing systems - Open Systems Interconnection - Basic connection oriented session protocol specification.* (See also CCITT Recommendation X.225.)

ISO/IEC 8327-2:[3)], *Information technology - Open Systems Interconnection - Basic connection oriented session protocol specification - Part 2: Protocol Implementation Conformance Statement (PICS) Proforma.*

ISO 8649:1988[2)], *Information processing systems - Open Systems Interconnection - Service definition for the Association Control Service Element.* (See also CCITT Recommendation X.217.)

ISO 8650:1988[2)], *Information processing systems - Open Systems Interconnection - Protocol specification for the Association Control Service Element.* (See also CCITT Recommendation X.227.)

1) The registration authority for ISO 2375 is the European Computer Manufacturers Association (ECMA), 114 rue du Rhone, CH-1204 Geneva, Switzerland, from whom the corresponding register, the *ISO International Register of Coded Character Sets to be used with Escape Sequences*, may be obtained.

2) Currently under revision.

3) To be published.

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ISO 8650:1988/Amd.1:1990, *Information processing systems - Open Systems Interconnection - Protocol specification for the Association Control Service Element. Ammendment 1.*

ISO/IEC 8650-2:1995, *Information technology - Open Systems Interconnection - Protocol specification for the Association Control Service Element: Protocol Implementation Conformance Statement (PICS) Proforma.*

ISO/IEC 8822:1994, *Information technology - Open Systems Interconnection - Presentation service definition.* (See also ITU-T Recommendation X.216.)

ISO/IEC 8823-1:1994, *Information technology - Open Systems Interconnection - Connection-oriented presentation protocol: Protocol specification.* (See also ITU-T Recommendation X.226.)

ISO/IEC 8823-2:1995, *Information technology - Open Systems Interconnection - Connection-oriented presentation protocol: Protocol Implementation Conformance Statement (PICS) Proforma.*

ISO/IEC 8824-1:1995 *Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation.* (See also ITU-T Recommendation X.208.)

ISO/IEC 8825-1:1995, *Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER).* (See also ITU-T Recommendation X.209.)

ISO 9040:1990, *Information technology - Open Systems Interconnection - Virtual Terminal Basic Class Service.*

ISO 9040:1990/Cor.1:1991, *Information technology - Open Systems Interconnection - Virtual Terminal Basic Class Service.* Technical Corrigendum 1.

ISO 9040:1990/Cor.2:1992, *Information technology - Open Systems Interconnection - Virtual Terminal Basic Class Service.* Technical Corrigendum 2.

ISO 9040:1990/Cor.3:1993, *Information technology - Open Systems Interconnection - Virtual Terminal Basic Class Service. Technical Corrigendum 3.*

ISO 9041-1:1990, *Information technology - Open Systems Interconnection - Virtual Terminal Basic Class Protocol - Part 1: Specification.*

ISO 9041-1:1990/Cor.1:1992, *Information technology - Open Systems Interconnection - Virtual Terminal Basic Class Protocol - Part 1: Specification. Technical Corrigendum 1.*

ISO 9041-1:1990/Cor.2:1993, *Information technology - Open Systems Interconnection - Virtual Terminal Basic Class Protocol - Part 1: Specification. Technical Corrigendum 2.*

ISO/IEC 9041-2:1993, *Information technology - Open Systems Interconnection - Virtual Terminal Basic Class Protocol - Part 2: Protocol Implementation Conformance Statement (PICS) Proforma.*

ISO/IEC 9545:1994, *Information technology - Open Systems Interconnection - Application Layer structure.* (See also ITU-T Recommendation X.207.)

ISO/IEC 9646-1:1994, *Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts.* (See also ITU-T Recommendation X.290.)

ISO/IEC 9646-7:1995, *Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements.* (See also Recommendation X.296.)

ISO/IEC 9834-5:1991, *Information technology - Open Systems Interconnection - Procedures for the operation of OSI Registration Authorities - Part 5: Register of VT Control Object Definitions.*

ISO/IEC TR 10000-1:1995, *Information technology - Framework and taxonomy of International Standardized Profiles - Part 1: General principles and documentation framework.*

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ISO/IEC TR 10000-2:1995, *Information technology - Framework and taxonomy of International Standardized Profiles - Part 2: Principles and Taxonomy for OSI profiles.*

ISO/IEC 10731:1994, ***Information technology - Open Systems Interconnection - Basic Reference Model: Conventions for the definition of OSI services.*** (See also Recommendation X.210.)

ISO/IEC ISP 11184-2:1996, *Information technology - International Standardized Profiles FVT1nn - Virtual Terminal Basic Class - Register of VTE-profiles - Part 2: FVT115 - A-mode Generalized Telnet VTE-profile.*

ISO/IEC ISP 11185-12:1995, ***Information technology - International Standardized Profiles FVT2nn - Virtual Terminal Basic Class - Register of control object type definitions - Part 12: FVT2116, FVT2117, FVT2118, FVT2119 - Generalized Telnet Synch, Signal, Negotiation and Subnegotiation Control Objects.***

ISO/IEC ISP 11187-1:[3], ***Information technology - International Standardized Profiles AVT1n, AVT2n - Virtual Terminal Basic Class - Application Profiles - Part 1: Common VT Protocol Requirements.***

ISO/IEC ISP 11187-2:[3], ***Information technology - International Standardized Profiles AVT1n, AVT2n - Virtual Terminal Basic Class - Application Profiles - Part 2: Common Supporting Layers Requirements.***

ISO/IEC ISP 11188-1:1995, ***Information technology - International Standardized Profile - Common upper layer requirements - Part 1: Basic connection oriented requirements.***

3 Definitions

For the purposes of this part of ISO/IEC ISP 11187, the following definitions apply.

3.1 General OSI terminology

3.1.1
This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC 7498-1:

a. application-entity;

b. application-process;

c. real open system.

3.1.2
This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC 10731:

a. service primitive;

b. service-provider.

3.1.3
This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC 8824-1:

a. component type;

b. module;

c. object identifier;

d. sequence type;

e. sequence-of type;

f. set type;

g. set-of type;

h. structured type.

3.1.4
This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC 9545:

a. AE-invocation;

b. application-association;

c. application-context;

d. application-service-element;

e. ASE-invocation;

f. control function.

