

INTERNATIONAL STANDARDIZED PROFILE

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

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

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

Partie 3: Profil d'application mode S de formulaires



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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 Standardized Profiles 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 11187-3 was prepared with the collaboration of

- OSI 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*
- *Part 2: Common Supporting Layers Requirements*
- *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.

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 the specification of 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. To evaluate conformance of a particular implementation, it is necessary to have a statement of which capabilities and options have been implemented for a given OSI specification. Such a statement is called an Implementation Conformance Statement (ICS). This International Standardized Profile also contains the specification of an ICS proforma for each specified Application Profile.

This part of ISO/IEC ISP 11187 was developed in close cooperation between the three Regional OSI Workshops, namely the OSI Implementors' Workshop (OIW) of the United States, the European Workshop for Open Systems (EWOS) and the OSI Asia-Oceania Workshop (AOW). It was developed under the editorship of EWOS from a functional standard specified in the European Pre-standard ENV 41 208. The text is harmonized between these three Workshops and it has been ratified by the plenary assemblies of each Workshop.

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

Part 3: AVT22 — S-mode Forms 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 Information Objects that provide these 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 realise a wide range of distinct functions. Particular functions may be realised through the selection of appropriate VT functional units, F-Profiles and other VTE-profile argument values. The specification of the selection required to realise 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 objects 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;
- 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 S-mode Forms 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 form-filling applications. This A-profile specifies a mode of operation of, and a selection of options for use with, the S-mode Forms VTE-profile FVT121. 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 S-mode Forms Application Profile specified herein in compliance with the relevant requirements, and in accordance with the relevant guidance, given in ISO/IEC 9646-7. The supplier of an implementation which is claimed to conform to ISO/IEC ISP 11187-3 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 subclass of the class of Application Profiles.

A Profile within this subclass has a Profile identifier of the form AVT*ab*, 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 of *a* greater than 2 are reserved for future developments.

This International Standardized Profile ISO/IEC ISP 11187 contains the specifications of the Profiles with identifiers of the form AVT1*b* and AVT2*b*. 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

AVT22 — S-mode Forms 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.