3.1.5
This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC 9646-1:

a. dynamic conformance requirement;

b. Implementation Conformance Statement;

c. Implementation Conformance Statement proforma;

d. Profile Requirements List;

e. Profile specific Implementation Conformance Statement;

f. Profile specific Implementation Conformance Statement proforma;

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g. Protocol Implementation Conformance Statement;

h. Requirements List;

i. static conformance requirement.

3.2 Terminology of VT standards

3.2.1
This part of ISO/IEC ISP 11187 makes use of the terms defined in ISO 9040 and the following term defined in ISO 9041-1:

a. protocol element.

4 Abbreviations

For the purposes of this part of ISO/IEC ISP 11187, the following abbreviations apply.

ACSE	Association Control Service Element;
AE	Application-entity;
AEI	AE-invocation;
AOW	OSI Asia-Oceanic Workshop;
AP	Application-process;
APDU	Application-protocol-data-unit;
ASE	Application-service-element;
ASEI	ASE-invocation;
ASN.1	Abstract Syntax Notation One;
CF	Control Function;
CO	Control object;
DO	Display object;
EWOS	European Workshop for Open Systems;
ICS	Implementation Conformance Statement;
OIW	OSE Implementor's Workshop;
OSE	Open Systems Environment.
OSI	Open Systems Interconnection;
PDU	Protocol Data Unit;
PICS	Protocol Implementation Conformance Statement;
RL	Requirements List;
SCS	System Conformance Statement;
VT	Virtual Terminal;
VTE	Virtual Terminal Environment;
VTPM	Virtual Terminal Protocol Machine.

All other abbreviations used are defined in ISO/IEC TR 10000 or ISO 9040.

5 Conformance

5.1 Conformance requirements

This Application Profile provides a specification for the use of the Virtual Terminal protocol in combination with supporting upper layer OSI protocols, with a VTE-profile and with a number of VT control objects. The protocols are specified by International Standards, the VTE-profile and VT control objects are information objects specified by International Standardized Profiles in accordance with the taxonomy of ISO/IEC TR 10000-2. Where the specification of an information object delegates certain elements to a referencing Application Profile, the additional information required is specified in clause 6 of this part of ISO/IEC ISP 11187.

Table 1 - Protocols required

Protocol name	Protocol specification	PICS proforma specification
VT	ISO 9041-1:1990	ISO/IEC 9041-2
ACSE	ISO 8650:1988	ISO/IEC 8650-2
Presentation	ISO 8823:1988	ISO/IEC 8823-2
Session	ISO 8327:1987 + AD2:1988	ISO/IEC 8327-2

Table 2 - Information Objects required

Taxonomy identifier	Object type	ISO/IEC ISP Reference
FVT115	VTE-profile	11184-2
FVT2116	Miscellaneous CO	11185-12
FVT2117	Miscellaneous CO	11185-12
FVT2118	Miscellaneous CO	11185-12
FVT2119	Miscellaneous CO	11185-12

This Application Profile distinguishes between initiator and responder end systems in its requirements. It is applicable to a real open system that includes:

— an implementation of each OSI protocol listed in table 1;

— an application-process or terminal-process which implements the control of virtual terminal functions and real devices in accordance with the semantic definition of the information objects listed in table 2.

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Table 2 specifies VT information objects by their taxonomy identifiers as given in ISO/IEC TR 10000-2. The table also gives the general classification of the object within the taxonomy, together with a reference to the ISP part that contains the specification.

A system claiming conformance to this Application Profile shall satisfy:

a. the conformance requirements contained in the specifications of each of the OSI protocols listed in table 1;

b. the conformance requirements contained in the specifications of each of the information objects listed in table 2;

c. the static conformance requirements specified in the RL given in annex A.

A system claiming conformance to this Application Profile shall also exhibit external behavior consistent with having implemented :

d. the virtual terminal protocol machine so as to support the VTE-profile FVT115 as a current-VTE (see A.2.1 of ISO 9041-1);

e. the relevant control objects listed in table 2 in accordance with the CO values, syntax and semantics clause of each specification (ISO/IEC 9834-5 requires there to be such a clause) and with clause 15 of ISO/IEC ISP 11184-2;

f. the additional information object requirements of clause 6 of this part of ISO/IEC ISP 11187;

g. the constraints specified in the Profile Specific ICS proforma given in annex B;

h. the dynamic conformance requirements specified in 8.1.

NOTE - Clause 14 of ISO 9040 permits, but does not require, the semantics of a CO to be specified as part of the registered type definition of the CO. Conformance requirements concerning the semantics of a CO are therefore included not in the CO type definition but instead in a referencing Application Profile. The Profile makes explicit the relationships between the VT base standards and particular information objects, the specifications for which will include between them the semantic specification of each relevant CO.

5.2 Profile ICS proforma

In compliance with 6.5.4 of ISO/IEC [DIS] 9646-7, a Profile ICS proforma for this Application Profile shall consist of:

— the PICS proformas listed in table 1;

— the Profile RL specified in annex A of this part of ISO/IEC ISP 11187;

— the Profile Specific ICS proforma specified in annex B of this part of ISO/IEC ISP 11187.

A conforming Profile ICS proforma shall be technically equivalent to this specification and shall preserve the numbering and ordering of the items in each PICS proforma and the Profile Specific ICS proforma.

A Profile ICS which conforms to this specification shall:

a. describe an implementation which conforms to the Application Profile specification of ISO/IEC ISP 11187-5;

b. be a conforming ICS proforma, which has been completed in accordance with the instructions for completion given in the constituent questionnaires;

c. include the information necessary to uniquely identify both the supplier and the implementation.

6 Information object requirements

The definition of the VTE-profile FVT115 referenced in table 2 above is given in ISO/IEC ISP 11184-2. By 13.1 of that definition, if there is a mutual agreement between the two communicating VT-users to operate that VTE-profile in accordance with a specific VT Application Profile then a default value for a VTE-profile argument that is specified by the Application Profile takes precedence over the default value specified in the VTE-profile definition.

In accordance with clause 9 of ISO/IEC ISP 11184-2 and clause 6 of ISO/IEC ISP 11187-1, a mutual agreement to operate the VTE-profile FVT115 in accordance with the Application Profile AVT16 is created by the establishment of

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a full-VTE for which the VTE-profile name is the ASN.1 object identifier

{ iso standard 11187 1 profiles(1) 115 16 }.

This clause provides the specifications that apply when such a mutual agreement has been established.

7 Control Object Usage

Concerning the usage of the Generalized Telnet Signal Control Object, defined by clause 7 of ISO/IEC 11185-12, a TELNET SYNCH command may be accompanied by an IP, AO, AYT or BREAK command by updating the SY control object followed by an update to the DI or KB control object with both the DM and other desired boolean selected.

8 Profile specific requirements

8.1 Negotiation of VTE-profile arguments

The requirements concerning the support of values for the 2 VTE-profile arguments of FVT115 follow from the VTE-parameter requirements given in tables A.10 to A.15 of the RL in annex A. This Application Profile also specifies requirements concerning the usage of these VTE-profile arguments by the VT-ASSOCIATE and VT-SWITCH-PROFILE services defined in 28.1 and 30.1 of ISO 9040 respectively. These requirements differ between initiator and responder roles.

NOTE - The negotiation procedure ensures that a VT-association request between two conforming implementations will always be accepted, and that the values negotiated for display object VTE-profile arguments will always be the values desired by the responder VT-user if these are supported by the initiator VT-user.

8.1.1
The following VTE-profile argument

r1 x-window

takes integer values. The default value is r1 = 80.

The initiator is not required to make an offer. The responder shall either make no response, in which case the default value takes effect, or shall respond with a value which was included in the initiator's offer.

8.1.2
The following VTE-profile argument

r2 repertoire-assignment

may occur a number of times. This parameter has a default value of " ISO International Registration Numbers 1 and 6".

Values for this argument form an ordered list. The associated 'capability' VTE-parameter is set implicitly to the number of occurrences in the list plus one (for the Virtual Terminal Service Transparent set whose use is described below).

The r2 argument in an Association Request is a sequence of offers. An offer is a sequence of representations of coded character sets from which the responder can choose.

The r2 argument in an Association Response is a sequence of values. A value is the representation of a specific coded character set from the offers made for this element of the ordered list.

The ordered list for the repertoires shall consist of the values in the same order as contained in the r2 argument of the response followed by the Virtual Terminal Service Transparent character set designated by the escape sequence "<ESC> 2/5 2/15 4/2". The offer and value for the Transparent character set is not sent as part of the PDU.

8.2 Device requirements for the keyboard device

The real device represented by device object "KEYBOARD-DEVICE" shall include the capabilities of an object updating device (as defined by 3.3.18 of ISO 9040) as well as the capabilities represented by the VTE-parameters of the device object.

8.2.1
The keyboard device shall be able to generate updates to the Synch, Signal, Negotiation and Subnegotiation COs, as specified in 14.1 of ISO/IEC ISP 11184-2.

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8.2.2
The keyboard device shall be able to generate updates in accordance with 8.2.1 corresponding to all values that are specified in the Profile specific ICS as supported for the Synch, Signal, Negotiation and Subnegotiation COs.

8.3 Device requirements for the display device

The real device represented by device object "DISPLAY-DEVICE" shall include a real display capable of representing the content of display object "D" as well as the capabilities represented by the VTE-parameters of the device object.

8.3.1
If the image displayed by the display device does not make available simultaneously the content of all DO array elements within the update window for the x-dimension then the device shall provide a means of scrolling the image to enable all such array elements to be imaged.

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Annex A
(normative)

Profile Requirements List

A.1 General

A Requirements List for a VT Application Profile specifies those static conformance requirements of the Application Profile that concern OSI protocols. In so doing, it provides the information required to determine whether or not a protocol exchange between two real open systems is consistent with the systems being conformant to those requirements.

This annex provides the Profile Requirements List (Profile RL) for the VT Application Profile AVT16 specified in this part of ISO/IEC ISP 11187, in compliance with ISO/IEC 9646-7.

This RL expresses restrictions upon answers allowed in the PICS proforma specified by:

— ISO/IEC 9041-2:1993;

which applies to the VT protocol specified by

— ISO 9041-1:1990;

— ISO 9041-1:1990/Cor.1:1992;

— ISO 9041-1:1990/Cor.2:1993.

This RL incorporates by reference, as nested RLs, that contained in the following ISP:

— ISO/IEC ISP 11187-1

and those contained in the specifications of each VT information object that is claimed, in the Profile Specific ICS for this Application Profile, to be supported by the implementation.

A.2 Notation

A.2.1 Item references

Each table entry in this RL corresponds to an item in the PICS proforma of ISO/IEC 9041-2 as referenced above. Individual items in the proforma are referenced by the means specified in 9.5 of ISO/IEC [DIS] 9646-7. Such a reference has the form y/z where y is a reference within the ICS proforma to the smallest subclause that contains the item concerned and z is the reference number of the item within that subclause.

A.2.2 Item names

Each table entry in this RL includes the item name that is given in the PICS proforma of ISO/IEC 9041-2. For PDU parameters these item names correspond to ASN.1 types, or to the identifiers of named types, that are used in the specification of the structure of VT PDUs given in clause 12 of ISO 9041-1. Where the type concerned is a structured type and the following entries in the RL refer to its components, the item names for the components are indented to indicate this relationship.

A.2.3 Negotiation capabilities

Each table entry in this RL for a VTE-parameter specifies whether or not that VTE-parameter is negotiable. This is informative; the normative requirement is provided by the specifications of the VT information objects referenced by this profile, in accordance with 5.4.3 of ISO/IEC ISP 11187-1.

A.2.4 Normative references

Each table entry in this RL for a PDU parameter may optionally contain a reference to additional normative requirements that are given in the body of the specification to which this RL is annexed.

NOTE - The status values in an RL are themselves normative requirements of the profile that do not require reference to static conformance requirements given elsewhere in the profile specification; see A.5.3 of ISO/IEC TR 10000-1. This is in contrast to the situation for an ICS proforma as specified in 8.3 of ISO/IEC 9646-7, so that the reference columns serve different purposes in these two contexts.

A.2.5 Status columns

The status value assigned to a capability in the PICS proforma determines the support answers that are permitted for an implementation that is claimed to conform to the base standard. It also determines the implications of the answers for a test of conformance to the base standard.

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Status values specified in this RL may strengthen those specified in the PICS proforma for an implementation that is claimed to conform to the profile. This strengthening may refer to the permitted answers, or to the implications for conformance testing, or both.