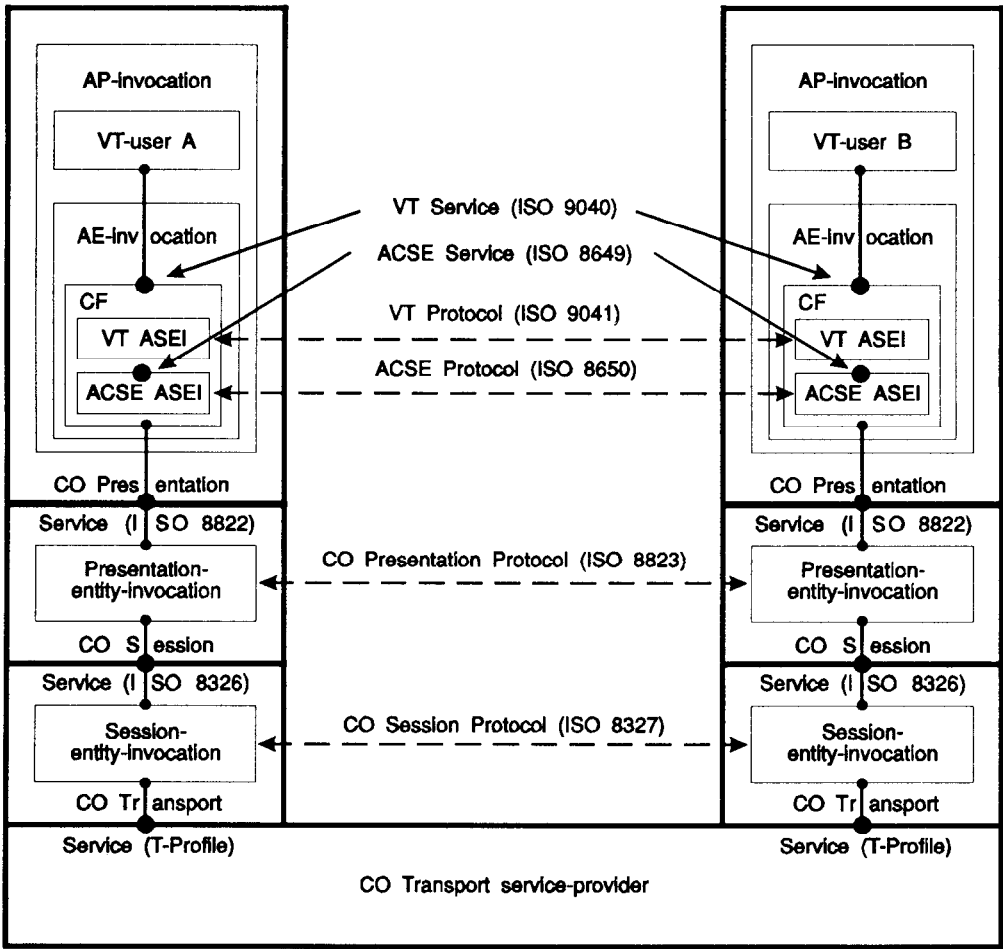


Figure 1 — Interactive VT communication between two end systems

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 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 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 behaviour 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 an asymmetry between the two communicating end systems. One end system is assumed

to possess a terminal device with facilities for the input and display of data by a human user. It may also possess a printer or other hard-copy device. 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. The other end system is assumed to have an application role and to contain an application package that the terminal end system desires to access. This asymmetry is recognised by the VT Service in accordance with 19.3.2 of ISO 9040. The VT-user of the end system with the real devices is designated as the Terminal VT-user, the other as the Application VT-user, and the two do not have equal access to the functions 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 ISP 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* (third edition).

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 8326:1987²⁾, *Information processing systems — Open Systems Interconnection — Basic connection oriented session service definition*. (See also CCITT Recommendation X.215).

ISO 8327:1987²⁾, *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 8649:1988²⁾, *Information processing systems — Open Systems Interconnection — Service definition for the Association Control Service Element*. (See also CCITT Recommendation X.217).

ISO 8650:1988²⁾, *Information processing systems — Open Systems Interconnection — Protocol specification for the*

1) The Registration Authority for ISO 2375 is the European Computer Manufacturers Association (ECMA), 114 rue du Rhône, CH-1204 Genève, 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.

Association Control Service Element. (See also CCITT Recommendation X.227).

ISO 8650:1988/Cor.1:1990, *Information processing systems — Open Systems Interconnection — Protocol specification for the Association Control Service Element. Technical Corrigendum 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 8823:1995, *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* (third edition). (See also ITU-T Recommendation X.680).

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)* (third edition). (See also ITU-T Recommendation X.690).

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* (second edition). (See also ITU-T Recommendation X.207 (1993)).

ISO/IEC 9646-1:1994, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 1: General concepts* (second edition). (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 ITU-T Recommendation X.296).

ISO/IEC 9834-4:1991, *Information technology — Open Systems Interconnection — Procedures for the Operation of OSI Registration Authorities — Part 4: Register of VTE Profiles.*

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* (third edition).

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

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

ISO/IEC ISP 11184-1:1995, *Information technology — International Standardized Profiles FVT1nn — Virtual Terminal Basic Class — Register of VTE-profiles — Part 1: FVT121, FVT122 — S-mode Forms and Paged VTE-profiles.*

ISO/IEC ISP 11185-1:1994, *Information technology — International Standardized Profiles FVT2nn — Virtual Terminal Basic Class — Register of control object type definitions — Part 1: FVT211, FVT212 — Sequenced and Unsequenced Application Control Objects.*

ISO/IEC ISP 11185-2:1994, *Information technology — International Standardized Profiles FVT2nn — Virtual Terminal Basic Class — Register of control object type definitions — Part 2: FVT213, FVT214 — Sequenced and Unsequenced Terminal Control Objects.*

ISO/IEC ISP 11185-4:1994, *Information technology — International Standardized Profiles FVT2nn — Virtual Terminal Basic Class — Register of control object type definitions — Part 4: FVT217 — Horizontal Tabulation Control Object.*

ISO/IEC ISP 11185-5:1994, *Information technology — International Standardized Profiles FVT2nn — Virtual Terminal Basic Class — Register of control object type definitions — Part 5: FVT218 — Logical Image Control Object.*

ISO/IEC ISP 11185-6:1994, *Information technology — International Standardized Profiles FVT2nn — Virtual Terminal*

Basic Class — Register of control object type definitions — Part 6: FVT219 — Status Message Control Object.