NOTE - The incorporation of nested RLs occurs similarly. When two RLs both specify a status value for the same capability, the strongest one applies.

A.2.5.1 PICS support answers

The support columns in the PICS proforma are used to specify whether or not a particular capability is claimed to be supported. When the PICS proforma is being completed as part of an ICS for this Application Profile, the following notation should be used wherever possible, in accordance with ISO/IEC 9646-7:

'yes' or 'y' the capability is claimed to be supported;

'no' or 'n' the capability is claimed to be not supported;

'n/a' or '-' no answer is being given.

Depending on the context, no answer means either that an answer is logically meaningless or that no claim is being made as to the level of support.

The above notation differs from that specified in the PICS proforma itself. Where the answers 'y', '-' and 'Ig' would be given as defined in the PICS proforma, the corresponding appropriate answers as defined above are 'yes', 'no' and 'n/a' or equivalents; see A.2.5.5 in particular concerning support of syntax but not semantics. The notation of ISO/IEC 9646-7 used above postdates that of the PICS proforma, is more precisely defined and no answer, i.e.'n/a', is permitted in situations where none of the notations defined in the PICS proforma is appropriate.

A.2.5.2 Profile status notation

The columns headed 'Status' or 'Sts' in this RL specify Profile status values. The following notation is used in these status columns:

m mandatory - this capability shall be supported. The only support answer permitted is 'yes' (or equivalent).

o optional - this capability may, but need not, be supported. The support answers permitted are 'yes', 'no' and 'n/a' (or equivalents). For the purposes of conformance testing, an answer 'no' should be treated as if the answer were 'n/a'

i irrelevant, out-of-scope - this capability may, but need not, be supported. The support answers permitted are 'yes', 'no' and 'n/a' (or equivalents). For the purposes of conformance testing, answers 'yes' and 'no' should be treated as if the answer were 'n/a'.

x excluded - this capability shall not be supported. The only support answer permitted is 'no' (or equivalent).

- not applicable - the dynamic conformance requirements of the base standards are such that this capability is not available in the context concerned, so that the question of its support does not arise. The only support answer permitted is 'n/a' (or equivalent).

Where the status of a capability is dependent on whether or not some other capability is supported, the following additional conventions are used:

c<integer> conditional status;

o.<integer> restricted optional status.

A conditional status is a status that involves a prerequisite. Its scope is a single item and it evaluates to one of the above status values according to the value of a predicate. The conditional expression is given in a footnote to the table concerned.

A restricted optional status is a status that involves a co-requisite. Its scope is a group of items within a single table, each of which is individually optional but where there is a restriction on the set of permitted support

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answers. The integer identifies a unique group of options and the corresponding restriction is given in a footnote to the table concerned.

NOTE 1 - The period in the status notation o.<integer> signifies that the restriction applies jointly to all items with the same integer. In contrast, if a status c<integer> is assigned to more than one item in the same table then it applies individually to each item. This notation follows 9.2 of ISO/IEC [DIS] 9646-7.

The status values of subparameters are indented to correspond to the pattern of the item names; see A.2.2. The status value given for a subparameter is conditional on the support of the parent parameter, i.e. the closest preceding parameter with one fewer level of indent, otherwise the subparameter is not applicable. This follows the conventions adopted in the PICS proforma.

Where the status values given in a table, or a section of a table, are conditional on the values taken by one or more parameters then the condition is specified by a predicate given at the head of the table or section concerned.

NOTE 2 - Such prerequisites arise when parameters play the part of identifier fields for classes of information object; see 3.6 of ISO/IEC [DIS] 8824-2. At the time of preparation of ISO 9041-1 this extension of ASN.1 to permit formal definition of classes of information object was not available, so the nature of such parameters remains implicit in the VT protocol specification.

A.2.5.3 Interpretation of 'supported'

For a functional unit, support means that the functions of the unit are implemented and available for use in accordance with the protocol specification.

For a VTE-parameter, support means that the VT protocol machine supports the Existence status 'Defined' for that VTE-parameter; see A.2.1 of ISO 9041-1.

For a PDU, support means that the PDU is capable of being sent or received, according to the role concerned, in the context of supported functional units.

For a PDU parameter, support means that the implementation is capable of handling the parameter, i.e. sending or receiving it according to the role concerned, for the value range specified in the PICS as supported. The capability to send the parameter does not require the parameter to be present in every instance of the PDU concerned. The capability to receive the parameter includes taking such action as is required in accordance with the semantics of the received value.

NOTE - The action appropriate to the semantics of a received parameter value is often simply to pass the decoded value transparently to the service user.

A.2.5.4 Interpretation of 'not supported'

A support answer of 'no' is a specific statement that a capability is not supported.

If a VTE-parameter is not supported, the VT protocol machine supports only the value 'Undefined' for the Existence status of that VTE-parameter; see A.2.1 of ISO 9041-1.

If a functional unit is not supported, it means that the functions of the unit are not available for use, either through not being implemented or through being explicitly disabled.

The VT protocol has no PDUs for which a support answer of 'no' is valid.

If a PDU parameter is not supported in a sending role, it means that the parameter will not be present in any instance of the PDU concerned that is generated by the implementation.

If a PDU parameter is valid according to the protocol specification, a claim that it is not supported in a receiving role can occur within this profile only if the parameter is excluded from being sent by a conforming peer implementation; see clause A.3. If the parameter is received, the implementation may either reject the PDU or may accept it and respond correctly to it within the protocol specification; see 7.4.3.1 of ISO/IEC [DIS] 9646-6. If it accepts the PDU then the implementation is operating outside of this profile; the peer implementation is necessarily not conformant to the profile. Such acceptance is not a case of non-conformance, nor shall it be considered to contradict the claim that the parameter is not supported when the implementation is configured to this profile.

NOTE - Some VT PDUs have parameters whose use is conditionally invalid according to the protocol

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specification, such as those for the negotiation of VTE-parameter values that are not permitted arguments of the VTE-profile concerned. It is a protocol error if an implementation receives a VT PDU that includes such an invalid parameter.

A.2.5.5 Interpretation of 'no answer'

If the status of a capability permits an answer 'n/a' then an implementation may provide partial support for the capability, for which neither 'yes' nor 'no' would be a correct description. Any behavior that is permitted by the protocol specification is also permitted by the profile; in particular the capability may be fully supported.

For a capability that has separate sending and receiving roles, this support answer can occur in a receiving role within this profile only if the parameter is excluded from being sent by a conforming peer implementation; see clause A.3. In this context it should be used if the syntax, but not the semantics, is supported for receiving, a situation for which the notation 'Ig' is specifically defined in the support notation of the PICS proforma.

A.2.6 Value columns

In principle there is no distinction between a PDU parameter and a parameter value, since for a parameter whose value is a value of a structured ASN.1 type, each component type appears in the PICS proforma as a subparameter with its own status value. However, a PICS specifies the status values and support answers for parameter values in a different manner than that for other capabilities.

A.2.6.1 PICS proforma allowed values

The PICS proforma includes 'allowed values' and 'supported values' columns for VTE-parameters and, separately in both sending and receiving roles, for PDU parameters. The 'allowed values' columns specify the values that are permitted to be included in the 'supported values' columns of the completed PICS.

The entries in the 'allowed values' columns of a PICS proforma shall be interpreted as assigning a status value 'optional' to each allowed value. All other values of the ASN.1 type concerned are prohibited according to the protocol specification. Where the PICS proforma does not contain an entry in the 'allowed values' column, all values of the ASN.1 type concerned shall be considered as allowed.

NOTE - The PICS proforma does not contain entries in the 'allowed values' columns for structured types, such as sequence-of and set-of types, if the protocol places restrictions only on the component types that have separate entries in the PICS proforma. Nevertheless this RL may place constraints on the permitted size of such sequences and sets, so the concept of allowed values is still required.

A.2.6.2 Profile values

A.2.6.2.1 Status notation for values

This RL may modify the status of an allowed value, as it may do for any other capability. Since a profile status may be assigned independently to each allowed value, an abbreviated notation is used in this RL as follows.

A status symbol is prefixed to a set of values. If it is one of the basic status values 'm', 'o', 'x' or 'n/a' then it applies individually to each member of the set; there is no implication for values not in the set. If it is a reference to a conditional expression of the form c<integer> then it applies individually to each member of the set but the referenced expression may also assign a status value to all allowed values not in the set. If it is a reference of the form o.<integer> to an expression of restricted optional status then its scope is the specified set of values but again the referenced expression may also assign a status value to all allowed values not in the set.

NOTE 1 - A restricted option may, for example, be used to specify that at least one value in the set shall be supported and that all values not in the set are excluded.

It is sometimes convenient to specify the scope of a restricted option by exclusion, so that the restriction applies to the allowed values that are not in the specified set. In this case a modified notation is used in this RL, of the form <status>.<integer>, where <status> is the basic status value that applies to the remaining values, i.e. those that are in the specified set.

NOTE 2 - A restricted option of the form m.<integer> may, for example, be used to specify that support for all values in a specific range of consecutive integer values is mandatory and that all other values are

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optional but with the requirement that the supported values, including the mandatory ones, shall all be consecutive.

This notation is also used in the case in which the restriction on the optional values is the extreme one of them all being excluded.

A.2.6.2.2 Specification of value sets

The status notation described in A.2.6.2.1 requires a notation for the specification of subsets from the set of allowed values. In this RL, different notations are used in the case of VTE-parameter values and PDU parameter values.

Values for VTE-parameters are given in the notation defined in A.2 of ISO 9040 for the definition of VTE-profiles. Subsets of values are defined by giving an explicit list separated by commas.

A PDU parameter takes values of a specific ASN.1 type. A subset of the allowed values is specified by an ASN.1 element set specification in the notation of clause 39 of ISO/IEC [DIS] 8824-1, the parent type being the type defined in the protocol specification for the parameter concerned.

NOTE - The RL may use an element set specification to specify size constraints on ASN.1 sequence-of and set-of types even though the PICS proforma does not contain a corresponding entry in the allowed values column.

A.2.6.3 PICS supported values

The entries in the 'supported values' columns of a PICS shall be interpreted as assigning a support answer 'yes' to each listed value. The support answer implied for an allowed value that is not in the list of supported values depends as follows on the status assigned to the value concerned:

— a support answer 'no' is assigned to each value for which the status is 'excluded';

— a support answer 'n/a', i.e. no answer, is assigned to each value for which the status is 'optional' or 'out-of-scope'.

A.2.6.4 Interpretation

The interpretation of the support answers for PDU parameter values is as specified in A.2.5.3 to A.2.5.5 for PDU parameters, for reasons given above.

A support answer 'yes' for a negotiable VTE-parameter value means that the implementation always offers this value, either explicitly or by default, in negotiation for this VTE-parameter and that it always accepts this value when offered. For a non-negotiable VTE-parameter it implies that the implementation supports this value if it is assigned to that VTE-parameter in accordance with the VTE-profile specification.

NOTE - This profile specifies that omission of an offer for a particular VTE-profile argument is to be interpreted as a default offer of all the values that have mandatory support, within the profile, for the initiator or responder role as appropriate.

A support answer 'no' for a negotiable VTE-parameter value means that the implementation does not offer this value in a negotiation of VTE-parameter values; if it accepts this value when offered by a non-conforming peer implementation then it is operating outside of the profile. For a non-negotiable VTE-parameter it implies that the implementation does not support this value if it is assigned to that VTE-parameter in accordance with the VTE-profile specification.

A support answer 'n/a' for a VTE-parameter value places no constraint on the ability of the implementation to offer, responder support this value, whether the value is determined by negotiation or otherwise.

A.3 Asymmetric requirements

The static conformance requirements of a profile may be different with respect to different roles, such as sending/receiving or initiating/responding. For example, a profile may require an implementation to be able to receive, and to respond correctly, to a wider range of values for a PDU parameter than may be sent to it by a conforming peer implementation. By 7.4.3 of ISO/IEC [DIS] 9646-6 and 6.6.3 of ISO/IEC TR 10000-1, a profile shall clearly identify, for each conformance requirement, whether there is, or is not, an asymmetry. If there is asymmetry, the profile shall identify the asymmetric requirements.

This RL specifies no requirements that are asymmetric between initiator and responder roles, other than those already contained in the base standards.

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This RL identifies an asymmetry between the protocol requirements of systems operating in initiator and responder roles. The requirements in each role are specified separately in the tables of the RL.