ISO/IEC ISP 11185-7:1994, Information technology — International Standardized Profiles FVT2nn — Virtual Terminal Basic Class — Register of control object type definitions — Part 7: FVT2110 — Entry-Control Control Object.

ISO/IEC ISP 11185-8:1994, Information technology — International Standardized Profiles FVT2nn — Virtual Terminal Basic Class — Register of control object type definitions — Part 8: FVT221 — Forms FEICO (Field Entry Instruction Control Object) No.1.

ISO/IEC ISP 11185-10:1994, Information technology — International Standardized Profiles FVT2nn — Virtual Terminal Basic Class — Register of control object type definitions — Part 10: FVT231 — Forms FEPCO (Field Entry Pilot Control Object) No.1.

ISO/IEC ISP 11185-13:1995, Information technology — International Standardized Profiles FVT2nn — Virtual Terminal Basic Class — Register of control object type definitions — Part 13: FVT2111 — Waiting Time Control Object.

ISO/IEC ISP 11187-1:1996, Information technology — International Standardized Profiles AVT1n, AVT2n — Virtual Terminal Basic Class — Application Profiles — Part 1: Common VT Protocol Requirements.

ISO/IEC ISP 11187-2:1996, 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) application-process-invocation;
- d) 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;
- 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.

3.2.2 This part of ISO/IEC ISP 11187 makes use of the following terms defined in ISO/IEC ISP 11185-10:

- a) device control store;
- b) device status store;
- c) local action function;
- d) local action operation;

- e) logical entry location;
- f) selectable field;
- g) signal event.

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;
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;
FEC	Field Entry Condition;
FEE	Field Entry Event;
FEI	Field Entry Instruction;
FEICO	Field Entry Instruction Control Object;
FEIR	Field Entry Instruction Record;
FEPCO	Field Entry Pilot Control Object;
FEPR	Field Entry Pilot Record;
FER	Field Entry Reaction;
ICS	Implementation Conformance Statement;
OSI	Open Systems Interconnection;
PDU	Protocol Data Unit;
PICS	Protocol Implementation Conformance Statement;
RIO	Reference Information Object;
RL	Requirements List;
SCS	System Conformance Statement;
TCCO	Termination Conditions Control Object;
VT	Virtual Terminal;
VTE	Virtual Terminal Environment;
VTPM	Virtual Terminal Protocol Machine.

Table 1 — Protocols required

Protocol name	Protocol specification	PICS proforma specification
VT	ISO 9041-1:1990	ISO/IEC 9041-2:1993
ACSE	ISO 8650:1988 ¹⁾	ISO/IEC 8650-2:1995
Presentation	ISO/IEC 8823-1:1995	ISO/IEC 8823-2:1995
Session	ISO 8327:1987 ¹⁾	ISO/IEC 8327-2:— ²⁾
1) Currently under revision. 2) To be published.		

Table 2 — Information objects required

Taxonomy identifier	Object type	ISO/IEC ISP Reference
FVT121	VTE-profile	11184-1:1995
FVT211	Miscellaneous CO	11185-1:1994
FVT212	Miscellaneous CO	11185-1:1994
FVT213	Miscellaneous CO	11185-2:1994
FVT214	Miscellaneous CO	11185-2:1994
FVT221	FEICO	11185-8:1994
FVT231	FEPCO	11185-10:1994
FVT2111	Miscellaneous CO	11185-13:1995

Table 3 — Additional information objects required for terminal implementation

Taxonomy identifier	Object type	ISO/IEC ISP Reference
FVT217	Miscellaneous CO	11185-4:1994
FVT218	Miscellaneous CO	11185-5:1994
FVT219	Miscellaneous CO	11185-6:1994
FVT2110	Miscellaneous CO	11185-7:1994

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.

This Application Profile distinguishes between terminal and application 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 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 and, in the case of a terminal implementation, also table 3.

Tables 2 and 3 specify VT information objects by their taxonomy identifiers as given in ISO/IEC TR 10000-2. The tables also give the general classification of the object within the taxonomy, together with a reference to the ISP part that contains the specification.

For an application implementation, implementation of the information objects listed in table 3 is optional, but if they are implemented then it shall be in accordance with the relevant semantic definition.

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 and, where appropriate, table 3;

- 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 behaviour consistent with having implemented :

- d) the virtual terminal protocol machine so as to support the VTE-profile FVT121 as a current-VTE (see A.2.1 of ISO 9041-1);
- e) the relevant control objects listed in tables 2 and 3 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 11184-1;
- 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 7.1.

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.

A system claiming conformance as a terminal implementation shall also exhibit external behaviour consistent with having implemented:

- i) the model of a terminal VT-user specified in 12.1 of ISO/IEC ISP 11185-10;
- j) the local processing function of that model in accordance with 12.2 of ISO/IEC ISP 11185-10.

A system claiming conformance as a terminal implementation shall also include real devices that satisfy the requirements specified in 7.2 and 7.3.

5.2 Profile ICS proforma

In compliance with 6.5.4 of ISO/IEC 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 11187-3;
- 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 FVT121 referenced in table 2 above is given in ISO/IEC ISP 11184-1. 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.

The type definitions of the FEICO FVT221 and FEPCO FVT231 referenced in table 2 above are given in parts 8 and 10 respectively of ISO/IEC ISP 11185. These definitions permit a referencing VTE-profile, and by delegation of authority consequently also a referencing Application Profile, to provide:

- semantic linkage between the FEICO, FEPCO and other COs that may be present in the VTE;
- a specification of the local action function that is accessed by certain FECs and FERs of the FEPCO;
- an initial content for the FEICO;
- an initial content for the FEPCO.

In accordance with clause 9 of ISO/IEC ISP 11184-1 and clause 6 of ISO/IEC ISP 11187-1, a mutual agreement to operate the VTE-profile FVT121 in accordance with the Application Profile AVT22 is created by the establishment of a full-VTE for which the VTE-profile name is the ASN.1 object identifier

{ iso standard 11187 1 profiles(1) 121 22 }.

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

6.1 Default values for VTE-profile arguments

6.1.1 This Application Profile specifies default values for the four VTE-profile arguments of FVT121 that enable the use of additional registered control objects to be negotiated. These are:

- r13 — CO-name;
- r14 — CO-type-identifier;
- r22 — device-control-object for device "D";
- r31 — device-control-object for device "P".

The default values for all other optional VTE-profile arguments of FVT121 are as specified in clause 13 of ISO/IEC ISP 11184-1.

NOTE — All of the 31 VTE-profile arguments of FVT121 are optional with the exception of r12. The value of profile argument r12

specifies, to the VT service-provider, which of the two communicating VT-users has the terminal role. Since either VT-user can initiate the VT-association, this value cannot be determined by default.

6.1.2 The default value for an optional single-occurrence VTE-profile argument is the value invoked when no value is specified for that argument in the response primitive of the negotiation service concerned. For multiple-occurrence VTE-profile arguments, two situations arise. If such an argument has a determinate number of occurrences then each occurrence is treated for the purposes of default as if it were a single-occurrence argument. If such an argument has an indeterminate number of occurrences then additional occurrences, with specific values, may be invoked by default even when values for one or more occurrences are specified in the response primitive. For such arguments a default value alone is not sufficient; a default procedure is required that specifies both the default value or values and the conditions under which they are invoked.

NOTE — The number of occurrences of a multiple-occurrence VTE-profile argument may be specified explicitly in a VTE-profile specification or may be determined by the value, or by the number of occurrences, of another argument; both situations count as determinate. The arguments listed in 6.1.1 are examples of arguments that have an indeterminate number of occurrences.

6.1.3 Annex C of this part of ISO/IEC ISP 11187 specifies certain nodes of the ASN.1 object identifier tree that shall be recognised as identifying sub-registers of a register of CO type definitions in accordance with ISO/IEC 9834-5. The sub-registers correspond to the five major classifications of CO types, namely Miscellaneous COs, FEICOs, FEPCOs, RIOs and TCCOs.

The default invocations of the four VTE-profile arguments listed in 6.1.1 are all determined by the CO-type-identifier values included in the offers made, and the values returned, for r14. If either the offers made, or the values returned, include any CO-type-identifier value that is not in accordance with annex C then no occurrences are invoked by default for any of the four VTE-profile arguments. Otherwise a separate default specification applies for each of the five major classifications of CO types.

The default occurrences for a particular classification are invoked when, and only when, no CO-type-identifier belonging to that classification is included in either the offers made, or the values returned, for r14. The default occurrences for each classification are specified in 6.1.4 to 6.1.6.