This RL identifies an asymmetry between sending and receiving. Its requirements in a sending role are specified explicitly in the tables of the RL. It places no explicit requirements on a protocol implementation in a receiving role beyond those contained in the base standards. According to A.3.2.1 of ISO/IEC [DIS] 9646-7, support of a PDU parameter is defined as being able to handle, in send and receive mode, the syntax of the parameter, its definition, its value range and other characteristics, and to use the parameter contents or its semantics to take an action. An initiator or responder implementation shall be considered to satisfy these requirements if it can handle in this manner the entire range of values that may be sent to it by a conforming responder or initiator implementation respectively, namely all values that are not explicitly excluded for sending.

NOTES

1 A protocol base standard may specify requirements concerning behavior on reception of a parameter value that is outside the range permitted by the base standard. These requirements still apply for conformance to any profile that includes the protocol concerned.

2 The behavior of an implementation is undefined if it receives a parameter value that is prohibited by a profile but permitted by the base standard; see A.2.5.4. By 7.4.3.1 of ISO/IEC [DIS] 9646-6, in a test of conformance the means of testing shall only exhibit in profile behavior and shall not attempt to coerce the receiving system under test to operate outside of the profile. This implies for this Application Profile that the means of testing shall not send parameter values to an implementation under test that are excluded from being sent by a conforming peer implementation.

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A.4 VT service options

Table A.1 gives requirements concerning VT functional units that are additional to those given in ISO/IEC 11187-1.

Table A.1 - Functional Units

Ref. (9041-2)	Feature	Status
A.2.1/4	Urgent Data	See note
A.2.1/5	Break	m
A.2.1/7	Structured Control Objects	m
NOTE Optional but recommended if present in supporting layers.		

A.5 VT environment parameters

Tables A.2 to A.8 below specify static conformance requirements concerning the VT environment parameters that are listed in A.3 of the PICS.

Table A.2 - Support requirements for VTE display, control and device objects

Item Ref. (9041-2)	Name of Item	Value	Terminal Status	Application Status
A.3.2/1	display-object-name	"K"	m	m
A.3.3/1	display-object-name	"D"	m	m
A.3.7.14/1	device-name	KEYBOARD-DEVICE	m	m
A.3.7.15/1	device-name	DISPLAY-DEVICE	m	m
A.3.8.1/1	CO-name	SY	m	m
A.3.8.1/1	CO-name	KB	m	m
A.3.8.1/1	CO-name	DI	m	m
A.3.8.1/1	CO-name	NI	m	m
A.3.8.1/1	CO-name	NA	m	m
A.3.8.1/1	CO-name	SBI	m	m
A.3.8.1/1	CO-name	SBA	m	m

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Table A.3 - VTE requirements for terminal display object

Item ref. (9041-2)	Name of item	Negot-iable	Profile values	Terminal Status	Application Status
A.3.5/5	x-window	Yes	m.1:80	m	m
A.3.7.2/1	repertoire-capability	Yes	m.2:2	m	m
A.3.7.2/2	repertoire-assignment	Yes	m.3	m	m
m.1	It is mandatory to support the default value of 80; all other values are optional.				
m.2	It is mandatory to support the default value of 2; all higher values are optional.				
m.3	It is mandatory to support the character set described in table A.5 and at least one of the character sets described in A.6, A.7 and A.8; all others are optional.				

Table A.4 - VTE requirements for application display object

Item ref. (9041-2)	Name of item	Negot-iable	Profile values	Terminal Status	Application Status
A.3.6/5	x-window	Yes	m.1:80	m	m
A.3.7.3/1	repertoire-capability	Yes	m.2:2	m	m
A.3.7.3/2	repertoire-assignment	Yes	m.3	m	m
m.1	It is mandatory to support the default value of 80; all other values are optional.				
m.2	It is mandatory to support the default value of 2; all higher values are optional.				
m.3	It is mandatory to support the character sets described in tables A.5, A.6, A.7 and A.8; all others are optional.				

Table A.5 - First repertoire referenced by VTE requirements for DOs

Table ref. (9041-2)	Item	Value
A.3.7.5 and A.3.7.6 Repertoire and font support	Repertoire name	Virtual Terminal Service Transparent Set
	Standard name	ISO 9040 default scheme based on ISO 2022
	Register reference Escape sequences	ISO 2375 Registration No. 125 ESC 2/5 2/15 4/2
	Fonts supported	"device-dependent"

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Table A.6 - Second repertoire referenced by VTE requirements for DOs

Table ref. (9041-2)	Item	Value
A.3.7.5 and A.3.7.6 Repertoire and font support	Repertoire name	IRV of ISO/IEC 646:1991 (C0 and G0 Sets)
	Standard name	ISO 9040 default scheme based on ISO 2022
	Register reference Escape sequences	ISO 2375 Registration No. 1 and No. 6 ESC 2/8 4/2, ESC 2/1 4/0
	Fonts supported	"device-dependent"

Table A.7 - Third repertoire referenced by VTE requirements for DOs

Table ref. (9041-2)	Item	Value
A.3.7.5 and A.3.7.6 Repertoire and font support	Repertoire name	IRV of ISO/IEC 646:1991 (G0 Set only)
	Standard name	ISO 9040 default scheme based on ISO 2022
	Register reference Escape sequences	ISO 2375 Registration No. 6 ESC 2/8 4/2
	Fonts supported	"device-dependent"

Table A.8 - Fourth repertoire referenced by VTE requirements for DOs

Table ref. (9041-2)	Item	Value
A.3.7.5 and A.3.7.6 Repertoire and font support	Repertoire name	ISO 8859/1 (Latin Alphabet No. 1)
	Standard name	ISO 9040 default scheme based on ISO 2022
	Register reference Escape sequences	ISO 2375 Registration No. 6 and No. 100 ESC 2/8 4/2, ESC 2/13 4/1
	Fonts supported	"device-dependent"

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A.6 Initiator/Responder Capabilities

Table A.9 identifies whether the configuration shall be an initiator or a responder.

Table A.9 - Initiator/Responder Capabilities

Item ref. (9041-2)	Name of Item	Normative Reference	Status
A.4.3/1	Initiator	5.1	c1
A.4.3/2	Responder	5.1	c2
c1	If terminal then m else x.		
c2	If application then m else x.		