NOTE — It is necessary to require no offer, as well as no response, so that a response to an explicit offer may specify that it supports none of the offered COs of the classification concerned without at the same time invoking the default COs of that classification.

6.1.4 The default for the FEICO classification consists of the invocation of a single occurrence for each of r13, r14 and r22, with the following values:

```
r13:  "EI"
r14:  { iso standard 9834 5 1 1 }
r22:  "EI"
```

There is no corresponding invocation of r31. This default designates a FEICO with the taxonomy type FVT221 that is linked to the main device.

6.1.5 The default for the FEPCO classification consists of the invocation of a single occurrence for each of r13, r14 and r22, with the following values:

```
r13:  "EP"
r14:  { iso standard 9834 5 2 1 }
r22:  "EP"
```

There is no corresponding invocation of r31. This default designates a FEPCO with the taxonomy type FVT231 that is linked to the main device.

6.1.6 The defaults for the Miscellaneous CO, RIO and TCCO classifications are empty; no occurrences are invoked for any of r13, r14, r22 and r31.

6.2 CO semantic linkages

The location of tabulation stops referenced by the "At tab stop" FEC defined by 12.5.5 of ISO/IEC ISP 11185-10 shall be determined by use of a Horizontal Tabulation CO of the type with taxonomy identifier FVT 217 as defined in ISO/IEC ISP 11185-4. This CO shall be invoked explicitly if required, with CO-name "HT", through use of VTE-profile arguments r13 and r14. If the VTE does not contain such a CO then this FEC predicate shall always evaluate "true".

The test of equivalence between a character and the content of a non-empty DO array element that is to be used by the 'At characters' FEC defined by 12.5.6 of ISO/IEC ISP 11185-10 shall be that specified in 12.3.5.2.2 of ISO/IEC ISP 11185-8 for validation of field entries by the FEICO. This specification permits the FEICO to control whether or not the test is case-sensitive.

In the model of the VT-user that is common to both parts 8 and 10 of ISO/IEC ISP 11185, the field-control object defined by 3.3 of ISO/IEC ISP 11184-1 shall be located in the device control store.

6.3 FEPCO local action function

The local action function that is accessed by several FECs and FERs of the FEPCO type FVT231 takes an integer argument and returns a local action operation. This Application Profile provides a minimum specification for the local action function, in which the assigned operations all update the logical entry location. This minimum specification may be augmented by other Application Profiles that are invoked simultaneously with this one, or by private agreements that are outside the scope of this Application Profile.

NOTE 1 — Values of the local action function are not constrained to be update operations for the logical entry location. Enhancements to this specification may therefore, for example, provide FERs with the ability to update other objects within the device control store and device status stores.

The minimum assignment of local action operations to argument values for the local action function is specified in table 4. The 'Arg' column gives the argument value and the 'Local action operation' column specifies the corresponding update to the logical entry location that is performed by the operation. The symbol "⋮=" is used as an assignment operator.

The integer values to which local action operations are assigned are structured as terminal signals of the "special"

type, in accordance with 15.3 of ISO/IEC ISP 11184-1. Table 4 also gives the names assigned there to the base values and to the flags set "on" for each argument value listed.

NOTE 2 — This structure permits the use of values for signal events that are suitable both as updates for the Sequenced Terminal CO and as arguments for the local action function.

Operations specified in table 4 in terms of logical coordinates (k, f, z) update each coordinate as indicated. The functions next(f) and previous(f) are defined in 19.1.3.2.2 of ISO 9040. The special address values "start-k" and "end-k" are defined in 19.1.3.5 of ISO 9040 and are to be interpreted as if the special value "log-current" gives the current value of the logical entry location.