A.7 VT PDUs and PDU parameters

The profile requirements concerning the VT PDUs and PDU parameters listed in A.4 and A.5 of the PICS are specified in the Common Requirements List of ISO/IEC ISP 11187-1.

A.8 Lower level negotiation elements

Tables A.10 to A.15 below specify static conformance requirements concerning the lower level negotiation elements that are listed in A.6 of the PICS.

Table A.10 - Profile Argument Offer List requirements

Item ref. (9041-2)	Name of item	Norm-ative ref.	TERMINAL SENDING	
			Status	Values
Prerequisite (VTE-profile-name for AVT16): A.5.2/8 or A.5.24/1 = {iso standard 11187 profiles(1) 115 16}				
A.6.1/7	vteParams		m	
A.6.1/8	displayObjects		m	
A.6.4/2	name		m	m.1:"D"
A.6.4/3	ParameterOffers		m	See table A.12
m.1	This value is mandatory; other values are excluded.			

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Table A.11 - Profile Argument Value List requirements

Item ref. (9041-2)	Name of item	Norm-ative ref.	APPLICATION SENDING	
			Status	Values
Prerequisite (Use of AVT16): Vena = TRUE, current-VTE = {iso standard 11187 profiles(1) 115 16}				
A.6.2/7	vteParams		m	
A.6.2/8	displayObjects		m	
A.6.5/2	name		m	m.1:"D"
A.6.5/3	ParameterOffers		m	See table A.14
m.1	This value is mandatory; other values are excluded.			

Table A.12 - CDS Offer requirements

Item ref. (9041-2)	Name of item	Norm-ative ref.	TERMINAL SENDING	
			Status	Values
Prerequisite: A.6.4/2 = "D"				
A.6.4/5	xParamOffer		m	
A.6.4.1/4	window	8.1.1	m	
A.6.12/1	limit IntegerOffer		m	
A.6.12/2	individualValue		c1	m.1:80
A.6.12/3	range		o	
A.6.12/4	minimum		o	o.1:1..80
A.6.12/5	maximum		o	o.1:80..MAX
A.6.4/9	repertoireOfferList	8.1.2	o	See table A.13
c1:	IF (range is sent) THEN o ELSE m.			
m.1:	It is mandatory to support this value; all other values are optional.			
o.1:	It is mandatory to support at least one of the values of the set, all other values are optional.			

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Table A.13 - Common offer requirements

Item ref. (9041-2)	Name of item	Norm-ative ref.	TERMINAL SENDING	
			Status	Values
A.6.4.1/B	CompoundRepertoireOffer	8.1.2		
A.6.4.1/6	SEQ OF RepertoireFontOffer		m	
A.6.4.1/8	SEQ OF SEQ		m	
A.6.4.1/9	repertoire		m	
A.6.4.1/11	iso2022		m	o.1:{'2842'H}|{'2842'H,'2140'H}|{'2842'H,'2D41'H}
o.1:	It is optional to offer any of the values in this set (it is mandatory for the application to accept any and all from this set); all other character sets are optional (both for the terminal and application sides).			

Table A.14 - CDS Value requirements

Item ref. (9041-2)	Name of item	Norm-ative ref.	APPLICATION SENDING	
			Status	Values
Prerequisite: A.6.5/2 = "D"				
A.6.5/5	xParamValues		m	
A.6.5.1/4	window	8.1.1	m	m.1:80
A.6.5/9	repertoire	8.1.2	m	See Table A.15
m.1:	It is mandatory to support this value, all other values are optional.			

Table A.15 - Common value requirements

Item ref. (9041-2)	Name of item	Norm-ative ref.	APPLICATION SENDING	
			Status	Values
A.6.5.1/B	CompoundRepertoireValue	8.1.2		
A.6.5.1/6	SEQ OF RepertoireFontValue		m	
A.6.5.1/8	SEQUENCE		m	
A.6.5.1/9	repertoireAssingt		m	
A.6.5.1/11	iso2022		m	m.1:{'2842'H}|{'2842'H,'2140'H}|{'2842'H,'2D41'H}
m.1:	It is mandatory to support all the values in this set; all other values are optional.			

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Annex B
(normative)

Profile Specific ICS Proforma

B.1 Identification of ICS proforma corrigenda

If corrigenda to this proforma are published, suppliers of the proforma should modify the proforma or attach additional pages, as appropriate, and shall then record the application of the corrigenda by completing table B.1.

Table B.1 - Identification of ICS proforma corrigenda

Identification of corrigenda applied to this ICS proforma	ISO/IEC ISP 11187-5:- Corr: Corr: Corr:

B.2 Instructions

This ICS proforma provides a means for the supplier of an implementation or client of a test laboratory to specify the level of support provided for the semantics of those VT information objects that are referenced by the A-mode Generalized Telnet Application Profile AVT16.

This information is provided by completing the questionnaire given in clause B.6. The questionnaire is in tabular form. Each tabular item describes a capability of an information object. Support for that capability implies that the semantic behavior of the capability has been implemented in the context of this Application Profile, in accordance with the specification of the information object concerned.

Each item provides a reference to the semantic specification of the capability, a status value describing the support requirements of the Application Profile and space for a support answer to be given. The references are prefixed by an identifier for the ISP concerned, as follows:

AP ISO/IEC ISP 11187-5:- (Application Profile);
VT ISO/IEC ISP 11184-2:- (VTE-profile);
CO ISO/IEC ISP 11185-12:- (Control Objects).

The following notation is used in the status columns:

- m mandatory, the capability is required to be implemented in conformance with the relevant specification;
- o optional, the capability may be implemented, and if it is implemented it is required to conform to the relevant specification;
- c conditional, the requirement depends on the support answer for some other item.

Each conditional status is numbered and references a footnote in the table concerned that gives the corresponding conditional expression. Support answers to other items are referenced in conditional expressions in the form y/z where y is the number of the smallest subclause that contains the item concerned and z is the reference number of the item within that subclause. An optional status may also have a corresponding footnote, for example to specify that two or more options are mutually exclusive.

Support answers shall be given using the following notation:

- 'yes' or 'y' supported;
- 'no' or 'n' not supported.

The following abbreviations are used in the column headings:

- Sts status;
- Spt support.