Table 4 — Minimum specification for the local action function

Arg	Name of base value	Flags "on"	Local action operation
270	LeftArrow	—	x := x-1
271	RightArrow	—	x := x+1
272	UpArrow	—	y := y-1
273	DownArrow	—	y := y+1
278	Home	—	(x,y,z) := "start-y"
279	End	—	(x,y,z) := "end-y"
280	PageUp	—	z := z-1; x := 1; y := 1
281	PageDown	—	z := z+1; x := 1; y := 1
2307	Tab	"shift"	f := next(f); k := 1
2308	BackTab	"shift"	f := previous(f); k := 1
2318	LeftArrow	"shift"	k := k-1
2319	RightArrow	"shift"	k := k+1
2320	UpArrow	"shift"	f := f-1; k := 1
2321	DownArrow	"shift"	f := f+1; k := 1
2326	Home	"shift"	(k,f,z) := "start-k"
2327	End	"shift"	(k,f,z) := "end-k"
2328	PageUp	"shift"	z := z-1; f := 1; k := 1
2329	PageDown	"shift"	z := z+1; f := 1; k := 1

Operations specified in terms of primitive coordinates (x, y, z) depend on the correspondence between logical and primitive addressing coordinates that is defined in 13.1.3.1 of ISO 9040. For any field this correspondence determines a range of values for k that starts at k=1 and ends at a bound specified in that subclause. If the initial value of the logical entry location is a logical address that is out of range, then the logical entry location shall be left unchanged. If the initial value is within range but the final primitive address is not within any field then the operation shall leave the f and z coordinates unchanged but shall set the k coordinate to zero. The special address values "start-y" and "end-y" are defined in 19.1.1.4 of ISO 9040 and are to be interpreted as if the special value "current" gives the primitive address that corresponds to the current value of the logical entry location.

Annex D gives some examples of FEPRs that make use of this local action function.

6.4 FEICO initial content

When the VTE includes, either by default or through explicit negotiation, a FEICO of type FVT221 with CO-name "EI" then it shall have the initial content that is specified in table 5. This

specification is given in terms of ASN.1 value notation for a value of the type FEI as exported from the module ISP11185-FEICO1 defined in ISO/IEC ISP 11185-8. For each FEIR_{nn}, nn is the FEIR-index value used to reference the FEIR in accordance with 20.3.4.2 of ISO 9040. This Application Profile also requires that FEICO update operations shall use an FEIR-index value greater than 127.

NOTE — The character oriented FEIRs for the initial content utilise the default rendition attributes; see 12.6a) of ISO/IEC ISP 11185-8.

Table 5 — FEICO Initial Content

FEIR No	ASN.1 Value of FEIs
FEIR00	-- Not used --
FEIR01	optionalField
FEIR02	mandatoryField
FEIR03	selectableField: { }
FEIR04	protectedField
FEIR05	fillField
FEIR06	echoReceivedChar
FEIR07	echoOff
FEIR08	ignoreCase
FEIR09	inhibitLogRendAttOp
FEIR10	allowedCharacters: { { lowValue {primaryValue '41'H, repertoire 1, attributes { }}, highValue '5A'H } } -- A,B,...,Z --
FEIR11	allowedCharacters: { { lowValue {primaryValue '61'H, repertoire 1, attributes { }}, highValue '7A'H } } -- a,b,...,z --
FEIR12	allowedCharacters: { { lowValue {primaryValue '30'H, repertoire 1, attributes { }}, highValue '39'H } } -- 0,1,...,9 --
FEIR13	disallowedCharacters: { { lowValue {primaryValue '41'H, repertoire 1, attributes { }}, highValue '5A'H } } -- A,B,...,Z --
FEIR14	disallowedCharacters: { { lowValue {primaryValue '61'H, repertoire 1, attributes { }}, highValue '7A'H } } -- a,b,...,z --
FEIR15	disallowedCharacters: { { lowValue {primaryValue '30'H, repertoire 1, attributes { }}, highValue '39'H } } -- 0,1,...,9 --
FEIR16–FEIR127	-- Reserved --

NOTE — The character-box graphic elements referenced by FEIR10–FEIR15 will only be as indicated in the ASN.1 comments if the first occurrence of the VTE-parameter repertoire-assignment takes either the ISO 9040 default value or some compatible value.

6.5 FEPCO initial content

When the VTE includes, either by default or through explicit negotiation, a FEPCO of type FVT231 with CO-name "EP" then it shall have the initial content that is specified in table 6. This specification is given in terms of ASN.1 value notation for values of the types FEE, FEC and FER as exported from the module ISP11185-FEPCO1 defined in ISO/IEC ISP 11185-10. For each FEPR_{nn}, nn is the FEPR-index value used to reference the FEPR in accordance with 20.3.5.2 of ISO 9040. This Application Profile also requires that FEPCO update operations shall use an FEPR-index value greater than 127.