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This notation is in accordance with ISO/IEC [DIS] 9646-7, to which reference should be made for further information.

B.3 Identification of the implementation

A supplier or a client of a test laboratory that completes a copy of this ICS proforma shall attach to that copy an identification of the implementation to which it applies, identifying:

a. the implementation and the system in which it resides;

b. the supplier of the system and/or the client of the test laboratory;

c. the person to contact if there are any queries concerning the content of the ICS.

B.4 Identification of the profile

This ICS proforma applies to the A-mode Forms Application Profile for VT whose specification is given in:

ISO/IEC ISP 11187-5: Information technology -International Standardized Profiles AVT1n, AVT2n - Virtual Terminal Basic Class - Application Profiles - Part 5: AVT16 - A-mode Generalized Telnet Application Profile.

B.5 Identification of corrigenda to referenced specifications

If corrigenda are published to the specification of the Application Profile, or to the specifications of any of the VT information objects referenced by the Application Profile, table B.2 shall be completed to list the corrigenda that have been implemented. Specifications are listed by their taxonomy identifier in accordance with ISO/IEC TR 10000-2 and corrigenda by the Technical Corrigenda or equivalent that are issued for the ISP containing the specification.

Table B.2 - Identification of corrigenda implemented for AVT16

Identification of corrigenda implemented for AVT16	ISO/IEC ISP 11187-5:- Corr: Corr:
Identification of corrigenda implemented for FVT115	ISO/IEC ISP 11184-2:- Corr: Corr:
Identification of corrigenda implemented for FVT2116	ISO/IEC ISP 11185-12:- Corr: Corr:
Identification of corrigenda implemented for FVT2117	ISO/IEC ISP 11185-12:- Corr: Corr:
Identification of corrigenda implemented for FVT2118	ISO/IEC ISP 11185-12:- Corr: Corr:
Identification of corrigenda implemented for FVT2119	ISO/IEC ISP 11185-12:- Corr: Corr:

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B.6 ICS proforma tables

Table B.3 shall be completed to indicate whether or not the implementation is claimed to conform to this Application Profile.

Table B.3 - Global statement of conformance

No.	Question	Reply
1	Are all the mandatory capabilities of ISO/IEC ISP 11187-5 implemented?	
NOTE - Answering 'No' to this question indicates non-conformance to the OSI specification. Non-supported mandatory capabilities are to be identified in the ICS, with an explanation of why the implementation is non-conforming.		

B.6.1 Information objects

Table B.4 shall be completed to indicate which VT information objects have been implemented in accordance with the semantics specified in Application Profile AVT16.

Table B.4 - Information objects

No.	Taxonomy Identifier	Sts	Reference	Support
1	FVT2116	m	AP 5.1	
2	FVT2117	m	AP 5.1	
3	FVT2118	m	AP 5.1	
4	FVT2119	m	AP 5.1	

The available TELNET options, and the values used to represent them, are specified in RFC's 854 and 855 or their successors. Table B5 shall be completed to indicate which of these options are implemented in accordance with these RFC's. Each value should be entered against the taxonomy identifier of the control object that is used to signal or negotiate the option, as appropriate.

The options that should be implemented for an implementation that is intended to interwork with an Internet host are specified in RFC 1123 or its successor.

Table B.5 - Control object data element support

No.	Taxonomy Identifier	Implemented Values
1	FVT2117	
2	FVT2118	
3	FVT2119	

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Annex C
(normative)

Identification of control object classes

C.1 CO classification by sub-register

The procedures specified in ISO/IEC 9834-5 for the form of entries in the International Register of VT Control Object Type Definitions specify that the register shall consist of a number of sub-registers, each of which corresponds to a major classification of VT control object. These procedures further specify that where a register entry is copied with no technical change from one register to a different one then the ASN.1 object identifier originally allocated may be retained to identify the same object in the new register or a new value may be allocated.

The form specified for new object identifier values assigned in the International Register permits the sub-register to be identified without reference to the register entry. Object identifiers retained from an old register may, but need not, permit similar identification of the sub-register. If they do so permit, then such identification requires knowledge of the object identifier structure used by the registration authority concerned.

This annex specifies the forms of ASN.1 object identifier that shall be recognised by a conforming implementation as identifying the sub-register to which a particular VT control object type definition belongs.

C.2 Object identifier forms

It is a recommendation of ISO 9040, given in C.1.1.2 of that International Standard, that object identifiers chosen by a registration authority should have a structure that includes a node which allows identification of the type of control object being registered. In the context of the International Register, this type represents the corresponding sub-register.

This structure requires there to be a node that identifies a VT control object, below which there is an arc that identifies the sub-register. In accordance with ISO 9040, the values to be used for this arc and the corresponding sub-registers are:

- 0 Miscellaneous COs;
- 1 FEICOs;
- 2 FEPCOs;
- 3 RIOs;
- 4 TCCOs.

Registration authorities operating in accordance with ISO/IEC 9834-1 have assigned the following object identifiers as identifying a VT control object:

- { iso(1) standard(0) 9040 controlObject(0) };
- { iso(1) standard(0) 9834 vt-co-def(5) };
- { iso(1) identified-organization(3) ewos(16) eg(2) vt(7) controlObject(0) };
- { iso(1) identified-organization(3) oiw(14) vtsig(12) controlObject(0) };

and have assigned the arc below each of these nodes as identifying a sub-register in accordance with the above recommendation of ISO 9040.

This Application Profile requires that when an ASN.1 object identifier with one of the above structures is received as a CO-type-identifier value then it shall be recognised as identifying the sub-register to which the referenced control object type definition belongs.

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Annex D
(informative)

TELNET References

For migration or gateway purposes, refer to RFC 1123 "Host Requirements for Applications" to determine which TELNET commands and options are recommended and/or required in conventional implementations.

The semantic definitions used by the Generalized Telnet Display and Control Objects are defined in the following documents:

Table D.1 - Non-normative Materials

Number	Name	Submission date
MIL-STD 1782	TELNET PROTOCOL U.S. Military Standard 1782	10 May 1984
RFC 854	TELNET PROTOCOL SPECIFICATION	May 1983
RFC 855	TELNET OPTIONS SPECIFICATION	May 1983
RFC 1123	REQUIREMENTS FOR INTERNET HOSTS -- Application and Support	October 1989

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